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FINAL FOCUSED REMEDIAL INVESTIGATION FOR SITE 1 SOIL AND OPERABLE UNIT 4  
(OU 4) ALLEGANY BALLISTICS LABORATORY NIROP ROCKET CENTER WV  
07/01/2006  
CH2M HILL

Final

**Focused Remedial Investigation  
for Site 1 Soil, Operable Unit 4,  
at  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia**

Contract Task Order 110

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# Acronyms and Abbreviations

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ABG	Active Burning Ground
ABL	Allegany Ballistics Laboratory
BAF	bioaccumulation factor
BCF	bioconcentration factor
BERA	baseline ecological risk assessment
bgs	below ground surface
BTAG	Biological Technical Assistance Group
CBC	Christmas Bird Count
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CO	Consent Order
COC	Constituent of Concern
COPC	Constituents of Potential Concern
CS	Confirmation Study
CSF	cancer slope factor
1,2-DCE	1,2-dichloroethene
2,6-DNT	2,6-dinitrotoluene
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ERA	ecological risk assessment
FDP	Former Disposal Pits
FS	Feasibility Study
GOCO	Government Owned, Contractor Operated
HHRA	human health risk assessment
HI	hazard index
HMX	high melting point explosive
HQ	hazard quotient
IAS	Initial Assessment Study
IDW	investigation derived waste
IEUBK	Integrated Exposure Uptake Biokinetic
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
$K_{oc}$	carbon/water partition coefficient
LOAEL	lowest observed adverse effects level
LTM	Long-Term Monitoring

mg/kg	milligrams per kilogram
mg/L	milligrams per liter
msl	mean sea level
NACIP	Navy Assessment and Control of Installation Pollutants Program
NAVSEA	Naval Sea Systems Command
NCEA	National Center for Environmental Assessment
NOAEL	no observed adverse effects level
NPL	National Priority List
OABG	Outside Active Burning Grounds
OU	Operable Unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
P/E	propellant/explosive
PRG	preliminary remediation goal
RAGS	Risk Assessment Guidance for Superfund
RBC	risk-based concentration
RCRA	Resource Conservation and Recovery Act
RDA	Recommended Dietary Allowance
RDX	royal demolition explosive
RfD	reference dose
RI	Remedial Investigation
RME	reasonable maximum exposure
ROD	Record of Decision
SERA	screening ecological risk assessment
SF	slope factor
SMDP	Scientific Management Decision Point
SSL	Soil Screening Level
SVOC	semi-volatile organic compound
1,1,1-TCA	1,1,1-trichloroethane
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCE	trichloroethene
TEF	toxic equivalency factor
TEQ	toxic equivalent quotient
TOC	total organic carbon
UCL	upper confidence limit
UF	uncertainty factor
µg/kg	micrograms per kilogram
VOC	volatile organic compound

# Introduction

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## 1.1 Project Background

The majority of Allegany Ballistics Laboratory (ABL) is a government-owned, contractor-operated (GOCO) research, development, and production facility. The remainder of the facility is exclusively owned and operated by the GOCO contractor. The facility is located in Mineral County, in the northeastern part of West Virginia, approximately 10 miles southwest of Cumberland, Maryland, along the West Virginia and Maryland border. The facility lies between the North Branch Potomac River, to the north and west, and Knobly Mountain, to the south and east. Several small towns are located near the facility, including Short Gap, West Virginia to the southeast, and Pinto, Maryland to the north (Figure 1-1).

ABL consists of approximately 1,634 acres of land and about 350 buildings. The facility is divided into two distinct operating plants, Plant 1 and Plant 2 (Figure 1-1). Plant 1 is a GOCO facility owned by the Navy and leased to its operator, ATK Tactical Systems Company LLC, by the Naval Sea Systems Command (NAVSEA) through a Facilities Use Contract. Plant 1, approximately 1,577 acres in area, is divided into developed and undeveloped areas. Plant 2, owned and operated by ATK, occupies the remaining 57 acres.

Nine present and former Installation Restoration Program (IRP) sites, including Site 1, were identified at Plant 1 of ABL: eight within the developed area and one within the undeveloped area. Figure 1-1 shows the relative locations of the two plants and IRP sites that are still within the remedial process. Site 1 is 11-acre area, consisting of several historical disposal units and the 8-acre Active Burning Ground (ABG) area, which is currently permitted under the Resource Conservation and Recovery Act (RCRA).

Several environmental investigations have been conducted at Site 1 since 1983. These include an Initial Assessment Study (IAS) (ES&E, 1983), a Confirmation Study (CS), which is reported as the Interim Remedial Investigation (Interim RI) (Roy F. Weston, 1989), a Focused RI (CH2M HILL, 1995a), a Focused Feasibility Study (Focused FS) for groundwater (CH2M HILL, 1995b), and an RI (CH2M HILL, 1996a). Numerous soil, groundwater, surface water, and sediment samples have been collected and analyzed for a variety of parameters to assess the site condition during these investigations. Section 2.3 provides additional detail regarding historical investigations pertaining to Site 1, including a soil level delineation conducted in 1998 to provide supplemental soil data.

Because of its size and complexity, for remedial action consideration, Site 1 has been investigated under two Operable Units (OUs): OU-3 for groundwater, surface water, and sediment and OU-4 for soil. A Record of Decision (ROD) was signed in May 1997 for OU-3 (Navy, 1997). The selected remedy comprises of an extraction and treatment system for the site-wide alluvial and bedrock groundwater, as well as a long-term monitoring (LTM) plan for groundwater, surface water, and sediment to provide a means for monitoring and evaluation of the remedy performance (CH2M HILL, 1998a and 2004a). For this reason, the focus of this RI is the surface and subsurface soil at Site 1, which is defined as OU-4.

Following the 1998 soil level delineation, it was determined that additional soil data would be necessary to adequately assess potential risks to human health and the environment. In addition, it was also concurred upon that the original human health and ecological risk assessments (ERAs) for Site 1 soil, performed in 1995, required revision to conform to current regulatory guidance and protocol. To satisfy both objectives, supplemental investigations were implemented in 2001 and 2004.

## 1.2 Project Objectives

The primary objective of this RI is to provide an evaluation of the nature and extent of the soil contamination present at Site 1 and the potential risks that soil contamination may pose to human receptors under residential and industrial scenarios and to ecological receptors. The discussion and assessments presented in this report are based on data collected as part of the 2001 and 2004 supplemental investigations, which are described herein, and on data from previous investigations deemed appropriate for inclusion in the evaluations.

## 1.3 Project Scope

Site 1 is 11-acre area, consisting of several historical disposal units and the 8-acre ABG area, which is currently permitted under RCRA.

Prior to 2001, several historical investigations were conducted at Site 1 including: Remedial Investigation (1992), Focused Remedial Investigation (1994), and Site 1 Soil Level Delineation (1998). These investigations indicated that the soil contamination at Site 1 posed potential risks and determined that collection of additional data was necessary to adequately delineate the extent of soil contamination and assess the potential risks. Therefore, this Focused RI was conducted to:

- Collect additional data to sufficiently define the nature and extent of soil contamination at Site 1; and
- Revise estimates of potential human health and ecological risks based on a more comprehensive set of data and current risk assessment guidance

As part of the Focused RI, these investigations were conducted including the Supplemental Soil Investigation (2001), the Soil Investigation at Active Burning Grounds (2001), the Step 4 Soil and Tissue Sampling in support of the Baseline ERA (July 2004), and the Supplemental Investigation of Site 1 Soil in support of Human Health and Ecological Risk Assessment (September 2004). These investigations are referred to as the supplemental investigations.

The human health risk assessment (HHRA) and ERA performed during this Focused RI utilized data from the 2001 and 2004 supplemental investigations, as well as previous historical data, mentioned above. The scope of the risk assessments is outlined in the 2004 Technical Memorandum *Approach for Revised Human Health and Ecological Risk Assessments for Site 1 Soil at Allegany Ballistics Laboratory* (CH2M HILL, 2004b), included as Appendix A of this report.

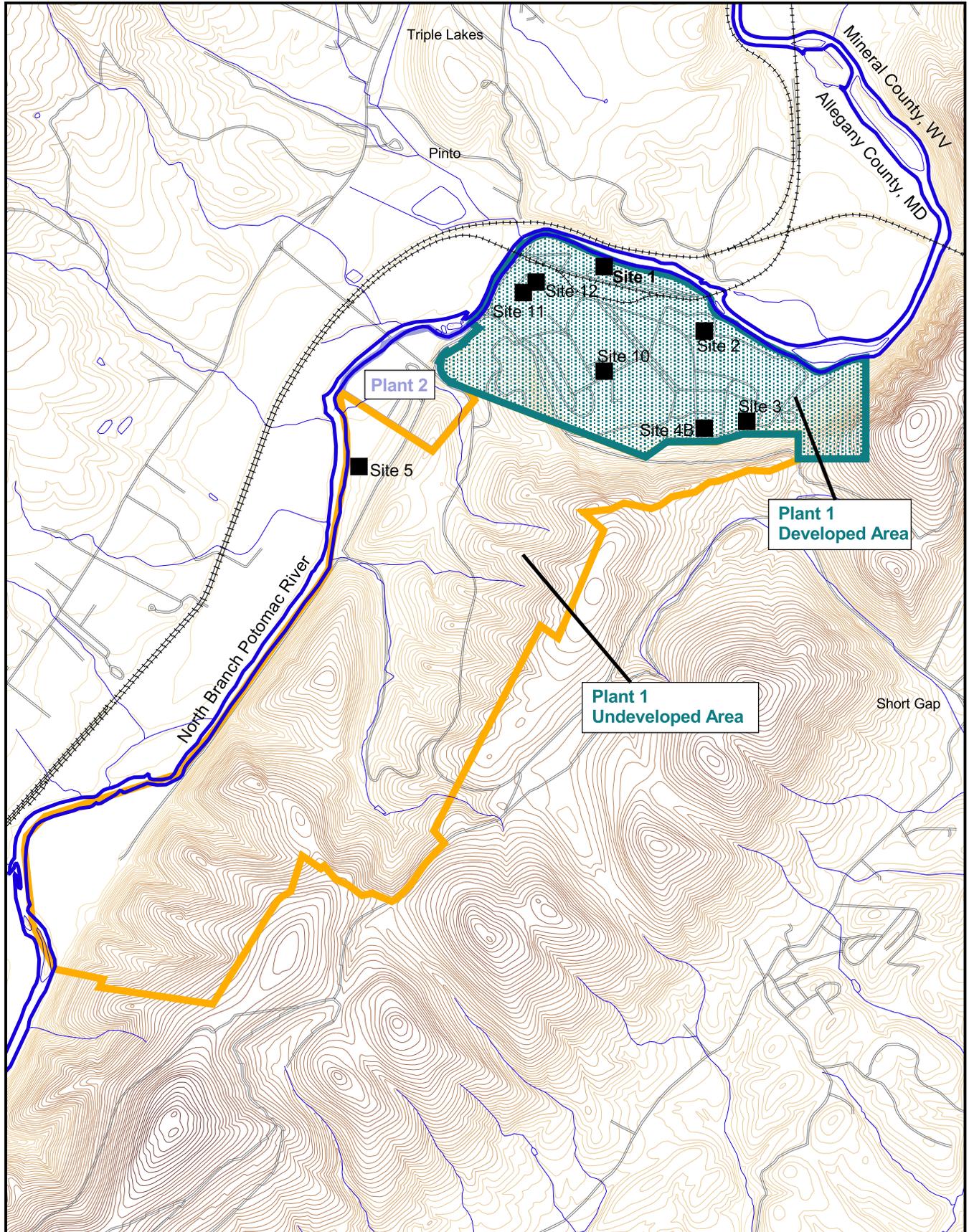
Although, the area within the 8-acre fenced ABG is an active permitted facility regulated under RCRA, per direction of the ABL Partnering Team, data from the ABG is included in

the evaluation of nature and extent, as well as in the risk assessments presented in this document. These data were not included in previous risk assessment for Site 1 soil.

In addition, because a ROD exists to address Site 1 groundwater, surface water, and sediment (OU-3), data for these media are included and discussed in this report only to the extent necessary to support evaluation of potential risks from exposure to Site 1 soil and the fate and transport of Site 1 soil contamination.

## 1.4 Report Organization

This report is divided into nine sections and includes 7 appendices. Section 2 describes the site setting and summarizes the previous environmental investigations. Section 3 describes the supplemental field investigations conducted in 2001 and 2004. Section 4 discusses the nature and extent of soil contamination. Contaminant fate and transport is discussed in Section 5. Sections 6 and 7 provide an updated HHRA and ERA, respectively. Section 8 provides summary and conclusions of the Focused RI for Site 1 Soil. References are summarized in Section 9.



**LEGEND**

- IRP Sites
- ⚡ Railroads
- 🌊 River Bank
- 🛣️ Roads

- 🟩 Plant 1
- 🟦 Plant 2
- 🟠 Plant 1 - Undeveloped Area

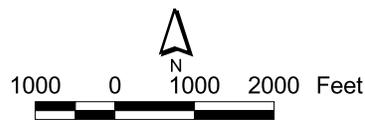


Figure 1-1  
Location of IRP Sites  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia

# Site Background

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The following subsections describe the physical setting of Site 1, and summarize the site history, including land use and previous investigations.

## 2.1 Site Setting

The physical setting of the ABL facility is described below using information compiled from literature review, historical investigations, and site visits.

### 2.1.1 Site Location and Description

Site 1 is an 11-acre area situated adjacent to the North Branch Potomac River along the northern border of the developed portion of Plant 1. The river borders Site 1 to the north. Site 1 is 11-acre area, consisting of several historical disposal units and the 8-acre ABG area, which is currently permitted under RCRA (Figure 2-1).

The land surrounding the ABL facility is primarily rural agricultural and forest. Several residences along US Route 220 in Maryland, ½ mile west of the facility in Maryland, obtain potable water from private wells. In addition, approximately three residences across the North Branch Potomac River from Plant 1, and several residences south of ABL in West Virginia obtain water from private wells. The latter private well users are separated from the facility by mountains.

### 2.1.2 Climate

The area around ABL is characterized by warm summers and cold winters with a fairly even distribution of precipitation throughout the year. The mean annual temperature is approximately 53° F, with an average minimum daily temperature of 20° F (January) and an average daily maximum temperature of 87° F (July). The average annual precipitation is about 33 inches. The average annual snowfall is 28.1 inches. The prevailing wind direction in this area is from the northwest, at an average speed of 6.2 miles per hour.

### 2.1.3 Topography

The 400-acre developed portion of Plant 1, including Site 1, and the entire area of Plant 2 are nearly flat. A portion of Site 1 bordering the river is located within the 100-year floodplain of the river. The elevation of the river adjacent to this area of Plant 1 averages about 10 feet below the 100-year floodplain.

The undeveloped portion of Plant 1 lies on the northwestern slope of Knobly Mountain. Elevations in this heavily forested terrain range from 675 to 1,600 feet above mean sea level (msl) (A.T. Kearney, 1993).

## 2.1.4 Surface Water Resources

The predominant hydrologic feature at ABL is the North Branch Potomac River, which borders the western and northern sides of the facility. The elevation of the river ranges from about 645 feet above msl at the eastern end of Plant 1 to about 655 feet above msl in the vicinity of Site 5, which is located in the undeveloped portion of Plant 1, on the western border of ABL (Figure 1-1). The river flows in a generally south to north direction past Site 5 and in a west to east direction along the northern facility boundary (the location of Site 1). The average annual river volumetric flow rate is estimated to be 886 cubic feet per second as measured at the Pinto gauging station, located just upriver from Site 1.

A series of stormwater drainage ditches, which generally hold standing water only during and immediately following rain events, collect storm water from the developed portion of Plant 1 and discharge it to the North Branch Potomac River through three National Pollution Discharge Elimination System permitted outfalls along the northern facility boundary. Site 1 contains one of the permitted outfalls to the river, located to the northwest of the ABG area (Figure 2-2).

## 2.1.5 Geology and Hydrogeology

The Site 1 geology and hydrogeology have been characterized during previous investigations through literature research and a number of project-specific field activities. These field activities included drilling, soil sampling, rock coring, geophysical logging, downhole video, seismic refraction, seismic reflection, fracture trace analysis, water-level measurements, and aquifer testing. The Site 1 geology and hydrogeology are briefly summarized herein; detailed descriptions are presented in the following reports: *Remedial Investigation of the Allegany Ballistics Laboratory Superfund Site* (CH2M HILL, 1996a), the *Focused Remedial Investigation of Site 1 at Allegany Ballistics Laboratory Superfund Site* (CH2M HILL, 1995a), the *Final Phase I Aquifer Testing at Allegany Ballistics Superfund Site* (CH2M HILL, 1998b), and the *Final Phase II Aquifer Testing at Site 1 at Allegany Ballistics Superfund Site* (CH2M HILL, 1999). Geological observations made during the 2001 and 2004 supplemental investigations do not alter the understanding of the site geology and hydrogeology, as presented in previous reports. Boring logs from the 2001 and 2004 supplemental investigations are included as Appendix B.

Generally, Site 1 is underlain by two distinct lithologies: (1) unconsolidated alluvial deposits of clay, silt, sand, and gravel; and (2) predominantly shale bedrock. Drilling activities at Site 1 indicate that the unconsolidated deposits overlying bedrock generally consist of two distinct layers of material. The upper, or surficial, layer consists of silty clay and is considered floodplain deposits of the North Branch Potomac River. At Site 1, this layer extends from the ground surface to an average depth of approximately 12 feet below ground surface (bgs).

Below the silty clay layer is a sand and gravel layer containing pebbles and cobbles, with variable but typically significant amounts of clay and silt. The sand and gravel layer, considered to be alluvial deposits of the North Branch Potomac River, has an average thickness of approximately 14.5 feet beneath Site 1.

Below the sand and gravel alluvium lies bedrock consisting of mainly calcareous shale and limestone of Silurian age. The average depth to bedrock at Site 1 is approximately 26.5 feet.

Water-level measurements taken in alluvial monitoring wells suggest the average depth to groundwater in the vicinity of the Former Disposal Pits (FDP) is 10 to 12 feet bgs, corresponding to the sand and gravel layer. Therefore, the sand and gravel alluvium constitutes the shallow, unconsolidated aquifer at the site. Recharge to this aquifer is believed to be derived from primarily infiltration of precipitation that falls on Plant 1. Depth to groundwater in the bedrock aquifer is approximately 20 feet bgs. As discussed in the previous reports, there is a high degree of interconnectivity between the alluvial and bedrock aquifer.

Within the alluvial and bedrock aquifers, natural groundwater flow is toward the North Branch Potomac River, which is believed to be its ultimate discharge point. However, since the commencement of the Site 1 groundwater remediation, groundwater under the majority of Site 1 is captured for treatment and does not reach the North Branch Potomac River.

## 2.2 Site History

Since 1943, the ABL facility has been used primarily for research, development, testing, and production of solid propellants and motors for ammunition, rockets, and armaments. The manufacturing of solid propellant rocket motors can be summarized for purposes of this text into three basic steps. The first step produces the rocket casing. The next step involves mixing the ingredients (e.g., nitroglycerin and nitrocellulose) to make the solid propellant. The third step involves filling the casing with the propellant. During this process, four general waste types are produced at ABL: spent solvents, reactive or ordnance materials, inert or non-ordnance materials, and solid waste.

Solvents are used at ABL to degrease cases, mix propellants, clean mixing bowls used for making propellant, and to clean molds and tools used in the overall process. The primary solvents used at ABL were acetone, methylene chloride, trichloroethene (TCE), and 1,1,1-trichloroethane (1,1,1-TCA). Each of these solvents has been used to varying degrees over the years. Acetone was the primary solvent used from 1942 until 1959. Although acetone was used after 1959 and is still used today, TCE was commonly used from 1959 until the late 1970s. Reportedly, the use of TCE was minimized in the 1980s. In the effort to minimize the use of TCE, the use of 1,1,1-TCA began in the late 1980s, but it is no longer used. Use of methylene chloride began in the late 1960s, but it also is no longer used. Currently, acetone, pentane, and kerosene are the primary solvents used.

Ordnance or reactive waste generated at ABL is waste material that, because of its composition, may burn violently or detonate. Typically, reactive wastes are excess or unused solid rocket propellants. Inert or non-ordnance wastes are ignitable solid wastes, which may be contaminated with reactive materials. The inert wastes are generated in areas where reactive propellant components are handled and, therefore, may or may not be contaminated with reactive wastes. However, because the wastes may be contaminated with reactive wastes, they are separated from ordinary solid waste and are burned in a manner similar to reactive ordnance waste. The ordinary solid wastes are deemed not contaminated with reactive materials, and may include trash, demolition debris, rocket casings, empty drums that once contained solvents, machinery waste, fiberglass and other resin-coated fibers.

Site 1 has been used for various types of waste burning and historical disposal activities. The following geographical divisions of Site 1 have been made, for discussion purposes, according to general historical site activities:

- Active Burning Grounds (ABG)
- Former Disposal Pits (FDP)
- Outside Active Burning Grounds (OABG)

Figure 2-1 displays the approximate boundaries for each of these geographical areas. The ABG consists of an 8-acre fenced area that is used to burn reactive debris in designated areas. Historical disposal of spent acid and solvents occurred in the three FDPs, located inside the boundary of the ABG area. The FDP and ABG areas are discussed separately due to the differing nature of historical disposal activities at each. The OABG area comprises the remaining area inside the Site 1 boundary and outside of the fenced ABG area. Historical burning and debris disposal activities occurred in this area. Each of these areas is discussed in more detail below.

### 2.2.1 Active Burning Grounds

The ABG area encompasses an 8-acre fenced area, regulated under RCRA and used for burning reactive wastes. A 6-foot tall locked fence surrounds the area. The majority of the area is covered by mowed grass. An asphalt road spans the east-west length of the fenced area.

Previously, eight earthen pads were used to burn solvents and explosive waste generated at the facility. Figure 2-2 shows the historical locations of these earthen burn pads. The pads were operated from 1959 until the mid-1990s and were numbered 1 through 8 going from east to west. During operations, each burn pad reportedly handled specific types of wastes. Pad 1 was a bunker for explosive wastes, while Pad 2 handled reactive wastes generated from the chemistry laboratory. Solid propellants were handled at Pads 3 and 4, and reactive solvents (e.g., acetone contaminated with explosives, nitrate esters nitroglycerin, and glycerin triacetate) were burned at Pads 5 through 8. Reactive solvents were typically absorbed into sawdust prior to burning (CH2M HILL, 1996a). The former earthen burn pads are not currently used and some have been overgrown by vegetation.

Burning of reactive material at Site 1 began in 1959 and continues today. Open burning occurs in the burning pans, which are large metal pans filled with non-reactive material, upon which the reactive and potentially reactive material is placed. The burning pans are located on earthen or asphalt burning pads. Currently, six steel burning pans are located in the ABG (Figure 2-2).

Consent Order (CO) #CO-R6,13,25-95-8 was issued on November 10, 1995 by the State of West Virginia for open burning of propellant and explosive (P/E) wastes and P/E contaminated wastes. The CO compliance program required cessation of open burning of P/E contaminated wastes by May 31, 1996. It also delineated three primary requirements: compliance demonstration; waste minimization and emissions mitigation; and utilization of an open burning management plan. Compliance demonstration included construction of an incinerator if open burning of P/E contaminated wastes was not ceased, research on alternative technologies, determination of impact on human health and the environment, and relocation of the burn site if the impacts were unacceptable.

The previous CO was superseded by CO-R6, 13, 25-99-35A (95) under which open burning is currently conducted. CO-R6, 13, 25-99-35A (95), was signed in 1999 between the West Virginia Department of Environmental Protection Office of Air Quality, NAVSEA, and ATK. The CO establishes the meteorological conditions under which open burning is allowed. In addition, it establishes the maximum mass of P/E waste material allowed at one time for open burning at the ABG area. Reactive waste material is placed in the various burn pans and, under suitable meteorological conditions, is ignited by ABG personnel. The burning rates vary considerably and range from very high rates for the pure energetics to very slow rates for P/E waste that contains appreciable quantities of sawdust and other cellulosic material. A RCRA permit is currently pending for the continued operation of the ABG.

Historical soil sampling activities in the ABG area were conducted in 1992, 1994, and 1998. During the 2001 and 2004 supplemental investigations, surface and subsurface soil samples within the ABG area were collected and analyzed. Both the historical and supplemental soil data were included in the revised HHRA and ERA, presented in this Focused RI Report, to determine the potential risks associated with constituents that may have been released from the earthen pads. Figure 2-3 illustrates the location of the soil samples from the ABG area included in the revised HHRA and ERA presented in this Focused RI Report.

## 2.2.2 Former Disposal Pits

Three unlined pits were historically used to dispose of used solvents, acids, and bases generated by plant operations. As shown in Figure 2-1, the three FDPs are located in the southwestern portion of the ABG area.

According to the RCRA Facility Investigation Report (A.T. Kearney, 1993), the three unlined pits were described as: two acid disposal pits, which were constructed as unlined crushed-limestone-filled earthen pits measuring approximately 4 feet by 4 feet in area and 4 feet in depth and a solvent disposal pit, which was constructed as an unlined earthen pit measuring approximately 50 feet by 50 feet in area and 4 feet in depth. There is no known documentation of which pits were used for waste acids, bases, or spent solvents. The pits were reportedly operated during the late 1970s and early 1980s and have since been backfilled. Spent solvents and acids potentially contaminated with reactive material were placed into the pits. After the materials percolated into the ground, the pit was ignited to burn off reactive filtrate. Reportedly, TCE was the primary spent solvent that was disposed in the pits (CH2M HILL, 1996a).

According to facility personnel, approximately 1,000 pounds of TCE per month were disposed of in the pit(s) between 1970 and 1978. Disposal of tetrachloroethene (PCE) and 1,1,1-TCA in the pit(s) was less than 5 pounds per year.

From 1972 to 1982, waste acids and bases generated by laboratory operations were disposed of by pouring them into pit(s) that had been lined with limestone. According to facility personnel, approximately one gallon of waste acid per month was disposed of in the pit(s) until disposal practices ceased.

Data from the FDP area were collected during previous investigations and the 2001 and 2004 supplemental investigations. Figure 2-4 illustrates the locations of soil samples

collected from the FDP Area and included in the revised HHRA and ERA presented in this Focused RI Report.

### **2.2.3 Outside Active Burning Grounds**

The OABG area includes the approximately 3 acres inside the Site 1 boundary that are outside of the 8-acre ABG area. Various waste disposal activities historically occurred within this area. Currently, the OABG area is not used for disposal activities. Based on historical waste disposal activities, the OABG has been divided into the following sub-areas for discussion, as shown on Figure 2-2:

- Former Inert Burn Area and Associated Disposal Area;
- Former Open Burn Area and Associated Disposal Area; and
- Drum Storage Pad.

Figure 2-5 illustrates the locations of soil samples collected from the OABG Area, which are included in the revised HHRA and ERA presented in this Focused RI.

#### **2.2.3.1 Former Inert Burn Area and Associated Disposal Area**

This area, where inert material was burned and disposed, is located along the river in the northeastern portion of the site. The former inert burn area is located along the river and lies east of the perimeter fence surrounding the ABG area. Ash from burning in this area was spread in the former inert burn disposal area and buried during successive disposal events. During a recent site visit, other debris, in addition to ash, was seen on the surface of the former inert burn disposal area. The approximate boundary of the former inert burn area and associated disposal area is shown in Figure 2-2. The area is currently covered by vegetation.

#### **2.2.3.2 Former Open Burn Area**

This area is located in the northwest part of the site. It consists of the former open burn area, former open burn disposal area, former burn cages, and western drainage ditch. The former open burn area was enclosed in a chain link fence where the solid wastes were burned. The resulting ash was spread along the lower floodplain area in a portion of the former open burn disposal area. In addition, demolition debris, concrete rubble, drums, and rocket casings were disposed of in the former open burn disposal area. The burn area reportedly operated during the 1960s. After that time, solid wastes were disposed of at the inert landfill, located at Site 5. Currently, solid wastes are disposed off site.

The western drainage ditch is an enhanced earthen drainage culvert that cuts through the disposal area and drains surface/storm water from Plant 1. Debris material, including ash buried during successive disposal events, and other debris are exposed in the walls of this culvert. Surface debris is also present throughout and to the east of the former open burn disposal area.

#### **2.2.3.3 Drum Storage Pad**

Reportedly, the drum storage pad operated from 1979 to 1981, storing 55-gallon drums containing spent solvents and bottom sludge from solvent recovery stills. The asphalt drum storage pad did not have berms or sumps for containment. The asphalt pad still exists although it is not currently used to store drums.

In August 1981, the State of West Virginia issued ABL a consent order for the improper storage of hazardous wastes at Site 1. Reports of deteriorated drums releasing their contents to the surrounding ground surface resulted in a cleanup effort in which the spilled material from the drums was removed from the ground surface and placed in new drums that were subsequently stored in ABL's permitted drum storage area. ABL complied with the terms of the order, which resulted in no further action being required by the State.

## 2.3 Previous Investigations

Six previous environmental investigations have been conducted at ABL that included an evaluation of Site 1 soil.

### 2.3.1 Initial Assessment Study (1983)

An IAS was performed at ABL in 1983 under the Navy Assessment and Control of Installation Pollutants Program (NACIP). The purpose of the IAS was to identify and assess sites that might pose a threat to human health or the environment as a result of the former hazardous materials handling and operations (ES&E, 1983).

Nine potentially contaminated sites, including Site 1, were identified based upon information obtained from historical records, photographs, site inspections, and personnel interviews. The IAS concluded that these sites did not pose an immediate threat. However, results of the IAS indicated the need for a CS at seven of the nine sites, including Site 1, to assess the potential impacts on human health and the environment by suspected contaminants.

### 2.3.2 Confirmation Study (1987)

Based on the IAS recommendations and in accordance with the NACIP, a CS was initiated in June 1984 and completed in August 1987. The CS focused on identifying the existence, concentration, and extent of contamination at the seven sites recommended for further investigation in the IAS. Field activities conducted under the CS included monitoring well installation; groundwater, surface water, sediment, and soil gas sample collection and analysis; and a geophysical survey inside the ABG area at Site 1.

### 2.3.3 Interim Remedial Investigation (1989)

As a result of the Superfund Amendments and Reauthorization Act of October 1986, the Navy changed its NACIP terminology and scope under the IRP to follow the rules, regulations, guidelines, and criteria established by U.S. Environmental Protection Agency (EPA) for the Superfund program. Accordingly, the results of the CS are documented in the Interim RI Report (Roy F. Weston, 1989). The Interim RI Report recommended further RI activities for six of the seven sites identified in the IAS, including Site 1.

### 2.3.4 Remedial Investigation (1996)

Based on the recommendations of the Interim RI Report and in accordance with the Navy's modified IRP policy, Hercules (former ABL operator) contracted CH2M HILL to conduct an RI (CH2M HILL, 1996a). The RI followed EPA RI/FS format under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as described in the

EPA Interim Final *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA, 1988).

During the RI, historical aerial photographs were reviewed to determine the type and location of potential waste disposal activities at Site 1 and other sites. A focused facility audit was also conducted to determine possible sources of contamination.

Field activities during the RI included installation of monitoring wells, soil sampling, groundwater sampling, surface water and sediment sampling, well testing, a fracture-orientation investigation, and water-level measurements. A variety of analytical methods and techniques were employed during the RI.

In June 1993, the EPA proposed the Plant 1 portion of the ABL facility for inclusion on the National Priority List (NPL) based upon the estimated potential risks to human health and the environment. The Plant 1 portion of ABL was added to the NPL at *Federal Register*, Volume 59, Number 27989, on May 31, 1994. Plant 2 is not on the NPL.

The results of the 1992 RI are presented in the *Remedial Investigation of the Allegany Ballistics Laboratory Report* (CH2M HILL, 1996a). Volatile organic compounds (VOCs), particularly TCE, were the primary constituents detected in soil, groundwater (in both alluvial and bedrock aquifers), surface water, and sediment samples collected at and adjacent to Site 1. The three former disposal pits were determined to be the primary source of VOC contamination at Site 1. Semi-volatile organic compounds (SVOCs), explosives, metals, and dioxins, were also detected in soil and ash samples.

The RI Report recommended additional investigation at Site 1 to further evaluate the nature and extent of contamination in soil, groundwater, surface water, and sediment.

### **2.3.5 Focused Remedial Investigation (1995)**

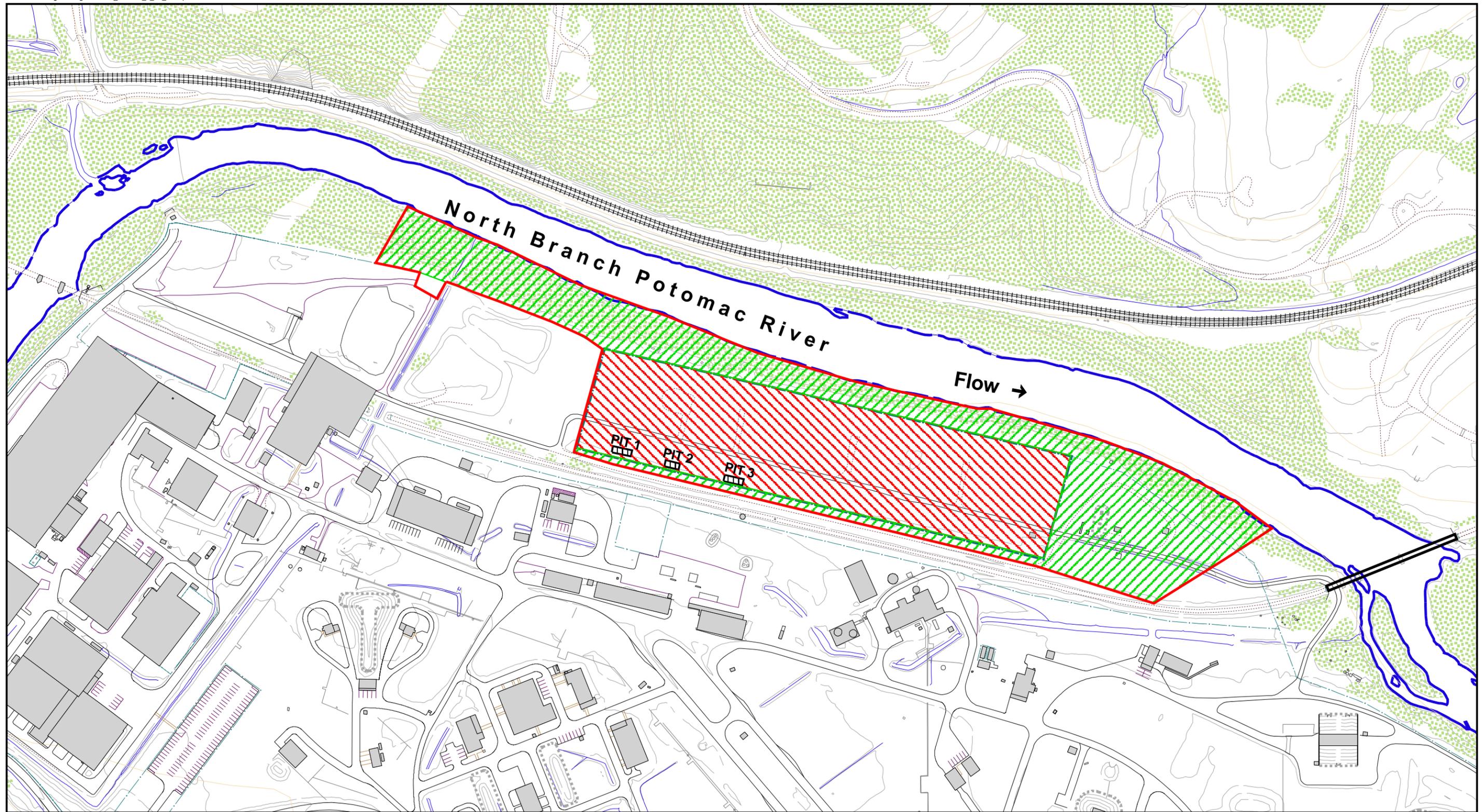
A Focused RI was conducted in 1994 to supplement Site 1 data collected during the RI and to re-evaluate potential risks to human health and the environment from contaminants in Site 1 media. The results are presented in the *Focused Remedial Investigation of Site 1 at Allegany Ballistics Laboratory Superfund Site Report* (CH2M HILL, 1995a). The results of the Focused RI confirmed that VOCs were the primary contaminants detected in Site 1 media, with TCE detected most often and at the greatest concentrations in soil and groundwater.

The Focused RI identified specific areas and media at Site 1 where remedial action alternatives should be evaluated in a Focused FS. These included areas of contaminated soil around the solvent disposal pits, north of the east and west ends of the ABG area along the river, and in the open and former inert burn disposal areas; contaminated groundwater in both alluvial and bedrock aquifers; and contaminated surface water and sediment in the North Branch Potomac River adjacent to Site 1.

### **2.3.6 Soil Level Delineation (1998)**

Based on soil data gathered during the Focused RI and previous investigations, supplemental soil sampling was conducted in October 1998 to further delineate potentially contaminated areas at Site 1. The soil level delineation was conducted in accordance with the *Site 1 Soil Level Delineation – Final* memorandum (CH2M HILL, 1998c), which defined the scope and rationale for sample collection and referenced the *Sampling and Analysis Plan for*

*the Focused Remedial Investigation/Feasibility Study for Site 1 at the Allegany Ballistics Laboratory Superfund Site* (CH2M HILL, 1994) as the methodology protocol. A formal report of the supplemental soil sampling effort was not generated; however, these and other historical data were evaluated to determine whether sufficient information existed to establish preliminary remediation goals (PRGs) for Site 1 soil. This evaluation resulted in identification of additional data requirements and the need to refine the human health and ERAs in accordance with current regulatory guidance. The memorandum (CH2M HILL, 1998c), soil delineation data set, and sample location map are included as Appendix C.

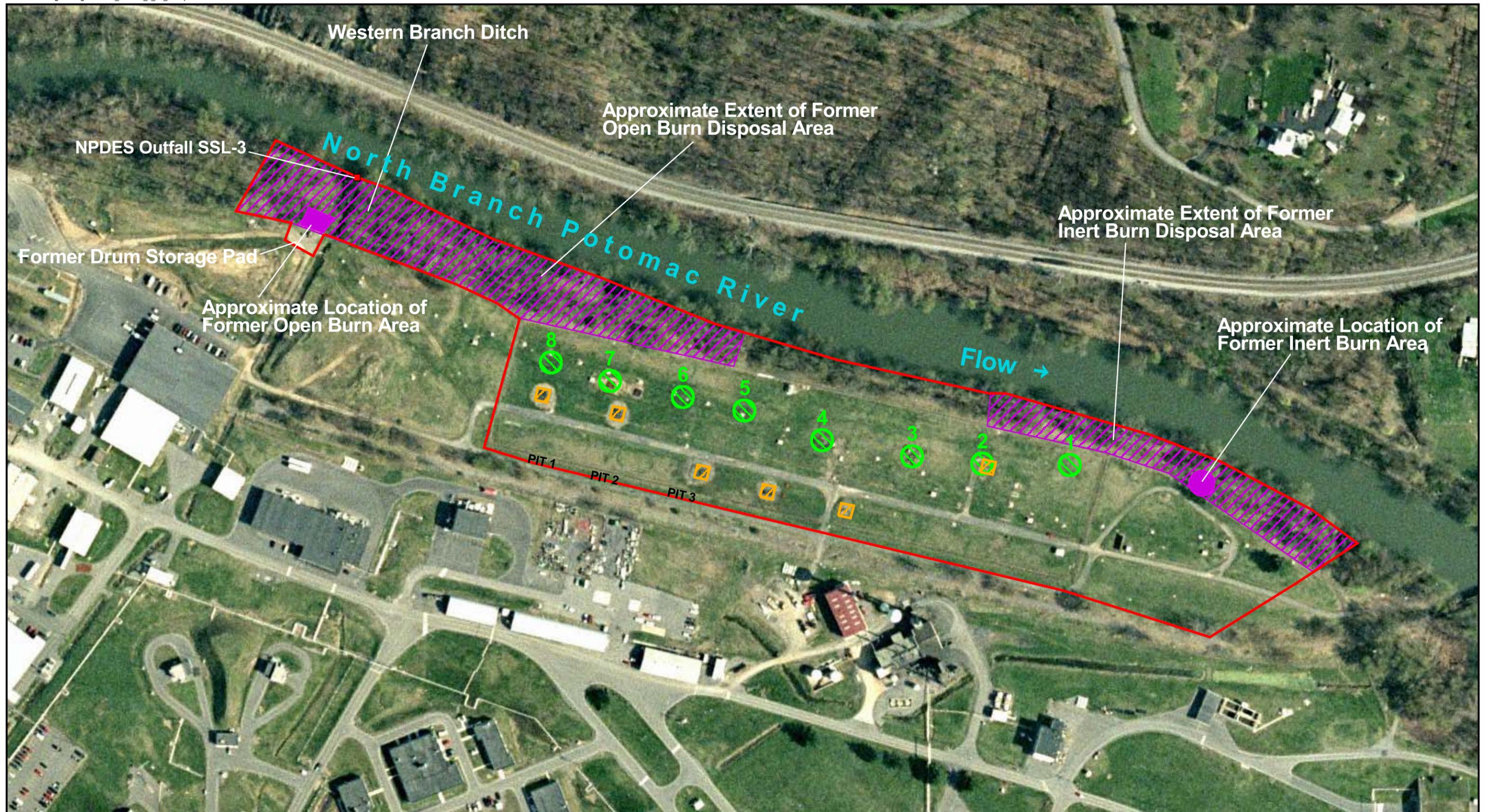


**LEGEND**

-  Approximate Locations of Former Disposal Pits
-  Active Burning Grounds
-  Outside Active Burning Grounds
-  Buildings
-  Vegetation
-  Water Bodies
-  Roads
-  Approximate Site 1 Boundary



Figure 2-1  
Site 1 Location Map  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



- LEGEND**
- Site 1 Boundary
  - NPDES Permitted Outfall
  - Approximate location of former burn pads
  - Approximate location of current burn pans
  - Buildings
  - Paved Road
  - Dirt Road
  - Vegetation

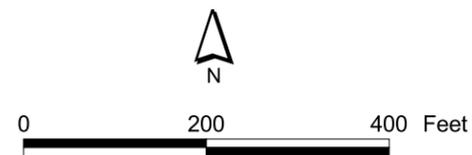
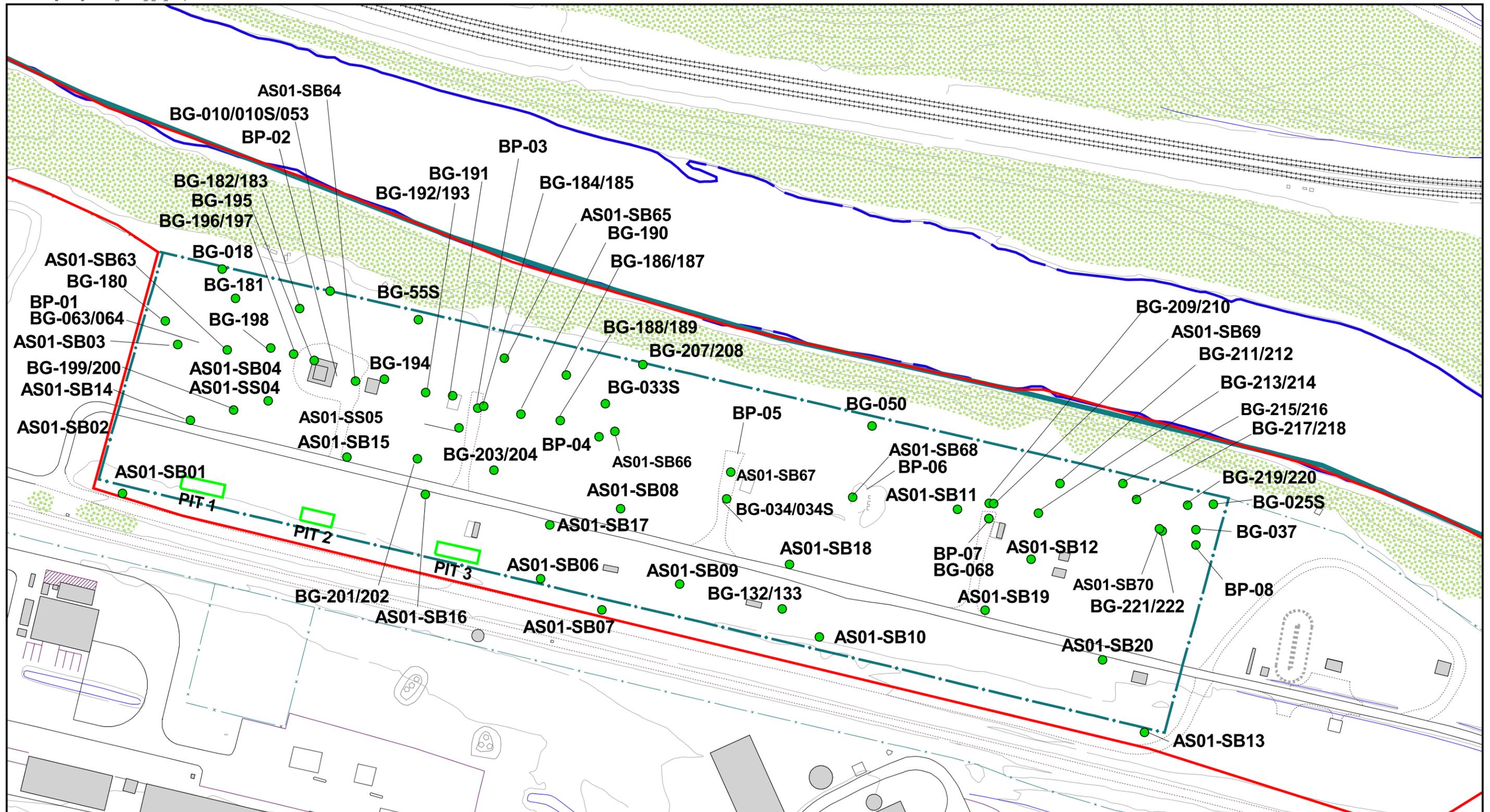


Figure 2-2  
Site 1 Features  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**LEGEND**

- Soil Sample Location
- ▭ Site 1 Boundary
- ▬ Active Burning Ground
- ▬ Former Disposal Pits
- ▭ Buildings
- ▭ Dirt Road
- ▭ Paved Road
- ▭ Vegetation

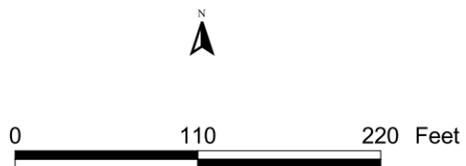
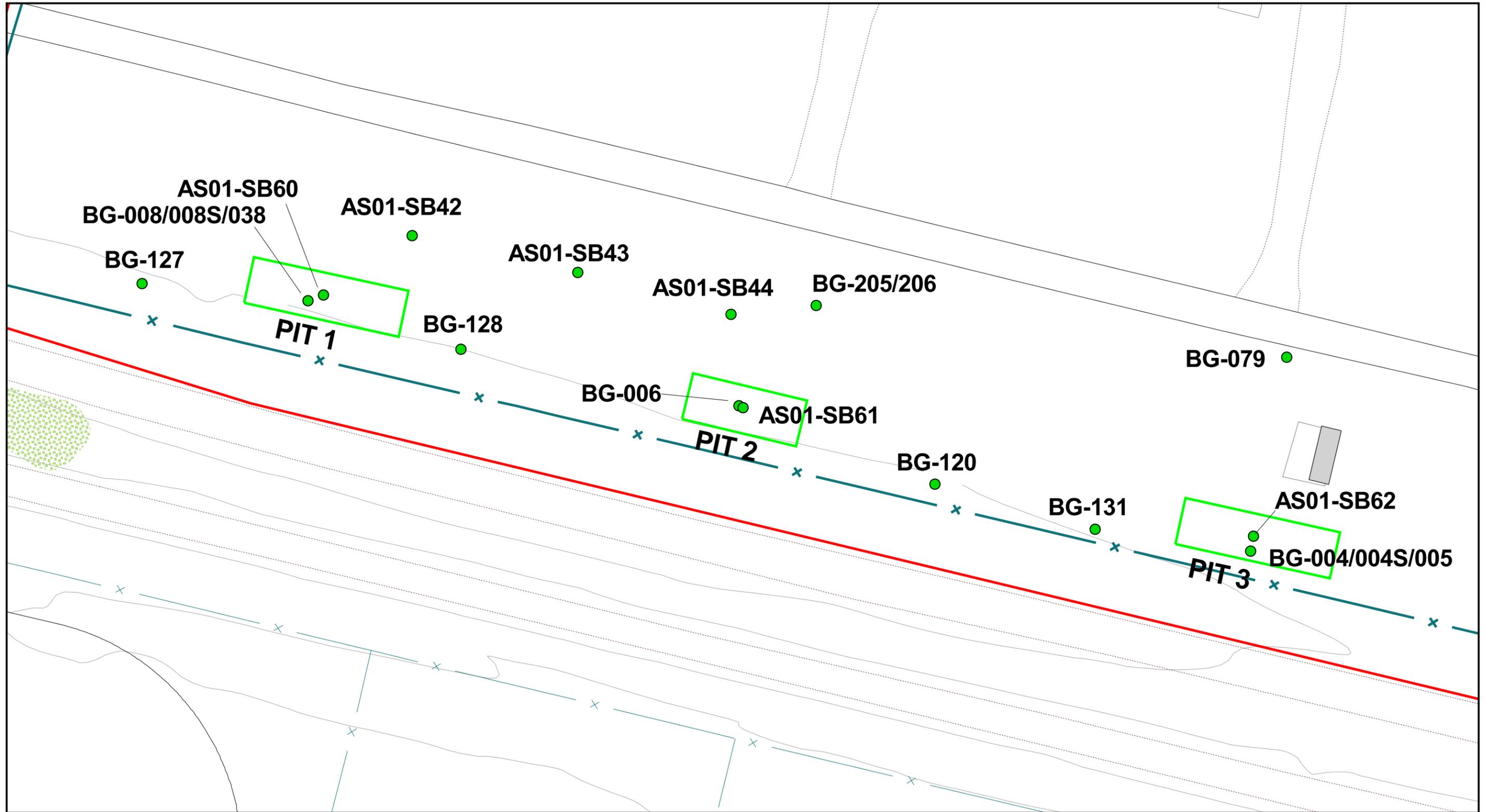


Figure 2-3  
Data from Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**LEGEND**

- Soil Sample Location
- ▭ Site 1 Boundary
- Active Burning Ground
- ▭ Former Disposal Pits
- ▭ Buildings
- ▭ Dirt Road
- ▭ Paved Road
- ▭ Vegetation

Figure 2-4  
 Data from Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia



## SECTION 3

# Supplemental Investigations

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In response to additional data needs identified in previous investigations, supplemental soil, sediment, and surface water samples were collected in 2001 and 2004 to augment the data sets for determining the nature and extent of contamination and assessments of potential human health and ecological risks.

## 3.1 Supplemental Investigations Scopes

The results of the 1992 RI, 1994 Focused RI, the 1995 Focused FS, and the 1998 Soil Level Delineation indicated that collection of additional data was necessary to adequately delineate the nature and extent of soil contamination at Site 1 and to assess the associated potential risks. For this reason, additional soil, sediment, and surface water samples were collected in February and October of 2001 and in July and September of 2004. For the purpose of this RI Report, these sampling events are referred to as the Supplemental Investigations.

Scopes of the supplemental investigations are summarized in the following subsections. Detailed scopes can be found in the respective work plans, referenced in each subsection. A summary of the samples collected during the 2001 and 2004 supplemental investigations is presented in Tables 3-1 and 3-2 for surface and subsurface soil samples, respectively. Raw analytical data for surface and subsurface soil samples are included as Appendix D.

### 3.1.1 Soil Investigation at Active Burning Grounds (February 2001)

This supplemental soil investigation was designed to adequately assess current conditions of soil within the ABG to support its continuing operation. The objectives of collecting the data were to assess potential risk to human health and the environment resulting from operation of the ABG, develop the ABG closure plan, assist in defining operational related monitoring, provide input to pan/pad redesign activities, and to provide the baseline for assessment of compliance with the Environmental Performance Standards. The samples were collected in accordance with the *Field Investigation Project Plans for the Burning Grounds RCRA Subpart X Permit Application* (CH2M HILL, 2001a).

Twenty discrete surface soil samples and seven subsurface soil samples were collected from locations within the ABG. The number and location of the proposed samples at the ABG were determined by reviewing existing soil data and by taking into consideration the historic locations, the existing locations, and the proposed locations of burn pads. Table 3-1 and 3-2 contain summaries of the sampling scope. Soil sample locations are shown in Figure 3-1.

### 3.1.2 Supplemental Soil, Surface Water, and Sediment Investigation (October 2001)

Based on a review of existing soil data, including the proximity of areas of potential soil contamination to the North Branch Potomac River, collection of additional data was deemed

necessary primarily to determine whether soil constituents in areas of suspected contamination were affecting the surface water and sediment quality of the river via runoff. The samples were collected in accordance with the *Final Work Plan for the Supplementary Investigation of Site 1 Surface, Subsurface Soil, Surface Water, and Sediment and Site 2 and 3 Soil in Support of Human and Ecological Risk Assessments* (CH2M HILL, 2001b). The results of this evaluation are discussed in section 5.2.3.

Twenty-one surface soil samples and 15 subsurface soil samples were collected in the investigation area (Figure 3-2). Soil samples were located in the OABG area, to the east and west of the Site 1 boundary, and within the approximate area of the former disposal pits. Sample locations were selected during a joint scoping effort by the regulatory agencies and the Navy conducted in May 2001. Soil samples were analyzed for metals, cyanide, VOCs, SVOCs, explosives, perchlorate, dioxin/furans, pH, total organic carbon (TOC), and grain size. The analytes for each sample were selected based upon the types of waste reportedly disposed of in each area and upon the existing analytical data. Tables 3-1 and 3-2 contain summaries of the sampling scope.

Twenty-four sediment and 14 surface water samples were collected in the reach of the North Branch Potomac River upstream of, adjacent to, and downstream of suspected areas of soil contamination at Site 1 (Figure 3-2). Sediment samples were analyzed for total metals, cyanide, VOCs, SVOCs, explosives, perchlorate, dioxin/furans, pH, TOC and grain size. Surface water samples were analyzed for total and dissolved metals, SVOCs, VOCs, pH, and hardness. The analytes for each sample were selected based upon the types of waste reportedly disposed of in each area and upon the existing analytical data. Table 3-3 contains a summary of the scope for the sediment and surface water samples.

### **3.1.3 Soil and Tissue Sampling in Support of the Baseline Ecological Risk Assessment [BERA] Step 4 (July 2004)**

The general objective of this investigation was to provide additional data with which to refine previous estimates of ecological risk from potential exposures to the surface soils at Site 1. The specific objectives of this investigation were to:

- Collect additional data, as recommended in Step 3 of a draft version of the ERA, to refine ecological exposure and risk estimates for the exposure pathways, receptors, areas, and constituents of concern (COCs);
- Collect data to directly assess potential toxicity of Site 1 surface soils to ecological receptors; and
- Provide adequate data to develop ecologically-based PRGs for Site 1 surface soils to aid the risk management decision-making process should unacceptable ecological risks be identified in Step 7 of the ERA.

To fill these identified data needs, surface soil samples were collected in accordance with the *Final Work Plan for Site 1 Soils Baseline Ecological Risk Assessment - Step 4* (CH2M HILL, 2004c). Table 3-1 contains a summary of the sampling scope. Soil sample locations are shown in Figure 3-3. In addition to surface soil samples, earthworm samples were also a work plan component. Although earthworms were found at many of the soil sample locations, sufficient tissue mass for the chemical analysis of all selected analyte groups could not be

obtained from all locations. Because of this, additional soil was collected to perform the following laboratory testing:

- 28-day laboratory toxicity testing using laboratory supplied earthworms and field-collected surface soil samples. Earthworms are standard surrogates that are frequently used in ERAs to evaluate soil invertebrate communities. Their extensive contact with soils (via both dermal and ingestion pathways), their status as permanent inhabitants, and the availability of standard test protocols (to evaluate survival, growth, and reproductive endpoints) make them well suited for use as a conservative surrogate for soil invertebrate communities.
- Tissue residue analysis (dioxins/furans) of the earthworms after 28 days in the site surface soil samples.

### 3.1.4 Supplemental Investigation of Site 1 Soil in Support of Human Health and Ecological Risk Assessments (September 2004)

The principal objective of the September 2004 Supplemental Investigation was to provide additional nature and extent data to adequately assess potential human and ecological risks for Site 1 soil. Samples were collected in accordance with the *Final Work Plan Addendum for Supplemental Investigation of Site 1 Soil in Support of Human Health and Ecological Risk Assessment* (CH2M HILL, 2004d).

During the supplemental soil investigation, soil borings were advanced in the approximate area of the three former disposal pits in the ABG area, the former earthen burn pads within the ABG area, and in the vicinity of the former inert burn area and associated disposal area, east of the ABG area. Tables 3-1 and 3-2 contain summaries of the sampling scope. Soil sample locations are shown in Figure 3-4. Soil boring logs are included as Appendix B.

Fifteen soil borings were advanced, from which 25 subsurface and 15 surface soil samples were collected at various depths (see Table 3-2). Soil borings were advanced using direct push technology (DPT) to a total depth of 8 feet bgs. The sample collection depths for each of the soil borings associated with the former earthen burn pads and the OABG area were based on elevated photoionization detector (PID) readings or visual observation of non-native material.

Three soil borings (AS01-SB60, AS01-SB61, and AS01-SB62) were advanced in the approximate locations of the three former disposal pits, based on interviews with ABL personnel, aerial photographs, boring logs, and GPR surveys. Both surface and subsurface soil samples were collected from these three locations. The subsurface samples were collected in 2-foot intervals to a depth of 8 feet bgs (i.e., 1 to 3 feet, 3 to 5 feet, 5 to 7 feet, and 7 to 8 feet). Although TCE was the primary constituent placed in the disposal pits, samples collected from each former pit area were analyzed for the full suite of VOCs, SVOCs, dioxins, furans, explosives, and metals.

Eight soil borings (AS01-SB63, AS01-SB64, AS01-SB65, AS01-SB66, AS01-SB67, AS01-SB68, AS01-SB69, and AS01-SB70) were completed within the approximate footprint of the eight former earthen burn pads. The approximate locations of the former burn pads were determined from interviews with ABL personnel, aerial photographs, and figures from the

RI Report (CH2M HILL, 1996a). Samples were analyzed for VOCs, SVOCs, dioxins, furans, explosives, and metals.

Four soil borings (AS01-SB71, AS01-SB72, AS01-SB73, and AS01-SB74) were completed in the vicinity of the former inert burn area and the associated disposal area. Soil samples were collected from the surface and subsurface to further delineate concentrations of SVOCs and other constituents that are potentially present in this area. Samples were analyzed for VOCs, SVOCs, dioxins, furans, polychlorinated biphenyls (PCBs), explosives, and metals.

## 3.2 Field Procedures

The following subsections describe general field methodologies that were followed during the supplemental investigations. Detailed field procedure information, including Standard Operating Procedures (SOPs), is provided in the respective work plans referenced in Section 3.1. Samples were collected in accordance with the Phase II SWMU Work Plan (CH2M HILL, 2000), as amended in the respective supplemental investigation work plans (CH2M HILL, 2001a; 2001b; 2004c; 2004d). Modifications to procedures cited in these work plans are highlighted in this section.

### 3.2.1 Surface Soil Sampling

Surface soil samples were collected using a decontaminated hand trowel and were placed in unpreserved sample containers for transport to the laboratory. The EnCore® sampler was used to collect, store and deliver soil in a sealed, headspace-free state for surface soil samples requiring VOC analysis. Surface soil samples were collected by advancing the EnCore® sampler directly into the undisturbed soil. Surface soil samples were collected from the depth ranges indicated Table 3-1.

Samples were labeled with a unique sample identification number and documented on a chain-of-custody form. The chain-of-custody form accompanied samples to the analytical laboratory. During sampling and shipment to the analytical laboratory, samples were kept at a maximum of four degrees Celsius using bagged ice.

### 3.2.2 Subsurface Soil Sampling

Subsurface soil samples were collected using DPT. The DPT probe, equipped with acetate liners, was advanced to the desired depth. Soil samples were extracted from the acetate liners and placed in glass jars for shipment to the laboratory. EnCore® samples were collected by advancing the EnCore® sampler into the desired interval of the undisturbed soil core after cutting open the acetate liner.

Samples were properly labeled with a unique sample identification number and documented on a chain-of-custody form. The chain-of-custody accompanied samples to the analytical laboratory. During sampling and shipment to the analytical laboratory, samples were kept at a maximum of four degrees Celsius using bagged ice.

The samples were collected in general accordance with the approved work plans cited in Section 3.1. Sample collection modifications from those in the Work Plan were as follows:

- Explosives and dioxins/furans were not analyzed for in two surface soil samples (AS01-SB21 and AS01-SB22) collected during the February 2001 Supplemental Investigation due to an oversight.

### 3.2.3 Surface Water and Sediment Sampling

Surface water and sediment samples were collected along the transects from near shore, mid-channel, and, at five of the nine transects, far shore locations. Mid-channel and far shore locations were established in the field using the near shore point as reference and projecting downstream at an approximate 45-degree angle from the shoreline.

Table 3-3 summarizes the surface water and sediment samples collected during the 2001 supplemental investigations. Note that the surface water and sediment samples in 2001 were not labeled sequentially because the sample labeling for these media incorporated the existing LTM station points.

The samples were collected in general accordance with the approved Work Plan (CH2M HILL, 2001b). Sample collection modifications from those in the Work Plan were as follows:

- Due to laboratory error, cyanide was analyzed for the far shore sediment sample (AS01-SD02B) collected from Transect 2 rather than for the near shore sample (AS01-SD01-R05) collected from Transect 1.
- Cyanide was analyzed for the near shore sediment sample (AS01-SD09) collected from Transect 8. Neither the Work Plan nor the chain-of-custody called for cyanide analyses of this sample.
- SVOCs were analyzed for the mid-channel surface water sample (AS01-SW05-R05) collected from Transect 9. Although not required by the Work Plan, this sample was collected in response to a diesel fuel release near Site 10 on June 12, 2001, which occurred during the sampling event. The sample was collected in the vicinity of where stormwater discharge from this area enters the North Branch Potomac River.
- Explosives were analyzed for the far shore sediment sample (AS01-SD06B) collected from Transect 3. Neither the Work Plan nor the chain-of-custody called for explosives analyses of this sample.
- Dioxins/furans were analyzed for the mid-channel sediment sample (AS01-SD09A) from Transect 8 rather than the near shore sediment sample (AS01-SD09). Although the chain-of-custody correctly identified dioxin/furans analysis for the near shore sample, the laboratory analyzed the mid-channel sample.
- The pH of surface water was measured with a field instrument rather than in the laboratory to obtain real-time, more representative measurements than can be provided by an offsite laboratory.
- Grain-size was analyzed for the mid-channel sediment sample (AS01-SD02B) rather than the far shore sediment sample (AS01-SD02A-R05) from Transect 2. Due to a lack of

sediment and the presence of large cobbles along the sampling transects in the far shore location, only a limited volume of sediment could be obtained there. Because the sediment volume was insufficient for sample analysis, the sampling protocol was changed so that the sediment sample was collected from the mid-channel location.

### **3.2.4 Tissue Sampling**

The work plan for the Soil and Tissue Sampling in Support of the BERA Step 4 included the collection of earthworm samples. Although earthworms were found at many of the soil sample locations, sufficient tissue mass for the chemical analysis of all selected analyte groups could not be obtained from all locations. Because of this, additional soil was collected to perform the laboratory bioaccumulation (tissue residue) testing defined in Section 3.1.3.

The results of the tissue samples are included in Appendix E.

### **3.2.5 Field Quality Assurance /Quality Control**

Quality assurance/quality control procedures were followed during the 2001 and 2004 supplemental investigations to ensure the appropriate custody and integrity of environmental samples. Accordingly, equipment rinsate blanks, trip blanks, matrix spike/matrix spike duplicates, and field duplicates were collected at predetermined intervals. The procedures were consistent with those specified in the approved Work Plan (CH2M HILL, 2000; 2001a; 2001b; 2004c; 2004d).

### **3.2.6 Surveying**

The sample locations were surveyed using a global positioning system unit. Surveyed locations were reported using the West Virginia state plane coordinate system.

### **3.2.7 Investigation-Derived Waste Management**

The investigation-derived waste (IDW) generated during the supplemental investigations comprised soil cuttings and equipment decontamination water. The IDW was disposed in accordance with the approved Work Plan (CH2M HILL, 2000; 2001a; 2001b; 2004c; 2004d).

## **3.3 Laboratory Procedures / Data Validation**

During the 2001 and 2004 supplemental investigations, soil, surface water, and sediment samples were collected and analyzed for VOCs, SVOCs, and explosives, dioxin/furans, pesticides, and metals in accordance to the analytical methods summarized in Table 3-4. Analytical services were performed by off-site laboratories and the results were validated by third parties in accordance with the Navy Installation Restoration Laboratory Quality Assurance Guide; Interim Guidance Document (Naval Facilities Engineering Center 1996).

TABLE 3-1  
 Summary of Surface Soil Sampling Scope for the Supplemental Investigations  
*Site 1 Focused Remedial Investigation for Soil*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Sample ID	Duplicate	Date	Area	Depth in Feet		VOCs	SVOCs	Explosives	Metals	Dioxins
				From	To					
<b>2001 Supplemental Investigations</b>										
AS01-SS01-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS02-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS03-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS04-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS05-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS06-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS08-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS14-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS15-R01X		02/21/01	ABG	0	1	X	X	X	X	X
AS01-SS07-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS09P-R01X	Yes	02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS09-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS10-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS11-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS12-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS13-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS16P-R01X	Yes	02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS16-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS17-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS18-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS19-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS20-R01X		02/22/01	ABG	0	1	X	X	X	X	X
AS01-SS26-(0-1)		10/23/01	OABG	0	1	X	X	X	X	
AS01-SS27-(0-1)		10/23/01	OABG	0	1	X	X	X	X	
AS01-SS39-(0-1)		10/23/01	OABG	0	1	X	X	X	X	
AS01-SS24-(0-1)		10/24/01	OABG	0	1	X	X	X	X	
AS01-SS25-(0-1)		10/24/01	OABG	0	1	X	X	X	X	
AS01-SS30-(0-1)		10/24/01	OABG	0	1	X	X	X	X	X
AS01-SS40-(0-1)		10/24/01	OABG	0	1	X	X	X	X	X
AS01-SS41-(0-1)		10/24/01	OABG	0	1	X	X	X	X	X
AS01-SS21-(0-1)		10/25/01	OABG	0	1	X	X	X	X	
AS01-SS21P-(0-1)	Yes	10/25/01	OABG	0	1	X	X	X	X	
AS01-SS22-(0-1)		10/25/01	OABG	0	1	X	X	X	X	
AS01-SS34-(0-1)		10/25/01	OABG	0	1	X	X	X	X	
AS01-SS34P-(0-1)	Yes	10/25/01	OABG	0	1	X	X	X	X	
AS01-SS36-(0-1)		10/25/01	OABG	0	1	X	X	X	X	X
AOCM-1-T		10/26/01	OABG	0	1	X	X	X	X	
AOCM-2-T		10/26/01	OABG	0	1	X	X	X	X	
AS01-SS23-(0-1)		10/26/01	OABG	0	1	X	X	X	X	
AS01-SS28-(0-1)		10/26/01	OABG	0	1	X	X	X	X	
AS01-SS29-(0-1)		10/26/01	OABG	0	1	X	X	X	X	
AS01-SS33-(0-1)		10/26/01	OABG	0	1	X	X	X	X	X
AS01-SS35-(0-1)		10/26/01	OABG	0	1	X	X	X	X	X
AS01-SS37-(0-1)		10/26/01	OABG	0	1	X	X	X	X	X
AS01-SS38-(0-1)		10/26/01	OABG	0	1	X	X	X	X	X
AS01-SS38P-(0-1)	Yes	10/26/01	OABG	0	1	X	X	X	X	X

TABLE 3-1

Summary of Surface Soil Sampling Scope for the Supplemental Investigations  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Sample ID	Duplicate	Date	Area	Depth in Feet		VOCs	SVOCs	Explosives	Metals	Dioxins
				From	To					
<b>2004 Supplemental Investigations</b>										
AS01-SS46-0-1		07/20/04	OABG	0	1	X	X		X	
AS01-SS47-0-1		07/20/04	OABG	0	1	X	X		X	
AS01-SS48-0-1		07/20/04	OABG	0	1	X	X		X	
AS01-SS49-0-1		07/20/04	OABG	0	1	X	X		X	
AS01-SS50-0-1		07/21/04	OABG	0	1	X	X		X	X
AS01-SS50P-0-1	Yes	07/21/04	OABG	0	1	X	X		X	X
AS01-SS51-0-1		07/21/04	OABG	0	1	X	X		X	X
AS01-SS52-0-1		07/21/04	OABG	0	1	X	X		X	X
AS01-SS53-0-1		07/21/04	OABG	0	1	X	X		X	X
AS01-SS54-0-1		07/21/04	OABG	0	1	X	X		X	X
AS01-SS55P-0-1	Yes	07/21/04	OABG	0	1					
AS01-SS56-0-1		07/21/04	OABG	0	1		X		X	X
AS01-SS57-0-1		07/21/04	OABG	0	1		X		X	X
AS01-SS58-0-1		07/21/04	OABG	0	1		X		X	X
AS01-SS59-0-1		07/21/04	OABG	0	1		X		X	X
AS01-SS60-0-0.5		09/21/04	FDP	0	0.5	X	X	X	X	X
AS01-SS61-0-0.5		09/21/04	FDP	0	0.5	X	X	X	X	X
AS01-SS62-0-0.5		09/21/04	FDP	0	0.5	X	X	X	X	X
AS01-SS63-0-0.5		09/22/04	ABG	0	0.5	X	X	X	X	X
AS01-SS64-0-0.5		09/22/04	ABG	0	0.5	X	X	X	X	X
AS01-SS65-0-0.5		09/22/04	ABG	0	0.5	X	X	X	X	X
AS01-SS66-0-0.5		09/23/04	ABG	0	0.5	X	X	X	X	X
AS01-SS67-0-0.5		09/23/04	ABG	0	0.5	X	X	X	X	X
AS01-SS68-0-0.5		09/23/04	ABG	0	0.5	X	X	X	X	X
AS01-SS69-0-0.5		09/23/04	ABG	0	0.5	X	X	X	X	X
AS01-SS69P-0-0.5	Yes	09/23/04	ABG	0	0.5	X	X	X	X	X
AS01-SS70-0-0.5		09/23/04	ABG	0	0.5	X	X	X	X	X
AS01-SS71-0-0.5		09/23/04	OABG	0	0.5	X	X	X	X	X
AS01-SS72-0-0.5		09/23/04	OABG	0	0.5	X	X	X	X	X
AS01-SS72P-0-0.5	Yes	09/23/04	OABG	0	0.5	X	X	X	X	X
AS01-SS73-0-0.5		09/23/04	OABG	0	0.5	X	X	X	X	X
AS01-SS74-0-0.5		09/23/04	OABG	0	0.5	X	X	X	X	X

**Notes:**

X indicates that the sample was analyzed for the indicated group of constituents.

OABG = Outside Active Burning Grounds

ABG = Active Burning Grounds

FDP = Former Disposal Pits

TABLE 3-2

Summary of Subsurface Soil Sampling Scope for the Supplemental Investigations

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Sample ID	Duplicate	Date	Area	Depth in Feet		VOCs	SVOCs	Explosives	Metals	Dioxins
				From	To					
<b>2001 Supplemental Investigations</b>										
AS01-SB14P-R01X	Yes	02/21/01	ABG	1	2	X	X	X	X	X
AS01-SB14-R01X		02/21/01	ABG	1	2	X	X	X	X	X
AS01-SB15-R01X		02/21/01	ABG	1	2	X	X	X	X	X
AS01-SB16-R01X		02/22/01	ABG	1	2	X	X	X	X	X
AS01-SB17-R01X		02/22/01	ABG	1	2	X	X	X	X	X
AS01-SB18-R01X		02/22/01	ABG	1	2	X	X	X	X	X
AS01-SB19-R01X		02/22/01	ABG	1	2	X	X	X	X	X
AS01-SB20-R01X		02/22/01	ABG	1	2	X	X	X	X	X
AS01-SB26-(1-2)		10/23/01	OABG	1	2	X	X		X	
AS01-SB27-(1-2)		10/23/01	OABG	1	2	X	X		X	
AS01-SB39-(1-2)		10/23/01	OABG	1	2	X	X		X	
AS01-SB24-(1-2)		10/24/01	OABG	1	2	X	X		X	
AS01-SB25-(1-2)		10/24/01	OABG	1	2	X	X		X	
AS01-SB30-(1-2)		10/24/01	OABG	1	2	X	X	X	X	X
AS01-SB40-(1-2)		10/24/01	OABG	1	2	X	X	X	X	X
AS01-SB41-(1-2)		10/24/01	OABG	1	2	X	X	X	X	X
AS01-SB42-(1-2)		10/24/01	FDP	1	2					
AS01-SB43-(1-2)		10/24/01	FDP	1	2					
AS01-SB44-(1-2)		10/24/01	FDP	1	2					
AS01-SB31-(1-2)		10/25/01	OABG	1	2					
AS01-SB34-(1-2)		10/25/01	OABG	1	2					
AS01-SB34P-(1-2)	Yes	10/25/01	OABG	1	2					
AS01-SB36-(1-2)		10/25/01	OABG	1	2					
AS01-SB38-(1-2)		10/26/01	OABG	1	2					
AS01-SB38P-(1-2)	Yes	10/26/01	OABG	1	2					
<b>2004 Supplemental Investigations</b>										
AS01-SB63-6.5-7		09/22/04	ABG	6.5	7	X	X	X	X	X
AS01-SB64-7.5-8		09/22/04	ABG	7.5	8	X	X	X	X	X
AS01-SB64P-7.5-8	Yes	09/22/04	ABG	7.5	8	X	X	X	X	X
AS01-SB65-1.5-2		09/22/04	ABG	1.5	2	X	X	X	X	X
AS01-SB60-1-3		09/22/04	FDP	1	3	X	X	X	X	X
AS01-SB60-3-5		09/22/04	FDP	3	5	X	X	X	X	X
AS01-SB60-5-7		09/22/04	FDP	5	7	X	X	X	X	X
AS01-SB60-7-8		09/22/04	FDP	7	8	X	X	X	X	X
AS01-SB61-1-3		09/22/04	FDP	1	3	X	X	X	X	X
AS01-SB61-3-5		09/22/04	FDP	3	5	X	X	X	X	X
AS01-SB61-5-7		09/22/04	FDP	5	7	X	X	X	X	X
AS01-SB61-7-8		09/22/04	FDP	7	8	X	X	X	X	X
AS01-SB61P-1-3	Yes	09/22/04	FDP	1	3	X	X	X	X	X
AS01-SB62-1-3		09/22/04	FDP	1	3	X	X	X	X	X
AS01-SB62-3-5		09/22/04	FDP	3	5	X	X	X	X	X
AS01-SB62-5-7		09/22/04	FDP	5	7	X	X	X	X	X
AS01-SB62-7-8		09/22/04	FDP	7	8	X	X	X	X	X
AS01-SB66-1.5-2		09/23/04	ABG	1.5	2	X	X	X	X	X
AS01-SB67-1.5-2		09/23/04	ABG	1.5	2	X	X	X	X	X
AS01-SB68-1.5-2		09/23/04	ABG	1.5	2	X	X	X	X	X
AS01-SB69-1-1.5		09/23/04	ABG	1	1.5	X	X	X	X	X

TABLE 3-2

Summary of Subsurface Soil Sampling Scope for the Supplemental Investigations

*Site 1 Focused Remedial Investigation for Soil*

*Allegany Ballistics Laboratory*

*Rocket Center, West Virginia*

Sample ID	Duplicate	Date	Area	Depth in Feet		VOCs	SVOCs	Explosives	Metals	Dioxins
				From	To					
AS01-SB70-1-1.5		09/23/04	ABG	1	1.5	X	X	X	X	X
AS01-SB70-2.5-3		09/23/04	ABG	2.5	3	X	X	X	X	X
AS01-SB71-1.5-2		09/23/04	OABG	1.5	2	X	X	X	X	X
AS01-SB72-4.5-5		09/23/04	OABG	4.5	5	X	X	X	X	X
AS01-SB73-1.5-2		09/23/04	OABG	1.5	2	X	X	X	X	X
AS01-SB74-4-4.5		09/23/04	OABG	4	4.5	X	X	X	X	X

**Notes:**

X indicates that the sample was analyzed for the indicated group of constituents.

TABLE 3-3

Summary of Sediment and Surface Water Sampling Scope for the Supplemental Investigations

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Sample ID	Duplicate	Date	Area	Depth in Feet		VOCs	SVOCs	Explosives	Metals	Dioxins
				From	To					
<b>Sediment Samples - October 2001 Supplemental Investigation</b>										
AS01-SD01A-R05		06/14/01	River	0	1	X	X	X	X	X
AS01-SD01-R05		06/14/01	River	0	1	X	X	X	X	X
AS01-SD02A-R05		06/14/01	River	0	1	X	X	X	X	
AS01-SD02B		06/14/01	River	0	1	X	X	X	X	
AS01-SD02C		06/14/01	River	0	1	X	X	X	X	X
AS01-SD02D		06/14/01	River	0	1	X	X	X	X	
AS01-SD02-R05		06/14/01	River	0	1	X	X	X	X	X
AS01-SD03A-R05		06/14/01	River	0	1	X	X	X	X	
AS01-SD03B		06/14/01	River	0	1	X	X	X	X	
AS01-SD03-R05		06/15/01	River	0	1	X	X	X	X	
AS01-SD04B		06/15/01	River	0	1	X	X	X	X	
AS01-SD04P-R05		06/15/01	River	0	1	X	X	X	X	
AS01-SD04-R05		06/15/01	River	0	1	X	X	X	X	
AS01-SD05C		06/15/01	River	0	1	X	X	X	X	X
AS01-SD05-R05		06/15/01	River	0	1	X	X	X	X	
AS01-SD06		06/15/01	River	0	1	X	X	X	X	X
AS01-SD06A		06/15/01	River	0	1	X	X	X	X	
AS01-SD06B	Yes	06/15/01	River	0	1	X	X	X	X	
AS01-SD06P		06/15/01	River	0	1	X	X	X	X	X
AS01-SD07		06/15/01	River	0	1	X	X	X	X	X
AS01-SD07A		06/15/01	River	0	1	X	X	X	X	
AS01-SD07B		06/15/01	River	0	1	X	X	X	X	
AS01-SD07BP	Yes	06/15/01	River	0	1	X	X	X	X	
AS01-SD07P		06/15/01	River	0	1	X	X	X	X	X
AS01-SD08		06/15/01	River	0	1	X	X	X	X	X
AS01-SD08A	Yes	06/15/01	River	0	1	X	X	X	X	
AS01-SD09		06/15/01	River	0	1	X	X	X	X	
AS01-SD09A	Yes	06/15/01	River	0	1	X	X	X	X	X
<b>Surface Water Samples - October 2001 Supplemental Investigation</b>										
AS01-SW01A-R05		06/13/01	River	NA	NA	X			X	
AS01-SW01-R05		06/13/01	River	NA	NA	X	X	X	X	
AS01-SW02A-R05		06/13/01	River	NA	NA	X			X	
AS01-SW02-R05		06/13/01	River	NA	NA	X	X	X	X	
AS01-SW03A-R05		06/13/01	River	NA	NA	X			X	
AS01-SW03P-R05		06/13/01	River	NA	NA	X	X	X	X	
AS01-SW03-R05		06/14/01	River	NA	NA	X	X	X	X	
AS01-SW04A-R05		06/14/01	River	NA	NA	X			X	
AS01-SW04-R05		06/14/01	River	NA	NA	X	X	X	X	
AS01-SW05C		06/14/01	River	NA	NA	X	X	X	X	
AS01-SW05-R05		06/14/01	River	NA	NA	X	X	X	X	
AS01-SW06	Yes	06/14/01	River	NA	NA	X	X	X	X	
AS01-SW06P		06/14/01	River	NA	NA	X	X	X	X	
AS01-SW07		06/14/01	River	NA	NA	X	X	X	X	
AS01-SW08	Yes	06/14/01	River	NA	NA	X	X	X	X	
AS01-SW09		06/14/01	River	NA	NA	X	X	X	X	

**Notes:**

X indicates that the sample was analyzed for the indicated group of constituents.

River = North Branch Potomac River adjacent to Site 1.

NA = Not applicable

TABLE 3-4

Analytical Methods for Soil, Surface Water, and Sediment Sampling in 2001 and 2004  
*Site 1 Focused Remedial Investigation for Soil*  
*Allegany Ballistics Laboratory*  
*Rocket Center, West Virginia*

Analyte Group	Method Number
TCL VOCs	CLP OLM04
TCL SVOCs	CLP OLM04
Dioxin/Furans	1613B
Explosives	SW-846 8330
Perchlorate	EPA 314M
Nitroglycerin	SW-846 8332
Metals	CLP ILM04
Total Organic Carbon	Lloyd Kahn
pH	9045C

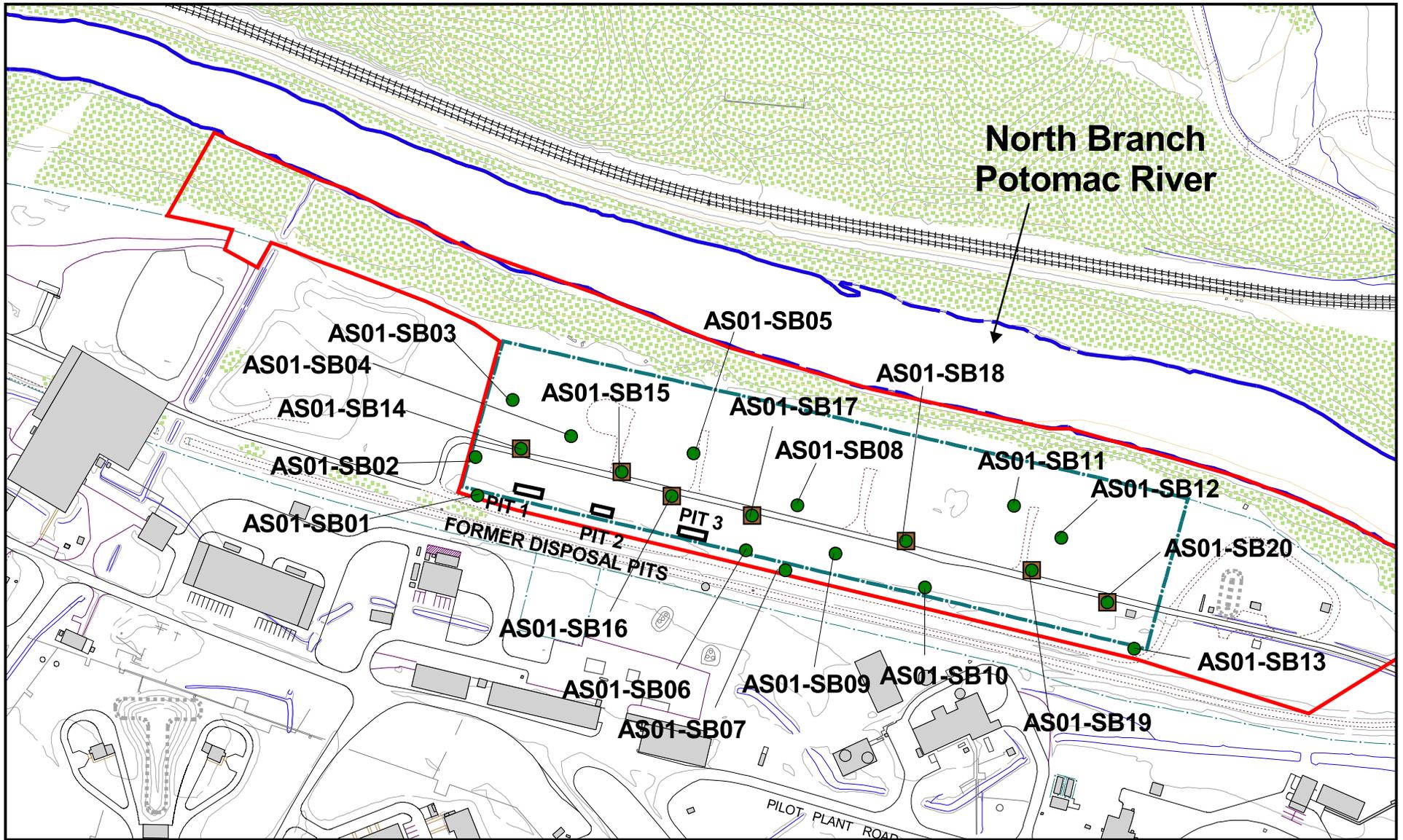
**Notes:**

TCL = Target compound list

VOCs = volatile organic compounds

SVOCs = semi-volatile organic compounds

PCB = Polychlorinated Biphenyls



**LEGEND**

- Surface Soil Sample Location
- Subsurface Soil Sample Location
- Site 1 Boundary
- Vegetation
- Buildings
- ∧ Roads
- ∩ Water Bodies

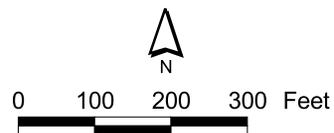
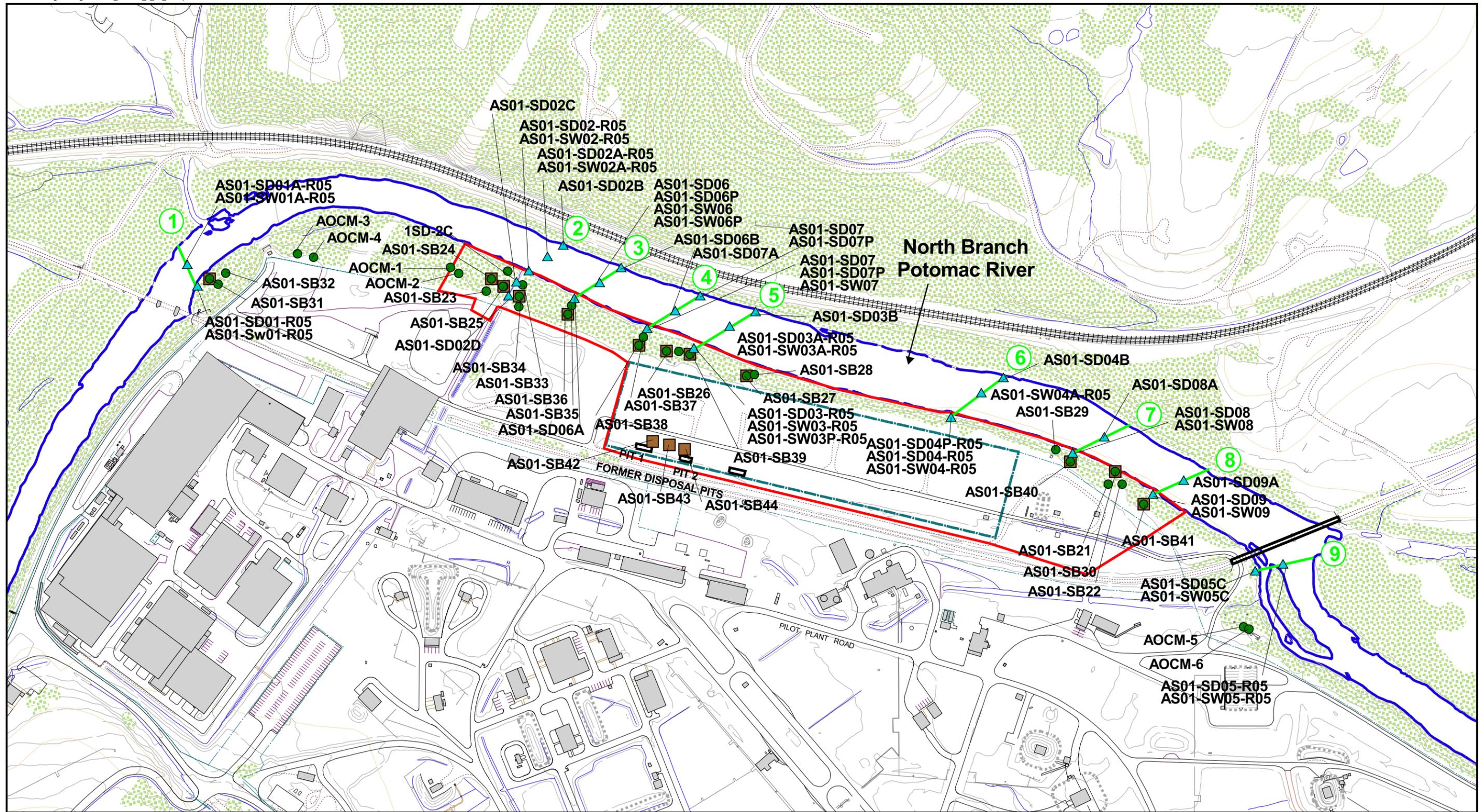


Figure 3-1  
February 2001 Supplemental Investigation Sample Locations  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



- LEGEND**
- Surface Soil Sample Location
  - Subsurface Soil Sample Location
  - Transects
  - Buildings
  - Vegetation
  - Water Bodies
  - Roads
  - Approximate Site 1 Boundary

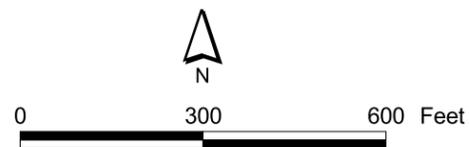
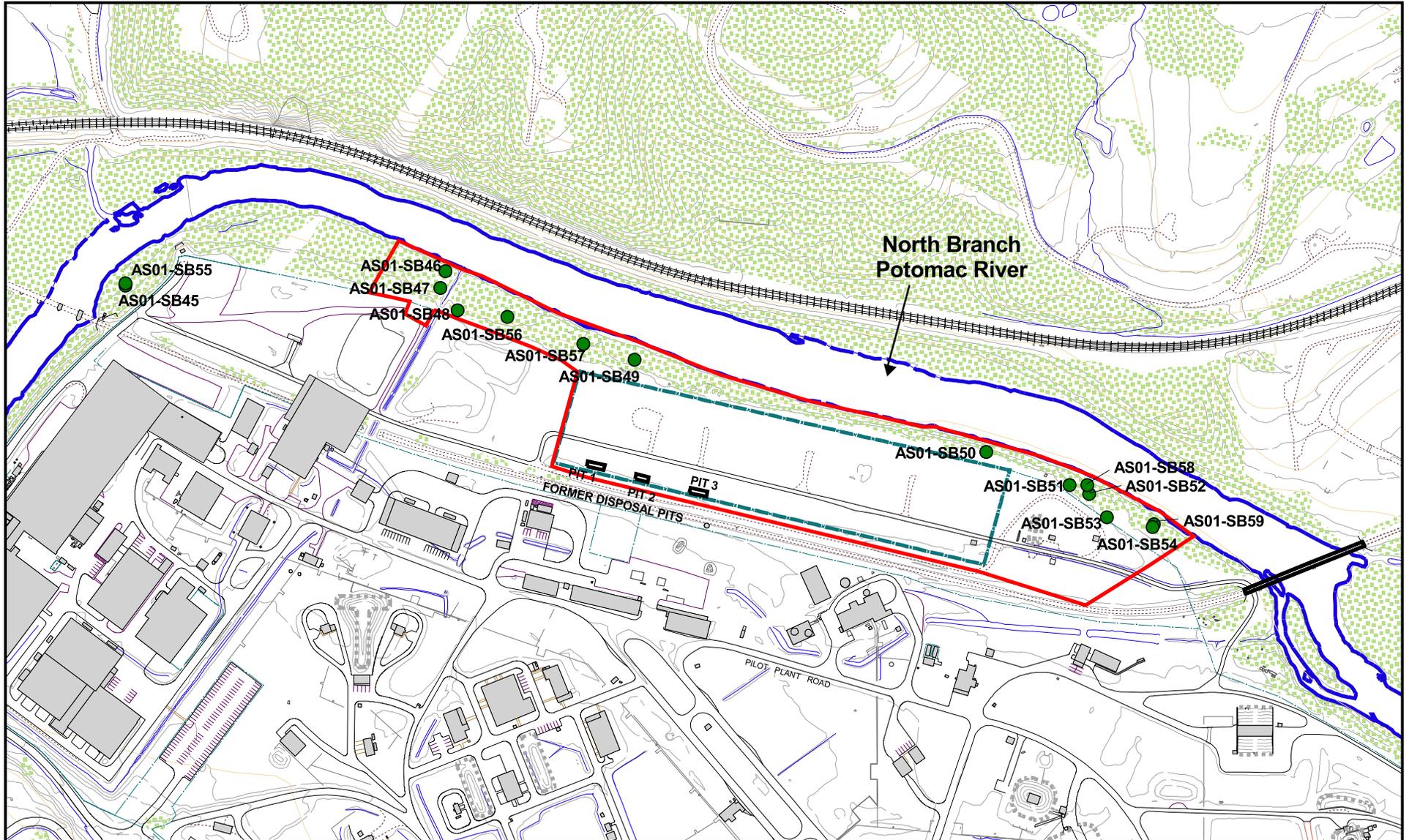


Figure 3-2  
 October 2001 Sample Locations  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia



**LEGEND**

- Surface Soil Sample Location
- ▭ Site 1 Boundary
- ▨ Vegetation
- ▭ Buildings
- ∩ Roads
- ∩ Water Bodies

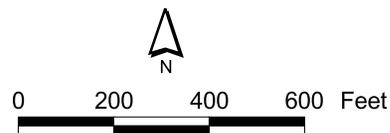
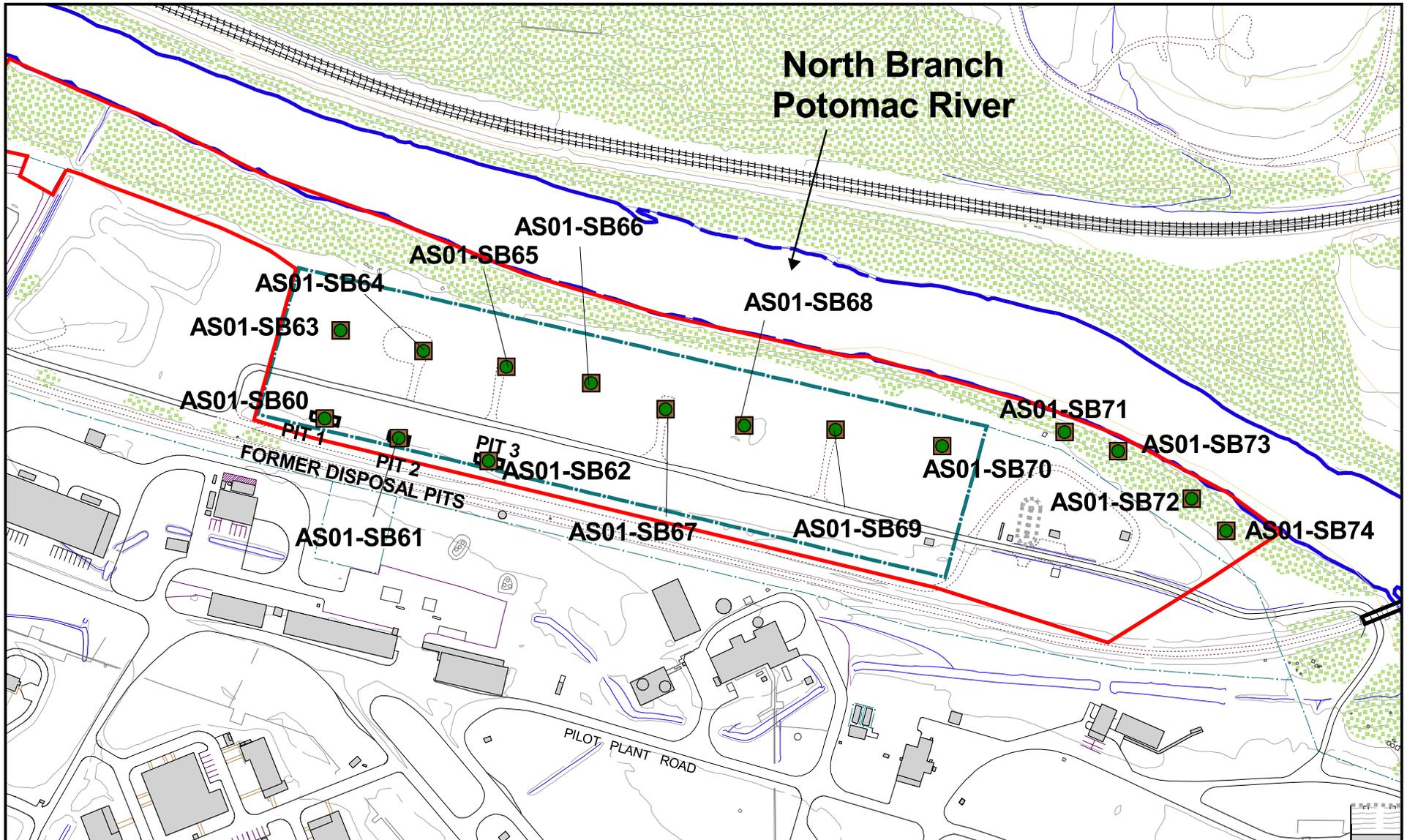


Figure 3-3  
July 2004 Supplemental Investigation Sample Locations  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**LEGEND**

-  Surface Soil Sample Location
-  Subsurface Soil Sample Location
-  Site 1 Boundary
-  Vegetation
-  Buildings
-  Roads
-  Water Bodies

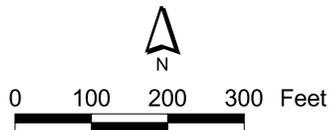


Figure 3-4  
September 2004 Supplemental Investigation Sample Locations  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia

## SECTION 4

# Nature and Extent of Soil Contamination

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This section describes the nature and extent of soil contamination at Site 1 by evaluating the soil data collected during the 1992 RI, 1994 Focused RI, 1998 Supplemental Soil Investigation, and the 2001 and 2004 supplemental investigations. The nature and extent of contamination is discussed in this section with respect to the COCs developed in the HHRA and ERA sections (Sections 6 and 7, respectively). The HHRA COCs for soil are listed in Table 4-1, which shows that metals, VOCs, SVOCs, and dioxin were identified for the OABG and FDP areas. No HHRA COCs were identified for the ABG area. As explained in Section 6, the HHRA COCs were determined based on residential and industrial receptor scenarios for the FDP and OABG areas, and, because it is currently used to burn explosive waste, industrial scenarios for the ABG. The ERA COCs for surface soil are listed in Table 4-2, which shows that metals, SVOCs, explosives, VOCs, and dioxins were identified for the OABG area. Metals, SVOCs, and explosives were identified as ERA COCs for the ABG and FDP areas. As explained in Section 7, for the purpose of the ERA, the OABG was considered the floodplain area and the ABG and FDP areas were grouped as the upland area.

Analytical results for the identified COCs were compared to screening values for the purpose of the nature and extent of contamination discussion. These screening levels provide a preliminary and conservative evaluation of the potential risk associated with constituents in site soil. Assessment of the risks potentially posed by site soil was performed in the HHRA and ERA, as explained in Sections 6 and 7, respectively. The HHRA screening values are the EPA Region III adjusted residential or industrial soil risk-based concentrations (RBCs). The ERA screening values originate from various literature sources depending on the constituent. Additional information on ERA screening values can be found in Section 7. Exceedances of the screening values are provided in Tables 4-3 to 4-8. Raw analytical data for both surface and subsurface soil samples are included as Appendix D.

Samples corresponding to a particular COC were compiled for the evaluation of its nature and extent, as discussed in the following subsections. Duplicates were not counted as individual samples in the total sample count; rather, the maximum concentration between the duplicate and original sample was retained for that sample location.

In both the HHRA and ERA, metal COC concentrations were compared to the background concentrations presented in *Final Technical Memorandum: Background Soil Investigation* (CH2M HILL, 2004e). Additional details concerning the HHRA and ERA background comparison are included in Sections 6 and 7, respectively. Because the background soil data set does not include samples taken from floodplain areas, reference surface soil samples (AS01-SS31, AS01-SS32, AS01-SS45, and AS01-SS55) were collected west of Site 1 and used for comparison to site-specific data in the ERA, as explained in Section 7.3.4.

## 4.1 Surface Soil

The HHRA and ERA data sets analyzed in this RI included 124 and 129 surface soil samples, respectively, from the ABG, OABG, and FDP areas. The five additional samples used in the

ERA were reference samples, from outside the Site 1 boundary, for comparison purposes. These surface soil samples, collected from a maximum depth of one ft bgs, were analyzed variously for VOCs, SVOCs, explosives, PCBs, dioxins/furans, and metals. The surface soil samples included in the HHRA and ERA are listed in Appendix A. Concentrations of COCs in surface soil that exceed screening values are discussed below by constituent group. In addition to comparison to screening values, concentrations of the metals COCs were compared to background values. Background values are presented in Table 4-9.

#### 4.1.1 VOCs

TCE and PCE were identified in the HHRA (Section 6) as VOC COCs. TCE is a COC for the OABG and FDP areas and PCE is a COC for the OABG area. No VOC COCs were identified in the HHRA for the ABG area. Three VOCs were identified as ERA COCs in the OABG area: 1,2-dichloroethene (1,2-DCE), methyl acetate, and TCE. No VOC COCs were identified in the ERA for the ABG or FDP areas. The extent of VOC COCs in Site 1 surface soil is represented by TCE in Figure 4-1, which displays TCE concentrations above the adjusted residential RBC of 1,600 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). Exceedances of corresponding human health or ecological screening criteria (or detections in the absence of screening values) for the other VOC COCs (i.e. 1,2-DCE and methyl acetate) are co-located with one or more of the TCE exceedances shown in the figure.

TCE exceeded the adjusted residential RBC ( $1,600 \mu\text{g}/\text{kg}$ ) in 12 of the 49 surface soil samples and the ERA screening value ( $10,920 \mu\text{g}/\text{kg}$ ) in 6 of the 49 surface soil samples from the OABG and FDP areas analyzed for VOCs. The maximum detected concentration was  $82,000 \mu\text{g}/\text{kg}$  in the surface soil sample from AS01-SB21, located in the former inert burn area (Figure 4-1). PCE concentrations did not exceed the HHRA screening criteria of  $1,200 \mu\text{g}/\text{kg}$  in the surface soil samples. However, subsurface soil PCE concentrations did exceed the adjusted RBC. PCE was identified as a HHRA COC based on combined surface and subsurface soil data and therefore for the OABG as a whole. Additional evaluations will utilize the data to determine the necessary remediation for surface and subsurface soil.

The concentration of 1,2-DCE exceeded the ecological screening value ( $300 \mu\text{g}/\text{kg}$ ) in one of six samples analyzed for 1,2-DCE in the ERA OABG sample set. The concentration in the sample from HCS-BG-110S (sample location shown in Figure 4-1) was  $16,000 \mu\text{g}/\text{kg}$ . No ecological screening value is available for methyl acetate; however, it was detected in seven of 34 samples, with a maximum concentration of  $1,600 \mu\text{g}/\text{kg}$  in the sample from AS01-SS72. As discussed in the ERA section (Section 7), detected constituents without screening values are retained as Constituent of Potential Concern (COPC)s. In the risk evaluation, these constituents are revisited (based upon data from related constituents, background, etc.) to determine if they should be retained as COCs. There were a few soil COCs that were retained that lacked screening values. However, these constituents overlap other similar constituents that do have screening values, in terms of spatial distribution, and therefore should have no impact on remedial decisions. Additional information is presented in the ERA Section 7.

In general, VOC exceedances of human health and/or ecological screening criteria in surface soil are encountered in one or more of the following areas: the former inert burn area and associated disposal area located in the northeastern portion of Site 1, the former open burn disposal area in the western portion of Site 1, and FDP 1.

### 4.1.2 SVOCs

Six SVOCs were identified as HHRA COCs for the OABG area: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Concentrations of these SVOCs, except benzo(k)fluoranthene, exceeded the corresponding adjusted residential RBCs. Similar to PCE, benzo(k)fluoranthene was identified as a HHRA COC based on combined surface and subsurface soil data (see Section 6) Forty-six surface soil samples from the OABG were analyzed for these compounds, except dibenz(a,h)anthracene, which was analyzed in 31 surface soil samples. The ERA identified two SVOC COCs for Site 1 surface soil: total polycyclic aromatic hydrocarbons (PAHs) for the OABG area and 2-nitroaniline for the ABG and FDP areas.

The extent of SVOC COCs in Site 1 surface soil is represented by benzo(a)pyrene in Figure 4-2, which displays concentrations of benzo(a)pyrene above the adjusted residential RBC of 87  $\mu\text{g}/\text{kg}$ . Exceedances of corresponding human health or ecological screening criteria (or detections in the absence of screening values) for the other SVOC COCs are co-located with one or more of the benzo(a)pyrene exceedances shown in the figure. These are further discussed below.

Benzo(a)anthracene concentrations exceeded the adjusted residential RBC of 870  $\mu\text{g}/\text{kg}$  in three of 46 samples, with a maximum concentration of 8,100  $\mu\text{g}/\text{kg}$  at AS01-SB57, located in the former open burn disposal area.

Benzo(a)pyrene concentrations exceeded the adjusted residential RBC of 87  $\mu\text{g}/\text{kg}$  in 23 of the 46 samples with a maximum concentration of 12,000  $\mu\text{g}/\text{kg}$  at AS01-SB57, located in the former open burn disposal area.

Benzo(b)fluoranthene concentrations exceeded the adjusted residential RBC of 870  $\mu\text{g}/\text{kg}$  in four of the 46 samples, with a maximum concentration of 21,000  $\mu\text{g}/\text{kg}$  at AS01-SB49, located in the former open burn disposal area.

Dibenz(a,h)anthracene concentrations exceeded the adjusted residential RBC of 87  $\mu\text{g}/\text{kg}$  in two of the 31 samples. These dibenz(a,h)anthracene concentrations were 230  $\mu\text{g}/\text{kg}$  and 430  $\mu\text{g}/\text{kg}$  for the samples from HCS-B2-4-4 and AS01-SB26, respectively. These samples are located in the western drainage ditch and former open burn disposal area, respectively.

Indeno(1,2,3-cd)pyrene concentrations exceeded the adjusted residential RBC of 870  $\mu\text{g}/\text{kg}$  in two of the 46 samples. The concentrations were 5,000  $\mu\text{g}/\text{kg}$  and 5,400  $\mu\text{g}/\text{kg}$  for the samples from AS01-SS49 and AS01-SB57, respectively, located in the former open burn disposal area.

The total PAHs exceeded ecological screening value of 7,462  $\mu\text{g}/\text{kg}$  in six of the 47 samples. The maximum detected value was 145,600  $\mu\text{g}/\text{kg}$  in the sample from AS01-SB57. PAH concentrations were elevated in a few specific sample locations (AS01-SB24, AS01-SB25, HCS-B2-4-4, and HCS-B2-5-3) along the banks of the western drainage ditch, the former open burn disposal area (AS01-SB49), and former inert burn disposal area (AS01-SB57). These locations coincide with the exceedances of the HHRA COC benzo(a)pyrene mapped in Figure 4-2.

No screening value exists for 2-nitroaniline. It was detected in two of 39 surface soil samples from the ABG and FDP areas. The concentrations were 94  $\mu\text{g}/\text{kg}$  and 13,000  $\mu\text{g}/\text{kg}$

µg/kg in samples HCS-BP-5 and HCS-BP-7, respectively. These sample locations coincide with the locations of former burning pads 5 and 7, respectively, in the ABG area.

In general, SVOC exceedances of the human health and ecological screening criteria in surface soil are encountered in one or more of the following areas: the western drainage ditch, the disposal area of the former open burn area, and the former inert burn area and associated disposal area.

### 4.1.3 Dioxins/Furans

As explained in the HHRA (Section 6), the toxicity of a dioxin mixture is expressed in terms of its Toxic Equivalent Quotient (TEQ), which is the amount of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD, the most toxic dioxin) it would take to equal the combined toxic effect of the dioxins found in that mixture. TEQs were calculated in the HHRA and ERA. The nature and extent of dioxin contamination is evaluated based on the calculated TEQ values.

Sixty surface soil samples in the HHRA data set from the three areas (ABG, OABG, and FDP) were analyzed for dioxins/furans. Dioxins were identified as HHRA COCs in the OABG and FDP areas. As shown in Figure 4-3, TCDD TEQ values exceeded the TEQ screening value ( $4.3 \times 10^{-6}$  µg/kg) in 22 samples. Two exceedances occurred in the FDP area: one in Pit 1 and one in Pit 2. The dioxin exceedances in the OABG area are located primarily in the two former burn areas and associated disposal areas, as seen in Figure 4-3. Two dioxin exceedances were also located along the western drainage ditch.

Total dioxin/furans based on the TEQ, were identified as ERA COCs in the OABG area. As with the dioxin exceedances of HHRA criteria, the greatest concentrations of these constituents generally occurred in the vicinities of the former open burn area and associated disposal area, the western drainage ditch (e.g., HCS-B2-10 and HCS-B2-C), and the former inert burn area and associated disposal area (e.g., AS01-SS72, HCS-B1-C, HCS-B1-4-S, and HCS-B1-11-S). Several of these samples (HCS-B2-C, HCS-B1-C, HCS-B1-4-S, and HCS-B1-11-S) consisted mostly of ash rather than soil.

### 4.1.4 Explosives

Sixty surface soil samples in the HHRA data set from the three areas (ABG, OABG, and FDP) were analyzed for explosives. No explosives were determined to be HHRA COCs.

Explosives were determined to be COCs in the ERA. High melting point explosive (HMX), nitroglycerin, and royal demolition explosive (RDX) were identified as ERA COCs in the OABG area. 1,3,5-trinitrobenzene, HMX, nitroglycerin, perchlorate, and RDX were identified as ERA COCs in the ABG and FDP areas. The locations of RDX exceedances in the three areas represent the maximum extent of explosives COCs in Site 1 surface soil. The RDX exceedances of ERA screening values are shown on Figure 4-4. The majority of RDX exceedances occurred in the ABG area, at locations in close proximity to the former burn pads. The one RDX exceedance in the FDP area occurs in the area believed to be Pit 3, next to which a burn pad was historically located. In the OABG area, the only RDX exceedance occurred at sample location AS01-SB72, located in the former inert burn area.

The only HMX exceedance in the OABG area occurred at sample location AS01-SB72, located in the former inert burn area. Nitroglycerin, for which a screening value does not exist, was also detected at this sample location. The only perchlorate exceedance of the ERA

screening value, and the only detected concentration of nitroglycerin in the ABG area, occurred at AS01-SB64. Detections of 1,3,5-trinitrobenzene, for which an ERA screening value does not exist, was detected at sample locations AS01-SB65 and BP-07, which coincide with RDX exceedances.

Spatially, exceedances of explosives in the surface soil were associated primarily with the former burn pads in the ABG.

#### 4.1.5 Metals

Ninety-three surface soil samples in the HHRA data set were analyzed for metals. Aluminum, antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, thallium, and vanadium were identified as HHRA COCs in the OABG area. Aluminum, arsenic, iron, manganese, thallium, and vanadium were identified as HHRA COCs in the FDP area. No HHRA COCs were identified in the ABG area. Arsenic, iron, manganese, and vanadium concentrations consistently exceeded the corresponding screening values in the OABG and FDP areas. Iron exceedances of the adjusted residential RBC, representative of these four metals, are shown on Figure 4-5. The other metal COCs exceeded screening criteria intermittently and the exceedances were co-located with the iron exceedances.

Comparison of detected metal concentrations to background values (CH2M HILL, 2004e) was performed in the HHRA and ERA. See Sections 6 and 7 for detailed description of these comparisons. Both the HHRA and ERA found that only manganese could potentially be associated with background conditions, based solely on comparison of site-specific metals concentrations to background concentrations. However, based on qualitative evaluation of the metals concentrations detected at Site 1 and elsewhere at Plant 1, many of the Site 1 metals concentrations are similar to metals concentrations detected at other Plant 1 sites. Delineation of areas containing elevated metals concentrations will be performed in subsequent evaluations.

Iron exceeded the HHRA screening criteria (2,300 µg/kg) in the three surface soil samples from the FDP area and the 55 surface soil samples from the OABG area. The maximum iron concentration detected in surface soils was 122,000 µg/kg, at sample location B1-4-S (Figure 4-5). The iron exceedances, representing the maximum extent of metals COCs in Site 1 surface soil, are located in the three former disposal pits, the former inert burn area and associated disposal area, the former open burn area and associated disposal area, and the western drainage ditch.

Nine metals (cadmium, chromium, copper, lead, mercury, nickel, silver, vanadium, and zinc) were identified as ERA COCs for the OABG area surface soil based upon a comparison to soil screening values, background, and reference concentrations. The greatest concentrations of these metals generally occurred in the vicinity of the former open burn area and associated disposal area, the western drainage ditch (e.g., HCS-B2-10 and HCS-B2-7-S), and in the vicinity of the former inert burn area (e.g., AS01-SB22, AS01-SB72, HCS-B1-4-S, and HCS-B1-11-S). Several of these samples (HCS-B2-7-S, HCS-B1-4-S, and HCS-B1-11-S) consist mostly of ash rather than soil.

Three metals (copper, lead, and mercury) were identified as ERA COCs for the ABG and FDP surface soil. The extent of metal ERA COCs can be represented by lead (Figure 4-6).

The maximum copper concentration (1,820 milligrams per kilogram [mg/kg]) at AS01-SS67 was the only notable copper exceedance of the ecological screening value and background UTL. This sample is located near Burn Pad 5. The maximum mercury concentration (7.20 mg/kg) was located at sample location AS01-SS70. This sample, and AS01-SS18, represented the only notable mercury exceedances of the ecological screening value and the only background UTL exceedances. AS01-SS70 is located near former burn pad 8 and AS01-SS18 is located along the access road south of former burn pads 5 and 6. Lead, which is believed attributable at least in part to deposition from burning activities at the ABG area, was elevated in two areas: the southwestern corner of the ABG (AS01-SS02), where the site maximum of 1,730 mg/kg occurred, and the northeastern corner of the ABG near former burn pad 8 (AS01-SS70).

#### 4.1.6 Polychlorinated Biphenyls

Seven surface samples collected in 1998 from the OABG area were analyzed for PCBs. PCBs were not detected in any sample.

## 4.2 Subsurface Soil

The HHRA data set analyzed in this RI included 173 subsurface soil samples. These samples were analyzed variously for VOCs, SVOCs, explosives, dioxins/furans, and metals. Concentrations of HHRA COCs in subsurface soil that exceed the screening levels are discussed below according to constituent class. As listed in Table 4-1, COCs were only identified for the OABG and FDP areas. No COCs were identified for the ABG area.

The qualitative evaluation of subsurface soil in the ERA did not produce COCs. Therefore, the discussion of the nature and extent of contamination in subsurface soil will be limited to the HHRA COCs.

#### 4.2.1 VOCs

The COCs identified in the HHRA were TCE for the OABG and FDP areas and PCE for the OABG area. Ninety-one subsurface soil samples from the OABG and FDP areas were analyzed for VOCs. TCE and PCE were the only VOC compounds whose detected concentrations in the subsurface soil samples exceeded the corresponding adjusted residential RBCs. TCE concentrations exceeded the adjusted residential RBC of 1,600 µg/kg in 28 of the 91 samples. The maximum concentration of 360,000 µg/kg was detected in the sample from HCS-BG-174 at a depth of two to three ft bgs.

PCE concentrations exceeded the adjusted residential RBC of 1,200 µg/kg in three of the 65 samples. The maximum concentration of 11,000 µg/kg was detected in the sample from AS01-SB72 at a depth of 4.5 to five ft bgs. The L qualifier indicates that the results may be biased low.

TCE concentrations exceeding the HHRA screening value of 1,600 µg/kg are shown on Figure 4-7. The exceedances occur in the former open burn disposal area, in the vicinity of the former inert burn area and associated disposal area, and in Pits 1 and 3. The greatest concentrations were detected in five areas of the OABG, two in the former inert burn disposal area and three in the former open burn disposal area.

Because the three PCE exceedances are co-located with TCE exceedances, the extent of TCE screening exceedances shown in Figure 4-6 represents the PCE exceedances as well.

## 4.2.2 SVOCs

Six SVOC compounds were identified as HHRA COCs for the OABG area: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Eighteen subsurface soil samples from the OABG area were analyzed for SVOCs.

Benzo(a)pyrene exceeded the HHRA screening value of 87 µg/kg in 10 of the 18 samples. The maximum concentration of 55,000 µg/kg was detected at sample location AS01-SB25, located in the former open burn area, at a depth of one to two ft bgs. Benzo(a)pyrene exceedances of the HHRA screening value are shown in Figure 4-8.

The other COCs exceeded the corresponding screening values in one of the 18 samples. These exceedances occurred in the same location as the benzo(a)pyrene maximum concentration, AS01-SB25, at a depth of 1 to 2 feet. The concentrations of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene in this sample which exceeded the screening criteria were 58,000 µg/kg, 65,000 µg/kg, 54,000 µg/kg, 2,100 µg/kg, and 18,000 µg/kg, respectively.

As shown in Figure 4-8, benzo(a)pyrene exceedances in the OABG area occur north of the ABG fence in the former open burn disposal area, along the banks of the western drainage ditch, and in two localized areas of the former inert burn disposal area.

## 4.2.3 Dioxin/Furans

Dioxins were identified as an HHRA COC for the OABG and FDP areas. As discussed previously, the toxicity of a dioxin mixture is expressed in terms of its TEQ. Additional information about the TEQ analysis is included in Section 6.

Thirty-four subsurface samples from the OABG and FDP areas, collected during the 2001 and 2004 supplemental investigations, were analyzed for dioxins. TEQ values exceeded the screening value in four samples from these two areas. The maximum TEQ value of  $7.75 \times 10^{-4}$  was calculated for a sample collected from AS01-SB62 from one to three ft bgs. The other three exceedances were from one location in the vicinity of the former inert burn area and two locations in the former open burn disposal area. These exceedances are shown on Figure 4-9.

## 4.2.4 Explosives

Explosives were not identified as COCs in the HHRA. Forty-two subsurface samples, which were collected during the 2001 and 2004 supplemental investigations, were analyzed for explosives. None of the detected concentrations exceeded the corresponding adjusted residential RBCs.

## 4.2.5 Metals

Eleven metals were identified as HHRA COCs for the OABG and FDP areas. Aluminum, antimony, arsenic, cadmium, chromium, copper, iron, manganese, mercury, thallium, and

vanadium were identified as COCs for the OABG area. Aluminum, arsenic, iron, manganese, thallium, and vanadium were identified as COCs for the FDP area.

Some of the metal concentrations in surface soil at Site 1 may be attributable to ash and debris from former burning activities. Some metal concentrations, such as manganese, may be representative of background concentrations in the area. Comparison of detected metal concentrations to background values was performed in the HHRA and ERA. See Sections 6 and 7 for detailed description of these comparisons. Both the HHRA and ERA found that manganese might be potentially associated with background conditions.

Forty subsurface soil samples were collected from the OABG and FDP areas and analyzed for metals. Similar to surface soil at Site 1, analytical results indicate that arsenic, iron, manganese, and vanadium are ubiquitous in subsurface soil. Figure 4-10 shows the iron concentrations that exceed the adjusted residential RBC of 2,300 mg/kg. Exceedances of arsenic, manganese, and vanadium were also encountered in these samples. Aluminum also exceeds the screening value in the majority of the samples shown in Figure 4-10. Exceedances of the other metal COCs are localized in eastern end of the former inert burn disposal area (from AS01-SB30 to AS01-SB74) and in one sample near the western drainage ditch (AS01-SB34). The three former disposal pits contain exceedances of adjusted residential RBC values for arsenic, iron, manganese, and vanadium. Aluminum and thallium also exceeded the corresponding screening values in some of the samples from the FDP area.

The maximum concentrations of the metal COCs, except vanadium, were detected in sample locations in the vicinity of the former inert burn disposal area (AS01-SB30, AS01-SB72, AS01-SB74, and B1-011). The maximum concentrations for aluminum, antimony, arsenic, cadmium, chromium, copper, iron, manganese, mercury, and thallium were 66,300 mg/kg (4.5 to 5 feet bgs), 17.2 L mg/kg (2.5 to 3 feet bgs), 31 mg/kg (1 to 2 feet bgs), 143 mg/kg (4.5 to 5 feet bgs), 282 mg/kg (4.5 to 5 feet bgs), 13,600 mg/kg (4.5 to 5 feet bgs), 122,000 mg/kg (1 to 2 feet bgs), 1,920 mg/kg (2 feet bgs), and 1.6 L mg/kg (1 to 3 feet bgs), respectively. The maximum concentration of vanadium was detected at sample location AS01-SB62, from the FDP area, at a depth of 1 to 3 feet bgs.

**TABLE 4-1**

Constituents of Concern Identified in the Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

	Outside Active Burning Grounds	Former Disposal Pits	Active Burning Grounds
<b>Non-cancer Hazard</b> (total HI>1, individual constituent HI>0.1)			
<b>Metals</b>			
Aluminum	X	X	
Antimony	X		
Arsenic	X	X	
Cadmium	X		
Chromium	X		
Copper	X		
Iron	X	X	
Manganese	X	X	
Mercury	X		
Thallium	X	X	
Vanadium	X	X	
<b>VOC</b>			
Trichloroethene	X	X	
<b>Cancer Risk</b> (total risk>10 <sup>-4</sup> , individual constituent risk>10 <sup>-6</sup> )			
<b>Metals</b>			
Arsenic	X	X	
<b>VOCs</b>			
Trichloroethene	X	X	
Polychloroethene	X		
<b>SVOCs</b>			
Benzo(a)anthracene	X		
Benzo(a)pyrene	X		
Benzo(b)fluoranthene	X		
Benzo(k)fluoranthene	X		
Dibenz(a,h)anthracene	X		
Indeno(1,2,3-cd)pyrene	X		
<b>Dioxins</b>			
2,3,7,8-TCDD (dioxin)	X	X	
<b>Risk from Lead</b>			
	Yes	No	No

**Notes:**

2,3,7,8-TCDD evaluated as Total 2,3,7,8-TCDD equivalents.

No COCs were identified for the ABG based on the results of the HHRA.

TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin

SVOCs = Semi-volatile organic compounds

VOCs = Volatile organic compounds

**TABLE 4-2**

Constituents of Concern Identified in the Ecological Risk Assessment  
*Site 1 Focused Remedial Investigation for Soil*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Constituent	Ecological Constituent of Concern			
	Floodplain		Upland	
	Surface Soil	Food Web	Surface Soil	Food Web
<b>Metals</b>				
Cadmium	X	X		
Chromium	X			
Copper	X		X	
Lead	X	X	X	
Mercury	X	X	X	
Nickel	X			
Silver	X			
Vanadium	X			
Zinc	X	X		
<b>SVOC</b>				
2-Nitroaniline			X	
PAHs, total	X			
<b>Explosives</b>				
1,3,5-Trinitrobenzene			X	
HMX	X		X	
Nitroglycerin	X		X	
Perchlorate			X	
RDX	X		X	
<b>VOC</b>				
1,2-Dichloroethene	X			
Methyl acetate	X			
Trichloroethene	X			
<b>Dioxin/furans</b>				
Total dioxin/furans (TEQ) <sup>1</sup>		X		

<sup>1</sup> Based upon 2,3,7,8-TCDD equivalents, mammalian TEFs, and the 17 individual dioxin/furan congeners

**Notes:**

Floodplain = Outside Active Burning Grounds

Upland = Active Burning Grounds and Former Disposal Pits

HMX = high melting explosive; octahydro-1,3,5,7-tetranitro-1,3,5,7 tetrazocine

RDX = research department explosive; hexahydro-1,3,5-trinitro-1,3,5 triazine

SVOCs = Semi-volatile organic compounds

VOCs = Volatile organic compounds

PAHs = polyaromatic hydrocarbon

TEQ = Toxic equivalents

TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin

TEF = toxic equivalency factors

TABLE 4-3

Exceedance of Adjusted Residential Soil RBC, Former Disposal Pits, Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	Residential	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	Adjusted	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
Chemical Name						
<b>Volatile Organic Compounds (UG/KG)</b>						
Acetone	7,000,000	160 B	52 J	140 B	12 U	11 U
Chlorobenzene	160,000	910 UJ	18 UJ	710 U	6 J	11 U
Ethylbenzene	780,000	910 UJ	18 UJ	710 U	5 J	11 U
Methyl acetate	7,800,000	910 UJ	18	180 J	NA	NA
Styrene	1,600,000	910 UJ	18 UJ	710 U	3 J	1 J
Toluene	1,600,000	910 UJ	18 UJ	710 U	4 J	11 U
Trichloroethene	1,600	1,800 J	18 U	1,100	93	57
Xylene, total	1,600,000	910 UJ	18 UJ	710 U	15	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>						
Benzo(b)fluoranthene	870	67 J	440 U	45 J	NA	NA
Chrysene	87,000	49 J	440 U	420 U	NA	NA
Fluoranthene	310,000	77 J	440 U	93 J	NA	NA
Phenanthrene	230,000	64 J	440 U	78 J	NA	NA
Pyrene	230,000	60 J	440 U	67 J	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	450 U	440 U	66 J	NA	NA
<b>Dioxin/Furans (UG/KG)</b>						
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.11	0.031	0.039	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.032	0.01	0.032	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	0.0056 J	0.0012 U	0.0061 J	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.012	0.0024 U	0.011	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.0054 J	0.0017 U	0.0022 U	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	0.0079	0.0015 U	0.0081	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	0.0058 J	0.0025 U	0.0022 U	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	0.0082	0.0018 U	0.0075	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	0.0043 J	0.0013 U	0.0056 J	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	0.0071	0.0015 U	0.0079	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-3

Exceedance of Adjusted Residential Soil RBC, Former Disposal Pits, Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	Residential	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	Adjusted	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
<b>Chemical Name</b>						
2,3,7,8-TCDD (dioxin)	0.0043	7.70E-04 J	5.60E-04 U	4.50E-04 U	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.0078	0.0023	0.0057	NA	NA
Octachlorodibenzo-p-dioxin	43	0.97	0.46	0.3	NA	NA
Octachlorodibenzofuran	43	0.056	0.016	0.035	NA	NA
Total heptachlorodibenzo-p-dioxin	--	0.23	0.065	0.078	NA	NA
Total heptachlorodibenzofuran	--	0.067	0.019	0.058	NA	NA
Total hexachlorodibenzo-p-dioxin	--	0.052	0.0083	0.018	NA	NA
Total hexachlorodibenzofuran	--	0.05	0.0029 U	0.057	NA	NA
Total pentachlorodibenzo-p-dioxin	--	0.0086	9.40E-04 U	0.0035	NA	NA
Total pentachlorodibenzofuran	--	0.046	0.0024 U	0.069	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	0.015	8.60E-04 U	0.011	NA	NA
Total tetrachlorodibenzofuran	--	0.071	0.011	0.094	NA	NA
<b>Explosives (UG/KG)</b>						
HMX	390,000	250 J	500 U	3,300	NA	NA
Perchlorate	5,500	54.9 U	106 U	74	NA	NA
RDX	5,800	130 J	96 J	1,000	NA	NA
<b>Total Metals (MG/KG)</b>						
Aluminum	7,800	7,020	6,910	3,940	NA	NA
Arsenic	0.43	8	7	3.2	NA	NA
Barium	550	151	125	53.7	NA	NA
Beryllium	16	0.97 J	0.92 B	0.32 B	NA	NA
Cadmium	7.8	0.45 J	0.11 B	0.095 B	NA	NA
Calcium	--	1,870	1,450	266,000	NA	NA
Chromium	23	12.2	11.9	5.1	NA	NA
Cobalt	160	13.3 J	13 J	4 J	NA	NA
Copper	310	24.1	18.5	10.5	NA	NA
Cyanide	160	0.27 J	0.91	0.26 J	NA	NA
Iron	2,300	24,900	24,900	9,950	NA	NA

NA - Not analyzed

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R - Unreliable result

U - Analyte not detected

TABLE 4-3

Exceedance of Adjusted Residential Soil RBC, Former Disposal Pits, Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	Residential	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	Adjusted	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
Chemical Name						
Lead	400	42.5	25	16.3	NA	NA
Magnesium	--	930 J	939 J	3,960 J	NA	NA
Manganese	160	810	762	228	NA	NA
Mercury	2.3	0.12 J	0.11 J	0.067 J	NA	NA
Nickel	160	22.5	20	9.3 J	NA	NA
Potassium	--	1,030 J	912 J	852 J	NA	NA
Selenium	39	1.1 L	0.61 UL	0.65 L	NA	NA
Sodium	--	70.3 U	67.9 U	139 J	NA	NA
Vanadium	7.8	18.8	18.8	11.9 J	NA	NA
Zinc	2,300	95.4	66.5	26.4	NA	NA
<b>Wet Chemistry (MG/KG)</b>						
% Moisture	--	27.1	24.6	21.4	NA	NA
Total organic carbon (TOC)	--	30,000	24,000	25,000	NA	NA
pH	--	6.1	5.7	8	NA	NA

Exceeds one or more criteria

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID		AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date		02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
Acetone	92,000,000	6 U	6 U	6 U	5 J	10	16	6 U
Chloroform	1,000,000	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Methyl acetate	100,000,000	NA						
Methylene chloride	380,000	3 B	4 B	4 B	5 B	9 B	2 B	6 B
Tetrachloroethene	5,300	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Trichloroethene	7,200	6 U	28	6 U	9	6 U	6 U	6 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	5,100,000	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Nitroaniline	310,000	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
Benzo(a)anthracene	3,900	66 J	340 UJ	370 U	400 U	370 U	24 J	380 U
Benzo(a)pyrene	390	54 J	340 U	370 U	400 U	370 U	23 J	380 U
Benzo(b)fluoranthene	3,900	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Benzo(g,h,i)perylene	3,100,000	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Caprolactam	51,000,000	NA						
Chrysene	390,000	110 J	340 UJ	26 J	400 U	370 U	43 J	33 J
Diethylphthalate	82,000,000	420 U	160 J	370 U	400 U	370 U	410 U	380 U
Dimethyl phthalate	1,000,000,000	420 U	2,300	370 U	400 U	370 U	410 U	380 U
Fluoranthene	4,100,000	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Naphthalene	2,000,000	40 J	340 U	370 U	400 U	370 U	410 U	380 U
Phenanthrene	3,100,000	140 J	340 UJ	39 J	400 U	370 U	60 J	50 J
Pyrene	3,100,000	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
bis(2-Ethylhexyl)phthalate	200,000	420 U	97 J	1,300	400 U	370 U	74 J	150 J
n-Nitrosodiphenylamine	580,000	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.054 J	0.056 J	0.121 U	0.126 U	0.105 U	0.116 U	0.095 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.046 U	0.039	0.062 U	0.064 U	0.039 U	0.056 U	0.04 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.023 U	0.028 U	0.032 U	0.032 U	0.019 U	0.012 U	0.021 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.116 U	0.147 U	0.119 U	0.091 U	0.076 U	0.111 U	0.099 U

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
Grounds, Surface Soil

Site 1 Focused Remedial Investigation for Soi

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID		AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date		02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
<b>Chemical Name</b>								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.02 U	0.024 U	0.028 U	0.027 U	0.016 U	0.01 U	0.018 U
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.082 U	0.102 U	0.068 U	0.078 U	0.074 U	0.077 U	0.074 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.023 U	0.028 U	0.03 U	0.032 U	0.019 U	0.013 U	0.02 U
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.071 U	0.088 U	0.059 U	0.068 U	0.065 U	0.067 U	0.064 U
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.007 U	0.008 U	0.005 U	0.006 U	0.006 U	0.006 U	0.006 U
Octachlorodibenzo-p-dioxin	190	0.722	0.411	0.307	0.109	0.09	0.366	0.347
Octachlorodibenzofuran	190	0.073 U	0.08	0.114 U	0.078 U	0.09 U	0.1 U	0.085 U
Total heptachlorodibenzo-p-dioxin	--	0.012 U	0.056	0.121 U	0.126 U	0.105 U	0.116 U	0.095 U
Total heptachlorodibenzofuran	--	0.046 U	0.039	0.067 U	0.064 U	0.039 U	0.056 U	0.04 U
Total hexachlorodibenzo-p-dioxin	--	0.116 U	0.147 U	0.119 U	0.091 U	0.076 U	0.111 U	0.099 U
Total hexachlorodibenzofuran	--	0.02 U	0.024 U	0.028 U	0.027 U	0.016 U	0.01 U	0.018 U
Total pentachlorodibenzo-p-dioxin	--	NA						
Total pentachlorodibenzofuran	--	NA						
Total tetrachlorodibenzo-p-dioxin	--	NA						
Total tetrachlorodibenzofuran	--	NA						
<b>Explosives (UG/KG)</b>								
1,3,5-Trinitrobenzene	3,100,000	420 U	340 U	476 R	454 R	454 R	476 R	417 R
2,4-Dinitrotoluene	200,000	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,6-Dinitrotoluene	100,000	420 U	340 U	370 U	400 U	370 U	410 U	380 U
HMX	5,100,000	454 U	1,190	2,400	454 U	2,250	476 U	417 U
Nitroglycerin	200,000	454 U	476 U	476 U	476 U	454 U	454 U	435 U
Perchlorate	72,000	66 U	56 U	68	96	880	95	58 U
RDX	26,000	454 U	735	476 U	454 U	784	476 U	417 U
Tetryl	410,000	454 U	454 U	476 U	454 U	454 U	476 U	417 U

NA - Not analyzed

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U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID		AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date		02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name								
Total Metals (MG/KG)								
Aluminum	100,000	7,800	4,680	7,490	7,540	7,590	7,410	6,280
Antimony	41	1.7 L	1.2 L	0.98 L	1.3 L	1.4 L	1.1 L	0.49 L
Arsenic	1.9	9.5	5	7.6	6.8	7.2	7.6	6.1
Barium	7,200	165	77.6	154	134	176	153	136
Beryllium	200	1.2 K	0.54 K	1.1 K	1 K	1.1 K	1 K	0.88 K
Cadmium	100	0.71	0.7	0.57 J	0.56 J	1.3	0.63	0.79
Calcium	--	NA						
Chromium	310	14.7	8.8	13.4	13.5	13.5	14.8	23.8
Cobalt	2,000	15.1	6.9	15	14.1	15	14.7	11.5
Copper	4,100	27.5	22.5	22.4	19.2	19.3	19.3	20.5
Cyanide	2,000	0.26 J	0.19 J	0.46 J	0.19 J	0.54 J	0.28 J	0.24 J
Iron	31,000	30,800	15,800	32,700	31,600	32,400	30,200	24,800
Lead	400	39.3	1,730	25.2	34.3	55.2	26.9	25.9
Magnesium	--	NA						
Manganese	2,000	954	419	912	797	1,010	928	783
Mercury	31	0.09	0.08	0.05	0.05	0.04	0.05	0.05
Nickel	2,000	24.1 K	16 K	20.9 K	20.6 K	22 K	23.1 K	20.8 K
Potassium	--	NA						
Selenium	510	0.47 J	0.33 U	0.35 U	0.36 U	0.33 U	0.44 J	0.33 U
Silver	510	0.23 J	0.54 J	0.12 U	0.12 U	0.11 U	0.12 U	0.11 U
Thallium	7.2	0.29 J	0.22 U	0.82 J	0.34 J	0.54 J	0.79 J	0.34 J
Tin	61,000	8 J	7.6 J	4.4 J	5.6 J	4.5 J	5.6 J	4.7 J
Vanadium	100	22.1	14.6	19.8	20.2	19.9	23.5	21.9
Zinc	31,000	108 K	271 K	73.6 K	100 K	75.6 K	98.9 K	86.3 K
Wet Chemistry (MG/KG)								
% Moisture	--	NA						
Nitrate	160,000	3.5	1.1 U	1.2 U	1.5	4.5	1.2 U	1.2 U
Total organic carbon (TOC)	--	78,400	35,300	23,400	21,200	19,000	42,100	32,700
pH	--	7.3	7.5	7.1	6.3	7.1	5.7	7.5

Exceeds one or more criteria

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 K - Reported value may be biased high  
 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi.  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB08	AS01-SB09			AS01-SB10	AS01-SB11	AS01-SB12	AS01-SB13
Sample ID		AS01-SS08-R01X	AS01-SS09-R01X	AS01-SS09P-R01X	AS01-SS10-R01X	AS01-SS11-R01X	AS01-SS12-R01X	AS01-SS13-R01X	
Sample Date		02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
Acetone	92,000,000	12	12 B	6 U	8 B	6 B	6 U	6 U	6 U
Chloroform	1,000,000	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Methyl acetate	100,000,000	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	380,000	9 B	8 B	9 B	4 B	15 B	10 B	3 B	
Tetrachloroethene	5,300	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Trichloroethene	7,200	6 U	6 U	6 U	6 U	3 J	6 U	6 U	
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	5,100,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
2-Nitroaniline	310,000	1,000 U	970 U	1,000 U	990 U	890 U	950 U	1,000 U	
Benzo(a)anthracene	3,900	400 U	390 U	24 J	400 U	360 U	380 U	410 U	
Benzo(a)pyrene	390	400 U	24 J	410 U	400 U	360 U	380 U	410 U	
Benzo(b)fluoranthene	3,900	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
Benzo(g,h,i)perylene	3,100,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
Caprolactam	51,000,000	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	390,000	24 J	47 J	43 J	42 J	360 U	26 J	37 J	
Diethylphthalate	82,000,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
Dimethyl phthalate	1,000,000,000	400 U	1,100	410 U	400 U	360 U	380 U	410 U	
Fluoranthene	4,100,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
Naphthalene	2,000,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
Phenanthrene	3,100,000	31 J	57 J	58 J	48 J	360 U	39 J	52 J	
Pyrene	3,100,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
bis(2-Ethylhexyl)phthalate	200,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
n-Nitrosodiphenylamine	580,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.102 U	0.066 U	0.085 U	0.07 U	0.076 U	0.087 U	0.074 U	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.051 U	0.03 U	0.049 U	0.033 U	0.034 U	0.033 U	0.036 U	
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.01 U	0.015 U	0.025 U	0.018 U	0.009 U	0.009 U	0.008 U	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.1 U	0.046 U	0.073 U	0.073 U	0.079 U	0.062 U	0.05 U	

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB08	AS01-SB09			AS01-SB10	AS01-SB11	AS01-SB12	AS01-SB13
Sample ID		AS01-SS08-R01X	AS01-SS09-R01X	AS01-SS09P-R01X	AS01-SS10-R01X	AS01-SS11-R01X	AS01-SS12-R01X	AS01-SS13-R01X	
Sample Date		02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01	
<b>Chemical Name</b>									
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.009 U	0.013 U	0.022 U	0.015 U	0.008 U	0.008 U	0.007 U	
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.068 U	0.037 U	0.033 U	0.049 U	0.054 U	0.073 U	0.031 U	
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.01 U	0.015 U	0.024 U	0.017 U	0.009 U	0.017 U	0.018 U	
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.059 U	0.031 U	0.029 U	0.042 U	0.046 U	0.063 U	0.027 U	
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.008 U	0.007 U	0.006 U	0.005 U	0.004 U	0.006 U	0.006 U	
Octachlorodibenzo-p-dioxin	190	0.345	0.427	0.402	0.39	0.1	0.284	0.414	
Octachlorodibenzofuran	190	0.086 U	0.066 U	0.092 U	0.069 U	0.049 U	0.07 U	0.073 U	
Total heptachlorodibenzo-p-dioxin	--	0.102 U	0.066 U	0.085 U	0.07 U	0.076 U	0.087 U	0.074 U	
Total heptachlorodibenzofuran	--	0.051 U	0.03 U	0.049 U	0.033 U	0.034 U	0.033 U	0.036 U	
Total hexachlorodibenzo-p-dioxin	--	0.1 U	0.046 U	0.073 U	0.073 U	0.079 U	0.062 U	0.05 U	
Total hexachlorodibenzofuran	--	0.009 U	0.013 U	0.022 U	0.015 U	0.008 U	0.008 U	0.007 U	
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	
<b>Explosives (UG/KG)</b>									
1,3,5-Trinitrobenzene	3,100,000	435 R	417 R	454 R	417 R	417 R	454 R	417 R	
2,4-Dinitrotoluene	200,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
2,6-Dinitrotoluene	100,000	400 U	390 U	410 U	400 U	360 U	380 U	410 U	
HMX	5,100,000	258 J	417 U	454 U	124 J	506	130 J	417 U	
Nitroglycerin	200,000	454 U	417 U	476 U	435 U	435 U	435 U	417 U	
Perchlorate	72,000	63 U	60 U	63 U	61 U	58 U	62 U	64 U	
RDX	26,000	435 U	417 U	454 U	417 U	417 U	454 U	417 U	
Tetryl	410,000	435 U	417 U	454 U	417 U	417 U	454 U	417 U	

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB08	AS01-SB09		AS01-SB10	AS01-SB11	AS01-SB12	AS01-SB13
Sample ID		AS01-SS08-R01X	AS01-SS09-R01X	AS01-SS09P-R01X	AS01-SS10-R01X	AS01-SS11-R01X	AS01-SS12-R01X	AS01-SS13-R01X
Sample Date		02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name								
<b>Total Metals (MG/KG)</b>								
Aluminum	100,000	7,320	9,240	9,800	8,350	9,510	7,950	10,400
Antimony	41	0.96 L	1.1 L	0.87 L	1.4 L	0.81 L	1.9 L	0.82 L
Arsenic	1.9	6.9	7.4	7.4	6.8	6.6	7.3	7.8
Barium	7,200	185	219	239	208	161	213	181
Beryllium	200	1.1 K	1.2 K	1.2 K	1.1 K	0.99 K	1.1 K	1.2 K
Cadmium	100	0.63	1	0.77	0.67	0.71	0.81	0.72
Calcium	--	NA	NA	NA	NA	NA	NA	NA
Chromium	310	12.7	14.6	15	13.2	15.7	14	16
Cobalt	2,000	13.6	14.5 K	14.4 K	15 K	15 K	14.6	16.5 K
Copper	4,100	18.1	21.5	21.6	17.9	17.6	19.7	20.7
Cyanide	2,000	0.37 J	0.26 J	0.35 J	0.35 J	0.06 U	0.33 J	0.23 J
Iron	31,000	28,200	28,900	29,200	30,100	33,200	30,700	33,200
Lead	400	30	38	31.3	29.5	96.9	53.4	25
Magnesium	--	NA	NA	NA	NA	NA	NA	NA
Manganese	2,000	982	1,080	1,120	999	730	1,120	1,050
Mercury	31	0.05	0.07	0.08	0.05	0.04	0.05	0.06
Nickel	2,000	21.1 K	25	25.6	22.3	33.4	22.8 K	28.1
Potassium	--	NA	NA	NA	NA	NA	NA	NA
Selenium	510	0.37 J	0.36 U	0.38 U	0.36 U	0.33 U	0.5 J	0.38 U
Silver	510	0.12 U	0.12 U	0.13 U	0.12 U	0.26 J	0.12 U	0.13 U
Thallium	7.2	0.68 J	0.68 J	0.46 J	0.78 J	1.1 J	0.24 U	0.88 J
Tin	61,000	4.7 J	5.6 J	6 J	4.3 J	4.1 J	4.7 J	4.9 J
Vanadium	100	19.7	24.6	25	22.5	21.4	20.1	33.1
Zinc	31,000	74.8 K	116 K	103 K	78 K	92.5 K	83.3 K	93.4 K
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	NA	NA	NA	NA	NA	NA	NA
Nitrate	160,000	1.3 U	1.5	1.3 U	4.2	1.2 U	1.6	1.7
Total organic carbon (TOC)	--	31,300	42,800	42,800	30,400	7,420	29,300	23,900
pH	--	6.5	7	6.8	7.6	6.9	6.9	7.5

Exceeds one or more

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 K - Reported value may be biased high  
 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB14	AS01-SB15	AS01-SB16		AS01-SB17	AS01-SB18	AS01-SB19
Sample ID		AS01-SS14-R01X	AS01-SS15-R01X	AS01-SS16-R01X	AS01-SS16P-R01X	AS01-SS17-R01X	AS01-SS18-R01X	AS01-SS19-R01X
Sample Date		02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
<b>Chemical Name</b>								
<b>Volatiles Organic Compounds (UG/KG)</b>								
Acetone	92,000,000	8 B	6 U	6 U	6 U	6 U	6 U	6 U
Chloroform	1,000,000	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Methyl acetate	100,000,000	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	380,000	6 B	3 B	5 B	8 B	6 B	4 B	5 B
Tetrachloroethene	5,300	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Trichloroethene	7,200	6 U	6 U	6 U	6 U	6 U	6 U	6 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	5,100,000	410 U	380 UJ	380 U	380 U	380 U	380 UL	20 J
2-Nitroaniline	310,000	1,000 U	960 U	940 U	950 U	960 U	950 UL	990 UJ
Benzo(a)anthracene	3,900	30 J	380 UJ	29 J	380 U	380 U	380 U	49 J
Benzo(a)pyrene	390	27 J	380 UJ	29 J	24 J	380 U	380 UL	40 J
Benzo(b)fluoranthene	3,900	410 UJ	380 UJ	380 UJ	380 U	380 U	380 UL	400 UJ
Benzo(g,h,i)perylene	3,100,000	410 UJ	380 UJ	380 UJ	380 U	380 U	380 UL	400 UJ
Caprolactam	51,000,000	NA	NA	NA	NA	NA	NA	NA
Chrysene	390,000	51 J	38 J	47 J	40 J	380 U	380 U	78 J
Diethylphthalate	82,000,000	410 U	380 U	380 U	380 U	380 U	380 U	400 UJ
Dimethyl phthalate	1,000,000,000	1,600	380 U	380 U	380 U	380 U	380 U	400 UJ
Fluoranthene	4,100,000	410 UJ	380 UJ	380 U	380 U	380 U	380 UL	400 UJ
Naphthalene	2,000,000	410 U	380 U	380 U	380 U	380 U	380 UL	400 U
Phenanthrene	3,100,000	53 J	45 J	62 J	49 J	380 U	380 UL	120 J
Pyrene	3,100,000	410 UJ	380 UJ	380 U	380 U	380 U	380 U	400 UJ
bis(2-Ethylhexyl)phthalate	200,000	870 J	74 J	250 J	380 U	380 U	380 U	1,100 J
n-Nitrosodiphenylamine	580,000	410 UJ	380 UJ	380 U	380 U	380 U	380 UL	400 UJ
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.071 U	0.098 U	0.795 U	0.076 U	0.081 U	0.073 U	0.072 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.038 U	0.053 U	0.389 U	0.043 U	0.047 U	0.037 U	0.035 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.019 U	0.011 U	0.208 U	0.022 U	0.024 U	0.009 U	0.019 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.07 U	0.095 U	0.595 U	0.064 U	0.058 U	0.074 U	0.062 U

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB14	AS01-SB15	AS01-SB16		AS01-SB17	AS01-SB18	AS01-SB19
Sample ID		AS01-SS14-R01X	AS01-SS15-R01X	AS01-SS16-R01X	AS01-SS16P-R01X	AS01-SS17-R01X	AS01-SS18-R01X	AS01-SS19-R01X
Sample Date		02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
<b>Chemical Name</b>								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.017 U	0.01 U	0.18 U	0.019 U	0.021 U	0.008 U	0.016 U
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.031 U	0.054 U	0.393 U	0.051 U	0.051 U	0.048 U	0.03 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.019 U	0.027 U	0.196 U	0.022 U	0.024 U	0.019 U	0.018 U
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.027 U	0.047 U	0.339 U	0.044 U	0.044 U	0.041 U	0.026 U
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.005 U	0.006 U	0.045 U	0.006 U	0.004 U	0.004 U	0.005 U
Octachlorodibenzo-p-dioxin	190	0.354	0.215	0.303	0.297	0.309	0.358	0.515
Octachlorodibenzofuran	190	0.023 J	0.063 U	0.709 U	0.072 U	0.096 U	0.061 U	0.079 U
Total heptachlorodibenzo-p-dioxin	--	0.071 U	0.098 U	0.795 U	0.076 U	0.081 U	0.073 U	0.072 U
Total heptachlorodibenzofuran	--	0.038 U	0.053 U	0.389 U	0.043 U	0.047 U	0.037 U	0.035 U
Total hexachlorodibenzo-p-dioxin	--	0.07 U	0.095 U	0.595 U	0.064 U	0.058 U	0.074 U	0.062 U
Total hexachlorodibenzofuran	--	0.017 U	0.01 U	0.18 U	0.019 U	0.021 U	0.008 U	0.016 U
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>								
1,3,5-Trinitrobenzene	3,100,000	410 U	380 UJ	417 R	454 R	417 R	476 R	400 U
2,4-Dinitrotoluene	200,000	410 U	380 U	380 U	380 U	380 U	380 U	400 UJ
2,6-Dinitrotoluene	100,000	410 U	380 U	380 U	380 U	380 U	380 U	400 UJ
HMX	5,100,000	454 U	454 U	417 U	454 U	417 U	269 J	123 J
Nitroglycerin	200,000	454 U	435 U	476 U	454 U	454 U	417 U	417 U
Perchlorate	72,000	63 U	61 U	59 U	59 U	220	62 U	62 U
RDX	26,000	454 U	454 U	417 U	454 U	417 U	476 U	435 U
Tetryl	410,000	454 U	454 U	417 U	454 U	417 U	476 U	435 U

NA - Not analyzed

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J - Reported value is estimated

K - Reported value may be biased high

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R - Unreliable result

U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB14	AS01-SB15	AS01-SB16		AS01-SB17	AS01-SB18	AS01-SB19
Sample ID		AS01-SS14-R01X	AS01-SS15-R01X	AS01-SS16-R01X	AS01-SS16P-R01X	AS01-SS17-R01X	AS01-SS18-R01X	AS01-SS19-R01X
Sample Date		02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name								
<b>Total Metals (MG/KG)</b>								
Aluminum	100,000	8,200	8,440	7,530	6,700	6,350	8,960	8,760
Antimony	41	1.6 L	1.2 L	0.5 L	0.45 L	0.23 UL	0.88 L	0.25 L
Arsenic	1.9	6.4	6.5	6.4	6.5	6.4	6.5	6.7
Barium	7,200	144	161	134	136	147	187	129
Beryllium	200	0.9 K	0.98 K	0.89 K	0.89 K	0.91 K	1 K	0.85 K
Cadmium	100	0.92	10.9	0.62	0.73	0.65	0.72	0.84
Calcium	--	NA	NA	NA	NA	NA	NA	NA
Chromium	310	13.5	13.6	11.5	10.8	10.8	13	12.7
Cobalt	2,000	11.6 K	11.7 K	10.6 K	10.7 K	11.4 K	11.4 K	10
Copper	4,100	29	27.2	17.3	17.4	17	18.7	22.8
Cyanide	2,000	0.34 J	0.31 J	0.27 J	0.21 J	0.3 J	0.35 J	0.41 J
Iron	31,000	24,600	24,800	22,600	22,800	23,900	24,800	21,300
Lead	400	101	75.8	26.6	25.8	30.4	134	184
Magnesium	--	NA	NA	NA	NA	NA	NA	NA
Manganese	2,000	741	777	672	712	813	915	674
Mercury	31	0.06	0.06	0.04 J	0.04	0.06	0.38	0.09
Nickel	2,000	22.1	22.7	21	17.6	18.5	21.3	22.8 K
Potassium	--	NA	NA	NA	NA	NA	NA	NA
Selenium	510	0.37 U	0.55 J	0.35 U	0.36 U	0.35 U	0.35 U	0.37 U
Silver	510	0.33 J	0.33 J	0.12 U	0.12 U	0.12 U	0.12 U	0.29 J
Thallium	7.2	0.37 J	0.45 J	0.24 U	0.46 J	0.49 J	0.23 U	0.62 J
Tin	61,000	8.4 J	5.8 J	5.5 J	5.5 J	4.3 J	4.9 J	6 J
Vanadium	100	26.6	31.2	17.2	16.1	24.9	24.4	36.7
Zinc	31,000	223 K	121 K	65.5 K	64 K	68.8 K	97 K	116 K
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	NA	NA	NA	NA	NA	NA	NA
Nitrate	160,000	4.2	4.7	1.7	1.4	3	2.1	2.5
Total organic carbon (TOC)	--	41,400	42,700	19,300	24,300	35,000	38,100	35,300
pH	--	7.5	7.6	7.8	7.9	7.6	7.7	7.6

Exceeds one or more

NA - Not analyzed  
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 U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID		AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date		02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
<b>Chemical Name</b>								
<b>Volatile Organic Compounds (UG/KG)</b>								
Acetone	92,000,000	10 B	2.6 B	2.2 B	2.4 B	2.6 B	2 B	5.1 B
Chloroform	1,000,000	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Methyl acetate	100,000,000	NA	14 U	12 U	1.2 J	13 U	13 U	1.7 J
Methylene chloride	380,000	2 B	3 B	4.2 B	3 B	7.5 B	7.1 B	8.2 B
Tetrachloroethene	5,300	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Trichloroethene	7,200	6 U	1.6 J	12 U	66	13 U	13 U	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	5,100,000	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
2-Nitroaniline	310,000	1,000 U	1,100 U	990 U	970 U	1,100 U	940 U	980 U
Benzo(a)anthracene	3,900	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
Benzo(a)pyrene	390	23 J	450 U	390 U	390 U	440 U	370 U	390 U
Benzo(b)fluoranthene	3,900	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
Benzo(g,h,i)perylene	3,100,000	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
Caprolactam	51,000,000	NA	450 U	390 U	390 U	440 U	46 J	390 U
Chrysene	390,000	40 J	450 U	390 U	390 U	440 U	370 U	390 U
Diethylphthalate	82,000,000	400 U	450 U	390 U	390 U	440 U	270 J	390 U
Dimethyl phthalate	1,000,000,000	400 U	450 U	390 U	390 U	440 U	520	390 U
Fluoranthene	4,100,000	400 U	450 U	390 U	390 U	440 U	370 U	390 U
Naphthalene	2,000,000	400 U	450 U	390 U	390 U	440 U	370 U	390 U
Phenanthrene	3,100,000	49 J	450 U	390 U	390 U	440 U	370 U	390 U
Pyrene	3,100,000	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
bis(2-Ethylhexyl)phthalate	200,000	400 UJ	450 U	390 U	390 U	440 U	140 B	390 U
n-Nitrosodiphenylamine	580,000	400 U	450 U	390 U	390 U	440 U	370 U	390 U
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.102 U	0.004 J	0.039	0.031	0.0094	0.0062	0.016
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.053 U	4.20E-04 U	0.018	0.0097	6.20E-04 U	0.0081	0.0038 J
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.027 U	3.60E-04 U	0.005 J	0.0026 U	0.0012 U	0.0041 J	0.0016 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.162 U	5.60E-04 U	0.0025 U	0.0029 U	0.0015 U	9.80E-04 U	7.70E-04 U

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result  
U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for SoI  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID		AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date		02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.023 U	3.60E-04 U	0.0026 U	0.0018 U	0.0011 U	0.003 J	5.80E-04 U
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.086 U	4.50E-04 U	0.0026 U	0.0015 U	8.50E-04 U	0.0032 J	8.80E-04 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.027 U	3.10E-04 U	0.002 U	1.00E-03 U	8.60E-04 U	0.0019 U	4.00E-04 U
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.074 U	5.20E-04 U	0.0022 U	0.0011 U	8.60E-04 U	0.0031 J	7.70E-04 U
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.009 U	3.00E-04 U	0.0033	0.0018	6.00E-04 U	0.0026	0.0017
Octachlorodibenzo-p-dioxin	190	0.369	0.13	0.49	0.38	0.28	0.05	0.47
Octachlorodibenzofuran	190	0.12 U	0.0011 U	0.023	0.016	0.0017 U	0.013	0.014
Total heptachlorodibenzo-p-dioxin	--	0.102 U	0.01	0.083	0.06	0.023	0.012	0.036
Total heptachlorodibenzofuran	--	0.053 U	5.70E-04 U	0.031	0.019	9.50E-04 U	0.012	0.0075
Total hexachlorodibenzo-p-dioxin	--	0.162 U	5.60E-04 U	0.014	0.011	0.0017 U	0.0088	0.0022 U
Total hexachlorodibenzofuran	--	0.023 U	3.70E-04 U	0.014	0.0033	0.0013 U	0.011	0.0016 U
Total pentachlorodibenzo-p-dioxin	--	NA	7.90E-04 U	0.0015 U	0.0013 U	0.0021 U	0.0045	0.0011 U
Total pentachlorodibenzofuran	--	NA	5.20E-04 U	0.009	0.0042	9.30E-04 U	0.012	0.0012 U
Total tetrachlorodibenzo-p-dioxin	--	NA	4.00E-04 U	0.0051	6.90E-04 U	7.00E-04 U	0.01	5.00E-04 U
Total tetrachlorodibenzofuran	--	NA	3.00E-04 U	0.033	0.019	6.00E-04 U	0.019	0.0025
<b>Explosives (UG/KG)</b>								
1,3,5-Trinitrobenzene	3,100,000	400 U	250 U	2,500 U	26 J	250 U	250 U	250 U
2,4-Dinitrotoluene	200,000	400 U	250 U	2,500 U	250 U	250 U	250 U	250 U
2,6-Dinitrotoluene	100,000	400 U	250 U	2,500 U	250 U	250 U	250 U	250 U
HMX	5,100,000	435 U	190 J	51,000	2,200	1,300	1,300	500 U
Nitroglycerin	200,000	454 U	2,500 U	98,000	2,500 U	2,500 U	2,500 U	2,500 U
Perchlorate	72,000	63 U	54.7 U	31,300	47 U	52.9 U	45.4 U	47.3 U
RDX	26,000	435 U	49 J	16,000	1,700	170 J	460 J	500 U
Tetryl	410,000	435 U	650 U	6,500 U	650 U	650 U	650 U	650 U

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

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U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID		AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date		02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name								
<b>Total Metals (MG/KG)</b>								
Aluminum	100,000	8,130	8,040	8,220	6,580	7,670	19,000	6,100
Antimony	41	1.3 L	0.74 UL	0.64 UL	0.63 UL	0.71 UL	0.61 UL	0.64 UL
Arsenic	1.9	7.6	7.5	6.8	6.7	6.5	3.4	6.5
Barium	7,200	208	187	255	159	212	86	103
Beryllium	200	1.1 K	1 B	1.1 B	0.87 B	1.1 B	0.28 B	0.83 B
Cadmium	100	0.74	0.15 B	0.13 B	0.17 B	0.28 B	0.35 B	0.22 B
Calcium	--	NA	1,610	1,250	2,090	2,040	202,000	7,330
Chromium	310	13.7	13.2	13.5	11.4	12.7	8.1	10.4
Cobalt	2,000	13.7	13.4 J	14.3	12.4	14.4	3.6 J	11.6 J
Copper	4,100	20.7	20.7	18	19.9	17.6 L	1,820 L	17.2 L
Cyanide	2,000	0.29 J	0.25 J	0.13 J	0.21 J	0.29 L	0.17 L	0.59 UL
Iron	31,000	28,400	27,000	27,800	24,300	28,600	8,980	23,400
Lead	400	58.1	64.9	16.2	65.7	14.1 J	138 J	44.4 J
Magnesium	--	NA	947 J	1,000 J	831 J	1,070 J	15,900	1,160 J
Manganese	2,000	1,090	941	1,120	879	1,070	208	520
Mercury	31	0.08	0.13 J	0.067 J	0.077 J	0.066 UL	0.092 L	0.06 L
Nickel	2,000	24.3 K	23.9	24	19.2	24	9.5	17.4
Potassium	--	NA	985 J	1,040 J	814 J	1,010 J	837 J	762 J
Selenium	510	0.37 J	0.63 U	0.55 U	0.54 U	0.61 UL	0.52 UL	0.54 UL
Silver	510	0.12 U	0.27 U	0.24 U	0.23 U	0.26 U	0.25 J	0.26 J
Thallium	7.2	0.87 J	2.2 L	2.3 L	1.4 L	1.3 U	1.1 U	1.1 U
Tin	61,000	5.1 J	NA	NA	NA	NA	NA	NA
Vanadium	100	23.7	18.1	17.1	15.6	17.1	10.3 J	13.5
Zinc	31,000	85.6 K	77.2	72.3	62.2	65.1 K	105 K	67.3 K
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	NA	26.9	15.8	14.9	24.4	11.8	15.5
Nitrate	160,000	9.9	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	47,300	11,000	12,000	13,000	9,300	2,400	11,000
pH	--	7.2	6.4	4.8	5.8	7.2	7.7	7.3

Exceeds one or more

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TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
		AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample ID		09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Sample Date									
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
Acetone	92,000,000	120 B	180 B	1.8 B	17 R	13 R	14 R	11 R	11 U
Chloroform	1,000,000	540 UJ	680 UJ	12 UJ	11 R	2 R	14 R	11 R	1 J
Methyl acetate	100,000,000	540 UJ	73 J	12 UJ	NA	NA	NA	NA	NA
Methylene chloride	380,000	320 B	400 B	9.2 B	11 R	7 R	14 R	11 R	4 J
Tetrachloroethene	5,300	410 J	420 J	12 UJ	11 R	13 R	14 R	11 R	11 U
Trichloroethene	7,200	870 J	1,400 J	38 J	2 R	3 R	14 R	11 R	7 J
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	5,100,000	390 U	390 U	410 U	NA	NA	NA	NA	NA
2-Nitroaniline	310,000	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
Benzo(a)anthracene	3,900	390 U	40 J	410 U	NA	NA	NA	NA	NA
Benzo(a)pyrene	390	390 U	48 J	410 U	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	3,900	390 U	68 J	410 U	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3,100,000	390 U	65 J	410 U	NA	NA	NA	NA	NA
Caprolactam	51,000,000	390 U	390 U	41 J	NA	NA	NA	NA	NA
Chrysene	390,000	390 U	81 J	410 U	NA	NA	NA	NA	NA
Diethylphthalate	82,000,000	390 U	390 U	410 U	NA	NA	NA	NA	NA
Dimethyl phthalate	1,000,000,000	390 U	390 U	410 U	NA	NA	NA	NA	NA
Fluoranthene	4,100,000	390 U	87 J	410 U	NA	NA	NA	NA	NA
Naphthalene	2,000,000	390 U	390 U	410 U	NA	NA	NA	NA	NA
Phenanthrene	3,100,000	390 U	62 J	410 U	NA	NA	NA	NA	NA
Pyrene	3,100,000	390 U	100 J	410 U	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	200,000	390 U	1,300	410 U	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	580,000	390 U	390 U	410 U	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.033	0.008	0.1	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.016	0.0039 J	0.013	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.007	0.0014 U	0.0049 J	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.0016 U	0.0014 U	0.0041 J	NA	NA	NA	NA	NA

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TABLE 4-4  
 Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
		AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample ID		09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Sample Date									
Chemical Name									
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.0042 J	0.0013 U	0.0033 J	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.0049 J	0.0015 U	0.0021 U	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.0037 J	9.60E-04 U	0.0023 U	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.005 J	0.0016 U	0.002 U	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.0046	0.0011 J	0.0022	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	190	0.87	0.057	1.3	NA	NA	NA	NA	NA
Octachlorodibenzofuran	190	0.038	0.0038 U	0.054	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	0.071	0.017	0.2	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	0.028	0.0039	0.026	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	0.017	0.014	0.037	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	0.032	0.0014 U	0.022	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	0.0028 U	0.0033 U	0.003 U	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	0.037	0.0024 U	0.012	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	0.0062	0.0064	0.0038	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	0.031	0.0077	0.012	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>									
1,3,5-Trinitrobenzene	3,100,000	500 U	750 U	250 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	200,000	500 U	750 U	250 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	100,000	500 U	750 U	250 U	NA	NA	NA	NA	NA
HMX	5,100,000	11,000	20,000	420 J	NA	NA	NA	NA	NA
Nitroglycerin	200,000	2,500 U	2,500 U	2,500 UJ	NA	NA	NA	NA	NA
Perchlorate	72,000	42.2	51.8	49.6 U	NA	NA	NA	NA	NA
RDX	26,000	1,400	2,100	210 J	NA	NA	NA	NA	NA
Tetryl	410,000	1,300 U	2,000 U	650 U	NA	NA	NA	NA	NA

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TABLE 4-4  
 Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID		AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date		09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name									
<b>Total Metals (MG/KG)</b>									
Aluminum	100,000	5,280	8,010	7,190	NA	NA	NA	NA	NA
Antimony	41	0.64 UL	0.64 UL	2.5 L	NA	NA	NA	NA	NA
Arsenic	1.9	4.8	6.7	5.2	NA	NA	NA	NA	NA
Barium	7,200	59.9	126	91.3	NA	NA	NA	NA	NA
Beryllium	200	0.44 B	0.88 B	0.73 B	NA	NA	NA	NA	NA
Cadmium	100	0.26 B	0.58 J	0.36 B	NA	NA	NA	NA	NA
Calcium	--	192,000	5,050	19,000	NA	NA	NA	NA	NA
Chromium	310	8	12.7	10.9	NA	NA	NA	NA	NA
Cobalt	2,000	6.6 J	13.3	10.2 J	NA	NA	NA	NA	NA
Copper	4,100	15.1 L	68.1 L	18.9 L	NA	NA	NA	NA	NA
Cyanide	2,000	0.59 UL	0.59 UL	0.62 UL	NA	NA	NA	NA	NA
Iron	31,000	13,400	24,800	22,500	NA	NA	NA	NA	NA
Lead	400	58.7 J	106 J	387 J	NA	NA	NA	NA	NA
Magnesium	--	18,400	1,180 J	3,480	NA	NA	NA	NA	NA
Manganese	2,000	341	665	543	NA	NA	NA	NA	NA
Mercury	31	0.13 L	0.16 L	7.2	NA	NA	NA	NA	NA
Nickel	2,000	12.7	23	14.5	NA	NA	NA	NA	NA
Potassium	--	979 J	1,020 J	720 J	NA	NA	NA	NA	NA
Selenium	510	0.54 UL	0.55 UL	0.57 UL	NA	NA	NA	NA	NA
Silver	510	0.39 J	3	0.57 J	NA	NA	NA	NA	NA
Thallium	7.2	1.1 U	1.1 U	1.2 U	NA	NA	NA	NA	NA
Tin	61,000	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	100	11 J	19.9	14.7	NA	NA	NA	NA	NA
Zinc	31,000	57.2 K	96.4 K	78.4 K	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	15.5	16	19.4	NA	NA	NA	NA	NA
Nitrate	160,000	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	8,700	14,000	9,100	NA	NA	NA	NA	NA
pH	--	7.6	7.9	7.5	NA	NA	NA	NA	NA

Exceeds one or more

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TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID		HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
<b>Chemical Name</b>										
<b>Volatile Organic Compounds (UG/KG)</b>										
Acetone	92,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	1,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	100,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	380,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5,300	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	7,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	5,100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	310,000	1,900 U	1,900 U	1,900 U	2,000 U	2,100 U	94 J	1,900 U	13,000 J	2,300 U
Benzo(a)anthracene	3,900	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(a)pyrene	390	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(b)fluoranthene	3,900	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(g,h,i)perylene	3,100,000	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Caprolactam	51,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	390,000	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Diethylphthalate	82,000,000	380 U	390 U	390 U	410 U	430 U	92 J	390 U	4,300 U	480 U
Dimethyl phthalate	1,000,000,000	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Fluoranthene	4,100,000	380 U	42 J	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Naphthalene	2,000,000	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Phenanthrene	3,100,000	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Pyrene	3,100,000	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
bis(2-Ethylhexyl)phthalate	200,000	1,600	390 U	390 U	410 U	59 J	290 J	41 J	1,400 J	480 U
n-Nitrosodiphenylamine	580,000	160 J	390 U	390 U	410 U	430 U	400 U	390 U	3,000 J	480 U
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID		HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
<b>Chemical Name</b>										
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	190	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	190	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>										
1,3,5-Trinitrobenzene	3,100,000	250 U	250 U	250 U	30,000	250 U				
2,4-Dinitrotoluene	200,000	720 J	390 U	390 U	410 U	430 U	400 U	390 U	510 U	480 U
2,6-Dinitrotoluene	100,000	130 J	390 U	390 U	410 U	430 U	400 U	390 U	510 U	510 U
HMX	5,100,000	7,600	4,600	2,200 U	2,300	2,200 U	3,900	14,000	12,000	2,200 U
Nitroglycerin	200,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	72,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	26,000	6,600	7,300	2,600	2,100	2,100	5,100	34,000	2,800	2,800
Tetryl	410,000	650 UJ	650 UJ	650 UJ	540 J	650 UJ				

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 K - Reported value may be biased high  
 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-4

Exceedance of Adjusted Residential Soil RBC, Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID		HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name										
Total Metals (MG/KG)										
Aluminum	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	41	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	7,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	310	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	4,100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	31,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	31	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	510	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	510	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin	61,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	31,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)										
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	160,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one or more

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 K - Reported value may be biased high  
 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	Residential	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	Adjusted	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
<b>Chemical Name</b>										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	2,200,000	NA	NA	NA	14 U	13 U	1.9 J	2.2 J	2 J	12 U
1,1-Dichloroethene	390,000	NA	NA	NA	1.8 J	2 J	12 U	12 U	11 U	12 U
1,2,4-Trichlorobenzene	78,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
4-Methyl-2-pentanone	--	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Acetone	7,000,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Chloroform	78,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Chloromethane	--	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Methyl acetate	7,800,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Methylcyclohexane	--	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Methylene chloride	85,000	NA	NA	NA	3.7 B	3.2 B	12 U	12 U	11 U	1.6 B
Tetrachloroethene	1,200	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Toluene	1,600,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Trichloroethene	1,600	NA	NA	NA	14 U	13 U	73,000	82,000	65,000	12 U
Xylene, total	1,600,000	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
cis-1,2-Dichloroethene	78,000	NA	NA	NA	14 U	13 U	1.7 J	1.5 J	12	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	390,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2-Methylnaphthalene	31,000	NA	NA	NA	58 J	420 UJ	390 UJ	390 UJ	380 UJ	390 U
3- and 4-Methylphenol	39,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Acenaphthene	470,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Acenaphthylene	--	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Acetophenone	780,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Anthracene	2,300,000	NA	NA	NA	56 J	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Benzaldehyde	780,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 UJ
Benzo(a)anthracene	870	NA	NA	NA	140 J	100 J	61 J	45 J	78 J	110 J
Benzo(a)pyrene	87	NA	NA	NA	130 B	83 B	55 J	45 J	79 J	120 B
Benzo(b)fluoranthene	870	NA	NA	NA	160 J	100 J	97 J	61 J	110 J	190 J
Benzo(g,h,i)perylene	230,000	NA	NA	NA	73 B	56 B	390 UJ	390 UJ	49 J	63 B

NA - Not analyzed

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L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	Residential	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	Adjusted	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name										
Benzo(k)fluoranthene	8,700	NA	NA	NA	170 B	110 B	64 J	63 J	83 J	170 B
Caprolactam	3,900,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Carbazole	32,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Chrysene	87,000	NA	NA	NA	220 J	130 J	110 J	80 J	120 J	190 J
Di-n-butylphthalate	780,000	NA	NA	NA	460 U	54 J	74 J	110 J	380 UJ	390 U
Dibenz(a,h)anthracene	87	NA	NA	NA	460 UJ	420 UJ	390 UJ	390 UJ	380 UJ	390 UJ
Dibenzofuran	16,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Diethylphthalate	6,300,000	NA	NA	NA	460 U	46 J	79 J	130 J	58 J	40 J
Dimethyl phthalate	78,000,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Fluoranthene	310,000	NA	NA	NA	230 J	140 J	120 J	90 J	140 J	200 J
Fluorene	310,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	54 J	52 J	390 UJ	390 UJ	380 UJ	64 J
Naphthalene	160,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Phenanthrene	230,000	NA	NA	NA	220 J	98 J	120 J	110 J	110 J	120 J
Pyrene	230,000	NA	NA	NA	300 J	150 J	110 J	89 J	150 J	220 J
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	180 B	54 B	96 J	68 J	100 J	42 B
n-Nitrosodiphenylamine	130,000	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>										
No Detections										
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
Grounds, Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	Residential	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	Adjusted	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
<b>Chemical Name</b>										
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>										
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	52 U	38 U	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	52 U	38 U	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>										
Aluminum	7,800	6,680	1,970	3,490	7,710	4,730	12,100	14,500	14,900	7,890
Antimony	3.1	11.7 U	16.3 U	7.90 U	6.9 J	17.4	9.2 J	14.2	5.6 J	2.1 U
Arsenic	0.43	6.60	1.5 B	4.30 J	16.6	9.6	13.1	12.2	19.3	10.2
Barium	550	64.1	24.6 B	41.5	168	125	592	646	312	121
Beryllium	16	0.790 B	0.390 U	0.230 B	2.1 J	1.3 J	1.1 J	0.99 J	1.2 J	1.5 J
Cadmium	7.8	2.70	0.580 U	2	0.84 U	0.76 U	11	12.4	6.5	0.69 U
Calcium	--	34,800	246,000	149,000	5,380	4,890	7,610 J	6,930 J	6,970 J	6,110
Chromium	23	19.3	7	22	15.6	13	43.3 J	42 J	224 J	22.5
Cobalt	160	10.6 B	1.60 B	5 B	42.8	24	23.7	21.8	34.5	18.9
Copper	310	25.6	5.20 B	33.9	46	33.3	526	453	1,080	57.4
Cyanide	160	NA	NA	NA	0.7 U	0.7	1.07	0.6 U	0.6 U	1.9

NA - Not analyzed

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	Residential	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	Adjusted	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
<b>Chemical Name</b>										
Iron	2,300	28,300	6,820	12,400	31,200	20,600	33,800	31,100	57,900	24,700
Lead	400	74.9	6.5	80.1	53.3	43.5	917	1,120	337	46
Magnesium	--	4,700	13,000	14,100	1,310 J	1,010 J	2,600	3,030	3,480	1,610
Manganese	160	421	161	266	1,640	1,100	1,050	1,080	1,460	719
Mercury	2.3	0.420	0.0600 B	5.30	0.34	0.31	4.7 K	4.6 K	2.5 K	0.24
Nickel	160	21.4	2.30 U	8.40	60.9	38.2	47.4	40.8	240	29.3
Potassium	--	1,190 B	634 B	603 B	1,160 J	855 J	1,060 J	1,030 J	1,070 J	1,290 J
Selenium	39	0.830 U	0.580 U	0.570 U	1.4 U	1.3 U	1.2 U	1.1 U	1.1 U	1.2 U
Silver	39	7.70	1.60 U	11.6	2.6 L	2 L	70.3 L	68.6 L	61 L	12.1 L
Sodium	--	71.6 B	123 B	127 B	83.1 J	89.5 J	162 J	205 J	198 J	86.7 J
Thallium	0.55	0.830 U	0.580 U	0.570 UJ	2 U	2.2 J	1.7 U	1.7 U	1.6 U	1.7 U
Vanadium	7.8	18.9	10.3 B	15.9	37.1	41.2	44.6	40.5	332	24.3
Zinc	2,300	123	23.6	261	220	144	957	1,030	1,360	235
<b>TCLP Metals (MG/L)</b>										
Barium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	8,300	7,100	9,000	9,500	7,000	8,600
pH	--	NA	NA	NA	7.06	6.65	7.96	7.38	7.04	6.88

Exceeds one or more criteria

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
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 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	Residential	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	Adjusted	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	2,200,000	11 U	12 U	2 J	14 U	12 U	13 U	14 U
1,1-Dichloroethene	390,000	11 U	12 U	13 U	14 U	2.6 J	13 U	14 U
1,2,4-Trichlorobenzene	78,000	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,2-Dichloroethene (total)	70,000	NA						
2-Butanone	4,700,000	11 U	12 U	13 U	14 U	12 U	13 U	14 U
4-Methyl-2-pentanone	--	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Acetone	7,000,000	11 U	12 U	13 U	14 U	9.6 J	13 U	14 U
Chloroform	78,000	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Chloromethane	--	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Methyl acetate	7,800,000	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Methylcyclohexane	--	11 U	12 U	1.3 J	14 U	12 U	13 U	14 U
Methylene chloride	85,000	6.8 B	4.4 B	6.9 B	14 U	2.5 B	1.5 B	14 U
Tetrachloroethene	1,200	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Toluene	1,600,000	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Trichloroethene	1,600	11 U	12 U	120	18	9.1 J	13	26
Xylene, total	1,600,000	11 U	12 U	13 U	14 U	1.4 J	13 U	14 U
cis-1,2-Dichloroethene	78,000	11 U	12 U	13 U	14 U	12 U	13 U	6.2 J
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	390,000	82 J	88 J	430 UL	43 J	410 U	420 U	440 U
2-Methylnaphthalene	31,000	170 J	170 J	430 UL	88 J	410 U	420 U	68 J
3- and 4-Methylphenol	39,000	370 U	390 U	430 U	420 U	410 U	420 U	110 J
Acenaphthene	470,000	90 J	160 J	430 UL	420 U	410 U	420 U	440 U
Acenaphthylene	--	47 J	48 J	430 UL	420 U	410 U	420 U	440 U
Acetophenone	780,000	370 U	390 U	430 U	420 U	410 U	420 U	440 U
Anthracene	2,300,000	440	310 J	47 L	56 J	410 U	420 U	66 J
Benzaldehyde	780,000	600	500	430 UL	420 U	410 U	420 UJ	440 U
Benzo(a)anthracene	870	760	680	180 L	180 J	100 J	83 J	220 J
Benzo(a)pyrene	87	680	750	160 L	170 J	100 B	84 B	240 J
Benzo(b)fluoranthene	870	840	970	240 L	260 J	120 J	98 J	290 J
Benzo(g,h,i)perylene	230,000	290 J	320 J	71 L	68 J	45 B	420 UJ	96 J

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

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R - Unreliable result

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	Residential	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	Adjusted	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name								
Benzo(k)fluoranthene	8,700	640	690	230 L	170 J	130 B	130 B	300 J
Caprolactam	3,900,000	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Carbazole	32,000	120 J	210 J	430 UL	43 J	410 U	420 U	440 U
Chrysene	87,000	960	890	290 L	300 J	160 J	130 J	350 J
Di-n-butylphthalate	780,000	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Dibenz(a,h)anthracene	87	51 J	390 U	430 L	420 U	410 UJ	420 UJ	440 U
Dibenzofuran	16,000	100 J	110 J	430 UL	420 U	410 U	420 U	440 U
Diethylphthalate	6,300,000	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Dimethyl phthalate	78,000,000	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Fluoranthene	310,000	1,200	1,200	310 L	380 J	190 J	150 J	360 J
Fluorene	310,000	130 J	160 J	430 UL	420 U	410 U	420 U	440 U
Indeno(1,2,3-cd)pyrene	870	270 J	310 J	68 L	64 J	57 J	420 UJ	110 J
Naphthalene	160,000	120 J	110 J	430 UL	57 J	410 U	420 U	440 U
Phenanthrene	230,000	1,300	1,100	220 L	360 J	140 J	120 J	250 J
Pyrene	230,000	1,800	1,400	440 L	410 J	190 J	180 J	460
bis(2-Ethylhexyl)phthalate	46,000	340 J	73 J	130 B	180 B	410 U	52 B	90 J
n-Nitrosodiphenylamine	130,000	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>								
No Detections								
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	0.0427
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	0.0124 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	4.66E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	7.85E-04
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.00346
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	0.00193
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.00330 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	0.00195
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	3.04E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	2.10E-04 U
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	0.00120

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	Residential	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	Adjusted	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name								
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.00101
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	0.00156 J
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	7.17E-04 J
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.00335 J
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	0.780
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	0.0304
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	0.0888
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	0.0147
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	0.0102
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	0.0206
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	2.10E-04 U
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	0.00292
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	0.00846
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	0.0153
Explosives (UG/KG)								
HMX	390,000	NA	NA	NA	NA	NA	620 U	670 U
Nitroglycerin	46,000	NA	NA	NA	NA	NA	62,000 U	67,000 U
Perchlorate	5,500	NA	NA	NA	NA	NA	60 U	70 U
RDX	5,800	NA	NA	NA	NA	NA	620 U	670 U
Total Metals (MG/KG)								
Aluminum	7,800	5,530	8,070	9,540	6,570	6,640	6,620	5,410
Antimony	3.1	2.1 U	2.2 U	2.4 U	2.4 U	2.3 U	2.3 U	2.5 U
Arsenic	0.43	14.4	18.2	18.4	11	13	14.4	10.5
Barium	550	166	220	231	248	220	196	176
Beryllium	16	1.7	1.9	1.8 J	1.5 J	1.8 J	1.9 J	1.7
Cadmium	7.8	0.77 J	0.93 J	0.77 U	0.8 U	0.74 U	0.75 U	0.82 U
Calcium	--	3,310	4,690	5,470	5,450	4,460	4,180	4,620
Chromium	23	11.6 J	15.4 J	17.9	11.4	12.6	13.4	9.5 J
Cobalt	160	58.2	55.6	43.9	38.7	41.8	39.7	51.1
Copper	310	41	48.2	55.2	40.2	37.4	35.6	36.2
Cyanide	160	1	0.6 U	0.7 U	0.7 U	0.6 U	1.3	0.7 U

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	Residential	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	Adjusted	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name								
Iron	2,300	25,800	32,300	34,500	21,900	26,800	26,800	18,900
Lead	400	42.4	47.6	55.1	46.7	42.2	45.3	38.1
Magnesium	--	951 J	1,420	1,670	1,680	1,380	1,190 J	1,130 J
Manganese	160	2,250	2,320	1,970	2,100	1,930	1,740	1,890
Mercury	2.3	0.29	0.28	0.18	0.14	0.69	0.16	0.14 U
Nickel	160	79.5	77.3	83.7	56	59.5	54	75.4
Potassium	--	604 J	953 J	1,150 J	809 J	812 J	818 J	592 J
Selenium	39	1.1 U	1.2 U	1.3 U	1.3 U	1.7	1.3 U	1.4 U
Silver	39	1.8 L	4 L	1.3 UL	1.3 UL	1.2 R	1.3 R	1.4 UL
Sodium	--	81.2 J	81.5 J	73.3 U	75.7 U	82.5 J	117 J	78.1 U
Thallium	0.55	1.6 U	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U
Vanadium	7.8	16.5	22.2	25.7	16.3	18.8	23.2	13.4 J
Zinc	2,300	231	246	207	168	176	161	206
<b>TCLP Metals (MG/L)</b>								
Barium	--	NA						
Cadmium	--	NA						
Lead	--	NA						
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	NA						
Total organic carbon (TOC)	--	7,300	8,700	9,300	8,300	9,600	7,000	8,300
pH	--	6.39	6.4	5.67	6.25	7.43	6.47	7.28

Exceeds one o

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	Residential	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	Adjusted	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	2,200,000	12 U	2 J	12 U	13 U	13 U	12 U	3.1 J
1,1-Dichloroethene	390,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2,4-Trichlorobenzene	78,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
4-Methyl-2-pentanone	--	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Acetone	7,000,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Chloroform	78,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Chloromethane	--	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Methyl acetate	7,800,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Methylcyclohexane	--	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Methylene chloride	85,000	12 U	2.1 J	1.3 B	1.3 J	13 U	1.6 B	13 U
Tetrachloroethene	1,200	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Toluene	1,600,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Trichloroethene	1,600	12 U	14 U	12 U	4.4 J	1.6 J	12 U	13 U
Xylene, total	1,600,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
cis-1,2-Dichloroethene	78,000	12 U	14 U	12 U	13 U	13 U	12 U	13 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	390,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
2-Methylnaphthalene	31,000	390 UJ	460 UJ	410 U	66 J	70 J	45 J	72 J
3- and 4-Methylphenol	39,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
Acenaphthene	470,000	390 UJ	460 UJ	410 U	58 J	420 UJ	400 U	430 UJ
Acenaphthylene	--	53 J	460 UJ	410 U	420 UJ	420 UJ	46 J	430 UJ
Acetophenone	780,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
Anthracene	2,300,000	52 J	51 J	140 J	130 J	86 J	54 J	430 UJ
Benzaldehyde	780,000	390 UJ	460 UJ	410 UJ	420 UJ	420 UJ	400 UJ	260 J
Benzo(a)anthracene	870	130 J	200 J	250 J	340 J	230 UJ	160 J	100 J
Benzo(a)pyrene	87	130 J	180 J	220 B	340 J	250 J	180 B	100 J
Benzo(b)fluoranthene	870	140 J	260 J	270 J	380 J	270 J	120 J	150 J
Benzo(g,h,i)perylene	230,000	55 J	59 J	69 B	140 J	110 J	140 B	50 J

NA - Not analyzed

B - Analyte not detected above associated blank

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	Residential	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	Adjusted	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name								
Benzo(k)fluoranthene	8,700	130 J	210 J	270 B	410 J	270 J	280 B	150 J
Caprolactam	3,900,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
Carbazole	32,000	46 J	460 UJ	410 U	89 J	60 J	51 J	430 UJ
Chrysene	87,000	200 J	280 J	340 J	450 J	330 J	240 J	180 J
Di-n-butylphthalate	780,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
Dibenz(a,h)anthracene	87	390 UJ	460 UJ	410 UJ	420 UJ	420 UJ	400 U	430 UJ
Dibenzofuran	16,000	390 UJ	460 UJ	410 U	44 J	420 UJ	400 U	430 UJ
Diethylphthalate	6,300,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
Dimethyl phthalate	78,000,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
Fluoranthene	310,000	340 J	260 J	460	560 J	400 J	300 J	150 J
Fluorene	310,000	390 UJ	460 UJ	55 J	59 J	44 J	400 U	430 UJ
Indeno(1,2,3-cd)pyrene	870	61 J	56 J	76 J	140 J	120 J	120 J	46 J
Naphthalene	160,000	390 UJ	460 UJ	410 U	48 J	50 J	400 U	53 J
Phenanthrene	230,000	340 J	150 J	440	470 J	320 J	240 J	210 J
Pyrene	230,000	270 J	270 J	510	610 J	390 J	300 J	290 J
bis(2-Ethylhexyl)phthalate	46,000	40 J	50 J	43 B	48 J	77 J	400 U	66 J
n-Nitrosodiphenylamine	130,000	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>								
No Detections								
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.0134	0.0314	0.111	NA	NA	0.0558	0.169
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.0136	0.00893 J	0.0263	NA	NA	0.0132	0.0283
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	1.02E-04 U	7.23E-04 J	0.00216	NA	NA	0.00139	0.00227
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	3.23E-04 J	6.41E-04	0.00262	NA	NA	0.00132	0.00228
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.00136	0.00292	0.0115	NA	NA	0.0117	0.00627
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	6.85E-04	0.00129	0.00536	NA	NA	0.00249	0.00746
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	1.89E-04 J	5.62E-04	0.00267	NA	NA	0.00157	0.00556 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	6.27E-04	0.00121	0.00443	NA	NA	0.00237	0.00563
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	1.04E-04 U	1.21E-04 U	9.91E-04 U	NA	NA	3.54E-04 U	3.88E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	1.52E-04 U	1.77E-04 U	0.00124	NA	NA	6.63E-04	0.00132 J
1,2,3,7,8-Pentachlorodibenzofuran	0.085	4.42E-04 J	6.86E-04	0.00287	NA	NA	0.00380	0.00263

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
*Site 1 Focused Remedial Investigation for Soi*  
*Allegany Ballistics Laboratory*  
*Rocket Center, West Virginia*

Station ID	RBC-Soil	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	Residential	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	Adjusted	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
<b>Chemical Name</b>								
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	1.94E-04	3.36E-04	0.00388	NA	NA	0.00162	0.00181
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	2.07E-04 U	6.89E-04	0.00461	NA	NA	0.00269	0.00381
2,3,7,8-TCDD (dioxin)	0.0043	4.71E-04 J	4.94E-04	0.00307	NA	NA	1.60E-04 U	0.00607 J
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.00319 J	0.00448	0.0283	NA	NA	0.00615	0.0353 J
Octachlorodibenzo-p-dioxin	43	0.219	0.489	1.66	NA	NA	1.41	2.24
Octachlorodibenzofuran	43	0.0100	0.0209	0.0496	NA	NA	0.0283	0.0631
Total heptachlorodibenzo-p-dioxin	--	0.0264	0.0638	0.239	NA	NA	0.115	0.344
Total heptachlorodibenzofuran	--	0.0136	1.19E-04 U	0.0285	NA	NA	0.0146	0.0920
Total hexachlorodibenzo-p-dioxin	--	0.00462	0.0106	0.0450	NA	NA	0.0223	0.0362
Total hexachlorodibenzofuran	--	0.00612	0.0124	0.0513	NA	NA	0.0524	0.0606
Total pentachlorodibenzo-p-dioxin	--	1.52E-04 U	7.41E-04	0.0148	NA	NA	0.0026	0.0118
Total pentachlorodibenzofuran	--	0.00243	0.00656	0.0397	NA	NA	0.0613	0.0386
Total tetrachlorodibenzo-p-dioxin	--	0.00137	0.0163	0.0424	NA	NA	0.00178	0.161
Total tetrachlorodibenzofuran	--	0.00882	0.0107	0.0879	NA	NA	0.0238	0.0787
<b>Explosives (UG/KG)</b>								
HMX	390,000	600 U	690 U	610 U	630 U	630 U	580 U	650 U
Nitroglycerin	46,000	60,000 U	69,000 U	61,000 U	63,000 U	63,000 U	58,000 U	65,000 U
Perchlorate	5,500	60 U	70 U	60 U	60 U	60 U	60 U	60 U
RDX	5,800	600 U	690 U	610 U	630 U	630 U	580 U	650 U
<b>Total Metals (MG/KG)</b>								
Aluminum	7,800	4,240	6,360	6,660	7,400	7,010	6,120	8,360
Antimony	3.1	2.1 U	2.5 U	2.3 U	2.3 U	2.3 U	2.2 U	2.4 U
Arsenic	0.43	11.7	15.1	17.9	16.5	15.5	13.8	17.9
Barium	550	80.1	152	219	203	201	188	225
Beryllium	16	1.5 J	1.9 J	1.9 J	2.1 J	2 J	1.9 J	1.7 J
Cadmium	7.8	0.7 U	0.81 U	0.75 U	0.9 J	0.93 J	0.72 U	0.78 U
Calcium	--	1,960 J	3,510 J	4,230	4,830 J	4,760 J	4,340	4,340 J
Chromium	23	12.4 J	15.6 J	15.3	15 J	13.8 J	13	16.5 J
Cobalt	160	38.4	52.3	41.7	59	60	39.3	41
Copper	310	23.2	34.1	45	59.2	59.8	37.5	44.9
Cyanide	160	0.6 U	0.7 U	0.9	0.6 U	0.6 U	0.7	0.7 U

NA - Not analyzed

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	Residential	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	Adjusted	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name								
Iron	2,300	31,300	35,600	33,600	32,300	29,800	27,800	34,800
Lead	400	26.7	32.8	40.8	48.3	49.7	47.2	48.3
Magnesium	--	561 J	1,030 J	1,280	1,210 J	1,140 J	1,200 J	1,440
Manganese	160	1,480	2,090	1,770	2,240	2,250	1,650	1,700
Mercury	2.3	0.11 U	0.14 U	0.18	0.41 K	0.39 K	0.18	0.18 K
Nickel	160	60.1	78.4	58.3	78.9	78.7	54.5	56.7
Potassium	--	399 J	784 J	906 J	912 J	847 J	746 J	1,160 J
Selenium	39	1.2 U	1.4 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U
Silver	39	1.2 UL	1.4 UL	1.7 L	9.8 L	7.9 L	1.7 L	1.3 UL
Sodium	--	107 J	121 J	70.9 U	90.6 J	116 J	82 J	144 J
Thallium	0.55	1.7 U	2 U	1.8 U	1.8 U	1.8 U	1.7 U	1.9 U
Vanadium	7.8	15.2	27.5	20.7	21.4	19.8	18.9	22.6
Zinc	2,300	183	239	189	283	274	186	204
<b>TCLP Metals (MG/L)</b>								
Barium	--	NA	NA	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	8,400	7,600	9,000	6,100	8,300	8,300	7,400
pH	--	6.53	6.51	7.31	6.52	6.74	6.95	6.79

Exceeds one o

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
*Site 1 Focused Remedial Investigation for Soi.*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB37	AS01-SB38			AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	Residential	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1	
Sample Date	Adjusted	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04	
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	2.2 J	12 U	12 U	13 U	13 U	12 U	12 UJ	
1,1-Dichloroethene	390,000	1 J	12 U	12 U	1.8 J	13 U	12 U	12 UJ	
1,2,4-Trichlorobenzene	78,000	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	NA	
2-Butanone	4,700,000	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
4-Methyl-2-pentanone	--	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
Acetone	7,000,000	13 U	12 U	12 U	13 U	13 U	12 U	5 B	
Chloroform	78,000	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
Chloromethane	--	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
Methyl acetate	7,800,000	13 U	12 U	12 U	13 U	13 U	12 U	3.3 J	
Methylcyclohexane	--	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
Methylene chloride	85,000	2.8 B	12 U	6.4 B	3.7 B	13 U	12 U	3.6 B	
Tetrachloroethene	1,200	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
Toluene	1,600,000	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
Trichloroethene	1,600	13 U	12 U	12 U	180	23	12 U	12 UJ	
Xylene, total	1,600,000	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ	
cis-1,2-Dichloroethene	78,000	13 U	12 U	12 U	11 J	13 U	12 U	12 UJ	
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	390,000	420 U	360 U	390 U	380 U	38 J	53 J	NA	
2-Methylnaphthalene	31,000	42 J	360 U	390 U	40 J	74 J	77 J	NA	
3- and 4-Methylphenol	39,000	420 U	360 U	390 U	380 U	370 U	400 U	NA	
Acenaphthene	470,000	420 U	360 U	390 U	380 U	370 U	400 U	11 J	
Acenaphthylene	--	420 U	360 U	390 U	380 U	370 U	41 J	400 U	
Acetophenone	780,000	420 U	360 U	390 U	380 U	370 U	400 U	NA	
Anthracene	2,300,000	50 J	48 J	390 U	380 U	49 J	99 J	12 J	
Benzaldehyde	780,000	420 R	360 U	390 U	380 U	370 U	300 J	NA	
Benzo(a)anthracene	870	160 J	150 J	100 J	120 J	140 J	180 J	9.5 J	
Benzo(a)pyrene	87	150 B	150 J	110 J	110 J	140 J	180 J	83 J	
Benzo(b)fluoranthene	870	260 J	200 J	130 J	170 J	170 J	240 J	150 J	
Benzo(g,h,i)perylene	230,000	130 B	60 J	54 J	44 J	71 J	89 J	52 J	

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB37	AS01-SB38			AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	Residential	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1	
Sample Date	Adjusted	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04	
Chemical Name									
Benzo(k)fluoranthene	8,700	170 B	200 J	83 J	140 J	150 J	210 J	47 J	
Caprolactam	3,900,000	420 U	360 U	390 U	380 U	370 U	400 U	NA	
Carbazole	32,000	420 U	360 U	390 U	380 U	370 U	43 J	NA	
Chrysene	87,000	230 J	210 J	160 J	190 J	250 J	280 J	110 J	
Di-n-butylphthalate	780,000	420 U	360 U	390 U	380 U	370 U	150 J	NA	
Dibenz(a,h)anthracene	87	420 U	360 UJ	390 U	380 UJ	370 U	400 U	NA	
Dibenzofuran	16,000	420 U	360 U	390 U	380 U	370 U	400 U	NA	
Diethylphthalate	6,300,000	420 U	360 U	390 U	380 U	370 U	99 J	NA	
Dimethyl phthalate	78,000,000	420 U	360 U	390 U	380 U	370 U	1,100	NA	
Fluoranthene	310,000	320 J	270 J	200 J	200 J	310 J	310 J	190 J	
Fluorene	310,000	420 U	360 U	390 U	380 U	370 U	400 U	8.3 J	
Indeno(1,2,3-cd)pyrene	870	95 J	58 J	57 J	52 J	66 J	86 J	52 J	
Naphthalene	160,000	420 U	360 U	390 U	380 U	52 J	51 J	NA	
Phenanthrene	230,000	230 J	190 J	130 J	150 J	300 J	260 J	130 J	
Pyrene	230,000	280 J	280 J	190 J	270 J	260 J	410	130 J	
bis(2-Ethylhexyl)phthalate	46,000	420 U	160 B	68 B	93 B	100 J	940	NA	
n-Nitrosodiphenylamine	130,000	420 U	360 U	390 U	380 U	370 U	440	NA	
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>									
No Detections									
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.466	0.0846	0.0737	NA	0.214	0.142	NA	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.0573	0.0174	0.0224	NA	0.240	0.0351	NA	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	0.00400	0.00114 U	0.00686	NA	0.0175	0.00271	NA	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.00758	0.00236	0.00792	NA	0.00672	0.00266	NA	
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.0156	0.00551	0.0107	NA	0.103	0.00698	NA	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.0170	0.00324	0.00748	NA	0.0148	0.00652	NA	
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	0.00537	0.00105	0.00623	NA	0.0429 J	0.00705 J	NA	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	0.0162	0.00406	0.00857	NA	0.0173	0.00434	NA	
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	5.55E-04 U	5.60E-04 J	0.00582	NA	0.00221	1.75E-04 U	NA	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	0.00297	7.31E-04	0.00528 J	NA	0.00557	0.00105	NA	
1,2,3,7,8-Pentachlorodibenzofuran	0.085	0.00591	0.00113	0.00676	NA	0.0213	0.00223	NA	

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB37	AS01-SB38			AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	Residential	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1	
Sample Date	Adjusted	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04	
<b>Chemical Name</b>									
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	0.00859 J	0.00123	0.00809	NA	0.0425	0.00213	NA	
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	0.00902	0.00153	0.00767	NA	0.0448	0.00266	NA	
2,3,7,8-TCDD (dioxin)	0.0043	0.00251	6.98E-04	0.00323	NA	0.00340	0.00203 J	NA	
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.0155 J	0.00316 J	0.00592 J	NA	0.0227 J	0.00759 J	NA	
Octachlorodibenzo-p-dioxin	43	3.87	1.04	1.07	NA	1.67	1.96	NA	
Octachlorodibenzofuran	43	0.0991	0.0298	0.0523	NA	0.214	0.116	NA	
Total heptachlorodibenzo-p-dioxin	--	0.903	0.158	0.156	NA	0.442	0.272	NA	
Total heptachlorodibenzofuran	--	0.115	0.0174	0.0666	NA	0.379	0.113	NA	
Total hexachlorodibenzo-p-dioxin	--	0.181	0.0397	0.0474	NA	0.207	0.0311	NA	
Total hexachlorodibenzofuran	--	0.107	0.0282	0.0532	NA	0.426	0.0576	NA	
Total pentachlorodibenzo-p-dioxin	--	0.0335	0.00486	0.00998	NA	0.0709	0.00901	NA	
Total pentachlorodibenzofuran	--	0.111	0.0210	0.0344	NA	0.536	0.0269	NA	
Total tetrachlorodibenzo-p-dioxin	--	0.0555	0.0121	0.0151	NA	0.0721	0.154	NA	
Total tetrachlorodibenzofuran	--	0.188	0.0269	0.0349	NA	0.625	0.0381	NA	
<b>Explosives (UG/KG)</b>									
HMX	390,000	620 U	580 U	590 U	NA	630 U	620 U	NA	
Nitroglycerin	46,000	62,000 U	58,000 U	59,000 U	NA	63,000 U	62,000 U	NA	
Perchlorate	5,500	60 U	60 U	60 U	NA	60 U	60 U	NA	
RDX	5,800	620 U	580 U	590 U	NA	630 U	620 U	NA	
<b>Total Metals (MG/KG)</b>									
Aluminum	7,800	6,570	6,370	5,540	6,730	15,600	6,930	5,740	
Antimony	3.1	2.3 U	2.1 U	2.1 U	2.4 U	6.7 J	2.2 U	0.64 UL	
Arsenic	0.43	12.9	8.8	9.1	13.1	24.9	16.3	8.6 L	
Barium	550	185	182	187	235	351	219	92.8 K	
Beryllium	16	1.5 J	1 J	1.1 J	1.5 J	1.2 J	1.6	1.3	
Cadmium	7.8	0.75 U	0.69 U	0.7 U	0.78 U	84.7	0.81 J	0.047 U	
Calcium	--	5,560	3,690	4,200	5,110	5,800	4,700	2,770	
Chromium	23	20.7	13.5	11.4	12.3	29.8 J	14.3 J	12.1 K	
Cobalt	160	29.5	20.5	21.5	38.3	43	44	35.6	
Copper	310	161	27.2	27.8	37.5	972	43.7	24.1 J	
Cyanide	160	1.3	1	0.8	0.7 U	0.6 U	0.6 U	0.2 B	

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
*Site 1 Focused Remedial Investigation for Soi*  
*Allegany Ballistics Laboratory*  
*Rocket Center, West Virginia*

Station ID	RBC-Soil	AS01-SB37	AS01-SB38			AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	Residential	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1	
Sample Date	Adjusted	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04	
Chemical Name									
Iron	2,300	25,000	20,700	19,500	23,100	70,900	29,500	29,500 J	
Lead	400	103	37	37.1	43.3	416	51.8	24.5	
Magnesium	--	1,460	1,120 J	1,110 J	1,530	1,690	1,390	859 J	
Manganese	160	1,310	1,120	1,160	1,940	1,510	1,960	1,200	
Mercury	2.3	0.28	0.11 U	0.12 U	0.12 U	0.17	0.17	0.077 J	
Nickel	160	47	30.4	31.8	54.5	79.4	63.3	56.6	
Potassium	--	848 J	812 J	796 J	870 J	1,370 J	870 J	691 J	
Selenium	39	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1 B	
Silver	39	3 L	1.2 UL	1.2 UL	1.3 UL	1.2 UL	1.2 UL	0.24 U	
Sodium	--	119 J	65.8 U	66.6 U	74.4 U	227 J	74.1 J	60.8 U	
Thallium	0.55	1.8 U	1.7 U	1.7 U	1.9 U	1.8 U	1.8 U	2.6 B	
Vanadium	7.8	32.2	21.8	20.8	16.1	29.7	22.2	15.5	
Zinc	2,300	362	107	108	165	1,400	192	163	
<b>TCLP Metals (MG/L)</b>									
Barium	--	NA	NA	NA	NA	NA	NA	NA	
Cadmium	--	NA	NA	NA	NA	NA	NA	NA	
Lead	--	NA	NA	NA	NA	NA	NA	NA	
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA	NA	NA	NA	NA	NA	15.7	
Total organic carbon (TOC)	--	7,900	7,700	8,200	7,500	7,300	7,700	43,900	
pH	--	7	6.6	6.11	6.56	8.23	6.76	6.8	

Exceeds one o

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	Residential	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0-1
Sample Date	Adjusted	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
1,1-Dichloroethene	390,000	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
1,2,4-Trichlorobenzene	78,000	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	2.8 J	12 U	610 UL	620 UL	14 U	1.9 J	700 U	670 UJ
4-Methyl-2-pentanone	--	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
Acetone	7,000,000	26 B	6.8 B	120 B	150 B	17 B	30 J	120 B	110 B
Chloroform	78,000	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
Chloromethane	--	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
Methyl acetate	7,800,000	2.9 J	12 U	850 L	450 L	2.9 J	11 J	320 J	300 J
Methylcyclohexane	--	1.5 J	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
Methylene chloride	85,000	3.2 B	2.5 B	220 B	250 B	6 B	3.8 B	310 B	290 B
Tetrachloroethene	1,200	12 UJ	12 U	610 UL	620 UL	14 U	12 U	730	560 J
Toluene	1,600,000	1.2 J	12 U	610 UL	620 UL	14 U	12 U	700 U	670 UJ
Trichloroethene	1,600	12 UJ	12 U	3,600 L	990 L	14 U	12 U	2,700	6,400 J
Xylene, total	1,600,000	12 UJ	12 UJ	610 UL	620 UL	14 U	12 U	700 U	670 UJ
cis-1,2-Dichloroethene	78,000	12 UJ	12 U	610 UL	620 UL	14 U	12 U	700 U	120 J
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	410 U	10 J	420 U	8,900 U	370 U	370 U	400 UL	440 U
Acenaphthylene	--	410 U	430 U	420 U	630 J	370 U	370 U	400 UL	440 U
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	12 J	24 J	10 J	920 J	370 U	370 U	400 UL	440 U
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	870	78 J	130 J	64 J	7,500 J	24 J	21 J	31 L	46 J
Benzo(a)pyrene	87	88 J	140 J	81 J	9,000	24 J	24 J	36 L	55 J
Benzo(b)fluoranthene	870	150 J	230 J	150 J	21,000 J	45 J	45 J	63 L	91 J
Benzo(g,h,i)perylene	230,000	53 J	81 J	51 J	3,700 J	18 J	11 J	21 L	34 J

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
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R - Unreliable result  
 U - Analyte not detected

TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	Residential	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0-1
Sample Date	Adjusted	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name									
Benzo(k)fluoranthene	8,700	42 J	80 J	45 J	8,600 J	11 J	11 J	17 L	36 J
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	87,000	110 J	150 J	98 J	10,000	37 J	33 J	45 L	63 J
Di-n-butylphthalate	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phtalate	78,000,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	160 J	260 J	120 J	4,000 J	53 J	49 J	56 L	93 J
Fluorene	310,000	410 U	10 J	420 U	8,900 U	370 U	370 U	400 UL	440 U
Indeno(1,2,3-cd)pyrene	870	57 J	93 J	54 J	5,000 J	19 J	14 J	21 L	33 J
Naphthalene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	100 J	140 J	74 J	310 J	46 J	37 J	30 L	53 J
Pyrene	230,000	140 J	190 J	110 J	7,500 J	42 J	34 J	46 L	68 J
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	130,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>									
No Detections									
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	0.0073 J	0.015 J	0.079 J	0.21 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	0.0024 J	0.0044 J	0.11 J	0.45 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	4.20E-04 J	9.00E-04 J	0.012	0.058 L
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	2.70E-04 J	4.90E-04 J	0.0045 J	0.014
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.0028 J	0.004 J	0.076	0.25 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	5.70E-04 J	7.00E-04 J	0.011	0.034
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	7.50E-04 J	0.0013 J	0.031	0.097 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	7.00E-04 J	0.0012 J	0.012 J	0.036 J
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	7.60E-05 U	1.60E-04 U	0.0018 J	0.0068
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	2.90E-04 J	3.40E-04 J	0.0063	0.017
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	0.0026 J	0.003 J	0.03	0.098 L

NA - Not analyzed  
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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	Residential	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0-1
Sample Date	Adjusted	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
<b>Chemical Name</b>									
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	5.30E-04 J	5.90E-04 J	0.025	0.065 L
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	0.0012 J	0.0018 J	0.039	0.095 L
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	2.70E-04 U	4.20E-04 U	0.0023 J	0.005 J
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	0.0025 J	0.0032 J	0.03 J	0.089 J
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	0.13 J	0.3 J	0.66	1.2 L
Octachlorodibenzofuran	43	NA	NA	NA	NA	0.012	0.016	0.11	0.57 L
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.021 J	0.04 J	0.19 J	0.49 J
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	0.0054 J	0.0095 J	0.17 J	0.67 J
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.0061 J	0.0099 J	0.11 J	0.33 J
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	0.0072 J	0.011 J	0.29 J	0.84 J
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.0033 J	0.0041 J	0.099 J	0.26 J
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	0.013 J	0.018 J	0.49 J	1.1 J
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.0042 J	0.0044 J	0.13 J	0.29 J
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	0.02 J	0.027 J	0.83 J	1.5 J
<b>Explosives (UG/KG)</b>									
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>									
Aluminum	7,800	7,090	8,490	7,270	9,160	6,190	6,230	14,000	23,400
Antimony	3.1	0.67 UL	0.7 UL	0.68 UL	0.72 UL	0.72 J	0.6 UL	1.1 J	2.6 J
Arsenic	0.43	11.1 L	11.9 L	8.5 L	12.4 L	5.9 L	5.8 L	8.5 L	8.6 L
Barium	550	148 K	160 K	132 K	186 K	102 K	102 K	259 K	232 K
Beryllium	16	1.6	1.6	1 B	1.5	0.73 B	0.66 B	0.94 B	0.92 B
Cadmium	7.8	0.54 B	0.25 B	0.3 B	0.069 B	0.067 B	0.044 U	13 J	4.5 J
Calcium	--	3,150	3,470	3,130	3,910	717 J	572 J	4,180	4,630
Chromium	23	14.2 K	15.7 K	14.1 K	19.7 K	10.4 K	10.3 K	23.5 K	42.7 K
Cobalt	160	46.8	41.8	23.4	34.6	10.7 J	10.4 J	23.9	20.3
Copper	310	37.8 J	46.6 J	43.1 J	43.5 J	17.3 J	17.4 J	123 J	253 J
Cyanide	160	0.33 B	0.36 B	0.23 B	0.28 B	0.25 B	1.5	0.34 B	1

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	Residential	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0-1
Sample Date	Adjusted	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name									
Iron	2,300	29,500 J	31,300 J	28,000 J	32,300 J	21,000 J	20,800 J	31,100 J	57,100 J
Lead	400	39.7	43.6	44.3	44.9	73	62	223	591
Magnesium	--	970 J	1,120 J	1,130 J	1,370	700 J	687 J	1,430	1,940
Manganese	160	1,650	1,580	1,060	1,480	591	586	990	771
Mercury	2.3	0.17 J	0.96 J	1 J	0.36 J	0.091 J	0.091 J	0.26 J	2.1 J
Nickel	160	64.4	60.2	36.6	54.5	15.1	15.3	37	50
Potassium	--	874 J	1,030 J	1,060 J	1,160 J	711 J	725 J	1,380 J	1,010 J
Selenium	39	1.1 B	1 B	0.86 B	1.1 B	0.88 B	0.95 B	1.1 B	0.61 U
Silver	39	0.97 B	2.9	3.3	0.54 B	0.22 U	0.22 U	1 B	2.4 J
Sodium	--	63.2 U	66 U	64 U	68.6 U	56.4 U	56.4 U	86.3 B	67.4 U
Thallium	0.55	1.4 B	3.3 B	2.5 B	5.2 B	2 B	1.6 B	1.7 B	2.7 B
Vanadium	7.8	18.3	21.3	21.8	21.8	16.1	16	26.5	22.4
Zinc	2,300	191	217	161	181	61.9	63.2	845	1,170
<b>TCLP Metals (MG/L)</b>									
Barium	--	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	19	22.4	20.1	25.3	9.2	9.3	17.4	24
Total organic carbon (TOC)	--	114,500	82,800	64,800	98,400	67,900	29,700	64,100	82,500
pH	--	6.8	6.9	6.9	6.8	5.1	5	7	6.8

Exceeds one o

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	Residential	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date	Adjusted	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	2,200,000	1,800 U	13 U	NA	NA	NA	NA	NA
1,1-Dichloroethene	390,000	1,800 U	13 U	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	78,000	1,800 U	13 U	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	1,800 U	13 U	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	--	1,800 U	13 UJ	NA	NA	NA	NA	NA
Acetone	7,000,000	250 B	4.2 B	NA	NA	NA	NA	NA
Chloroform	78,000	1,800 U	13 U	NA	NA	NA	NA	NA
Chloromethane	--	1,800 U	13 U	NA	NA	NA	NA	NA
Methyl acetate	7,800,000	1,800 U	13 U	NA	NA	NA	NA	NA
Methylcyclohexane	--	1,800 U	13 U	NA	NA	NA	NA	NA
Methylene chloride	85,000	760 B	4 B	NA	NA	NA	NA	NA
Tetrachloroethene	1,200	1,800 U	13 UJ	NA	NA	NA	NA	NA
Toluene	1,600,000	1,800 U	13 UJ	NA	NA	NA	NA	NA
Trichloroethene	1,600	36,000	13 U	NA	NA	NA	NA	NA
Xylene, total	1,600,000	1,800 U	13 UJ	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	78,000	1,800 U	13 U	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	400 U	420 U	400 U	400 U	450 U	4,100 J	400 U
Acenaphthylene	--	400 U	420 U	400 U	400 U	450 U	4,400 U	400 U
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	400 U	14 J	8.4 J	69 J	15 J	8,300	12 J
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	870	34 J	99 J	80 J	74 J	87 J	8,100	70 J
Benzo(a)pyrene	87	40 J	120 J	82 J	79 J	100 J	12,000 J	88 J
Benzo(b)fluoranthene	870	75 J	240 J	170 J	130 J	160 J	16,000 J	170 J
Benzo(g,h,i)perylene	230,000	22 J	63 J	41 J	46 J	69 J	4,200 J	53 J

NA - Not analyzed

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
*Site 1 Focused Remedial Investigation for Soi*  
*Allegany Ballistics Laboratory*  
*Rocket Center, West Virginia*

Station ID	RBC-Soil Residential Adjusted	AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID		AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Benzo(k)fluoranthene	8,700	25 J	75 J	45 J	49 J	61 J	7,300	55 J
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA	NA	NA
Chrysene	87,000	48 J	150 J	120 J	120 J	130 J	8,500	110 J
Di-n-butylphthalate	780,000	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	78,000,000	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	87 J	190 J	170 J	190 J	150 J	12,000	140 J
Fluorene	310,000	400 U	420 U	400 U	8.5 J	450 U	5,500	400 U
Indeno(1,2,3-cd)pyrene	870	23 J	75 J	46 J	58 J	69 J	5,400	53 J
Naphthalene	160,000	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	72 J	120 J	60 J	86 J	120 J	31,000	91 J
Pyrene	230,000	50 J	150 J	130 J	120 J	150 J	21,000	110 J
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	130,000	NA	NA	NA	NA	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>								
No Detections								
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	1.1 J	0.21 J	0.045 J	0.021	0.16	0.33 J	0.12 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.13	0.044	0.0088	0.0031 J	0.028	0.032 K	0.039
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	0.0081	0.0028 J	7.20E-04 J	3.10E-04 U	0.002 J	0.0027 J	0.005 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.032	0.0062 J	9.20E-04 J	2.50E-04 U	0.0034 J	0.01	0.0048 J
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.082 J	0.013 J	0.0016 J	0.0018 J	0.0082 J	0.0083 J	0.035 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.11	0.011	0.002 J	8.00E-04 J	0.0081	0.02 K	0.008
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	0.037 J	0.0066	4.30E-04 J	4.90E-04 J	0.0036 J	0.0051 J	0.0093
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	0.13	0.0067	0.0019 J	7.10E-04 J	0.0068	0.027 J	0.0052 J
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	0.0014 J	4.10E-04 J	1.90E-04 U	1.80E-04 U	4.30E-04 J	3.80E-04 J	5.60E-04 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	0.044	0.0026 J	2.90E-04 U	2.70E-04 U	0.0024 J	0.0081	0.0027 J
1,2,3,7,8-Pentachlorodibenzofuran	0.085	0.024 J	0.0045 J	8.10E-04 J	2.90E-04 J	0.0032 J	0.0077	0.04

NA - Not analyzed

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R - Unreliable result

U - Analyte not detected

TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	Residential	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date	Adjusted	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
<b>Chemical Name</b>								
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	0.036	0.0036 J	4.90E-04 J	1.90E-04 J	0.003 J	0.0045 J	0.0071
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	0.045	0.0056 J	8.50E-04 J	9.40E-04 J	0.004 J	0.01	0.046
2,3,7,8-TCDD (dioxin)	0.0043	0.016	0.0035 J	0.0011 J	5.00E-04 U	0.0043 J	0.0019	0.0049
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.038 J	0.021 J	0.0049 J	0.0023 J	0.024 J	0.015 J	0.12 J
Octachlorodibenzo-p-dioxin	43	3.8 J	3.2 J	0.78 J	0.27 J	2.3 J	2 K	1.5 J
Octachlorodibenzofuran	43	0.093	0.096	0.019	0.0091 J	0.046	0.055 K	0.059
Total heptachlorodibenzo-p-dioxin	--	2.6 J	0.57 J	0.09 J	0.092	0.31	0.86 J	0.31 J
Total heptachlorodibenzofuran	--	0.21	0.12 J	0.025 J	0.0092 J	0.071 J	0.084	0.083 J
Total hexachlorodibenzo-p-dioxin	--	1.3	0.088 J	0.017 J	0.0094 J	0.076	0.25 J	0.062 J
Total hexachlorodibenzofuran	--	0.36 J	0.081 J	0.015 J	0.0071 J	0.056 J	0.092 J	0.11 J
Total pentachlorodibenzo-p-dioxin	--	0.69 J	0.042 J	0.0043 J	5.30E-04 J	0.034 J	0.13 J	0.033 J
Total pentachlorodibenzofuran	--	0.66 J	0.094 J	0.015 J	0.0094 J	0.057 J	0.13 J	0.24 J
Total tetrachlorodibenzo-p-dioxin	--	0.53 J	0.11 J	0.0094 J	0.0018	0.071 J	0.083 J	0.046 J
Total tetrachlorodibenzofuran	--	1 J	0.13 J	0.017 J	0.0069 J	0.14 J	0.35 J	0.46 J
<b>Explosives (UG/KG)</b>								
HMX	390,000	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>								
Aluminum	7,800	26,000	8,790	5,680	5,940	8,500	11,600	7,060
Antimony	3.1	3.6 J	0.68 UL	0.65 UL	0.66 UL	0.72 UL	3 J	0.64 UL
Arsenic	0.43	12.5 L	12.8 L	9.5 L	9.7 L	11.8 L	11.2 L	11.2 L
Barium	550	316 K	181 K	113 K	107 K	166 K	188 K	147 K
Beryllium	16	0.71 B	1.5	1.4	1.4	1.5	0.76 B	1.5
Cadmium	7.8	11 J	0.3 B	0.085 B	0.049 U	0.4 B	5.2 J	0.46 B
Calcium	--	22,500	3,800	2,910	2,490	3,520	11,800	2,770
Chromium	23	63.8 K	17.1 K	11.2 K	11.5 K	15.6 K	59.5 K	14 K
Cobalt	160	20	37.1	39.4	41.5	42.8	15.8	39.7
Copper	310	284 J	44.1 J	26.7 J	26.6 J	41 J	517 J	39.8 J
Cyanide	160	0.16 B	0.26 B	0.28 B	0.24 B	0.36 B	0.66 U	0.3 B

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for SoI  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	Residential	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date	Adjusted	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Iron	2,300	28,700 J	32,400 J	28,200 J	29,000 J	31,600 J	30,400 J	28,700 J
Lead	400	1,310	47.4	26.9	35.7	38	939	43.7
Magnesium	--	5,040	1,310	863 J	866 J	1,300 J	4,540	938 J
Manganese	160	1,240	1,520	1,360	1,390	1,710	919	1,420
Mercury	2.3	1 J	0.3 J	0.079 J	0.11 J	0.25 J	0.44 J	0.23 J
Nickel	160	70.5	56.6	63.6	66.7	59.7	45.5	57.4
Potassium	--	1,700 J	1,300 J	637 J	728 J	1,200 J	1,430 J	919 J
Selenium	39	0.69 B	2.1 B	0.83 B	0.85 B	1.6 B	0.6 U	1.6 B
Silver	39	42.6	0.45 B	0.24 U	0.24 U	1.2 B	5.5	0.24 U
Sodium	--	217 B	64.3 U	61.7 U	62.2 U	68.4 U	149 B	60.7 U
Thallium	0.55	5.1 B	3.5 B	1.2 UL	3.3 B	3.1	1.8 B	3.1 B
Vanadium	7.8	173	25.4	15.4	16	21.9	58.3	22.1
Zinc	2,300	1,400	176	181	180	200	841	180
<b>TCLP Metals (MG/L)</b>								
Barium	--	NA	NA	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	16.8	20.4	17.1	17.6	25.1	23.8	15.7
Total organic carbon (TOC)	--	58,700	113,200	62,000	50,200	103,600	45,800	110,600
pH	--	7.9	7	6.9	6.9	6.9	7.5	6.5

Exceeds one o

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5
Sample Date	Adjusted	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2,200,000	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
1,1-Dichloroethene	390,000	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
1,2,4-Trichlorobenzene	78,000	NA	15 UJ	79 J	880 UL	1,300 UL	12 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
4-Methyl-2-pentanone	--	NA	15 UJ	750 UJ	430 L	1,300 UL	12 U
Acetone	7,000,000	NA	3.2 B	180 B	190 B	220 B	2.8 B
Chloroform	78,000	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
Chloromethane	--	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
Methyl acetate	7,800,000	NA	15 UJ	180 J	1,600 L	1,300 UL	12 U
Methylcyclohexane	--	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
Methylene chloride	85,000	NA	6.4 B	460 B	590 B	770 B	5.1 B
Tetrachloroethene	1,200	NA	15 UJ	420 J	300 L	1,300 UL	12 U
Toluene	1,600,000	NA	15 UJ	750 UJ	150 L	1,300 UL	12 U
Trichloroethene	1,600	NA	15 UJ	4,400 J	4,100 L	22,000 L	4.9 J
Xylene, total	1,600,000	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
cis-1,2-Dichloroethene	78,000	NA	15 UJ	750 UJ	880 UL	1,300 UL	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	390,000	NA	500 U	450 U	440 U	390 U	430 U
2-Methylnaphthalene	31,000	NA	500 U	450 U	440 U	390 U	430 U
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	410 U	500 U	450 U	440 U	390 U	430 U
Acenaphthylene	--	410 U	500 U	450 U	440 U	390 U	430 U
Acetophenone	780,000	NA	500 U	55 J	440 U	390 U	430 U
Anthracene	2,300,000	21 J	500 U	450 U	440 U	390 U	430 U
Benzaldehyde	780,000	NA	500 U	450 U	440 U	390 U	430 U
Benzo(a)anthracene	870	99 J	500 U	450 U	440 U	390 U	430 U
Benzo(a)pyrene	87	110 J	500 U	450 U	440 U	390 U	430 U
Benzo(b)fluoranthene	870	200 J	500 U	450 U	440 U	390 U	430 U
Benzo(g,h,i)perylene	230,000	57 J	500 U	450 U	440 U	390 U	430 U

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 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5
Sample Date	Adjusted	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Benzo(k)fluoranthene	8,700	61 J	500 U	450 U	440 U	390 U	430 U
Caprolactam	3,900,000	NA	68 J	450 U	440 U	390 U	430 U
Carbazole	32,000	NA	500 U	450 U	440 U	390 U	430 U
Chrysene	87,000	120 J	500 U	450 U	440 U	390 U	430 U
Di-n-butylphthalate	780,000	NA	500 U	450 U	440 U	390 U	430 U
Dibenz(a,h)anthracene	87	NA	500 U	450 U	440 U	390 U	430 U
Dibenzofuran	16,000	NA	500 U	450 U	440 U	390 U	430 U
Diethylphthalate	6,300,000	NA	500 U	1,300	53 J	390 U	430 U
Dimethyl phthalate	78,000,000	NA	500 U	450 U	440 U	390 U	430 U
Fluoranthene	310,000	220 J	50 J	450 U	440 U	390 U	51 J
Fluorene	310,000	410 U	500 U	450 U	440 U	390 U	430 U
Indeno(1,2,3-cd)pyrene	870	58 J	500 U	450 U	440 U	390 U	430 U
Naphthalene	160,000	NA	500 U	450 U	440 U	390 U	430 U
Phenanthrene	230,000	120 J	500 U	450 U	440 U	390 U	43 J
Pyrene	230,000	160 J	500 U	450 U	440 U	390 U	430 U
bis(2-Ethylhexyl)phthalate	46,000	NA	76 B	99 B	440 U	390 U	82 B
n-Nitrosodiphenylamine	130,000	NA	500 U	450 U	440 U	390 U	430 U
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>							
No Detections							
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.14 J	0.02	0.35	0.84	0.11	0.045
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.027	0.011	0.81	1.4	0.079	0.024
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	0.0022 J	0.0011 U	0.12	0.24	0.0064	0.0016 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.0038 J	0.0017 U	0.023	0.054	0.005 J	0.0015 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.0079 J	0.0032 U	0.18	0.36	0.02	0.006 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.0069	0.0016 U	0.047	0.13	0.0098	0.0029 U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	0.0025 J	0.0036 U	0.21	0.42	0.018	0.0038 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	0.0038 J	0.0019 U	0.069	0.11	0.0092	0.0028 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	2.70E-04 U	0.0013 U	0.015	0.031	0.0013 U	0.0015 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	0.0018 J	0.0031 U	0.031	0.053	0.0037 J	0.0021 U
1,2,3,7,8-Pentachlorodibenzofuran	0.085	0.0024 J	0.004 J	0.19	0.25	0.012	0.0028 U

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5
Sample Date	Adjusted	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04
<b>Chemical Name</b>							
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	0.002 J	0.003 U	0.16	0.33	0.023	0.0035 J
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	0.0029 J	0.005 J	0.19	0.3	0.02	0.0047 J
2,3,7,8-TCDD (dioxin)	0.0043	0.0028	7.10E-04 U	0.01	0.01	0.0015	9.30E-04 J
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.013 J	0.005	0.19	0.19	0.016	0.0057
Octachlorodibenzo-p-dioxin	43	2.3 J	0.36	1.2	1.2	1.1	0.56
Octachlorodibenzofuran	43	0.068	0.02	0.68	0.73	0.047	0.022
Total heptachlorodibenzo-p-dioxin	--	0.37 J	0.043	0.63	1.4	0.23	0.094
Total heptachlorodibenzofuran	--	0.076 J	0.019	1.3	2.3	0.12	0.038
Total hexachlorodibenzo-p-dioxin	--	0.051 J	0.017	0.5	1.1	0.18	0.076
Total hexachlorodibenzofuran	--	0.046 J	0.0069 U	1.5	3.1	0.16	0.029
Total pentachlorodibenzo-p-dioxin	--	0.02 J	0.0036 U	0.36	0.62	0.066	0.026
Total pentachlorodibenzofuran	--	0.051 J	0.025	1.7	2.8	0.17	0.022
Total tetrachlorodibenzo-p-dioxin	--	0.042 J	0.011	0.33	0.37	0.051	0.022
Total tetrachlorodibenzofuran	--	0.072 J	0.03	2.3	2.9	0.21	0.048
<b>Explosives (UG/KG)</b>							
HMX	390,000	NA	500	520,000	530,000	120 J	500 U
Nitroglycerin	46,000	NA	2,500 UJ	500 J	2,500 UJ	2,500 UJ	2,500 UJ
Perchlorate	5,500	NA	60.6 U	311	120	47.8 U	52.2 U
RDX	5,800	NA	82 J	7,300 J	50,000 U	500 U	500 U
<b>Total Metals (MG/KG)</b>							
Aluminum	7,800	8,420	7,620	53,700	23,300	7,410	8,710
Antimony	3.1	0.67 UL	0.82 UL	1 L	3.4 L	0.65 UL	0.71 UL
Arsenic	0.43	12.7 L	9.5	7.2	6.8	8.7	7.5
Barium	550	184 K	150	263	225	198	194
Beryllium	16	1.5	1.2 B	0.75 B	0.021 U	0.86 B	1.1 B
Cadmium	7.8	0.37 B	1.8	373	38	2.1	0.7 J
Calcium	--	3,630	3,410	6,580	4,940	2,750	6,600
Chromium	23	16.4 K	15.1	72.6	319	37.6	31.1
Cobalt	160	42	27	18.1	27.7	16.3	18.5
Copper	310	44.1 J	35.6 L	248 L	139 L	172 L	94.9 L
Cyanide	160	0.16 B	0.76 UL	1.4 L	0.67 UL	0.6 UL	0.65 UL

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 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5
Sample Date	Adjusted	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Iron	2,300	32,400 J	28,700	53,300	54,200	40,700	31,600
Lead	400	45.3	61.5 J	687 J	814 J	111 J	66.8 J
Magnesium	--	1,250	1,290 J	4,510	3,970	1,310	2,100
Manganese	160	1,750	1,250	415	878	888	986
Mercury	2.3	0.24 J	0.23	56.3	1.5	0.42	0.34
Nickel	160	62.9	42.8	43.9	56	37	29.3
Potassium	--	1,070 J	1,180 J	690 J	973 J	934 J	1,180 J
Selenium	39	0.81 B	0.83 L	1 L	1.7 L	0.81 L	0.75 L
Silver	39	0.25 U	0.7 J	12.3	10	41.2	0.97 J
Sodium	--	63.7 U	77.5 U	258 B	498 J	61.2 U	66.9 U
Thallium	0.55	2.9 B	1.5 U	1.3 U	1.3 U	1.1 U	1.3 U
Vanadium	7.8	24.9	23.4	14.1	17.8	30.2	19.5
Zinc	2,300	181	179 K	2,060 K	958 K	311 K	182 K
<b>TCLP Metals (MG/L)</b>							
Barium	--	NA	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>							
% Moisture	--	19.6	34	27.3	25.2	16.4	23.4
Total organic carbon (TOC)	--	98,700	27,000	23,000	25,000	19,000	10,000
pH	--	6.4	7.6	6.5	7.2	7.2	7.9

Exceeds one o

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 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for SoI  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	B1-003		B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005
Sample ID	Residential	HCS-B1-3-S	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92
Chemical Name											
<b>Volatile Organic Compounds (UG/KG)</b>											
1,1,1-Trichloroethane	2,200,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	78,000	NA	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	7,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	78,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	85,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1,200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1,600,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	1,600	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	1,600,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>											
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	380 U	370 U	NA	NA	120 J	40 J
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	NA	NA	NA	380 U	370 U	NA	NA	400 U	67 J
Acenaphthylene	--	NA	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	NA	NA	NA	380 U	370 U	NA	NA	730	190 J
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	870	NA	NA	NA	NA	380 U	88 J	NA	NA	1,700	700
Benzo(a)pyrene	87	NA	NA	NA	NA	380 U	70 J	NA	NA	1,400	690
Benzo(b)fluoranthene	870	NA	NA	NA	NA	380 U	82 J	NA	NA	1,500	730
Benzo(g,h,i)perylene	230,000	NA	NA	NA	NA	380 U	57 J	NA	NA	910	440

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	B1-003		B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005
Sample ID	Residential	HCS-B1-3-S	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92
Chemical Name											
Benzo(k)fluoranthene	8,700	NA	NA	NA	NA	380 U	56 J	NA	NA	1,100	580
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	380 U	370 U	NA	NA	NA	NA
Chrysene	87,000	NA	NA	NA	NA	380 U	87 J	NA	NA	1,600	870
Di-n-butylphthalate	780,000	NA	NA	NA	NA	380 U	55 J	NA	NA	400 UJ	390 UJ
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	380 U	370 U	NA	NA	230 J	390 U
Dibenzofuran	16,000	NA	NA	NA	NA	380 U	370 U	NA	NA	260 J	52 J
Diethylphthalate	6,300,000	NA	NA	NA	NA	380 U	300 J	NA	NA	400 U	390 U
Dimethyl phthalate	78,000,000	NA	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U
Fluoranthene	310,000	NA	NA	NA	NA	380 U	64 J	NA	NA	2,900	1,200
Fluorene	310,000	NA	NA	NA	NA	380 U	370 U	NA	NA	410	81 J
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	NA	380 U	51 J	NA	NA	790	390 J
Naphthalene	160,000	NA	NA	NA	NA	380 U	370 U	NA	NA	76 J	390 U
Phenanthrene	230,000	NA	NA	NA	NA	380 U	370 U	NA	NA	2,300	720
Pyrene	230,000	NA	NA	NA	NA	380 U	61 J	NA	NA	2,300	970
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U
n-Nitrosodiphenylamine	130,000	NA	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>											
No Detections											
<b>Dioxin/Furans (UG/KG)</b>											
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	0.340 J	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	1.10 J	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	0.0790 J	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	0.0990 UJ	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.410 UJ	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	0.120 UJ	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.360 UJ	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	0.0180 UJ	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.0400 UJ	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	0.0560 J	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	0.220 J	NA	NA	NA

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	B1-003		B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005
		HCS-B1-3-S	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3
Sample ID	Sample Date	07/17/92	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92
<b>Chemical Name</b>											
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.0310 UJ	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	0.240 J	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	0.00650 UJ	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	0.140 J	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	0.150 J	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	1.70 J	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	0.850 J	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	1.5 J	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	1.10 J	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	1.70 J	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	0.830 J	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	1.20 J	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	0.660 J	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	3.30 J	NA	NA	NA
<b>Explosives (UG/KG)</b>											
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>											
Aluminum	7,800	17,500 J	37,100 J	96,900 J	51,700 J	NA	NA	7,510 J	6,110 J	NA	NA
Antimony	3.1	4.30 J	12.3 J	12.9 J	16.4 J	NA	NA	3.10 J	3.40 J	NA	NA
Arsenic	0.43	14.4 J	13.9	8.40 J	14.2 J	NA	NA	7.30 J	7.70 J	NA	NA
Barium	550	338	389	758	425	NA	NA	94.8	132	NA	NA
Beryllium	16	0.910	0.830	0.530	0.810	NA	NA	0.180	1.40	NA	NA
Cadmium	7.8	21.6 J	22.9 J	57.1 J	154 J	NA	NA	3.30 J	0.740 UJ	NA	NA
Calcium	--	5,800	4,900	8,790	3,600	NA	NA	1,070	4,460	NA	NA
Chromium	23	46.1 J	51.4 J	100 J	103 J	NA	NA	10 J	31.5 J	NA	NA
Cobalt	160	18.3	28.4	39.8	31.6	NA	NA	5.5	21.1	NA	NA
Copper	310	226 J	309 J	780 J	855 J	NA	NA	81.9 J	136 J	NA	NA
Cyanide	160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	B1-003		B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005
Sample ID	Residential	HCS-B1-3-S	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92
<b>Chemical Name</b>											
Iron	2,300	26,200	27,200	122,000	45,700	NA	NA	10,500	28,500	NA	NA
Lead	400	607	793 J	12,100	6,680	NA	NA	4,990	68.6	NA	NA
Magnesium	--	1,870	2,010	8,810	4,230	NA	NA	737	2,190	NA	NA
Manganese	160	588	1,030	592	681	NA	NA	147	501	NA	NA
Mercury	2.3	0.310	0.560	1	2.5	NA	NA	2.10	0.320	NA	NA
Nickel	160	44.2	39.4	107	74.1	NA	NA	11.4	55.1	NA	NA
Potassium	--	1,460	1,510	1,520	1,110	NA	NA	151 U	620	NA	NA
Selenium	39	0.710 J	0.5 J	3.90 J	0.470 R	NA	NA	0.470 R	0.940 J	NA	NA
Silver	39	4.20	5.80	12.6	24.8	NA	NA	8.90	6.5	NA	NA
Sodium	--	467 UJ	335 UJ	9,740	373 UJ	NA	NA	342 UJ	298 UJ	NA	NA
Thallium	0.55	0.640 U	0.550 U	0.560 U	0.520 U	NA	NA	0.510 U	0.560 U	NA	NA
Vanadium	7.8	34.7	22.3	18.1	30.3	NA	NA	5.60	108	NA	NA
Zinc	2,300	1,010 J	1,290 J	3,860 J	2,160 J	NA	NA	291 J	408 J	NA	NA
<b>TCLP Metals (MG/L)</b>											
Barium	--	NA	NA	NA	NA	NA	NA	2.43	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA	0.216	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA	6.01	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>											
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one o

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning

Grounds, Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	B2-006	B2-007			B2-010	B2-C	BG-016/016S/054	BG-023/023S/083	
Sample ID	Residential	HCS-B2-6-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	2,200,000	NA	NA	NA	NA	NA	12 U	11 U	11 U	
1,1-Dichloroethene	390,000	NA	NA	NA	NA	NA	12 U	11 U	11 U	
1,2,4-Trichlorobenzene	78,000	490 U	NA	NA	NA	NA	NA	NA	NA	
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA	11 U	11 U	
2-Butanone	4,700,000	NA	NA	NA	NA	NA	12 U	11 U	11 U	
4-Methyl-2-pentanone	--	NA	NA	NA	NA	NA	12 U	11 U	11 U	
Acetone	7,000,000	NA	NA	NA	NA	NA	12 U	11 U	11 U	
Chloroform	78,000	NA	NA	NA	NA	NA	12 U	11 U	11 U	
Chloromethane	--	NA	NA	NA	NA	NA	12 U	11 U	11 U	
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA	NA	NA	
Methylcyclohexane	--	NA	NA	NA	NA	NA	NA	NA	NA	
Methylene chloride	85,000	NA	NA	NA	NA	NA	12 U	11 U	11 U	
Tetrachloroethene	1,200	NA	NA	NA	NA	NA	12 U	11 U	11 U	
Toluene	1,600,000	NA	NA	NA	NA	NA	12 UJ	11 U	11 U	
Trichloroethene	1,600	NA	NA	NA	NA	NA	7 J	14 U	11 U	
Xylene, total	1,600,000	NA	NA	NA	NA	NA	12 UJ	11 U	11 U	
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA	NA	NA	
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA	
2-Methylnaphthalene	31,000	68 J	NA	NA	NA	NA	NA	NA	NA	
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA	
Acenaphthene	470,000	490 U	NA	NA	NA	NA	NA	NA	NA	
Acenaphthylene	--	490 U	NA	NA	NA	NA	NA	NA	NA	
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA	
Anthracene	2,300,000	490 U	NA	NA	NA	NA	NA	NA	NA	
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA	
Benzo(a)anthracene	870	95 J	NA	NA	NA	NA	NA	NA	NA	
Benzo(a)pyrene	87	83 J	NA	NA	NA	NA	NA	NA	NA	
Benzo(b)fluoranthene	870	100 J	NA	NA	NA	NA	NA	NA	NA	
Benzo(g,h,i)perylene	230,000	84 J	NA	NA	NA	NA	NA	NA	NA	

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	B2-006	B2-007			B2-010	B2-C	BG-016/016S/054	BG-023/023S/083	
Sample ID	Residential	HCS-B2-6-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	
Chemical Name										
Benzo(k)fluoranthene	8,700	130 J	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	87,000	160 J	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	780,000	490 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	490 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	16,000	490 U	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	490 U	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	78,000,000	490 U	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	200 J	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	310,000	490 U	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	60 J	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	160,000	490 U	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	180 J	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	230,000	170 J	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	82 B	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	130,000	490 U	NA	NA	NA	NA	NA	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>										
No Detections										
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	0.510	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	0.360	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	0.0320 U	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	0.130 U	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.290 U	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	0.120 U	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.240 U	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	0.0680 U	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.140 U	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	0.110 U	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	0.0760	NA	NA	NA	NA

NA - Not analyzed

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning

Grounds, Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	B2-006	B2-007			B2-010	B2-C	BG-016/016S/054	BG-023/023S/083	
Sample ID	Residential	HCS-B2-6-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	
<b>Chemical Name</b>										
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.140 U	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	0.0580 U	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	0.100 U	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	0.120 U	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	3.30	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	0.430	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	1.30	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	0.440	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	1.80	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	0.780	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.410	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	0.150	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.320	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	0.360	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>										
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>										
Aluminum	7,800	NA	5,000 J	8,430 J	34,700 J	11,100 J	NA	NA	NA	NA
Antimony	3.1	NA	3.20 J	4.5 J	25.1 J	5 J	NA	NA	NA	NA
Arsenic	0.43	NA	6.90 J	14.3 J	11 J	12.9 J	NA	NA	NA	NA
Barium	550	NA	72.3	195	695	248	NA	NA	NA	NA
Beryllium	16	NA	1.20	1.10	0.930	1.5	NA	NA	NA	NA
Cadmium	7.8	NA	0.710 UJ	1.90 J	37.5 J	6.80 J	NA	NA	NA	NA
Calcium	--	NA	2,180	6,520	20,500	11,500	NA	NA	NA	NA
Chromium	23	NA	15.3 J	29.8 J	110 J	34 J	NA	NA	NA	NA
Cobalt	160	NA	18.9	25.6	30.6 J	25.5	NA	NA	NA	NA
Copper	310	NA	54.5 J	2,150 J	1,970 J	348 J	NA	NA	NA	NA
Cyanide	160	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

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TABLE 4-5

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	B2-006	B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		
Sample ID	Residential	HCS-B2-6-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	
Sample Date	Adjusted	07/17/92	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	
<b>Chemical Name</b>										
Iron	2,300	NA	30,400	25,100	31,300	31,900	NA	NA	NA	
Lead	400	NA	74.6	272	472	200	NA	NA	NA	
Magnesium	--	NA	662	2,110	9,840	1,940	NA	NA	NA	
Manganese	160	NA	559	552	926	770	NA	NA	NA	
Mercury	2.3	NA	0.400	2.70	16.8	3.20	NA	NA	NA	
Nickel	160	NA	38	40.3	185	66.4	NA	NA	NA	
Potassium	--	NA	558	885	1,710	781	NA	NA	NA	
Selenium	39	NA	0.780 J	0.790 J	0.610 J	0.540 J	NA	NA	NA	
Silver	39	NA	2.10	121	106	64.5	NA	NA	NA	
Sodium	--	NA	315 UJ	244 UJ	1,290	439 UJ	NA	NA	NA	
Thallium	0.55	NA	0.540 U	0.460 U	0.520 U	0.490 U	NA	NA	NA	
Vanadium	7.8	NA	14.6	82.7	100	75.8	NA	NA	NA	
Zinc	2,300	NA	163 J	636 J	4,230 J	849 J	NA	NA	NA	
<b>TCLP Metals (MG/L)</b>										
Barium	--	NA	NA	NA	NA	0.971	NA	NA	NA	
Cadmium	--	NA	NA	NA	NA	0.0633	NA	NA	NA	
Lead	--	NA	NA	NA	NA	0.128	NA	NA	NA	
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA	
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA	
pH	--	NA	NA	NA	NA	NA	NA	NA	NA	

Exceeds one o

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	BG-084/084S/106	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161
Sample ID	Residential	HCS-BG-84S	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161
Sample Date	Adjusted	06/20/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	2,200,000	11 UJ	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA
1,1-Dichloroethene	390,000	11 U	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA
1,2,4-Trichlorobenzene	78,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
1,2-Dichloroethene (total)	70,000	11 U	1,800 U	71 U	16,000	1,700 U	1,800 U	NA	NA	NA
2-Butanone	4,700,000	11 U	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA
4-Methyl-2-pentanone	--	11 UJ	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA
Acetone	7,000,000	11 U	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA
Chloroform	78,000	1 J	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA
Chloromethane	--	11 U	370 J	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	85,000	5 J	1,800 U	99 U	1,600 U	1,700 U	1,800 U	NA	NA	NA
Tetrachloroethene	1,200	11 UJ	1,800 U	29 J	1,600 U	1,700 U	1,800 U	NA	NA	NA
Toluene	1,600,000	11 UJ	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA
Trichloroethene	1,600	110 J	27,000	890	26,000	8,000	7,300	NA	NA	NA
Xylene, total	1,600,000	11 UJ	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	460 U	47 J	440 U	440 U	440 U	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Acenaphthylene	--	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	870	NA	110 J	100 J	85 J	100 J	100 J	NA	NA	NA
Benzo(a)pyrene	87	NA	71 J	80 J	61 J	85 J	85 J	NA	NA	NA
Benzo(b)fluoranthene	870	NA	99 J	120 J	84 J	150 J	170 J	NA	NA	NA
Benzo(g,h,i)perylene	230,000	NA	63 J	67 J	56 J	83 J	440 U	NA	NA	NA

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	BG-084/084S/106	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161
Sample ID	Residential	HCS-BG-84S	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161
Sample Date	Adjusted	06/20/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98
Chemical Name										
Benzo(k)fluoranthene	8,700	NA	61 J	46 J	58 J	61 J	46 J	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Chrysene	87,000	NA	100 J	130 J	89 J	160 J	130 J	NA	NA	NA
Di-n-butylphthalate	780,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	460 U	450 U	440 U	57 J	440 U	NA	NA	NA
Dibenzofuran	16,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Diethylphthalate	6,300,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Dimethyl phthalate	78,000,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Fluoranthene	310,000	NA	190 J	230 J	160 J	210 J	200 J	NA	NA	NA
Fluorene	310,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	NA	59 J	62 J	52 J	83 J	440 U	NA	NA	NA
Naphthalene	160,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
Phenanthrene	230,000	NA	140 J	220 J	100 J	150 J	140 J	NA	NA	NA
Pyrene	230,000	NA	130 J	150 J	100 J	150 J	140 J	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
n-Nitrosodiphenylamine	130,000	NA	460 U	450 U	440 U	440 U	440 U	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>										
No Detections										
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	BG-084/084S/106	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161
Sample ID	Residential	HCS-BG-84S	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161
Sample Date	Adjusted	06/20/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98
<b>Chemical Name</b>										
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>										
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>										
Aluminum	7,800	NA	9,910	7,800	6,600	7,860	8,000	NA	NA	NA
Antimony	3.1	NA	7.60 U	7.40 U	7 U	7.60 UJ	7.80 UJ	NA	NA	NA
Arsenic	0.43	NA	15.8	11.4	10.2	13.4 J	14.8 J	NA	NA	NA
Barium	550	NA	179	120	118	154	159	NA	NA	NA
Beryllium	16	NA	1.90	1.90	1.80	1.90	1.70	NA	NA	NA
Cadmium	7.8	NA	3.5 U	2.90 U	2.30 U	2.30 U	3.10	NA	NA	NA
Calcium	--	NA	3,800	2,890	3,230	2,820	2,750	NA	NA	NA
Chromium	23	NA	23.6	13.1	11.9	15.1	19.9	NA	NA	NA
Cobalt	160	NA	31.2	38.6	55.2	37.2	26.8	NA	NA	NA
Copper	310	NA	75.5	37.3	33.7	48	49.8	NA	NA	NA
Cyanide	160	NA	1.40 U	1.20 U	1.10 U	1.30 U	1.20 U	NA	NA	NA

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TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
*Site 1 Focused Remedial Investigation for Soil*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil	BG-084/084S/106	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161
Sample ID	Residential	HCS-BG-84S	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161
Sample Date	Adjusted	06/20/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98
Chemical Name										
Iron	2,300	NA	38,600	32,600	28,700	30,400	35,200	NA	NA	NA
Lead	400	NA	53.3	37.1	38.5	57.6	53.3	NA	NA	NA
Magnesium	--	NA	1,230	914 B	1,010 B	997 B	1,110 B	NA	NA	NA
Manganese	160	NA	1,060	1,080	1,820	1,460	962	NA	NA	NA
Mercury	2.3	NA	0.460	0.140	0.100	0.360	0.480	NA	NA	NA
Nickel	160	NA	50.8	58.8	76.1	53.3	42.3	NA	NA	NA
Potassium	--	NA	1,020 B	722 B	755 B	702 B	824 B	NA	NA	NA
Selenium	39	NA	1.40	0.470 U	0.440 U	1.10 B	1.30	NA	NA	NA
Silver	39	NA	3.30	1.5 B	1.10 B	1.70 J	2.70 J	NA	NA	NA
Sodium	--	NA	53.6 B	59 B	59.9 B	35.6 U	43.3 U	NA	NA	NA
Thallium	0.55	NA	0.710 U	0.700 U	0.660 U	0.720 U	0.730 U	NA	NA	NA
Vanadium	7.8	NA	26.2	20.1	18.8	23.2	24.5	NA	NA	NA
Zinc	2,300	NA	206	210	233	192 J	187 J	NA	NA	NA
<b>TCLP Metals (MG/L)</b>										
Barium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one o

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 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-162	BG-165	BG-171	BG-179	
Sample ID		HCS-BG-162	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date		10/20/98	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name						
<b>Volatile Organic Compounds (UG/KG)</b>						
1,1,1-Trichloroethane	2,200,000	NA	NA	NA	NA	NA
1,1-Dichloroethene	390,000	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	78,000	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA
2-Butanone	4,700,000	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	--	NA	NA	NA	NA	NA
Acetone	7,000,000	NA	NA	NA	NA	NA
Chloroform	78,000	NA	NA	NA	NA	NA
Chloromethane	--	NA	NA	NA	NA	NA
Methyl acetate	7,800,000	NA	NA	NA	NA	NA
Methylcyclohexane	--	NA	NA	NA	NA	NA
Methylene chloride	85,000	NA	NA	NA	NA	NA
Tetrachloroethene	1,200	NA	NA	NA	NA	NA
Toluene	1,600,000	NA	NA	NA	NA	NA
Trichloroethene	1,600	NA	NA	NA	NA	NA
Xylene, total	1,600,000	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>						
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	NA	NA	NA	NA
Acenaphthylene	--	NA	NA	NA	NA	NA
Acetophenone	780,000	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	NA	NA	NA	NA
Benzaldehyde	780,000	NA	NA	NA	NA	NA
Benzo(a)anthracene	870	NA	NA	NA	NA	NA
Benzo(a)pyrene	87	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	870	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	230,000	NA	NA	NA	NA	NA

NA - Not analyzed

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J - Reported value is estimated

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R - Unreliable result

U - Analyte not detected

TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-162	BG-165	BG-171	BG-179	
Sample ID		HCS-BG-162	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date		10/20/98	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name						
Benzo(k)fluoranthene	8,700	NA	NA	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA
Chrysene	87,000	NA	NA	NA	NA	NA
Di-n-butylphthalate	780,000	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	NA	NA
Dimethyl phthalate	78,000,000	NA	NA	NA	NA	NA
Fluoranthene	310,000	NA	NA	NA	NA	NA
Fluorene	310,000	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	NA	NA
Naphthalene	160,000	NA	NA	NA	NA	NA
Phenanthrene	230,000	NA	NA	NA	NA	NA
Pyrene	230,000	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	130,000	NA	NA	NA	NA	NA
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>						
No Detections						
<b>Dioxin/Furans (UG/KG)</b>						
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA

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U - Analyte not detected

TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-162	BG-165	BG-171	BG-179	
Sample ID		HCS-BG-162	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date		10/20/98	10/20/98	10/21/98	10/21/98	10/21/98
<b>Chemical Name</b>						
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>						
HMX	390,000	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>						
Aluminum	7,800	NA	NA	NA	NA	NA
Antimony	3.1	NA	NA	NA	NA	NA
Arsenic	0.43	NA	NA	NA	NA	NA
Barium	550	NA	NA	NA	NA	NA
Beryllium	16	NA	NA	NA	NA	NA
Cadmium	7.8	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA
Chromium	23	NA	NA	NA	NA	NA
Cobalt	160	NA	NA	NA	NA	NA
Copper	310	NA	NA	NA	NA	NA
Cyanide	160	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-5  
 Exceedance of Adjusted Residential Soil RBC, Outside Active Burning  
 Grounds, Surface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-162	BG-165	BG-171	BG-179	
Sample ID		HCS-BG-162	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date		10/20/98	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name						
Iron	2,300	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA
Manganese	160	NA	NA	NA	NA	NA
Mercury	2.3	NA	NA	NA	NA	NA
Nickel	160	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA
Selenium	39	NA	NA	NA	NA	NA
Silver	39	NA	NA	NA	NA	NA
Sodium	--	NA	NA	NA	NA	NA
Thallium	0.55	NA	NA	NA	NA	NA
Vanadium	7.8	NA	NA	NA	NA	NA
Zinc	2,300	NA	NA	NA	NA	NA
TCLP Metals (MG/L)						
Barium	--	NA	NA	NA	NA	NA
Cadmium	--	NA	NA	NA	NA	NA
Lead	--	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)						
% Moisture	--	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA

Exceeds one o

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 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB42	AS01-SB43	AS01-SB44	AS01-SB60			
Sample ID		AS01-SB42-(1-2)	AS01-SB43-(1-2)	AS01-SB44-(1-2)	AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8
Sample Date		10/24/01	10/24/01	10/24/01	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	2,200,000	12 U	12 U	12 U	12 U	11 U	510 U	12 U
Chlorobenzene	160,000	12 U	12 U	12 U	12 U	11 U	510 U	12 UJ
Ethylbenzene	780,000	12 U	12 U	12 U	12 U	11 U	510 U	12 UJ
Tetrachloroethene	1,200	12 U	12 U	12 U	12 U	11 U	510 U	12 UJ
Toluene	1,600,000	12 U	12 U	12 U	12 U	11 U	510 U	12 UJ
Trichloroethene	1,600	18	12 U	12 U	130	170	930	150
Xylene, total	1,600,000	12 U	12 U	12 U	12 U	11 U	510 U	12 UJ
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
2-Methylnaphthalene	31,000	370 U	370 U	340 U	450 U	400 U	380 U	400 U
Fluoranthene	310,000	43 J	370 U	340 U	450 U	400 U	380 U	400 U
Naphthalene	160,000	370 U	370 U	340 U	450 U	400 U	380 U	400 U
Phenanthrene	230,000	47 J	370 U	340 U	450 U	400 U	380 U	400 U
bis(2-Ethylhexyl)phthalate	46,000	370 U	370 U	43 J	450 U	400 U	380 U	400 U
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.00429	0.00205	0.00211	0.0023 U	0.0067	0.0011 U	0.0045 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	4.61E-04	0.00321	6.10E-05 U	2.50E-04 U	4.00E-04 U	3.60E-04 U	2.30E-04 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	9.70E-05 U	9.07E-04 J	7.40E-05 U	3.10E-04 U	5.40E-04 U	4.60E-04 U	3.10E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	8.60E-05 U	7.40E-05 U	8.90E-05 U	2.70E-04 U	4.90E-04 U	4.40E-04 U	2.80E-04 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	6.70E-05 U	0.00138	5.00E-05 U	2.00E-04 U	3.90E-04 U	3.60E-04 U	2.00E-04 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	7.40E-05 U	6.30E-05 U	7.60E-05 U	2.60E-04 U	4.90E-04 U	4.50E-04 U	2.80E-04 U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	6.60E-05 U	5.20E-04	4.90E-05 U	2.00E-04 U	4.00E-04 U	3.60E-04 U	2.00E-04 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	7.30E-05 U	6.20E-05 U	7.50E-05 U	2.60E-04 U	4.80E-04 U	4.40E-04 U	2.70E-04 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	8.10E-05 U	6.00E-05 U	6.00E-05 U	2.20E-04 U	4.30E-04 U	3.90E-04 U	2.00E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	7.60E-05 U	7.00E-05 U	7.50E-05 U	4.40E-04 U	7.10E-04 U	6.80E-04 U	3.70E-04 U
1,2,3,7,8-Pentachlorodibenzofuran	0.085	9.40E-05 U	2.85E-04	6.80E-05 U	2.90E-04 U	5.30E-04 U	4.50E-04 U	2.60E-04 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	7.70E-05 U	5.70E-05 U	5.80E-05 U	2.00E-04 U	3.90E-04 U	3.50E-04 U	1.80E-04 U

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID Sample ID Sample Date	RBC-Soil Residential Adjusted	AS01-SB42	AS01-SB43	AS01-SB44	AS01-SB60			
		AS01-SB42-(1-2)	AS01-SB43-(1-2)	AS01-SB44-(1-2)	AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8
		10/24/01	10/24/01	10/24/01	09/22/04	09/22/04	09/22/04	09/22/04
<b>Chemical Name</b>								
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	9.90E-05 U	8.10E-05 U	7.10E-05 U	3.00E-04 U	5.30E-04 U	4.60E-04 U	2.70E-04 U
2,3,7,8-TCDD (dioxin)	0.0043	9.70E-05 U	8.80E-05 U	9.30E-05 U	2.00E-04 U	4.00E-04 U	3.70E-04 U	2.20E-04 U
2,3,7,8-Tetrachlorodibenzofuran	0.043	2.07E-04 J	3.12E-04 J	8.10E-05 U	1.90E-04 U	2.80E-04 U	2.70E-04 U	1.50E-04 U
Octachlorodibenzo-p-dioxin	43	0.170	0.0842	0.109	0.065	0.29	0.034	0.17
Octachlorodibenzofuran	43	0.0021	0.0100	1.16E-04 U	5.20E-04 U	5.70E-04 U	6.60E-04 U	7.80E-04 U
Total heptachlorodibenzo-p-dioxin	--	0.00966	0.00396	0.00538	0.0031 U	0.014	0.0018 U	0.0088
Total heptachlorodibenzofuran	--	8.10E-04	0.00471	6.10E-05 U	3.10E-04 U	5.40E-04 U	4.60E-04 U	3.10E-04 U
Total hexachlorodibenzo-p-dioxin	--	2.10E-04	6.20E-05 U	4.00E-04	3.70E-04 U	5.50E-04 U	9.40E-04 U	6.20E-04 U
Total hexachlorodibenzofuran	--	6.60E-05 U	0.00304	4.90E-05 U	2.20E-04 U	4.30E-04 U	3.90E-04 U	2.00E-04 U
Total pentachlorodibenzo-p-dioxin	--	7.60E-05 U	7.00E-05 U	7.50E-05 U	4.40E-04 U	7.10E-04 U	9.60E-04 U	3.70E-04 U
Total pentachlorodibenzofuran	--	9.40E-05 U	0.00105	6.80E-05 U	3.00E-04 U	5.30E-04 U	4.60E-04 U	2.70E-04 U
Total tetrachlorodibenzo-p-dioxin	--	9.70E-05 U	8.80E-05 U	9.30E-05 U	2.00E-04 U	4.00E-04 U	3.70E-04 U	2.20E-04 U
Total tetrachlorodibenzofuran	--	2.92E-04	5.48E-04	8.10E-05 U	1.90E-04 U	2.80E-04 U	2.70E-04 U	1.50E-04 U
<b>Explosives (UG/KG)</b>								
HMX	390,000	570 U	570 U	560 U	500 U	500 U	500 U	500 U
Perchlorate	5,500	60 U	60 U	60 U	54.6 U	48.1 U	46.4 U	48.9 U
RDX	5,800	570 U	570 U	560 U	500 U	58 J	53 J	500 U
<b>Total Metals (MG/KG)</b>								
Aluminum	7,800	7,930	4,430	5,690	7,350	7,830	7,820	8,600
Arsenic	0.43	10.6	4.4	6.7	5.8	6.4	6	6
Barium	550	192	98.3	206	158	119	92.6	97.6
Beryllium	16	1.1 J	0.63 J	0.92 J	0.94 B	0.91 B	0.72 B	0.68 B
Calcium	--	2,210	1,420	2,320	1,680	1,310	972 J	1,160 J
Chromium	23	13.6 J	8.1 J	10 J	11.9	12.8	12.3	13.6
Cobalt	160	15.3	11.9	13.3	13.3 J	14.6	13.7	12.4
Copper	310	16.9	11.1	15.5	15.8	14.6	13.3	11.8
Cyanide	160	0.6 U	0.6 U	0.6 U	0.68 U	0.6 U	0.58 U	0.61 U
Iron	2,300	30,100	14,900	20,000	26,300	28,700	26,300	26,000

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TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB42	AS01-SB43	AS01-SB44	AS01-SB60			
Sample ID		AS01-SB42-(1-2)	AS01-SB43-(1-2)	AS01-SB44-(1-2)	AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8
Sample Date		10/24/01	10/24/01	10/24/01	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
Lead	400	16.2	13	15.1	14.2	13.8	13.4	12.3
Magnesium	--	1,100 J	732 J	940 J	963 J	979 J	1,030 J	1,230 J
Manganese	160	1,020	647	972	853	790	753	624
Mercury	2.3	0.12 U	0.12 U	0.11 U	0.068 U	0.06 U	0.099 J	0.097 J
Nickel	160	22.9	11.7	18.2	21.3	20	16.5	15.3
Potassium	--	1,010 J	552 J	599 J	911 J	991 J	991 J	935 J
Selenium	39	1.1 U	1.1 U	1.2 U	0.63 U	0.55 U	0.53 U	0.56 U
Silver	39	1.1 UL	1.1 UL	1.2 UL	0.27 U	0.24 U	0.23 U	0.24 U
Sodium	--	66.1 J	64.8 U	65.7 U	69.8 U	61.6 U	59.4 U	62.5 U
Thallium	0.55	1.6 U	1.6 U	1.7 U	1.3 UL	1.3 L	1.1 UL	1.2 UL
Vanadium	7.8	19.5	10.6 J	13.3	16.3	17.6	17.2	18.7
Zinc	2,300	71.1	37.9	57.5	54.5	52.9	56	67
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	NA	NA	NA	26.7	16.9	13.8	18.1
Total organic carbon (TOC)	--	NA	7,700	NA	9,100	5,200	4,400	2,500
pH	--	NA	NA	NA	6.7	6.4	6.4	5.8

Exceeds one or more criteria

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
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 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB61					AS01-SB62			
		AS01-SB61-1-3	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
		09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
<b>Chemical Name</b>										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	2,200,000	13 U	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Chlorobenzene	160,000	13 U	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Ethylbenzene	780,000	13 U	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Tetrachloroethene	1,200	13 U	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	55 J	530 UJ
Toluene	1,600,000	13 U	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Trichloroethene	1,600	13 U	13 U	11 U	12 U	12 U	25,000 J	12,000 J	6,800 J	6,300 J
Xylene, total	1,600,000	13 U	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
2-Methylnaphthalene	31,000	440 U	440 U	410 U	380 U	390 U	400 U	170 J	71 J	400 U
Fluoranthene	310,000	440 U	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Naphthalene	160,000	440 U	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Phenanthrene	230,000	440 U	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
bis(2-Ethylhexyl)phthalate	46,000	440 U	440 U	410 U	380 U	390 U	400 U	89 J	390 U	46 J
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.015	0.0095	0.0049 J	0.0047 J	0.0037 J	1.8	0.02	0.0041 J	0.0034 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.003 U	2.70E-04 U	4.50E-04 U	3.60E-04 U	7.00E-04 U	1.7	0.0018 U	3.80E-04 U	7.10E-04 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	4.40E-04 U	3.20E-04 U	5.70E-04 U	4.40E-04 U	7.40E-04 U	0.4	5.40E-04 U	2.80E-04 U	5.80E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	4.00E-04 U	3.50E-04 U	5.90E-04 U	5.00E-04 U	0.0011 U	0.075	6.10E-04 U	2.50E-04 U	4.70E-04 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.0015 U	2.30E-04 U	4.20E-04 U	3.30E-04 U	6.30E-04 U	1	8.50E-04 U	2.20E-04 U	5.50E-04 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	5.00E-04 U	3.20E-04 U	5.80E-04 U	4.80E-04 U	9.30E-04 U	0.17	5.60E-04 U	2.40E-04 U	4.60E-04 U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	4.90E-04 U	2.30E-04 U	4.50E-04 U	3.10E-04 U	6.10E-04 U	0.76	5.00E-04 U	2.20E-04 U	4.00E-04 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	9.40E-04 U	4.90E-04 U	5.70E-04 U	4.80E-04 U	9.90E-04 U	0.16	6.70E-04 U	3.20E-04 U	4.40E-04 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	3.60E-04 U	2.40E-04 U	4.70E-04 U	3.00E-04 U	5.40E-04 U	0.056	4.90E-04 U	2.20E-04 U	4.20E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	7.50E-04 U	4.30E-04 U	8.30E-04 U	6.30E-04 U	0.0011 U	0.094	8.30E-04 U	3.40E-04 U	7.30E-04 U
1,2,3,7,8-Pentachlorodibenzofuran	0.085	8.00E-04 U	3.10E-04 U	5.20E-04 U	3.90E-04 U	6.70E-04 U	0.71	5.70E-04 U	2.20E-04 U	4.90E-04 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	3.40E-04 U	2.30E-04 U	4.10E-04 U	2.70E-04 U	4.50E-04 U	0.29	4.20E-04 U	2.00E-04 U	3.80E-04 U

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TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB61					AS01-SB62			
		AS01-SB61-1-3	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample ID		09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Sample Date										
Chemical Name										
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	7.30E-04 U	3.20E-04 U	5.70E-04 U	5.00E-04 U	9.80E-04 U	0.6	6.60E-04 U	2.40E-04 U	5.40E-04 U
2,3,7,8-TCDD (dioxin)	0.0043	3.80E-04 U	2.70E-04 U	5.80E-04 U	3.30E-04 U	6.40E-04 U	0.016	3.70E-04 U	1.90E-04 U	4.30E-04 U
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.0017	1.60E-04 U	4.20E-04 U	2.10E-04 U	3.90E-04 U	0.38	7.80E-04 U	1.50E-04 U	5.60E-04 U
Octachlorodibenzo-p-dioxin	43	0.32	0.36	0.15	0.16	0.091	8.9 J	0.46	0.1	0.052
Octachlorodibenzofuran	43	0.0095 J	3.50E-04 U	8.80E-04 U	7.70E-04 U	0.039	1.4	0.0036 U	8.40E-04 U	0.0012 U
Total heptachlorodibenzo-p-dioxin	--	0.035	0.021	0.011	0.0096	0.0078	3.4	0.041	0.0089	0.0072
Total heptachlorodibenzofuran	--	0.0036	3.20E-04 U	5.70E-04 U	4.40E-04 U	7.40E-04 U	3.3	0.0029 U	4.70E-04 U	7.30E-04 U
Total hexachlorodibenzo-p-dioxin	--	0.0022 U	9.20E-04 U	8.90E-04 U	5.50E-04 U	0.0027 U	1.4	0.0016 U	7.90E-04 U	1.00E-03 U
Total hexachlorodibenzofuran	--	0.0015 U	2.40E-04 U	4.70E-04 U	3.30E-04 U	6.30E-04 U	4.6	8.50E-04 U	2.20E-04 U	5.50E-04 U
Total pentachlorodibenzo-p-dioxin	--	8.60E-04 U	4.30E-04 U	8.30E-04 U	6.30E-04 U	0.0023 U	0.68	8.30E-04 U	3.40E-04 U	7.30E-04 U
Total pentachlorodibenzofuran	--	0.0046 U	3.20E-04 U	7.20E-04 U	5.00E-04 U	8.00E-04 U	4.5	6.60E-04 U	2.40E-04 U	8.20E-04 U
Total tetrachlorodibenzo-p-dioxin	--	6.60E-04 U	2.70E-04 U	5.80E-04 U	3.30E-04 U	6.40E-04 U	0.45	3.70E-04 U	1.90E-04 U	4.30E-04 U
Total tetrachlorodibenzofuran	--	0.0047	1.60E-04 U	4.20E-04 U	2.10E-04 U	3.90E-04 U	3.9	7.80E-04 U	1.50E-04 U	5.60E-04 U
<b>Explosives (UG/KG)</b>										
HMX	390,000	500 U	500 U	500 U	500 U	500 U	1,500	1,200	750	350 J
Perchlorate	5,500	53.9 U	53.3 U	49.5 U	46.5 U	47.7 U	288	269	757	459
RDX	5,800	500 U	500 U	500 U	500 U	500 U	2,100	4,500	5,500	3,600
<b>Total Metals (MG/KG)</b>										
Aluminum	7,800	7,870	6,980	6,940	7,610	9,090	7,930	7,490	7,860	9,000
Arsenic	0.43	6.2	5.7	5.7	6.4	8.2	6	6.2	6.6	7.3
Barium	550	186	117	111	103	117	149	72.2	86.1	202
Beryllium	16	1 B	0.83 B	0.82 B	0.81 B	0.81 B	1.1 B	0.81 B	0.91 B	0.91 B
Calcium	--	1,950	1,240 J	1,210 J	701 J	1,300	2,090	503 J	596 J	599 J
Chromium	23	12.8	10.9	11.5	12.4	13.2	12.7	12.6	11.9	13.6
Cobalt	160	13.6	12.3 J	13.1	14	16.2	15	10.4 J	13.9	14.5
Copper	310	16.7	13.2	14.7	15.4	15.8	17.3	16.3	17.3	15.3
Cyanide	160	0.67 U	0.67 U	0.62 U	0.58 U	0.6 U	0.14 J	0.6 U	0.59 U	0.6 U
Iron	2,300	27,100	24,300	25,300	27,400	29,000	27,800	27,600	28,500	31,100

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TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB61					AS01-SB62			
		AS01-SB61-1-3	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample ID		09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Sample Date										
Chemical Name										
Lead	400	15.3	12	15.4	13.2	16.5	14.5	13.8	14.6	15.1
Magnesium	--	1,030 J	870 J	878 J	974 J	1,550 J	979 J	869 J	1,010 J	1,230 J
Manganese	160	995	757	783	701	833	918	532	686	725
Mercury	2.3	0.071 J	0.095 J	0.12 J	0.063 J	0.06 U	0.062 J	0.06 U	0.07 J	0.086 J
Nickel	160	23.2	18.1	18.8	18.4	20.3	21.8	18	18.5	18.4
Potassium	--	973 J	940 J	858 J	934 J	909 J	1,060 J	975 J	974 J	761 J
Selenium	39	0.62 U	0.61 U	0.57 U	0.53 U	0.55 U	0.55 U	0.55 U	0.63 J	0.55 U
Silver	39	0.27 U	0.27 U	0.25 U	0.23 U	0.24 U				
Sodium	--	69 U	68.3 U	63.4 U	59.5 U	61 U	61.3 U	61.3 U	60.5 U	61.5 U
Thallium	0.55	1.3 UL	1.3 UL	1.4 L	1.1 UL	1.5 L	1.6 L	1.1 UL	1.1 UL	1.2 UL
Vanadium	7.8	16.8	15.1	15.8	16.8	20.4	17.1	16.6	17.8	19.9
Zinc	2,300	61.5	47.7	52.6	53	63.6	57.3	54.7	56.9	76.4
Wet Chemistry (MG/KG)										
% Moisture	--	25.8	25	19.2	13.9	16.1	16.5	16.5	15.4	16.7
Total organic carbon (TOC)	--	14,000	6,500	7,400	4,200	3,700	8,200	7,600	5,000	2,300
pH	--	6.7	6.8	6.3	5.8	5.9	7.1	5.6	4.8	4

Exceeds one or n

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TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-004/004S/005/039				BG-006/007	
		HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)
Sample ID		07/13/92	07/13/92	07/13/92	06/20/94	07/13/92	06/21/94
Sample Date							
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2,200,000	730 U	760 U	4,500 U	NA	6 UJ	NA
Chlorobenzene	160,000	730 U	760 U	4,500 U	NA	6 UJ	NA
Ethylbenzene	780,000	730 U	320 J	4,500 U	NA	6 UJ	NA
Tetrachloroethene	1,200	730 U	740 J	4,500 U	NA	6 UJ	NA
Toluene	1,600,000	730 U	660 J	4,500 U	NA	6 UJ	NA
Trichloroethene	1,600	3,800	160,000	76,000 J	NA	5 J	NA
Xylene, total	1,600,000	290 J	1,700	4,500 U	NA	2 J	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
2-Methylnaphthalene	31,000	350 J	NA	NA	NA	NA	NA
Fluoranthene	310,000	380 U	NA	NA	NA	NA	NA
Naphthalene	160,000	250 J	NA	NA	NA	NA	NA
Phenanthrene	230,000	380 U	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	320 J	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA

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 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-004/004S/005/039				BG-006/007	
		HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)
Sample ID		07/13/92	07/13/92	07/13/92	06/20/94	07/13/92	06/21/94
Sample Date							
Chemical Name							
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>							
HMX	390,000	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>							
Aluminum	7,800	NA	NA	NA	8,610	NA	6,110
Arsenic	0.43	NA	NA	NA	6.40	NA	4.30
Barium	550	NA	NA	NA	114	NA	67.3
Beryllium	16	NA	NA	NA	0.840 B	NA	0.640 B
Calcium	--	NA	NA	NA	472 B	NA	91,700
Chromium	23	NA	NA	NA	13.4	NA	9.60
Cobalt	160	NA	NA	NA	14.6	NA	6.60 B
Copper	310	NA	NA	NA	17	NA	492
Cyanide	160	NA	NA	NA	1.20 U	NA	1.20 U
Iron	2,300	NA	NA	NA	29,600	NA	21,400

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TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-004/004S/005/039				BG-006/007	
		HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)
Sample ID							
Sample Date		07/13/92	07/13/92	07/13/92	06/20/94	07/13/92	06/21/94
Chemical Name							
Lead	400	NA	NA	NA	14.8	NA	9
Magnesium	--	NA	NA	NA	1,120	NA	24,200
Manganese	160	NA	NA	NA	761	NA	409
Mercury	2.3	NA	NA	NA	0.0800 B	NA	0.0600 U
Nickel	160	NA	NA	NA	17.7	NA	13.3
Potassium	--	NA	NA	NA	856 B	NA	840 B
Selenium	39	NA	NA	NA	0.880 U	NA	0.870 U
Silver	39	NA	NA	NA	1.10 UJ	NA	1.10 UJ
Sodium	--	NA	NA	NA	38.1	NA	75.3 B
Thallium	0.55	NA	NA	NA	0.880 U	NA	0.870 U
Vanadium	7.8	NA	NA	NA	23.6	NA	15
Zinc	2,300	NA	NA	NA	61.1 J	NA	43.5 J
<b>Wet Chemistry (MG/KG)</b>							
% Moisture	--	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA

Exceeds one or n

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 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soi  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-008/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131
		HCS-BG-38	HCS-BG-8	HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131
Sample ID		07/13/92	06/21/94	07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94
Sample Date									
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	260 J	NA	6 UJ	11 U	12 U	12 U	12 U	2 J
Chlorobenzene	160,000	740 U	NA	6 UJ	11 U	12 U	4 J	2 J	12 U
Ethylbenzene	780,000	740 U	NA	6 UJ	11 U	12 U	3 J	12 U	12 U
Tetrachloroethene	1,200	330 J	NA	6 UJ	11 U	12 U	12 U	12 U	12 U
Toluene	1,600,000	170 J	NA	6 UJ	11 U	12 U	3 J	2 J	12 U
Trichloroethene	1,600	42,000	NA	380	11 U	12 U	230	260	270
Xylene, total	1,600,000	190 J	NA	6 UJ	11 U	12 U	8 J	12 U	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-008/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131
		HCS-BG-38	HCS-BG-8	HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131
		07/13/92	06/21/94	07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94
<b>Chemical Name</b>									
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>									
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>									
Aluminum	7,800	NA	8,100	NA	NA	NA	NA	NA	NA
Arsenic	0.43	NA	5.90	NA	NA	NA	NA	NA	NA
Barium	550	NA	76.2	NA	NA	NA	NA	NA	NA
Beryllium	16	NA	0.900 B	NA	NA	NA	NA	NA	NA
Calcium	--	NA	826 B	NA	NA	NA	NA	NA	NA
Chromium	23	NA	12	NA	NA	NA	NA	NA	NA
Cobalt	160	NA	15.7	NA	NA	NA	NA	NA	NA
Copper	310	NA	16.7	NA	NA	NA	NA	NA	NA
Cyanide	160	NA	1.20 U	NA	NA	NA	NA	NA	NA
Iron	2,300	NA	28,600	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-008/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131
		HCS-BG-38	HCS-BG-8	HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131
		07/13/92	06/21/94	07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94
Chemical Name									
Lead	400	NA	13.4	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	1,050	NA	NA	NA	NA	NA	NA
Manganese	160	NA	886	NA	NA	NA	NA	NA	NA
Mercury	2.3	NA	0.0700 B	NA	NA	NA	NA	NA	NA
Nickel	160	NA	20.4	NA	NA	NA	NA	NA	NA
Potassium	--	NA	911 B	NA	NA	NA	NA	NA	NA
Selenium	39	NA	0.820 U	NA	NA	NA	NA	NA	NA
Silver	39	NA	1.20 J	NA	NA	NA	NA	NA	NA
Sodium	--	NA	49.6 U	NA	NA	NA	NA	NA	NA
Thallium	0.55	NA	0.820 U	NA	NA	NA	NA	NA	NA
Vanadium	7.8	NA	20.2	NA	NA	NA	NA	NA	NA
Zinc	2,300	NA	82.7 J	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one or n

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-205/206	
		HCS-BG-205	HCS-BG-206
Sample ID			
Sample Date		10/27/98	10/27/98
Chemical Name			
<b>Volatile Organic Compounds (UG/KG)</b>			
1,1,1-Trichloroethane	2,200,000	11 U	11 U
Chlorobenzene	160,000	11 U	11 U
Ethylbenzene	780,000	11 U	11 U
Tetrachloroethene	1,200	11 U	11 U
Toluene	1,600,000	11 U	11 U
Trichloroethene	1,600	11 U	11 U
Xylene, total	1,600,000	11 U	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>			
2-Methylnaphthalene	31,000	NA	NA
Fluoranthene	310,000	NA	NA
Naphthalene	160,000	NA	NA
Phenanthrene	230,000	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA
<b>Dioxin/Furans (UG/KG)</b>			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
 Site 1 Focused Remedial Investigation for Soils  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-205/206	
		HCS-BG-205	HCS-BG-206
Sample ID			
Sample Date		10/27/98	10/27/98
Chemical Name			
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA
Octachlorodibenzofuran	43	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA
Total heptachlorodibenzofuran	--	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA
Total hexachlorodibenzofuran	--	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA
Total pentachlorodibenzofuran	--	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA
Explosives (UG/KG)			
HMX	390,000	NA	NA
Perchlorate	5,500	NA	NA
RDX	5,800	NA	NA
Total Metals (MG/KG)			
Aluminum	7,800	NA	NA
Arsenic	0.43	NA	NA
Barium	550	NA	NA
Beryllium	16	NA	NA
Calcium	--	NA	NA
Chromium	23	NA	NA
Cobalt	160	NA	NA
Copper	310	NA	NA
Cyanide	160	NA	NA
Iron	2,300	NA	NA

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-6  
 Exceedance of Adjusted Residential Soil RBC, Former Disposal  
 Pits, Subsurface Soil  
*Site 1 Focused Remedial Investigation for Soil*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-205/206	
		HCS-BG-205	HCS-BG-206
Sample ID			
Sample Date		10/27/98	10/27/98
Chemical Name			
Lead	400	NA	NA
Magnesium	--	NA	NA
Manganese	160	NA	NA
Mercury	2.3	NA	NA
Nickel	160	NA	NA
Potassium	--	NA	NA
Selenium	39	NA	NA
Silver	39	NA	NA
Sodium	--	NA	NA
Thallium	0.55	NA	NA
Vanadium	7.8	NA	NA
Zinc	2,300	NA	NA
Wet Chemistry (MG/KG)			
% Moisture	--	NA	NA
Total organic carbon (TOC)	--	NA	NA
pH	--	NA	NA

Exceeds one or n

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18
		AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X
Sample ID		02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01
Sample Date							
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	29,000,000	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloroethene (total)	920,000	6 U	6 U	6 U	6 U	6 U	6 U
Carbon disulfide	10,000,000	6 U	6 U	6 U	6 U	6 U	6 U
Methyl acetate	100,000,000	NA	NA	NA	NA	NA	NA
Methylene chloride	380,000	3 B	6 B	4 B	4 B	6 B	9 B
Tetrachloroethene	5,300	6 U	6 U	6 U	6 U	6 U	6 U
Trichloroethene	7,200	6 U	6 U	6 U	5 J	6 U	6 U
Xylene, total	20,000,000	6 U	6 U	6 U	6 U	6 U	6 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
Acetophenone	10,000,000	380 U	400 U	390 U	390 U	370 U	400 U
Benzo(a)anthracene	3,900	380 U	400 U	390 U	390 U	370 UJ	400 U
Benzo(a)pyrene	390	380 U	400 U	390 U	390 U	370 U	400 U
Benzo(b)fluoranthene	3,900	380 U	400 U	390 U	390 U	370 U	400 U
Chrysene	390,000	380 U	400 U	390 U	390 U	370 UJ	400 U
Diethylphthalate	82,000,000	380 U	400 U	390 U	390 U	370 U	400 U
Fluoranthene	4,100,000	380 U	400 U	390 U	390 U	370 U	400 U
Phenanthrene	3,100,000	380 U	400 U	390 U	390 U	370 U	400 U
Pyrene	3,100,000	380 U	400 U	390 U	390 U	370 UJ	400 U
bis(2-Ethylhexyl)phthalate	200,000	380 U	400 U	390 U	390 U	370 UJ	400 U
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.292 U	0.084 U	0.356 U	0.321 U	0.395 U	0.317 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.145 U	0.044 U	0.2 U	0.159 U	0.196 U	0.169 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	0.189 U	0.051 U	0.262 U	0.208 U	0.256 U	0.221 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.289 U	0.079 U	0.373 U	0.327 U	0.414 U	0.322 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.069 U	0.024 U	0.093 U	0.074 U	0.091 U	0.079 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.254 U	0.071 U	0.328 U	0.288 U	0.364 U	0.284 U

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID Sample ID Sample Date	RBC-Soil Industrial Adjusted	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18
		AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X
		02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01
<b>Chemical Name</b>							
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.059 U	0.02 U	0.08 U	0.064 U	0.078 U	0.068 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	0.266 U	0.069 U	0.343 U	0.301 U	0.38 U	0.296 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	0.075 U	0.022 U	0.102 U	0.081 U	0.1 U	0.086 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	0.196 U	0.073 U	0.215 U	0.211 U	0.241 U	0.194 U
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.137 U	0.052 U	0.147 U	0.147 U	0.177 U	0.126 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.07 U	0.022 U	0.095 U	0.075 U	0.092 U	0.08 U
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.123 U	0.045 U	0.131 U	0.132 U	0.158 U	0.112 U
2,3,7,8-TCDD (dioxin)	0.019	0.014 U	0.006 U	0.015 U	0.015 U	0.017 U	0.014 U
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.009 U	0.004 U	0.01 U	0.01 U	0.012 U	0.008 U
Octachlorodibenzo-p-dioxin	190	0.158	0.035 J	0.171	0.131	0.12	0.16
Octachlorodibenzofuran	190	0.266 U	0.077 U	0.132 U	0.308 U	0.441 U	0.323 U
Total heptachlorodibenzo-p-dioxin	--	0.292 U	0.084 U	0.356 U	0.321 U	0.395 U	0.317 U
Total heptachlorodibenzofuran	--	0.145 U	0.044 U	0.2 U	0.159 U	0.196 U	0.169 U
Total hexachlorodibenzo-p-dioxin	--	0.254 U	0.071 U	0.328 U	0.288 U	0.364 U	0.284 U
Total hexachlorodibenzofuran	--	0.059 U	0.02 U	0.08 U	0.064 U	0.078 U	0.068 U
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>							
HMX	5,100,000	276 J	340 J	454 U	454 U	454 U	476 U
Nitroglycerin	200,000	435 U	454 U	454 U	476 U	476 U	454 U
Perchlorate	72,000	120	92	61 U	62	2,500	61 U
RDX	26,000	454 U	435 U	454 U	454 U	454 U	476 U
<b>Total Metals (MG/KG)</b>							
Aluminum	100,000	9,160	9,280	9,330	9,120	10,200	10,200
Antimony	41	2.1 L	1.3 L	1.5 L	1.6 B	1.9 L	1.3 L
Arsenic	1.9	6.5	6.6	7.2	7	6.9	7

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18
		AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X
		02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01
<b>Chemical Name</b>							
Barium	7,200	151	154	183	207	195	203
Beryllium	200	1.1	1.1	1.2	1.1	1.2	1.3
Cadmium	100	0.23 U	0.23 U	0.24 U	0.23 U	0.22 U	0.24 U
Calcium	--	NA	NA	NA	NA	NA	NA
Chromium	310	14.5 J	14.8 J	15.6 J	15.3 J	15.7 J	15.2 J
Cobalt	2,000	14.3	14.7	15.2	15.6	15.9	16.4
Copper	4,100	15.5	16.2	17.1	17.5	16.8	16.9
Cyanide	2,000	0.15 B	0.24 B	0.19 B	0.22 B	0.12 B	0.3 B
Iron	31,000	31,300	32,300	31,600	32,700	32,700	32,800
Lead	400	14.9 K	15.9 K	20.1 K	16 K	16.7 K	22.1 K
Magnesium	--	NA	NA	NA	NA	NA	NA
Manganese	2,000	911	926	1,030	1,010	1,070	1,170
Mercury	31	0.03 B	0.04 B	0.04 B	0.03 B	0.03 B	0.04 B
Nickel	2,000	22.4 J	23.7 J	24.2 J	24.1 J	25.1 J	27.1 J
Potassium	--	NA	NA	NA	NA	NA	NA
Selenium	510	1.4 K	1.2 K	1.3 K	1.3 K	1.2 K	1.3 K
Silver	510	0.12 U	0.12 U	0.12 U	0.11 U	0.12 U	0.12 U
Thallium	7.2	1.9	2.1	1.7	1.6	1.5	1.7
Vanadium	100	20.9	21.1	22	21.4	23	23.3
Zinc	31,000	66.3	65.6	71.3	70.5	70.2	73.5
<b>Wet Chemistry (MG/KG)</b>							
% Moisture	--	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	9,050	9,370	9,930	9,410	8,940	11,900
pH	--	7	7.1	7.3	7.3	7.5	7.4

Exceeds one or more criteria

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB19	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65
Sample ID		AS01-SB19-R01X	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2
Sample Date		02/22/01	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04
<b>Chemical Name</b>							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	29,000,000	6 U	6 U	11 U	530 U	480 U	11 U
1,2-Dichloroethene (total)	920,000	6 U	6 U	NA	NA	NA	NA
Carbon disulfide	10,000,000	6 U	6 U	11 U	530 U	480 U	11 U
Methyl acetate	100,000,000	NA	NA	11 U	530 U	480 U	11 U
Methylene chloride	380,000	10 B	5 B	3 B	320 B	270 B	2.5 B
Tetrachloroethene	5,300	6 U	6 U	11 U	530 U	480 U	11 U
Trichloroethene	7,200	6 U	6 U	13	600	520	140
Xylene, total	20,000,000	6 U	6 U	11 U	530 U	480 U	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
Acetophenone	10,000,000	380 U	380 U	400 U	380 U	380 U	55 J
Benzo(a)anthracene	3,900	380 U	380 U	400 U	380 U	380 U	400 U
Benzo(a)pyrene	390	380 U	380 U	400 U	380 U	380 U	400 U
Benzo(b)fluoranthene	3,900	380 U	380 U	400 U	380 U	380 U	400 U
Chrysene	390,000	380 U	380 U	400 U	380 U	380 U	400 U
Diethylphthalate	82,000,000	380 U	380 U	400 U	380 U	380 U	400 U
Fluoranthene	4,100,000	380 U	380 U	400 U	380 U	380 U	400 U
Phenanthrene	3,100,000	380 U	380 U	400 U	380 U	380 U	400 U
Pyrene	3,100,000	380 U	380 U	400 U	380 U	380 U	400 U
bis(2-Ethylhexyl)phthalate	200,000	380 U	380 U	400 U	380 U	380 U	400 U
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.359 U	0.089 U	0.0017 U	0.003 J	0.0029 J	0.004 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	0.172 U	0.048 U	2.10E-04 U	2.40E-04 U	1.50E-04 U	4.90E-04 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	0.225 U	0.056 U	2.70E-04 U	3.00E-04 U	1.70E-04 U	6.00E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.356 U	0.033 U	3.50E-04 U	3.20E-04 U	2.20E-04 U	7.10E-04 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.082 U	0.01 U	2.40E-04 U	2.20E-04 U	1.50E-04 U	5.30E-04 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.313 U	0.03 U	3.10E-04 U	3.00E-04 U	2.10E-04 U	6.70E-04 U

NA - Not analyzed

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J - Reported value is estimated

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB19	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65
Sample ID		AS01-SB19-R01X	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2
Sample Date		02/22/01	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04
<b>Chemical Name</b>							
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	0.07 U	0.009 U	2.30E-04 U	2.10E-04 U	1.40E-04 U	4.90E-04 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	0.327 U	0.055 U	3.30E-04 U	3.00E-04 U	2.10E-04 U	6.70E-04 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	0.089 U	0.024 U	2.30E-04 U	2.30E-04 U	1.40E-04 U	4.80E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	0.113 U	0.035 U	4.20E-04 U	4.80E-04 U	2.80E-04 U	0.0012 U
1,2,3,7,8-Pentachlorodibenzofuran	0.38	0.16 U	0.05 U	2.50E-04 U	2.30E-04 U	1.60E-04 U	6.90E-04 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	0.083 U	0.025 U	1.90E-04 U	2.10E-04 U	1.30E-04 U	4.60E-04 U
2,3,4,7,8-Pentachlorodibenzofuran	0.038	0.143 U	0.043 U	3.00E-04 U	2.60E-04 U	1.70E-04 U	7.70E-04 U
2,3,7,8-TCDD (dioxin)	0.019	0.015 U	0.006 U	2.10E-04 U	2.00E-04 U	1.50E-04 U	5.50E-04 U
2,3,7,8-Tetrachlorodibenzofuran	0.19	0.011 U	0.004 U	1.70E-04 U	1.60E-04 U	1.10E-04 U	5.00E-04 U
Octachlorodibenzo-p-dioxin	190	0.192	0.048	0.056	0.098	0.089	0.14
Octachlorodibenzofuran	190	0.385 U	0.086 U	4.20E-04 U	3.90E-04 U	5.70E-04 U	9.10E-04 U
Total heptachlorodibenzo-p-dioxin	--	0.359 U	0.089 U	0.0018 U	0.0077	0.0065	0.0094
Total heptachlorodibenzofuran	--	0.172 U	0.048 U	2.70E-04 U	3.00E-04 U	1.70E-04 U	6.00E-04 U
Total hexachlorodibenzo-p-dioxin	--	0.313 U	0.03 U	3.50E-04 U	9.80E-04 U	9.10E-04 U	7.10E-04 U
Total hexachlorodibenzofuran	--	0.07 U	0.009 U	2.40E-04 U	2.30E-04 U	1.50E-04 U	5.30E-04 U
Total pentachlorodibenzo-p-dioxin	--	NA	NA	4.20E-04 U	4.80E-04 U	2.80E-04 U	0.0012 U
Total pentachlorodibenzofuran	--	NA	NA	3.00E-04 U	2.60E-04 U	1.70E-04 U	7.70E-04 U
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	2.10E-04 U	2.00E-04 U	1.50E-04 U	5.50E-04 U
Total tetrachlorodibenzofuran	--	NA	NA	1.70E-04 U	1.60E-04 U	1.10E-04 U	5.00E-04 U
<b>Explosives (UG/KG)</b>							
HMX	5,100,000	435 U	417 U	500 U	310 J	1,300	1,500
Nitroglycerin	200,000	435 U	454 U	2,500 U	2,500 U	2,500 U	2,500 U
Perchlorate	72,000	60 U	59 U	48.5 U	18,800	16,800	29.7 J
RDX	26,000	435 U	417 U	500 U	1,100	1,100	940
<b>Total Metals (MG/KG)</b>							
Aluminum	100,000	9,820	10,200	8,050	7,450	7,300	7,620
Antimony	41	0.24 UL	2 L	0.65 UL	0.62 UL	0.63 UL	0.65 UL
Arsenic	1.9	7.6	7	6.8	6.7	6.3	6.1

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB19	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65
Sample ID		AS01-SB19-R01X	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2
Sample Date		02/22/01	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04
<b>Chemical Name</b>							
Barium	7,200	194	196	102	81.3	102	167
Beryllium	200	1.2	1.2	0.75 B	0.79 B	0.77 B	1 B
Cadmium	100	0.24 U	0.23 U	0.048 U	0.046 U	0.046 U	0.091 B
Calcium	--	NA	NA	874 J	679 J	675 J	1,640
Chromium	310	16.1 J	15.8 J	12.6	13.7	12.1	12.9
Cobalt	2,000	15.9	16	14.9	12	13.1	14.1
Copper	4,100	18.6	17.6	15.4	13.7	13.5	17
Cyanide	2,000	0.28 B	0.14 B	0.61 U	0.57 U	0.58 U	0.6 U
Iron	31,000	33,100	33,500	28,900	29,900	28,400	28,100
Lead	400	25 K	16.6 K	13.7	11.9	12.9	13.7
Magnesium	--	NA	NA	1,030 J	1,040 J	1,010 J	1,010 J
Manganese	2,000	1,080	1,100	579	500	600	932
Mercury	31	0.04 B	0.03 B	0.061 J	0.057 U	0.066 J	0.075 J
Nickel	2,000	25.3 J	25.9 J	17.4	17.2	16.5	22.7
Potassium	--	NA	NA	959 J	832 J	743 J	979 J
Selenium	510	1.4 K	0.98 K	0.56 U	0.53 U	0.53 U	0.55 U
Silver	510	0.12 U	0.12 U	0.24 U	0.23 U	0.23 U	0.24 U
Thallium	7.2	2.1	1.8	1.2 UL	1.1 UL	1.1 UL	1.2 UL
Vanadium	100	24.8	23.5	18.2	17.6	17	16.9
Zinc	31,000	75.2	78.7	58.4	64.1	63.4	60.3
<b>Wet Chemistry (MG/KG)</b>							
% Moisture	--	NA	NA	17.5	12.9	13.9	16.8
Total organic carbon (TOC)	--	12,300	11,400	3,400	2,400	2,700	8,600
pH	--	7.4	7.6	5.6	4.9	4.8	6.9

Exceeds one o

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB66	AS01-SB67	AS01-SB68	AS01-SB69	AS01-SB70	BG-010/010S/053	
Sample ID		AS01-SB66-1.5-2	AS01-SB67-1.5-2	AS01-SB68-1.5-2	AS01-SB69-1-1.5	AS01-SB70-2.5-3	HCS-BG-10	HCS-BG-53
Sample Date		09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/13/92	07/13/92
<b>Chemical Name</b>								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	29,000,000	14 U	12 U	610 UJ	800 UL	660 U	6 UJ	5 J
1,2-Dichloroethene (total)	920,000	NA	NA	NA	NA	NA	6 UJ	16
Carbon disulfide	10,000,000	14 U	12 U	610 UJ	800 UL	660 U	6 UJ	6 UJ
Methyl acetate	100,000,000	14 U	12 U	610 UJ	82 L	660 U	NA	NA
Methylene chloride	380,000	10 B	10 B	370 B	480 B	370 B	12 UJ	13 UJ
Tetrachloroethene	5,300	14 U	12 U	610 UJ	5,800 L	660 U	6 UJ	6 UJ
Trichloroethene	7,200	14 U	11 J	940 J	12,000 L	1,800	5 J	480
Xylene, total	20,000,000	14 U	12 U	610 UJ	800 UL	660 U	2 J	6 UJ
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
Acetophenone	10,000,000	400 U	400 U	420 U	390 U	450 U	NA	NA
Benzo(a)anthracene	3,900	400 U	400 U	51 J	390 U	450 U	NA	NA
Benzo(a)pyrene	390	400 U	400 U	44 J	390 U	450 U	NA	NA
Benzo(b)fluoranthene	3,900	400 U	400 U	67 J	390 U	450 U	NA	NA
Chrysene	390,000	400 U	400 U	69 J	390 U	450 U	NA	NA
Diethylphthalate	82,000,000	400 U	220 J	280 J	390 U	340 J	NA	NA
Fluoranthene	4,100,000	400 U	400 U	150 J	390 U	450 U	NA	NA
Phenanthrene	3,100,000	400 U	400 U	120 J	390 U	450 U	NA	NA
Pyrene	3,100,000	400 U	400 U	95 J	390 U	450 U	NA	NA
bis(2-Ethylhexyl)phthalate	200,000	400 U	71 B	110 B	390 U	2,300	NA	NA
<b>Dioxin/Furans (UG/KG)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	0.0067	0.058	0.0049 J	0.0083	0.025	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	4.70E-04 U	0.11	3.40E-04 U	7.70E-04 U	0.0042 J	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	6.60E-04 U	0.027	3.80E-04 U	0.0011 U	7.70E-04 U	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.0014 U	0.0051 J	7.60E-04 U	0.0016 U	0.0017 U	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	0.0011 U	0.06	5.20E-04 U	0.0012 U	0.0031 U	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	0.0013 U	0.012	6.60E-04 U	0.0015 U	0.0015 U	NA	NA

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB66	AS01-SB67	AS01-SB68	AS01-SB69	AS01-SB70	BG-010/010S/053	
Sample ID		AS01-SB66-1.5-2	AS01-SB67-1.5-2	AS01-SB68-1.5-2	AS01-SB69-1-1.5	AS01-SB70-2.5-3	HCS-BG-10	HCS-BG-53
Sample Date		09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/13/92	07/13/92
Chemical Name								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	1.00E-03 U	0.039	4.70E-04 U	0.0011 U	0.0012 U	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	0.0013 U	0.012	6.60E-04 U	0.0015 U	0.0023 U	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	0.0011 U	0.0034 J	4.70E-04 U	0.0012 U	0.0013 U	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	0.0019 U	0.0084	0.0012 U	0.002 U	0.0026 U	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.38	7.70E-04 U	0.035	4.80E-04 U	8.60E-04 U	0.0023 U	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	7.30E-04 U	0.031	3.60E-04 U	8.30E-04 U	0.0012 U	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.038	8.20E-04 U	0.038	5.00E-04 U	8.80E-04 U	0.0023 U	NA	NA
2,3,7,8-TCDD (dioxin)	0.019	4.90E-04 U	0.0026	3.90E-04 U	5.30E-04 U	7.90E-04 U	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.19	4.90E-04 U	0.032	5.30E-04 U	5.50E-04 U	0.003	NA	NA
Octachlorodibenzo-p-dioxin	190	0.32	0.23	0.16	0.28	0.31	NA	NA
Octachlorodibenzofuran	190	0.0013 U	0.15	0.0036 U	0.0036 U	0.0076 J	NA	NA
Total heptachlorodibenzo-p-dioxin	--	0.015	0.11	0.014	0.023	0.05	NA	NA
Total heptachlorodibenzofuran	--	6.60E-04 U	0.2	5.50E-04 U	0.0011 U	0.0042	NA	NA
Total hexachlorodibenzo-p-dioxin	--	0.0014 U	0.17	9.10E-04 U	0.0016 U	0.016	NA	NA
Total hexachlorodibenzofuran	--	0.0011 U	0.29	5.20E-04 U	0.0012 U	0.0031 U	NA	NA
Total pentachlorodibenzo-p-dioxin	--	0.0019 U	0.14	0.0012 U	0.002 U	0.0032 U	NA	NA
Total pentachlorodibenzofuran	--	8.20E-04 U	0.28	5.00E-04 U	9.90E-04 U	0.0067	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	4.90E-04 U	0.13	3.90E-04 U	7.20E-04 U	0.013	NA	NA
Total tetrachlorodibenzofuran	--	4.90E-04 U	0.23	5.30E-04 U	5.50E-04 U	0.026	NA	NA
<b>Explosives (UG/KG)</b>								
HMX	5,100,000	810	4,600	5,200	570	2,100	NA	NA
Nitroglycerin	200,000	2,500 U	2,500 U	2,000 J	2,500 UJ	4,500 J	NA	NA
Perchlorate	72,000	48.2 U	438	26.6	91.2	65	NA	NA
RDX	26,000	96 J	69 J	74 J	5,200	730	NA	NA
<b>Total Metals (MG/KG)</b>								
Aluminum	100,000	7,300	10,100	50,500	6,100	19,100	NA	NA
Antimony	41	0.65 UL	0.66 UL	0.69 UL	0.64 UL	17.2 L	NA	NA
Arsenic	1.9	5.6	5.3	7	7.6	5.6	NA	NA

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	AS01-SB66	AS01-SB67	AS01-SB68	AS01-SB69	AS01-SB70	BG-010/010S/053	
Sample ID		AS01-SB66-1.5-2	AS01-SB67-1.5-2	AS01-SB68-1.5-2	AS01-SB69-1-1.5	AS01-SB70-2.5-3	HCS-BG-10	HCS-BG-53
Sample Date		09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/13/92	07/13/92
<b>Chemical Name</b>								
Barium	7,200	186	196	150	156	152	NA	NA
Beryllium	200	0.98 B	0.85 B	0.87 B	0.89 B	0.72 B	NA	NA
Cadmium	100	0.27 B	0.46 J	0.47 J	0.31 B	11.9	NA	NA
Calcium	--	2,010	93,200	2,030	3,230	14,600	NA	NA
Chromium	310	12	10.7	19.9	11.3	11.9	NA	NA
Cobalt	2,000	13.1	8.4 J	15.1	12.5	10.2 J	NA	NA
Copper	4,100	16.3 L	24.1 L	36.4 L	20.1 L	136 L	NA	NA
Cyanide	2,000	0.6 UL	0.61 UL	0.64 UL	0.59 UL	0.21 L	NA	NA
Iron	31,000	26,600	20,700	24,500	23,700	20,200	NA	NA
Lead	400	12.8 J	269 J	914 J	24.6 J	1,760 J	NA	NA
Magnesium	--	1,020 J	2,040	923 J	980 J	2,790	NA	NA
Manganese	2,000	922	546	692	783	687	NA	NA
Mercury	31	0.06 UL	0.44	2	0.45	0.068 UL	NA	NA
Nickel	2,000	21.9	18.9	21.6	18.8	20.5	NA	NA
Potassium	--	931 J	1,030 J	1,050 J	935 J	1,180 J	NA	NA
Selenium	510	0.55 UL	9 L	0.58 UL	0.55 UL	0.62 UL	NA	NA
Silver	510	0.24 U	0.29 J	2.8	0.24 U	4.1	NA	NA
Thallium	7.2	1.2 U	1.2 U	1.2 U	1.1 U	1.3 U	NA	NA
Vanadium	100	15.9	13.9	19.4	14.7	15.4	NA	NA
Zinc	31,000	59.7 K	108 K	222 K	62.8 K	202 K	NA	NA
<b>Wet Chemistry (MG/KG)</b>								
% Moisture	--	17	18.4	21.3	15.8	26.2	NA	NA
Total organic carbon (TOC)	--	9,100	11,000	14,000	13,000	11,000	NA	NA
pH	--	6.8	6.3	7.2	6.6	7.4	NA	NA

Exceeds one o

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-017/018	BG-034/034S	BG-037	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181
Sample ID		HCS-BG-18	HCS-BG-34	HCS-BG-37	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181
Sample Date		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98
<b>Chemical Name</b>										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	29,000,000	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	11 U	12 U	12 U	11 U
1,2-Dichloroethene (total)	920,000	6 UJ	6 UJ	6 UJ	6 UJ	6 UJ	11 U	12 U	12 U	11 U
Carbon disulfide	10,000,000	6 UJ	6 UJ	2 J	6 UJ	6 UJ	11 U	12 U	12 U	11 U
Methyl acetate	100,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	380,000	23 UJ	20 UJ	24 UJ	21 UJ	16 UJ	11 U	4 J	12 U	11 U
Tetrachloroethene	5,300	6 UJ	6 UJ	3 J	6 UJ	12 J	11 U	12 U	12 U	11 U
Trichloroethene	7,200	48 J	1 J	37 J	2 J	30	89	37	12 U	34
Xylene, total	20,000,000	3 J	6 UJ	6 UJ	4 J	6 UJ	11 U	12 U	12 U	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
Acetophenone	10,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3,900	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	390	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	3,900	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	390,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	82,000,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	4,100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	3,100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	3,100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	200,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

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R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-017/018	BG-034/034S	BG-037	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181
Sample ID	Industrial	HCS-BG-18	HCS-BG-34	HCS-BG-37	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181
Sample Date	Adjusted	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98
<b>Chemical Name</b>										
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	190	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	190	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>										
HMX	5,100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	200,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	72,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	26,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>										
Aluminum	100,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	41	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-017/018	BG-034/034S	BG-037	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181
Sample ID	Industrial	HCS-BG-18	HCS-BG-34	HCS-BG-37	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181
Sample Date	Adjusted	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98
<b>Chemical Name</b>										
Barium	7,200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	200	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	310	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	4,100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	31,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	31	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	2,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	510	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	510	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	7.2	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	100	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	31,000	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one o

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-182/183		BG-184/185		BG-186/187		BG-188/189		BG-190
		HCS-BG-182 10/27/98	HCS-BG-183 10/27/98	HCS-BG-184 10/27/98	HCS-BG-185 10/27/98	HCS-BG-186 10/27/98	HCS-BG-187 10/27/98	HCS-BG-189 10/27/98	HCS-BG-188 10/27/98	HCS-BG-190 10/27/98
<b>Sample ID</b>										
<b>Sample Date</b>										
<b>Chemical Name</b>										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	29,000,000	11 U	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U
1,2-Dichloroethene (total)	920,000	11 U	3 J	12 U	11 U	11 U	11 U	12 U	12 U	12 U
Carbon disulfide	10,000,000	11 U	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U
Methyl acetate	100,000,000	NA								
Methylene chloride	380,000	11 U	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U
Tetrachloroethene	5,300	11 U	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U
Trichloroethene	7,200	63	140	26	30	2 J	10 J	18	10 J	53
Xylene, total	20,000,000	11 U	12 U	12 U	11 U	11 U	11 U	12 U	12 U	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
Acetophenone	10,000,000	NA								
Benzo(a)anthracene	3,900	NA								
Benzo(a)pyrene	390	NA								
Benzo(b)fluoranthene	3,900	NA								
Chrysene	390,000	NA								
Diethylphthalate	82,000,000	NA								
Fluoranthene	4,100,000	NA								
Phenanthrene	3,100,000	NA								
Pyrene	3,100,000	NA								
bis(2-Ethylhexyl)phthalate	200,000	NA								
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA								
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA								
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	NA								
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA								
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA								
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA								

NA - Not analyzed

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-182/183		BG-184/185		BG-186/187		BG-188/189		BG-190
		HCS-BG-182 10/27/98	HCS-BG-183 10/27/98	HCS-BG-184 10/27/98	HCS-BG-185 10/27/98	HCS-BG-186 10/27/98	HCS-BG-187 10/27/98	HCS-BG-189 10/27/98	HCS-BG-188 10/27/98	HCS-BG-190 10/27/98
<b>Sample ID</b>										
<b>Sample Date</b>										
<b>Chemical Name</b>										
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA								
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	NA								
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	NA								
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	NA								
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA								
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA								
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA								
2,3,7,8-TCDD (dioxin)	0.019	NA								
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA								
Octachlorodibenzo-p-dioxin	190	NA								
Octachlorodibenzofuran	190	NA								
Total heptachlorodibenzo-p-dioxin	--	NA								
Total heptachlorodibenzofuran	--	NA								
Total hexachlorodibenzo-p-dioxin	--	NA								
Total hexachlorodibenzofuran	--	NA								
Total pentachlorodibenzo-p-dioxin	--	NA								
Total pentachlorodibenzofuran	--	NA								
Total tetrachlorodibenzo-p-dioxin	--	NA								
Total tetrachlorodibenzofuran	--	NA								
<b>Explosives (UG/KG)</b>										
HMX	5,100,000	NA								
Nitroglycerin	200,000	NA								
Perchlorate	72,000	NA								
RDX	26,000	NA								
<b>Total Metals (MG/KG)</b>										
Aluminum	100,000	NA								
Antimony	41	NA								
Arsenic	1.9	NA								

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-182/183		BG-184/185		BG-186/187		BG-188/189		BG-190
		HCS-BG-182 10/27/98	HCS-BG-183 10/27/98	HCS-BG-184 10/27/98	HCS-BG-185 10/27/98	HCS-BG-186 10/27/98	HCS-BG-187 10/27/98	HCS-BG-189 10/27/98	HCS-BG-188 10/27/98	HCS-BG-190 10/27/98
<b>Chemical Name</b>										
Barium	7,200	NA								
Beryllium	200	NA								
Cadmium	100	NA								
Calcium	--	NA								
Chromium	310	NA								
Cobalt	2,000	NA								
Copper	4,100	NA								
Cyanide	2,000	NA								
Iron	31,000	NA								
Lead	400	NA								
Magnesium	--	NA								
Manganese	2,000	NA								
Mercury	31	NA								
Nickel	2,000	NA								
Potassium	--	NA								
Selenium	510	NA								
Silver	510	NA								
Thallium	7.2	NA								
Vanadium	100	NA								
Zinc	31,000	NA								
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA								
Total organic carbon (TOC)	--	NA								
pH	--	NA								

Exceeds one o

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-191	BG-192/193			BG-194	BG-195	BG-196/197		BG-198
		HCS-BG-191 10/27/98	HCS-BG-192 10/27/98	HCS-BG-193 10/27/98	HCS-BG-194 10/27/98	HCS-BG-195 10/27/98	HCS-BG-196 10/27/98	HCS-BG-197 10/27/98	HCS-BG-198 10/27/98	
<b>Sample ID</b>										
<b>Sample Date</b>										
<b>Chemical Name</b>										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	29,000,000	12 U	12 U							
1,2-Dichloroethene (total)	920,000	12 U	12 U							
Carbon disulfide	10,000,000	12 U	12 U							
Methyl acetate	100,000,000	NA	NA							
Methylene chloride	380,000	12 U	12 U							
Tetrachloroethene	5,300	12 U	12 U							
Trichloroethene	7,200	12 U	12 U	12 U	12 U	74	12 U	12 U	12 U	2 J
Xylene, total	20,000,000	12 U	12 U							
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
Acetophenone	10,000,000	NA	NA							
Benzo(a)anthracene	3,900	NA	NA							
Benzo(a)pyrene	390	NA	NA							
Benzo(b)fluoranthene	3,900	NA	NA							
Chrysene	390,000	NA	NA							
Diethylphthalate	82,000,000	NA	NA							
Fluoranthene	4,100,000	NA	NA							
Phenanthrene	3,100,000	NA	NA							
Pyrene	3,100,000	NA	NA							
bis(2-Ethylhexyl)phthalate	200,000	NA	NA							
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA	NA							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA	NA							
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	NA	NA							
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA							
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA	NA							
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA							

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-191	BG-192/193			BG-194	BG-195	BG-196/197		BG-198
		HCS-BG-191 10/27/98	HCS-BG-192 10/27/98	HCS-BG-193 10/27/98	HCS-BG-194 10/27/98	HCS-BG-195 10/27/98	HCS-BG-196 10/27/98	HCS-BG-197 10/27/98	HCS-BG-198 10/27/98	
<b>Chemical Name</b>										
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA							
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	NA	NA							
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	NA	NA							
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	NA	NA							
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA	NA							
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA							
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA	NA							
2,3,7,8-TCDD (dioxin)	0.019	NA	NA							
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA	NA							
Octachlorodibenzo-p-dioxin	190	NA	NA							
Octachlorodibenzofuran	190	NA	NA							
Total heptachlorodibenzo-p-dioxin	--	NA	NA							
Total heptachlorodibenzofuran	--	NA	NA							
Total hexachlorodibenzo-p-dioxin	--	NA	NA							
Total hexachlorodibenzofuran	--	NA	NA							
Total pentachlorodibenzo-p-dioxin	--	NA	NA							
Total pentachlorodibenzofuran	--	NA	NA							
Total tetrachlorodibenzo-p-dioxin	--	NA	NA							
Total tetrachlorodibenzofuran	--	NA	NA							
<b>Explosives (UG/KG)</b>										
HMX	5,100,000	NA	NA							
Nitroglycerin	200,000	NA	NA							
Perchlorate	72,000	NA	NA							
RDX	26,000	NA	NA							
<b>Total Metals (MG/KG)</b>										
Aluminum	100,000	NA	NA							
Antimony	41	NA	NA							
Arsenic	1.9	NA	NA							

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-191	BG-192/193			BG-194	BG-195	BG-196/197		BG-198
		HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195	HCS-BG-196	HCS-BG-197	HCS-BG-198	
Sample ID		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Sample Date										
Chemical Name										
Barium	7,200	NA	NA							
Beryllium	200	NA	NA							
Cadmium	100	NA	NA							
Calcium	--	NA	NA							
Chromium	310	NA	NA							
Cobalt	2,000	NA	NA							
Copper	4,100	NA	NA							
Cyanide	2,000	NA	NA							
Iron	31,000	NA	NA							
Lead	400	NA	NA							
Magnesium	--	NA	NA							
Manganese	2,000	NA	NA							
Mercury	31	NA	NA							
Nickel	2,000	NA	NA							
Potassium	--	NA	NA							
Selenium	510	NA	NA							
Silver	510	NA	NA							
Thallium	7.2	NA	NA							
Vanadium	100	NA	NA							
Zinc	31,000	NA	NA							
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA	NA							
Total organic carbon (TOC)	--	NA	NA							
pH	--	NA	NA							

Exceeds one o

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TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-199/200		BG-201/202		BG-203/204		BG-207/208	
		HCS-BG-199 10/27/98	HCS-BG-200 10/27/98	HCS-BG-201 10/27/98	HCS-BG-202 10/27/98	HCS-BG-203 10/27/98	HCS-BG-204 10/27/98	HCS-BG-207 10/27/98	HCS-BG-208 10/27/98
<b>Sample ID</b>									
<b>Sample Date</b>									
<b>Chemical Name</b>									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	29,000,000	12 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
1,2-Dichloroethene (total)	920,000	12 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
Carbon disulfide	10,000,000	12 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
Methyl acetate	100,000,000	NA							
Methylene chloride	380,000	12 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
Tetrachloroethene	5,300	12 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
Trichloroethene	7,200	29	55	11 U	12 U	11 U	11 U	10 J	9 J
Xylene, total	20,000,000	12 U	12 U	11 U	12 U	11 U	11 U	11 U	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
Acetophenone	10,000,000	NA							
Benzo(a)anthracene	3,900	NA							
Benzo(a)pyrene	390	NA							
Benzo(b)fluoranthene	3,900	NA							
Chrysene	390,000	NA							
Diethylphthalate	82,000,000	NA							
Fluoranthene	4,100,000	NA							
Phenanthrene	3,100,000	NA							
Pyrene	3,100,000	NA							
bis(2-Ethylhexyl)phthalate	200,000	NA							
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA							
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	NA							
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA							
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA							
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-199/200		BG-201/202		BG-203/204		BG-207/208	
		HCS-BG-199 10/27/98	HCS-BG-200 10/27/98	HCS-BG-201 10/27/98	HCS-BG-202 10/27/98	HCS-BG-203 10/27/98	HCS-BG-204 10/27/98	HCS-BG-207 10/27/98	HCS-BG-208 10/27/98
<b>Sample ID</b>									
<b>Sample Date</b>									
<b>Chemical Name</b>									
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA							
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	NA							
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	NA							
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	NA							
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA							
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA							
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA							
2,3,7,8-TCDD (dioxin)	0.019	NA							
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA							
Octachlorodibenzo-p-dioxin	190	NA							
Octachlorodibenzofuran	190	NA							
Total heptachlorodibenzo-p-dioxin	--	NA							
Total heptachlorodibenzofuran	--	NA							
Total hexachlorodibenzo-p-dioxin	--	NA							
Total hexachlorodibenzofuran	--	NA							
Total pentachlorodibenzo-p-dioxin	--	NA							
Total pentachlorodibenzofuran	--	NA							
Total tetrachlorodibenzo-p-dioxin	--	NA							
Total tetrachlorodibenzofuran	--	NA							
<b>Explosives (UG/KG)</b>									
HMX	5,100,000	NA							
Nitroglycerin	200,000	NA							
Perchlorate	72,000	NA							
RDX	26,000	NA							
<b>Total Metals (MG/KG)</b>									
Aluminum	100,000	NA							
Antimony	41	NA							
Arsenic	1.9	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-199/200		BG-201/202		BG-203/204		BG-207/208	
		HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207	HCS-BG-208
		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
<b>Sample ID</b>									
<b>Sample Date</b>									
<b>Chemical Name</b>									
Barium	7,200	NA							
Beryllium	200	NA							
Cadmium	100	NA							
Calcium	--	NA							
Chromium	310	NA							
Cobalt	2,000	NA							
Copper	4,100	NA							
Cyanide	2,000	NA							
Iron	31,000	NA							
Lead	400	NA							
Magnesium	--	NA							
Manganese	2,000	NA							
Mercury	31	NA							
Nickel	2,000	NA							
Potassium	--	NA							
Selenium	510	NA							
Silver	510	NA							
Thallium	7.2	NA							
Vanadium	100	NA							
Zinc	31,000	NA							
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA							
Total organic carbon (TOC)	--	NA							
pH	--	NA							

Exceeds one o

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-209/210		BG-211/212		BG-213/214		BG-215/216	
		HCS-BG-209 10/27/98	HCS-BG-210 10/27/98	HCS-BG-211 10/27/98	HCS-BG-212 10/27/98	HCS-BG-213 10/27/98	HCS-BG-214 10/27/98	HCS-BG-215 10/27/98	HCS-BG-216 10/27/98
<b>Sample ID</b>									
<b>Sample Date</b>									
<b>Chemical Name</b>									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	29,000,000	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U
1,2-Dichloroethene (total)	920,000	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U
Carbon disulfide	10,000,000	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U
Methyl acetate	100,000,000	NA							
Methylene chloride	380,000	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U
Tetrachloroethene	5,300	32	60	3 J	6 J	5 J	6 J	11 U	11 U
Trichloroethene	7,200	44	120	4 J	11 J	46	110	18	12
Xylene, total	20,000,000	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
Acetophenone	10,000,000	NA							
Benzo(a)anthracene	3,900	NA							
Benzo(a)pyrene	390	NA							
Benzo(b)fluoranthene	3,900	NA							
Chrysene	390,000	NA							
Diethylphthalate	82,000,000	NA							
Fluoranthene	4,100,000	NA							
Phenanthrene	3,100,000	NA							
Pyrene	3,100,000	NA							
bis(2-Ethylhexyl)phthalate	200,000	NA							
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA							
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	NA							
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA							
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA							
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-209/210		BG-211/212		BG-213/214		BG-215/216	
		HCS-BG-209 10/27/98	HCS-BG-210 10/27/98	HCS-BG-211 10/27/98	HCS-BG-212 10/27/98	HCS-BG-213 10/27/98	HCS-BG-214 10/27/98	HCS-BG-215 10/27/98	HCS-BG-216 10/27/98
<b>Sample ID</b>									
<b>Sample Date</b>									
<b>Chemical Name</b>									
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA							
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	NA							
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	NA							
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	NA							
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA							
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA							
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA							
2,3,7,8-TCDD (dioxin)	0.019	NA							
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA							
Octachlorodibenzo-p-dioxin	190	NA							
Octachlorodibenzofuran	190	NA							
Total heptachlorodibenzo-p-dioxin	--	NA							
Total heptachlorodibenzofuran	--	NA							
Total hexachlorodibenzo-p-dioxin	--	NA							
Total hexachlorodibenzofuran	--	NA							
Total pentachlorodibenzo-p-dioxin	--	NA							
Total pentachlorodibenzofuran	--	NA							
Total tetrachlorodibenzo-p-dioxin	--	NA							
Total tetrachlorodibenzofuran	--	NA							
<b>Explosives (UG/KG)</b>									
HMX	5,100,000	NA							
Nitroglycerin	200,000	NA							
Perchlorate	72,000	NA							
RDX	26,000	NA							
<b>Total Metals (MG/KG)</b>									
Aluminum	100,000	NA							
Antimony	41	NA							
Arsenic	1.9	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

**TABLE 4-7**

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-209/210		BG-211/212		BG-213/214		BG-215/216	
		HCS-BG-209 10/27/98	HCS-BG-210 10/27/98	HCS-BG-211 10/27/98	HCS-BG-212 10/27/98	HCS-BG-213 10/27/98	HCS-BG-214 10/27/98	HCS-BG-215 10/27/98	HCS-BG-216 10/27/98
<b>Sample ID</b>									
<b>Sample Date</b>									
<b>Chemical Name</b>									
Barium	7,200	NA							
Beryllium	200	NA							
Cadmium	100	NA							
Calcium	--	NA							
Chromium	310	NA							
Cobalt	2,000	NA							
Copper	4,100	NA							
Cyanide	2,000	NA							
Iron	31,000	NA							
Lead	400	NA							
Magnesium	--	NA							
Manganese	2,000	NA							
Mercury	31	NA							
Nickel	2,000	NA							
Potassium	--	NA							
Selenium	510	NA							
Silver	510	NA							
Thallium	7.2	NA							
Vanadium	100	NA							
Zinc	31,000	NA							
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA							
Total organic carbon (TOC)	--	NA							
pH	--	NA							

Exceeds one o

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-217/218		BG-219/220		BG-221/222	
		HCS-BG-217 10/27/98	HCS-BG-218 10/27/98	HCS-BG-219 10/27/98	HCS-BG-220 10/27/98	HCS-BG-221 10/27/98	HCS-BG-222 10/27/98
<b>Sample ID</b>							
<b>Sample Date</b>							
<b>Chemical Name</b>							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	29,000,000	11 U	11 U	11 U	13 U	11 U	11 U
1,2-Dichloroethene (total)	920,000	11 U	11 U	11 U	13 U	11 U	11 U
Carbon disulfide	10,000,000	11 U	11 U	11 U	13 U	11 U	11 U
Methyl acetate	100,000,000	NA	NA	NA	NA	NA	NA
Methylene chloride	380,000	11 U	11 U	11 U	13 U	11 U	11 U
Tetrachloroethene	5,300	11 U	7 J	11 U	13 U	11 U	11 U
Trichloroethene	7,200	3 J	3 J	23	37 J	11 U	11 U
Xylene, total	20,000,000	11 U	11 U	11 U	13 U	11 U	11 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
Acetophenone	10,000,000	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	3,900	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	390	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	3,900	NA	NA	NA	NA	NA	NA
Chrysene	390,000	NA	NA	NA	NA	NA	NA
Diethylphthalate	82,000,000	NA	NA	NA	NA	NA	NA
Fluoranthene	4,100,000	NA	NA	NA	NA	NA	NA
Phenanthrene	3,100,000	NA	NA	NA	NA	NA	NA
Pyrene	3,100,000	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	200,000	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.9	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.9	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.9	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-217/218		BG-219/220		BG-221/222	
		HCS-BG-217 10/27/98	HCS-BG-218 10/27/98	HCS-BG-219 10/27/98	HCS-BG-220 10/27/98	HCS-BG-221 10/27/98	HCS-BG-222 10/27/98
<b>Sample ID</b>							
<b>Sample Date</b>							
<b>Chemical Name</b>							
1,2,3,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.19	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.019	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.38	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.038	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.019	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.19	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	190	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	190	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>							
HMX	5,100,000	NA	NA	NA	NA	NA	NA
Nitroglycerin	200,000	NA	NA	NA	NA	NA	NA
Perchlorate	72,000	NA	NA	NA	NA	NA	NA
RDX	26,000	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>							
Aluminum	100,000	NA	NA	NA	NA	NA	NA
Antimony	41	NA	NA	NA	NA	NA	NA
Arsenic	1.9	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-7

Exceedance of Adjusted Residential Soil RBC, Active Burning

Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Industrial Adjusted	BG-217/218		BG-219/220		BG-221/222	
		HCS-BG-217 10/27/98	HCS-BG-218 10/27/98	HCS-BG-219 10/27/98	HCS-BG-220 10/27/98	HCS-BG-221 10/27/98	HCS-BG-222 10/27/98
<b>Sample ID</b>							
<b>Sample Date</b>							
<b>Chemical Name</b>							
Barium	7,200	NA	NA	NA	NA	NA	NA
Beryllium	200	NA	NA	NA	NA	NA	NA
Cadmium	100	NA	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA	NA
Chromium	310	NA	NA	NA	NA	NA	NA
Cobalt	2,000	NA	NA	NA	NA	NA	NA
Copper	4,100	NA	NA	NA	NA	NA	NA
Cyanide	2,000	NA	NA	NA	NA	NA	NA
Iron	31,000	NA	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA	NA
Manganese	2,000	NA	NA	NA	NA	NA	NA
Mercury	31	NA	NA	NA	NA	NA	NA
Nickel	2,000	NA	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA	NA
Selenium	510	NA	NA	NA	NA	NA	NA
Silver	510	NA	NA	NA	NA	NA	NA
Thallium	7.2	NA	NA	NA	NA	NA	NA
Vanadium	100	NA	NA	NA	NA	NA	NA
Zinc	31,000	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>							
% Moisture	--	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA

Exceeds one o

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31
Sample ID	Residential	AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)
Sample Date	Adjusted	10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2,200,000	11 U	11 U	9 J	2.6 J	12 U	13 U
1,1-Dichloroethene	390,000	11 U	11 U	1 J	12 U	12 U	13 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	11 U	11 U	12 U	12 U	12 U	13 U
4-Methyl-2-pentanone	--	11 U	11 U	12 U	12 U	12 U	13 U
Acetone	7,000,000	11 U	11 U	12 U	12 U	12 U	13 U
Benzene	12,000	11 U	11 U	12 U	12 U	12 U	13 U
Bromomethane	11,000	11 U	11 U	12 U	12 U	12 U	13 U
Carbon disulfide	780,000	11 U	11 U	12 U	12 U	12 U	13 U
Chlorobenzene	160,000	11 U	11 U	12 U	12 U	12 U	13 U
Chloromethane	--	11 U	11 U	12 U	12 U	12 U	13 U
Methyl acetate	7,800,000	11 U	11 U	12 U	12 U	12 U	13 U
Methylene chloride	85,000	1.8 B	4 B	5.9 B	3.9 B	12 U	1.6 J
Tetrachloroethene	1,200	11 U	11 U	12 U	12 U	6.1 J	13 U
Toluene	1,600,000	11 U	11 U	12 U	12 U	12 U	13 U
Trichloroethene	1,600	11 U	11 U	25,000	12 U	13,000	13 U
Xylene, total	1,600,000	11 U	11 U	12 U	12 U	12 U	13 U
cis-1,2-Dichloroethene	78,000	11 U	11 U	80	12 U	38	13 U
trans-1,2-Dichloroethene	160,000	11 U	11 U	2 J	12 U	12 U	13 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	390,000	350 U	890	400 U	46 J	51 J	420 UJ
2-Methylnaphthalene	31,000	350 U	1,900	50 J	87 J	170 J	420 UJ
3- and 4-Methylphenol	39,000	350 U	320 U	400 U	360 U	390 U	420 UJ
Acenaphthene	470,000	350 U	12,000	400 U	360 U	59 J	420 UJ
Acenaphthylene	--	350 U	350	400 U	46 J	50 J	420 UJ
Acetophenone	780,000	350 U	320 U	400 U	360 U	390 U	420 UJ
Anthracene	2,300,000	350 U	21,000	400 U	49 J	170 J	72 J
Benzaldehyde	780,000	350 U	320 U	400 U	360 U	390	420 UJ

NA - Not analyzed

B - Analyte not detected above associated blank

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31
Sample ID		AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)
Sample Date		10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01
Chemical Name							
Benzo(a)anthracene	870	350 U	58,000	130 J	180 J	370 J	170 J
Benzo(a)pyrene	87	350 U	55,000	130 J	190 J	320 J	150 J
Benzo(b)fluoranthene	870	350 U	65,000	170 J	330 J	320 J	150 J
Benzo(g,h,i)perylene	230,000	350 U	17,000	56 J	72 J	130 J	55 J
Benzo(k)fluoranthene	8,700	350 U	54,000	130 J	210 J	390	170 J
Caprolactam	3,900,000	350 U	320 U	400 U	360 U	390 U	420 UJ
Carbazole	32,000	350 U	9,500	400 U	360 U	58 J	420 UJ
Chrysene	87,000	350 U	63,000	220 J	290 J	520	200 J
Di-n-butylphthalate	780,000	350 U	57 J	400 U	360 U	390 U	420 UJ
Dibenz(a,h)anthracene	87	350 U	2,100	400 UJ	360 UJ	390 U	420 UJ
Dibenzofuran	16,000	350 U	6,800	400 U	360 U	69 J	420 UJ
Diethylphthalate	6,300,000	350 U	320 U	400 U	360 U	390 U	420 UJ
Fluoranthene	310,000	48 J	97,000	270 J	310 J	740	310 J
Fluorene	310,000	350 U	11,000	400 U	360 U	80 J	420 UJ
Indeno(1,2,3-cd)pyrene	870	350 U	18,000	52 J	84 J	130 J	44 J
Naphthalene	160,000	47 J	650	400 U	52 J	100 J	420 UJ
Phenanthrene	230,000	50 J	96,000	240 J	230 J	750	220 J
Pyrene	230,000	350 U	160,000	250 J	380	780	350 J
bis(2-Ethylhexyl)phthalate	46,000	350 U	320 U	69 B	120 B	54 J	120 J
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	0.0681	0.0433
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	0.0856	0.0292
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	0.00525	0.00343
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	0.00216	0.00165
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.0260	0.0194
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	0.00539	0.00291
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.0111 J	0.00473
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	0.00542	0.00317
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	5.69E-04	3.21E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	0.00119	7.94E-04 J

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31
Sample ID		AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)
Sample Date		10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	0.00464	0.00689
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	0.0104	0.00523
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	0.00782	0.00693
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	5.39E-04 U	4.52E-04
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	0.00364 J	0.00809 J
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	0.547	0.488
Octachlorodibenzofuran	43	NA	NA	NA	NA	0.150	0.0531
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.123	0.0879
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	0.147	0.0326
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.0476	0.0636
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	0.116	0.0644
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.0118	0.0154
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	0.0922	0.0563
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	0.0143	0.0289
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	0.0977	0.0755
<b>Explosives (UG/KG)</b>							
HMX	390,000	NA	NA	NA	NA	590 U	640 U
Nitroglycerin	46,000	NA	NA	NA	NA	59,000 U	64,000 U
Perchlorate	5,500	NA	NA	NA	NA	60 U	60 U
RDX	5,800	NA	NA	NA	NA	590 U	640 U
<b>Total Metals (MG/KG)</b>							
Aluminum	7,800	5,320	3,130	8,540	7,920	18,100	4,330
Antimony	3.1	2 U	2 U	2.2 U	2.2 U	6.6 J	2.3 U
Arsenic	0.43	11.9	7.3	20.6	14.7	31	10.5
Barium	550	141	59.8	208	194	647	81.9
Beryllium	16	1.5	1 J	1.9 J	1.4 J	1.3	1.6 J
Cadmium	7.8	0.67 U	0.64 U	0.72 U	0.72 U	12.4	0.76 U
Calcium	--	3,730	1,220	4,560	3,510	6,100	2,150 J
Chromium	23	12.3 J	10 J	20.8	16.8	112 J	11.2 J

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burning Grounds, Subsurface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31
Sample ID	Residential	AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)
Sample Date	Adjusted	10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01
Chemical Name							
Cobalt	160	24.3	16.2	28	20.4	40.3	25.3
Copper	310	50.7	27.8	64.9	37.3	332	32.9
Cyanide	160	0.6 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U
Iron	2,300	20,900	16,900	36,500	31,500	122,000	26,100
Lead	400	59.1	21.8	73.4	38.7	2,540	27.9
Magnesium	--	655 J	538 J	1,130 J	1,110 J	3,600	677 J
Manganese	160	631	382	836	884	1,060	672
Mercury	2.3	0.26	0.45	0.7	0.35	4.5	0.13 K
Nickel	160	34.1	25	42.1	28.7	63.6	41.8
Potassium	--	417 J	312 J	906 J	939 J	1,120 J	419 J
Selenium	39	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	1.3 U
Silver	39	1.1 UL	1.9 L	1.2 UL	1.2 UL	43.1 L	1.3 UL
Sodium	--	73.8 J	60.8 U	80.2 J	68.3 U	155 J	120 J
Thallium	0.55	1.6 U	1.5 U	1.7 U	1.7 U	1.7 U	1.8 U
Vanadium	7.8	12.6	10.4 J	21.4	19.7	26.6	12.5 J
Zinc	2,300	148	131	212	127	999	149
Wet Chemistry (MG/KG)							
% Moisture	--	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	7,500	NA	8,200	6,800	6,700	7,800
pH	--	NA	NA	NA	6.58	NA	NA

Exceeds one or more criteria
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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB34		AS01-SB36	AS01-SB38		AS01-SB39
		AS01-SB34-(1-2)	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)
Sample ID		10/25/01	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01
Sample Date							
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2,200,000	11 U	12 U	11 U	1.9 J	11 U	11 J
1,1-Dichloroethene	390,000	11 U	12 U	11 U	11 U	11 U	12 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	11 U	12 U	11 U	11 U	11 U	12 U
4-Methyl-2-pentanone	--	11 U	12 U	11 U	11 U	11 U	12 UJ
Acetone	7,000,000	11 U	12 U	11 U	11 U	11 U	12 U
Benzene	12,000	11 U	12 U	11 U	11 U	11 U	12 U
Bromomethane	11,000	11 U	12 U	11 U	11 U	11 U	12 U
Carbon disulfide	780,000	11 U	12 U	11 U	11 U	11 U	12 U
Chlorobenzene	160,000	11 U	12 U	11 U	11 U	11 U	12 UJ
Chloromethane	--	11 U	12 U	11 U	11 U	11 U	12 U
Methyl acetate	7,800,000	11 U	12 U	11 U	11 U	11 U	12 U
Methylene chloride	85,000	11 U	12 U	11 U	4.1 B	7 B	5 B
Tetrachloroethene	1,200	11 U	12 U	11 U	11 U	11 U	12 UJ
Toluene	1,600,000	11 U	12 U	11 U	11 U	11 U	12 UJ
Trichloroethene	1,600	8.4 J	23	11 U	11 U	11 U	16,000
Xylene, total	1,600,000	11 U	12 U	11 U	11 U	11 U	12 UJ
cis-1,2-Dichloroethene	78,000	11 U	12 U	11 U	11 U	11 U	38
trans-1,2-Dichloroethene	160,000	11 U	12 U	11 U	11 U	11 U	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	390,000	380 UJ	390 UJ	360 UJ	370 U	340 U	46 J
2-Methylnaphthalene	31,000	380 UJ	66 J	360 UJ	370 U	340 U	200 J
3- and 4-Methylphenol	39,000	380 UJ	390 UJ	360 UJ	370 U	340 U	380 U
Acenaphthene	470,000	380 UJ	390 UJ	360 UJ	370 U	340 U	380 U
Acenaphthylene	--	380 UJ	390 UJ	360 UJ	370 U	340 U	75 J
Acetophenone	780,000	380 UJ	390 UJ	360 UJ	370 U	340 U	380 U
Anthracene	2,300,000	380 UJ	87 J	360 UJ	370 U	340 U	110 J
Benzaldehyde	780,000	380 UJ	130 J	360 UJ	370 U	340 U	380 U

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB34		AS01-SB36	AS01-SB38		AS01-SB39
		AS01-SB34-(1-2)	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)
		10/25/01	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01
<b>Chemical Name</b>							
Benzo(a)anthracene	870	75 J	210 J	60 J	370 U	170 J	310 J
Benzo(a)pyrene	87	85 J	190 J	62 J	370 U	170 J	310 J
Benzo(b)fluoranthene	870	110 J	280 J	55 J	370 U	190 J	360 J
Benzo(g,h,i)perylene	230,000	62 J	96 J	41 J	370 U	97 J	140 J
Benzo(k)fluoranthene	8,700	82 J	200 J	62 J	370 U	180 J	370 J
Caprolactam	3,900,000	380 UJ	390 UJ	360 UJ	370 U	340 U	380 U
Carbazole	32,000	380 UJ	59 J	360 UJ	370 U	340 U	79 J
Chrysene	87,000	110 J	290 J	82 J	370 U	190 J	460
Di-n-butylphthalate	780,000	380 UJ	390 UJ	360 UJ	370 U	280 J	380 U
Dibenz(a,h)anthracene	87	380 UJ	390 UJ	360 UJ	370 U	340 U	380 UJ
Dibenzofuran	16,000	380 UJ	390 UJ	360 UJ	370 U	340 U	81 J
Diethylphthalate	6,300,000	380 UJ	390 UJ	360 UJ	370 U	340 U	380 U
Fluoranthene	310,000	140 J	290 J	120 J	370 U	250 J	570
Fluorene	310,000	380 UJ	47 J	360 UJ	370 U	340 U	53 J
Indeno(1,2,3-cd)pyrene	870	53 J	75 J	360 UJ	370 U	99 J	140 J
Naphthalene	160,000	380 UJ	46 J	360 UJ	370 U	340 U	140 J
Phenanthrene	230,000	100 J	350 J	86 J	370 U	89 J	590
Pyrene	230,000	120 J	580 J	95 J	370 U	240 J	700
bis(2-Ethylhexyl)phthalate	46,000	53 J	90 J	360 UJ	60 B	7,000	150 B
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.191	0.262	0.142	0.00887	0.0103	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.255	0.242	0.0254	0.00202	0.00191	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	0.0168	0.0108	0.00214	8.40E-05 U	8.90E-05 U	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.0130	0.0147	0.00273	2.47E-04 J	1.85E-04 U	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.177	0.116	0.0101	9.24E-04	9.33E-04	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.0225	0.0291	0.00678	4.58E-04	5.17E-04	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	0.0458	0.0380	0.00191	2.22E-04 J	1.35E-04 U	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	0.0310	0.0390	0.00618	6.80E-04 J	6.58E-04 J	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	0.0028	0.00144	3.52E-04 U	9.60E-05 U	1.57E-04 U	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	0.00692	0.00798	0.00107	8.50E-05 U	1.33E-04 U	NA

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB34		AS01-SB36	AS01-SB38		AS01-SB39
		AS01-SB34-(1-2)	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)
Sample ID		10/25/01	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01
Sample Date							
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	0.085	0.0533	0.0201	0.00232	3.11E-04 J	3.34E-04	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	0.0670	0.0447	0.00207	2.02E-04	1.54E-04 U	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	0.0633	0.0395	0.00311	3.32E-04 J	2.18E-04 U	NA
2,3,7,8-TCDD (dioxin)	0.0043	0.00139	0.00244	0.00381	1.20E-04 U	1.32E-04 U	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.0303 J	0.0196 J	0.0314	8.26E-04 J	8.07E-04 J	NA
Octachlorodibenzo-p-dioxin	43	0.907	1.08	2.02	0.202	0.173	NA
Octachlorodibenzofuran	43	0.113	0.103	0.0541	0.00354	0.00267	NA
Total heptachlorodibenzo-p-dioxin	--	0.435	0.582	0.341	0.0192	0.0189	NA
Total heptachlorodibenzofuran	--	0.271	0.286	0.0622	0.00483	0.00427	NA
Total hexachlorodibenzo-p-dioxin	--	0.671	0.987	0.0689	0.00396	0.00351	NA
Total hexachlorodibenzofuran	--	0.524	0.380	0.0557	0.00348	0.00359	NA
Total pentachlorodibenzo-p-dioxin	--	0.194	0.262	0.00746	8.50E-05 U	1.33E-04 U	NA
Total pentachlorodibenzofuran	--	0.571	0.481	0.0332	0.00141	0.00114	NA
Total tetrachlorodibenzo-p-dioxin	--	0.296	0.362	0.0435	1.20E-04 U	6.66E-04	NA
Total tetrachlorodibenzofuran	--	0.705	0.440	0.0826	0.00275	0.00379	NA
<b>Explosives (UG/KG)</b>							
HMX	390,000	570 U	600 U	540 U	560 U	560 U	NA
Nitroglycerin	46,000	57,000 U	60,000 U	54,000 U	56,000 U	56,000 U	NA
Perchlorate	5,500	60 U	60 U	50 U	60 U	60 U	NA
RDX	5,800	570 U	600 U	540 U	560 U	560 U	NA
<b>Total Metals (MG/KG)</b>							
Aluminum	7,800	13,000	6,460	4,080	7,650	7,120	8,630
Antimony	3.1	4.9 J	2.2 U	2 U	2 U	2.1 U	2.2 U
Arsenic	0.43	14.7	15	10	10.7	9	21.5
Barium	550	328	167	93.9	152	163	228
Beryllium	16	1.3 J	1.8 J	0.89 J	1 J	0.99 J	1.9 J
Cadmium	7.8	12.6	0.76 J	1.3	0.66 U	0.67 U	0.8 J
Calcium	--	4,760 J	3,660 J	2,410 J	1,410	1,710	5,330
Chromium	23	37.1 J	14 J	12.5 J	14	12.6	23.9

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	AS01-SB34		AS01-SB36	AS01-SB38		AS01-SB39
		AS01-SB34-(1-2)	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)
Sample ID		10/25/01	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01
Sample Date							
Chemical Name							
Cobalt	160	28.6	40.7	15.6	15.2	13.8	28.4
Copper	310	999	82.9	46.5	22.4	23.1	72
Cyanide	160	0.6 U	0.6 U	0.5 U	0.6 U	0.6 U	0.6 U
Iron	2,300	40,900	29,600	24,400	28,300	24,100	34,200
Lead	400	210	53.2	44.3	18.8	28.2	88.6
Magnesium	--	1,930	937 J	780 J	1,080 J	1,070 J	1,060 J
Manganese	160	1,130	1,450	585	843	831	791
Mercury	2.3	0.57 K	0.52 K	0.14 K	0.1 U	0.11 U	0.79
Nickel	160	73.7	53.8	22.9	18	18.8	43.1
Potassium	--	1,080 J	664 J	519 J	889 J	926 J	936 J
Selenium	39	1.1 U	1.2 U	1.1 U	1.1 U	1.1 U	1.3
Silver	39	95.3 L	9.3 L	6 L	1.1 UL	1.1 UL	1.2 UL
Sodium	--	268 J	96.7 J	106 J	62.7 U	64 U	92.9 J
Thallium	0.55	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.7 U
Vanadium	7.8	80.3	22.6	13.5	19.1	19.5	20.7
Zinc	2,300	1,080	290	220	76.5	78.1	226
Wet Chemistry (MG/KG)							
% Moisture	--	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	7,000	6,100	8,000	6,000	9,500	7,300
pH	--	NA	NA	NA	NA	NA	NA

Exceeds one or

NA - Not analyzed

B - Analyte not detected above associated blank

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K - Reported value may be biased high

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB40	AS01-SB41	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SB40-(1-2)	AS01-SB41-(1-2)	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5
Sample Date	Adjusted	10/24/01	10/24/01	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2,200,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
1,1-Dichloroethene	390,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	NA	NA
2-Butanone	4,700,000	12 U	11 U	14 U	4,300 UL	12,000 UL	2 J
4-Methyl-2-pentanone	--	12 U	11 U	14 U	4,300 UL	12,000 UL	3.7 J
Acetone	7,000,000	12 U	11 U	2.6 B	4,300 UL	1,800 B	16 B
Benzene	12,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
Bromomethane	11,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
Carbon disulfide	780,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
Chlorobenzene	160,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
Chloromethane	--	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
Methyl acetate	7,800,000	12 U	11 U	14 U	2,800 L	12,000 UL	15 U
Methylene chloride	85,000	12 U	4 B	7.8 B	2,700 B	7,400 B	12 B
Tetrachloroethene	1,200	8.9 J	11 U	26	11,000 L	12,000 UL	3.3 J
Toluene	1,600,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
Trichloroethene	1,600	15	29	13 J	77,000 L	170,000 L	57
Xylene, total	1,600,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
cis-1,2-Dichloroethene	78,000	12 U	11 U	14 U	2,600 L	12,000 UL	15 U
trans-1,2-Dichloroethene	160,000	12 U	11 U	14 U	4,300 UL	12,000 UL	15 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	390,000	69 J	49 J	440 U	470 U	400 U	460 U
2-Methylnaphthalene	31,000	110 J	96 J	440 U	470 U	400 U	460 U
3- and 4-Methylphenol	39,000	64 J	350 U	NA	NA	NA	NA
Acenaphthene	470,000	66 J	41 J	440 U	470 U	400 U	460 U
Acenaphthylene	--	91 J	350 U	440 U	470 U	400 U	460 U
Acetophenone	780,000	370 U	350 U	440 U	51 J	400 U	460 U
Anthracene	2,300,000	110 J	120 J	440 U	470 U	400 U	460 U
Benzaldehyde	780,000	370 U	350 U	440 U	470 U	400 U	460 U

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Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB40	AS01-SB41	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SB40-(1-2)	AS01-SB41-(1-2)	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5
Sample Date	Adjusted	10/24/01	10/24/01	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Benzo(a)anthracene	870	300 J	220 J	440 U	470 U	400 U	460 U
Benzo(a)pyrene	87	310 J	220 J	440 U	470 U	400 U	460 U
Benzo(b)fluoranthene	870	440	250 J	51 J	470 U	400 U	460 U
Benzo(g,h,i)perylene	230,000	140 J	110 J	440 U	470 U	400 U	460 U
Benzo(k)fluoranthene	8,700	380	190 J	440 U	470 U	400 U	460 U
Caprolactam	3,900,000	370 U	350 U	66 J	470 U	400 U	460 U
Carbazole	32,000	99 J	91 J	440 U	470 U	400 U	460 U
Chrysene	87,000	510	330 J	440 U	470 U	400 U	460 U
Di-n-butylphthalate	780,000	370 U	350 U	440 U	170 J	400 U	460 U
Dibenz(a,h)anthracene	87	370 U	350 U	440 U	470 U	400 U	460 U
Dibenzofuran	16,000	58 J	63 J	440 U	470 U	400 U	460 U
Diethylphthalate	6,300,000	370 U	350 U	440 U	3,400	400 U	460 U
Fluoranthene	310,000	810	450	71 J	470 U	400 U	460 U
Fluorene	310,000	82 J	70 J	440 U	470 U	400 U	460 U
Indeno(1,2,3-cd)pyrene	870	140 J	110 J	440 U	470 U	400 U	460 U
Naphthalene	160,000	84 J	98 J	440 U	470 U	400 U	460 U
Phenanthrene	230,000	710	520	54 J	470 U	400 U	460 U
Pyrene	230,000	790	370	48 J	470 U	400 U	460 U
bis(2-Ethylhexyl)phthalate	46,000	84 J	350 U	440 U	120 B	75 B	57 B
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	0.0594	0.0106	0.0093	0.33	0.014	0.011
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	0.0223	0.00195	0.0022 U	0.72	0.0022 U	0.052
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	5.53E-04 U	1.39E-04 U	1.00E-03 U	0.085	4.50E-04 U	1.00E-03 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.00166	2.50E-04	0.0012 U	0.025	0.0013 U	0.0011 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	0.00602	9.82E-04	9.80E-04 U	0.21	0.0012 U	0.011
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	0.00318	3.70E-04	1.00E-03 U	0.045	0.0012 U	0.0014 U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	0.00563 J	5.52E-04 J	9.20E-04 U	0.18	0.0011 U	0.0058 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	0.00241	6.45E-04	1.00E-03 U	0.039	0.0012 U	0.002 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	2.35E-04 U	8.40E-05 U	9.80E-04 U	0.0092	0.0011 U	0.0014 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	8.48E-04	7.80E-05 U	0.0022 U	0.031	0.0015 U	0.0017 U

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Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB40	AS01-SB41	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SB40-(1-2)	AS01-SB41-(1-2)	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5
Sample Date	Adjusted	10/24/01	10/24/01	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	0.085	0.00289	5.40E-04	8.00E-04 U	0.15	7.90E-04 U	0.0037 J
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	0.00188	2.62E-04	6.80E-04 U	0.14	8.30E-04 U	0.0049 J
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	0.00307	4.61E-04	9.10E-04 U	0.16	9.00E-04 U	0.0057 J
2,3,7,8-TCDD (dioxin)	0.0043	8.39E-04 U	9.60E-05 U	5.20E-04 U	0.0088	5.70E-04 U	9.60E-04 U
2,3,7,8-Tetrachlorodibenzofuran	0.043	0.00448 J	0.00186	8.60E-04 J	0.16	0.0018	0.0054
Octachlorodibenzo-p-dioxin	43	0.731	0.479	0.4	1	0.58	0.067
Octachlorodibenzofuran	43	0.0442	0.00468	0.0076 J	0.62	0.0079 J	0.021
Total heptachlorodibenzo-p-dioxin	--	0.113	0.0221	0.021	0.62	0.03	0.023
Total heptachlorodibenzofuran	--	0.0506	0.00424	0.0022 U	1.1	0.0029 U	0.064
Total hexachlorodibenzo-p-dioxin	--	0.0254	0.00254	0.0015 U	0.56	0.0013 U	0.012
Total hexachlorodibenzofuran	--	0.0304	0.00271	0.0013 U	1.3	0.0012 U	0.054
Total pentachlorodibenzo-p-dioxin	--	0.00427	7.80E-05 U	0.0022 U	0.35	0.0015 U	0.0047
Total pentachlorodibenzofuran	--	0.0216	0.00313	0.0018 U	1.4	0.0016 U	0.051
Total tetrachlorodibenzo-p-dioxin	--	0.0110	0.00179	5.20E-04 U	0.3	5.70E-04 U	0.0064
Total tetrachlorodibenzofuran	--	0.0268	0.00617	8.60E-04	1.7	0.012	0.093
<b>Explosives (UG/KG)</b>							
HMX	390,000	580 U	570 U	1,500	75,000	76 J	100 J
Nitroglycerin	46,000	58,000 U	57,000 U	2,500 UJ	30,000 J	2,500 UJ	2,500 UJ
Perchlorate	5,500	60 U	60 U	53.6 U	199	48.1 U	55.8 U
RDX	5,800	580 U	570 U	140 J	1,800 J	500 U	500 U
<b>Total Metals (MG/KG)</b>							
Aluminum	7,800	5,870	5,820	6,380	66,300	6,670	39,900
Antimony	3.1	2.1 U	2.1 U	0.72 UL	2.5 L	0.65 UL	1.4 L
Arsenic	0.43	10	14.2	7	3.9	7.1	7
Barium	550	153	124	96.5	307	128	72.2
Beryllium	16	1 J	1.2	0.89 B	0.46 B	0.98 B	1 B
Cadmium	7.8	0.69 U	0.68 U	0.44 J	143	0.35 B	11.6
Calcium	--	12,400	3,670	6,800	5,040	1,620	10,500
Chromium	23	13.1 J	11.9 J	14.2	38.1	12.6	282

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Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	AS01-SB40	AS01-SB41	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74
Sample ID	Residential	AS01-SB40-(1-2)	AS01-SB41-(1-2)	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5
Sample Date	Adjusted	10/24/01	10/24/01	09/23/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Cobalt	160	19.6	21	13.4 J	20.2	15	53.9
Copper	310	32	38.7	22.5 L	436 L	21.8 L	13,600 L
Cyanide	160	0.6 U	0.6 U	0.67 UL	0.79 L	0.6 UL	0.7 UL
Iron	2,300	21,000	26,800	23,600	29,800	27,700	33,500
Lead	400	56.2	44.8	39.2 J	810 J	20.5 J	865 J
Magnesium	--	2,350	865 J	1,530	4,310	1,030 J	30,400
Manganese	160	829	666	558	462	747	822
Mercury	2.3	0.36	0.26	0.27	22.7	0.17 L	0.17 L
Nickel	160	25.1	30.9	20.8	38.7	22.5	347
Potassium	--	788 J	830 J	1,010 J	722 J	747 J	862 J
Selenium	39	1.2 U	1.1 U	1 L	0.95 L	0.6 L	1.2 L
Silver	39	1.2 UL	1.1 UL	0.69 J	13.3	0.38 J	19.5
Sodium	--	115 J	70.8 J	68.6 U	603 J	61.6 U	225 B
Thallium	0.55	1.7 U	1.6 U	1.3 U	1.4 U	1.2 U	1.3 U
Vanadium	7.8	13.5	15.2	14.2	14.3	16.5	53.4
Zinc	2,300	110	160	78.9 K	2,060 K	79.2 K	1,010 K
Wet Chemistry (MG/KG)							
% Moisture	--	NA	NA	25.3	29.6	16.9	28.4
Total organic carbon (TOC)	--	7,300	8,000	12,000	28,000	11,000	2,800
pH	--	NA	NA	7.4	6.8	6.9	7.8

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Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	B1-003		B1-011	B1-CS	BG-003	BG-015	BG-084/084S/106	
		HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84
Sample ID		07/17/92	07/17/92	07/17/92	06/20/94	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
1,1-Dichloroethene	390,000	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
1,2-Dichloroethene (total)	70,000	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
2-Butanone	4,700,000	NA	NA	NA	NA	12 UJ	11 UJ	1,500 U	12 U
4-Methyl-2-pentanone	--	NA	NA	NA	NA	12 UJ	11 UJ	1,500 U	12 U
Acetone	7,000,000	NA	NA	NA	NA	12 UJ	11 UJ	430 J	12 U
Benzene	12,000	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
Bromomethane	11,000	NA	NA	NA	NA	12 UJ	11 UJ	1,500 UJ	12 UJ
Carbon disulfide	780,000	NA	NA	NA	NA	6 UJ	2 J	750 U	6 U
Chlorobenzene	160,000	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
Chloromethane	--	NA	NA	NA	NA	12 UJ	11 UJ	1,500 U	12 U
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	85,000	NA	NA	NA	NA	17 UJ	22 UJ	1,500 UJ	12 UJ
Tetrachloroethene	1,200	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
Toluene	1,600,000	NA	NA	NA	NA	6 UJ	6 UJ	750 U	6 U
Trichloroethene	1,600	NA	NA	NA	NA	8 J	26 J	2,500 J	100 J
Xylene, total	1,600,000	NA	NA	NA	NA	2 J	2 J	750 U	6 U
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	380 U	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	NA	NA	380 U	NA	NA	NA	NA
Acenaphthylene	--	NA	NA	NA	380 U	NA	NA	NA	NA
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	NA	NA	380 U	NA	NA	NA	NA
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA

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Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	B1-003		B1-011	B1-CS	BG-003	BG-015	BG-084/084S/106	
		HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84
Sample ID		07/17/92	07/17/92	07/17/92	06/20/94	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
Benzo(a)anthracene	870	NA	NA	NA	380 U	NA	NA	NA	NA
Benzo(a)pyrene	87	NA	NA	NA	380 U	NA	NA	NA	NA
Benzo(b)fluoranthene	870	NA	NA	NA	380 U	NA	NA	NA	NA
Benzo(g,h,i)perylene	230,000	NA	NA	NA	380 U	NA	NA	NA	NA
Benzo(k)fluoranthene	8,700	NA	NA	NA	380 U	NA	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	380 U	NA	NA	NA	NA
Chrysene	87,000	NA	NA	NA	380 U	NA	NA	NA	NA
Di-n-butylphthalate	780,000	NA	NA	NA	380 U	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	380 U	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	380 U	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	51 J	NA	NA	NA	NA
Fluoranthene	310,000	NA	NA	NA	380 U	NA	NA	NA	NA
Fluorene	310,000	NA	NA	NA	380 U	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	380 U	NA	NA	NA	NA
Naphthalene	160,000	NA	NA	NA	380 U	NA	NA	NA	NA
Phenanthrene	230,000	NA	NA	NA	380 U	NA	NA	NA	NA
Pyrene	230,000	NA	NA	NA	380 U	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	380 U	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

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K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	B1-003		B1-011	B1-CS	BG-003	BG-015	BG-084/084S/106	
		HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84
Sample ID		07/17/92	07/17/92	07/17/92	06/20/94	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)									
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)									
Aluminum	7,800	8,120 J	18,800 J	19,900 J	NA	NA	NA	NA	NA
Antimony	3.1	2.80 J	2.90 J	12.9 J	NA	NA	NA	NA	NA
Arsenic	0.43	4.5	4.5 J	12.8 J	NA	NA	NA	NA	NA
Barium	550	109	138	1,510	NA	NA	NA	NA	NA
Beryllium	16	0.900	0.870	0.860	NA	NA	NA	NA	NA
Cadmium	7.8	0.670 J	3.40 J	46.8 J	NA	NA	NA	NA	NA
Calcium	--	2,480	2,980	20,400	NA	NA	NA	NA	NA
Chromium	23	13.2 J	46.9 J	99.8 J	NA	NA	NA	NA	NA

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	B1-003		B1-011	B1-CS	BG-003	BG-015	BG-084/084S/106	
		HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84
Sample ID		07/17/92	07/17/92	07/17/92	06/20/94	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
Cobalt	160	14.3	14.5	26.8	NA	NA	NA	NA	NA
Copper	310	28.8 J	79.9 J	1,390 J	NA	NA	NA	NA	NA
Cyanide	160	NA	NA	NA	NA	NA	NA	NA	NA
Iron	2,300	27,500	28,400	81,100	NA	NA	NA	NA	NA
Lead	400	6.5 J	173	993	NA	NA	NA	NA	NA
Magnesium	--	1,600	1,630	9,160	NA	NA	NA	NA	NA
Manganese	160	686	597	1,920	NA	NA	NA	NA	NA
Mercury	2.3	0.230	0.280	4.60	NA	NA	NA	NA	NA
Nickel	160	19.4	25.7	102	NA	NA	NA	NA	NA
Potassium	--	911	882	1,750	NA	NA	NA	NA	NA
Selenium	39	0.420 UJ	0.550 J	0.710 J	NA	NA	NA	NA	NA
Silver	39	0.420	1.10	104	NA	NA	NA	NA	NA
Sodium	--	210 UJ	251 UJ	1,290 B	NA	NA	NA	NA	NA
Thallium	0.55	0.470 U	0.490	0.560 U	NA	NA	NA	NA	NA
Vanadium	7.8	17.6	17.9	97.5	NA	NA	NA	NA	NA
Zinc	2,300	95 J	383 J	3,350 J	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one or

NA - Not analyzed  
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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-099		BG-102/102S	BG-110/110S	BG-112			BG-113
		HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113
Sample ID		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	6 UJ	6 U	880 U	820 U	7 UJ	7 U	7 UJ	410 J
1,1-Dichloroethene	390,000	6 UJ	6 U	880 U	820 U	7 UJ	7 U	7 UJ	880 U
1,2-Dichloroethene (total)	70,000	6 UJ	6 U	260 J	27,000	33 J	7 U	7 UJ	880 U
2-Butanone	4,700,000	13 UJ	13 U	1,800 U	1,400 J	13 UJ	13 U	13 UJ	1,800 U
4-Methyl-2-pentanone	--	13 UJ	13 U	1,800 U	1,600 U	13 UJ	13 U	13 UJ	1,800 U
Acetone	7,000,000	13 UJ	13 U	1,800 U	1,600 U	13 UJ	13 UJ	24 J	820 J
Benzene	12,000	6 UJ	6 U	880 U	820 U	7 UJ	7 U	7 UJ	880 U
Bromomethane	11,000	13 UJ	13 U	1,800 UJ	1,600 UJ	13 UJ	13 U	13 UJ	1,800 UJ
Carbon disulfide	780,000	3 J	6 U	880 U	820 U	6 J	2 J	2 J	880 U
Chlorobenzene	160,000	6 UJ	6 U	880 U	820 U	7 UJ	7 U	7 UJ	880 U
Chloromethane	--	13 UJ	13 U	1,800 U	1,600 U	13 UJ	13 UJ	13 UJ	1,800 U
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	85,000	20 UJ	14 B	1,800 UJ	1,600 UJ	31 UJ	17 UJ	29 UJ	1,800 UJ
Tetrachloroethene	1,200	6 UJ	6 U	1,400	820 U	7 UJ	7 U	7 UJ	880 U
Toluene	1,600,000	6 UJ	6 U	880 U	820 U	7 UJ	7 U	7 UJ	880 U
Trichloroethene	1,600	8 J	5 J	25,000 J	34,000	56 J	11 J	14 J	94,000
Xylene, total	1,600,000	6 UJ	6 U	880 U	820 U	6 J	7 U	7 UJ	880 U
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	--	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-099		BG-102/102S	BG-110/110S	BG-112			BG-113
		HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113
Sample ID		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
Benzo(a)anthracene	870	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	87	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	870	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	8,700	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	87,000	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	310,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	NA	NA

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-099		BG-102/102S	BG-110/110S	BG-112			BG-113
		HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113
Sample ID		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>									
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>									
Aluminum	7,800	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	3.1	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.43	NA	NA	NA	NA	NA	NA	NA	NA
Barium	550	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7.8	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	23	NA	NA	NA	NA	NA	NA	NA	NA

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U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-099		BG-102/102S	BG-110/110S	BG-112		BG-113	
		HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113
Sample ID		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Sample Date									
Chemical Name									
Cobalt	160	NA	NA	NA	NA	NA	NA	NA	NA
Copper	310	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	160	NA	NA	NA	NA	NA	NA	NA	NA
Iron	2,300	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	160	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	2.3	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	160	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	39	NA	NA	NA	NA	NA	NA	NA	NA
Silver	39	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	--	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.55	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7.8	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,300	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one or

NA - Not analyzed

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-134	BG-135	BG-136	BG-137	BG-138		BG-139	BG-140
Sample ID		HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP	HCS-BG-139	HCS-BG-140
Sample Date		11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	440 J	11 UJ	56 U	190 J	460 J	470 J	1,800 U	3 J
1,1-Dichloroethene	390,000	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U	1,800 U	4 J
1,2-Dichloroethene (total)	70,000	2,300	11 U	11 J	12 UJ	1,300 J	1,200 J	1,800 U	2 J
2-Butanone	4,700,000	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U	1,800 U	12 U
4-Methyl-2-pentanone	--	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U	1,800 U	12 UJ
Acetone	7,000,000	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U	1,800 U	12 U
Benzene	12,000	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U	1,800 U	5 J
Bromomethane	11,000	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U	1,800 U	12 U
Carbon disulfide	780,000	1,500 U	11 U	56 R	12 UJ	1,700 U	1,600 U	1,800 U	12 UJ
Chlorobenzene	160,000	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U	1,800 U	2 J
Chloromethane	--	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U	570 J	12 U
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	85,000	1,500 U	11 U	57 U	12 UJ	1,700 U	1,600 U	1,800 U	12 U
Tetrachloroethene	1,200	1,500 U	2 J	56 U	12 UJ	1,700 U	1,600 U	1,800 U	12 UJ
Toluene	1,600,000	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U	1,800 U	2 J
Trichloroethene	1,600	230,000	73	730	7 J	140,000	120,000	4,400	41
Xylene, total	1,600,000	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U	1,800 U	12 UJ
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	--	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-134	BG-135	BG-136	BG-137	BG-138		BG-139	BG-140
Sample ID		HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP	HCS-BG-139	HCS-BG-140
Sample Date		11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94
Chemical Name									
Benzo(a)anthracene	870	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	87	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	870	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	8,700	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	87,000	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	780,000	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	310,000	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	160,000	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	230,000	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

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R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-134	BG-135	BG-136	BG-137	BG-138		BG-139	BG-140
Sample ID	Residential	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP	HCS-BG-139	HCS-BG-140
Sample Date	Adjusted	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>									
HMX	390,000	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>									
Aluminum	7,800	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	3.1	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	0.43	NA	NA	NA	NA	NA	NA	NA	NA
Barium	550	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	16	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	7.8	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	23	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-134	BG-135	BG-136	BG-137	BG-138		BG-139	BG-140
Sample ID	Residential	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP	HCS-BG-139	HCS-BG-140
Sample Date	Adjusted	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94
Chemical Name									
Cobalt	160	NA	NA	NA	NA	NA	NA	NA	NA
Copper	310	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	160	NA	NA	NA	NA	NA	NA	NA	NA
Iron	2,300	NA	NA	NA	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	160	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	2.3	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	160	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	39	NA	NA	NA	NA	NA	NA	NA	NA
Silver	39	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	--	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.55	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	7.8	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2,300	NA	NA	NA	NA	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA	NA	NA

Exceeds one or

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U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148	BG-149
Sample ID	Residential	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148	HCS-BG-149
Sample Date	Adjusted	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	2,200,000	2 J	30 J	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
1,1-Dichloroethene	390,000	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
1,2-Dichloroethene (total)	70,000	12 UJ	12 J	12 U	12 U	1 J	1,600 U	840 J	24,000	1,500 U
2-Butanone	4,700,000	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
4-Methyl-2-pentanone	--	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Acetone	7,000,000	12 UJ	12 UJ	12 U	12 U	12	1,600 U	1,800 U	1,600 U	1,500 U
Benzene	12,000	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Bromomethane	11,000	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Carbon disulfide	780,000	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Chlorobenzene	160,000	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Chloromethane	--	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Methyl acetate	7,800,000	NA								
Methylene chloride	85,000	17 J	8 J	2 J	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
Tetrachloroethene	1,200	12 UJ	12 UJ	12 UJ	12 U	12 U	2,200	480 J	160 J	1,500 U
Toluene	1,600,000	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	210 J	1,500 U
Trichloroethene	1,600	5 J	160 J	15	28	12	20,000	53,000	64,000	6,400
Xylene, total	1,600,000	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U	1,500 U
cis-1,2-Dichloroethene	78,000	NA								
trans-1,2-Dichloroethene	160,000	NA								
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	390,000	NA								
2-Methylnaphthalene	31,000	NA								
3- and 4-Methylphenol	39,000	NA								
Acenaphthene	470,000	NA								
Acenaphthylene	--	NA								
Acetophenone	780,000	NA								
Anthracene	2,300,000	NA								
Benzaldehyde	780,000	NA								

NA - Not analyzed

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148	BG-149
Sample ID	Residential	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148	HCS-BG-149
Sample Date	Adjusted	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
Benzo(a)anthracene	870	NA								
Benzo(a)pyrene	87	NA								
Benzo(b)fluoranthene	870	NA								
Benzo(g,h,i)perylene	230,000	NA								
Benzo(k)fluoranthene	8,700	NA								
Caprolactam	3,900,000	NA								
Carbazole	32,000	NA								
Chrysene	87,000	NA								
Di-n-butylphthalate	780,000	NA								
Dibenz(a,h)anthracene	87	NA								
Dibenzofuran	16,000	NA								
Diethylphthalate	6,300,000	NA								
Fluoranthene	310,000	NA								
Fluorene	310,000	NA								
Indeno(1,2,3-cd)pyrene	870	NA								
Naphthalene	160,000	NA								
Phenanthrene	230,000	NA								
Pyrene	230,000	NA								
bis(2-Ethylhexyl)phthalate	46,000	NA								
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA								
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA								
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA								
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA								
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA								
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA								
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA								
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA								
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA								

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

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L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148	BG-149
Sample ID	Residential	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148	HCS-BG-149
Sample Date	Adjusted	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA								
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA								
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA								
2,3,7,8-TCDD (dioxin)	0.0043	NA								
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA								
Octachlorodibenzo-p-dioxin	43	NA								
Octachlorodibenzofuran	43	NA								
Total heptachlorodibenzo-p-dioxin	--	NA								
Total heptachlorodibenzofuran	--	NA								
Total hexachlorodibenzo-p-dioxin	--	NA								
Total hexachlorodibenzofuran	--	NA								
Total pentachlorodibenzo-p-dioxin	--	NA								
Total pentachlorodibenzofuran	--	NA								
Total tetrachlorodibenzo-p-dioxin	--	NA								
Total tetrachlorodibenzofuran	--	NA								
Explosives (UG/KG)										
HMX	390,000	NA								
Nitroglycerin	46,000	NA								
Perchlorate	5,500	NA								
RDX	5,800	NA								
Total Metals (MG/KG)										
Aluminum	7,800	NA								
Antimony	3.1	NA								
Arsenic	0.43	NA								
Barium	550	NA								
Beryllium	16	NA								
Cadmium	7.8	NA								
Calcium	--	NA								
Chromium	23	NA								

NA - Not analyzed

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148	BG-149
Sample ID	Residential	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148	HCS-BG-149
Sample Date	Adjusted	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
Cobalt	160	NA								
Copper	310	NA								
Cyanide	160	NA								
Iron	2,300	NA								
Lead	400	NA								
Magnesium	--	NA								
Manganese	160	NA								
Mercury	2.3	NA								
Nickel	160	NA								
Potassium	--	NA								
Selenium	39	NA								
Silver	39	NA								
Sodium	--	NA								
Thallium	0.55	NA								
Vanadium	7.8	NA								
Zinc	2,300	NA								
Wet Chemistry (MG/KG)										
% Moisture	--	NA								
Total organic carbon (TOC)	--	NA								
pH	--	NA								

Exceeds one or

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID		HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date		11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	2,200,000	1,500 U	12 U	11 U						
1,1-Dichloroethene	390,000	1,500 U	12 U	11 U						
1,2-Dichloroethene (total)	70,000	1,500 U	12 U	11 U	11 U	52	11 U	7,100	11 U	11 U
2-Butanone	4,700,000	1,500 U	12 U	11 U						
4-Methyl-2-pentanone	--	1,500 U	12 U	11 U						
Acetone	7,000,000	1,500 U	12 U	11 U	11 U	11 U	3 J	11 U	11 U	11 U
Benzene	12,000	1,500 U	12 U	11 U						
Bromomethane	11,000	1,500 U	3 J	11 U						
Carbon disulfide	780,000	1,500 U	12 U	11 U						
Chlorobenzene	160,000	1,500 U	12 U	11 U						
Chloromethane	--	1,300 J	12 U	11 U						
Methyl acetate	7,800,000	NA								
Methylene chloride	85,000	1,500 U	12 U	11 U	3 J	6 J	4 J	11 U	11 U	11 U
Tetrachloroethene	1,200	1,500 U	1 J	11 U						
Toluene	1,600,000	1,500 U	12 U	11 U						
Trichloroethene	1,600	17,000	12 U	11 U	11 U	900	11 U	46,000	21	57
Xylene, total	1,600,000	1,500 U	12 U	11 U						
cis-1,2-Dichloroethene	78,000	NA								
trans-1,2-Dichloroethene	160,000	NA								
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	390,000	NA								
2-Methylnaphthalene	31,000	360 U	NA							
3- and 4-Methylphenol	39,000	NA								
Acenaphthene	470,000	360 U	NA							
Acenaphthylene	--	360 U	NA							
Acetophenone	780,000	NA								
Anthracene	2,300,000	360 U	NA							
Benzaldehyde	780,000	NA								

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID		HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date		11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Benzo(a)anthracene	870	77 J	NA							
Benzo(a)pyrene	87	74 J	NA							
Benzo(b)fluoranthene	870	360 U	NA							
Benzo(g,h,i)perylene	230,000	360 U	NA							
Benzo(k)fluoranthene	8,700	180 J	NA							
Caprolactam	3,900,000	NA								
Carbazole	32,000	360 U	NA							
Chrysene	87,000	110 J	NA							
Di-n-butylphthalate	780,000	360 U	NA							
Dibenz(a,h)anthracene	87	360 U	NA							
Dibenzofuran	16,000	360 U	NA							
Diethylphthalate	6,300,000	360 U	NA							
Fluoranthene	310,000	190 J	NA							
Fluorene	310,000	360 U	NA							
Indeno(1,2,3-cd)pyrene	870	360 U	NA							
Naphthalene	160,000	360 U	NA							
Phenanthrene	230,000	130 J	NA							
Pyrene	230,000	140 J	NA							
bis(2-Ethylhexyl)phthalate	46,000	420 UJ	NA							
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA								
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA								
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA								
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA								
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA								
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA								
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA								
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA								
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA								
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA								

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID		HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date		11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA								
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA								
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA								
2,3,7,8-TCDD (dioxin)	0.0043	NA								
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA								
Octachlorodibenzo-p-dioxin	43	NA								
Octachlorodibenzofuran	43	NA								
Total heptachlorodibenzo-p-dioxin	--	NA								
Total heptachlorodibenzofuran	--	NA								
Total hexachlorodibenzo-p-dioxin	--	NA								
Total hexachlorodibenzofuran	--	NA								
Total pentachlorodibenzo-p-dioxin	--	NA								
Total pentachlorodibenzofuran	--	NA								
Total tetrachlorodibenzo-p-dioxin	--	NA								
Total tetrachlorodibenzofuran	--	NA								
Explosives (UG/KG)										
HMX	390,000	NA								
Nitroglycerin	46,000	NA								
Perchlorate	5,500	NA								
RDX	5,800	NA								
Total Metals (MG/KG)										
Aluminum	7,800	4,510	NA							
Antimony	3.1	5.90 UJ	NA							
Arsenic	0.43	8.30 J	NA							
Barium	550	74.7	NA							
Beryllium	16	1.20	NA							
Cadmium	7.8	2.10 U	NA							
Calcium	--	3,050	NA							
Chromium	23	8.80	NA							

NA - Not analyzed

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J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID	Residential	HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date	Adjusted	11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Cobalt	160	20.2	NA							
Copper	310	31.3	NA							
Cyanide	160	1.10 U	NA							
Iron	2,300	25,200	NA							
Lead	400	30.4	NA							
Magnesium	--	642 B	NA							
Manganese	160	534	NA							
Mercury	2.3	0.220	NA							
Nickel	160	31.3	NA							
Potassium	--	481 B	NA							
Selenium	39	0.470 B	NA							
Silver	39	2.10 J	NA							
Sodium	--	31.3 U	NA							
Thallium	0.55	0.560 U	NA							
Vanadium	7.8	17.3	NA							
Zinc	2,300	124 J	NA							
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	--	NA								
Total organic carbon (TOC)	--	NA								
pH	--	NA								

Exceeds one or

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172
		HCS-BG-163 10/27/98	HCS-BG-164 10/27/98	HCS-BG-166 10/27/98	HCS-BG-167 10/27/98	HCS-BG-168 10/27/98	HCS-BG-169 10/27/98	HCS-BG-170 10/27/98	HCS-BG-172 10/27/98
<b>Chemical Name</b>									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	2,200,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
1,1-Dichloroethane	390,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
1,2-Dichloroethane (total)	70,000	11 U	11 U	3 J	11 U	3 J	11 U	11 U	11 U
2-Butanone	4,700,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
4-Methyl-2-pentanone	--	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Acetone	7,000,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Benzene	12,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Bromomethane	11,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Carbon disulfide	780,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Chlorobenzene	160,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Chloromethane	--	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Methyl acetate	7,800,000	NA							
Methylene chloride	85,000	3 J	11 U	7 J	4 J	13 U	11 U	11 U	12
Tetrachloroethene	1,200	11 U	11 U	11 U	11 U	13 U	11 U	11 U	41
Toluene	1,600,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
Trichloroethene	1,600	21	4 J	92,000	51,000	720	11 U	8 J	700
Xylene, total	1,600,000	11 U	11 U	11 U	11 U	13 U	11 U	11 U	11 U
cis-1,2-Dichloroethene	78,000	NA							
trans-1,2-Dichloroethene	160,000	NA							
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	390,000	NA							
2-Methylnaphthalene	31,000	NA							
3- and 4-Methylphenol	39,000	NA							
Acenaphthene	470,000	NA							
Acenaphthylene	--	NA							
Acetophenone	780,000	NA							
Anthracene	2,300,000	NA							
Benzaldehyde	780,000	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172
		HCS-BG-163 10/27/98	HCS-BG-164 10/27/98	HCS-BG-166 10/27/98	HCS-BG-167 10/27/98	HCS-BG-168 10/27/98	HCS-BG-169 10/27/98	HCS-BG-170 10/27/98	HCS-BG-172 10/27/98
<b>Chemical Name</b>									
Benzo(a)anthracene	870	NA							
Benzo(a)pyrene	87	NA							
Benzo(b)fluoranthene	870	NA							
Benzo(g,h,i)perylene	230,000	NA							
Benzo(k)fluoranthene	8,700	NA							
Caprolactam	3,900,000	NA							
Carbazole	32,000	NA							
Chrysene	87,000	NA							
Di-n-butylphthalate	780,000	NA							
Dibenz(a,h)anthracene	87	NA							
Dibenzofuran	16,000	NA							
Diethylphthalate	6,300,000	NA							
Fluoranthene	310,000	NA							
Fluorene	310,000	NA							
Indeno(1,2,3-cd)pyrene	870	NA							
Naphthalene	160,000	NA							
Phenanthrene	230,000	NA							
Pyrene	230,000	NA							
bis(2-Ethylhexyl)phthalate	46,000	NA							
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA							
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA							
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA							
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA							
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA							
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA							
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA							
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA							
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172
		HCS-BG-163	HCS-BG-164	HCS-BG-166	HCS-BG-167	HCS-BG-168	HCS-BG-169	HCS-BG-170	HCS-BG-172
Sample ID		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Sample Date									
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA							
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA							
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA							
2,3,7,8-TCDD (dioxin)	0.0043	NA							
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA							
Octachlorodibenzo-p-dioxin	43	NA							
Octachlorodibenzofuran	43	NA							
Total heptachlorodibenzo-p-dioxin	--	NA							
Total heptachlorodibenzofuran	--	NA							
Total hexachlorodibenzo-p-dioxin	--	NA							
Total hexachlorodibenzofuran	--	NA							
Total pentachlorodibenzo-p-dioxin	--	NA							
Total pentachlorodibenzofuran	--	NA							
Total tetrachlorodibenzo-p-dioxin	--	NA							
Total tetrachlorodibenzofuran	--	NA							
<b>Explosives (UG/KG)</b>									
HMX	390,000	NA							
Nitroglycerin	46,000	NA							
Perchlorate	5,500	NA							
RDX	5,800	NA							
<b>Total Metals (MG/KG)</b>									
Aluminum	7,800	NA							
Antimony	3.1	NA							
Arsenic	0.43	NA							
Barium	550	NA							
Beryllium	16	NA							
Cadmium	7.8	NA							
Calcium	--	NA							
Chromium	23	NA							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172
		HCS-BG-163 10/27/98	HCS-BG-164 10/27/98	HCS-BG-166 10/27/98	HCS-BG-167 10/27/98	HCS-BG-168 10/27/98	HCS-BG-169 10/27/98	HCS-BG-170 10/27/98	HCS-BG-172 10/27/98
<b>Chemical Name</b>									
Cobalt	160	NA							
Copper	310	NA							
Cyanide	160	NA							
Iron	2,300	NA							
Lead	400	NA							
Magnesium	--	NA							
Manganese	160	NA							
Mercury	2.3	NA							
Nickel	160	NA							
Potassium	--	NA							
Selenium	39	NA							
Silver	39	NA							
Sodium	--	NA							
Thallium	0.55	NA							
Vanadium	7.8	NA							
Zinc	2,300	NA							
<b>Wet Chemistry (MG/KG)</b>									
% Moisture	--	NA							
Total organic carbon (TOC)	--	NA							
pH	--	NA							

Exceeds one or

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 K - Reported value may be biased high  
 L - Reported value may be biased low

R - Unreliable result  
 U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-173	BG-174	BG-175/176		BG-177/178	
Sample ID		HCS-BG-173	HCS-BG-174	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2,200,000	11 U					
1,1-Dichloroethane	390,000	11 U					
1,2-Dichloroethene (total)	70,000	11 U	6 J	11 U	11 U	11 U	11 U
2-Butanone	4,700,000	11 U					
4-Methyl-2-pentanone	--	11 U					
Acetone	7,000,000	11 U					
Benzene	12,000	11 U					
Bromomethane	11,000	11 U					
Carbon disulfide	780,000	11 U					
Chlorobenzene	160,000	11 U					
Chloromethane	--	11 U					
Methyl acetate	7,800,000	NA	NA	NA	NA	NA	NA
Methylene chloride	85,000	3 J	2 J	11 U	11 U	11 U	11 U
Tetrachloroethene	1,200	4 J	11 U				
Toluene	1,600,000	11 U					
Trichloroethene	1,600	390	360,000	99	530	42	160
Xylene, total	1,600,000	11 U					
cis-1,2-Dichloroethene	78,000	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	160,000	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	390,000	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	31,000	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	39,000	NA	NA	NA	NA	NA	NA
Acenaphthene	470,000	NA	NA	NA	NA	NA	NA
Acenaphthylene	--	NA	NA	NA	NA	NA	NA
Acetophenone	780,000	NA	NA	NA	NA	NA	NA
Anthracene	2,300,000	NA	NA	NA	NA	NA	NA
Benzaldehyde	780,000	NA	NA	NA	NA	NA	NA

NA - Not analyzed

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J - Reported value is estimated

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TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-173	BG-174	BG-175/176		BG-177/178	
Sample ID		HCS-BG-173	HCS-BG-174	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name							
Benzo(a)anthracene	870	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	87	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	870	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	230,000	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	8,700	NA	NA	NA	NA	NA	NA
Caprolactam	3,900,000	NA	NA	NA	NA	NA	NA
Carbazole	32,000	NA	NA	NA	NA	NA	NA
Chrysene	87,000	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	780,000	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	87	NA	NA	NA	NA	NA	NA
Dibenzofuran	16,000	NA	NA	NA	NA	NA	NA
Diethylphthalate	6,300,000	NA	NA	NA	NA	NA	NA
Fluoranthene	310,000	NA	NA	NA	NA	NA	NA
Fluorene	310,000	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	870	NA	NA	NA	NA	NA	NA
Naphthalene	160,000	NA	NA	NA	NA	NA	NA
Phenanthrene	230,000	NA	NA	NA	NA	NA	NA
Pyrene	230,000	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	46,000	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.43	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.43	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.043	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0043	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-173	BG-174	BG-175/176		BG-177/178	
		HCS-BG-173 10/27/98	HCS-BG-174 10/27/98	HCS-BG-175 10/27/98	HCS-BG-176 10/27/98	HCS-BG-177 10/27/98	HCS-BG-178 10/27/98
<b>Chemical Name</b>							
1,2,3,7,8-Pentachlorodibenzofuran	0.085	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0085	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	0.0043	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.043	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	43	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	43	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	--	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	--	NA	NA	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>							
HMX	390,000	NA	NA	NA	NA	NA	NA
Nitroglycerin	46,000	NA	NA	NA	NA	NA	NA
Perchlorate	5,500	NA	NA	NA	NA	NA	NA
RDX	5,800	NA	NA	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>							
Aluminum	7,800	NA	NA	NA	NA	NA	NA
Antimony	3.1	NA	NA	NA	NA	NA	NA
Arsenic	0.43	NA	NA	NA	NA	NA	NA
Barium	550	NA	NA	NA	NA	NA	NA
Beryllium	16	NA	NA	NA	NA	NA	NA
Cadmium	7.8	NA	NA	NA	NA	NA	NA
Calcium	--	NA	NA	NA	NA	NA	NA
Chromium	23	NA	NA	NA	NA	NA	NA

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-8

Exceedance of Adjusted Residential Soil RBC, Outside Active Burnin

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory

Rocket Center, West Virginia

Station ID	RBC-Soil Residential Adjusted	BG-173	BG-174	BG-175/176		BG-177/178	
Sample ID		HCS-BG-173	HCS-BG-174	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name							
Cobalt	160	NA	NA	NA	NA	NA	NA
Copper	310	NA	NA	NA	NA	NA	NA
Cyanide	160	NA	NA	NA	NA	NA	NA
Iron	2,300	NA	NA	NA	NA	NA	NA
Lead	400	NA	NA	NA	NA	NA	NA
Magnesium	--	NA	NA	NA	NA	NA	NA
Manganese	160	NA	NA	NA	NA	NA	NA
Mercury	2.3	NA	NA	NA	NA	NA	NA
Nickel	160	NA	NA	NA	NA	NA	NA
Potassium	--	NA	NA	NA	NA	NA	NA
Selenium	39	NA	NA	NA	NA	NA	NA
Silver	39	NA	NA	NA	NA	NA	NA
Sodium	--	NA	NA	NA	NA	NA	NA
Thallium	0.55	NA	NA	NA	NA	NA	NA
Vanadium	7.8	NA	NA	NA	NA	NA	NA
Zinc	2,300	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)							
% Moisture	--	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	NA	NA	NA	NA	NA	NA
pH	--	NA	NA	NA	NA	NA	NA

Exceeds one or

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

TABLE 4-9

Background Concentrations in Soil  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

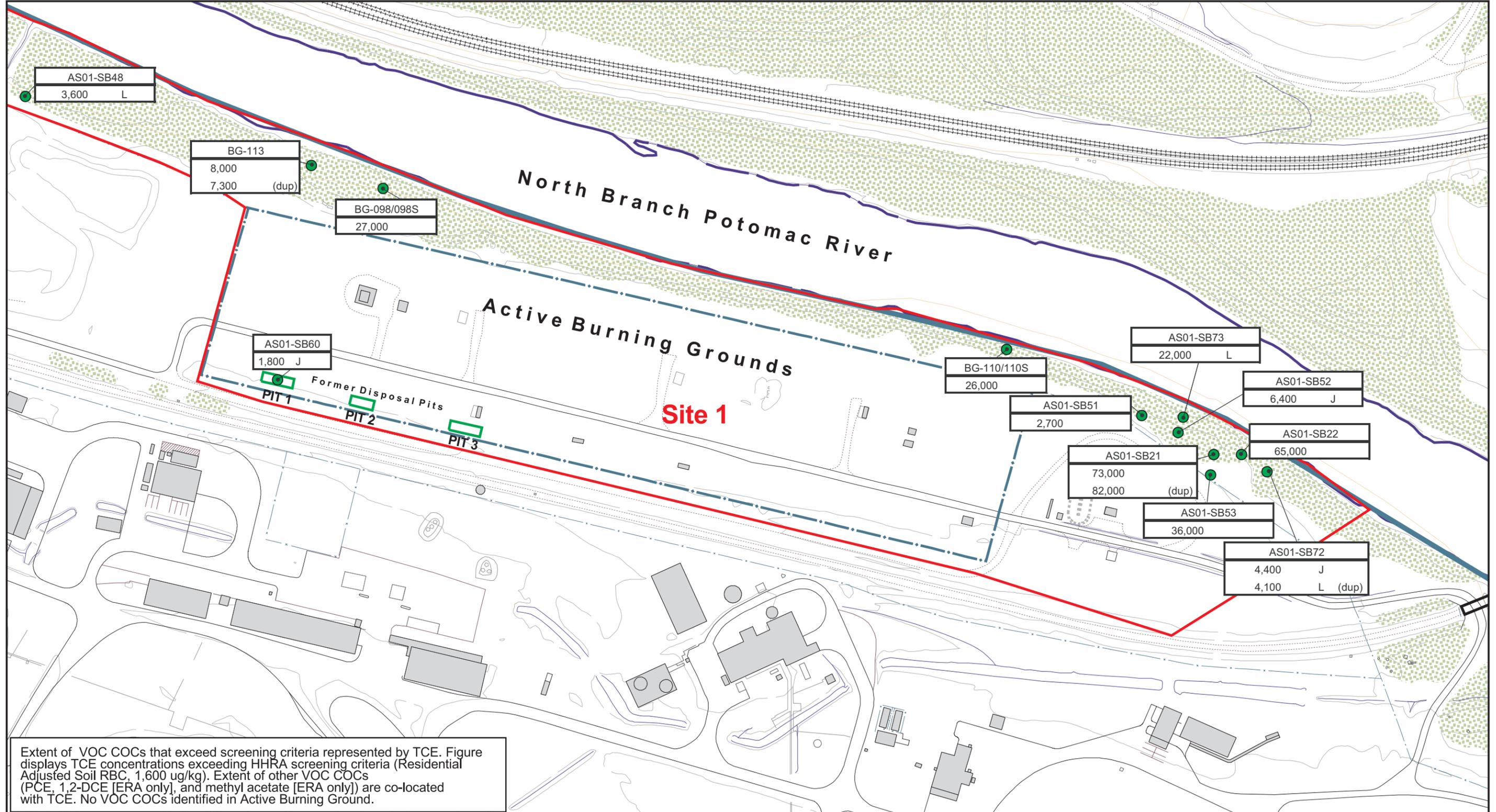
Matrix <sup>1†</sup>	Parameter	Background LTL (mg/kg)	Background UTL (mg/kg)	Assumed Distribution for UTL	UTL Percentile Estimated	Normality p-value	Lognormality p-value	95% UCL (of the mean)	Method of UCL Calculation
SS/SB	Aluminum	3,330	7,970	Normal	95	0.122	0.078	5900	Normal
SS/SB	Antimony	0.42	1.2	Nonparametric	95	0.000	0.000	0.36	Bootstrap t
SS/SB	Arsenic	3.3	10.9	Nonparametric	95	0.000	0.004	5.88	Bootstrap t
SS	Barium	62.8	203	Normal	95	0.634	0.396	143	Normal
SB	Barium	43.7	138	Lognormal	95	0.641	0.650	86.5	Normal
SS	Beryllium	0.575	1.21	Lognormal	95	0.242	0.682	0.892	Normal
SB	Beryllium	0.431	0.92	Lognormal	95	0.391	0.832	0.673	Normal
SS	Cadmium	0.0124	0.55	Normal	95	0.181	0.000	0.319	Normal
SB	Cadmium	0.00	0.34	Normal	95	0.226	0.000	0.187	Normal
SS	Calcium	322	3,060	Lognormal	95	0.000	0.061	1380	Bootstrap t
SB	Calcium	268	1,230	Normal	95	0.655	0.033	819	Normal
SS/SB	Chromium	7.53	13.9	Lognormal	95	0.005	0.158	10.7	Bootstrap t
SS/SB	Cobalt	6.1	20.9	Nonparametric	95	0.000	0.004	12.4	Bootstrap t
SS/SB	Copper	6.9	36.7	Nonparametric	95	0.000	0.000	16.2	Bootstrap t
SS	Cyanide, Total	0.061	0.31	Nonparametric	90	0.000	0.001	0.126	Bootstrap t
SB	Cyanide, Total	0.061	0.32	Nonparametric	90	0.000	0.000	0.0807	Bootstrap t
SS	Iron	16,600	27,900	Lognormal	95	0.126	0.366	22500	Normal
SB	Iron	16,200	30,900	Normal	95	0.356	0.164	24600	Normal
SS	Lead	10.8	44.4	Nonparametric	90	0.000	0.002	23.9	Bootstrap t
SB	Lead	6.3	22.5	Nonparametric	90	0.000	0.019	12.9	Bootstrap t
SS/SB	Magnesium	412	1,930	Nonparametric	95	0.000	0.002	848	Bootstrap t
SS	Manganese	465	1,090	Normal	95	0.712	0.415	819	Normal
SB	Manganese	275	852	Normal	95	0.166	0.068	604	Normal
SS/SB	Mercury	0.023	0.31	Nonparametric	95	0.000	0.000	0.0541	Bootstrap t
SS	Nickel	12.7	32.4	Nonparametric	90	0.000	0.013	20.9	Bootstrap t
SB	Nickel	10.7	23	Lognormal	95	0.025	0.566	17	Bootstrap t
SS/SB	Potassium	517	1,050	Normal	95	0.233	0.002	810	Normal
SS/SB	Selenium	0.27	1.7	Nonparametric	95	0.001	0.000	0.994	Bootstrap t
SS/SB	Sodium	15	31.9	Nonparametric	95	0.000	0.000	11.2	Bootstrap t
SS	Thallium	0.5	2.3	Nonparametric	90	0.000	0.000	1.06	Bootstrap t
SB	Thallium	0.5	2.1	Nonparametric	90	0.000	0.000	0.73	Bootstrap t
SS/SB	Vanadium	9.55	17.8	Normal	95	0.767	0.109	14.1	Normal
SS	Zinc	41.1	136	Nonparametric	90	0.000	0.004	76.3	Bootstrap t
SB	Zinc	36.2	68.6	Lognormal	95	0.355	0.952	52.6	Normal

1: SS = Surface Soil, SB = Subsurface soil, SS/SB = combined surface and subsurface soil

UTL = Upper Tolerance Limit

LTL = Lower Tolerance Limit

Background concentrations for silver are not provided as there were no detections for this constituent.



Extent of VOC COCs that exceed screening criteria represented by TCE. Figure displays TCE concentrations exceeding HHRA screening criteria (Residential Adjusted Soil RBC, 1,600 ug/kg). Extent of other VOC COCs (PCE, 1,2-DCE [ERA only], and methyl acetate [ERA only]) are co-located with TCE. No VOC COCs identified in Active Burning Ground.

- LEGEND**
- TCE Exceedance of HHRA Screening Value
  - ▭ Site 1 Boundary
  - ▬ Active Burning Ground
  - ▬ Former Disposal Pits
  - ▭ Buildings
  - ▬ Dirt Road
  - ▬ Paved Road
  - ▭ Vegetation

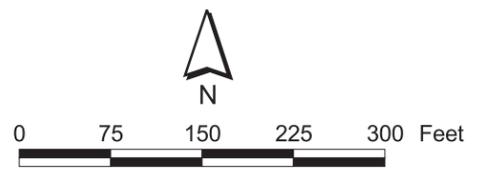
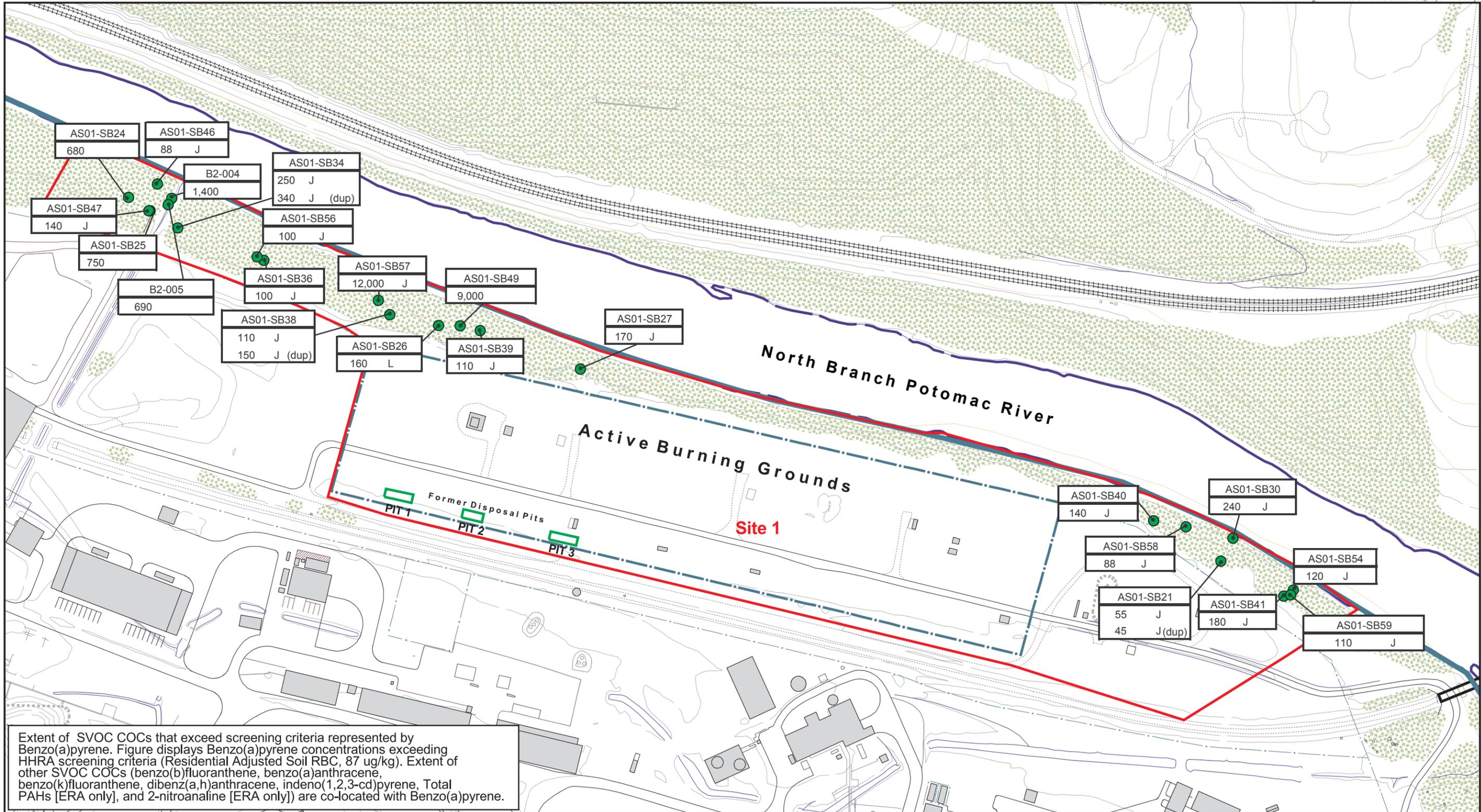


Figure 4-1  
Extent of TCE in Site 1 Surface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**LEGEND**

- Benzo(a)pyrene Exceedance of HHRA Screening Value
- ▭ Site 1 Boundary
- ▭ Active Burning Grounds
- ▭ Former Disposal Pits
- ▭ Buildings
- ▭ Dirt Road
- ▭ Paved Road
- ▭ Vegetation

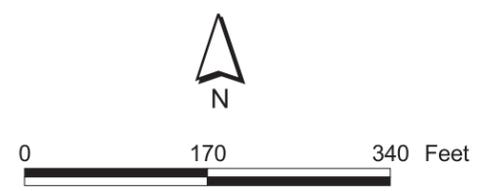
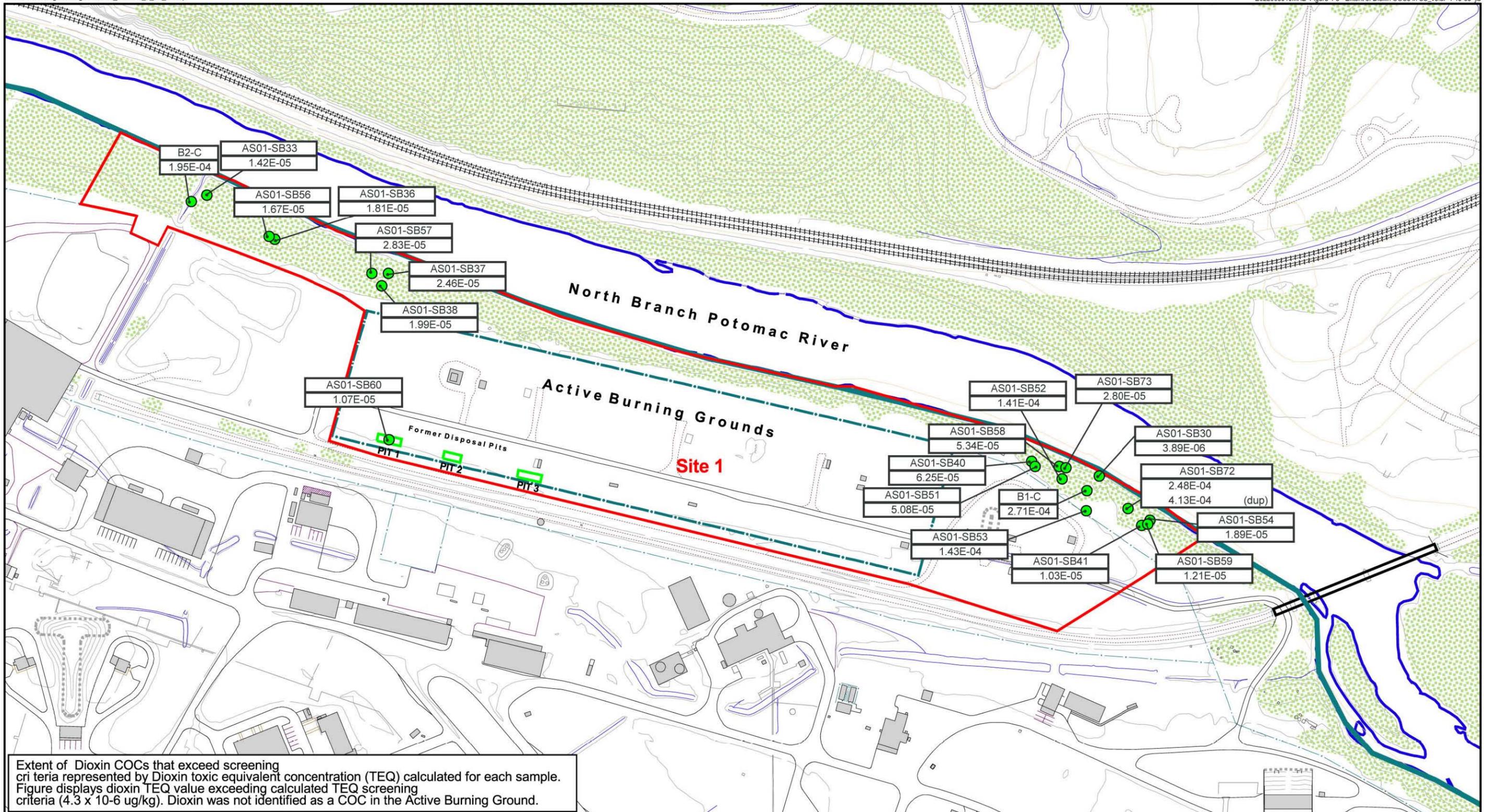


Figure 4-2  
Extent of Benzo(a)pyrene in Site 1 Surface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



- LEGEND**
- Dioxin Exceedance of TEQ Screening Value
  - ▭ Site 1 Boundary
  - ▬ Active Burning Ground
  - ▬ Former Disposal Pits
  - ▭ Buildings
  - ▬ Dirt Road
  - ▬ Paved Road
  - ▭ Vegetation

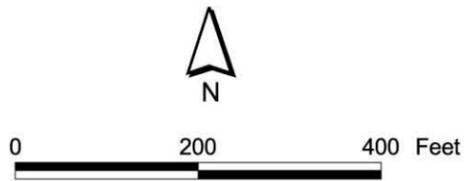
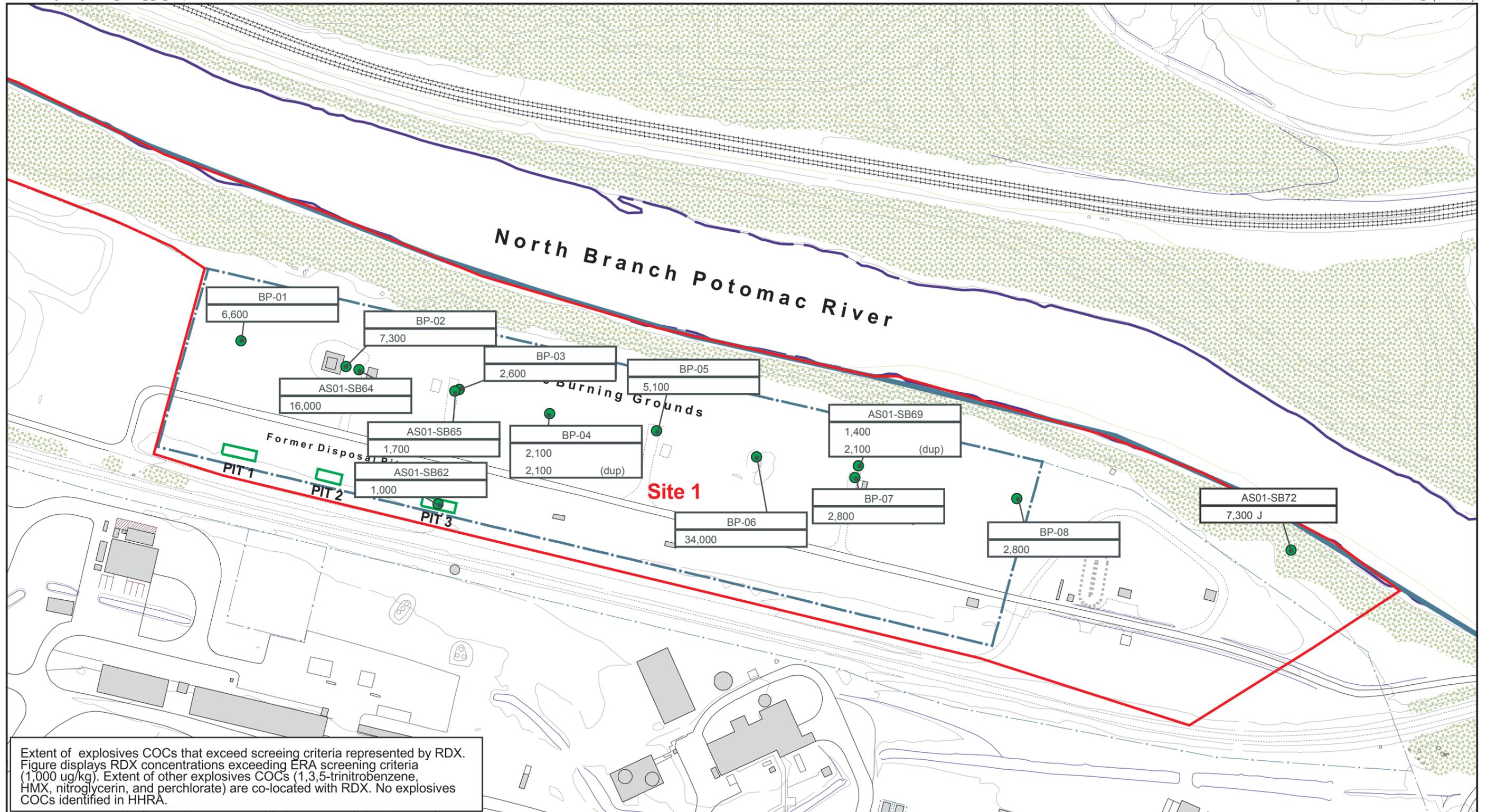


Figure 4-3  
Extent of Dioxin Toxic Equivalent Concentration in Site 1 Surface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia

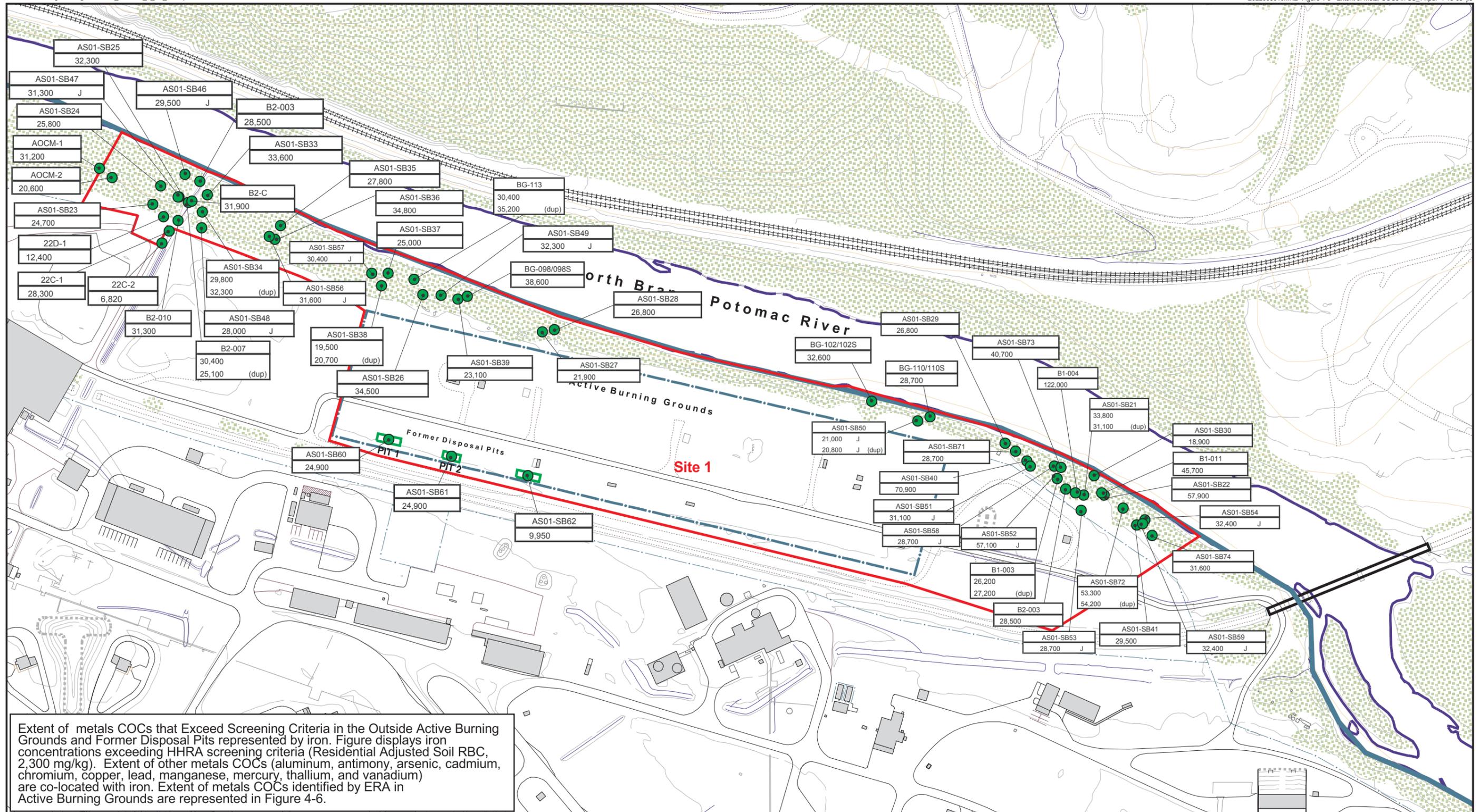


Extent of explosives COCs that exceed screening criteria represented by RDX. Figure displays RDX concentrations exceeding ERA screening criteria (1,000 ug/kg). Extent of other explosives COCs (1,3,5-trinitrobenzene, HMX, nitroglycerin, and perchlorate) are co-located with RDX. No explosives COCs identified in HHRA.

- LEGEND**
- RDX Exceedance of ERA Screening Value
  - ▭ Site 1 Boundary
  - ▬ Active Burning Grounds
  - ▬ Former Disposal Pits
  - ▭ Buildings
  - ▬ Dirt Road
  - ▬ Paved Road
  - ▬ Vegetation



Figure 4-4  
Extent of RDX in Site 1 Surface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



Extent of metals COCs that Exceed Screening Criteria in the Outside Active Burning Grounds and Former Disposal Pits represented by iron. Figure displays iron concentrations exceeding HHRA screening criteria (Residential Adjusted Soil RBC, 2,300 mg/kg). Extent of other metals COCs (aluminum, antimony, arsenic, cadmium, chromium, copper, lead, manganese, mercury, thallium, and vanadium) are co-located with iron. Extent of metals COCs identified by ERA in Active Burning Grounds are represented in Figure 4-6.

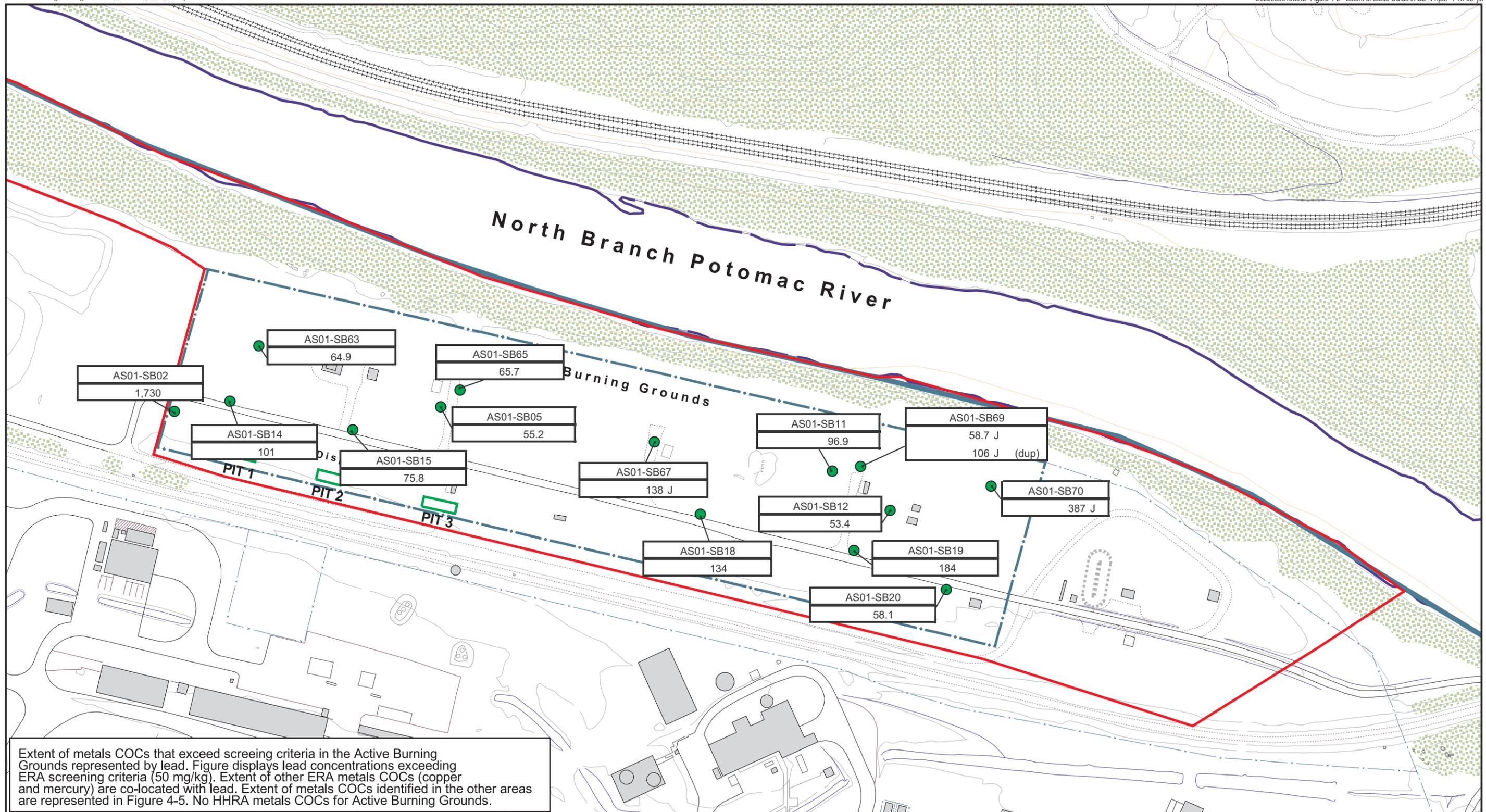
**LEGEND**

- Iron Exceedance of HHRA Screening Value
- ▭ Site 1 Boundary
- ▬ Active Burning Grounds
- ▬ Former Disposal Pits
- ▭ Buildings
- ▭ Dirt Road
- ▭ Paved Road
- ▭ Vegetation



0 200 400 Feet

Figure 4-5  
 Extent of Iron in Site 1 Surface Soil  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia



- LEGEND**
- Lead Exceedance of ERA Screening Value
  - ▭ Site 1 Boundary
  - Active Burning Ground
  - ▭ Former Disposal Pits
  - ▭ Buildings
  - ▭ Dirt Road
  - ▭ Paved Road
  - ▭ Vegetation

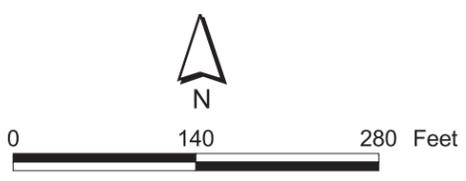
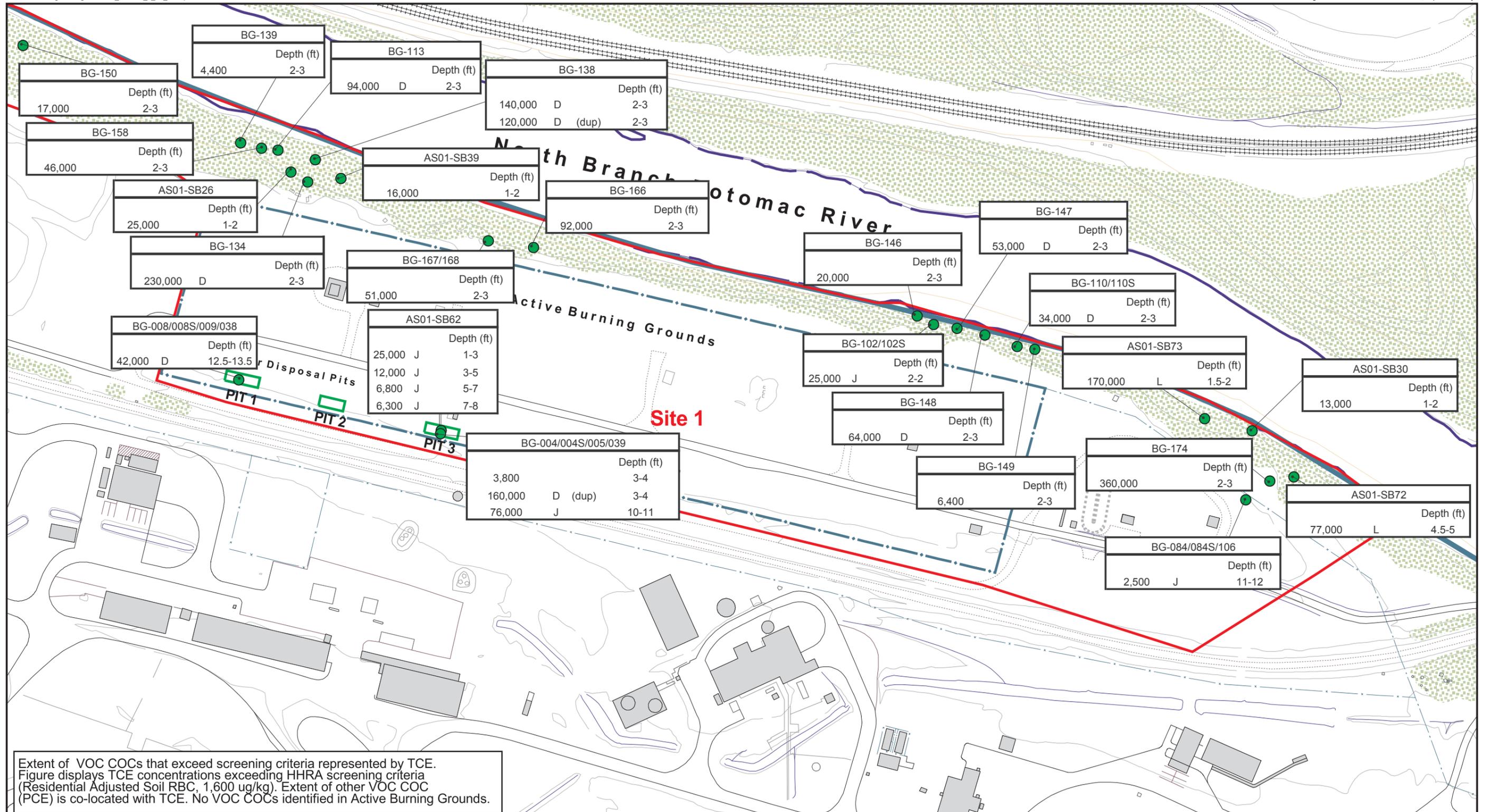


Figure 4-6  
Extent of Lead in Site 1 Surface Soil-ABG  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**LEGEND**  
 ● TCE Exceedance of HHRA Screening Value  
 ■ Site 1 Boundary  
 ~ Active Burning Grounds  
 ~ Former Disposal Pits  
 ■ Buildings  
 ~ Dirt Road  
 ~ Paved Road  
 ~ Vegetation

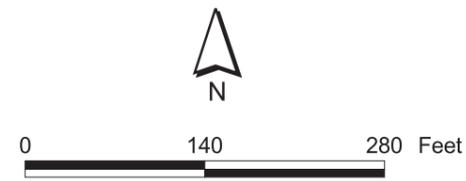
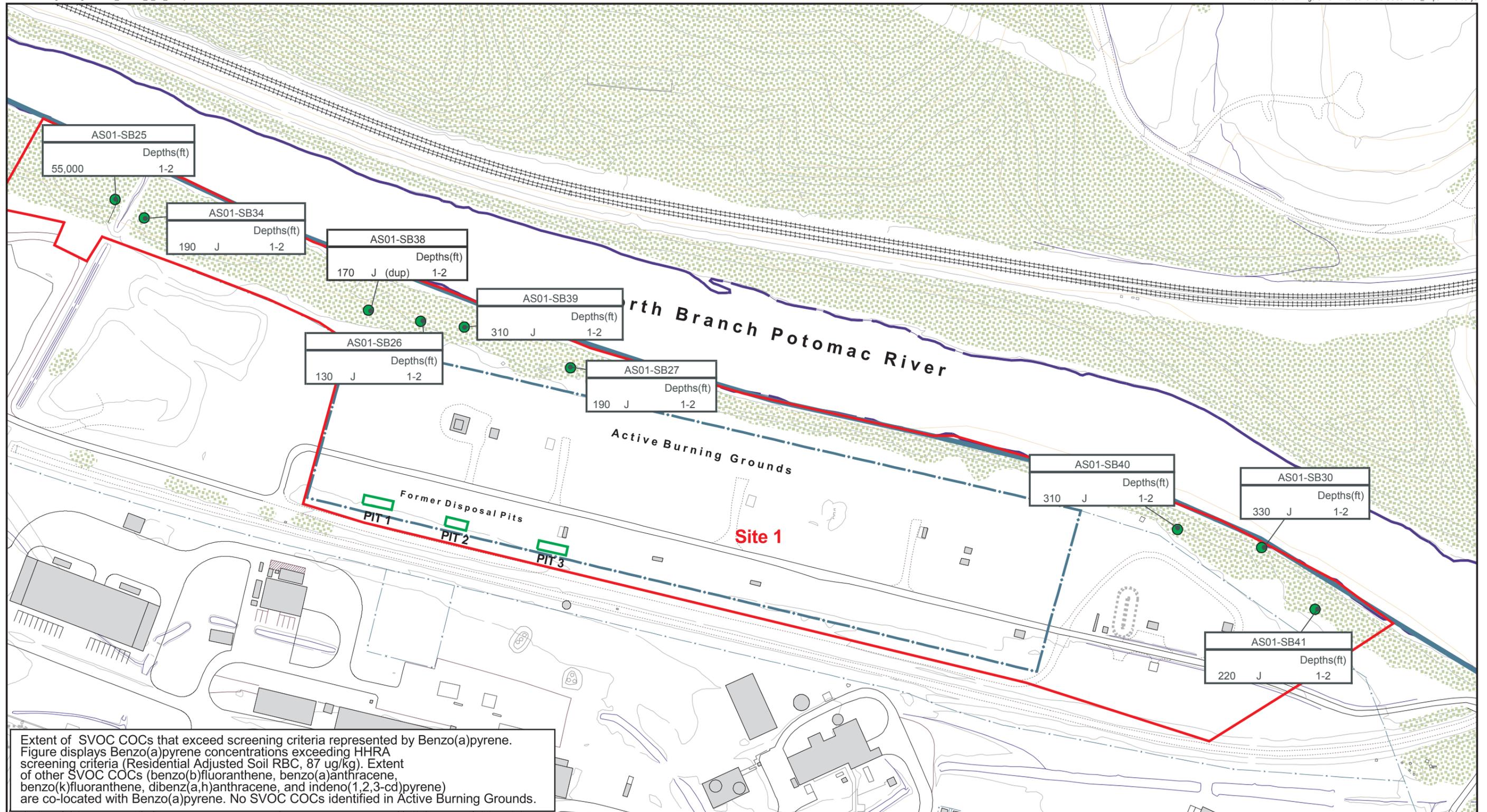


Figure 4-7  
 Extent of TCE in Site 1 Subsurface Soil  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia



Extent of SVOC COCs that exceed screening criteria represented by Benzo(a)pyrene. Figure displays Benzo(a)pyrene concentrations exceeding HHRA screening criteria (Residential Adjusted Soil RBC, 87 ug/kg). Extent of other SVOC COCs (benzo(b)fluoranthene, benzo(a)anthracene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene) are co-located with Benzo(a)pyrene. No SVOC COCs identified in Active Burning Grounds.

- LEGEND**
- Benzo(a)pyrene Exceedance of HHRA Screening Value
  - ▭ Site 1 Boundary
  - ∩ Active Burning Grounds
  - ∩ Former Disposal Pits
  - ▭ Buildings
  - ∩ Dirt Road
  - ∩ Paved Road
  - ∩ Vegetation

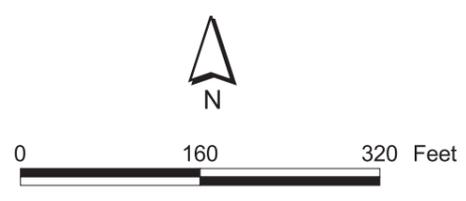
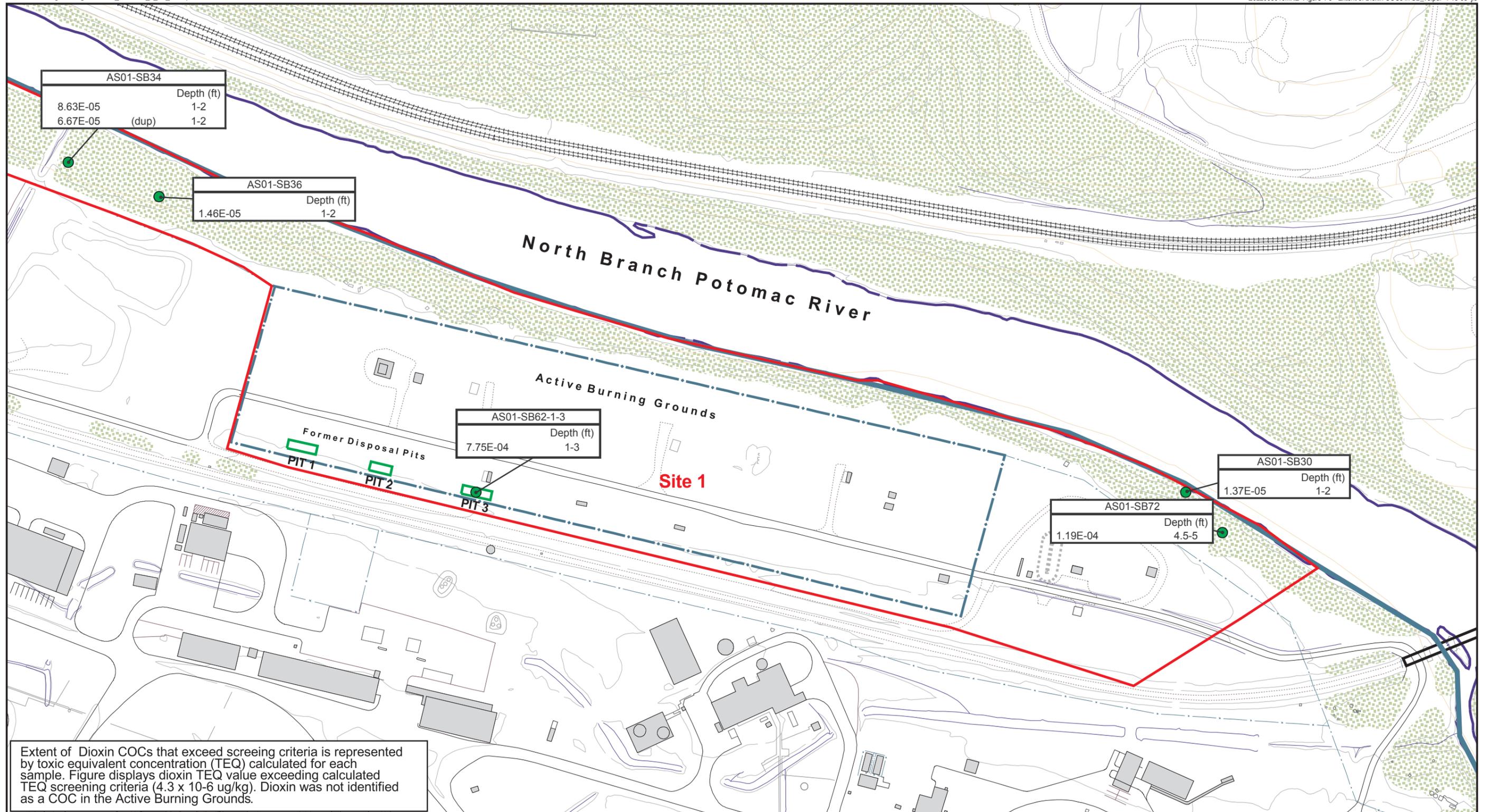


Figure 4-8  
Extent of Benzo(a)pyrene in Site 1 Subsurface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



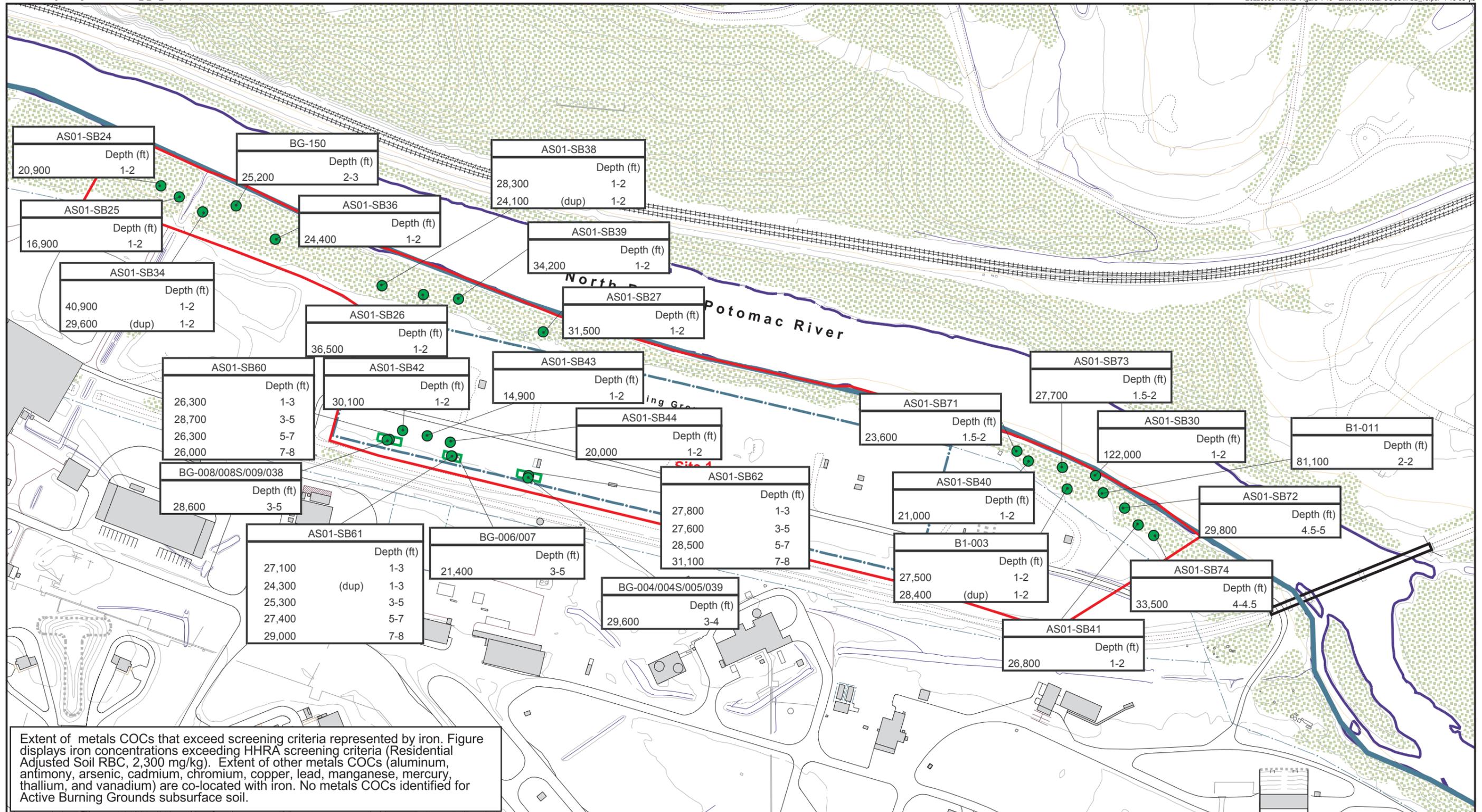
**LEGEND**

- Dioxin TEQ Exceedance of Screening Value
- ▭ Site 1 Boundary
- ▭ Active Burning Grounds
- ▭ Former Disposal Pits
- ▭ Buildings
- ▭ Dirt Road
- ▭ Paved Road
- ▭ Vegetation



0 160 320 Feet

Figure 4-9  
Extent of Dioxin Toxic Equivalent  
Concentration in Site 1 Subsurface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**LEGEND**

- Iron Exceedance of HHRA Screening Value
- ▭ Site 1 Boundary
- ▭ Active Burning Grounds
- ▭ Former Disposal Pits
- ▭ Buildings
- ▭ Dirt Road
- ▭ Paved Road
- ▭ Vegetation



0 200 400 Feet

Figure 4-10  
Extent of Iron in Site 1 Subsurface Soil  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia

# Contaminant Fate and Transport

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This section provides a qualitative discussion of the fate and transport of contaminants identified in Site 1 soil and how these contaminants may be transported to other environmental media.

## 5.1 Chemical and Physical Properties

Mobility and persistence are two key terms used to describe the movement and partitioning of constituents in the environment (air, water, soil). Mobility is the potential for a constituent to migrate through a medium and persistence is a measure of how long a constituent will remain in the environment.

Several physicochemical properties are typically used to predict the mobility and persistence of constituents in media. Principal properties that influence the mobility and persistence include molecular weight, water solubility, vapor pressure, Henry's Law Constant, and carbon/water partition coefficient ( $K_{oc}$ ).

**Molecular Weight:** The molecular weight of a pure compound influences other physical characteristics of a compound. For example, organic compounds with higher molecular weights have less tendency to volatilize than those with lower molecular weights.

**Water Solubility:** Water solubility is the maximum concentration of a constituent that can dissolve in pure water at a given temperature and pH. Water solubility is a critical property affecting the environmental transport of a constituent; highly soluble constituents can be rapidly leached from contaminated soil and are generally mobile in groundwater. The solubility of constituents that are not readily soluble in water, such as metals, can be enhanced in the presence of organic solvents. In general, VOCs have relatively high water solubilities and metals have relatively low water solubilities.

**Vapor Pressure/Henry's Law Constant:** A constituent's tendency to volatilize from water depends on its vapor pressure and water solubility. Highly water-soluble constituents generally volatilize from water less readily than constituents with low water solubility. While vapor pressure is a measure of the volatility of constituents in their pure state, the Henry's Law Constant is the ratio of a constituent's vapor pressure (in atmosphere) to its solubility (in moles/m<sup>3</sup>). The Henry's Law Constant is more accurate than vapor pressure in estimating releases from water to air. Constituents with Henry's Law Constant greater than approximately 10<sup>-3</sup> atmosphere-cubic meters per mole (atm-m<sup>3</sup>/mol) (e.g., VOCs) can be expected to volatilize readily from water, while constituents with values less than 10 atm-m<sup>3</sup>/mol (e.g., SVOCs) will volatilize only to a limited extent.

**Carbon/Water Partition Coefficient ( $K_{oc}$ ):** The  $K_{oc}$  is often used to estimate the extent to which a constituent will partition between organic matter and water. Constituents with low  $K_{oc}$  values (less than 10 milliliters per gram) are found mainly in the water phase, and constituents with high  $K_{oc}$  values tend to adsorb to the soil matrix. The distribution coefficient ( $K_d$ ) is defined as the product of the  $K_{oc}$  and the fraction of organic carbon.

Degradation can occur by both chemical and biological processes. Chemical degradation can occur through such processes as hydrolysis and photolysis. Biological degradation is the biological decomposition or chemical alteration of organic compounds by micro-organisms. Biological degradation occurs most readily among organic compounds, with VOCs typically being more biodegradable than SVOCs. Many organic compounds degrade to compounds that may be more toxic than the parent compound (e.g., TCE degrades to DCE and vinyl chloride). Rates of degradation are available in literature but vary greatly according to the nature and conditions of the experiments used to obtain the data.

Other environmental factors that may affect the mobility and persistence of contaminants include pH, concentration of other constituents in the media, soil moisture, oxidation-reduction potential, water chemistry, organic-matter content, and the presence and types of microorganisms in the subsurface.

## 5.2 Mechanisms of Migration

There are a number of mechanisms by which constituents can migrate from contaminated areas at Site 1 to onsite and offsite receptors. Precipitation infiltration can leach residual contaminants from vadose zone soil to groundwater. Migration of contaminants from surface soil to air can occur via fugitive dust emissions and volatilization. Organic chemical vapors can migrate laterally through the soil via permeable zones or along man-made conduits such as buried utility lines. Surface water runoff or groundwater discharge can lead to contamination of surface water bodies. The potential for contaminants at Site 1 to migrate from soil to other media via these mechanisms is qualitatively discussed in the following subsections.

### 5.2.1 Migration into Air

Transport of contaminants from surface soil to air can occur via dust generation or volatilization. Fugitive dust emissions of contaminated particulates can occur primarily from soil that is not covered by pavement or vegetation. Because the soil surface at Site 1 is predominantly covered with vegetation, the potential for the contaminants in surface soil to be released to air via fugitive dust emission is significantly minimized.

#### 5.2.1.1 VOCs

Volatilization will be the primary transport mechanism of TCE from the surface soil to the air. This transport mechanism is likely enhanced by the high portion of coarse-grain materials in the surface soil of these areas (see Appendix A). It is also likely that volatilization occurs at higher rates during periods with warm air temperatures and windy conditions.

#### 5.2.1.2 SVOCs

SVOCs have a low water solubility and low volatility, relative to VOCs. The constituents tend to be adsorbed to fine-grain soil particles. As a result, fugitive dust emissions may be the primary transport mechanism of these constituents from surface soil to the atmosphere. It is likely that this process occurs at higher rates during dry weather and windy conditions. However, the releases of these constituents from soil to air are considered to be at insignificant levels at Site 1 because of the vegetative cover in these areas.

### 5.2.1.3 Dioxins/Furans

Dioxins/furans have similar properties to SVOCs in terms of their mobility. Therefore, their release from soil to air will be similar to that of SVOCs, which makes their release from soil to air an insignificant pathway at Site 1.

### 5.2.1.4 Explosives

In general, explosive have similar properties to SVOCs in terms of their mobility. Therefore, their release from soil to air will be similar to that of SVOCs, which makes their release from soil to air an insignificant pathway at Site 1.

### 5.2.1.5 Metals

In general, metals have similar properties to SVOCs in terms of their mobility. Therefore, their release from soil to air will be similar to that of SVOCs, which makes their release from soil to air an insignificant pathway at Site 1.

## 5.2.2 Migration into Groundwater

Surface and subsurface soil contamination at Site 1 potentially serves as a source of groundwater contamination. Percolation of both rainfall and snowmelt through the unsaturated, contaminated soil and fill can dissolve certain contaminants, transporting them to the underlying groundwater. The rates of migration by this process vary greatly for different contaminants, depending upon the rate of transfer between the soil and water and the amount of precipitation. Constituents that are the most susceptible to leaching to groundwater are those with high water solubilities and low  $K_{oc}$  values.

### 5.2.2.1 VOCs

Releases of VOCs from soil are the source of VOC groundwater contamination at the site. TCE is heavier than water and thus will tend to migrate vertically downward in groundwater. Discontinuous clay lenses were found throughout the unconsolidated material during drilling and sampling activities. Depending on their thickness and horizontal extent, these clay lenses can impede the downward migration of infiltrating precipitation and, hence, dissolved contamination.

PCE and its daughter products migrate vertically through the soil to the groundwater or preferentially along high permeable layers in the alluvium before ultimately reaching the groundwater.

Once in groundwater, dissolved TCE migrates in the predominant direction of groundwater flow toward the North Branch Potomac River under normal (i.e., non-pumping) conditions. This transport mechanism, however, is prevented by the ongoing groundwater capture at Site 1.

### 5.2.2.2 SVOCs

The water solubilities of SVOCs are significantly lower than those of VOCs. The average vapor pressures and Henry's Law Constant for SVOCs are also orders of magnitude lower than VOCs. These physical properties indicate that, in general, SVOCs are more stable compounds than VOCs and consequently less mobile than VOCs in the environment. In addition, SVOCs typically have much higher  $K_{oc}$  values than VOCs, which suggest their

higher sorptive capacity (preference for the solid [soil]) phase over the water phase and contributing to their relative immobility.

The relatively immobile nature of SVOCs in the environment and relatively low concentrations in soil at Site 1 likely account for their detection only at trace levels in groundwater samples.

### 5.2.2.3 Dioxins/Furans

Like SVOCs, the water solubilities of dioxins/furans are much less than those of VOCs. Consequently, their migration to groundwater is significantly impeded and they would not be expected to be present in groundwater at significant concentrations.

### 5.2.2.4 Explosives

Like SVOCs, the water solubilities of most explosives are much less than those of VOCs. Consequently, their migration to groundwater is significantly impeded and they would not be expected to be present in groundwater at significant concentrations. Transformation, sorption, and mineralization to CO<sub>2</sub> are some of the processes affecting the fate and transport of explosives. Redox potential strongly affects the rate and products resulting from explosives transformation. Sorption can be affected significantly by cation substitution on clay minerals, and competitive sorption can affect the mobility of explosives and their degradation products.

The perchlorate molecule will adhere weakly to soil particles. Because it dissolves readily in water, it moves easily from soil into groundwater. Perchlorate is usually stable in water and it does not break down easily. Perchlorate is chemically stable and can persist for decades under normal environmental conditions. However, the biological reduction of perchlorate to the chloride ion can occur naturally in the environment under anaerobic (oxygen-free) conditions and in the presence of anaerobic microorganisms. In some anaerobic conditions, there are microorganisms that can naturally break down the perchlorate molecule. Research has shown that these microorganisms are widespread throughout the environment.

Once in groundwater, perchlorate migrates in the predominant direction of groundwater flow toward the North Branch Potomac River under normal (i.e., non-pumping) conditions. This transport mechanism, however, is prevented by the ongoing groundwater capture at Site 1.

### 5.2.2.5 Metals

Metals are typically adsorbed to metal oxide coatings (especially those of iron and manganese) and sand grains and to inorganic carbon in the soil matrix. Metals in solution in the soil water may also be adsorbed to clay minerals exhibiting an overall negative charge, especially when the metals are present at low concentrations.

Metals in soil may be subject to leaching as water infiltrates from the surface and passes through the soil. Depending on their form, metals are often insoluble in water and are much more stable than organics. Therefore, they may be much less mobile than VOCs. However, complexing of metals can enhance their mobility.

Organic contamination may act to change the mobility of metals in the soil. Mobility of metals may be affected if biodegradation of organic contaminants, such as TCE, changes the

pH or Eh (oxidation potential) conditions. Specifically, aerobic biodegradation consumes oxygen, decreasing the Eh within the contaminated soil. The lower Eh enhances the mobility of such metals as arsenic, which is more mobile in the trivalent ( $As^{+3}$ ) state than in the pentavalent ( $As^{+5}$ ) state. Carbonic acid, formed when carbon dioxide produced by biodegradation dissolves in groundwater, will decrease pH. Together, these processes can result in the desorption of certain metal ions, as well as dissolution of hydrous oxides that otherwise would adsorb metals. This may, in part, explain the elevated metals concentrations associated with elevated VOC concentrations in certain monitoring wells encountered in the Site 1 Focused RI (CH2M HILL, 1995a).

Once in the groundwater, metals are influenced by physical properties, in addition to the flow of the aquifer. Dispersion and adsorption continue to affect the migration rates. The greater the degree of dispersion, the lower the concentration is along the centerline of the migrating plume and the more broadly the contaminants are distributed. The higher the degree of adsorption, the slower the rate of metal migration, because it is retarded by the exchange process. As discussed previously, the presence of certain VOCs can enhance the mobility of metals by increasing their solubility.

### 5.2.3 Migration into Surface Water and Sediment

Transport mechanisms that could lead to migration of contaminants in soil to surface water and sediment are surface runoff and groundwater discharge. The degree and direction of surface runoff is determined mainly by the surface topography and the relative proximity of nearby receiving surface waters. Groundwater discharge to surface water is a function of the difference between hydraulic head in the aquifer and that of nearby surface water bodies.

Because of the reversed hydraulic gradient near the river due to the ongoing groundwater containment system at the site, discharge of groundwater contaminants to surface water and sediment is considered to be insignificant. However, surface runoff can transport contaminated soil into the river or drainage ditches that discharge to the river.

A study of the spatial correlation between constituents detected in surface soil and surface water/sediment was conducted as part of the October 2001 Supplemental Investigation to assess whether runoff was a significant transport mechanism for soil-related contaminants. Tables 5-1 and 5-2 present detected results for the surface water and sediment samples, respectively, collected in 2001. The complete set of data collected during the Supplemental Investigations is included as Appendix D. The spatial correlation findings are presented below. Additional information is presented as part of the ERA in section 7.3.6.

#### 5.2.3.1 VOCs

No spatial correlation was found between VOCs in surface soil and VOCs in sediment. During the October 2001 Supplemental Investigation, no VOCs were detected in sediment or surface water at concentrations exceeding the corresponding adjusted residential RBCs. The information above, together with historical surface water and sediment data, indicates the occurrences of VOCs in surface water and sediment are sporadic, temporally and spatially, and that surface runoff to the river is not a substantial transport mechanism of VOCs. In fact, historical data suggest groundwater discharge was the primary transport mechanism of VOCs to the river. Temporal data, collected since the extraction system was

put into operation, show VOC levels have declined to nearly non-detect levels in the river as the groundwater extraction system has eliminated the groundwater transport mechanism.

### 5.2.3.2 SVOCs

SVOCs were not detected in surface water samples above the corresponding RBC screening levels in the October 2001 Supplemental Investigation. Further, the SVOCs found in surface soil at the site were not detected in the surface water of the North Branch Potomac River.

During the October 2001 Supplemental Investigation, one sediment sample, 1SD-2D, contained three PAHs at levels above the corresponding adjusted residential RBCs. The sample was collected from the western drainage ditch, near the former open burn area, roughly 100 feet from the North Branch Potomac River. The three PAHs were benzo(a)anthracene (9,500 µg/kg), benzo(a)pyrene (7,600 µg/kg), and benzo(b)fluoranthene (11,000 µg/kg). As described in Section 4, the greatest PAH concentrations in surface and subsurface soil were found in the former open burn area, which is adjacent to the western drainage ditch. Observations made during the site visit noted that this western drainage ditch cuts through the ash and debris associated with the former open burn area. This information suggests runoff from ash and debris associated with former open burning may be transporting soil contaminants to the drainage ditch.

### 5.2.3.3 Dioxins/Furans

The dioxin/furan compounds present in surface soil at the site were not detected in the surface water of the North Branch Potomac River. However, analytical results indicate that surface soil and sediment dioxin/furan concentrations are spatially related. The dioxins/furans present in the surface soil near the former open burn area, former inert burn area, and associated disposal areas were also present in nearby river sediment locations.

Three dioxin/furan analytes were detected in three of the nine sediment samples collected during the 2001 Supplemental Investigation. They were 1,2,3,4,6,7,8-heptachlorodibenzofuran, total heptachlorodibenzofuran, and total octachlorodibenzo-p-dioxin.

1,2,3,4,6,7,8-heptachlorodibenzofuran (0.06 µg/kg) and total heptachlorodibenzofuran (0.06 µg/kg) were detected in 1SD-2, a near shore sample adjacent to the western drainage ditch, just downstream of its confluence with the North Branch Potomac River. This sample is roughly 50 feet downgradient of surface soil sample AS01-SB33, which had 1,2,3,4,6,7,8-heptachlorodibenzofuran and total heptachlorodibenzofuran concentrations of 0.0263 and 0.0285 µg/kg, respectively. The 1,2,3,4,6,7,8-heptachlorodibenzofuran concentration in 1SD-2 was below the adjusted residential RBC of 0.43 µg/kg. No Region III adjusted residential RBC value exists for total heptachlorodibenzofuran.

Total octachlorodibenzo-p-dioxin was detected in 1SD-6 (2.0 µg/kg), a near shore sample adjacent to the former open burn disposal area, and 1SD-9A (0.2 µg/kg), a mid-channel sample adjacent to the former inert burn area. 1SD-6 is located roughly 170 feet downstream of 1SD-2 and on the same transect as surface soil samples AS01-SB35 and AS01-SB36, which had total octachlorodibenzo-p-dioxin concentrations of 1.41 and 2.24 µg/kg, respectively. 1SD-9A is located downgradient and adjacent to three surface soil samples (AS01-SB30, AS01-SB40, and AS01-SB41) that had total octachlorodibenzo-p-dioxin concentrations ranging from 0.780 to 1.96 µg/kg. No Region III adjusted residential RBC value exists for total octachlorodibenzo-p-dioxin.

The above information suggests that runoff from areas associated with former burning activities may transport dioxins/furans to the North Branch Potomac River.

#### 5.2.3.4 Explosives

No explosives were detected in the surface water and sediment samples collected during the October 2001 Supplemental Investigation, which suggests runoff is not a significant transport mechanism for explosives, with respect to accumulation in the North Branch Potomac River.

#### 5.2.3.5 Metals

In general, analytical results indicate that the elevated metal sediment concentrations may be attributable to runoff from nearby surface soil that also exhibits elevated metal concentrations. This is particularly true near the western drainage ditch and the former inert burn area. No spatial relationship was determined between surface soil and surface water concentrations of metals.

Analytical results indicate that surface soil and sediment metal concentrations are spatially related. Twenty-two of the 25 sediment samples collected during the October 2001 Supplemental Investigation had at least one metal with a concentration exceeding its corresponding adjusted residential RBC. These metals and the corresponding number of adjusted residential RBC exceedances are: arsenic (25), iron (21), and manganese (5). No metals were identified as COCs in sediment in the HHRA. In general, concentrations of metals in Site 1 sediment are comparable to sediment background sediment samples collected upgradient of Site 5. Concentrations of some metals, such as chromium, lead, and nickel, are generally greater than the Site 5 background sediment samples.

The greatest iron concentrations in sediment occurred in the western drainage ditch (1SD-2D) and in the mid-channel river sediment sample (1SD-2A) directly adjacent to the western drainage ditch. The greatest arsenic concentration occurred in a mid-channel river sediment sample (1SD-3A) adjacent to the former open burn disposal area. The greatest manganese concentration occurred in a near-shore river sediment sample (1SD-8) near the former inert burn area.

TABLE 5-1  
 Detected Compounds in Surface Water  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-3/1SW-3		1SD-3A/1SW-3A
Sample ID	AS01-SW01-R05	AS01-SW01A-R05	AS01-SW02-R05	AS01-SW02A-R05	AS01-SW03-R05	AS01-SW03P-R05	AS01-SW03A-R05
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name							
<b>Volatile Organic Compounds (UG/L)</b>							
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
<b>Semi-volatile Organic Compounds (UG/L)</b>							
Butylbenzylphthalate	10 U	NA	10 U	NA	10 U	10 U	NA
Di-n-butylphthalate	10 U	NA	10 U	NA	1.5 J	10 U	NA
Diethylphthalate	10 U	NA	10 U	NA	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	4.2 J	NA	1.4 J	NA	1.3 J	1.6 J	NA
<b>Total Metals (UG/L)</b>							
Aluminum	389	412	649	640	739	656	748
Antimony	4.9 U	6.9 J	5.9 J	4.9 U	4.9 U	4.9 U	5.2 B
Arsenic	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	4.1 J	6.8 J
Barium	55.2 J	53.2 J	51.9 J	48.4 J	54.8 J	53.1 J	49 J
Beryllium	0.1 U	0.1 U	0.13 J	0.1 J	0.18 J	0.13 J	0.14 J
Calcium	47,500	45,400	43,200	40,000	44,500	44,400	38,600
Cobalt	1.6 J	1.7 J	2.6 J	2.2 J	2.8 J	2.9 J	2.6 J
Copper	1.1 J	1.3 J	2.7 J	1.5 J	2.6 J	1.3 J	2.9 J
Iron	222	255	816	596	950	617	1,140
Lead	2 U	2 U	2 U	2 U	2.6 J	2 U	2 U
Magnesium	12,600	12,100	11,600	10,800	12,300	12,300	10,700
Manganese	247	243	265	253	286	283	255
Potassium	3,350 J	3,190 J	2,940 J	2,690 J	2,910 J	2,820 J	2,510 J
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.7 J	2.2 U	2.2 U
Sodium	27,900	26,500	21,400	19,900	21,200	20,900	18,200
Thallium	3.5 J	2.3 U	2.3 U	6.2 J	2.3 U	2.3 U	2.3 U
Zinc	24.7	24.3	35.1	28.3	23.3	14.5 J	18.9 J
<b>Dissolved Metals (UG/L)</b>							

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

L - Reported value may be biased low

U - Analyte not detected

UL - Not detected, quantitation limit is probably higher

TABLE 5-1  
 Detected Compounds in Surface Water  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-3/1SW-3		1SD-3A/1SW-3A
Sample ID	AS01-SW01-R05	AS01-SW01A-R05	AS01-SW02-R05	AS01-SW02A-R05	AS01-SW03-R05	AS01-SW03P-R05	AS01-SW03A-R05
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name							
Aluminum	274	277	402	399	349	336	395
Antimony	4.9 U	4.9 U	6.8 J	4.9 U	4.9 U	4.9 U	6.2 B
Arsenic	4.1 J	3.7 U	4.4 J	3.7 U	3.7 U	3.7 U	5.6 J
Barium	45 J	45.6 J	41.6 J	42.2 J	47.4 J	48.1 J	44.6 J
Calcium	40,400	40,800	39,000	39,000	44,000	44,700	41,200
Copper	0.7 U	0.7 U	0.7 U	0.7 U	1.1 J	0.7 U	0.7 U
Iron	80.7 J	75 J	190	192	213	236	226
Magnesium	10,700	10,800	10,400	10,500	12,100	12,300	11,500
Manganese	152	154	99.8	112	111	144	109
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Potassium	2,730 J	2,770 J	2,490 J	2,540 J	2,800 J	2,860 J	2,630 J
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Silver	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL
Sodium	23,100 J	23,600 J	19,000 J	19,300 J	21,000 J	21,300 J	19,500 J
Thallium	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Zinc	3.6 J	4 J	8 J	7.2 J	10.7 J	10.8 J	1.6 J
Wet Chemistry (MG/L)							
Hardness	171	163	156	144	162	162	140

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 U - Analyte not detected

UL - Not detected, quantitation limit is probably higher

TABLE 5-1  
 Detected Compounds in Surface Water  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-4/1SW-4	1SD-4A/1SW-4A	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6/1SW-6		1SD-7/1SW-7	1SD-8/1SW-8	1SD-9/1SW-9
Sample ID	AS01-SW04-R05	AS01-SW04A-R05	AS01-SW05-R05	AS01-SW05C	AS01-SW06	AS01-SW06P	AS01-SW07	AS01-SW08	AS01-SW09
Sample Date	06/13/01	06/13/01	06/13/01	06/13/01	06/14/01	06/14/01	06/14/01	06/13/01	06/13/01
Chemical Name									
<b>Volatile Organic Compounds (UG/L)</b>									
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U
Trichloroethene	10 U	10 U	10 U	10 U	10 U	5.2 J	10 U	10 U	10 U
<b>Semi-volatile Organic Compounds (UG/L)</b>									
Butylbenzylphthalate	1.2 J	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Di-n-butylphthalate	1.7 B	NA	1.3 B	10 U	10 U	1.6 J	10 U	1 B	10 U
Diethylphthalate	10 U	NA	10 U	1.5 J	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	7.1 B	NA	1.9 B	10 U	1.8 J	10 U	1.9 J	1.1 B	10 U
<b>Total Metals (UG/L)</b>									
Aluminum	357	381	346	555	732	998	758	370	377
Antimony	5.2 B	4.9 U	4.9 U	4.9 U	5.8 J	5.6 J	4.9 U	4.9 U	7.8 B
Arsenic	6.2 B	3.7 U	3.7 U	7 B	3.7 U	3.7 U	3.7 U	4.5 B	6.8 B
Barium	48 J	49.8 J	49.8 J	51.5 J	54.9 J	59.5 J	52.8 J	49 J	50.6 J
Beryllium	0.1 U	0.1 U	0.1 U	0.12 J	0.18 J	0.2 J	0.14 J	0.1 U	0.1 U
Calcium	43,400	44,800	45,400	43,200	44,900	46,600	42,600	44,100	45,300
Cobalt	1.3 J	1.1 U	1.6 J	4.1 J	2.7 J	3.1 J	2.8 J	1.1 U	1.1 U
Copper	1.6 J	1.3 J	1.4 J	2.6 J	2.1 J	3.2 J	1.8 J	1.6 J	0.7 U
Iron	159	198	194	514	897	1,460	1,330	209	243
Lead	2 U	2 U	2 U	2 U	2 U	2.6 J	2 U	2.1 J	2 U
Magnesium	11,400	11,900	12,000	11,400	12,200	12,700	11,600	11,500	11,900
Manganese	264	268	271	383	291	315	270	258	291
Potassium	2,790 J	2,880 J	2,900 J	2,620 J	2,890 J	3,240 J	2,780 J	2,790 J	2,820 J
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	3.2 J	4.1 J
Sodium	21,300 J	21,900	22,200 J	20,600 J	21,500	22,600	20,700	21,600 J	22,100 J
Thallium	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Zinc	10.8 B	12.4 B	11.6 B	18.9 B	30.3	38.3	27.2	12.8 B	15.2 B
<b>Dissolved Metals (UG/L)</b>									

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

L - Reported value may be biased low

U - Analyte not detected

UL - Not detected, quantitation limit is probably higher

TABLE 5-1  
 Detected Compounds in Surface Water  
*Site 1 Focused Remedial Investigation for Soil*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-4/1SW-4	1SD-4A/1SW-4A	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6/1SW-6		1SD-7/1SW-7	1SD-8/1SW-8	1SD-9/1SW-9
Sample ID	AS01-SW04-R05	AS01-SW04A-R05	AS01-SW05-R05	AS01-SW05C	AS01-SW06	AS01-SW06P	AS01-SW07	AS01-SW08	AS01-SW09
Sample Date	06/13/01	06/13/01	06/13/01	06/13/01	06/14/01	06/14/01	06/14/01	06/13/01	06/13/01
Chemical Name									
Aluminum	258	274	273	276	373	325	408	246	243
Antimony	4.9 U	6.8 J	5.5 J	6.8 J	4.9 U	4.9 U	4.9 U	4.9 U	8 J
Arsenic	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Barium	45.7 J	50.1 J	49.3 J	53.3 J	45.3 J	46.1 J	44.1 J	45.6 J	47.8 J
Calcium	42,300	46,100	45,600	49,200	41,400	43,400	41,100	42,200	43,900
Copper	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	1.2 J	0.7 U	0.7 U
Iron	65.6 J	78.9 J	74 J	97.9 J	184	190	204	61.8 J	60.3 J
Magnesium	11,100	12,300	12,100	13,000	11,200	11,800	11,200	11,000	11,500
Manganese	188	209	195	216	97.3	96.7	98.4	186	175
Mercury	0.2 U	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Potassium	2,600 J	2,890 J	2,860 J	3,070 J	2,600 J	2,760 J	2,730 J	2,570 J	2,730 J
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.6 J	2.2 U	2.2 U	2.2 U
Silver	0.6 UL	0.6 UL	0.6 UL	0.6 UL	2.1 L	0.6 UL	0.6 UL	0.6 UL	0.6 UL
Sodium	20,500 J	22,600 J	22,300 J	24,300 J	19,600 J	20,700 J	19,800 J	20,600 J	21,700 J
Thallium	8.7 J	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Zinc	3.2 J	2 B	6.8 B	9.9 B	5.6 J	7.6 J	13.1 J	4.4 B	4.8 B
Wet Chemistry (MG/L)									
Hardness	155	161	163	155	162	169	154	158	162

NA - Not analyzed  
 B - Analyte not detected above associated blank  
 J - Reported value is estimated  
 L - Reported value may be biased low  
 U - Analyte not detected

UL - Not detected, quantitation limit is probably higher

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
Acetone	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	510 U	440 U	490 U	410 U	620 U	430 U	290 J	420 U
2-Methylnaphthalene	510 U	440 U	490 U	410 U	620 U	430 U	1,000	420 U
3- and 4-Methylphenol	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Acenaphthene	510 U	440 U	490 U	410 U	620 U	430 U	2,300	420 U
Anthracene	510 U	440 U	490 U	410 U	620 U	430 U	5,100	420 U
Benzo(a)anthracene	510 U	440 U	490 U	410 U	620 U	430 U	9,500	420 U
Benzo(a)pyrene	510 U	440 U	490 U	410 U	620 U	430 U	7,600	420 U
Benzo(b)fluoranthene	510 U	440 U	490 U	410 U	620 U	430 U	11,000	47 J
Benzo(g,h,i)perylene	510 U	440 U	490 U	410 U	620 U	430 U	2,100	420 U
Benzo(k)fluoranthene	510 U	440 U	490 U	410 U	620 U	430 U	1,900	420 U
Carbazole	510 U	440 U	490 U	410 U	620 U	430 U	3,200	420 U
Chrysene	510 U	440 U	490 U	410 U	620 U	430 U	8,400	49 J
Di-n-butylphthalate	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Dibenz(a,h)anthracene	510 U	440 U	490 U	410 U	620 U	430 U	310 J	420 U
Dibenzofuran	510 U	440 U	490 U	410 U	620 U	430 U	1,800	420 U
Fluoranthene	510 U	49 J	490 U	410 U	620 U	430 U	19,000	78 J
Fluorene	510 U	440 U	490 U	410 U	620 U	430 U	2,700	420 U
Indeno(1,2,3-cd)pyrene	510 U	440 U	490 U	410 U	620 U	430 U	2,500	420 U
Naphthalene	510 U	440 U	490 U	410 U	620 U	430 U	800	420 U
Phenanthrene	510 U	440 U	490 U	410 U	620 U	430 U	17,000	53 J
Phenol	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Pyrene	510 U	440 U	490 U	410 U	620 U	430 U	14,000	70 J
bis(2-Ethylhexyl)phthalate	510 U	440 U	52 J	410 U	67 J	57 J	65 J	54 J
<b>Dioxin/Furans (UG/KG)</b>								

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

UJ

UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01 U	0.006 U	0.06	NA	NA	0.009 U	NA	NA
Octachlorodibenzo-p-dioxin	0.3 B	0.1 B	0.4 B	NA	NA	0.3 B	NA	NA
Total heptachlorodibenzofuran	0.01 U	0.006 U	0.06	NA	NA	0.009 U	NA	NA
<b>Explosives (UG/KG)</b>								
No Detections								
<b>Total Metals (MG/KG)</b>								
Aluminum	3,920	5,830	6,430	6,890	5,950	7,270	8,410	5,470
Antimony	1.8 B	1.3 U	3.6 B	2.7 B	2.2 B	1.3 U	3.5 B	2.5 J
Arsenic	1.3 J	6.9	4.9	15.7	9.3	7.1	9.1	10.7 K
Barium	58.6 J	73.1	65.2	108	67.4 J	60	176	83.1
Beryllium	1.1 J	1.3 J	1 J	1.6	1.8 J	0.85 J	0.93 J	1.5
Cadmium	0.12 U	0.1 U	0.33 J	0.1 U	0.15 U	0.1 U	6	0.1 U
Calcium	2,750	1,830	7,490	3,520	2,820	13,800	6,990	1,480
Chromium	3.5	8.9	8	22.8	8.8	9.5	19.6	8.3
Cobalt	24	27.5	26.9	43.8	48.4	15.3	16.5	42.9
Copper	13.3	17.8	87.2	23.3	28	29.9	203	30.4
Iron	12,600	35,000	26,700	60,600	29,300	28,300	32,800	25,700
Lead	19.3	15.2	26.8	20.1	31.2	16.3	134	35.6
Magnesium	424 J	572 J	1,360 J	1,370	866 J	1,880	1,510	638 J
Manganese	617	818	980	1,550	1,160	748	730	1,350 K
Mercury	0.14 U	0.13 U	1.4 J	0.12 U	0.18	0.24 J	0.87	0.21 L
Nickel	38.9	45.1	43.5	62.3	69.6	24.2	31	45.1 J
Potassium	337 J	592 J	531 J	777 J	605 J	826 J	1,010 J	558 J
Selenium	0.67 U	0.57 U	0.64 U	0.53 U	1.6 J	0.56 U	0.62 U	0.54 U
Silver	0.18 U	0.23 J	103	0.21 J	0.25 J	3.7	89.2	0.2 L
Sodium	93.5 U	80.2 U	126 J	74.4 U	112 U	78.9 U	200 J	76.1 U
Thallium	0.7 U	0.6 U	0.64 U	0.56 U	0.84 U	0.59 U	0.65 U	0.57 U
Vanadium	7.9 J	16.1	13.9 J	33.6	16.2 J	24.4	23.5	17.8

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U - Analyte not detected

UJ

UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
<b>Sample ID</b>	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
<b>Sample Date</b>	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
<b>Chemical Name</b>								
Zinc	117	131	281	171	218	101	572	155 K
<b>Wet Chemistry (MG/KG)</b>								
Total organic carbon (TOC)	43,000	42,000	67,000	60,000	39,000	47,000	51,000	28,000
pH	7.13	7.3	7.36	7.35	7.33	8	7.48	5.94

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 UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
Acetone	12 U	19 U	21 U	17 U	13 J	15 U	13 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	410 U	630 U	690 U	560 U	710 U	510 U	450 U
2-Methylnaphthalene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
3- and 4-Methylphenol	410 U	630 U	260 J	400 J	710 U	510 U	450 U
Acenaphthene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Anthracene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Benzo(a)anthracene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Benzo(a)pyrene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Benzo(b)fluoranthene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Benzo(g,h,i)perylene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Benzo(k)fluoranthene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Carbazole	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Chrysene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Di-n-butylphthalate	64 J	150 J	690 U	560 U	89 J	88 J	46 J
Dibenz(a,h)anthracene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Dibenzofuran	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Fluoranthene	410 U	630 U	690 U	92 J	710 U	510 U	450 U
Fluorene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Indeno(1,2,3-cd)pyrene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Naphthalene	410 U	630 U	690 U	560 U	710 U	510 U	450 U
Phenanthrene	410 U	630 U	690 U	67 J	710 U	510 U	450 U
Phenol	410 U	630 U	130 J	560 U	710 U	510 U	450 U
Pyrene	410 U	630 U	690 U	73 J	710 U	510 U	450 U
bis(2-Ethylhexyl)phthalate	78 J	88 J	83 J	68 J	75 J	62 J	450 U
<b>Dioxin/Furans (UG/KG)</b>							

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UJ

UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01
Chemical Name							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.004 U
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.1 B
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.004 U
Explosives (UG/KG)							
No Detections							
Total Metals (MG/KG)							
Aluminum	4,500	8,090	7,980	8,070	14,000	4,700	4,620
Antimony	2.9 B	2.3 B	2 B	3.4 B	2.7 J	1.5 U	1.4 J
Arsenic	7.8	14.4	14.2 K	11.3	17.3	7.1	8.2
Barium	45.1	147	137	136	183	62.5	68.2
Beryllium	1.2 J	2.2	2.2	2.2	3.4	1.4 J	1.2 J
Cadmium	0.07 U	0.15 U	0.22 J	0.35 J	0.29 J	0.12 U	0.11 U
Calcium	1,660	2,980	3,420	3,480	4,560	1,760	2,650
Chromium	9.4 J	13.8 J	8	9.6	16.8 J	8.8 J	12.8 J
Cobalt	26.6	61.1	58.4	64.6	56.7	33.9	27.4
Copper	247	37.4	38	36.3	59.6 J	22.9 J	21 J
Iron	37,200	34,100	33,900	33,800	42,400	25,900	28,900
Lead	17	36.6	32.2	31.8	47.3	20.9	29.5
Magnesium	545	1,120 J	1,160 J	1,260 J	1,660 J	602 J	629 J
Manganese	560	2,350	1,450 K	1,690	2,120	920	663
Mercury	0.12 U	0.19 U	0.21 UL	0.19 J	0.19 U	0.15 U	0.15
Nickel	44.9	89.1	91 J	94.7	85.9	60	45.4
Potassium	568 J	842 J	757 J	835 J	1,140 J	484 J	505 J
Selenium	0.55 U	0.83 U	0.89 U	0.74 U	0.93 U	0.66 U	0.58 U
Silver	0.15 U	0.34 J	0.24 UL	0.24 J	0.25 U	0.28 J	0.16 U
Sodium	76.4 U	117 U	124 U	112 J	130 U	92.5 U	81.8 U
Thallium	0.57 U	0.87 U	0.93 U	0.78 U	1.2 J	0.69 U	0.61 U
Vanadium	15.3	19.6	21.9	20.6	27.8	13.6 J	15.3

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UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01
Chemical Name							
Zinc	143 J	262 J	269 K	273	240 J	181 J	148 J
Wet Chemistry (MG/KG)							
Total organic carbon (TOC)	20,000	79,000	140,000	46,000	78,000	14,000	17,000
pH	7.19	6.86	7.04	7.23	6.84	6.89 R	6.69 R

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TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID Sample ID Sample Date	1SD-6/1SW-6		1SD-6A	1SD-6B	1SD-7/1SW-7		1SD-7A	1SD-7B	
	AS01-SD06 06/15/01	AS01-SD06P 06/15/01	AS01-SD06A 06/15/01	AS01-SD06B 06/15/01	AS01-SD07 06/15/01	AS01-SD07P 06/15/01	AS01-SD07A 06/15/01	AS01-SD07B 06/15/01	AS01-SD07BP 06/15/01
<b>Chemical Name</b>									
<b>Volatile Organic Compounds (UG/KG)</b>									
Acetone	18 U	18 U	11 U	23 U	19 U	17 U	13 U	20 U	23 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
2-Methylnaphthalene	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
3- and 4-Methylphenol	580 U	610 U	380 U	780 U	160 J	1,300	440 U	670 U	780 U
Acenaphthene	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Anthracene	580 U	83 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Benzo(a)anthracene	580 U	180 J	380 U	780 U	630 U	570 U	52 J	670 U	780 U
Benzo(a)pyrene	580 U	120 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Benzo(b)fluoranthene	580 U	160 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Benzo(g,h,i)perylene	580 U	62 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Benzo(k)fluoranthene	580 U	63 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Carbazole	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Chrysene	580 U	170 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Di-n-butylphthalate	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	98 J
Dibenz(a,h)anthracene	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Dibenzofuran	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Fluoranthene	79 J	360 J	380 U	84 J	630 U	62 J	120 J	670 U	780 U
Fluorene	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Indeno(1,2,3-cd)pyrene	580 U	65 J	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Naphthalene	580 U	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U
Phenanthrene	580 U	300 J	380 U	780 U	630 U	570 U	110 J	670 U	780 U
Phenol	580 U	87 J	380 U	110 J	84 J	170 J	440 U	100 J	780 U
Pyrene	70 J	300 J	380 U	84 J	630 U	570 U	100 J	670 U	780 U
bis(2-Ethylhexyl)phthalate	230 J	93 J	78 J	79 J	69 J	74 J	440 U	110 J	100 J
<b>Dioxin/Furans (UG/KG)</b>									

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TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-6/1SW-6		1SD-6A	1SD-6B	1SD-7/1SW-7		1SD-7A	1SD-7B	
	AS01-SD06	AS01-SD06P	AS01-SD06A	AS01-SD06B	AS01-SD07	AS01-SD07P	AS01-SD07A	AS01-SD07B	AS01-SD07BP
Sample ID	AS01-SD06	AS01-SD06P	AS01-SD06A	AS01-SD06B	AS01-SD07	AS01-SD07P	AS01-SD07A	AS01-SD07B	AS01-SD07BP
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
<b>Chemical Name</b>									
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01 U	0.01 U	NA	NA	0.01 U	0.007 U	NA	NA	NA
Octachlorodibenzo-p-dioxin	0.6	2	NA	NA	0.2 B	0.2 B	NA	NA	NA
Total heptachlorodibenzofuran	0.01 U	0.01 U	NA	NA	0.01 U	0.007 U	NA	NA	NA
<b>Explosives (UG/KG)</b>									
No Detections									
<b>Total Metals (MG/KG)</b>									
Aluminum	6,620	9,850	4,190	10,800	6,620	5,430	2,620	8,090	7,710
Antimony	4.2 B	4.4 B	2.3 B	3.7 B	3.4 B	8.8 B	1.8 B	4.2 J	2.2 U
Arsenic	13.1 K	17.2 K	7 K	17.8 K	12.9 K	16.2 K	1.9 K	14.3 K	12.4
Barium	87.6	136	146	133	93.5	65.3 J	52.1	163	169
Beryllium	2	2.6	1.3	3.1	2.4	2	0.87 J	2	2.1 J
Cadmium	0.24 J	0.74 J	0.09 U	0.41 J	0.37 J	0.44 J	0.1 U	0.27 J	0.18 U
Calcium	2,960	19,700	1,350	4,450	2,400	1,990	3,060	3,880	4,650
Chromium	9.3	23.5	6.1	16.6	8.9	10.3	0.18 U	6.3	7.8
Cobalt	34.8	35.7	140	36.2	89	72.9	22	60.3	61.3
Copper	41.9	73.8	21.9	74.1	46.2	37.3	10.9	35.2	37.6
Iron	23,100	32,300	25,000	38,700	34,000	41,300	8,720	32,500	32,700
Lead	34	69.7	45.9	75	54.3	34.7	17.7	30.9	35.6
Magnesium	623 J	949 J	493 J	1,000 J	831 J	2,140	447 J	1,470 J	1,480 J
Manganese	663 K	376 K	1,310 K	512 K	1,030 K	1,240 K	726 K	2,130 K	2,360
Mercury	0.62 L	1.2 L	0.1 UL	1.5 L	0.17 UL	0.16 UL	0.13 UL	0.19 UL	0.23 U
Nickel	60.7 J	64.1 J	45.5 J	65 J	114 J	91.2 J	32.1 J	89.9 J	90.7
Potassium	462 J	695 J	407 J	885 J	568 J	650 J	241 J	1,020 J	830 J
Selenium	0.77 U	0.8 U	0.5 U	0.98 U	0.82 U	1.5 J	1.8	0.88 U	0.99 U
Silver	0.52 L	3.6 L	0.73 L	0.46 L	0.22 UL	1.9 L	0.16 UL	0.24 UL	0.87 J
Sodium	107 U	334 J	70.3 U	231 J	114 U	868 J	79.7 U	135 J	139 U
Thallium	3.3 B	3.7 B	2.5 B	2.8 B	3.9 B	3.9 B	0.77 B	0.92 U	1 U
Vanadium	14.4 J	20.8	11.7	22.3 J	15.6 J	18	5.6 J	20.8	19.4 J

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UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-6/1SW-6		1SD-6A	1SD-6B	1SD-7/1SW-7		1SD-7A	1SD-7B	
Sample ID	AS01-SD06	AS01-SD06P	AS01-SD06A	AS01-SD06B	AS01-SD07	AS01-SD07P	AS01-SD07A	AS01-SD07B	AS01-SD07BP
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name									
Zinc	208 K	462 K	139 K	322 K	354 K	288 K	90.8 K	246 K	254
Wet Chemistry (MG/KG)									
Total organic carbon (TOC)	51,000	110,000	15,000	39,000	14,000	74,000	40,000	14,000	66,000
pH	6.89	7.19	7	6.51	7.12	7.09	7.26	7.17	6.98

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R - Unreliable result  
 U - Analyte not detected  
 UJ  
 UL

TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-8/1SW-8	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01
<b>Chemical Name</b>				
<b>Volatile Organic Compounds (UG/KG)</b>				
Acetone	21 U	13 U	16 U	14 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>				
1,1-Biphenyl	710 U	420 U	530 U	460 U
2-Methylnaphthalene	710 U	420 U	530 U	460 U
3- and 4-Methylphenol	710 U	420 U	530 U	460 U
Acenaphthene	710 U	420 U	530 U	460 U
Anthracene	710 U	420 U	530 U	460 U
Benzo(a)anthracene	710 U	420 U	530 U	460 U
Benzo(a)pyrene	710 U	420 U	530 U	460 U
Benzo(b)fluoranthene	710 U	420 U	530 U	460 U
Benzo(g,h,i)perylene	710 U	420 U	530 U	460 U
Benzo(k)fluoranthene	710 U	420 U	530 U	460 U
Carbazole	710 U	420 U	530 U	460 U
Chrysene	710 U	420 U	530 U	460 U
Di-n-butylphthalate	120 J	45 J	66 J	65 J
Dibenz(a,h)anthracene	710 U	420 U	530 U	460 U
Dibenzofuran	710 U	420 U	530 U	460 U
Fluoranthene	710 U	420 U	62 J	460 U
Fluorene	710 U	420 U	530 U	460 U
Indeno(1,2,3-cd)pyrene	710 U	420 U	530 U	460 U
Naphthalene	710 U	420 U	530 U	460 U
Phenanthrene	710 U	420 U	530 U	460 U
Phenol	710 U	420 U	530 U	460 U
Pyrene	710 U	420 U	57 J	460 U
bis(2-Ethylhexyl)phthalate	710 U	420 U	95 J	51 J
<b>Dioxin/Furans (UG/KG)</b>				

NA - Not analyzed

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TABLE 5-2

Detected Compounds in Sediment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-8/1SW-8	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name				
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.02 U	NA	NA	0.009 U
Octachlorodibenzo-p-dioxin	0.5 B	NA	NA	0.2
Total heptachlorodibenzofuran	0.02 U	NA	NA	0.009 U
Explosives (UG/KG)				
No Detections				
Total Metals (MG/KG)				
Aluminum	11,900	5,760	5,090	4,180
Antimony	2.1 U	2.2 J	1.5 U	1.5 J
Arsenic	14.7	10.2	8	9.2
Barium	201	53.1	78.8	45.5 J
Beryllium	2.7	1.6	1.6	1.3 J
Cadmium	0.29 J	0.1 U	0.28 J	0.11 U
Calcium	5,250	1,250	1,950	1,320 J
Chromium	13.8 J	16.6 J	6 J	8.2 J
Cobalt	80.8	29.7	49.8	31.2
Copper	46.9 J	28.8 J	27.4 J	20.3 J
Iron	39,100	52,000	21,100	30,200
Lead	38.8	28.7	26.4	18.1
Magnesium	1,770 J	534 J	637 J	601 J
Manganese	2,920	1,470	1,310	491
Mercury	0.2 U	0.13	0.16 U	0.14 U
Nickel	119	72	64.2	51.8
Potassium	1,510 J	748 J	429 J	442 J
Selenium	0.92 U	0.54 U	0.69 U	0.6 U
Silver	0.62 J	0.25 J	0.19 U	0.16 U
Sodium	129 U	75.7 U	96.4 U	83.4 U
Thallium	2.2 J	3.8	0.72 U	3.7
Vanadium	29.7	29	13.1 J	13.5 J

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

UJ

UL

TABLE 5-2

Detected Compounds in Sediment  
*Site 1 Focused Remedial Investigation for Soil*  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Station ID	1SD-8/1SW-8	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name				
Zinc	302 J	152 J	217 J	174 J
Wet Chemistry (MG/KG)				
Total organic carbon (TOC)	63,000	3,600	28,000	23,000
pH	6.81	7.14	6.92	6.54

NA - Not analyzed

B - Analyte not detected above associated blank

J - Reported value is estimated

K - Reported value may be biased high

L - Reported value may be biased low

R - Unreliable result

U - Analyte not detected

UJ

UL

# Human Health Risk Assessment

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## 6.1 Introduction

This section presents the results of an assessment of potential human health risks associated with the presence of soil, surface water, and sediment contaminants at Site 1. Site 1 groundwater and the North Branch Potomac River surface water and sediment have been addressed as part of a ROD (EPA, 1997a). Surface water and sediment are included in this report to help evaluate whether surface runoff may be contributing constituents to the river, which present an unacceptable level of potential risk.

A HHRA was prepared as part of the 1995 Focused Remedial Investigation for Site 1 (CH2M HILL, 1995a). The 1995 risk assessment and this current risk assessment differ as follows:

1. Different data sets were utilized for the 1995 and the current risk assessments. The differences between the data sets are as follows.
  - Additional data have been collected since the 1995 Focused RI and were incorporated into the current risk assessment.
  - Some of the data evaluated in the 1995 risk assessment were not included in the current risk assessment. Specifically, data that were not validated to a level currently acceptable to EPA were excluded from the current risk assessment data set (see Sections 6.2.1 and 6.2.2).
  - Surface water and sediment data collected in 2001 were included for the runoff to surface water and sediment evaluation. It should be noted that surface water and sediment samples were also collected in 2002, 2003, and 2004. However, these data were not evaluated quantitatively in this risk assessment, but are discussed in Section 6.2.2.2. The 2001 data were quantitatively evaluated in the risk assessment because they were collected during the supplemental investigation intended to identify spatial relationships with surface soil.
2. Risk assessment guidance has been revised since the 1995 risk assessment was performed. The current risk assessment is presented in the format of Risk Assessment Guidance for Superfund (RAGS) Part D standard tables, which were not available in 1995 (the first draft of RAGS Part D was released by EPA in 1998).
3. For the current risk assessment, the site was separated into three areas (the FDP area, the ABG area, and the OABG area), based on historical and potential future use. The FDP and OABG were conservatively evaluated under the future residential scenario. Additionally, although the ABG is an active, permitted unit that will continue under industrial use for the foreseeable future, it was also evaluated under residential scenarios, in response to comments received on the draft RI.
4. Current RBCs and toxicity numbers were used in the current risk assessment.

5. The 1995 risk assessment used frequency of detection as a COPC selection criterion, which is no longer accepted practice. Consequently, frequency of detection was not used as a COPC selection criterion in the current risk assessment. Additionally, iron was retained as a COPC for the current risk assessment, but was not quantitatively evaluated in the 1995 assessment because there were no toxicity factors for iron available at that time.
6. Residential exposure to only surface soil was evaluated in the 1995 assessment. The current residential scenario assumes that during residential development the subsurface soil would be mixed with the surface soil and may be placed on the surface. Therefore, exposure to combined surface and subsurface soil was evaluated for potential future residents in the current risk assessment.
7. In the 1995 assessment it was assumed that data sets with 10 or more samples fit a log-normal distribution and those with three to nine samples fit a normal distribution. For the current assessment, the Shapiro-Wilks W-test or Lillifors test, the Anderson-Darling test, and the Kolmogorov-Smirnov test were used to determine the distribution of data sets with greater than five samples and the exposure point concentration (EPC) (95 percent upper confidence limit [UCL]) was calculated based on the distribution. For data sets with less than five samples, the maximum detected concentration was used as the exposure point concentration.
8. A number of the exposure parameters, such as skin surface area, have been updated based on studies performed and guidance issued since the 1995 assessment. In some cases the values are more conservative and in some cases less conservative.
9. The main risk drivers in soil in the 1995 risk assessment were dioxins and furans and reference doses (RfDs) were used to calculate the non-cancer hazards. However, in the current risk assessment dioxins were evaluated only for the cancer scenario and not evaluated for the non-cancer scenario because there are no longer published reference doses for dioxins. Dioxins are still risk drivers, based on the carcinogenic risk, for a number of the potential receptors.

The current baseline risk assessment was conducted to assess the potential human health impacts from the site under current conditions, as well as to determine if any further actions are needed at the site to be sufficiently protective of human health. The current risk assessment has been prepared utilizing conservative assumptions, and potential exposure pathways have been considered based on current and potential future site use. The risk assessment incorporates the general methodology described in *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual, Part A, Interim Final* (EPA, 1989), *Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)* (EPA, 2001a), and EPA Region III Technical Guidance Manuals for Risk Assessment (EPA, 1992; 1993a).

The results of the Site 1 baseline HHRA will be used to document the potential risk to human health, and to provide a basis to select action levels, as necessary.

The HHRA includes the following components:

- **Identification of Constituents of Potential Concern (COPCs)** - identifies and characterizes the distribution of COPCs found on the site. Constituents identified in this screening are the focus of the subsequent evaluation in the risk assessment.

- **Exposure Assessment** - identifies potential pathways by which exposure could occur; characterizes the potentially exposed populations (e.g., industrial workers, construction workers, residents); and estimates the magnitude, frequency, and duration of exposures.
- **Toxicity Assessment** - identifies the types of adverse health effects associated with exposure to COPCs and lists available toxicity factors (e.g., cancer slope factors [CSFs] and RfDs) for the COPCs.
- **Risk Characterization** - integrates the results of the exposure assessment and toxicity assessment to estimate the potential risks to human health.
- **Uncertainty Assessment** - identifies sources of uncertainty associated with the data, methodology, and the values used in the risk assessment estimation.

These components are described briefly in the following sections. Spreadsheets prepared in accordance with EPA RAGS Part D were used to screen for COPCs, and to calculate estimated exposures and health risks associated with the COPCs. These spreadsheets are presented in Appendix F, Tables 1 through 10.2.CTE.

## 6.2 Identification of Constituents of Potential Concern

The identification of COPCs includes data collection, data evaluation, and data screening steps. The data collection and evaluation steps involve gathering and reviewing the available site data and identifying a set of data that is of acceptable quality for the risk assessment. This data set is then further screened against concentrations that are protective of human health to reduce the data set to those constituents and media of potential concern. The data used for the quantitative risk analysis were validated and met the Data Quality Objectives presented in *Work Plan for the Supplemental Investigation of Site 1 Surface, Subsurface Soil, Surface Water and Sediment Site 2 and 3 Soil in Support of Human and Ecological Risk Assessment* (CH2M HILL, 2001b).

### 6.2.1 Data Evaluation and Selection

Previous field investigations and sampling and monitoring programs have generated information on the constituents in the Site 1 media. The investigation activities that have occurred at Site 1 are discussed in Sections 2.3 and 3.1.

The data collected during previous investigations were evaluated to determine their reliability for use in the quantitative risk assessment. Validated data were available for constituents in the surface soil, subsurface soil, surface water, and sediment. Table 6-1 summarizes the samples that were used to estimate potential exposures and risks in each medium (i.e. surface soil, soil [combined surface and subsurface soil], surface water, and sediment).

A review of the data and discussions with EPA and the Navy identified the following criteria for data usability:

- Estimated values flagged with a J qualifier were treated as unqualified detected concentrations and were included in the calculation of summary statistics without modification.

- Data qualified with an R (rejected) were not used in the risk assessment and were not included in the total count of samples analyzed for a constituent.
- Data qualified with a B (blank contamination) were used in the risk assessment as if they were non-detects, with the blank-related concentrations of each constituent used as the sample detection limit. One-half of the blank-related concentrations were used to calculate exposure point concentrations in the risk assessment.
- One-half of the sample detection limit (DL) was used in the risk assessment for cases where no detectable constituent quantities were found in that sample, but the constituent was detected in that medium at the site.
- For duplicate samples, the maximum concentration between the two samples was used. In calculating the frequency of detection and the 95 percent UCL, the duplicates were counted as a single sample.

## 6.2.2 Data Summary

Data were collected during the Site 1 soil delineation investigation in 1998, RI in 1992, Site 1 Focused RI in 1994, Supplemental Soil Investigation in 2001, Soil Investigation at the Active Burning Grounds in 2001, and Supplemental Investigation in Support Of Human Health and ERA in 2004. The data used in the risk assessment have been fully validated and are assumed to represent current conditions. For each data grouping for each medium (surface soil, soil, surface water, and sediment), constituent-specific summary statistics, including frequency of detection and minimum and maximum detected concentrations, are presented in Appendix F as Tables 2.1 through 2.14, for the data sets used for risk calculations.

This risk assessment evaluated the soil data collected from the OABG area as one area, the soil data collected from the ABG area as another area, and the soil data collected from the FDP area as a third area. The data used in the HHRA, and the rationale for using these data, are discussed in the *Approach for Revised Human Health and Ecological Risk Assessments for Site 1 Soil at Allegany Ballistics Laboratory* (CH2M HILL, 2004b). The samples used in the HHRA are summarized in the following subsections.

### 6.2.2.1 Soil

As discussed above, the surface and subsurface soil samples were divided into three groups: samples collected from the FDP area, samples collected from the ABG area, and samples collected from the OABG area.

Soil samples were collected during the different investigations for specific purposes and the analysis conducted on each sample varied. The analysis of the soil samples included TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, dioxins/furans, explosives, TAL metals, perchlorate, and cyanide. Table 6-1 summarizes each soil sample evaluated in the risk assessment and the corresponding analysis.

### 6.2.2.2 Surface Water and Sediment

Surface water and sediment samples were collected along the reach of the North Branch Potomac River adjacent to Site 1. Surface water and sediment samples collected in June 2001 were quantitatively evaluated in this report. Surface water and sediment samples collected in 2002, 2003, and 2004, during the LTM sampling, were compared to the 2001 samples

collected from the same locations, and no major differences were noted. Because the 2001 samples were analyzed for a greater number of constituents, and no notable differences were observed between the 2001 and later sampling events, the 2001 data are assumed to be representative of current conditions and were used in the quantitative risk evaluation. Further, these data were collected at the same time soil samples were collected adjacent to the river in order to evaluate potential surface runoff effects.

Surface water samples were analyzed for TCL VOCs, TCL SVOCs, explosives, cyanide, and TAL total and dissolved metals. Table 6-1 summarizes each sample evaluated in the risk assessment and the corresponding analysis.

Sediment samples were analyzed for TCL VOCs, TCL SVOCs, explosives, dioxins/furans, explosives, TAL metals, cyanide, and perchlorate. Table 6-1 summarizes each sample evaluated in the risk assessment and the corresponding analysis.

### 6.2.3 Selection of Constituents of Potential Concern (COPCs)

The detected constituents were screened in accordance with EPA Region III guidelines (EPA, 1993a), using the steps described below. The COPC selection process was conservative to ensure selection of the constituents representing the majority of potential risk associated with the site. The maximum detected concentration of each constituent in each medium was compared to a screening value (typically an RBC) to select the COPCs for the medium. EPA Region III RBCs based on noncarcinogenic effects were divided by ten to account for exposure to multiple constituents. RBCs based on carcinogenic effects were used as presented in the RBC Table (EPA, 2005). If the maximum concentration of a constituent exceeded the screening value, the constituent was selected as a COPC and retained for the risk evaluation.

- **Comparison with Health-based Criteria for Surface Soil and Soil (combined surface and subsurface soil):** The maximum detected constituent concentrations in surface soil and combined surface and subsurface soil from the FDP, OABG, and ABG areas were compared with EPA Region III residential soil RBCs (EPA, 2005). Maximum detected constituent concentrations in soil from within the ABG area were also compared with industrial soil RBCs (EPA, 2005), because this area is expected to remain an active RCRA unit. Lead concentrations in surface soil were compared to the EPA residential child lead soil screening value of 400 mg/kg. If the maximum lead concentration exceeded the screening value, it was evaluated quantitatively for the industrial worker using the adult lead model and the residential child using the Integrated Exposure Uptake Biokinetic (IEUBK) model.
- **Comparison with Health-based Criteria for Volatile and Fugitive Dusts from Soil:** The ambient air concentrations associated with volatile and fugitive dust emissions from soil were compared with EPA Region III ambient air RBCs (EPA, 2005). Air concentrations were estimated from the maximum detected soil concentrations using methodology in EPA's Soil Screening Guidance (EPA, 1996a), as shown in the Appendix F Table 2 supplement tables for the soil-to-air pathway evaluations.
- **Comparison with Health-based Criteria for Leaching to Groundwater from Soil:** The maximum detected concentrations in soil were compared with the EPA Region III soil screening levels (SSLs), soil, for groundwater migration, based on a DAF of 20 (EPA,

2005). The SSLs based on noncarcinogenic effects were divided by ten to account for exposure to multiple constituents. This comparison was not used to select COPCs for the direct contact exposure pathway, but was discussed in Section 6.3.2.2 as a potential transport pathway for soil contaminants.

- **Comparison with Health-based Criteria for Surface Water:** The maximum detected constituent concentrations in surface water were compared to ten times the EPA Region III tap water RBCs (EPA, 2005). Lead concentrations in surface water were compared to the Safe Drinking Water Act lead action level of 15 µg/L.
- **Comparison with Health-based Criteria for Sediment:** The maximum detected constituent concentrations in sediment were compared to ten times the EPA Region III residential soil RBCs (EPA, 2005). Lead concentrations in sediment were compared to the EPA residential child soil screening value of 400 mg/kg.
- **Comparison with Recommended Dietary Allowances (RDAs):** Constituents that are human nutrients, present at low concentrations (i.e., only slightly elevated above naturally occurring levels), and toxic only at very high doses, were eliminated from the quantitative risk analysis. These constituents are calcium, magnesium, potassium, and sodium.

For constituents that are not in the EPA Region III RBC table (EPA, 2005), appropriate constituents were chosen as surrogates and their RBCs were used as the screening value. These constituents and their surrogates are identified in Tables 2 series in Appendix F. Additionally, for constituents that have been removed from the RBC table because their RBCs were based on “retired” toxicity values, the RBC for that constituent from the previous RBC table (April, 2005) was used as the screening value. These constituents are identified in the Table 2 series in Appendix F.

#### 6.2.4 Constituents of Potential Concern

Table 6-2 identifies the constituents that were selected as COPCs. A summary of the COPC screening for each medium is shown in Appendix F, Tables 2.1 through 2.14. COPCs are shown for the combined surface and surface soil for the ABG area for both the industrial and residential scenario. The screening for the ABG area was done differently than for the other areas because the residential scenario was added to the risk assessment based on comments received on the draft HHRA. Therefore, the COPCs selected based on the original industrial screening were evaluated for the industrial scenario, and the COPCs selected based on the residential screening were evaluated for the residential scenario. For the other two soil areas, COPCs for both the industrial and residential scenarios were selected based on residential screening.

### 6.3 Exposure Assessment

Exposure refers to the potential contact of an individual with a constituent. The exposure assessment identifies pathways and routes by which an individual may be exposed to the COPCs and estimates the magnitude, frequency, and duration of potential exposure. A conceptual exposure model showing potential exposure scenarios identified under current and potential future conditions is presented in Figure 6-1. The following subsections discuss the three components of exposure assessment:

- Characterization of exposure setting.
- Identification of exposure pathways.
- Quantification of exposure.

### 6.3.1 Characterization of Exposure Setting

Characterizing an exposure setting consists of two parts: (1) identifying the physical characteristics of the site as they relate to exposure, and (2) characterizing human populations on or near the site (the potentially exposed populations).

Basic site characteristics such as physical setting, climate, groundwater hydrology, and the presence and location of surface water were summarized in the Section 2.

Potentially exposed populations are identified based on their locations relative to the site, their activity patterns, and the presence of potentially sensitive subpopulations. Table 6-3 summarizes the potentially exposed populations evaluated in this risk assessment.

#### 6.3.1.1 Current Land Use

As described in Section 1, ABL is a GOCO research, development, testing, and production facility. Since approximately 1956, Site 1 has been used for various types of waste burning and disposal activities. The only building on site is a shed, located adjacent to the ABG. The shed is not a fully enclosed structure and is open on one side. The northern part of Site 1, in the OABG area, is accessible to site workers and potential trespassers/visitors. Access to the North Branch Potomac River, which borders the site, is unrestricted and the river is used for recreational activities.

Industrial workers may come in contact with the surface soil under current site conditions. Industrial workers may work inside the open shed for a maximum of 10 minutes a day. Adolescent trespassers could gain access to the site and contact the surface soil. Because the North Branch Potomac River is used for recreational activities, adult and adolescent recreational users could wade in the river and be exposed to contaminants, if present, in surface water and sediment. A ROD is in place and addresses the river media. However, this exposure scenario was included in the current evaluation to determine if there are potential risks resulting from soil contaminant runoff into the river.

Groundwater was not evaluated as part of this risk assessment because a groundwater ROD and remediation system is in place at the site. One of the groundwater remediation system objectives is to eliminate potential impacts on the surface water and sediment in the river as a result of contaminated groundwater discharge.

#### 6.3.1.2 Potential Future Uses

Site 1 is anticipated to remain an industrial area in the future. The area within the 8-acre fenced ABG is currently an active permitted facility regulated under the Resource Conservation and Recovery Act (RCRA), with the same anticipated future use. Future construction of a building or structure at the site is not planned. The most conservative, future use of the site, although unlikely, is residential development. The soil data were used to conservatively assess the future residential exposure scenario to reflect unrestricted use.

The potential future exposure scenario assumes that the subsurface soil will be excavated and become surface soil. Under this scenario, potential future exposure to soil could occur

by industrial workers, trespassers/visitors, and residents. Excavation activities at the site may also expose the construction workers to the soil.

Like the current land use exposure scenario, adult and adolescent recreational users could be exposed to site constituents in surface water and sediment of the North Branch Potomac River, from soil contaminant transport by runoff.

As mentioned above, groundwater is not evaluated as part of this risk assessment.

### 6.3.2 Identification of Exposure Pathways

An exposure pathway can be described as a mechanism that moves a COPC from its source to an exposed population or individual, referred to as a receptor. An exposure pathway must be complete or exposure cannot occur. A complete exposure pathway has five elements:

- A source (e.g., chemical residues in soil).
- A mechanism for release and migration of a constituent (e.g., runoff).
- An environmental transport medium (e.g., soil, surface water).
- A point or site of potential human contact (exposure point such as contact with soil).
- A route of intake (e.g., incidental ingestion of soil).

All five elements must be present for a pathway to be considered complete. The following subsections discuss the elements as they pertain to the site.

#### 6.3.2.1 Contaminant Sources

Sources at Site 1 include contaminated soil from past disposal and burning of hazardous and non-hazardous waste. The constituents detected in soil, surface water, and sediment were chlorinated VOCs, SVOCs, dioxins, explosives, and metals.

#### 6.3.2.2 Release and Transport Mechanisms

The fate and transport of constituents in surface soil, soil (combined surface and subsurface soil), surface water, and sediment are determined by physical characteristics of the site as well as by the chemical and physical properties of the constituents. A detailed description of the fate and transport of contaminants is presented in Section 5 of this report.

The primary transport mechanisms of the exposure pathway from sources at Site 1 appear to be fugitive dust and volatilization emissions from soil, runoff to the river (for the OABG area), and leaching from soil to groundwater.

Leaching from soil to groundwater was evaluated by comparing the maximum detected concentrations from each of the three areas evaluated in the risk assessment to the EPA Region III SSLs based on a DAF of 20 (as presented in Appendix F, Table 2s). The comparison of soil data to the EPA Region III SSLs was not performed to identify COPCs for the HHRA, or to identify COCs in the risk assessment. Rather, it was performed to evaluate the potential for contaminants to leach from soil to groundwater.

For the FDP area, the maximum detected concentrations of PCE, TCE, xylene, naphthalene, dioxins, arsenic, chromium, manganese, and thallium in soil exceeded the SSL. At the ABG area, the maximum detected concentrations of chloroform, PCE, TCE, naphthalene, nitrosodiphenylamine, dioxins, 2,4-dinitrotoluene, 2,6-dinitrotoluene (2,6-DNT), antimony, arsenic, barium, cadmium, chromium, copper, manganese, selenium, and silver in soil

exceeded the SSL. The maximum detected concentrations of 1,2,4-trichlorobenzene, 1,2-dichloroethene, benzene, chloroform, chloromethane, methyl acetate, PCE, TCE, 2-methylnaphthalene, acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, carbazole, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, naphthalene, pyrene, dioxins, antimony, arsenic, barium, cadmium, chromium, copper, manganese, selenium, silver, thallium, vanadium, and zinc in the OABG area soil exceeded the SSL.

The conservative comparison of maximum detected soil concentration in each of the three areas to the EPA Region III SSLs indicates that soil contamination may be contributing to the groundwater contamination, particularly for PCE and TCE. However, the potential groundwater contamination that would result from leaching of these constituents from soil is much lower in magnitude than the known contribution resulting from the presence of DNAPL in the alluvial and bedrock aquifers beneath Site 1. A ROD is in place to address Site 1 groundwater contamination and groundwater is currently being remediated.

### 6.3.2.3 Potential Exposure Points and Exposure Routes

Exposure points are locations where humans could come in contact with contamination. On-site exposure points comprise surface soil, soil (combined surface and subsurface soil), surface water, and sediment.

Potential exposure routes are evaluated for potential current and future site use. Existing and potential exposure pathways are illustrated in the conceptual exposure model (Figure 6-1). Exposure scenarios and potentially complete pathways of exposure evaluated in this risk assessment are presented in Table 6-3.

### 6.3.2.4 Current Exposure Routes

The only contaminated media currently accessible at the site are surface soil (from the FDP, the ABG, and OABG areas), surface water, and sediment. Based on current site use, potential receptors at the site are industrial workers, adult and adolescent trespasser/visitors, and adult and adolescent recreational users. Table 6-3 identifies the current exposure routes for each of these receptors.

Exposure to indoor air is not considered a current complete exposure pathway. The only structure currently on site is a shed, which is open on one side. There is no vapor intrusion pathway since this structure does not represent a building where air pressures inside the structure would be different from ambient air pressures. The vapor intrusion mechanism (advective transport from soil gas to indoor air) would not apply in this case. Additionally, the maximum time an industrial worker typically spends in this structure is 10 min/day.

### 6.3.2.5 Future Exposure Routes

The property is currently owned by the government and the probable future use of the site is the same as the current use. Therefore, the most likely future receptors are industrial workers, adolescent trespassers, and construction workers. The potential future exposure scenario assumes that the subsurface soil will be excavated and become surface soil. Exposure to surface and subsurface soil for a future residential child and adult scenario was conservatively included in this evaluation to account for an unrestricted use scenario. Additionally, adult and adolescent recreational exposure to contaminants in surface water

and sediment was considered. Table 6-3 identifies the future exposure routes for each of these receptors.

The future exposure scenarios assume that a building will not be constructed on the site, and therefore, there is no potential for inhalation of indoor air associated with vapor intrusion into a building. This is consistent with the current 10-year RCRA permit. If future plans change, and include construction of an industrial or residential building at the site, the vapor intrusion pathway should be evaluated. If the vapor intrusion pathway turned out to be significant, mitigation would be performed for a future building.

The exposure pathways listed above were selected in consultation with EPA Region III and the Navy (CH2M HILL, 2002a; 2004b). These pathways were quantified for potential exposure.

### 6.3.3 Quantification of Exposure

Exposure is quantified by estimating the exposure point concentrations and constituent intake by the receptors for both the reasonable maximum exposure (RME) and central tendency exposure (CTE) scenarios.

#### 6.3.3.1 Exposure Point Concentrations

Exposure point concentrations are estimated constituent concentrations that a receptor may contact and are specific to each exposure medium. Exposure point concentrations may be directly monitored or estimated using environmental fate and transport models. For this assessment, fate and transport modeling was used to estimate constituent concentrations in fugitive dust and volatile emissions from soil. Ambient air concentrations associated with particle and volatile emissions from soil were estimated by calculating a site-specific particulate emission factor and chemical-specific volatilization factors. The airborne particulate emissions and volatile emissions from soil were estimated following EPA's Soil Screening Guidance Document (EPA, 1996b).

The RME EPC for each COPC was calculated as a 95percent UCL of the arithmetic mean of the data set, using ProUCL Version 3.0 (Singh, et al., 2004). First, the distribution of each data set was determined (normal, log normal, and/or gamma, or nonparametric) using either the Shapiro-Wilks test (when there were 50 samples or less in the data set) or the Lillifor's test (when there were greater than 50 samples in the data set) to test for a normal or log normal distribution, and the Anderson-Darling and Kolmogorov-Smirnov Tests to test for a gamma distribution. Based on the distribution of the data and the skewness of the data points, ProUCL recommended a 95 percent UCL that was used as the RME EPC for the data set. For normally distributed data sets, the 95 percent UCL was calculated using the student's t-statistic. For log normally distributed data sets, a 95 percent UCL based either on the Land's H-statistics or Minimum Variance Unbiased Estimate (MVUE) of the mean using the Chebychev Theorem was calculated, depending on the skewness and size of the data set. For data sets with a gamma distribution (i.e., positively skewed data sets), the approximate gamma, or adjusted gamma 95 percent UCL, was used, depending on the extent of the skewness of the data set. For non-parametric data sets (data not fitting any of the three distributions mentioned above), a non-parametric Chebychev method was used to calculate the 95 percent UCL. In cases where there was less than five samples in the data set,

or the recommended UCL exceeded the maximum detected concentration, the maximum concentration was used as the RME EPC.

The RME EPC, which is based on the 95 percent UCL of the arithmetic mean concentration, was used as the CTE EPC.

The EPCs are included in Appendix F, Tables 3.1.RME through 3.14.CTE.

### 6.3.3.2 Estimation of Constituent Intakes for Individual Pathways

Constituent intake is the amount of a constituent entering the receptor's body. Constituent intakes are generally expressed as follows:

$$I = \frac{C \times CR \times EF \times ED}{BW \times AT} = (\text{mg/kg/day})$$

Where:

I = intake (mg/kg-day)

C = constituent concentration at exposure point (milligrams per liter [mg/L], mg/kg, mg/m<sup>3</sup>)

CR = contact rate, or amount of contaminated medium contacted per unit time or event (L/day, mg/event, m<sup>3</sup>/day)

EF = exposure frequency (days/year)

ED = exposure duration (years)

BW = body weight of exposed individual (kg)

AT = averaging time, or period over which exposure is averaged (days)

The intake equation requires specific exposure parameters for each exposure pathway. Appendix F, Tables 4.1.RME through 4.6.CTE present the exposure factors used for different scenarios at the site. Both RME and CTE intakes were included in this evaluation. CTE intakes were calculated for exposure scenarios with RME cumulative cancer risks greater than 1x10<sup>-4</sup> or cumulative non-cancer hazards greater than one.

For residential exposure to soil, lifetime age-adjusted intakes were calculated for carcinogenic constituents. Age-adjusted exposure factors were calculated using the equations presented in the EPA Region III RBC table (EPA, 2005).

For the dermal contact with soil pathway, an absorption factor is required. Dermal absorption factors were obtained from EPA's RAGS, Part E (EPA, 2004b), Exhibit 3-4 and the update to RAGS, Part E Exhibit 3-4 (EPA, 2004c). For the inorganic constituents not included in this reference, one percent was used as the default value (EPA, 1995a).

## 6.4 Toxicity Assessment

Toxicity assessment defines the relationship between the magnitude of exposure and possible severity of adverse effects, and weighs the quality of available toxicological evidence. Toxicity assessment generally consists of two steps: hazard identification and dose-response assessment. Hazard identification is the process of determining the potential

adverse effects from exposure to the constituent along with the type of health effect involved. Dose-response assessment is the process of quantitatively evaluating the toxicity information and characterizing the relationship between the dose of the contaminant administered or received and the incidence of adverse health effects in the exposed population. Toxicity criteria (e.g., RfDs and SFs) are derived from the dose-response relationship.

The EPA recommends that a tiered approach be used to obtain the toxicity values, the RfDs and CSFs, used to calculate non-cancer and cancer risks, respectively (EPA, 2003). The sources of toxicity values are as follows: (1) Integrated Risk Information System (IRIS), (2) Provisional Peer-Reviewed Toxicity values (PPRTV) and (3) other EPA and non-EPA sources including the National Center for Environmental Assessment (NCEA), Agency for Toxic Substances and Disease Registry, Health Effects Assessment Summary Tables, California EPA, and EPA's Office of Water and World Health Organization. If no toxicity values were available for a detected constituent, surrogate constituents were selected and their RfDs were used for the COPC selection process.

Health effects are divided into two broad groups: noncarcinogenic and carcinogenic. This division is based on the different mechanisms of action currently associated with each category. Constituents causing noncarcinogenic health effects are evaluated independently from those having carcinogenic effects. Some constituents may produce both noncarcinogenic and carcinogenic effects, and are therefore evaluated in both groups. The following subsections discuss noncarcinogenic and carcinogenic effects separately.

Per EPA guidance, oral toxicity values (RfDs and CSFs) were adjusted from administered doses to absorbed doses for evaluating dermal toxicity. The RfDs and CSFs were adjusted using oral absorption factors from EPA's RAGS Part E (EPA, 2004b). The adjusted dermal RfDs and CSFs are summarized in Appendix F, Tables 5.1 and 6.1, respectively.

#### **6.4.1 Toxicity Information for Noncarcinogenic Effects**

Noncarcinogenic health effects include a variety of toxic effects on body systems, such as renal toxicity (toxicity to the kidneys) and central nervous system disorders. Noncarcinogenic health effects can be grouped into two basic categories: acute toxicity and chronic toxicity. Acute toxicity can occur after a single exposure (usually at high doses), and the effect is most often seen immediately. Chronic toxicity generally occurs after repeated exposure (usually at low doses) and is seen months or years after the initial exposure. The toxicity of a constituent is assessed through a review of toxic effects noted in short-term (acute) animal studies, long-term (chronic) animal studies, and epidemiological investigations of exposed human populations, typically in the workplace.

EPA (1989) defines the chronic RfD as a dose which is likely to be without appreciable risk of deleterious effects during a lifetime of exposure. Chronic RfDs are specifically developed to be protective for long-term exposure to a constituent (for example, 7 years to a lifetime), and consider uncertainty in the toxicological data base and sensitive receptors. Chronic RfDs may be overly protective if used to evaluate the potential for adverse health effects resulting from short-term exposure. EPA's NCEA develops subchronic RfDs for short-term exposure (2 weeks to 7 years). Subchronic RfDs were used for the construction worker scenario because the exposure duration is assumed to be 1 year.

EPA-derived oral and inhalation RfDs, and associated uncertainty factor (UF) and modifying factor (MF) values, available for the COPCs at Site 1 are listed in Tables 5.1 and 5.2 in Appendix F.

## 6.4.2 Toxicity Information for Carcinogenic Effects

Potential carcinogenic effects from human exposure to constituents are estimated quantitatively using oral and inhalation CSFs. CSFs may be derived from the results of chronic animal bioassays, human epidemiological studies, or both. Animal bioassays are usually conducted at dose levels that are much higher than levels likely to be produced by human exposure to environmental media. This design detects possible adverse effects in the relatively small test populations used in the studies. These high dose levels must be extrapolated to lower doses. A number of mathematical models and procedures have been developed to extrapolate from the high doses used in the studies to the low doses typically associated with environmental exposures.

The EPA-preferred linearized multistage model is usually used to estimate the greatest linear slope (within the upper 95 percent UCL) at low extrapolated doses that is consistent with the data. The 95 percent UCL slope of the dose-response curve is subjected to various adjustments, including an inter-species scaling factor, to derive a CSF. It is assumed that if a cancer response occurs at the dose level in the study, there is some probability that a response will occur at lower exposure levels (i.e., a dose-response relationship with no threshold is assumed). Dose-response data derived from human epidemiological studies are fitted to dose-time-response curves on an ad hoc basis. In both types of analyses, conservative (e.g., health protective) assumptions are applied and the models are believed to provide rough estimates of the upper limits on potential lifetime risk.

EPA-derived oral and inhalation CSFs are listed in Tables 6.1 and 6.2, respectively, in Appendix F. The adjusted dermal SFs are summarized in Table 6.1 in Appendix F.

## 6.4.3 Toxic Equivalency Factors for Dioxins

Since the toxicity assessment approach used for dioxins differs from the approach used for other COPCs, it warrants additional discussion. In this HHRA, the term “dioxin” refers to the group of compounds that share certain chemical structures and toxicity modes-of-action. These dioxin-like compounds are members of two closely related families: the chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs). The term dioxin is also used for the compound TCDD. TCDD is the most toxic of the dioxins, and can be classified as a “human carcinogen” under the EPA’s draft guidelines, based on the weight of the animal and human evidence; the other CDDs and CDFs can be classified as “likely human carcinogens” (EPA, 2004a).

Dioxins (including CDDs and CDFs) are believed to cause toxic effects due to similar biological reactions. As a result, the EPA advocates adding together the toxicity of individual dioxins in order to evaluate complex environmental mixtures to which people could be exposed. Because dioxins differ in their potential to elicit toxic effects, toxic equivalency factors (TEFs) have been developed. TEFs compare the relative toxicity of different CDDs and CDFs to TCDD, which is considered the most potent of the compounds. The toxicity of a mixture can thus be expressed in terms of its TEQ, which is the amount of TCDD it would take to equal the combined toxic effect of the dioxins found in that mixture.

The use of the TEQ approach represents a key assumption upon which many of the conclusions in the reassessment are based (EPA, 2003).

To calculate the TEQ, one-half the detection limit was used as a proxy value for dioxin compounds that were not detected. The TEQs are calculated on Tables 2.1.A, 2.3.A, 2.5.A, 2.7.A, 2.9.A, 2.11.A, and 2.14.A in Appendix F.

#### **6.4.4 Constituents for Which no EPA Toxicity Values Are Available**

Most of the constituents detected at the site have toxicity factors or appropriate surrogate constituents were available for use in the COPC selection. However, lead does not have available published toxicity factors. Lead is regulated by EPA based on blood-lead uptake using a physiologically-based pharmacokinetic model referred to as the IEUBK model. As a screening tool, lead is screened at 400 mg/kg (EPA, 1994) in soil and sediment, and 15 µg/L (Safe Drinking Water Act action level) in surface water.

Lead was retained as a COPC for surface soil and combined surface and subsurface soil from the OABG and ABG areas. Risks associated with industrial worker exposure to lead in soil from these areas were evaluated following the *Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposure to Lead in Soil* (EPA, 1996c) (the adult lead model). This approach uses a methodology to relate soil lead intake to blood lead concentrations in women of child-bearing age. The methodology focuses on estimating the blood lead concentration in fetuses of women exposed to lead contaminated soil.

Potential risks associated with exposure to lead in soil from OABG by child residents (ages 0-7 years) were evaluated using the IEUBK model.

The default assumptions for parameters except the site-specific soil lead concentration were used in both models. The results of these models are included in Section 6.4.2, the risk assessment results

#### **6.4.5 Toxicity Profiles of Selected Constituents**

Detailed toxicity information for the COPCs can be found in EPA's IRIS database, Agency for Toxic Substances and Disease Registry toxicological profiles, and other published literature.

### **6.5 Risk Characterization**

Risk characterization is the process of integrating the previous elements of the risk assessment into quantitative and semi-quantitative expressions of risk. The quantification of risk is then used as an integral component in remedial decision-making and selection of potential remedies or actions, as necessary.

#### **6.5.1 Noncarcinogenic and Carcinogenic Risk Estimation Methods**

Potential human health risks are discussed independently for carcinogenic and noncarcinogenic contaminants because of the different toxicological endpoints, relevant exposure duration, and methods used to characterize risk. The noncarcinogenic health impacts from carcinogens are also assessed.

### 6.5.1.1 Noncarcinogenic Risk Estimation

Noncarcinogenic health risks are estimated by comparing actual or expected exposure levels to threshold concentrations (or RfDs). The expected intake divided by the RfD is equal to the hazard quotient (HQ):

$$\text{HQ} = \text{Intake} / \text{RfD}$$

The intake and RfD are expressed in the same units and represent the same exposure period (i.e., chronic or subchronic). The intake and RfD also represent the same exposure route, (i.e., oral intakes are divided by the oral RfD). When the HQ exceeds unity (i.e., exposure exceeds the RfD), a certain degree of health risk is indicated. To assess the potential for noncarcinogenic health effects posed by exposure to multiple constituents, a “hazard index” approach is used (EPA, 1989). This approach assumes that noncarcinogenic hazards associated with exposure to more than one constituent are additive. Synergistic or antagonistic interactions between constituents are not accounted for. The hazard index (HI) may exceed one, even if all of the individual HQs are less than one. The constituents may then be segregated by similar mechanisms of toxicity and toxicological effects, and separate HIs derived based on mechanism and target organs affected. If the HIs for all of the target organs/effects are less than one, it can generally be assumed there is no unacceptable hazard to the receptor.

### 6.5.1.2 Carcinogenic Risk Estimation

The potential for carcinogenic effects due to exposure to site-related contamination is evaluated by estimating excess lifetime cancer risk. Excess lifetime carcinogenic risk is the incremental increase in the probability of developing cancer during one’s lifetime in addition to the background probability of developing cancer. For example, the background incidence of cancer in the U.S. population is approximately 30 percent (including both lethal and non-lethal forms). Therefore, a  $2 \times 10^{-6}$  excess lifetime carcinogenic risk means that an individual’s probability of developing cancer in his or her lifetime changes from approximately 0.300000 to 0.300002. Or, expressed another way, for every one million people exposed to the carcinogen throughout their lifetime, the incidence of cancer *may* increase by two cases.

Risk is calculated by multiplying the intake by the CSF.

$$\text{Risk} = \text{Intake} \times \text{CSF}$$

The combined risk from exposure to multiple constituents at a site was evaluated by adding the risks from individual constituents. Risks were also added across the pathways, if an individual could be exposed through multiple pathways. For example, a person contacting the soil on-site could be exposed by both the oral and dermal pathways.

When a cumulative carcinogenic risk to an individual receptor under the assumed RME exposure conditions at the site exceeds 100 in a million ( $10^{-4}$  excess cancer risk), CERCLA generally requires remedial action to reduce the potential risks at the site (EPA, 1991). If the cumulative risk is less than  $10^{-4}$ , action generally is not required, but may be warranted if a risk-based chemical-specific standard, for example, a maximum contaminant level (MCL), is exceeded.

## 6.5.2 Risk Assessment Results

The results of the risk characterization are presented below for each potential receptor. A summary of the results is shown in Table 6-4 for the RMEs and Table 6-5 for the CTEs. CTE risks were calculated only when the RME hazards exceeded one or the cancer risks exceeded  $10^{-4}$ .

The noncarcinogenic hazards and carcinogenic risks are calculated in Appendix F, Tables 7.1.RME through 7.17.CTE. Tables 9.1.RME through 9.10.RME in Appendix F summarize the RME total potential risks to each receptor. Tables 9.1.CTE through 9.5.CTE in Appendix F summarize the CTE total potential risks to each receptor that had risks that exceeded an HI of 1.0 or a carcinogenic risk of  $1 \times 10^{-4}$ . Tables 10.1.RME through 10.2.CTE in Appendix F summarize only the constituents that contribute an HQ above 0.1 to scenarios with a total HI greater than 1.0, or a cancer risk above  $10^{-6}$  to scenarios with a total carcinogenic risk greater than  $10^{-4}$ .

### 6.5.2.1 Current Industrial Worker

The risk assessment assumed that a current industrial worker could be exposed to site surface soil. Table 9.1.RME, Appendix F, summarizes the hazards and risks to the current industrial worker.

The noncarcinogenic hazard associated with exposure to surface soil from the FDP area by an industrial worker (0.29) is below EPA's target HI of 1.0. The carcinogenic risk ( $5.9 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the surface soil from the OABG area by an industrial worker (0.96) is below EPA's target HI of 1.0. The carcinogenic risk ( $4.5 \times 10^{-5}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the surface soil from the ABG area by an industrial worker (0.13) is below EPA's target HI of 1.0. The carcinogenic risk ( $8.6 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The maximum detected concentrations of lead in the surface soil from the OABG and ABG areas were above the lead soil screening value of 400 mg/kg. Risks associated with industrial worker exposure to lead in these areas were calculated using the adult lead model. The adult lead model evaluation of surface soil from the OABG and ABG areas resulted in geometric mean blood level concentrations in the range of 2.4 to 2.6  $\mu\text{g}/\text{dl}$ , and 1.7 to 1.9, respectively (Appendix F, Tables Lead-1 and Lead-2). The corresponding 95<sup>th</sup> percentile blood lead levels for fetuses of the industrial worker as a result of ingestion of soil from these areas is in the range of 5.2 to 9.3  $\mu\text{g}/\text{dl}$ . These results are below EPA's recommended level of 10  $\mu\text{g}/\text{dl}$ . The probability that the fetal blood concentration would be greater than the target blood lead concentration of 10  $\mu\text{g}/\text{dl}$  is less than five percent in all cases. Therefore, the potential risk from exposure to lead in surface soil from these areas for the fetuses of industrial workers is within an acceptable level.

### 6.5.2.2 Current Adolescent Trespasser

The risk assessment assumed that a current adolescent trespasser/visitor could be exposed to site surface soil. Appendix F, Table 9.2.RME summarizes hazards and risks to the adolescent visitor.

The noncarcinogenic hazard associated with exposure to surface soil from the FDP area by an adolescent trespasser/visitor (0.13) is below EPA's target HI of 1.0. The carcinogenic risk ( $7.6 \times 10^{-7}$ ) is below EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the surface soil from the OABG area by an adolescent trespasser/visitor (0.45) is below EPA's target HI of 1.0. The carcinogenic risk ( $6.8 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the surface soil from the ABG area by an adolescent trespasser/visitor (0.042) is below EPA's target HI of 1.0. The carcinogenic risk ( $1.1 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The maximum detected concentrations of lead in the surface soil from the OABG and ABG areas were above the lead soil screening value of 400 mg/kg. There is currently no method available to evaluate trespasser exposure to lead. However, a lead exposure analysis was performed using surface soil samples collected from these areas for an industrial worker (Section 6.4.2.1). Since the more conservative industrial worker scenario does not identify risk, it is assumed that no risk exists for the trespasser scenario.

### 6.5.2.3 Future Industrial Worker

The risk assessment assumed that a future industrial worker could be exposed to site soil (combined surface and subsurface soil) from the FDP, ABG, and OABG areas. Table 9.3.RME summarizes the hazards and risks to the future industrial worker.

The noncarcinogenic hazard associated with exposure to combined surface and subsurface soil from the FDP area by a future industrial worker (0.32) is below EPA's target HI of 1.0. The carcinogenic risk ( $4.2 \times 10^{-5}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the combined from the OABG area by an industrial worker (0.90) is below EPA's target HI of 1.0. The carcinogenic risk ( $6.8 \times 10^{-5}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the combined soil from the ABG area by an industrial worker (0.13) is below EPA's target HI of 1.0. The carcinogenic risk ( $1.7 \times 10^{-5}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The maximum detected concentrations of lead in the combined surface and subsurface soil from the OABG and ABG areas were above the soil screening value of 400 mg/kg. The adult lead model evaluation of the combined surface and subsurface soil from the OABG and ABG areas resulted in geometric mean blood level concentrations in the range of 2.3 to 2.5  $\mu\text{g}/\text{dl}$ , and 1.7 to 1.9, respectively (Appendix F, Tables Lead-3 and Lead-4). The corresponding 95<sup>th</sup> percentile blood lead levels for fetuses of the industrial worker as a result of ingestion of soil from these areas is in the range of 5.3 to 8.9  $\mu\text{g}/\text{dl}$ . These results are below EPA's recommended level of 10  $\mu\text{g}/\text{dl}$ . The probability that the fetal blood concentration would be greater than the target blood lead concentration of 10  $\mu\text{g}/\text{dl}$  is less than five percent in all cases. Therefore, the potential risk from exposure to lead in combined surface and subsurface soil from these areas for the fetuses of industrial workers is within an acceptable level.

#### 6.5.2.4 Future Adolescent Trespasser

The risk assessment assumed that a future adolescent trespasser/visitor could be exposed to site soil (combined surface and subsurface soil) from the FDP, the ABG, and the OABG areas. Table 9.4.RME, Appendix F, summarizes the hazards and risks to the future adolescent trespasser/visitor.

The noncarcinogenic hazard associated with exposure to combined soil from the FDP area by an adolescent trespasser/visitor (0.14) is below EPA's target HI of 1.0. The carcinogenic risk ( $5.6 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the combined soil from the OABG area by an adolescent trespasser/visitor (0.41) is below EPA's target HI of 1.0. The carcinogenic risk ( $1.0 \times 10^{-5}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to the combined soil from the ABG area by an adolescent trespasser/visitor (0.041) is below EPA's target HI of 1.0. The carcinogenic risk ( $2.4 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The maximum detected concentrations of lead in the combined surface and subsurface soil from the OABG and ABG areas were above the soil screening value of 400 mg/kg. There is currently no method available to evaluate trespasser exposure to lead. However, a lead exposure analysis was performed using surface and subsurface soil samples collected in these areas for a future industrial worker (Section 6.4.2.3).

#### 6.5.2.5 Future Resident

For the purpose of risk estimation, it was assumed that the site could be developed for unrestricted or residential purposes in the future. Therefore, the child and adult resident were evaluated for potential exposure to site soil (combined surface and subsurface soil) from the FDP, OABG, and ABG areas. Carcinogenic risks were calculated for a lifetime resident instead of for the individual child and adult resident, as directed by EPA Region III risk assessment guidance. Tables 9.5.RME, 9.6.RME, and 9.7.RME, in Appendix F, summarize the hazards and risks to the future adult, child, and lifetime residents, respectively.

The noncarcinogenic hazard associated with exposure to combined soil in the FDP area by an adult resident (0.38) is below EPA's target HI of 1.0. The noncarcinogenic hazard to a child resident (3.3) is above EPA's target HI of 1.0. The main contributor to this hazard is iron, the only constituent contributing an individual HI above 1.0, through the ingestion pathway. Additional contributors to the hazard include TCE, arsenic, manganese, thallium, and vanadium, which each contribute an individual HI between 0.1 and 1.0. The CTE noncarcinogenic hazard to the child resident (1.3) is above the EPA's target HI of 1.0 (Appendix F, Table 9.3.CTE). There are no individual constituents or target organs/effects with HIs above 1.0.

The RME carcinogenic risk associated with exposure to combined soil in the FDP area by the resident exposed over his or her lifetime ( $1.7 \times 10^{-4}$ ) exceeds EPA's acceptable risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ . This risk is associated with dioxins, TCE, and arsenic. The CTE carcinogenic risk ( $1.3 \times 10^{-4}$ ) also exceeds EPA's acceptable risk range (Appendix F, Table 9.4.CTE).

The noncarcinogenic hazard associated with exposure to the combined soil from the OABG area by an adult resident (1.1) is slightly above EPA's target HI of 1.0. There are no

individual constituents or target organ/effects with HIs above 1.0. The noncarcinogenic hazard associated for a child resident (8.9) is also above EPA's target HI of 1.0. Iron, cadmium, manganese, and vanadium are the main contributors to this hazard. The CTE noncarcinogenic hazard due to exposure to the soil by an adult resident (0.46) is below EPA's target HI of 1.0 (Appendix F, Table 9.2.CTE). The CTE noncarcinogenic to a child resident (3.7) is above EPA's target HI of 1.0 (Appendix F, Table 9.3.CTE). There are no individual constituents or target organ/effects with HIs above 1.0.

The RME carcinogenic risk associated with exposure to soil from the OABG area by the resident, exposed over his or her lifetime ( $2.6 \times 10^{-4}$ ), is above EPA's acceptable risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ . The risk is primarily associated with PAHs, arsenic, and dioxin. The CTE carcinogenic risk ( $8.2 \times 10^{-5}$ ) is within EPA's target risk range. (Appendix F, Table 9.4.CTE).

The noncarcinogenic hazard associated with exposure to combined soil in the ABG area by an adult resident (0.36) is below EPA's target HI of 1.0. The noncarcinogenic hazard to a child resident (3.3) is above EPA's target HI of 1.0. The main contributor to this hazard is iron, the only constituent contributing an individual HI above 1.0, through the ingestion pathway. Additional contributors to the hazard include perchlorate, arsenic, manganese, thallium, and vanadium, which each contribute an individual HI between 0.1 and 1.0. The CTE noncarcinogenic hazard to the child resident (1.1) is above the EPA's target HI of 1.0 (Appendix F, Table 9.3.CTE). There are no individual constituents or target organs/effects with HIs above 1.0.

The RME carcinogenic risk associated with exposure to combined soil in the ABG area by the resident exposed over his or her lifetime ( $6.3 \times 10^{-5}$ ) is within EPA's acceptable risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  (Appendix F, Table 9.7.RME).

The maximum detected concentration of lead in the combined surface and subsurface soil from the OABG and ABG areas were above the soil screening value of 400 mg/kg. Therefore, an assessment of risks associated with exposure to lead in these areas was performed using the EPA's IEUBK model for the residential child. The results of the IEUBK model for the OABG area using the average lead concentration of 559 mg/kg indicates exposure to lead in soil would be a potential health concern for residential receptors. The geometric blood lead concentration for children 0-72 months old would be 6.3  $\mu\text{g}/\text{L}$ , and 16.6 percent of the population may have a blood lead concentration above the 10  $\mu\text{g}/\text{L}$  target level. EPA considers lead in soil to be a potential health concern if greater than five percent of the population has a blood-lead level greater than 10  $\mu\text{g}/\text{dL}$ . The IEUBK model output is included in Appendix F, Table Lead-5 and Figure Lead-1.

The results of the IEUBK model for the ABG area using the average lead concentration of 158 mg/kg indicates exposure to lead in the soil would not be a risk to residential receptors. The geometric mean blood lead concentration for children 0-72 months old would be 3.4  $\mu\text{g}/\text{L}$ , and only 0.56 percent of the population may have a blood lead concentration above the 10  $\mu\text{g}/\text{L}$  target level. The IEUBK model output is included in Appendix F, Table Lead-6, and Figure Lead-2.

#### 6.5.2.6 Future Construction Worker

The risk assessment assumed that a future construction worker could be exposed to combined soil (surface and subsurface soil) from the FDP, OABG, and ABG areas during

construction or excavation activities. Table 9.8.RME, Appendix F, summarizes the hazards and risks to the construction worker.

The noncarcinogenic hazard associated with exposure to combined soil from the FDP area by a construction worker (1.1) is slightly above EPA's target HI of 1.0. There are no individual constituents or target organ/effects with HIs above 1.0. The carcinogenic risk ( $6.6 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ . The CTE noncarcinogenic hazard (0.25) is below the EPA target hazard.

The noncarcinogenic hazard associated with exposure to soil from the OABG area for a construction worker (1.2) is above EPA's target HI of 1.0. There are no individual constituents or target organ/effects with HIs above 1.0. The carcinogenic risk ( $9.6 \times 10^{-6}$ ) is within the EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ . The CTE noncarcinogenic hazard (0.63) is below the EPA's target HI of 1.0 (Appendix F, Table 9.5.CTE).

The noncarcinogenic hazard associated with exposure to soil from the ABG area for a construction worker (0.58) is below EPA's target HI of 1.0. The carcinogenic risk ( $2.7 \times 10^{-6}$ ) is within EPA's target risk range.

The maximum detected concentrations of lead in the combined surface and subsurface soil from the OABG and ABG areas were above the soil screening value of 400 mg/kg. Therefore, the adult lead model was used to evaluate potential risks associated with exposure to lead. The ingestion rate was changed from that used for the default industrial worker to the average ingestion rate for a contact-intense worker scenario of 100 mg/kg as recommended in the Frequent Questions from Risk Assessors on the Adult Lead Methodology, an EPA's website (<http://www.epa.gov/superfund/programs/lead/almfaq.htm#receptor>). The remainders of the input parameters were left as the default values. The lead model evaluation resulted in geometric mean blood level concentrations in the range of 3.1 to 3.3  $\mu\text{g}/\text{dl}$  for the OABG area and 2.0 to 2.2  $\mu\text{g}/\text{dl}$  for the ABG area (Appendix F, Tables Lead-7 and Lead-8). The corresponding 95<sup>th</sup> percentile blood lead levels for fetuses of the construction worker as a result of ingestion of soil from these areas are in the range of 6.0 to 11.7  $\mu\text{g}/\text{dl}$ . The probability that the fetal blood concentration would be greater than the target blood lead concentration of 10  $\mu\text{g}/\text{dl}$  is less than 5 percent for the ABG area, however, for the OABG the probably may exceed 5 percent (4.3 to 7.3 percent). Therefore, there may be a risk associated with exposure to lead in soil at the OABG area by construction workers.

#### 6.5.2.7 Current/Future Adult Recreational Person

The risk assessment assumed that a current/future recreational adult could be exposed to surface water and sediment along the reach of the North Branch Potomac River adjacent to Site 1. Table 9.9.RME, Appendix F, summarizes the hazards and risks to the adult recreational person.

The noncarcinogenic hazard associated with exposure to surface water by an adult recreational user (0.0097) is below EPA's target HI of 1.0. The carcinogenic risk ( $2.7 \times 10^{-7}$ ) is below EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to sediment by an adult recreational user (0.074) is below EPA's target HI of 1.0. The carcinogenic risk ( $2.2 \times 10^{-6}$ ) is within the EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The cumulative RME hazard and risk for the recreational adult exposed to surface water and sediment are within or below EPA's target risk levels.

#### 6.5.2.8 Current/Future Adolescent Recreational Person

The risk assessment assumed that a current/future recreational adolescent could be exposed to surface water and sediment along the reach of the North Branch Potomac River adjacent to Site 1. Table 9.10.RME, Appendix F, summarizes the hazards and risks to the adolescent recreational person

The noncarcinogenic hazard associated with exposure to surface water by an adolescent recreational person (0.002) is below EPA's target HI of 1.0. The carcinogenic risk ( $1.9 \times 10^{-7}$ ) is below the EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The noncarcinogenic hazard associated with exposure to sediment by an adolescent recreational person (0.075) is below EPA's target HI of 1.0. The carcinogenic risk ( $1.0 \times 10^{-6}$ ) is within EPA's target risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$ .

The cumulative RME hazard and risk for the recreational adolescent exposed to surface water and sediment are below or within EPA's target risk levels.

### 6.5.3 Targeted Area Risk Assessments

The purpose of the targeted area assessment was to ensure that no COCs were missed in the risk assessment by combining all of the data within an area and to identify potential areas of concern at each area with elevated COCs. The three sets of data included in the risk assessment were evaluated statistically to determine if outliers are present that may represent sub-areas with higher constituent concentrations. Based on this review, targeted areas were identified for further evaluation in the HHRA. The objectives for conducting the targeted area evaluations were to:

- Ensure a conservative approach to assessing risk is applied to areas with localized higher constituent concentrations;
- Identify potential areas of concern for elevated levels of site constituents; and
- Ensure that each COC is identified.

#### 6.5.3.1 Statistical Approach for Identification of Outliers

Outlier analyses were performed on the highest five concentrations for each parameter when more than ten results were available in the data set to determine if there were any sub-areas with higher contamination. In accordance with EPA guidance (EPA, 2000a), two separate mathematical outlier tests were used depending on the available sample size. For sample sizes of 25 or more, Rosner's test was applied. For sample sizes less than 25, Dixon's Extreme Value test was used. Whereas Rosner's test handles potential multiple outliers directly, the Extreme Value test does not, although it was nevertheless applied sequentially for each elevated value. These outlier tests were performed with a significance level of 0.05.

The concentrations deemed mathematical outliers via these tests are reported in Appendix F, Table B-1. In assessing these results, it is important to note that these tests help demonstrate when elevated concentrations are unlikely to belong to the same population as the lower concentrations. These tests do not consider how these elevated concentrations

compare to risk based levels. However, this comparison was done after performing the tests, and the result shown on the Table B-1 in Appendix F.

Both of these outlier tests are based on an assumption that the remaining concentrations represent a normal distribution (after the potential outlier is excluded). This assumption is seldom true, particularly with site data which is potentially affected by source contamination. The remaining concentrations were transformed as suggested in EPA guidance (EPA, 2000a) using one of three transformations. These were the square root transformation, the cubic root transformation, and the natural logarithmic transformation. The logarithmic transformation is a standard transformation in environmental applications and can transform a relatively heavily skewed population into one relatively normal population (although distributions appearing more heavily skewed can certainly exist). The square root and cubic root transformations can adjust data with intermediate levels of skewness into more normally distributed data.

Each transformation was evaluated for each potential outlier. The transformation offering the greatest probability for normality (via the Shapiro-Wilk test for normality) was chosen for each individual case. For many cases, even the most heavily skewed option, the lognormal distribution, could not be verified since the remaining concentrations were even more heavily skewed. Since assuming a more heavily skewed distribution makes it less likely that elevated concentrations are identified as outliers, limiting the skewness to the lognormal level (which appears reasonable) typically results in the elevated concentrations being classified as outliers (more outliers than if more heavily skewed transformations were considered).

Probability plots were developed for the data, and are presented in Appendix F, Figures 1 through 6. Probability plots graph the measured concentrations against those expected if the data (or the transformed data) are normally distributed. As a result, the data points tend to form straight lines when the data resemble a normal distribution. These plots also serve as a convenient visual tool to stretch all the individual concentrations across the graph, so that it is easy to see the overall distribution and how elevated concentrations compare to the others.

For each constituent with a mathematical outlier, plots were provided in Appendix F, Figures 7 through 12 for untransformed data, as well as transformed data using the three transformations discussed above (square root, cubic root, and logarithmic). Hence, these probability plots help to show how the different transformations aid in understanding whether the data should be evaluated as untransformed or transformed during the statistical evaluations. The mathematical outliers, listed in Appendix F, Table B-1, are marked with an X symbol in these plots. Another symbol is used when these mathematical outliers appear to be part of noise about the detection limit. Since a value of  $\frac{1}{2}$  the detection limit is used as a proxy for each non-detect, the outlier tests for constituents with a large percentage of non-detects often identify the rare detects as outliers even though these concentrations are not much higher than the detection limit. An attempt was made to identify these cases by identifying those mathematical outliers that were within 50 percent of the median detection limit. These cases are indicated in Table 1 and are shown in the figures with an N symbol in lieu of the X symbol used with the other outliers. The choice of 50 percent is an arbitrary one that seeks to include a buffer zone slightly higher than the

detection limit itself. On the plots, the non-detects are plotted as  $\frac{1}{2}$  the detection limit, just as they are used in calculations.

### 6.5.3.2 Results of the Statistical Evaluation

The statistical calculations provide a consistent and objective list of outliers that may represent localized areas with elevated constituent concentrations. Appendix F, Table B-1 indicates if these outlier concentrations were detected above the RBCs. Constituents/samples that were not detected at concentrations above the RBCs (and therefore, not retained as COPCs in the HHRA) were not evaluated separately as targeted risk areas. Samples with outlier concentrations above the RBCs were evaluated to determine if a separate target area assessment should be performed. If the constituent was already identified as a COC in the HHRA, it was not evaluated separately for a targeted area. Because this constituent was identified as a COC, it will be considered further during future evaluation (i.e., an FS) of the site. If a constituent was not identified in the HHRA as a COC, it was evaluated for a targeted area to ensure that each COC was identified.

### 6.5.3.3 Results of the Targeted Risk Assessment

The following targeted areas were evaluated:

- Lead (sample AS01-SS02-R01X, AS01-SB68-1.5-2, AS01-SB70-2.5-3) in the ABG area.
- Antimony and mercury (sample AS01-SB70-2.5-3) in the ABG area.
- Copper (sample AS01-SS67-0-0.5) in the ABG area.
- PCE and TCE (sample AS01-SB69-1-1.5) in the ABG area.
- Dioxins (sample AS01-SB67-1.5-2) in the ABG area.
- Chromium (samples AS01-SS22-0-1, AS01-SS72-0-0.5, AS01-SB74-4-4.5) in the OABG area.
- Copper and nickel (sample AS01-SB74-4-4.5) in the OABG area.
- Mercury (sample AS01-SS72-0-0.5) in the OABG area.
- Vanadium (sample AS01-SS22-0-1) in the OABG area.
- HMX and RDX (sample AS01-SS72-0-0.5) in the OABG area.

The results of the calculations for the targeted area risk assessments identified above are presented in Appendix F, Targeted Area Evaluation Tables 1 through 10. The calculated risks and hazards for all of these targeted areas, except for the metals in the OABG area, are below or within EPA's target risk levels. Exposure to chromium, copper, mercury, or vanadium by a future resident at the concentration detected in the associated sample identified would result in a noncarcinogenic hazard above EPA's target level. However, it is unlikely that the receptor would just be exposed to the soil represented by that sample. The samples within the vicinity of these targeted area samples have lower concentrations.

The concentrations of lead in the associated three targeted areas within the ABG would pose a risk to both an industrial worker or a future resident if exposed to concentrations of lead similar to that found in those specific samples. However, it is unlikely that the receptor would just be exposed to the soil represented by those few samples and not across the full ABG area.

The following constituents were identified as having potential targeted areas, but were not evaluated in a separate risk assessment because they are COCs for the full HHRA.

- Dioxin in the FDP area (samples from AS01-SB62 and AS01-SB60).

- PAHs in the OABG area (samples from AS01-SB25, AS01-SB49, and AS01-SB57).
- Perchlorate (samples AS01-SB64-7.5-8 and AS01-SS64-0-0.5) in the ABG area.

A number of constituents were identified as having potential targeted areas, but were not evaluated in a separate risk assessment because the concentrations were below the RBCs. These constituents are identified in Table B-1, Appendix F.

## 6.6 Uncertainty Associated with Human Health Assessment

The risk measures used in risk assessments are not fully probabilistic estimates of risk, but are conditional estimates given that a set of assumptions about exposure and toxicity are realized. Thus, it is important to specify the assumptions and uncertainties inherent in the risk assessment to place the risk estimates in proper perspective.

A site-specific discussion on the individual components of the risk assessment is presented in the following subsections.

### 6.6.1 General Uncertainty in COPC Selection

The uncertainty in sampling and possibility of missing a contaminated location is expected to be minimal at this site, because of the large amount of sampling data available. The quantitative uncertainty associated with the other factors is also minimal because the data were validated prior to use in the risk assessment. The general assumptions used in the COPC selection are conservative to ensure the estimation of greatest potential risk.

### 6.6.2 Uncertainty Associated with Exposure Assessment

Most of the exposure pathways analyzed are assumed, and exposure factors used for quantitation of exposure are conservative and reflect worst-case or upper-bound assumptions on the exposure. Exposure to the soil, surface water, and sediment is assumed to occur primarily at the areas with the greatest detected concentrations.

Inhalation exposure point concentrations are estimated using the models suggested by EPA, which assume a continued source of contaminants in the emitting medium and do not account for depletion of the source due to volatilization or air-borne dust emission. The inhalation intake estimates also assume that a receptor is always in the downwind direction of the site, while in reality the wind direction changes frequently.

The percent of a constituent absorbed through the skin is likely to be affected by many parameters. Some of the parameters include soil loading, soil moisture content, organic content, pH, and presence of other constituents. The availability of a constituent depends on site-specific fate and transport properties of the constituent species available for eventual absorption of skin. Constituent concentrations, specific properties of the constituent, and soil release kinetics impact the amount of a constituent that is absorbed. These factors contribute to the uncertainty associated with these dermal absorption estimates and make quantitation of the amount of certain constituents absorbed from soil difficult. Following risk assessment guidance (EPA, 2004b), dermal exposure to VOCs in soil was not quantified. It is assumed the majority of the VOCs would volatilize from the skin surface prior to being absorbed. It should also be noted that dermal exposure to PAHs may result in effects/risks to the skin. The methods available and used to evaluate dermal exposure risks do not

account for this, but measure risks associated after dermal absorption and intake of the PAHs into the body.

### 6.6.3 Uncertainty Associated with Toxicity Assessment

Uncertainties associated with the noncarcinogenic toxicity factors are included in Appendix F, Tables 5.1 and 5.2. Several UFs may be applied to account for uncertainty in the RfDs. UFs account for uncertain data quality, extrapolation of data from animal studies to human exposures, or the use of subchronic studies to develop chronic criteria. These UFs range between 10 and 10,000, and reflect the varying degrees of uncertainty in the toxicity criteria.

The uncertainty associated with CSFs is mostly associated with the low dose extrapolation where carcinogenicity at low doses is assumed to be straight line responses. This is a conservative assumption, which introduces a high uncertainty into SFs that are from this extrapolated area of the dose-response curve. Additionally, most of the experimental studies indicate existence of a threshold for carcinogenicity, while the extrapolation process assumes that there is no threshold. Additional uncertainty is in the prediction of relative sensitivities of different species of animals and the applicability of animal data to humans.

Therefore, the CSFs developed by the EPA represent upper bound estimates. Any carcinogenic risks generated in this assessment should be regarded as an upper bound estimate on the potential carcinogenic risks rather than an accurate representation of carcinogenic risk. The true carcinogenic risk is likely to be less than the predicted value.

Toxicity values for chromium VI were conservatively used in evaluating total chromium risks. In all likelihood, the chromium type found at the site is chromium III. This may result in an over-estimation of the risk associated with total chromium.

Use of provisional toxicity factors (toxicity values from sources other than IRIS) increases the degree of uncertainty associated with the risk assessment. Provisional RfDs for aluminum, copper, iron, thallium, TCE, PCE, and vanadium were used in this assessment. Provisional CSFs for dioxin, TCE, and PCE were used in the assessment.

Iron is an essential human nutrient, which complicates the derivation of an RfD (EPA, 1999a). The future child resident had an estimated HQ from ingestion of iron in soil from the OABG area of 1.6, which is above the EPA target value of one. However, the estimated RME intake of iron via incidental ingestion of soil from the OABG area (0.48 mg/kg-day; Appendix F, Table 7.28) is within the RDA<sup>1</sup> range for children ages 6 months to 10 years (0.36–1.11 mg/kg-day) (EPA, 1999a; National Academy of Sciences, 1989). The future child resident had an estimated HQ of 1.2 from ingestion of iron in soil from the ABG area, which is greater than the EPA's target level of one. The estimated RME intake of iron via incidental ingestion of soil from the ABG area (0.37 mg/kg-day, Appendix F, Table 7.40.RME) is within the RDA range for children ages 6 months to 10 years (0.36–1.11 mg/kg-day) (EPA,1999a). Therefore, exposure to iron in soil by child residents should not be considered a health concern since it is within the range associated with levels that meet the known nutrient needs of healthy individuals.

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<sup>1</sup> RDAs are defined as "the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known nutrient needs of practically all healthy persons." (NAS, 1989). Therefore RDAs are not commonly used as screening values for environmental assessments. These values are presented here as a frame of reference for daily intakes that are associated with nutritive requirements.

The provisional toxicity values used for TCE in this assessment were provided by NCEA. NCEA developed these provisional toxicity values subsequent to the withdrawal of the TCE CSFs from IRIS in 1989. The NCEA CSFs were the same values that were withdrawn from IRIS in 1989 (oral CSF =  $1.1 \times 10^{-2}$  per mg/kg-day and inhalation CSF =  $6.0 \times 10^{-3}$  per mg/kg-day). In 1992, NCEA also recommended a provisional noncarcinogenic toxicity value (oral RfD =  $6.0 \times 10^{-3}$  mg/kg-day). However, these values, similar to all NCEA toxicity values, are considered provisional and are to be periodically reassessed based on the up-to-date scientific understanding.

In August 2001, NCEA completed a draft health assessment of the health risks posed by TCE. The draft health assessment was made available for public comment and includes a disclaimer that it is a preliminary draft and “has not been formally released by EPA and should not at this stage be construed to represent Agency policy. It is being circulated for comment on its technical merit and policy implications,” (EPA, 2001b). The draft health assessment proposed a provisional oral RfD of  $3.0 \times 10^{-4}$  mg/kg-day based on effects to the liver, kidney, and developing fetuses. A provisional inhalation RfD of  $1.1 \times 10^{-2}$  mg/kg-day was also suggested based on critical effects in the central nervous system, liver, and endocrine system. Several CSFs were developed in the 2001 draft health assessment, with most SFs falling between  $2 \times 10^{-2}$  and  $4 \times 10^{-1}$  per mg/kg-day.

Because the toxicity values in the draft 2001 health assessment are different than the current provisional toxicity values, to characterize the uncertainty associated with the quantitative estimate of risk from exposure to TCE, a parallel set of risk calculations was performed using the toxicity values in the draft 2001 health assessment. The following values were used (also shown on Appendix F, Table 5.1, 5.2, 6.1, and 6.2, identified as TCE - draft 2001):

- Oral CSF =  $4.0 \times 10^{-1}$  (mg/kg-day)<sup>-1</sup>
- Inhalation CSF =  $4.0 \times 10^{-1}$  (mg/kg-day)<sup>-1</sup>
- Oral RfD =  $3.0 \times 10^{-4}$  mg/kg-day
- Inhalation RfD =  $1.1 \times 10^{-2}$  mg/kg-day

Table 6-6 shows the results of the risk assessment using these toxicity values, and compares them to the results using the pre-2001 values. The following bullets show those scenarios in which use of the draft 2001 values would result in a different conclusion:

- Current Industrial Worker. Exposure to surface soil from the OABG area would result in a noncarcinogenic hazard and cancer risk above EPA’s target levels. However, TCE alone would not pose a risk or hazard.
- Future Industrial Worker. Exposure to combined soil from the FDP or OABG areas would result in a cancer risk above EPA’s target risk range, primarily associated with inhalation of TCE. Exposure to combined soil from the OABG area would result in a noncarcinogenic hazard above EPA’s target level. However, TCE alone would not pose a hazard.
- Future Adult Resident. Exposure to combined soil from the FDP area would result in a noncarcinogenic hazard above EPA’s target level. TCE alone would not pose a hazard, however, TCE would be the primary driver of the hazard.
- Future Child Resident. Exposure to TCE in combined soil from the FDP and OABG areas would result in a noncarcinogenic hazard above EPA’s target level. Using the pre-draft

2001 TCE value would not result in TCE alone posing a hazard above one; however, the 2001 draft TCE toxicity values would result in TCE as a primary risk driver for the child resident.

- Future Lifetime Resident. TCE would be a primary risk driver with a cancer risk above EPA's target risk range for exposure to combined soil from the FDP and OABG areas, using the draft 2001 TCE toxicity values.

#### 6.6.4 Uncertainty in Risk Characterization

The uncertainties identified in each component of risk assessment ultimately contribute to uncertainty in risk characterization. The addition of risks and HIs across pathways and constituents contributes to uncertainty based on the interaction of constituents such as additivity, synergism, potentiation, susceptibility of exposed receptors.

A comparison of site data to background data was not used to select COPCs. However, the risk drivers, identified in Section 6.6, were compared to background data to determine if they could be associated with background conditions and not necessarily site related (Appendix F, Background Tables 1 and 2). Two sample comparisons of site versus background data are recommended by EPA background guidance (EPA, 2002). This test can include a two sample t test when both site and background data sets have suitable sample size (at least 20 in each) and both data sets can be considered normally distributed. None of the cases met the requirements of this t test, so the Wilcoxon Rank Sum (WRS) test, a nonparametric central tendency comparison was used.

The WRS test is a nonparametric test used for determining whether a difference exists between two populations (EPA, 2002). It can be used to test whether measurements from one population (such as the site population) tend to be shifted higher than those from another population (such as the background population). As a nonparametric test based on ranks of the data, it is less influenced by spurious results in either data set than parametric tests, such as a t-test, which makes a distributional assumption about the data. The WRS test calculates the probability that the observed differences between the two populations are due merely to random variability in the data, as opposed to being due to an actual elevated shift in one. If this probability is less than a chosen significance level, in this case 0.05, the decision is made that a significant difference does exist between the two populations.

The results of the background comparison for the risk drivers indicated that manganese in combined soil from the FDP area is the only risk driver that is likely associated with background conditions. Removal of manganese from the total hazard calculation would not result in any changes in the conclusions of the risk assessment.

### 6.7 Summary and Conclusions

This baseline risk assessment was conducted to evaluate the potential human health risks associated with the site-related activities on:

- Surface soil at the FDP area
- Surface soil at the OABG area
- Surface soil from the ABG area
- Combined soil (surface and subsurface soil) from the FDP area

- Combined soil from the OABG area
- Combined soil from the ABG area
- Surface water from the river
- Sediment from the river

Potential risks were calculated for a:

- Current/future industrial worker
- Current/future adolescent trespasser/visitor
- Current/future adult recreational person
- Current/future adolescent recreational person
- Future adult resident
- Future child resident
- Future lifetime resident
- Future construction worker

Table 6-7 presents a summary of the risks by receptors and media and identifies if the risks are acceptable or unacceptable. If the risks were found to be unacceptable, the COCs are listed.

This risk assessment quantifies potential human health risks at Site 1 under current and future use scenarios based on current site conditions. The risk assessment results are presented in Appendix F, Tables 9.1.RME through 9.5.CTE. The results for the risk drivers only (those constituents contributing an individual HI of greater than 0.1 to a total HI that is greater than 1.0, or an individual cancer risk of  $10^{-6}$  to a total cancer risk that is greater than  $10^{-4}$ ) are included in Appendix F, Tables 10.1.RME through 10.2.CTE. The RME risks are summarized in Table 6-4, and the CTE risks are summarized in Table 6-5.

The maximum detected lead concentrations in surface and combined surface and subsurface soil in the ABG and OABG areas were above the EPA recommended level. However, based on a quantitative analysis, exposure to surface and combined surface and subsurface soil would not result in unacceptable risks for industrial workers. However, there may be a risk from exposure to lead in the soil from the OABG area for a construction worker. Additionally, exposure to lead in soil from the OABG area represents an unacceptable level of potential risk to child residents.

There were no unacceptable risks from exposure to surface water and sediment. Therefore, there were no risk drivers identified for either surface water or sediment from the North Branch Potomac River.

There were no unacceptable risks from exposure to surface soil at the FDP, OABG, or ABG areas by the potential current receptors (industrial worker and adolescent trespasser/visitor). Therefore, based on current site use, there are no risks or hazards above EPA's target levels.

There were no unacceptable risks from exposure to combined surface soil and subsurface soil at the FDP, OABG, or ABG areas by a potential future industrial worker or adolescent trespasser/visitor. The carcinogenic risk to a future industrial worker exposed to soil in the three areas on a full-time basis would result in a carcinogenic risk slightly above EPA's target risk range. However, this scenario is unlikely, based on current work processes at the facility. Therefore, based on the assumed future industrial use of the site, exposure to

combined surface and subsurface soil would not result in unacceptable levels of potential risk at any of the three areas evaluated in the risk assessment.

Exposure to combined soil (surface and subsurface soil) from the FDP area could result in a potential noncarcinogenic hazard above EPA's target level for a future child resident and a potential carcinogenic risk above EPA's target risk range for a future lifetime resident. The hazard to the child resident is primarily associated with iron, with smaller contributions (HI of 0.1 to 1.0) from TCE, aluminum, arsenic, manganese, thallium, and vanadium. The carcinogenic risk is primarily associated with dioxin, with contributions from TCE and arsenic. While the total potential noncarcinogenic hazard to a future construction worker exceeds EPA's target level, when separated by target organ, there are no target organ/effects above the target level, and therefore, no unacceptable hazards.

Exposure to combined surface and subsurface soil from the OABG area could result in a potential noncarcinogenic hazard above EPA's target level for a future child resident and a potential carcinogenic risk above EPA's target risk range for a future lifetime resident. The hazard to the child resident is primarily associated with cadmium, iron, manganese, and vanadium, with smaller contributions between an HI of 0.1 to 1.0 from TCE, antimony, arsenic, chromium, copper, mercury, and thallium. The carcinogenic risk is primarily associated with PAHs, with contributions from dioxin, TCE, PCE, and arsenic. While the total potential noncarcinogenic hazards to a future adult resident and future construction worker exceed EPA's target level, when separated by target organ, there are no target organ/effects above the target level, and therefore, no unacceptable hazards.

Exposure to combined surface and subsurface soil from the ABG area could result in a potential noncarcinogenic hazard above EPA's target level for a future child resident. The hazard to the child resident is primarily associated with iron, with smaller contributions from perchlorate, arsenic, manganese, thallium, and vanadium.

In conclusion, the only receptors with potential hazards or risks above EPA's target levels, based on exposure to each individual area evaluated for Site 1, are the potential future child resident and the lifetime resident. The calculated child resident noncarcinogenic hazards and/or the lifetime resident carcinogenic risks associated with exposure to soil from the FDP, OABG, or ABG areas exceed EPA's target risk levels. Potential noncarcinogenic hazards are primarily associated with exposure to metals, and potential carcinogenic risks are primarily associated with exposure to dioxin, TCE, PAHs, and arsenic. No unacceptable potential risks were identified under the current/future industrial worker or the current/future construction worker for the three areas.

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
<b>Surface Soil - Former Disposal Pits</b>			
<i>Surface Soil</i>			
AS01-SS60-0-0.5	09/21/2004	AS01-SS60	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS61-0-0.5	09/21/2004	AS01-SS61	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS62-0-0.5	09/21/2004	AS01-SS62	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
HCS-BG-4S	06/20/1994	BG-004/004S/005/039	VOCs
HCS-BG-8S	06/20/1994	BG-008/008S/009/038	VOCs
<b>Surface Soil - Active Burning Grounds</b>			
<i>Surface Soil</i>			
AS01-SS01-R01X	02/21/2001	AS01-SS01	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS02-R01X	02/21/2001	AS01-SS02	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS03-R01X	02/21/2001	AS01-SS03	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS04-R01X	02/21/2001	AS01-SS04	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS05-R01X	02/21/2001	AS01-SS05	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS06-R01X	02/21/2001	AS01-SS06	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS07-R01X	02/22/2001	AS01-SS07	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS08-R01X	02/21/2001	AS01-SS08	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS09P-R01X <sup>a</sup>	02/22/2001	AS01-SS09	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS09-R01X	02/22/2001	AS01-SS09	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS10-R01X	02/22/2001	AS01-SS10	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS11-R01X	02/22/2001	AS01-SS11	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS12-R01X	02/22/2001	AS01-SS12	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS13-R01X	02/22/2001	AS01-SS13	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS14-R01X	02/21/2001	AS01-SS14	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS15-R01X	02/21/2001	AS01-SS15	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS16P-R01X <sup>b</sup>	02/22/2001	AS01-SS16	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS16-R01X	02/22/2001	AS01-SS16	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS17-R01X	02/22/2001	AS01-SS17	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS18-R01X	02/22/2001	AS01-SS18	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS19-R01X	02/22/2001	AS01-SS19	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS20-R01X	02/22/2001	AS01-SS20	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
HCS-BG-10S	06/20/1994	BG-010/010S/053	VOCs
HCS-BG-25S	06/20/1994	BG-025/025S/048	VOCs
HCS-BG-33S	06/20/1994	BG-033/033S	VOCs
HCS-BG-34S	06/20/1994	BG-034/034S	VOCs
HCS-BG-55S	06/20/1994	BG-055/055S	VOCs
HCS-BP-1	07/13/1992	BP-01	Explo., VOCs, SVOCs
HCS-BP-2	07/13/1992	BP-02	Explo., VOCs, SVOCs
HCS-BP-3	07/13/1992	BP-03	Explo., VOCs, SVOCs
HCS-BP-4	07/13/1992	BP-04	Explo., VOCs, SVOCs
HCS-BP-4/DUP <sup>c</sup>	07/13/1992	BP-04	Explo., VOCs, SVOCs
HCS-BP-5	07/13/1992	BP-05	Explo., VOCs, SVOCs
HCS-BP-6	07/13/1992	BP-06	Explo., VOCs, SVOCs
HCS-BP-7	07/13/1992	BP-07	Explo., VOCs, SVOCs
HCS-BP-8	07/13/1992	BP-08	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS63-0-0.5	09/22/2004	AS01-SS63	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS63-0-0.5/DUP <sup>d</sup>	09/22/2004	AS01-SS63	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS64-0-0.5	09/22/2004	AS01-SS64	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS65-0-0.5	09/22/2004	AS01-SS65	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS66-0-0.5	09/23/2004	AS01-SS66	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS67-0-0.5	09/23/2004	AS01-SS67	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS68-0-0.5	09/23/2004	AS01-SS68	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS69-0-0.5	09/23/2004	AS01-SS69	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS69-0-0.5/DUP <sup>e</sup>	09/23/2004	AS01-SS69	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS70-0-0.5	09/23/2004	AS01-SS70	VOCs, SVOCs, Dioxins/Furans, Explo., Metals

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
<b>Surface Soil - Outside Active Burning Grounds</b>			
<i>Surface Soil</i>			
AOCM-1-T	10/26/2001	AOCM-1	VOCs, SVOCs, Explo. Metals, Cyanide
AOCM-2-T	10/26/2001	AOCM-2	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS21-(0-1)	10/25/2001	AS01-SS21	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS21P-(0-1) <sup>f</sup>	10/25/2001	AS01-SS21	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS22-(0-1)	10/25/2001	AS01-SS22	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS23-(0-1)	10/26/2001	AS01-SS23	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS24-(0-1)	10/24/2001	AS01-SS24	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS25-(0-1)	10/24/2001	AS01-SS25	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS26-(0-1)	10/23/2001	AS01-SS26	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS27-(0-1)	10/23/2001	AS01-SS27	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS28-(0-1)	10/26/2001	AS01-SS28	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS29-(0-1)	10/26/2001	AS01-SS29	VOCs, SVOCs, Explo. Metals, Perchlorate, Cyanide
AS01-SS30-(0-1)	10/24/2001	AS01-SS30	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS33-(0-1)	10/26/2001	AS01-SS33	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS34-(0-1)	10/25/2001	AS01-SS34	VOCs, SVOCs, Explo. Metals, Perchlorate, Cyanide
AS01-SS34P-(0-1) <sup>g</sup>	10/25/2001	AS01-SS34	VOCs, SVOCs, Explo. Metals, Perchlorate, Cyanide
AS01-SS35-(0-1)	10/26/2001	AS01-SS35	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS36-(0-1)	10/25/2001	AS01-SS36	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS37-(0-1)	10/26/2001	AS01-SS37	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS38-(0-1)	10/26/2001	AS01-SS38	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS38P-(0-1) <sup>h</sup>	10/26/2001	AS01-SS38	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS39-(0-1)	10/23/2001	AS01-SS39	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SS40-(0-1)	10/24/2001	AS01-SS40	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS41-(0-1)	10/24/2001	AS01-SS41	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
HCS-B1-12-1	11/16/1994	B1-12S/12	VOCs, SVOCs, Explo.
HCS-B1-13-1	11/16/1994	B1-13S/13	VOCs, SVOCs, Explo.
HCS-B2-10	07/17/1992	B2-010	Metals
HCS-B2-3-4	07/17/1992	B2-003	Metals
HCS-B2-4-4	01/01/1992	B2-004	VOCs, SVOCs, Explo.
HCS-B2-5-3	07/17/1992	B2-005	VOCs, SVOCs, Explo.
HCS-B2-6-3	07/17/1992	B2-006	VOCs, SVOCs, Explo.
HCS-B2-7-3	07/17/1992	B2-007	Metals
HCS-BG-102S	11/16/1994	BG-102/102S	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-110S	11/16/1994	BG-110/110S	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-113S	11/15/1994	BG-113	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-113S/DUP <sup>j</sup>	11/15/1994	BG-113	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-152	10/20/1998	BG-152	Pest/PCBs
HCS-BG-153	10/20/1998	BG-153	Pest/PCBs
HCS-BG-161	10/20/1998	BG-161	Pest/PCBs
HCS-BG-162	10/20/1998	BG-162	Pest/PCBs
HCS-BG-165	10/20/1998	BG-165	Pest/PCBs
HCS-BG-16S	06/20/1994	BG-016/016S/054	VOCs
HCS-BG-171	10/21/1998	BG-171	Pest/PCBs
HCS-BG-179	10/21/1998	BG-179	Pest/PCBs
HCS-BG-179/DUP <sup>i</sup>	10/21/1998	BG-179	Pest/PCBs
HCS-BG-23S	06/21/1994	BG-023/023S/083	VOCs
HCS-BG-23S/DUP <sup>k</sup>	06/21/1994	BG-023/023S/083	VOCs
HCS-BG-84S	06/20/1994	BG-084/084S/106	VOCs
HCS-BG-98S	11/16/1994	BG-098/098S	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-B1-11-S	07/17/1992	B1-011	Metals
HCS-B1-3-S	07/17/1992	B1-003	Metals
HCS-B1-4-S	07/17/1992	B1-003	Metals
HCS-B1-C	07/17/1992	B1-C	Dioxins/Furans, Metals
HCS-B2-7-S	07/17/1992	B2-007	Metals
HCS-B2-C	07/17/1992	B2-C	Dioxins/Furans, Metals

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
AS01-SS46-0-1	07/20/2004	AS01-SS46	VOCs, SVOCs, Metals, Cyanide
AS01-SS47-0-1	07/20/2004	AS01-SS47	VOCs, SVOCs, Metals, Cyanide
AS01-SS48-0-1	07/20/2004	AS01-SS48	VOCs, SVOCs, Metals, Cyanide
AS01-SS49-0-1	07/20/2004	AS01-SS49	VOCs, SVOCs, Metals, Cyanide
AS01-SS50-0-1	07/21/2004	AS01-SS50	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS51-0-1	07/21/2004	AS01-SS51	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS52-0-1	07/21/2004	AS01-SS52	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS52-0-1	07/21/2004	AS01-SS52	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS53-0-1	07/21/2004	AS01-SS53	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS54-0-1	07/21/2004	AS01-SS54	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS56-0-1	07/21/2004	AS01-SS56	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS57-0-1	07/21/2004	AS01-SS57	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS58-0-1	07/21/2004	AS01-SS58	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS59-0-1	07/21/2004	AS01-SS59	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS71-0-0.5	09/23/2004	AS01-SS71	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS72-0-0.5	09/23/2004	AS01-SS72	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS72-0-0.5/DUP <sup>l</sup>	09/23/2004	AS01-SS72	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS73-0-0.5	09/23/2004	AS01-SS73	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS74-0-0.5	09/23/2004	AS01-SS74	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
<b>Soil - Former Disposal Pits</b>			
<i>Surface Soil</i>			
AS01-SS60-0-0.5	09/21/2004	AS01-SS60	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS61-0-0.5	09/21/2004	AS01-SS61	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS62-0-0.5	09/21/2004	AS01-SS62	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
HCS-BG-4S	06/20/1994	BG-004/004S/005/039	VOCs
HCS-BG-8S	06/20/1994	BG-008/008S/009/038	VOCs
<i>Subsurface Soil</i>			
AS01-SB42-(1-2)	10/24/2001	AS01-SB42	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate
AS01-SB43-(1-2)	10/24/2001	AS01-SB43	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate
AS01-SB44-(1-2)	10/24/2001	AS01-SB44	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate
HCS-BG-120	06/21/1994	BG-120/121	VOCs
HCS-BG-120/DUP <sup>m</sup>	06/21/1994	BG-120/121	VOCs
HCS-BG-127	06/22/1994	BG-126/127	VOCs
HCS-BG-128	06/22/1994	BG-128/129	VOCs
HCS-BG-131	06/22/1994	BG-130/131	VOCs
HCS-BG-205	10/27/1998	BG-205/206	VOCs
HCS-BG-206	10/27/1998	BG-205/206	VOCs
HCS-BG-38	07/13/1992	BG-008/008S/009/038	VOCs
HCS-BG-4(92)	07/13/1992	BG-004/004S/005/039	VOCs, SVOCs, Explo.
HCS-BG-4(92)/DUP <sup>n</sup>	07/13/1992	BG-004/004S/005/039	VOCs
HCS-BG-4(94)	06/20/1994	BG-004/004S/005/039	Metals, Cyanide
HCS-BG-5(92)	07/13/1992	BG-004/004S/005/039	VOCs
HCS-BG-6(92)	07/13/1992	BG-006/007	VOCs
HCS-BG-6(94)	06/21/1994	BG-006/007	Metals, Cyanide
HCS-BG-79	07/13/1992	BG-079	VOCs
HCS-BG-8	06/21/1994	BG-008/008S/009/038	Metals, Cyanide
AS01-SB60-1-3	09/22/2004	AS01-SB60	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB60-3-5	09/22/2004	AS01-SB60	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB60-5-7	09/22/2004	AS01-SB60	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB60-7-8	09/22/2004	AS01-SB60	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB61-1-3	09/22/2004	AS01-SB61	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB61P-1-3 <sup>o</sup>	09/22/2004	AS01-SB61	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB61-3-5	09/22/2004	AS01-SB61	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB61-5-7	09/22/2004	AS01-SB61	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB61-7-8	09/22/2004	AS01-SB61	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB62-1-3	09/22/2004	AS01-SB62	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB62-3-5	09/22/2004	AS01-SB62	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB62-5-7	09/22/2004	AS01-SB62	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB62-7-8	09/22/2004	AS01-SB62	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
<b>Soil - Active Burning Grounds</b>			
<i>Surface Soil</i>			
AS01-SS01-R01X	02/21/2001	AS01-SS01	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS02-R01X	02/21/2001	AS01-SS02	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS03-R01X	02/21/2001	AS01-SS03	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS04-R01X	02/21/2001	AS01-SS04	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS05-R01X	02/21/2001	AS01-SS05	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS06-R01X	02/21/2001	AS01-SS06	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS07-R01X	02/22/2001	AS01-SS07	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS08-R01X	02/21/2001	AS01-SS08	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS09P-R01X <sup>a</sup>	02/22/2001	AS01-SS09	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS09-R01X	02/22/2001	AS01-SS09	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS10-R01X	02/22/2001	AS01-SS10	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS11-R01X	02/22/2001	AS01-SS11	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS12-R01X	02/22/2001	AS01-SS12	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS13-R01X	02/22/2001	AS01-SS13	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS14-R01X	02/21/2001	AS01-SS14	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS15-R01X	02/21/2001	AS01-SS15	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS16P-R01X <sup>b</sup>	02/22/2001	AS01-SS16	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS16-R01X	02/22/2001	AS01-SS16	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS17-R01X	02/22/2001	AS01-SS17	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS18-R01X	02/22/2001	AS01-SS18	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS19-R01X	02/22/2001	AS01-SS19	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SS20-R01X	02/22/2001	AS01-SS20	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
HCS-BG-10S	06/20/1994	BG-010/010S/053	VOCs
HCS-BG-25S	06/20/1994	BG-025/025S/048	VOCs
HCS-BG-33S	06/20/1994	BG-033/033S	VOCs
HCS-BG-34S	06/20/1994	BG-034/034S	VOCs
HCS-BG-55S	06/20/1994	BG-055/055S	VOCs
HCS-BP-1	07/13/1992	BP-01	Explo., VOCs, SVOCs
HCS-BP-2	07/13/1992	BP-02	Explo., VOCs, SVOCs
HCS-BP-3	07/13/1992	BP-03	Explo., VOCs, SVOCs
HCS-BP-4	07/13/1992	BP-04	Explo., VOCs, SVOCs
HCS-BP-4/DUP <sup>c</sup>	07/13/1992	BP-04	Explo., VOCs, SVOCs
HCS-BP-5	07/13/1992	BP-05	Explo., VOCs, SVOCs
HCS-BP-6	07/13/1992	BP-06	Explo., VOCs, SVOCs
HCS-BP-7	07/13/1992	BP-07	Explo., VOCs, SVOCs
HCS-BP-8	07/13/1992	BP-08	Explo., VOCs, SVOCs
AS01-SS63-0-0.5	09/22/2004	AS01-SS63	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS63-0-0.5/DUP <sup>d</sup>	09/22/2004	AS01-SS63	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS64-0-0.5	09/22/2004	AS01-SS64	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS65-0-0.5	09/22/2004	AS01-SS65	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS66-0-0.5	09/23/2004	AS01-SS66	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS67-0-0.5	09/23/2004	AS01-SS67	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS68-0-0.5	09/23/2004	AS01-SS68	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS69-0-0.5	09/23/2004	AS01-SS69	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS69-0-0.5/DUP <sup>e</sup>	09/23/2004	AS01-SS69	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SS70-0-0.5	09/23/2004	AS01-SS70	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
<i>Subsurface Soil</i>			
AS01-SB14P-R01X <sup>p</sup>	02/21/2001	AS01-SB14	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB14-R01X	02/21/2001	AS01-SB14	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB15-R01X	02/21/2001	AS01-SB15	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB16-R01X	02/22/2001	AS01-SB16	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB17-R01X	02/22/2001	AS01-SB17	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB18-R01X	02/22/2001	AS01-SB18	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB19-R01X	02/22/2001	AS01-SB19	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB20-R01X	02/22/2001	AS01-SB20	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
HCS-BG-10	07/13/1992	BG-010/010S/053	VOCs
HCS-BG-132	06/22/1994	BG-132/133	VOCs

TABLE 6-1

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 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
HCS-BG-133	11/15/1994	BG-133	VOCs
HCS-BG-18	07/13/1992	BG-017/018	VOCs
HCS-BG-180	10/27/1998	BG-180	VOCs
HCS-BG-181	10/27/1998	BG-181	VOCs
HCS-BG-182	10/27/1998	BG-182/183	VOCs
HCS-BG-183	10/27/1998	BG-182/183	VOCs
HCS-BG-184	10/27/1998	BG-184/185	VOCs
HCS-BG-185	10/27/1998	BG-184/185	VOCs
HCS-BG-186	10/27/1998	BG-186/187	VOCs
HCS-BG-187	10/27/1998	BG-186/187	VOCs
HCS-BG-188	10/27/1998	BG-188/189	VOCs
HCS-BG-189	10/27/1998	BG-188/189	VOCs
HCS-BG-190	10/27/1998	BG-190	VOCs
HCS-BG-191	10/27/1998	BG-191	VOCs
HCS-BG-192	10/27/1998	BG-192/193	VOCs
HCS-BG-193	10/27/1998	BG-192/193	VOCs
HCS-BG-194	10/27/1998	BG-194	VOCs
HCS-BG-195	10/27/1998	BG-195	VOCs
HCS-BG-196	10/27/1998	BG-196/197	VOCs
HCS-BG-197	10/27/1998	BG-196/197	VOCs
HCS-BG-198	10/27/1998	BG-198	VOCs
HCS-BG-199	10/27/1998	BG-199/200	VOCs
HCS-BG-200	10/27/1998	BG-199/200	VOCs
HCS-BG-201	10/27/1998	BG-201/202	VOCs
HCS-BG-202	10/27/1998	BG-201/202	VOCs
HCS-BG-203	10/27/1998	BG-203/204	VOCs
HCS-BG-204	10/27/1998	BG-203/204	VOCs
HCS-BG-207	10/27/1998	BG-207/208	VOCs
HCS-BG-208	10/27/1998	BG-207/208	VOCs
HCS-BG-209	10/27/1998	BG-209/210	VOCs
HCS-BG-210	10/27/1998	BG-209/210	VOCs
HCS-BG-211	10/27/1998	BG-211/212	VOCs
HCS-BG-212	10/27/1998	BG-211/212	VOCs
HCS-BG-213	10/27/1998	BG-213/214	VOCs
HCS-BG-214	10/27/1998	BG-213/214	VOCs
HCS-BG-215	10/27/1998	BG-215/216	VOCs
HCS-BG-216	10/27/1998	BG-215/216	VOCs
HCS-BG-217	10/27/1998	BG-217/218	VOCs
HCS-BG-218	10/27/1998	BG-217/218	VOCs
HCS-BG-219	10/27/1998	BG-219/220	VOCs
HCS-BG-220	10/27/1998	BG-219/220	VOCs
HCS-BG-221	10/27/1998	BG-221/222	VOCs
HCS-BG-222	10/27/1998	BG-221/222	VOCs
HCS-BG-34	07/13/1992	BG-034/034S	VOCs
HCS-BG-37	07/13/1992	BG-037	VOCs
HCS-BG-50	07/13/1992	BG-059/050	VOCs
HCS-BG-53	07/13/1992	BG-010/010S/053	VOCs
HCS-BG-68	07/13/1992	BG-067/068	VOCs
AS01-SB63-6.5-7	09/22/2004	AS01-SB63	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB64-7.5-8	09/22/2004	AS01-SB64	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB64P-7.5-8 <sup>a</sup>	09/22/2004	AS01-SB64	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB65-1.5-2	09/22/2004	AS01-SB65	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB66-1.5-2	09/23/2004	AS01-SB66	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB67-1.5-2	09/23/2004	AS01-SB67	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB68-1.5-2	09/23/2004	AS01-SB68	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB69-1-1.5	09/23/2004	AS01-SB69	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SB70-1-1.5	09/23/2004	AS01-SB70	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
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Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
<b>Soil - Outside Active Burning Grounds</b>			
<i>Surface Soil</i>			
AOCM-1-T	10/26/2001	AOCM-1	VOCs, SVOCs, Explo. Metals, Cyanide
AOCM-2-T	10/26/2001	AOCM-2	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS21-(0-1)	10/25/2001	AS01-SS21	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS21P-(0-1) <sup>f</sup>	10/25/2001	AS01-SS21	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS22-(0-1)	10/25/2001	AS01-SS22	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS23-(0-1)	10/26/2001	AS01-SS23	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS24-(0-1)	10/24/2001	AS01-SS24	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS25-(0-1)	10/24/2001	AS01-SS25	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS26-(0-1)	10/23/2001	AS01-SS26	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS27-(0-1)	10/23/2001	AS01-SS27	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS28-(0-1)	10/26/2001	AS01-SS28	VOCs, SVOCs, Explo. Metals, Cyanide
AS01-SS29-(0-1)	10/26/2001	AS01-SS29	VOCs, SVOCs, Explo. Metals, Perchlorate, Cyanide
AS01-SS30-(0-1)	10/24/2001	AS01-SS30	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS33-(0-1)	10/26/2001	AS01-SS33	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS34-(0-1)	10/25/2001	AS01-SS34	VOCs, SVOCs, Explo. Metals, Perchlorate, Cyanide
AS01-SS34P-(0-1) <sup>g</sup>	10/25/2001	AS01-SS34	VOCs, SVOCs, Explo. Metals, Perchlorate, Cyanide
AS01-SS35-(0-1)	10/26/2001	AS01-SS35	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS36-(0-1)	10/25/2001	AS01-SS36	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS37-(0-1)	10/26/2001	AS01-SS37	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS38-(0-1)	10/26/2001	AS01-SS38	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS38P-(0-1) <sup>h</sup>	10/26/2001	AS01-SS38	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS39-(0-1)	10/23/2001	AS01-SS39	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SS40-(0-1)	10/24/2001	AS01-SS40	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS41-(0-1)	10/24/2001	AS01-SS41	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
HCS-B1-12-1	11/16/1994	B1-12S/12	VOCs, SVOCs, Explo.
HCS-B1-13-1	11/16/1994	B1-13S/13	VOCs, SVOCs, Explo.
HCS-B2-10	07/17/1992	B2-010	Metals
HCS-B2-3-4	07/17/1992	B2-003	Metals
HCS-B2-4-4	01/01/1992	B2-004	VOCs, SVOCs, Explo.
HCS-B2-5-3	07/17/1992	B2-005	VOCs, SVOCs, Explo.
HCS-B2-6-3	07/17/1992	B2-006	VOCs, SVOCs, Explo.
HCS-B2-7-3	07/17/1992	B2-007	Metals
HCS-BG-102S	11/16/1994	BG-102/102S	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-110S	11/16/1994	BG-110/110S	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-113S	11/15/1994	BG-113	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-113S/DUP <sup>j</sup>	11/15/1994	BG-113	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-BG-152	10/20/1998	BG-152	Pest/PCBs
HCS-BG-153	10/20/1998	BG-153	Pest/PCBs
HCS-BG-161	10/20/1998	BG-161	Pest/PCBs
HCS-BG-162	10/20/1998	BG-162	Pest/PCBs
HCS-BG-165	10/20/1998	BG-165	Pest/PCBs
HCS-BG-16S	06/20/1994	BG-016/016S/054	VOCs
HCS-BG-171	10/21/1998	BG-171	Pest/PCBs
HCS-BG-179	10/21/1998	BG-179	Pest/PCBs
HCS-BG-179/DUP <sup>i</sup>	10/21/1998	BG-179	Pest/PCBs
HCS-BG-23S	06/21/1994	BG-023/023S/083	VOCs
HCS-BG-23S/DUP <sup>k</sup>	06/21/1994	BG-023/023S/083	VOCs
HCS-BG-84S	06/20/1994	BG-084/084S/106	VOCs
HCS-BG-98S	11/16/1994	BG-098/098S	VOCs, SVOCs, Explo., Metals, Cyanide
HCS-B1-11-S	07/17/1992	B1-011	Metals
HCS-B1-3-S	07/17/1992	B1-003	Metals
HCS-B1-4-S	07/17/1992	B1-003	Metals
HCS-B1-C	07/17/1992	B1-C	Dioxins/Furans, Metals
HCS-B2-7-S	07/17/1992	B2-007	Metals
HCS-B2-C	07/17/1992	B2-C	Dioxins/Furans, Metals
AS01-SS46-0-1	07/20/2004	AS01-SS46	VOCs, SVOCs, Metals, Cyanide
AS01-SS47-0-1	07/20/2004	AS01-SS47	VOCs, SVOCs, Metals, Cyanide
AS01-SS48-0-1	07/20/2004	AS01-SS48	VOCs, SVOCs, Metals, Cyanide

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
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Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
AS01-SS49-0-1	07/20/2004	AS01-SS49	VOCs, SVOCs, Metals, Cyanide
AS01-SS50-0-1	07/21/2004	AS01-SS50	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS51-0-1	07/21/2004	AS01-SS51	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS52-0-1	07/21/2004	AS01-SS52	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS52-0-1	07/21/2004	AS01-SS52	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS53-0-1	07/21/2004	AS01-SS53	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS54-0-1	07/21/2004	AS01-SS54	VOCs, SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS56-0-1	07/21/2004	AS01-SS56	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS57-0-1	07/21/2004	AS01-SS57	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS58-0-1	07/21/2004	AS01-SS58	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS59-0-1	07/21/2004	AS01-SS59	SVOCs, Dioxins/Furans, Metals, Cyanide
AS01-SS71-0-0.5	09/23/2004	AS01-SS71	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS72-0-0.5	09/23/2004	AS01-SS72	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS72-0-0.5/DUP <sup>l</sup>	09/23/2004	AS01-SS72	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS73-0-0.5	09/23/2004	AS01-SS73	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
AS01-SS74-0-0.5	09/23/2004	AS01-SS74	VOCs, SVOCs, Dioxins/Furans, Explo. Metals, Perchlorate, Cyanide
<i>Subsurface Soil</i>			
AS01-SB24-(1-2)	10/24/2001	AS01-SB24	VOCs, SVOCs, Explo., Metals
AS01-SB25-(1-2)	10/24/2001	AS01-SB25	VOCs, SVOCs, Explo., Metals
AS01-SB26-(1-2)	10/23/2001	AS01-SB26	VOCs, SVOCs, Explo., Metals
AS01-SB27-(1-2)	10/23/2001	AS01-SB27	VOCs, SVOCs, Explo., Metals
AS01-SB30-(1-2)	10/24/2001	AS01-SB30	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB31-(1-2)	10/25/2001	AS01-SB31	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB34-(1-2)	10/25/2001	AS01-SB34	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB34P-(1-2) <sup>r</sup>	10/25/2001	AS01-SB34	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB36-(1-2)	10/25/2001	AS01-SB36	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB38-(1-2)	10/26/2001	AS01-SB38	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB38P-(1-2) <sup>s</sup>	10/26/2001	AS01-SB38	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB39-(1-2)	10/23/2001	AS01-SB39	VOCs, SVOCs, Explo., Metals
AS01-SB40-(1-2)	10/24/2001	AS01-SB40	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB41-(1-2)	10/24/2001	AS01-SB41	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
HCS-B1-11-2	07/17/1992	B1-011	Metals
HCS-B1-3-1	07/17/1992	B1-003	Metals
HCS-B1-3-1/DUP <sup>l</sup>	07/17/1992	B1-003	Metals
HCS-B1-CS	06/20/1994	B1-CS	VOCs, SVOCs, Explo.
HCS-BG-102	07/13/1992	BG-102/102S	VOCs
HCS-BG-106	07/13/1992	BG-084/084S/106	VOCs
HCS-BG-110	07/13/1992	BG-110/110S	VOCs
HCS-BG-112	07/13/1992	BG-112	VOCs
HCS-BG-112/DUP <sup>u</sup>	07/13/1992	BG-112	VOCs
HCS-BG-112R	07/13/1992	BG-112	VOCs
HCS-BG-113	07/13/1992	BG-113	VOCs
HCS-BG-134	11/16/1994	BG-134	VOCs
HCS-BG-135	11/16/1994	BG-135	VOCs
HCS-BG-136	11/16/1994	BG-136	VOCs
HCS-BG-137	11/16/1994	BG-137	VOCs
HCS-BG-138	11/16/1994	BG-138	VOCs
HCS-BG-138/DUP <sup>y</sup>	11/16/1994	BG-138	VOCs
HCS-BG-139	11/15/1994	BG-139	VOCs
HCS-BG-140	11/15/1994	BG-140	VOCs
HCS-BG-141	11/16/1994	BG-141	VOCs
HCS-BG-142	11/16/1994	BG-142	VOCs
HCS-BG-143	11/16/1994	BG-143	VOCs
HCS-BG-144	11/16/1994	BG-144	VOCs
HCS-BG-145	11/16/1994	BG-145	VOCs
HCS-BG-146	11/16/1994	BG-146	VOCs
HCS-BG-147	11/16/1994	BG-147	VOCs
HCS-BG-148	11/16/1994	BG-148	VOCs
HCS-BG-149	11/16/1994	BG-149	VOCs

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
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Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
HCS-BG-15	07/13/1992	BG-015	VOCs
HCS-BG-150	11/15/1994	BG-150	VOCs
HCS-BG-151	03/04/1995	BG-151	VOCs
HCS-BG-154	10/27/1998	BG-154	VOCs
HCS-BG-155	10/27/1998	BG-155	VOCs
HCS-BG-156	10/27/1998	BG-156	VOCs
HCS-BG-157	10/27/1998	BG-157	VOCs
HCS-BG-158	10/27/1998	BG-158	VOCs
HCS-BG-159	10/27/1998	BG-159/160	VOCs
HCS-BG-160	10/27/1998	BG-159/160	VOCs
HCS-BG-163	10/27/1998	BG-163/164	VOCs
HCS-BG-164	10/27/1998	BG-163/164	VOCs
HCS-BG-166	10/27/1998	BG-166	VOCs
HCS-BG-167	10/27/1998	BG-167/168	VOCs
HCS-BG-168	10/27/1998	BG-167/168	VOCs
HCS-BG-169	10/27/1998	BG-169	VOCs
HCS-BG-170	10/27/1998	BG-170	VOCs
HCS-BG-172	10/27/1998	BG-172	VOCs
HCS-BG-173	10/27/1998	BG-173	VOCs
HCS-BG-174	10/27/1998	BG-174	VOCs
HCS-BG-175	10/27/1998	BG-175/176	VOCs
HCS-BG-176	10/27/1998	BG-175/176	VOCs
HCS-BG-177	10/27/1998	BG-177/178	VOCs
HCS-BG-178	10/27/1998	BG-177/178	VOCs
HCS-BG-3	07/13/1992	BG-003	VOCs
HCS-BG-84	07/13/1992	BG-084/084S/106	VOCs
HCS-BG-99	07/13/1992	BG-099	VOCs
HCS-BG-99R	07/13/1992	BG-099	VOCs
AS01-SB71-1.5-2	09/23/2004	AS01-SB71	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB72-4.5-5	09/23/2004	AS01-SB72	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB73-1.5-2	09/23/2004	AS01-SB73	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SB74-4.4-5	09/23/2004	AS01-SB74	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
<b>Surface Water</b>			
AS01-SW01-R05	06/14/2001	1SD-1/1SW-1	VOCs, SVOCs, Explo., Total Metals, , Cyanide, Dissolved Metals
AS01-SW01A-R05	06/14/2001	1SD-1A/1SW-1A	VOCs, Total Metals, Cyanide, Dissolved Metals
AS01-SW02-R05	06/14/2001	1SD-2/1SW-2	VOCs, SVOCs, Explo., Total Metals, Cyanide, Dissolved Metals
AS01-SW02A-R05	06/14/2001	1SD-2A/1SW-2A	VOCs, Total Metals, Cyanide, Dissolved Metals
AS01-SW03-R05	06/14/2001	1SD-3/1SW-3	VOCs, SVOCs, Explo., Total Metals, Cyanide, Dissolved Metals
AS01-SW03P-R05 <sup>W</sup>	06/14/2001	1SD-3/1SW-3	VOCs, SVOCs, Explo., Total Metals, Cyanide, Dissolved Metals
AS01-SW03A-R05	06/14/2001	1SD-3A/1SW-3A	VOCs, Total Metals, Cyanide, Dissolved Metals
AS01-SW04-R05	06/13/2001	1SD-4/1SW-4	VOCs, SVOCs, Explo., Total Metals, Cyanide, Dissolved Metals
AS01-SW04A-R05	06/13/2001	1SD-4A/1SW-4A	VOCs, Total Metals, Cyanide, Dissolved Metals
AS01-SW05-R05	06/13/2001	1SD-5/1SW-5	VOCs, SVOCs, Explo., Total Metals, Cyanide, Dissolved Metals
AS01-SW05C	06/13/2001	1SD-5C/1SW-5C	VOCs, SVOCs, Explo., Total Metals, Cyanide, Dissolved Metals
AS01-SW06	06/14/2001	1SD-6/1SW-6	VOCs, SVOCs, Explo., Total Metals, Dissolved Metals
AS01-SW06P <sup>x</sup>	06/14/2001	1SD-6/1SW-6	VOCs, SVOCs, Explo., Total Metals, Dissolved Metals
AS01-SW07	06/14/2001	1SD-7/1SW-7	VOCs, SVOCs, Explo., Total Metals, Dissolved Metals
AS01-SW08	06/13/2001	1SD-8/1SW-8	VOCs, SVOCs, Explo., Total Metals, Dissolved Metals
AS01-SW09	06/13/2001	1SD-9/1SW-9	VOCs, SVOCs, Explo., Total Metals, Dissolved Metals

TABLE 6-1

Summary of Data Used in Baseline Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
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Medium/ SampleID	Date of Sampling	Sample Locations	Parameters
<b>Sediment</b>			
AS01-SD01-R05	06/15/2001	1SD-1/1SW-1	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate
AS01-SD01A-R05	06/15/2001	1SD-1A/1SW-1A	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SD02-R05	06/15/2001	1SD-2/1SW-2	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SD02A-R05	06/15/2001	1SD-2A/1SW-2A	VOCs, SVOCs, Explo., Metals, Perchlorate, Cyanide
AS01-SD02B	06/15/2001	1SD-2B	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SD02C	06/15/2001	1SD-2C	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate
AS01-SD02D	06/15/2001	1SD-2D	VOCs, SVOCs, Explo., Metals
AS01-SD03-R05	06/15/2001	1SD-3/1SW-3	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SD03A-R05	06/14/2001	1SD-3A/1SW-3A	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SD03B	06/14/2001	1SD-3B	VOCs, SVOCs, Explo., Metals
AS01-SD04-R05	06/15/2001	1SD-4/1SW-4	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SD04P-R05 <sup>y</sup>	06/15/2001	1SD-4/1SW-4	VOCs, SVOCs, Explo., Metals
AS01-SD04A-R05	06/14/2001	1SD-4A/1SW-4A	VOCs, SVOCs, Explo., Metals
AS01-SD04B	06/14/2001	1SD-4B	VOCs, SVOCs, Explo., Metals
AS01-SD05-R05	06/14/2001	1SD-5/1SW-5	VOCs, SVOCs, Explo., Metals, Perchlorate, Cyanide
AS01-SD05C	06/14/2001	1SD-5C/1SW-5C	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SD06	06/15/2001	1SD-6/1SW-6	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate
AS01-SD06P <sup>z</sup>	06/15/2001	1SD-6/1SW-6	VOCs, SVOCs, Dioxins/Furans, Explo., Metals
AS01-SD06A	06/15/2001	1SD-6A	VOCs, SVOCs, Explo., Metals, Perchlorate
AS01-SD06B	06/15/2001	1SD-6B	VOCs, SVOCs, Explo., Metals, Perchlorate
AS01-SD07	06/15/2001	1SD-7/1SW-7	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate, Cyanide
AS01-SD07P <sup>aa</sup>	06/15/2001	1SD-7/1SW-7	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate
AS01-SD07A	06/15/2001	1SD-7A	VOCs, SVOCs, Explo., Metals, Perchlorate
AS01-SD07B	06/15/2001	1SD-7B	VOCs, SVOCs, Explo., Metals
AS01-SD07BP <sup>ab</sup>	06/15/2001	1SD-7B	VOCs, SVOCs, Explo., Metals, Cyanide
AS01-SD08	06/14/2001	1SD-8/1SW-8	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate
AS01-SD08A	06/14/2001	1SD-8A	VOCs, SVOCs, Explo., Metals, Perchlorate
AS01-SD09	06/14/2001	1SD-9/1SW-9	VOCs, SVOCs, Explo., Metals, Perchlorate, Cyanide
AS01-SD09A	06/14/2001	1SD-9A	VOCs, SVOCs, Dioxins/Furans, Explo., Metals, Perchlorate
VOC - Volatile Organic Constituents SVOC - Semivolatile Organic Constituents Metals - Inorganic Constituents Explo. - Explosives Pest/PCBs - Pesticides and Polychlorinated Biphenyls			
<sup>a</sup> duplicate of AS01-SS09-R01X			<sup>b</sup> duplicate of AS01-SS16-R01X
<sup>c</sup> duplicate of HCS-BP-4			<sup>d</sup> duplicate of AS01-SS63-0-0.5
<sup>e</sup> duplicate of AS01-SS69-0-0.5			<sup>f</sup> duplicate of AS01-SS21-(0-1)
<sup>g</sup> duplicate of AS01-SS34-(0-1)			<sup>h</sup> duplicate of AS01-SS38-(0-1)
<sup>i</sup> duplicate of HCS-BG-113S			<sup>j</sup> duplicate of HCS-BG-179
<sup>k</sup> duplicate of HCS-BG-23S			<sup>l</sup> duplicate of AS01-SS72-0-0.5
<sup>m</sup> duplicate of HCS-BG-120			<sup>n</sup> duplicate of HCS-BG-4(92)
<sup>o</sup> duplicate of AS01-SB61-1-3			<sup>p</sup> duplicate of AS01-SB14-R01X
<sup>q</sup> duplicate of AS01-SB64-7.5-8			<sup>r</sup> duplicate of AS01-SB34-(1-2)
<sup>s</sup> duplicate of AS01-SB38-(1-2)			<sup>t</sup> duplicate of HCS-B1-3-1
<sup>u</sup> duplicate of HCS-BG-112			<sup>v</sup> duplicate of HCS-BG-138
<sup>w</sup> duplicate of AS01-SW03-R05			<sup>x</sup> duplicate of AS01-SW06
<sup>y</sup> duplicate of AS01-SD04-R05			<sup>z</sup> duplicate of AS01-SD06
<sup>aa</sup> duplicate of AS01-SD07			<sup>ab</sup> duplicate of AS01-SD07B

TABLE 6-2  
 Summary of Constituents of Potential Concern for the HHRA  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Soil												Surface Water	Sediment
Former Disposal Pits				Outside Active Burning Grounds				Active Burning Grounds				Site 1	Site 1
Surface Soil*	Surface and Subsurface Soil*	Surface Soil - Air	Surface and Subsurface Soil - Air	Surface Soil*	Surface and Subsurface Soil*	Surface Soil - Air	Surface and Subsurface Soil - Air	Surface Soil	Surface and Subsurface Soil**	Surface Soil - Air	Surface and Subsurface Soil - Air	Surface Water	Sediment
Trichloroethene 2,3,7,8-TCDD equivalents Arsenic Iron Manganese Vanadium	Trichloroethene 2,3,7,8-TCDD equivalents Arsenic Copper Iron Manganese Thallium Vanadium	Trichloroethene	Trichloroethene	Trichloroethene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene 2,3,7,8-TCDD equivalents HMX RDX Antimony Arsenic Cadmium Chromium Copper Iron Lead Manganese Mercury Nickel Silver Thallium Vanadium Zinc	Tetrachloroethene Trichloroethene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene 2,3,7,8-TCDD equivalents HMX RDX Antimony Arsenic Cadmium Chromium Copper Iron Lead Manganese Mercury Nickel Silver Thallium Vanadium Zinc	Trichloroethene Chromium	Tetrachloroethene Trichloroethene Chromium	2,3,7,8-TCDD equivalents Arsenic Iron Lead	<i>Industrial</i> Tetrachloroethene Trichloroethene 2,3,7,8-TCDD equivalents RDX Arsenic Iron Lead  <i>Residential</i> Tetrachloroethene Trichloroethene 2,3,7,8-TCDD equivalents Perchlorate RDX Antimony Arsenic Cadmium Chromium Copper Iron Lead Manganese Mercury Thallium Vanadium	Trichloroethene	Trichloroethene	Trichloroethene Arsenic Thallium	Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Arsenic Iron Manganese

\* Aluminum is a COPC based on a retired toxicity factor. Therefore, aluminum is not evaluated quantitatively as a COPC in the HHRA.  
 \*\* 2-Nitroaniline, nitroglycerin, and aluminum are COPCs for the residential scenario based on retired toxicity factors. Therefore, they are not evaluated quantitatively as COPCs in the HHRA.

TABLE 6-3

Exposure Pathways Evaluated for the HHRA  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Media	Exposure Route	Current		Future					Current/Future	
		Industrial Worker	Trespasser/Visitor	Industrial Worker	Trespasser/Visitor	Resident		Construction Worker	Recreational Person	
			Adolescents		Adolescents	Adult	Child		Adult	Adolescents
Surface Soil - Former Disposal Pits	Ingestion	x	x							
	Dermal	x	x							
	Inhalation	x	x							
Surface Soil - Outside Active Burning Grounds	Ingestion	x	x							
	Dermal	x	x							
	Inhalation	x	x							
Surface Soil - Active Burning Grounds	Ingestion	x	x							
	Dermal	x	x							
	Inhalation	x	x							
Surface and Subsurface Soil* - Former Disposal Pits	Ingestion			x	x	x	x	x		
	Dermal			x	x	x	x	x		
	Inhalation			x	x	x	x	x		
Surface and Subsurface Soil* - Outside Active Burning Grounds	Ingestion			x	x	x	x	x		
	Dermal			x	x	x	x	x		
	Inhalation			x	x	x	x	x		
Surface and Subsurface Soil* - Active Burning Grounds	Ingestion			x	x	x	x	x		
	Dermal			x	x	x	x	x		
	Inhalation			x	x	x	x	x		
Surface Water - Site 1	Ingestion								x	x
	Dermal								x	x
	Inhalation									
Sediment - Site 1	Ingestion								x	x
	Dermal								x	x
	Inhalation									

X Quantitative evaluation (if COPCs selected for pathway).

\*Subsurface soil can potentially be brought to the surface following future excavation activities. Exposure to combined surface soil and subsurface soil evaluated as an exposure pathway.

TABLE 6-4

Summary of RME Cancer Risks and Hazard Indices  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Receptor	Media	Exposure Route	Cancer Risk	COPCs with Cancer Risks >10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-5</sup> and <10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-6</sup> and <10 <sup>-5</sup>	Hazard Index	COPCs with HI > 1
Current Industrial Worker	Surface Soil - Former Disposal Pits	Ingestion	4.8E-06			Arsenic	0.17	
		Inhalation	6.0E-08				0.00	
		Dermal Contact	1.1E-06				0.12	
		Total	5.9E-06				0.29	
	Surface Soil - Outside Active Burning Grounds	Ingestion	2.8E-05			Benzo(a)pyrene, Benzo(b)fluoranthene, 2,3,7,8-TCDD (dioxin), Arsenic	0.53	
		Inhalation	1.5E-06			Trichloroethene	0.00012	
		Dermal Contact	1.6E-05			Benzo(a)pyrene, Benzo(b)fluoranthene, 2,3,7,8-TCDD (dioxin), Arsenic	0.43	
		Total	4.5E-05				0.96	
	Surface Soil - Active Burning Grounds	Ingestion	6.8E-06			2,3,7,8-TCDD (dioxin), Arsenic	0.12	
		Inhalation	2.3E-08				0.00	
		Dermal Contact	1.8E-06			2,3,7,8-TCDD (dioxin)	0.011	
		Total	8.6E-06				0.13	
		Receptor Total	6.0E-05				1.4	
	Current Trespasser/Visitor Adolescents	Surface Soil - Former Disposal Pits	Ingestion	4.9E-07				0.047
Inhalation			1.5E-09				0.00	
Dermal Contact			2.7E-07				0.084	
Total			7.6E-07				0.13	
Surface Soil - Outside Active Burning Grounds		Ingestion	2.9E-06				0.15	
		Inhalation	3.9E-08				0.0000084	
		Dermal Contact	3.9E-06			Benzo(a)pyrene	0.30	
		Total	6.8E-06				0.45	
Surface Soil - Active Burning Grounds		Ingestion	7.0E-07				0.034	
		Inhalation	6.0E-10				0.0	
		Dermal Contact	4.5E-07				0.0076	
		Total	1.1E-06				0.042	
		Receptor Total	8.7E-06				0.62	
Future Industrial Worker		Soil* - Former Disposal Pits	Ingestion	2.9E-05		2,3,7,8-TCDD (dioxin)	Arsenic	0.20
	Inhalation		3.0E-06			Trichloroethene	0.00	
	Dermal Contact		1.1E-05			2,3,7,8-TCDD (dioxin)	0.12	
	Total		4.2E-05				0.32	
	Soil* - Outside Active Burning Grounds	Ingestion	3.9E-05		Benzo(a)pyrene	Benzo(a)anthracene, Benzo(b)fluoranthene, 2,3,7,8-TCDD (dioxin), Arsenic	0.51	
		Inhalation	4.3E-06			Trichloroethene	0.00162	
		Dermal Contact	2.4E-05		Benzo(a)pyrene	Benzo(a)anthracene, Benzo(b)fluoranthene, 2,3,7,8-TCDD (dioxin), Arsenic	0.39	
		Total	6.8E-05				0.90	
	Soil* - Active Burning Grounds	Ingestion	1.3E-05		2,3,7,8-TCDD (dioxin)	Arsenic	0.12	
		Inhalation	4.4E-08				0.00	
		Dermal Contact	4.2E-06			2,3,7,8-TCDD (dioxin)	0.011	
		Total	1.7E-05				0.13	
		Receptor Total	1.3E-04				1.3	

TABLE 6-4

Summary of RME Cancer Risks and Hazard Indices  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Receptor	Media	Exposure Route	Cancer Risk	COPCs with Cancer Risks >10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-5</sup> and <10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-6</sup> and <10 <sup>-5</sup>	Hazard Index	COPCs with HI > 1
Future Trespasser/Visitor Adolescents	Soil* - Former Disposal Pits	Ingestion	2.9E-06			2,3,7,8-TCDD (dioxin)	0.056	
		Inhalation	7.6E-08				0.00	
		Dermal Contact	2.6E-06			2,3,7,8-TCDD (dioxin)	0.085	
		Total	5.6E-06				0.14	
	Soil* - Outside Active Burning Grounds	Ingestion	4.0E-06			Benzo(a)pyrene	0.15	
		Inhalation	1.1E-07				0.000116	
		Dermal Contact	6.0E-06			Benzo(a)pyrene	0.27	
		Total	1.0E-05				0.41	
	Soil* - Active Burning Grounds	Ingestion	1.3E-06			2,3,7,8-TCDD (dioxin)	0.034	
		Inhalation	1.1E-09				0.00	
		Dermal Contact	1.0E-06			2,3,7,8-TCDD (dioxin)	0.0075	
		Total	2.4E-06				0.041	
		Receptor Total	1.8E-05				0.59	
	Future Resident - Adult	Soil* - Former Disposal Pits	Ingestion	NA				0.28
Inhalation			NA				0.00	
Dermal Contact			NA				0.10	
Total			0.0E+00				0.38	
Soil* - Outside Active Burning Grounds		Ingestion	NA				0.72	
		Inhalation	NA				0.0068	
		Dermal Contact	NA				0.33	
		Total	0.0E+00				1.1	
Soil* - Active Burning Grounds		Ingestion	NA				0.34	
		Inhalation	NA				0.00	
		Dermal Contact	NA				0.018	
		Total	0.0E+00				0.36	
		Receptor Total	0.0E+00				1.8	
Future Resident - Child		Soil* - Former Disposal Pits	Ingestion	NA				2.6
	Inhalation		NA				0.00	
	Dermal Contact		NA				0.68	
	Total		0.0E+00				3.3	
	Soil* - Outside Active Burning Grounds	Ingestion	NA				6.7	Iron
		Inhalation	NA				0.023	
		Dermal Contact	NA				2.1	
		Total	0.0E+00				8.9	
	Soil* - Active Burning Grounds	Ingestion	NA				3.2	Iron
		Inhalation	NA				0.00	
		Dermal Contact	NA				0.12	
		Total	0.0E+00				3.3	
		Receptor Total	0.0E+00				15	

TABLE 6-4

Summary of RME Cancer Risks and Hazard Indices  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Receptor	Media	Exposure Route	Cancer Risk	COPCs with Cancer Risks >10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-5</sup> and <10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-6</sup> and <10 <sup>-5</sup>	Hazard Index	COPCs with HI > 1	
Future Resident - Child/Adult	Soil* - Former Disposal Pits	Ingestion	1.3E-04	2,3,7,8-TCDD (dioxin)	Arsenic	Trichloroethene	NA		
		Inhalation	2.2E-05		Trichloroethene		NA		
		Dermal Contact	2.3E-05		2,3,7,8-TCDD (dioxin)	Arsenic	NA		
		Total	1.7E-04				0.00		
	Soil* - Outside Active Burning Grounds	Ingestion	1.7E-04			Benzo(a)pyrene, 2,3,7,8-TCDD (dioxin), Arsenic	Tetrachloroethene, Trichloroethene, Benzo(a)anthracene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene	NA	
		Inhalation	3.2E-05			Trichloroethene		NA	
		Dermal Contact	5.2E-05				Benzo(a)anthracene, Benzo(b)fluoranthene, Dibenzo(a,h)anthracene, Indeno(1,2,3-cd)pyrene, 2,3,7,8-TCDD (dioxin), Arsenic	NA	
		Total	2.6E-04			Benzo(a)pyrene		0.00	
	Soil* - Active Burning Grounds	Ingestion	5.7E-05			2,3,7,8-TCDD (dioxin), Arsenic	RDX	NA	
		Inhalation	3.3E-07				2,3,7,8-TCDD (dioxin), Arsenic	NA	
		Dermal Contact	5.3E-06					NA	
		Total	6.3E-05					0.0	
			Receptor Total	4.9E-04				0.00	
	Future Construction Worker	Soil* - Former Disposal Pits	Ingestion	5.5E-06			2,3,7,8-TCDD (dioxin)	0.95	
Inhalation			4.7E-07				0.00		
Dermal Contact			6.3E-07				0.18		
Total			6.6E-06				1.1		
Soil* - Outside Active Burning Grounds		Ingestion	7.5E-06				Benzo(a)pyrene, 2,3,7,8-TCDD (Dioxin), Arsenic	1.2	
		Inhalation	6.9E-07					0.00645	
		Dermal Contact	1.5E-06					0.057	
		Total	9.6E-06					1.2	
Soil* - Active Burning Grounds		Ingestion	2.4E-06				2,3,7,8-TCDD (dioxin)	0.57	
		Inhalation	7.0E-09					0.00	
		Dermal Contact	2.5E-07					0.016	
		Total	2.7E-06					0.58	
		Receptor Total	1.9E-05				2.9		
Current/Future Recreational Person - Adult		Surface Water - Site 1	Ingestion	8.3E-08				0.0029	
	Inhalation		NA				NA		
	Dermal Contact		1.9E-07				0.0068		
	Total		2.7E-07				0.0097		
	Sediment - Site 1	Ingestion	1.2E-06					0.022	
		Inhalation	NA					NA	
		Dermal Contact	1.0E-06					0.052	
		Total	2.2E-06					0.074	
			Receptor Total	2.5E-06				0.084	

TABLE 6-5

Summary of CTE Cancer Risks and Hazard Indices  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Receptor	Media	Exposure Route	Cancer Risk	COPCs with Cancer Risks >10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-5</sup> and <10 <sup>-4</sup>	COPCs with Cancer Risks >10 <sup>-6</sup> and <10 <sup>-5</sup>	Hazard Index	COPCs with HI > 1
Current Industrial Worker	Surface Soil - Outside Active Burning Grounds	Ingestion	3.2E-06				0.23	
		Inhalation	1.7E-07				0.000051	
		Dermal Contact	7.2E-07				0.075	
		Total	4.1E-06				0.30	
		Receptor Total	4.1E-06				0.30	
Future Resident - Adult	Soil* - Outside Active Burning Grounds	Ingestion	NA				0.24	
		Inhalation	NA				NA	
		Dermal Contact	NA				0.22	
		Total	0.0E+00				0.46	
		Receptor Total	0.0E+00				0.46	
Future Resident - Child	Soil* - Former Disposal Pits	Ingestion	NA				0.86	
		Inhalation	NA				0.00	
		Dermal Contact	NA				0.46	
		Total	0.0E+00				1.3	
	Soil* - Outside Active Burning Grounds	Ingestion	NA				2.2	
		Inhalation	NA				NA	
		Dermal Contact	NA				1.4	
		Total	0.0E+00				3.7	
	Soil* - Active Burning Grounds	Ingestion	NA				1.1	
		Inhalation	NA				NA	
		Dermal Contact	NA				0.08	
		Total	0.0E+00				1.1	
	Receptor Total	0.0E+00				6.1		
Future Resident - Child/Adult	Soil* - Former Disposal Pits	Ingestion	3.5E-05		2,3,7,8-TCDD (dioxin)	Arsenic	NA	
		Inhalation	9.7E-06			Trichloroethene	NA	
		Dermal Contact	8.9E-05		2,3,7,8-TCDD (dioxin)	Arsenic	NA	
		Total	1.3E-04				0.00	
	Soil* - Outside Active Burning Grounds	Ingestion	4.7E-05			Benzo(a)pyrene, 2,3,7,8-TCDD (Dioxin), Arsenic	NA	
		Inhalation	1.4E-05			Trichloroethene	NA	
		Dermal Contact	2.1E-05			Benzo(a)pyrene, 2,3,7,8-TCDD (Dioxin), Arsenic	NA	
		Total	8.2E-05				0.00	
	Receptor Total	2.2E-04				0.00		
	Future Construction Worker	Soil* - Former Disposal Pits	Ingestion	1.4E-06			2,3,7,8-TCDD (dioxin)	0.23
Inhalation			1.8E-07				0.00	
Dermal Contact			1.1E-07				0.022	
Total			1.7E-06				0.25	
Soil* - Outside Active Burning Grounds		Ingestion	1.9E-06				0.58	
		Inhalation	2.6E-07				0.00244	
		Dermal Contact	2.5E-07				0.057	
		Total	2.5E-06				0.63	
Soil* - Active Burning Grounds		Ingestion	1.4E-06				0.04	
		Inhalation	1.8E-07				0.00	
		Dermal Contact	1.1E-07				0.0016	
		Total	1.7E-06				0.04	
Receptor Total		5.9E-06				0.93		

\*Combines surface and subsurface soil.

TABLE 6-6  
 Effect of Use of Draft 2001 TCE Toxicity Values on Human Health Risk Assessment Results  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Receptor	Media	Pre-2001		Draft-2001	
		Cancer Risk	Hazard Index	Cancer Risk	Hazard Index
Current Industrial Worker	Surface Soil - Former Disposal Pits	5.9E-06	0.29	1.0E-05	0.29
	Surface Soil - Outside Active Burning Grounds	4.5E-05	0.96	1.5E-04	1.1
	Surface Soil - Active Burning Grounds	8.6E-06	0.13	1.0E-05	0.13
	<b>TOTAL</b>	6.0E-05	1.4	1.7E-04	1.5
Current Trespasser/Visitor Adolescents	Surface Soil - Former Disposal Pits	7.6E-07	0.13	8.8E-07	0.13
	Surface Soil - Outside Active Burning Grounds	6.8E-06	0.44	9.7E-06	0.49
	Surface Soil - Active Burning Grounds	1.1E-06	0.04	1.1E-06	0.05
	<b>TOTAL</b>	8.7E-06	0.61	1.2E-05	0.67
Future Industrial Worker	Soil - Former Disposal Pits	4.2E-05	0.32	2.5E-04	0.67
	Soil - Outside Active Burning Grounds	6.8E-05	0.90	2.6E-04	1.2
	Soil - Active Burning Grounds	1.7E-05	0.13	2.6E-05	0.13
	<b>TOTAL</b>	1.3E-04	1.3	5.3E-04	2.0
Future Trespassers/Visitors Adolescents	Soil - Former Disposal Pits	5.6E-06	0.14	1.2E-05	0.21
	Soil - Outside Active Burning Grounds	1.0E-05	0.41	1.6E-05	0.48
	Soil - Active Burning Grounds	2.4E-06	0.041	3.4E-06	0.04
	<b>TOTAL</b>	1.8E-05	0.59	3.1E-05	0.73
Future Resident - Adult	Soil - Former Disposal Pits	NA	0.38	NA	1.3
	Soil - Outside Active Burning Grounds	NA	1.1	NA	1.9
	Soil - Active Burning Grounds		0.4	NA	0.37
	<b>TOTAL</b>	0.0E+00	1.8	0.0E+00	3.5
Future Resident - Child	Soil - Former Disposal Pits	NA	3.3	NA	8.0
	Soil - Outside Active Burning Grounds	NA	8.9	NA	13
	Soil - Active Burning Grounds		3.3	NA	3.4
	<b>TOTAL</b>	0.0E+00	15	0.0E+00	24
Future Resident - Child/Adult	Surface Soil - Former Disposal Pits	1.7E-04	NA	1.7E-03	NA
	Surface Soil - Outside Active Burning Grounds	2.6E-04	NA	1.7E-03	NA
	Soil - Active Burning Grounds	6.3E-05		1.1E-04	NA
	<b>TOTAL</b>	4.9E-04	0.00	3.4E-03	0.00
Future Construction Worker	Soil - Former Disposal Pits	6.6E-06	1.1	3.9E-05	2.7
	Soil - Outside Active Burning Grounds	9.6E-06	1.2	4.0E-05	2.2
	Soil - Active Burning Grounds	2.7E-06	0.58	4.2E-06	0.61
	<b>TOTAL</b>	1.9E-05	2.9	8.4E-05	5.5
Current/Future Recreational Person - Adult	Surface Water - Site 1	2.7E-07	0.010	1.2E-06	0.031
	Sediment - Site 1	2.2E-06	0.074	2.2E-06	0.074
	<b>TOTAL</b>	2.5E-06	0.084	3.4E-06	0.10
Current/Future Recreational Person - Adolescents	Surface Water - Site 1	1.9E-07	0.0020	8.2E-07	0.022
	Sediment - Site 1	1.0E-06	0.075	1.0E-06	0.075
	<b>TOTAL</b>	1.2E-06	0.077	1.9E-06	0.097

TABLE 6-7

Summary of Risks Identified in the Human Health Risk Assessment  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

Receptor	Media	Risk	Constituents of Concern
Current Industrial Worker	Surface Soil - Former Disposal Pits	Acceptable	None
	Surface Soil - Outside Active Burning Grounds	Acceptable	None
	Surface Soil - Active Burning Grounds	Acceptable	None
Current Trespasser/Visitor Adolescents	Surface Soil - Former Disposal Pits	Acceptable	None
	Surface Soil - Outside Active Burning Grounds	Acceptable	None
	Surface Soil - Active Burning Grounds	Acceptable	None
Future Industrial Worker	Soil* - Former Disposal Pits	Acceptable	None
	Soil* - Outside Active Burning Grounds	Acceptable	None
	Soil* - Active Burning Grounds	Acceptable	None
Future Trespasser/Visitor Adolescents	Soil* - Former Disposal Pits	Acceptable	None
	Soil* - Outside Active Burning Grounds	Acceptable	None
	Soil* - Active Burning Grounds	Acceptable	None
Future Resident - Adult	Soil* - Former Disposal Pits	Acceptable	None
	Soil* - Outside Active Burning Grounds	Acceptable	None
	Soil* - Active Burning Grounds	Acceptable	None
Future Resident - Child	Soil* - Former Disposal Pits	Unacceptable (noncarcinogenic)	<b>Iron</b> , TCE, arsenic, manganese, thallium, and vanadium
	Soil* - Outside Active Burning Grounds	Unacceptable (noncarcinogenic and lead)	Lead, <b>cadmium, iron, manganese, vanadium</b> , TCE, antimony, arsenic, chromium, copper, mercury, and thallium
	Soil* - Active Burning Grounds	Unacceptable (noncarcinogenic)	Perchlorate, arsenic, <b>iron</b> , manganese, thallium, vanadium
Future Resident - Child/Adult	Soil* - Former Disposal Pits	Unacceptable (carcinogenic)	<b>Dioxin</b> , TCE, arsenic
	Soil* - Outside Active Burning Grounds	Unacceptable (carcinogenic)	<b>PAHs</b> , dioxin, TCE, PCE, and arsenic
	Soil* - Active Burning Grounds	Acceptable	None
Future Construction Worker	Soil* - Former Disposal Pits	Acceptable	None
	Soil* - Outside Active Burning Grounds	Acceptable	None
	Soil* - Active Burning Grounds	Acceptable	None
Current/Future Recreational Person - Adult	Surface Water - North Branch Potomac River Adjacent to Site 1	Acceptable	None
	Sediment - North Branch Potomac River Adjacent to Site 1	Acceptable	None
Current/Future Recreational Person - Adolescents	Surface Water - North Branch Potomac River Adjacent to Site 1	Acceptable	None
	Sediment - North Branch Potomac River Adjacent to Site 1	Acceptable	None

**Notes:**

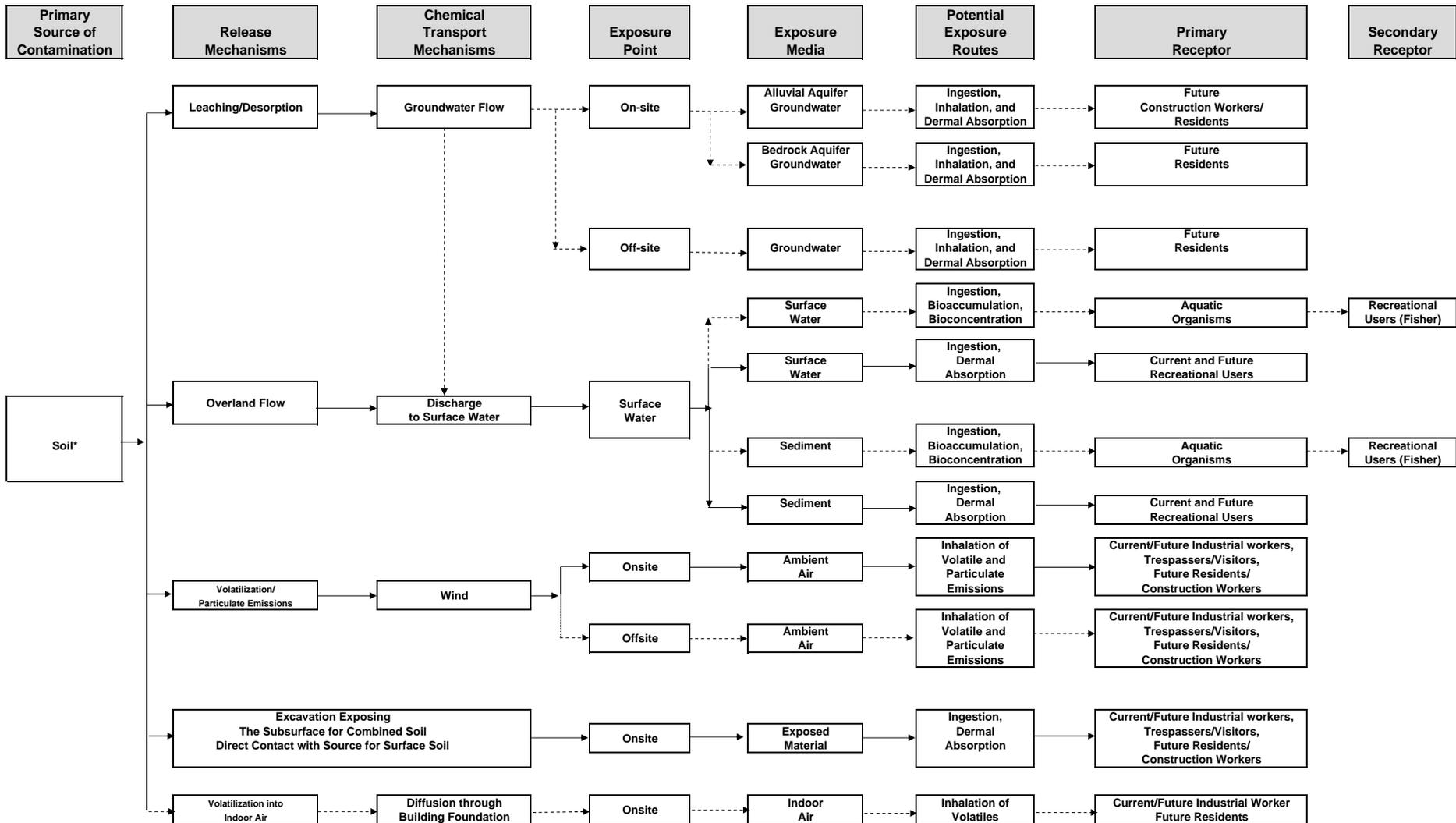
\* = Combined surface and subsurface soil

Bolded constituents of concern are the primary risk drivers.

TCE = trichloroethene

PCE = polychloroethene

PAHs = polycyclic aromatic hydrocarbons



\* Current scenario is for surface soil and future scenarios are for combined surface and subsurface soil.  
 ———> Complete Pathway  
 - - - - -> Incomplete Pathway

Figure 6-1  
 Conceptual Site Model for Potential Human Exposures  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia

# Ecological Risk Assessment

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This section contains the evaluation of potential risks to ecological receptors and considers analytical data collected as part of previous evaluations conducted at Site 1, as discussed in Sections 2 and 3, as well as data collected specifically for this ERA. Surface water and sediment are included in this ERA to help evaluate whether surface runoff from the OABG source areas may be contributing constituents to the river that could potentially present an unacceptable risk.

This report constitutes a BERA and is completed through Step 7 of the 8-step ERA process (EPA, 1997b) for terrestrial habitats. The results of this ERA will be used to determine the scope of any Step 8 (risk management) activities that may be required for Site 1 soils to address unacceptable risks to ecological receptors. Step 8 activities, if needed, will be conducted as part of future evaluations.

Previous evaluations include a Focused RI (CH2M HILL, 1995a), in which a qualitative ERA was conducted at Site 1. This ERA involved a comparison of surface water, sediment, and surface soil data collected in 1994 with medium-specific screening values. In addition, two ERAs (ERM, 1996; CH2M HILL, 2002b) have been conducted on the ABG area. These previous ERAs were used as information sources to help characterize the environmental setting (habitats and biota) of Site 1. Due to the large number of analytical samples that have been collected since 1995, potential ecological risks were re-evaluated for this ERA.

## 7.1 Introduction

This section describes the ERA process, defines the scope and approach for the ERA, and summarizes previous ERAs that have been conducted at Site 1.

### 7.1.1 Ecological Risk Assessment Process

ERAs are conducted using a tiered, step-wise approach and are punctuated with Scientific Management Decision Points (SMDPs). SMDPs represent points in the ERA process where agreement on conclusions, actions, or methodologies is needed so that the ERA process can continue (or terminate) in a technically defensible manner. The results of the ERA at a particular SMDP are used to determine how the ERA process should proceed, for example, to the next step in the process or directly to a later step. The process continues until a final decision has been reached (i.e., remedial action if unacceptable risks are identified, or no further action if risks are acceptable). The process can also be iterative if data needs are identified at any step; the needed data are collected and the process starts again at the point appropriate to the type of data collected.

This ERA was conducted in accordance with the *Navy Policy for Conducting Ecological Risk Assessments* (Chief of Naval Operations, 1999), the Navy guidance for implementing this ERA policy (Naval Facilities Engineering Command, 2001), and the Navy/Tier 2 ERA approach developed for EPA Region 3. The Navy ERA policy and guidance, which describe

a process consisting of eight steps organized into three tiers, are conceptually similar to the 8-step ERA process outlined in EPA ERA guidance for the Superfund program (EPA, 1997b). For both sets of guidance, Steps 1 and 2 involve conducting a screening ERA (SERA) using very conservative assumptions. The BERA represents Steps 3 through 7. The BERA uses more realistic assumptions and site-specific data to refine the risk estimates from the SERA for components that fail the initial screen. Step 8 addresses risk management issues. The major differences between the Navy ERA policy/guidance and the EPA ERA guidance are: (1) the Navy policy/guidance provides clearly defined criteria for exiting the ERA process at specific points, (2) the Navy policy/guidance divides Step 3 (the first step of the BERA) into two distinct sub-steps (Steps 3A and 3B), with a potential exit point after Step 3A, and (3) the Navy policy/guidance incorporates risk management considerations throughout all tiers of the ERA process.

The screening (preliminary) problem formulation is the first step of an ERA and establishes the goals, scope, and focus of the SERA. Step 1 of the ERA process is intended to answer two main questions: (1) do complete exposure pathways exist?; and (2) are sufficient data available to conduct the SERA? If no complete exposure pathways exist, the ERA process terminates at Step 1 with a conclusion of negligible risk. If one or more complete exposure pathways are known to, or are likely to, exist, the ERA process continues to Step 2 but only evaluates those pathways that have been determined to be critical. An evaluation of the available data is then conducted to determine if they are adequate to support the SERA. If not, additional data are collected before the ERA process continues. The second step of the ERA process involves conducting a screening exposure assessment, a screening effects assessment, and a screening risk calculation (risk characterization).

The results of the SERA are used to evaluate the potential for unacceptable ecological risks based upon very conservative assumptions. If the results of the SERA suggest that further ecological risk evaluation is warranted, the ERA process would proceed to the BERA (Steps 3 through 7), which is a more detailed phase of the ERA process, for the pathways, constituents, receptors, and areas identified in the SERA. As indicated above, the first step of the BERA (Step 3) is divided into two distinct sub-steps in Navy ERA guidance.

Step 3 of the EPA ERA guidance consists of the following activities (EPA, 1997b):

1. Refinement of the COPCs from the SERA.
2. Further characterizing the potential ecological effects of constituents.
3. Refining information on constituent fate and transport, complete exposure pathways, and receptors potentially at risk.
4. Selecting assessment endpoints.
5. Refining the conceptual model and risk hypotheses from the SERA.

Step 3A of the Navy policy/guidance (refinement of conservative exposure assumptions) corresponds to the first activity listed above for the EPA ERA guidance. In Step 3A, a refined evaluation of exposure estimates is conducted using more realistic assumptions and additional methodologies relative to those used in the SERA, which is intended to be a very conservative assessment. Examples of more realistic exposure assumptions include using central tendency (e.g., mean) estimates (rather than maximums) for media concentrations,

bioaccumulation factors (BAFs), and exposure parameters. Examples of additional methodologies include consideration of background and upgradient concentrations, bioavailability, and detection frequency (Chief of Naval Operations, 1999; Naval Facilities Engineering Command, 2001).

If risk estimates (and their associated uncertainty) are acceptable following Step 3A, the site will meet the conditions of the exit criterion specified in the Navy guidance. If the Step 3A evaluation does not support a determination of acceptable risk within acceptable uncertainty, the site continues to Step 3B. This possible exit point is not present in the EPA ERA guidance.

Step 3B of the Navy policy/guidance (problem formulation) corresponds conceptually to the last four activities listed above for the EPA ERA guidance. In Step 3B, the preliminary conceptual model from the SERA is refined based upon the results of the Step 3A evaluation to develop a revised list of key receptors, critical exposure pathways, key COPCs, assessment endpoints, measurement endpoints, and risk hypotheses. Based upon the refined conceptual model, the lines of evidence to be used in characterizing risk are determined. Agreement on the refined conceptual model, COPCs, exposure pathways, endpoints, and risk hypotheses constitutes the SMDP at the end of Step 3 in both Navy and EPA ERA guidance.

Following the completion of Step 3, a decision point is reached with two potential outcomes. If the refined risk estimates are acceptable for each selected assessment endpoint, the investigation proceeds to risk characterization (Step 7) to document this conclusion, and the ERA process terminates. If the uncertainties associated with the refined risk estimates are unacceptable and/or the risk estimates indicate that unacceptable risks may exist, site-specific studies might be required and the ERA process continues (Steps 4 through 6).

Step 7 consists of the documentation and synthesis of the information and data identified in Steps 1 through 3 (no additional study) or Steps 1 through 6 (additional study). In this step, risk is evaluated and characterized using both quantitative and qualitative methods.

Conclusions are made as to whether or not there is a reasonable potential for unacceptable ecological risk, and if there is a potential for ecological risk, the magnitude of that risk. The results of the completed BERA (Step 7) are used to make any necessary risk management decisions (Step 8) related to current or future risks. Possible decisions include:

- There is adequate information to conclude that no significant ecological risks exist. The assessment should stop at Step 7.
- There is adequate information to conclude that ecological risks warrant remedial action. Whether or not remedial actions are taken, and the specific actions taken, will depend upon a number of risk management factors such as the results of any HHRAs and the potential impact of the remedial action itself on the habitats and biota present. This analysis would occur as part of Step 8.
- There is not adequate information to estimate risk or the risk estimate is believed to be too conservative or uncertain to recommend remediation. The assessment should be refined.

### 7.1.2 Scope and Approach for the ERA

The scope and approach for the risk assessment of Site 1 soils was outlined in the 2004 Technical Memorandum (CH2M HILL, 2004b). Because of their proximity and similarity in

habitat, the ABG and FDP areas are addressed together in this ERA and referred to as “upland habitats.” Because most of the OABG area is within the floodplain of the river, this area is referred to as “floodplain habitats” in this ERA.

In October 1996, the Navy issued a Proposed Plan for groundwater, surface water, and sediment at Site 1 and, in May 1997, signed a ROD that addressed these media. Soils were not addressed by this ROD. The principal component of the remedy specified in the ROD was a groundwater capture and treatment system, which started operation in September 1998. An associated LTM program for groundwater, surface water and sediment, and river biota (fish and aquatic invertebrates) is being used to evaluate the effectiveness of the remedy. Thus, the focus of this ERA is on soils. However, the surface water and sediment in the adjacent portions of the North Branch Potomac River are also assessed in this ERA to evaluate the potential for overland constituent migration from the Site 1 soils in floodplain habitats to the river.

### 7.1.3 Previous Ecological Risk Assessments

As part of the Focused RI (CH2M HILL, 1995a), a qualitative ERA was conducted at Site 1 in 1995. This ERA involved a comparison of surface water, sediment, and surface soil data collected in 1994 with medium-specific screening values. In addition, two ERAs (ERM, 1996; CH2M HILL, 2002b) have been conducted on the ABG area. The data and results from these previous ERAs are considered in this ERA where appropriate.

## 7.2 Facility Environmental Setting

This section describes the environmental setting (e.g., habitats and biota) of the ABL facility. The description of the environmental setting at Site 1 is provided in Section 7.3.1.1 as part of the problem formulation for terrestrial habitats. A description of the facility history is contained in Section 2.2.

### 7.2.1 Physiographic Features

The major physiographic features (climate, topography, geology/soils, hydrology, and hydrogeology) of the ABL facility and surrounding area were described in Section 2.1. The specific features of Site 1 are described in Section 7.3.1.1.

### 7.2.2 Habitats

Plant 2 and the northern portion of Plant 1 are almost entirely developed. The remaining portion of Plant 1 is situated on forested, mountainous land that is largely undeveloped. The land surrounding the ABL facility is primarily composed of woodland and cropland. Across the river from ABL (in Maryland), cropland lies to the northeast and west, and a small residential area and woodlands lie to the north. The areas south and east of the ABL facility are composed largely of mountainous woodlands with some cropland and pastureland. Two limestone quarries occur south and east of the facility. The quarry located to the east of Plant 1 has been inactive since 1989. The second quarry, which is actively used, is located south of the facility on Route 956. A large paper mill, a regional publicly owned treatment works, and sources of acid mine drainage are located upstream of the ABL facility. Discharges from these sources are known to have historically impacted water quality and aquatic life in the North Branch Potomac River (CH2M HILL, 2002b).

### 7.2.2.1 Terrestrial Habitats

The following terrestrial habitat types occur on or near the ABL facility (ERM, 1996):

- **Upland Forest:** This is the major terrestrial habitat type that occurs on the ABL facility (undeveloped portion of Plant 1) and in surrounding areas. The dominant plant species in the overstory include white oak, scarlet oak, chestnut oak, black oak, red maple, sugar maple, pignut hickory, sassafras, Virginia pine, and pitch pine. Other species that are present in the overstory include tulip poplar, hackberry, white ash, black cherry, and basswood. The understory (higher elevations) is composed of woody shrubs including mountain laurel, azalea, striped maple, flowering dogwood, redbud, witch-hazel, wild grape, and lowbush blueberry. Woody shrubs and vines present at lower elevations include blackberry, poison ivy, multiflora rose, and Japanese honeysuckle. Ground cover plant species include ferns, mosses, violets, rue anemone, and twinleaf.
- **Successional Thicket/Forest:** This habitat type was observed at two locations: (1) within the ABL facility on hillsides just west of Route 956, and (2) near the town of MacKenzie. These areas were formerly cleared land that is now dominated by woody shrubs and small trees. The dominant tree species include Virginia pine, scarlet oak, red maple, black walnut, black cherry, and black locust. Shrub species include hawthorn, hackberry, red cedar, flowering dogwood, and Virginia rose. Vines and ground cover species include wild grape, poison ivy, Virginia creeper, trailing pine, springcress, and redtop.
- **Successional Field/Thicket:** This habitat type occurs in two areas on the Maryland side of the North Branch Potomac River. These areas appear to be recently abandoned farmland that consists of a mixture of herbaceous plants and woody shrubs. Dominant herbaceous species include red clover, foxtail, orchard grass, Queen Anne's lace, yellow and white sweet clover, spreading dogbane, milkweed, goldenrod, wild onion, violet, springcress, and poison ivy. Shrub species include hawthorne, multiflora rose, and blackberry.
- **Agricultural Fields:** This habitat type encompasses agricultural fields that are currently farmed or are currently fallow. These fields are scattered throughout the ERM (1996) study area (2-mile [3-km] radius around Site 1) but are more common in the flatter areas on or near the river floodplain. Cropland includes corn, sorghum, barley, oats, wheat, buckwheat, cowpeas, alfalfa, and clover. Pastureland and fallow fields may contain bluegrass, other tall grass species, orchard grass, foxtail, redtop, brome sedge, crown vetch, wild onion, red clover, corn speedwell, henbit, bull thistle, pokeweed, mile-a-minute weed, goldenrod, evening primrose, teasel, daisy fleabane, Queen Anne's lace, yellow sweet clover, spreading dogbane, and milkweed.
- **Rock Outcrop:** Rock outcrops exist along portions of Knobly Mountain and along parts of the North Branch Potomac River. These areas consist of exposed rock and are either unvegetated or are vegetated with lichens, mosses, and other pioneering species. Caves and small caverns are scattered throughout this habitat type.
- **Quarry:** One active limestone quarry operation occurs near the top of Knobly Mountain just off of Route 956. This habitat type has minimal habitat value.
- **Developed (Vegetated):** This habitat type is scattered within the developed areas of Plants 1 and 2 and also occurs in surrounding residential areas. It is composed of a

combination of buildings, other structures, roads, and maintained grass lawns. Mowing frequency varies by area, with some areas only infrequently mowed. Infrequent mowing allows other herbaceous species such as orchard grass, least hop clover, redtop, yellow hawkweed, English plantain, goatsbeard, wild onion, fescue, cheatgrass, heal-all, yellow and white sweet clover, yarrow, deer tongue grass, ox-eye daisy, curled dock, and switchgrass to become established.

- **Developed (Unvegetated):** This habitat type includes larger areas occupied by buildings, other structures, and parking lots. Large portions of Plant 1 (northern area) and Plant 2 are composed of this habitat type. The habitat value of these areas is limited due to the lack of vegetation, although some urban-adapted species (e.g., rock doves) and species that nest on structures (e.g., barn swallows), may utilize these areas.

### 7.2.2.2 Wetland and Aquatic Habitats

Other than the North Branch Potomac River and its associated floodplain, wetland areas are relatively uncommon on and in the vicinity of the ABL facility. The distribution of wetlands (based upon 1979 aerial photographs) from National Wetland Inventory mapping of the area is shown on Figure 7-1. The following wetland and aquatic habitat types occur within the site vicinity (ERM, 1996):

- **Riparian Forest:** This is the dominant wetland habitat type on and near the ABL facility and is associated with the floodplain of the North Branch Potomac River (PFO; Figure 7-1). This habitat type is dominated by American sycamore, American elm, black walnut, silver maple, river birch, black willow, slippery elm, eastern cottonwood, and box elder in the overstory, and wild grape, common spicebush, multiflora rose, Japanese knotweed, jewelweed, springcress, garlic mustard, and smartweed in the shrub and ground layers. Table G-1, in Appendix G, includes a summary of available physical parameter measurements in floodplain surface soil from riparian forest areas along the northern boundary of Site 1. The locations of these surface soil samples are depicted on Figure 3-2.
- **Non-forested Vegetated Wetlands:** These habitat types include scrub-shrub (PSS) and emergent (PEM) wetlands. These wetland types are relatively uncommon in the vicinity of the ABL facility (Figure 7-1). Typical plant species in these wetlands include pin oak, red maple, silver maple, and black willow saplings; buttonbush; swamp dewberry; multiflora rose; soft rush; broad-leaved cattail; fox sedge; tussock sedge; shallow sedge; redtop; forget-me-not; smartweed; jewelweed; and horsetail. Water depths are typically 1 foot or less in these wetlands.
- **Open Water:** Open water habitats include the North Branch Potomac River (R2OW), several small intermittent streams, and storm water retention and agricultural ponds (POW) (Figure 7-1). The latter two wetland types are relatively uncommon in the vicinity of the ABL facility. The river in the vicinity of the ABL facility has an average annual flow of about 886 cubic feet per second (cfs) and a seven consecutive day low flow (7Q10) of 61.6 cfs based upon U.S. Geological Survey data from the Pinto gauging station, located just upriver of Site 1 (U.S. Geological Survey, 2001; ERM, 1996). The river typically does not contain any submerged aquatic vegetation, perhaps due to the turbid nature of the water. The water is relatively hard (average hardness of 158 mg/L in 14 samples collected from the river adjacent to Site 1 in Spring 2001 and 195 mg/L in four

samples collected from the river adjacent to Site 5 in June 2001). Tables G-2 and G-3 summarize physical parameter measurements for surface water and sediment, respectively, collected from the portion of the North Branch Potomac River adjacent to Site 1. The locations of these surface water and sediment samples are depicted on Figure 7-2.

CH2M HILL (1995a; 1996b) has described the river habitat at four locations (STN1 through STN4; Figure 7-3) used for biological sampling in July 1994. In general, the river in the vicinity of the ABL facility consists of interspersed shallow riffle areas (composed of large rocks, cobbles, and gravel) and deeper pools (composed of sand and gravel). Submerged logs and other detritus occur throughout the river channel. Many areas of the river are partially shaded by the canopy of trees occurring along the riverbank and the river near the facility is considered warm water habitat. Waters are typically turbid.

### 7.2.2.3 Special Habitats

There are no wilderness areas, wildlife refuges, or wild and scenic rivers in the immediate vicinity of the ABL facility. Dan's Mountain Wildlife Management Area is located about 3 miles southeast of the facility and Dan's Mountain State Park is located about 5.5 miles southeast of the facility (ERM, 1996). Both of these areas are owned and maintained by the State of Maryland.

## 7.2.3 Biota

A general description of the biota present on the ABL facility and in surrounding areas was compiled from literature review, existing documents, and site visits. Most of the site visit information is associated with CERCLA sites located within Plant 1. Two field surveys and one site visit have been conducted at or near Site 1: (1) as part of the ERA for Site 1 (in the Focused RI) on 11-13 June 1994 (CH2M HILL, 1995a); (2) during an ERA for the ABG area on 3-6 June 1996 (ERM, 1996); and (3) as part of an ERA for the ABG area on 22 August 2000 (site visit; CH2M HILL, 2002b). The biota known or expected to occur in the site vicinity are discussed by major taxonomic group in the following subsections.

### 7.2.3.1 Birds

Bird species that have been observed at the ABL facility are listed in Table G-4; 40 bird species were observed during the two field surveys and one site visit. The bird species observed during the surveys were generally typical of those expected based upon the geographic area, the time of year, weather conditions, and the habitats present.

The West Virginia and Maryland Breeding Bird Atlas projects were 6-year (1984-1989) and 5-year (1983-1987) projects, respectively, to map the distribution of bird species nesting in the two states (Buckelew and Hall, 1994; Robbins and Blom, 1996). Based upon data from both of these surveys, 103 bird species are known or suspected of breeding in the survey blocks that encompass the facility and immediate vicinity. This includes 53 species listed as confirmed breeders, 39 species listed as probable breeders, and 11 species listed as possible breeders (Table G-5). One additional species (great blue heron) is listed as "observed," meaning that the species was observed during the atlas project but breeding status could not be ascertained in these survey blocks.

To characterize winter bird usage in the facility vicinity, Christmas Bird Count (CBC) data from 1995 to 2000 were used (BirdSource, 2000). CBCs are one-day counts conducted annually by the National Audubon Society using volunteer observers during the months of December or January within a circle with a diameter of 15 miles. Birds seen or heard are enumerated during these counts. The nearest CBC plot is centered approximately 8 miles east/northeast of ABL near Spring Gap, Maryland.

Table G-6 lists the number of birds, by species, observed during the five CBC surveys conducted from 1995 to 2000 for the Allegany County census plot; 88 species were observed during this period. Based upon 5-year mean values, the five most commonly observed bird species during the winter period are: (1) European starling; (2) rock dove; (3) American crow; (4) dark-eyed junco; and (5) Canada goose. Because this census plot encompasses a much larger area and more diverse habitats, many of the species listed in Table G-6 may not actually occur on the ABL facility.

### 7.2.3.2 Mammals

Mammalian species that have been observed at the ABL facility are listed in Table G-4; nine mammalian species were observed during the two field surveys and one site visit. The mammalian species observed during the surveys were generally typical of those expected based upon the geographic area, the time of year, weather conditions, and the habitats present.

### 7.2.3.3 Reptiles and Amphibians

Amphibian and reptile species that have been observed at the ABL facility are listed in Table G-4; only two reptiles and one amphibian were observed during the two field surveys and one site visit. This is likely due to the difficulty in observing these species during these types of field surveys. Table G-7 provides a list of amphibians and reptiles known to occur within Mineral County, West Virginia. Not all of the species listed in Table G-7 are likely to occur on the facility, or in the immediate vicinity, due to habitat preferences. However, Table G-7 does provide a better indication of the types of reptiles and amphibians that may occur within suitable habitats in the facility vicinity.

### 7.2.3.4 Aquatic Organisms

The watershed of the North Branch Potomac River has a history of anthropogenic impacts dating back to the turn of the century. Forests were clearcut and burned, and acid mine drainage from unregulated coal extraction created biological “dead zones” in the main stem and in many tributaries. Discharges of effluent from the Upper Potomac River Commission Wastewater Treatment Plant at Westernport have created highly discolored and turbid conditions in the North Branch Potomac River, which persist for many miles downstream. A paper mill is responsible for approximately 98 percent of the discharge from the wastewater treatment plant. Although the plant discharge is over 21 miles upstream of Pinto, Maryland it still influences water quality and aquatic communities in the reaches of the river adjacent to the ABL facility (CH2M HILL, 1995a).

**Fish:** Beginning in 1988, the Maryland Department of Natural Resources began characterizing the freshwater fishery in the North Branch Potomac River. Surveys of water quality, benthic macroinvertebrate communities, and fish were conducted in 1989, 1990, 1992, and 1993 (CH2M HILL, 1995a). One of the survey stations is located at Pinto

(Station 6), which is near the southwestern portion of Site 1. Table G-8 lists the fish species collected, reported as catch per unit effort (individuals per hour from electroshocking surveys), at Station 6, as well as at the next upstream station (Station 5, approximately 20 miles upstream of ABL) and at the next downstream station (Station 7, about 11 miles downstream of ABL).

**Macroinvertebrates:** A macroinvertebrate survey was conducted in the North Branch Potomac River in July 1994 as part of the Site 1 ERA (CH2M HILL, 1995a). Four sampling stations (STN 1 through 4; Figure 7-3) were selected based upon proximity to potential source areas. Two quantitative benthic macroinvertebrate samples (A and B; Table G-9) were collected at each station using a Surber sampler. Qualitative samples were also collected using a kick net to assist in the characterization of invertebrate community structure.

The aquatic biotas at Station 1 were quite limited. Some attached plants were present, but little in the way of filamentous algae, macrophytes, and fish. Most of the substrate was covered with a fine layer of silt. Kick net samples for benthic macroinvertebrates within the sampling area produced a restricted community structure. The most abundant components were the aquatic worms from the family Tubificidae. Crayfish (Decapoda) of the genus *Orconectes* were common as well as several midge (Chironomidae) species. Mayflies (Ephemeroptera) of the family Heptageniidae were also common. Specimens from the family Sialidae (alderflies) and Corydalidae (dobsonflies) were also noted.

Mayflies (Ephemeroptera) of the family Heptageniidae were abundant at Station 2, as were crayfish. Amphipods (scuds and sideswimmers) were quite common and associated with leaf litter. Aquatic worms (principally tubificids), riffle beetles, (Elimidae), alderflies (Salidae), and dobsonflies (Corydalidae) also were noted. The benthic macroinvertebrate diversity was generally quite low at this station.

Some diatoms and attached filamentous algae were present at Station 3. No aquatic plants, slimes, or fish were noted. Crayfish (Decapoda) and mayflies (Ephemeroptera) were the main constituents of the benthic macroinvertebrate community. The available substrate material was covered with a fine layer of silt, which limited invertebrate community structure.

Macroinvertebrate community structure, based upon qualitative observations, indicated an abundance of crayfish (Decapoda) at Station 4. Mayflies (Ephemeroptera), principally from the family Heptageniidae, and caddisflies (Trichoptera) of the family Hydropsychidae, were most common. Adult damselflies (Zygoptera) also were noted in the area. Periphytic growth on cobble substrates (probably diatoms) were noted. Some filamentous green algae also was present. Macrophytes were not observed in this reach. A fine layer of silt was present on substrate materials. Several fish, possibly creek chubs, were observed in the area.

Macroinvertebrates are also being sampled in the North Branch Potomac River as part of a LTM program at Site 1. Macroinvertebrates are collected at eight stations (BIOTA 1 through BIOTA 6, BIOTA 1B, and BIOTA 4B<sup>2</sup>; Figure 7-3) using Hester-Dendy plate samplers, which are left in place for a 6-week period. To date, four sampling events (July 1998, July 2000, July

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<sup>2</sup> BIOTA 1B and BIOTA 4B were first sampled in 2004.

2002, and July/August 2004) have occurred. The results (number of individual taxa from three sample replicates) are summarized in Tables G-10 through G-13.

The number of organisms and taxa were relatively consistent among stations in July 1998. Organisms from the family Chironomidae were numerically dominant at all stations. The density of organisms at the most downstream station (Station 6) was low relative to the other stations in July 2000, although the number of taxa was relatively consistent among stations. Chironomids and oligochaetes dominated at most stations, although insects from the two orders Ephemeroptera and Trichoptera were relatively common at all stations except Station 5. In July 2002, the number of taxa was highest at Stations 1, 2, and 6 and lowest at Station 4. The density of organisms was highest at Stations 1 and 6, intermediate at Station 2, and lowest at Stations 3, 4, and 5. Chironomids were the dominant taxon at all six stations, although insects from the two orders Ephemeroptera and Trichoptera occurred at all stations. In July/August 2004, the number of taxa was highest at Stations 1B, 3, and 6 and lowest at Station 5. The density of organisms was highest at Stations 1 and 4, intermediate at Stations 1B, 2, 3, and 6, and lowest at Stations 4B and 5. Chironomids were the dominant taxon at all eight stations.

#### 7.2.3.5 Threatened and Endangered Species

The West Virginia Department of Natural Resources, Natural Heritage Program completed a detailed field study of the ABL facility in 1993 to document the occurrence of rare, threatened, and endangered species (McDonald, 1993). Based upon Natural Heritage Database records, 41 species of rare, threatened, or endangered plants or animals were known to occur in Mineral County, nine of which could occur on the ABL facility based upon habitat preferences. These 41 species (plus an additional species found during the 1993 survey and three federally listed species included in the report) are listed in Table G-14 along with their current (June 2000) status. One of the original 41 species (flatleaf rush) is no longer listed. Of the three federally listed species addressed in the 1993 report, the peregrine falcon has since been de-listed (25 August 1999), the bald eagle has been downlisted to threatened and is proposed for delisting (6 July 1999), and the loggerhead shrike is no longer on the list of "candidate" species. Consultation with the U.S. Fish and Wildlife Service, conducted as part of the 1995 ERA of Site 1 (CH2M HILL, 1995a; 1996b), revealed no known occurrences of federally listed species (except for occasional transients) in the area.

Five of the species addressed in the 1993 report, four plants and one mammal, were found to occur on the ABL facility (Table G-14). Four of these species are currently ranked S3 (somewhat vulnerable to extinction; the lowest of the listing categories) and one is ranked S2 (very rare). These five species were located in the extreme southern portion of the facility, well away from developed areas and several miles from Site 1.

As part of the ERA for Site 1 conducted in 1995 (CH2M HILL, 1995a; 1996b), the State of Maryland was also contacted regarding potential occurrences of rare species in the site vicinity. Six species were identified (Table G-15). The sora inhabits densely vegetated freshwater and salt marshes as well as damp meadows. Maryland represents the southern limits of its breeding range. This species is extremely unlikely to occur at ABL because the ABL property does not provide suitable habitat.

The eastern small-footed bat occurs in the Appalachian Mountains of western Maryland, Virginia, and North Carolina. The bat is found most often near caves. Little is known about

the bat's habitat requirements, although roosts usually are found in hemlock forests. It roosts during the fall and winter in inconspicuous places such as under boulders, in crevices in rock falls and quarries, or around the entrances to caves and mines. It may frequent buildings in the summer. No caves have been observed on ABL. Directly across the river in Pinto, Maryland, however, several limestone caves have been reported.

Side-oats grama occurs in plains, prairies, and rocky hills from Maine and Ontario to Montana south to Virginia, Alabama, Texas, and Arizona. It is most abundant in fine-textured soil, seldom grows in coarse-textured soil, and is better adapted to calcareous and moderately alkaline soil than to neutral or acid soil. This species is known to occur in the extreme southern portion of the ABL facility (McDonald, 1993).

Harebell is a member of the bluebell family that occurs along rocky banks and shores and in meadows. Virginia mountain mint prefers dry woods, meadows, fields, and thickets. Cliff stonetop prefers damp calcareous rocks. Neither of these species is known to occur on the site or in the immediate site vicinity nor are they expected to based on habitat preferences.

## 7.3 Terrestrial Habitats

As discussed in Section 7.1, the focus of this ERA is on surface soil. The surface water and sediment in the adjacent portions of the North Branch Potomac River are also assessed to evaluate the potential for overland constituent migration from the Site 1 soils in floodplain habitats to the river (see Section 7.4).

### 7.3.1 Problem Formulation

Problem formulation establishes the goals, scope, and focus of the ERA. As part of problem formulation, the environmental setting of Site 1 is characterized in terms of the habitats and biota known or likely to be present. The types and concentrations of constituents that are present in ecologically relevant media are also described based upon available analytical data. A conceptual model is developed for Site 1 that describes source areas, transport pathways and exposure media, exposure pathways and routes, and receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are developed to evaluate those receptors for which critical exposure pathways exist. The fate, transport, and toxicological properties of the constituents present at Site 1, particularly the potential to bioaccumulate, are also considered during this process.

#### 7.3.1.1 Environmental Setting

Since the early 1940s, Site 1 has been used for various types of waste burning and disposal activities. Site 1 is an aggregate of a number of potential source areas from often unrelated activities that occurred within the same general geographic area.

The central portion of Site 1 (containing the FDP and ABG areas) consists of maintained (periodically mowed) grasses and other herbaceous plants, and is enclosed by a 6-foot chain-link perimeter fence. The maintained grassy area within the fence is approximately 8 acres in size. The dominant plant species in this area are listed in Table G-16. Most of these plants are non-native (alien) species that are characteristic of disturbed habitats. No wetlands or other surface drainage features occur within the fenced area (Figures 7-1 and

7-2). The portion of Site 1 immediately east of the fenced area consists of maintained grass and has similar plant species.

The northern portion of Site 1 consists of forested floodplain along the southern bank of the North Branch Potomac River. The forested floodplain extends from the riverbank to near the Site 1 perimeter fence. This floodplain area adjacent to Site 1 covers approximately 14 acres. A narrow strip, about 4 feet in width, outside and along the northern edge of the perimeter fence is mowed. Silver maple is the dominant canopy species in this forested area with canopy heights of about 40 to 50 feet. American sycamore also commonly occurs near the edge of the riverbank and black locust commonly occurs near the perimeter fence. Shrubs and saplings are generally scattered throughout the forested area. Cinnamon fern, eulalia, white snakeroot, rough-stemmed goldenrod, and common bog nettle are common ground cover species. Japanese knotweed occurs in dense stands. St. John's wort and false nettle are found near the perimeter fence (Table G-16).

The portion of Site 1 west of the fenced area is approximately 2 acres in size and includes a pile of soil fill approximately 20 feet in height. Most of the top of the fill area is sparsely vegetated. The slopes are vegetated with a variety of grasses and other herbaceous species (Table G-16), and a few black locust trees. Several sycamore trees are located on the western side of the roadway that leads to the former drum storage area (just north and west of the fill area). A small portion of the 100-year floodplain occurs in this area (Figure 7-2). A narrow ditch is located along the western edge of the fill area. The ditch carries storm water flow and ultimately discharges to the North Branch Potomac River. Broad-leaf cattail is present within portions of the ditch.

Wildlife observed at Site 1 and adjacent areas were discussed in Section 7.2.3. The habitat provided by the forested areas adjacent to the river, the river itself, and, to a lesser extent, the open herbaceous areas within the Site 1 perimeter fence is likely used by a variety of amphibians, reptiles, birds, and mammals. Aquatic species present in the river were also discussed in Section 7.2.3.

### 7.3.1.2 Summary of Analytical Data

The soil samples used in this ERA were selected in the 2004 Technical Memorandum (CH2M HILL, 2004b) based upon an evaluation of the available data (current and historical) using a set of selection criteria that included validation status and sample depth. Selected samples were divided into the three geographical areas (ABG, FDP, and OABG), plus reference samples. Samples within each geographical area were subdivided into surface (0 to 12 inches bgs) samples and subsurface (12 to 24 inches bgs) samples (Table G-17).

Surface water and sediment samples from the North Branch Potomac River have been collected upstream of, adjacent to, and downstream of Site 1 in 1992, 1994, 1998, 1999, 2000, 2001, 2002, 2003, and 2004 (Table G-17). Only the data from LTM Rounds 4 (2000), 5 (2001, including expanded sampling associated with the Supplemental RI), and 6 (2002) were used, quantitatively, in this ERA. The data collected during Round 5 and the Supplemental RI sampling were designed to evaluate potential transport from soil areas to the river by collecting surface soil, sediment, and surface water samples along a series of transects that extended from the far bank of the river into the floodplain area of Site 1. Thus, they represent the data most relevant to this ERA. LTM Rounds 4 and 6 were also included because they represented the rounds of available data collected before and after the

Supplemental RI sampling. These surface water and sediment data were initially used in this ERA to qualitatively evaluate the potential for transport of site-related constituents from source areas associated with Site 1 (that occur within the 100-year floodplain of the river) to the river. Where such transport was potentially significant, these surface water and sediment data were also used for quantitative risk evaluation (see Section 7.4). More recent surface water and sediment data from LTM Rounds 7 (2002), 8 (2003), and 9 (2004) are also considered, qualitatively, to determine if concentrations have changed notably from those found in Rounds 4 through 6.

Table G-17 provides a summary of the data selected for use in this ERA. Sampling locations are shown on Figures 2-3, 2-4, and 2-5 (soil) and 7-2 (surface water and sediment). The analytical data are summarized in Tables G-18 (floodplain surface soil), G-19 (upland surface soil), G-20 (floodplain subsurface soil), G-21 (upland subsurface soil), G-22 (earthworm tissue), G-23 (surface water samples collected adjacent to, and downgradient of, Site 1), and G-24 (sediment samples collected adjacent to, and downgradient of, Site 1). Background and reference surface and subsurface soil data are discussed in Section 7.3.4 and presented in Section 7.3.5. Upgradient surface water and sediment data are discussed in Section 7.4.4 and presented in Section 7.4.5. Table G-25 lists the samples used in this ERA, by medium and spatial group. The raw analytical data are provided in Appendix D.

### 7.3.1.3 Conceptual Model

The conceptual model relates potentially exposed receptor populations with potential source areas based upon physical site characteristics and complete exposure pathways. Important components of the conceptual model are the identification of potential source areas (including non-site-related sources), transport pathways, exposure media, exposure pathways and routes, and receptor groups. Actual or potential exposures of ecological receptors associated with a site are determined by identifying the most likely, and most important, pathways of contaminant release and transport. A complete exposure pathway has three components: (1) a source of constituents that results in a release to the environment; (2) a pathway of constituent transport through an environmental medium; and (3) an exposure or contact point for an ecological receptor. Figure 7-4 illustrates a diagrammatic conceptual model for Site 1. Key components of this conceptual model are discussed in the following subsections.

**Potential Source Areas.** Potential source areas associated with Site 1 are:

- The ABG area, a RCRA unit located within the boundaries of Site 1.
- Three FDPs that lie in the southwestern portion of the ABG area. These pits are CERCLA-related potential source areas.
- Potential CERCLA-related source areas in the OABG area (in the river floodplain) and associated with Site 1 include: (1) the former inert burn area and associated disposal area (former inert burn area, ash disposal area, and scattered disposal of construction materials, rocket casings, drums and other debris); (2) former open burn area and associated disposal area (former open burn area, associated disposal area, former burn cages and disposal area, the Western Drainage Ditch, and a former hazardous waste storage area), and (3) portions of Area of Concern M (construction debris).

A detailed description of these potential source areas can be found in Section 2.2. As noted in Section 7.2.3, there are other potential non-facility-related sources to the North Branch Potomac River located upstream of Site 1.

**Transport Pathways and Exposure Media.** A transport pathway describes the mechanisms whereby site-related constituents, once released, may be transported from a source to ecologically relevant media (such as surface water) where exposures may occur.

**Floodplain Areas:** Site-related constituents in floodplain surface soil may be transported via surface runoff and periodic inundation (e.g., during spring flood events) to the North Branch Potomac River or the Western Drainage Ditch. Although the groundwater table is very near the ground surface in the river floodplain, the low gradient between the floodplain and the river makes significant transport of site-related constituents via groundwater unlikely. In addition, the groundwater gradient is reversed from the river back towards the extraction well alignment (in the central portion of the site) along the majority of the reach of river adjacent to Site 1. Site-related constituents in surface soil from the 100-year floodplain, and in the sediment and surface water of the Western Drainage Ditch and the North Branch Potomac River (which may be co-mingled with constituent contributions from upstream sources), may be taken up and accumulated in the tissue of biota, and thus be transported to upper trophic level receptors via food webs.

**Upland Areas:** Site-related constituents in upland surface soil are unlikely to be transported via surface runoff or groundwater to the North Branch Potomac River. The upland portion of the site is relatively flat, contains no drainage features (such as drainage ditches), and is completely covered with periodically mowed grasses and other herbaceous plants (except on a few unpaved roads and in the area immediately surrounding a few of the active burn pans). Thus, significant surface runoff is not likely to occur even during flood events. The extraction and treatment system currently in place at Site 1 prevents groundwater from the upland portions of the site from discharging to the river. Site-related constituents in upland surface soil may be taken up and accumulated in the tissue of biota, and thus be transported to upper trophic level receptors via food webs.

**Exposure Pathways and Routes.** An exposure pathway links a source of contamination with one or more receptors through exposure via one or more media and exposure routes. Exposure, and thus potential risk, can only occur if complete exposure pathways exist. Figure 7-4 shows the complete exposure pathways to ecological receptors at Site 1. Complete exposure pathways for terrestrial receptors to surface soils in both the upland and floodplain portions of the site exist for species that may utilize these habitats. Potentially complete exposure pathways to aquatic (e.g., benthic invertebrates and fish) and semi-aquatic (e.g., herons) receptors utilizing the portion of the North Branch Potomac River adjacent to Site 1 also exist.

An exposure route describes the specific mechanism(s) by which a receptor is exposed to a constituent present in an environmental medium. Terrestrial plants may be exposed through their root surfaces during water and nutrient uptake to constituents present in surface soil. Unrooted, floating aquatic plants, and rooted submerged vascular aquatic plants and algae, may be exposed to constituents directly from the water or (for rooted plants) from sediment.

Animals may be exposed to constituents through: (1) direct inhalation of gaseous constituents or of constituents adhered to airborne particulate matter; (2) incidental ingestion of contaminated abiotic media (e.g., soil or sediment) during feeding or preening activities; (3) the direct ingestion of contaminated water; (4) the ingestion of contaminated plant and/or animal tissues for constituents that have entered food webs; and/or (5) dermal contact with contaminated abiotic media. These routes, where applicable, are depicted on Figure 7-4.

Based upon the general fate properties (e.g., relatively high adsorption to solids) of the site-related constituents present on Site 1 (metals, PAHs, explosives, and dioxin/furans) and the protection offered by hair or feathers, dermal and inhalation exposures for upper trophic level receptor species are not considered significant relative to ingestion exposures and are therefore not directly evaluated in the ERA. The upper trophic level receptors considered in this ERA are unlikely to be exposed to significant airborne sources of constituents because the site is vegetated and little wind erosion of the soil would be expected. Furthermore, the primary constituents of potential concern present on the site typically adsorb to soil suggesting the potential for volatilization and thus exposure via inhalation is limited. Incidental ingestion of soil during feeding, preening, or grooming activities is considered in the risk estimates. Direct contact is considered for lower trophic level receptors (e.g., soil invertebrates).

**Receptors.** Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all ecological receptors present at a site. Therefore, specific receptor species or species groups (e.g., meadow vole) are often selected as surrogates to evaluate potential risks to larger portions of the ecological community (guilds; e.g., herbivorous mammals) used to represent the assessment endpoints (e.g., survival and reproduction of herbivorous mammals). Selection criteria typically include those species that:

- Are known to occur, or are likely to occur, at the site.
- Have a particular ecological, economic, or aesthetic value.
- Are representative of taxonomic groups, life history traits, and/or trophic levels in the habitats present at the site for which complete exposure pathways are likely to exist.
- Can, because of toxicological sensitivity or potential exposure magnitude, be expected to represent potentially sensitive populations at the site.

The following upper trophic level receptor species have been chosen for exposure modeling in terrestrial floodplain habitats based upon the criteria listed above:

- American robin (*Turdus migratorius*) - terrestrial avian omnivore
- Red-shouldered hawk (*Buteo lineatus*) - terrestrial avian carnivore
- Long-tailed weasel (*Mustela frenata*) - terrestrial mammalian carnivore
- Meadow vole (*Microtus pennsylvanicus*) - terrestrial mammalian herbivore
- Short-tailed shrew (*Blarina brevicauda*) - terrestrial mammalian invertivore

The following upper trophic level receptor species have been chosen for exposure modeling in terrestrial upland habitats based upon the criteria listed above:

- American robin (*Turdus migratorius*) - terrestrial avian omnivore
- American kestrel (*Falco sparverius*) - terrestrial avian carnivore
- Meadow vole (*Microtus pennsylvanicus*) - terrestrial mammalian herbivore
- Red fox (*Vulpes vulpes*) - terrestrial mammalian carnivore
- Short-tailed shrew (*Blarina brevicauda*) - terrestrial mammalian invertivore

Upper trophic level receptor species quantitatively evaluated in the ERA were limited to birds and mammals, the taxonomic groups with the most available information regarding exposure and toxicological effects. Lower trophic level receptor species were evaluated in the ERA based upon those taxonomic groupings for which screening values have been developed (see Section 7.3.3); these groupings and screening values are used in most ERAs. As such, specific species of terrestrial biota (plants and soil invertebrates) were not chosen as receptors because of the limited information available for specific species and because these receptors are evaluated on a community level via a comparison to soil screening values developed for these groups.

Amphibians and reptiles are also applicable receptor groups. Individual species of amphibians and reptiles are not, however, selected for evaluation because of the general lack of available toxicological information for these taxonomic groups for direct effects (reptiles) and effects from exposures via food webs (reptiles and amphibians). Potential risks to amphibians and reptiles from food web exposures are evaluated using other fauna (birds and mammals) as surrogates. Similarly, potential risks to these groups from direct exposures to surface soil are evaluated using screening values developed for other taxonomic groups (described above) and the results of toxicity tests with other (non-amphibian and non-reptilian) species.

**Endpoints and Risk Hypotheses.** The conclusion of the problem formulation includes the selection of ecological endpoints and risk hypotheses, which are based upon the conceptual model. Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process (EPA, 1997b). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. The considerations for selecting assessment and measurement endpoints are summarized in EPA (1997b) and discussed in detail in Suter (1989; 1990; 1993). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints define ecological attributes that are to be protected (assessment endpoints) and measurable characteristics of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by constituents attributable to the site (EPA, 1997b). Assessment endpoints contain an entity (e.g., fox population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or contaminant sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself. Effects on individual organisms are important for some receptors, such as rare and endangered species; population- and community-level effects are typically more relevant to ecosystems. Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of constituent exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level.

Table G-26 shows the assessment endpoints, risk hypotheses, and measurement endpoints used in the ERA for terrestrial habitats. Table G-26 also shows the receptors associated with each endpoint.

### 7.3.2 Exposure Assessment

The principal activity associated with the exposure assessment is the estimation of constituent concentrations in applicable media, termed exposure point concentrations (EPCs), to which the receptors may be exposed. This is accomplished through the selection of appropriate sets of the available analytical data using a set of criteria (e.g., validation status, sampling date). Once the analytical data sets are selected, EPCs are calculated as a particular point on the distribution of concentrations. At the screening level, the EPC is the maximum detected concentration. At the baseline level, EPCs are typically central tendency estimates (e.g., arithmetic mean). EPCs are then used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors.

#### 7.3.2.1 Selection Criteria for Analytical Data

Available analytical data (described in Section 7.3.1.2 and summarized in Table G-17) were selected for use in the ERA based upon a set of selection criteria that included:

- Data must have been validated by a qualified data validator using acceptable data validation methods (an exception was three 1995 surface soil samples that were used, even though they have not been validated, since they filled a spatial gap in sample coverage). Rejected (R) values were not used in the ERA. Unqualified data and data qualified as J (estimated), L (biased low), or K (biased high) were treated as detected. Data qualified as U (undetected) or B (blank contamination) were treated as non-detected.
- For samples with duplicate analyses, the higher of the two concentrations was used when both values were detects or when both values were non-detects. In cases where one result was a detection and the other a non-detect, the detected value was used in the assessment.
- For soil, samples collected from within 12 inches of the ground surface (surface soil) were quantitatively used because this depth range represents the most realistic potential exposures for most of the ecological receptors evaluated in terrestrial habitats. Since some ecological receptors may be exposed, at least periodically, to deeper soils (e.g., down to 2 feet below the ground surface), available subsurface soil data from the 12 to 24-inch depth interval (a few samples that extended down to 3 feet were also used) were also qualitatively considered to determine if constituent concentrations in the subsurface layers were higher than in surface layers.

### 7.3.2.2 Data Groupings

As discussed in Section 7.1.2, soil analytical data were partitioned based upon source area, which also corresponded with major habitat types, as follows:

- **Floodplain:** Soil samples collected from the OABG area (Figure 2-5), which generally corresponds to the river (forested) floodplain.
- **Upland:** Soil samples collected from the ABG and FDP areas (Figure 2-4), which generally correspond to periodically mowed grass habitats.

These spatial groupings were used to better evaluate potential risks in areas with differing habitat structure, habitat quality, source areas, and/or transport potential.

### 7.3.2.3 Exposure Point Concentrations

EPCs are calculated as a particular point on the distribution of concentrations. At the screening level, the EPC is the maximum detected concentration. At the baseline level, EPCs are typically central tendency estimates (e.g., median, geometric mean, or arithmetic mean), which provide a more representative estimate of potential exposures and risks to receptor populations (the focus of the selected assessment endpoints).

When direct measures of constituent concentrations in prey species' tissues were not available, medium-specific EPCs were used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors. Measured tissue concentrations were available for soil invertebrates (earthworms) from floodplain habitats for some constituents. These data are summarized in Table G-22 and were based upon five 28-day laboratory bioaccumulation tests with site surface soil samples collected from floodplain habitats (attempts to field-collect earthworms from the site yielded insufficient tissue mass). Dietary items for which tissue concentrations were modeled included terrestrial plants, soil invertebrates (constituents without measured tissue concentrations), and small mammals. Incidental ingestion of soil and ingestion of drinking water were included when calculating the total exposure. The models and parameter values used for calculating these tissue concentrations are outlined in the following subsections.

Not all constituents were evaluated for food web exposures. Only those constituents with the potential to bioaccumulate were evaluated for exposures via food webs. This list of bioaccumulating constituents is provided in Table G-27 for relevant constituents and is based upon the list provided in Table 4-2 of EPA (2000b).

For initial (screening) exposure estimates, the uptake of constituents from the abiotic media into these food items was based upon conservative (e.g., 90<sup>th</sup> percentile) bioconcentration factors (BCFs) or BAFs from the literature, where available. The use of 90<sup>th</sup> percentile values is generally recommended to provide for a conservative screening assessment (Sample et al., 1998a; 1998b; Bechtel Jacobs, 1998). BCFs and BAFs used for baseline exposure estimates were based upon, or modeled from, central tendency estimates (e.g., median or mean). For mean values, arithmetic means were used for normally distributed parameters; when the distribution was log-normal, the geometric mean was used. Default factors of 1.0 were used only when data were not available for a constituent in the literature. If measured tissue concentrations were available, they were used in place of modeled values.

In the baseline assessment, using central tendency estimates (rather than high-end values or maximums) for exposure parameters such as BAFs provides a more representative estimate of potential exposures and risks to populations (the focus of the assessment endpoints) of upper trophic level receptors. Since these upper trophic level receptors are highly mobile, they would be expected to effectively average their exposure over time as they forage within the area defining their home range. Average prey concentrations are most appropriately estimated using central tendency estimates of media concentrations and accumulation factors. For example, the wildlife dietary exposure models contained in the *Wildlife Exposure Factors Handbook* (EPA, 1993b) specify the calculation of an average daily dose. Increasing the representativeness of the exposure estimates relative to population-level effects is consistent with the intent of a BERA. In cases where adequate spatial sampling coverage exists, mean concentrations are also appropriate for evaluating potential risks to populations of lower trophic level receptors because the members of the population are expected to be found throughout an area (where suitable habitat is present), rather than concentrated in one particular location. While effects to individual organisms might be important for some receptors, such as rare and endangered species, population- and community-level effects are typically more relevant to ecosystems. A discussion of the uncertainties associated with the number of available samples and their spatial distribution is contained in Section 7.5.

For direct exposures, individual PAHs were evaluated but PAHs in surface soil were also evaluated based upon the sum total concentration of the individual constituents (one-half of the reporting limit was used for non-detects). For both direct exposures and exposure via food webs, dioxins and furans were evaluated as a single group using the TEQ approach and the TEFs listed in Table G-28. Mammalian TEFs were used to calculate soil concentrations for comparison to screening values. Both mammalian and bird TEFs were used to calculate the surface soil concentrations used in the food web models.

**Terrestrial Plants.** Tissue concentrations in the above-ground vegetative portion of terrestrial plants were estimated by multiplying the surface soil concentration for each constituent by constituent-specific soil-to-plant BCFs obtained from the literature. These BCFs are listed in Table G-29.

The BCF values used were based upon root uptake from soil and on the ratio between dry-weight soil and dry-weight plant tissue. Literature values based upon the ratio between dry-weight soil and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BCF by the estimated solids content for terrestrial plants (15 percent [0.15]; Sample et al., 1997).

For organic constituents without literature-based BCFs, soil-to-plant BCFs were estimated using the algorithm provided in Travis and Arms (1988):

$$\log B_v = 1.588 - (0.578) (\log K_{ow})$$

where:  $B_v$  = Soil-to-plant BCF (unitless; dry-weight basis)  
 $K_{ow}$  = Octanol-water partitioning coefficient (unitless)

The log  $K_{ow}$  values used in the calculations were obtained mostly from EPA (1995b; 1996d) and are listed in Table G-27.

**Soil Invertebrates (Earthworms).** Measured tissue concentrations in soil invertebrates (earthworms) from floodplain habitats were available for dioxins and furans (Table G-22). These data were also used to calculate site-specific BAF values, which were used in the food web models for upland habitats (Table G-30). For other constituents, tissue concentrations were estimated by multiplying the surface soil concentration for each constituent by constituent-specific BCFs or BAFs obtained from the literature. These BCF/BAF values are listed in Table G-30.

BCFs are calculated by dividing the concentration of a constituent in the tissues of an organism by the concentration of that same constituent in the surrounding environmental medium (in this case, soil) without accounting for uptake via the diet. BAFs consider both direct exposure to soil and exposure via the diet. Because earthworms consume soil, BAFs are more appropriate values and were used in the food web models when available. BAFs based upon depurated analyses (soil was purged from the gut of the earthworm prior to analysis) were given preference over undepurated analyses when selecting BAF values because direct ingestion of soil is accounted for separately in the food web model.

The BCF/BAF values used were based upon the ratio between dry-weight soil and dry-weight earthworm tissue. Literature values based upon the ratio between dry-weight soil and wet-weight earthworm tissue were converted to a dry-weight basis by dividing the wet-weight BCF/BAF by the estimated solids content for earthworms (16 percent [0.16]; EPA, 1993b). For constituents without available measured BAFs or BCFs, an earthworm BAF of 1.0 was assumed.

**Small Mammals.** Whole-body tissue concentrations in small mammals (shrews, voles, and/or mice) were estimated using one of two methodologies. For constituents with literature-based soil-to-small mammal BAFs, the small mammal tissue concentration was calculated by multiplying the surface soil concentration for each constituent by a constituent-specific soil-to-small mammal BAF obtained from the literature. These BAF values are listed in Table G-31.

The BAF values used were based upon the ratio between dry-weight soil and whole-body dry-weight tissue. Literature values based upon the ratio between dry-weight soil and wet-weight tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for small mammals (32 percent [0.32]; EPA, 1993b). BAFs for shrews were those reported in Sample et al. (1998b) for insectivores (or for general small mammals if insectivore values were unavailable), for voles were those reported for herbivores, and for mice were those reported for omnivores.

For constituents without soil-to-small mammal BAF values, an alternate approach was used to estimate whole-body tissue concentrations. Because most constituent exposure for these small mammal species is via the diet, it was assumed that the concentration of each constituent in the small mammal's tissues is equal to the constituent concentration in its diet multiplied by a diet to whole-body BAF (wet-weight basis) derived from the literature. For constituents lacking diet to whole-body BAF values, a BAF of one was assumed. The use of a diet to whole-body BAF of one is likely to result in reasonable estimates of constituent concentrations even for constituents that are known to bioaccumulate or biomagnify based upon reported literature values. For example, a maximum BAF (wet-weight) value of 1.0 was reported by Simmons and McKee (1992) for PCBs based upon laboratory studies with white-footed mice. Menzie et al. (1992) reported BAF values (wet-weight) for DDT of 0.3 for

voles and 0.2 for short-tailed shrews. Reported BAF (wet-weight) values for dioxin were only slightly above one (1.4) for the deer mouse (EPA, 1990). Resulting tissue concentrations (wet-weight) were converted to a dry-weight basis using an estimated solids content of 32 percent (see above).

#### 7.3.2.4 Dietary Intakes

Upper trophic level receptor exposures via food webs to constituents present in surface soil were determined using measured or estimated constituent concentrations in each relevant dietary component for each receptor, as described in the previous section. Incidental ingestion of soil and ingestion of drinking water were included when calculating the total exposure.

Dietary intakes for each upper trophic level receptor were calculated using the following formula (modified from EPA, 1993b):

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

where: $DI_x$	=	Dietary intake for constituent x (mg constituent/kg body weight/day)
$FIR$	=	Food ingestion rate (kg/day, dry-weight)
$FC_{xi}$	=	Concentration of constituent x in food item i (mg/kg, dry-weight)
$PDF_i$	=	Proportion of diet composed of food item i (dry-weight basis)
$SC_x$	=	Concentration of constituent x in surface soil (mg/kg, dry-weight)
$PDS$	=	Proportion of diet composed of surface soil (dry-weight basis)
$WIR$	=	Water ingestion rate (L/day)
$WC_x$	=	Concentration of constituent x in water (mg/L)
$BW$	=	Body weight (kg, wet weight)

Incidental ingestion of soil was modeled as a dietary component rather than using a separate soil ingestion rate. Parameter values for the selected receptors are listed in Tables G-32 (screening) and G-33 (baseline). When measured food and water ingestion rates were not available for a receptor from the literature, the rates were estimated using allometric equations from EPA (1993b).

The exposure parameter values were selected to provide for a conservative evaluation in the initial screening. Examples of these conservative assumptions include:

- All of the dietary items consumed by the receptor are obtained from the site (i.e., an Area Use Factor of one is assumed) at the point of maximum concentration.
- Constituents are 100 percent bioavailable.
- Maximum food and water ingestion rates are used (calculated maximum ingestion rates using allometric equations were based upon the maximum adult body weight).
- Minimum adult body weights are used.

For the refined baseline estimates:

- Central tendency estimates (e.g., mean, median, or midpoint) for body weight and ingestion rates were used. Central tendency estimates for these exposure parameters are more relevant for a BERA because they better represent the characteristics of a greater proportion of the individuals in the population. Populations or communities (rather than individual organisms) were emphasized when developing the assessment endpoints for the ERA.

### 7.3.3 Effects Assessment

The effects assessment defines the methods and data used to define an adverse ecological effect. For the terrestrial portion of this ERA, effects data are available from multiple lines of evidence, as follows:

- **Screening Values for Surface Soil** - Analytical data are compared to available surface soil screening values.
- **Screening Values for Ingestion Exposures** - Food web exposure estimates are compared to available ingestion-based screening values for upper trophic level receptors.
- **Toxicity Testing** - Laboratory toxicity tests (bioassays) were conducted using split samples of surface soil collected from floodplain areas of the site. Earthworms were the test organism and a total of 15 tests were conducted, two of which were from reference areas.
- **Bioavailability Measures** - Additional data were collected to help evaluate constituent-specific bioavailability in surface soil.

#### 7.3.3.1 Surface Soil Screening Values

The screening values used in the ERA were based upon Region 3 Biological Technical Assistance Group (BTAG) screening values (EPA, 1995b) and additional screening values available in the literature. When more than one screening value (e.g., soil fauna, soil flora) was available for a constituent, the lowest of these values was selected. Soil screening values based upon Dutch soil standards for certain organic constituents were adjusted based upon a TOC value of 2.72 percent for upland habitats and 3.64 percent for floodplain habitats. These values represent the arithmetic mean from site-specific surface soil samples (Tables G-18 and G-19). The surface soil screening values used in the ERA are listed in Table G-34.

#### 7.3.3.2 Ingestion Screening Values

Ingestion screening values for dietary exposures were derived for each bioaccumulative constituent evaluated in the ERA. Screening values were derived for both mammalian and avian receptors, the only two taxonomic groups for which sufficient toxicological information was generally available for the range of constituents evaluated. Toxicological information from the literature for wildlife species most closely related to the receptor species were used, where available, but were supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) where necessary. The ingestion screening values are expressed as milligrams of the constituent per kilogram body weight of the receptor per day (mg/kg-BW/day).

Survival, growth, and reproduction were emphasized as toxicological endpoints because they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied toxicological endpoints for ecological receptors. If several chronic toxicological studies were available from the literature, the most appropriate study was selected for each receptor species based upon study design, study methodology, study duration, study endpoint, and test species. No Observed Adverse Effect Levels (NOAELs) were utilized, where available, as the primary screening values. When chronic NOAEL values were unavailable, estimates were extrapolated from chronic Lowest Observed Adverse Effect Levels (LOAELs) using an UF of 10. Maximum Acceptable Toxicant Concentrations (MATCs), defined as the geometric mean of the NOAEL and LOAEL, were also calculated. Ingestion screening values for mammals and birds are summarized in Tables G-35 and G-36, respectively.

### 7.3.3.3 Toxicity Testing

Laboratory-based earthworm toxicity tests (bioassays) were conducted using split samples of surface soil collected from the floodplain portions of Site 1. Earthworm toxicity tests were 28 days in duration and used *Eisenia fetida*. *E. foetida* was selected over *Lumbriculus terrestris* because there are more test data available on *E. foetida*, *L. terrestris* is intolerant of non-loamy soils, and toxicity testing laboratories sometimes experience difficulty meeting control performance criteria with *L. terrestris*. Test endpoints were survival, growth, and reproduction.

Toxicity test reports are provided in Appendix E. The toxicity tests were conducted based upon the protocols provided in the final Step 4 work plan (CH2M HILL, 2004c). The results of toxicity testing help to directly evaluate the toxicity and bioavailability of constituents in site-specific surface soil samples. Lines of evidence for the effects assessment include:

- **Comparison of biological response between site and reference samples** - Statistical comparisons were conducted for each test endpoint (e.g., survival) between site and reference samples as well as between site/reference samples and controls. In general, the comparison of site samples to reference samples is more meaningful in evaluating the potential for biological impacts than the control comparison because the control is run with formulated (artificial) test media that is not generally comparable to site media in physical attributes. The purposes of the control samples are to evaluate test organism viability and the proper functioning of the test apparatus, not to reflect field conditions or exposures. The test results indicate whether organism performance is significantly different when exposed to media collected from the site relative to the reference area and/or control. The absence of a significant difference is a line of evidence supporting minimal risk. The presence of a significant difference that reflects reduced performance triggered additional evaluation. If no significant difference existed and survival was low, the potential reasons for the low survival were investigated (see Section 7.5).
- **Existence of patterns between laboratory toxicity test results and soil chemical or physical characteristics** - A combination of statistical and observational methods was used to identify constituent and/or physical parameters in soils that were potentially responsible for decreased *E. fetida* survival, growth, and/or reproduction. A suite of parameters that were potentially contributing to decreased endpoint response (toxicity) were first identified using step-wise multiple regression. Those parameters identified in multiple regression were further evaluated with simple correlation and visual

evaluation to identify patterns associated with the decreased response. Both parametric (Pearson product-moment) and non-parametric (Spearman rank) correlation coefficients were calculated. Soil physical parameters, including pH, TOC, percent moisture, and grain size, were included in the analyses because of their potential to affect the behavior and toxicity of constituents. If multiple regression and correlation analyses failed to identify significant relationships among parameters and endpoint responses, further analyses were conducted to determine if different individual or classes of parameters were responsible for observed toxicity at each sample location (i.e., parameter[s] responsible at one location were not responsible at other sample locations, and no site-wide gradient or relationship was present; see Section 7.3.4.3).

#### 7.3.3.4 Bioavailability Measures

Data collected to evaluate the potential constituent-specific bioavailability in surface soil included TOC, pH, and grain size.

### 7.3.4 Risk Characterization

The risk characterization portion of the ERA uses the information generated during the three previous parts of the ERA (problem formulation, exposure assessment, and effects assessment) to estimate potential risks to ecological receptors. In addition to the lines of evidence that were described in Section 7.3.3, the following additional factors were considered during the risk characterization:

- **Essential Nutrients:** Calcium, magnesium, potassium, and sodium were excluded from consideration because they are essential macronutrients that are needed in relatively high concentrations for normal metabolism, growth, and reproduction.
- **Frequency of Detection:** Constituents that were detected in less than five percent of the samples in a medium were considered for exclusion in that medium if at least 20 samples were available (EPA, 1989). It is unlikely that infrequently detected constituents represent a risk to receptors at the population level, due to limited spatial exposure. However, a qualitative spatial evaluation was conducted to insure that localized areas with elevated concentrations were not eliminated from consideration based upon this criterion.
- **Facility-wide Background Concentrations:** Facility-specific background concentrations were also considered for surface soils. This evaluation involved a direct comparison of concentrations to the upper tolerance limits (UTLs) from the background study (CH2M HILL, 2004e).
- **Reference Concentrations -** Because the background soil data set does not include samples taken from floodplain areas, constituent concentrations in site soil samples were also compared, qualitatively, with site-specific reference soil samples (AS01-SS31, AS01-SS32, AS01-SS45, and AS01-SS55) collected in the river floodplain adjacent to the upgradient river transect (Transect 1; Figure 7-2). The locations of the reference samples were selected during a site visit, attended by the Tier 1 Partnering Team and BTAG, to scope the 2001 supplemental sampling. In addition, as part of the ERA Step 4 studies conducted in July 2004, samples were collected at the reference locations near Transect 1 (AS01-SS45 and AS01-SS55) for earthworm bioassays and bioaccumulation tests (split surface soil samples were also collected for analytical chemistry). The bioassay data

from these samples were used as the reference for the bioassay statistical comparisons (in addition to comparisons to laboratory control samples).

Step 7 (baseline risk characterization) consists of the documentation and synthesis of the information and data identified in Steps 1 through 6. In the terrestrial portion of this ERA, risk was characterized using both quantitative and qualitative methods and a weight-of-evidence approach.

#### 7.3.4.1 Comparison with Surface Soil Screening Values

Surface soil exposure concentrations are compared with the corresponding screening values to derive risk estimates using the HQ method. HQs are calculated by dividing the constituent concentration in the surface soil by the corresponding constituent-specific soil screening value. HQs exceeding one indicate the potential for unacceptable risk since the constituent concentration (exposure) exceeds the screening value (effect). HQs less than or equal to one indicate that unacceptable risks are unlikely.

**Floodplain Soils.** Maximum floodplain surface soil concentrations are compared to screening values in Table G-37. Based upon this comparison, 16 metals (aluminum, antimony, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, and zinc) had HQs exceeding one based upon detected concentrations and were retained.

Eighteen SVOCs (17 PAHs and 3- and 4-methylphenol), two explosives (HMX and RDX), and two VOCs (trichloroethene [TCE] and 1,2-DCE) had HQs exceeding one based upon detected concentrations and were retained. Total PAHs also exceeded screening values and were retained. Acetophenone, benzaldehyde, caprolactam, carbazole, dibenzofuran, nitroglycerin, 1,1-dichloroethene, 2-butanone, acetone, chloromethane, methyl acetate, and methylcyclohexane were retained because they were detected and screening values were not available.

Mean concentrations in floodplain surface soil are compared with soil screening values in Table G-38. Based upon this comparison, 12 metals (aluminum, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, vanadium, and zinc) had mean HQs exceeding one based upon detected concentrations. Fifteen individual PAH compounds, total PAHs, 3- and 4-methylphenol, HMX, and 1,2-DCE also had mean HQs exceeding one based upon detected concentrations. These constituents were identified as COPCs. Although the mean HQs for antimony, RDX, and TCE did not exceed one, these constituents were also identified as COPCs based upon the frequency of exceedance and/or the magnitude of the maximum HQ. Acetophenone, benzaldehyde, caprolactam, carbazole, dibenzofuran, nitroglycerin, 1,1-dichloroethene, 2-butanone, acetone, chloromethane, methyl acetate, and methylcyclohexane were identified as COPCs because they were detected but lacked screening values (Table G-38).

**Upland Soils.** Maximum upland surface soil concentrations are compared to screening values in Table G-39. Based upon this comparison, 13 metals (aluminum, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, thallium, vanadium, and zinc) had HQs exceeding one based upon detected concentrations and were retained.

Three SVOCs (chrysene, phenanthrene, and n-nitrosodiphenylamine) and three explosives (HMX, perchlorate, and RDX) had HQs exceeding one based upon detected concentrations

and were retained. 2-Nitroaniline, caprolactam, 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, 2,6-DNT, nitroglycerin, acetone, and methyl acetate were retained because they were detected and screening values were not available.

Mean concentrations in upland surface soil are compared with soil screening values in Table G-40. Based upon this comparison, nine metals (aluminum, chromium, copper, iron, lead, manganese, mercury, vanadium, and zinc) had mean HQs exceeding one based upon detected concentrations. Chrysene, phenanthrene, perchlorate, and RDX also had mean HQs exceeding one based upon detected concentrations. These constituents were identified as COPCs. Although the mean HQ for HMX did not exceed one, this constituent was also identified as a COPC based upon the magnitude of the maximum HQ. 2-Nitroaniline, caprolactam, 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, 2,6-DNT, nitroglycerin, acetone, and methyl acetate were identified as COPCs because they were detected but lacked screening values (Table G-40).

#### 7.3.4.2 Terrestrial Food Web Exposures

Exposure doses for upper trophic level receptors from exposures via the food web are compared with the corresponding ingestion-based screening values to derive risk estimates using the HQ method. HQs are calculated by dividing the exposure dose by the corresponding constituent- and receptor-specific screening value. HQs exceeding one indicate the potential for unacceptable risk since the dose (exposure) exceeds the screening value (effect). HQs less than or equal to one indicate that unacceptable risks are unlikely.

**Floodplain Habitats.** HQs based upon maximum exposure doses for each terrestrial upper trophic level receptor are listed in Table G-41. Based upon a comparison to NOAELs, 10 metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), pyrene, and dioxin/furans had HQs exceeding one for one or more receptors. Ingestion screening values were not available for any receptor for 4-bromophenyl-phenylether and 4-chlorophenyl-phenylether, neither of which was detected in floodplain surface soils.

HQs based upon mean exposure doses for terrestrial upper trophic level receptors are listed in Table G-42. Based upon a comparison to NOAELs, arsenic (short-tailed shrew), cadmium (short-tailed shrew, long-tailed weasel, and American robin), lead (short-tailed shrew, American robin, and red-shouldered hawk), mercury (short-tailed shrew and meadow vole), zinc (long-tailed weasel, American robin, and red-shouldered hawk), and dioxin/furans (short-tailed shrew and long-tailed weasel) had HQs exceeding one. HQs exceeded one based upon the LOAEL for mercury exposures to the short-tailed shrew (HQ of 1.30). HQs exceeded one based upon MATCs for cadmium (short-tailed shrew), lead (American robin), mercury (short-tailed shrew), zinc (American robin), and dioxin/furans (long-tailed weasel). Thus, cadmium, lead, mercury, zinc, and dioxin/furans were identified as COPCs for floodplain food web exposures.

**Upland Habitats.** HQs based upon maximum exposure doses for each terrestrial upper trophic level receptor are listed in Table G-43. Based upon a comparison to NOAELs, eight metals (arsenic, cadmium, chromium, copper, lead, mercury, selenium, and zinc), hexachlorobenzene, pentachlorophenol, and dioxin/furans had HQs exceeding one for one or more receptors. The exceedances for hexachlorobenzene and pentachlorophenol were based upon maximum reporting limits, which were elevated in several samples (see Section

7.5). Ingestion screening values were not available for any receptor for 4-bromophenyl-phenylether and 4-chlorophenyl-phenylether, neither of which was detected in upland surface soils.

HQs based upon mean exposure doses for terrestrial upper trophic level receptors are listed in Table G-44. Based upon a comparison to NOAELs, arsenic (short-tailed shrew), lead (American robin), and dioxin/furans (short-tailed shrew and red fox) had HQs exceeding one. No HQ exceeded one based upon the LOAEL. HQs exceeded one based upon MATCs for dioxin/furans (short-tailed shrew; 1.36). The risk estimates for dioxin/furans were complicated by relatively high detection limits for some congeners in a few samples. This resulted in inflated TEQ-based surface soil concentrations (when one-half of the detection limit was used for non-detects to calculate the soil concentration) and thus ingestion-based risk estimates. This is especially relevant because the least toxic congeners (the heptas and octas) were most frequently detected in upland surface soils. If only detects are considered in the risk estimates, the MATC-based HQ is less than one. Thus, no constituent was selected as a COPC for upland food web exposures.

#### 7.3.4.3 Toxicity Testing

Survival and growth data from earthworm toxicity tests with floodplain surface soil samples were analyzed to determine statistically significant differences between the test surface soils and the laboratory control, and the test surface soils and the reference soils. Survival and growth data were evaluated to determine homogeneity of sample variances and normality of distribution using Shapiro-Wilk's Test for Normality and the F-Test for Equality of Two Variances, respectively. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were based upon the two-sample t-test. Statistical difference was evaluated at a p-value equal to 0.05. In cases where survival or growth in a site-related treatment was equal to or greater than that observed in the laboratory control or reference soil, no statistical evaluation was conducted.

At the end of the 28-day exposure period, the mean worm survival in the laboratory control soil was 97.5 percent (Table G-45). Worms recovered from the laboratory control soil had a mean wet weight of 236 mg/surviving worm. Worms from the laboratory control soil also exhibited signs of reproduction (determined by the presence of cocoons and/or juvenile worms). The minimum acceptable survival in the laboratory control is 90 percent based upon the test protocol. The control data indicate that the organisms were healthy and not stressed by handling. Survival in reference soils was only 47.5 percent and 13 percent for AS01-SS45 and AS01-SS55, respectively. However, mean wet weight in the reference soils was 285 mg/surviving worm and 775 mg/surviving worm for AS01-SS45 and AS01-SS55, respectively, both of which were higher than in the control. Worms from AS01-SS45 exhibited signs of reproduction, but worms from AS01-SS55 did not (Table G-45).

Review of survival data, as compared to laboratory control survival, indicates that soil samples AS01-SS46, AS01-SS47, AS01-SS48, AS01-SS49, AS01-SS51, AS01-SS53, AS01-SS54, AS01-SS56, AS01-SS57, and AS01-SS59 exhibited a significant negative impact on worm survival (Table G-45). No site soil sample exhibited a significant negative impact on worm survival when compared to survival in either reference soil sample (Table G-45).

*E. fetida* growth, as compared to laboratory control growth, indicates that soil samples AS01-SS56 and AS01-SS57 exhibited a significant negative impact on worm growth (Table G-45). Soil samples AS01-SS56, AS01-SS57, and AS01-SS59 exhibited a significant negative impact on worm growth when compared to reference soil sample AS01-SS45. Soils in the laboratory control, AS01-SS50, AS01-SS57, AS01-SS58, and AS01-SS59 exhibited a significant negative impact on worm growth when compared to reference sample AS01-SS55 (Table G-45).

Review of *E. fetida* reproduction data indicates that eleven of the fifteen tested soil samples, including the reference sample AS01-SS45, but not the reference sample AS01-SS55, showed signs of reproduction (juvenile or cocoon production) (Table G-45).

A combination of statistical and observational methods was used to identify chemical and/or physical parameters in soils that were potentially responsible for the decreased *E. fetida* survival, growth, and/or reproduction (Table G-46). Parameters that were potentially contributing to decreased endpoint response (toxicity) were identified using multiple regression and simple correlation analyses, as well as visual evaluation of single-parameter dose-response scatterplots in some cases. Only those constituents that were detected and identified as COPCs in floodplain surface soils (Table G-38) were included in the analyses. Soil physical parameters, including pH, TOC, percent moisture, and grain size were also included in the analyses because of their potential to affect the behavior and toxicity of the COPCs. The mean response across replicates for a given endpoint was used in the analyses.

Step-wise multiple regression was performed on the parameters discussed above to identify those parameters that best predict the *E. fetida* responses (survival, number of juveniles, number of cocoons, and weight). The regression coefficients (*B*) values generated by the multiple regression analysis provide an estimate of the contribution of each parameter to the prediction of the *E. fetida* response. In these analyses, several assumptions for multiple regression were violated, including the assumption that the relationship between the response and the parameter value are linear, the effects of each parameter value on the response are additive, data are normally distributed, and parameters are not highly correlated. Most data were not normally distributed (as determined by Shapiro-Wilk's Test for Normality), and natural log transformation did not achieve normality. Therefore, untransformed data were used in the analyses. Because analysis for VOCs was not performed for every sample, they were not included in the multiple regression analysis and only simple correlation and visual evaluation, as warranted, was performed for these analytes. As a consequence of the violation of the remaining assumptions, some of the multiple regression results may be unreliable and *B* coefficients may not accurately represent the relative importance of different parameters for predicting bioassay responses. Therefore, multiple regression results were used to identify a suite of constituents potentially driving toxicity, for which additional evaluation (simple correlation and visual evaluation) was needed. Both parametric (Pearson product-moment) and non-parametric (Spearman rank) correlation coefficients were calculated, and the most significant of the two results is presented for each parameter.

Multiple regression identified the best predictors of *E. foetida* survivorship as a suite of analytes that include iron, zinc, pH, and percent gravel (Table G-46). pH had the greatest contribution to the prediction of observed survivorship ( $B = -0.53$ ), and pH had the only significant negative correlation with survivorship. However, the strength of the relationship was weak ( $r^2 = 0.33$ ). In addition, the range of pH observed in site samples were within the

tolerance range of *E. foetida*, and samples with high mortality had near neutral pH conditions, suggesting that pH toxicity or effects on other analytes was unlikely. No other significant negative correlations were identified using simple correlation, including for VOCs (Table G-46).

Multiple regression did not identify a significant relationship for the prediction of the number of *E. foetida* juveniles (Table G-46). Of the suite of parameters identified in multiple regression, cadmium had the greatest contribution to the prediction of the number of juveniles ( $B = -0.01$ ). However, significant negative correlations were not identified for any parameters, including VOCs (Table G-46).

Multiple regression identified the best predictors of the number of *E. foetida* cocoons as a suite of parameters that included copper, mercury, manganese, nickel, potassium, thallium, acenaphthene, benzo(b)fluoranthene, pH, percent moisture, percent fine sand, percent medium sand, and percent fines (Table G-46). Mercury concentrations accounted for the greatest amount of variation in the observed number of cocoons, although this relationship was positive. Significant negative correlations were not identified for any of these parameters or for VOCs (Table G-46).

Multiple regression did not identify a significant relationship for the prediction of *E. foetida* growth (weight). Of the suite of parameters identified in multiple regression, pH had the greatest contribution to the prediction of the number of juveniles ( $B = 727$ ) (Table G-46). However, significant negative correlations were not identified for any parameters, including VOCs (Table G-46).

Because multiple regression and correlation analyses failed to identify any chemical (or physical) parameters potentially responsible for the decreased response (relative to the control) in the toxicity test, it is unlikely that a gradient of COPC concentrations at the bioassay sample locations is present in the floodplain. Further analyses of the *E. foetida* toxicity test results were performed under the hypothesis that the cause of toxicity at each location was the result of different individual or classes of COPCs. To investigate this hypothesis, concentrations of COPCs in each bioassay sample were compared to the soil screening values, survivorship NOECs, and reproduction NOECs. Survivorship NOECs were calculated as the maximum concentration in samples that did not have a significant reduction in survivorship as compared to the control (Table G-47). Reproduction NOECs were calculated as the maximum concentration in samples that showed signs of reproduction (Table G-47). Growth NOECs were not included in these analyses because growth appeared dependent upon the survivorship, with larger worms observed in samples with lower survivorship, and vice versa. To some degree, reproduction in a sample was also dependent upon survivorship, as samples with very low survivorship did not have signs of reproduction but fewer worms were available in the samples to reproduce. HQs were calculated using each of these three sets of values (screening values, survivorship NOECs, and reproduction NOECs). HQs were also summed for each constituent group (VOCs, PAHs, and metals; HQs for total PAHs were calculated separately).

The results of these comparisons are presented in Table G-48. In general, screening values were more conservative than toxicity test NOECs. Reproduction NOECs were the least conservative values, and only one sample (AS01-SB51) had a reproduction NOEC HQ greater than one (for cadmium). In each sample, a different combination of constituent class (VOCs, PAHs, or metals) or individual COPCs was identified that could potentially be

responsible for the observed toxicity. However, causation could not be attributed to these classes or COPCs due to the lack of consistent patterns in the results as there does not appear to be a consistent pattern in exceedance magnitude and the three sample groupings (unimpacted, impacted survivorship, and impacted survivorship and reproduction). Each of these groups exhibited exceedances (e.g., of soil screening values) and the magnitude of these exceedances were often similar among groups. Metals with survivorship NOEC HQs greater than one included aluminum, cadmium, chromium, copper, lead, nickel, silver, vanadium and zinc. PAHs with survivorship NOEC HQs greater than one included acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene. VOCs with survivorship NOEC HQs greater than one included 2-butanone, acetone, methyl acetate, methylcyclohexane, trichloroethene, PCE, and 1,2-DCE.

In summary, no chemical or physical parameters were identified using multiple regression and correlation analyses as potentially responsible for *E. foetida* toxicity. While pH was identified, along with other parameters, in significant relationships with survivorship and growth (weight), the range of pHs observed were also within the tolerance range of *E. foetida*, and samples with high mortality had near neutral pH conditions, suggesting that pH toxicity was unlikely. A comparison to soil screening values, and to survivorship and reproduction NOECs derived from the toxicity tests, identified a different combination of constituent class (VOCs, PAHs, or metals) or individual COPCs as potentially responsible for toxicity at each sample location. However, causation could not be attributed to these classes or COPCs due to the lack of consistent patterns in the results.

### 7.3.5 Risk Evaluation

In this section, the various lines of evidence discussed in the previous section are integrated for each habitat type/area in order to evaluate the potential for unacceptable risks. In addition, source areas and exposure pathways that may be contributing to these risks are identified as are the constituents and receptors that are driving the risk estimates.

#### 7.3.5.1 Terrestrial Floodplain Habitats

Floodplain habitats were defined as those areas of Site 1 within the 100-year floodplain of the river and in the OABG area. This section evaluates the potential for direct effects, and indirect effects via food web exposures, for ecological receptors that may utilize these habitats.

**Surface Soils – Metals.** Thirteen metals (aluminum, antimony, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, silver, vanadium, and zinc) were identified as COPCs in floodplain surface soils (Table G-49). To evaluate the potential significance of the screening value exceedances for these metals, surface soil concentrations were compared to facility-specific background surface soil concentrations and site-specific floodplain reference surface soil concentrations. Background and reference concentrations are summarized in Table G-50 and are compared to floodplain surface soil concentrations in Table G-51.

The metals exceeded background upper tolerance limits (UTLs), although manganese concentrations were comparable to reference based upon maximum and mean ratios (Table G-51). Thus, only manganese can be considered consistent with background or reference surface soil concentrations. However, several of the remaining 12 metals are

unlikely to present an unacceptable risk based upon bioavailability considerations and other available data from the literature including:

- **Aluminum** - EPA (2004d) indicates that aluminum should not present an unacceptable risk in surface soils if the soil pH is 5.5 or greater. All but one floodplain surface soil sample (AS01-SS50; pH of 5.1) had pH values greater than 5.5.
- **Antimony** - EPA (2004d) has developed an ecological SSL of 78.0 mg/kg for antimony. The maximum concentration in floodplain surface soil is about one-third of this value.
- **Iron** - EPA (2004d) indicates that iron should not represent an unacceptable risk in surface soil if the soil pH is between 5 and 8. All but one floodplain surface soil sample (AS01-SS40; pH of 8.2) had pH values outside of this range.

Based upon this evaluation, the remaining nine metals (cadmium, chromium, copper, lead, mercury, nickel, silver, vanadium, and zinc) were identified as COCs for floodplain surface soil. The highest concentrations of these metals generally occurred in the vicinity of the former open burn area and associated disposal area that is located near Transect 2 and the Western Drainage Ditch (e.g., HCS-B2-10 and HCS-B2-7-S) and between Transects 8 and 9 in the vicinity of the former inert burn area (e.g., AS01-SS22, AS01-SS72, HCS-B1-4-S, and HCS-B1-11-S). Several of these samples (HCS-B2-7-S, HCS-B1-4-S, and HCS-B1-11-S) consist mostly of ash rather than soil.

**Surface Soils – Organics.** Fifteen individual PAH compounds, total PAHs, six other SVOCs (3- and 4-methylphenol, acetophenone, benzaldehyde, caprolactam, carbazole, dibenzofuran), three explosives (HMX, RDX, and nitroglycerin), and eight VOCs (1,2-DCE, TCE, 1,1-dichloroethene, 2-butanone, acetone, chloromethane, methyl acetate, and methylcyclohexane) were identified as COPCs in floodplain surface soils (Table G-49). Background UTLs are not available for these organic constituents. These constituents were either not detected in reference soils or were detected at lower concentrations (Table G-51). Thus, none of these organic constituents is consistent with background or reference concentrations.

Although 15 individual PAH compounds exceeded surface soil screening values, the screening value for 14 PAHs (100 µg/kg) was a BTAG Region 3 value reportedly based upon carcinogenic effects in mice treated with benzo(a)pyrene. Because the objective of this portion of the analysis is to evaluate potential effects to plants and soil invertebrates (exposures via ingestion routes for upper trophic level receptors were evaluated separately using more appropriate toxicological endpoints than carcinogenicity), this screening value (100 µg/kg) has limited applicability to this ERA. Toxicologically-based screening values for lower trophic level receptors were available for two PAHs (neither of which was identified as a COPC based upon these more realistic screening values) - acenaphthene (2,500 µg/kg) and fluorene (1,700 µg/kg). Both of these values are substantially higher than 100 µg/kg and were higher than the mean concentration for each of the individual PAHs (Table G-38). This suggests that toxicologically-based screening values based upon lower trophic level organisms for the 15 PAH COPCs would likely be higher as well. This is supported by the results of the toxicity tests, in which screening values for 8 of 12 detected individual PAHs were lower than survivorship NOECs, and the screening values were substantially lower than reproduction NOECs.

Total PAH concentrations (compared to a generic effects-based screening value for total PAHs of 7,462 µg/kg; Table G-38) exceeded screening values based upon the mean concentration. However, EPA (1999b) reports a soil invertebrate screening value for higher molecular weight PAHs (extrapolated to total PAHs) of 25,000 µg/kg based upon toxicity tests conducted using benzo(a)pyrene. Mean total PAH concentrations in site surface soil were less than this value. Given these factors, and the lack of exceedances from food web modeling, potential risks to terrestrial receptors from exposure to PAHs in surface soil are of low magnitude on a site-wide basis. However, PAH concentrations were elevated in a few samples (AS01-SS24, AS01-SS25, HCS-B2-4-4, and HCS-B2-5-3) and clustered along the banks of the Western Drainage Ditch that enters the river at Transect 2 and adjacent to Transects 3 (AS01-SS49) and 7 (AS01-SS57) (Figure 3-2). At two of these locations (AS01-SS49 and AS01-SS57), PAHs were identified as potentially responsible for soil invertebrate toxicity in the toxicity tests. The areas defined by sample locations AS01-SS49 and AS01-SS57 represent localized areas with elevated PAH concentrations. Thus, PAHs were identified as COCs.

Acetophenone, caprolactam, and 3- and 4-methylphenol had low frequencies of detection (1 of 21 or 25 samples, or less than five percent). Because of this low frequency of detection, and a low maximum HQ of 1.10 for 3- and 4-methylphenol, these constituents are unlikely to pose a risk to ecological receptor populations and they are not identified as COCs.

Benzaldehyde, carbazole, and dibenzofuran were detected in four, six, and five floodplain surface soil samples, at maximum concentrations of 600, 210, and 260 µg/kg (0.60, 0.21, and 0.26 mg/kg), respectively (Table G-49). While there is little information regarding the potential toxicity to soil invertebrates and/or terrestrial plants following direct exposure to these three constituents, available data suggest that the maximum observed concentrations of these three constituents are too low to elicit adverse effects. In studies with oligochaete worms (*Enchytraeus crypticus*) exposed to carbazole-spiked soil, the resulting LC<sub>50</sub> (survival) and EC<sub>50</sub> (reproduction) values were greater than 2,100 and 52 mg/kg, respectively (Sverdrup et al., 2002). Comparable values for dibenzofuran were 400 and 130 mg/kg, respectively. In a similar study exposing collembolans or springtails (*Folsomia fimetaria*) to spiked soil, the LC<sub>50</sub> and EC<sub>50</sub> values were 2,500 and 35 mg/kg, respectively, for carbazole and 50 and 23 mg/kg, respectively for dibenzofuran (Sverdrup et al., 2001). Carbazole and dibenzofuran surface soil concentrations are well below these effect concentrations. The EC<sub>50</sub> value from 14-day plant toxicity tests with benzaldehyde was 448 mg/kg (Hulzebos et al., 1993), well above concentrations in site surface soil. Thus, these constituents were not identified as COCs.

HMX and RDX each exceeded its screening value at one sample location (AS01-SS-72), by a factor of 106 and 7.30, respectively. Nitroglycerin, which does not have a screening value, was also detected only at this location. Thus, the area defined by this sample represents a localized area with elevated concentrations for these explosives, which were subsequently identified as COCs.

TCE exceeded screening values by factors of 2 to 7 in four samples (AS01-SS-21, AS01-SS-22, AS01-SS53, and AS01-SS73) located between Transects 8 and 9 in the vicinity of the former inert burn area. TCE also exceeded screening values by a factor of about 2 near Transects 3 (HCS-BG-98S) and 4 (HCS-BG-110S). 1,2-DCE also exceeded screening values (maximum HQ of 53) at HCS-BG-110S. Thus, the areas defined by these samples represent localized

areas with elevated concentrations for these VOCs and they were identified as COCs. Of the six remaining VOC COPCs, several had low frequencies of detection (less than 5 percent), including 2-butanone (2 of 41 samples), acetone (2 of 42 samples), and chloromethane (1 of 41 samples), and, therefore, are unlikely to pose an unacceptable risk to ecological receptor populations. In addition, the maximum concentrations for 1,1-dichloroethene (2.60 µg/kg), 2-butanone (2.80 µg/kg), acetone (30.0 µg/kg), and methylcyclohexane (1.50 µg/kg) were less than 300 µg/kg, a typical screening value for other VOCs (Table G-37). The maximum concentration of chloromethane (370 µg/kg) was substantially less than the screening value for the chemically similar bromodichloromethane (45,000 µg/kg; Table G-37). Thus, these five VOCs were not identified as COCs. Methyl acetate, which was detected in 7 of 34 samples at a maximum concentration of 1,600 µg/kg (Table G-49), was identified as a COC because its maximum concentration exceeded the survivorship and reproduction NOECs from the earthworm toxicity tests. The highest exceedance for this constituent occurred at AS01-SS72.

**Food Web Exposures.** Except for mercury, there were no exceedances (based upon LOAELs) for terrestrial-based food web exposures in floodplain habitats. The mean HQ (based upon the LOAEL) for the short-tailed shrew was 1.30 for mercury. In addition to mercury, HQs exceeded one based upon the MATC for cadmium (short-tailed shrew), lead (American robin), zinc (American robin), and dioxin/furans (long-tailed weasel). Thus, these five constituents were identified as COCs. The highest concentrations of these constituents generally occurred in the vicinity of the former open burn area and associated disposal area that is located near Transect 2 and the western drainage ditch (e.g., HCS-B2-10 and HCS-B2-C) and between Transects 8 and 9 in the vicinity of the former inert burn area (e.g., AS01-SS72, HCS-B1-C, HCS-B1-4-S, and HCS-B1-11-S). Several of these samples (HCS-B2-C, HCS-B1-C, HCS-B1-4-S, and HCS-B1-11-S) consisted mostly of ash rather than soil.

**Soil Toxicity Tests.** No surface soil toxicity test sample from floodplain habitats showed reduced responses for all endpoints (survival, growth, and reproduction) relative to the control (Table G-45). Seven samples had mean survival of less than 25 percent (and four of these showed no signs of reproduction) and can be considered the most impacted samples. Except for AS01-SS55, which was one of the reference samples, these samples fell into two groups: (1) samples from the vicinity of the former open burn area and associated disposal area that is located near Transect 2 and the Western Drainage Ditch (AS01-SS46, AS01-SS47, and AS01-SS48), and (2) samples located near Transects 8 and 9 in the vicinity of the former inert burn area (AS01-SS51, AS01-SS53, and AS01-54). These results are generally consistent with the results from the surface soil screening.

The four samples that did not differ from the control for any endpoint included AS01-SS45 (reference), AS01-SS50 (located near Transect 4), and AS01-SS52 and AS01-SS58 (located near Transects 8 and 9 in the vicinity of the former inert burn area). The area near Transect 2 (located near the Western Drainage Ditch) appears to be the most impacted based upon the toxicity tests because the three samples from this area fell into the most impacted group. The area near Transects 8 and 9, from which six samples were collected, showed variable results as it included three of the most impacted samples and two of the least impacted samples. Other areas of the floodplain were intermediate in their response but showed signs of reproduction.

**Subsurface Soils.** Concentrations of inorganics and dioxin/furans were generally higher in surface soils relative to subsurface soils in floodplain habitats (Table G-52). However, concentrations of PAHs and VOCs were generally higher in subsurface soils.

### 7.3.5.2 Terrestrial Upland Habitats

Upland habitats were defined as those areas of Site 1 within the ABG and FDP areas. This section evaluates the potential for direct effects, and indirect effects via food web exposures, for ecological receptors that may utilize these habitats.

**Surface Soils – Metals.** Nine metals (aluminum, chromium, copper, iron, lead, manganese, mercury, vanadium, and zinc) were identified as COPCs in upland surface soils (Table G-49). To evaluate the potential significance of the screening value exceedances for these metals, surface soil concentrations were compared to facility-specific background and site-specific reference surface soil concentrations. Background and reference concentrations (CH2M HILL, 2004e) are summarized in Table G-50 and are compared to upland surface soil concentrations in Table G-53.

The nine metals exceeded background UTLs in at least one sample, although chromium, iron, manganese, vanadium, and zinc concentrations were comparable to reference based upon maximum and mean ratios (Table G-53). Chromium, iron, manganese, vanadium, and zinc can thus be considered consistent with reference surface soil concentrations. Maximum concentrations of these five metals were also generally less than NOECs from earthworm toxicity tests (Table G-54). Of the four remaining metals, aluminum is unlikely to present an unacceptable risk based upon bioavailability considerations. EPA (2004d) indicates that aluminum should not present an unacceptable risk in surface soils if the soil pH is 5.5 or greater. All but one upland surface soil sample (AS01-SS64; pH of 4.8) had pH values greater than 5.5. In addition, maximum aluminum concentrations did not exceed NOEC values from earthworm toxicity tests (Table G-54).

Based upon this evaluation, the remaining three metals (copper, lead, and mercury) were identified as COCs for upland surface soil. However, widespread, high-magnitude exceedances of soil screening values, earthworm NOECs, and background UTLs did not occur for any of these metals. The maximum copper concentration (1,820 mg/kg) at AS01-SS67 was the only exceedance of the survivorship and reproduction NOECs and the only notable exceedance of soil screening values and background UTLs. This sample is located near Burn Pad 5. The maximum mercury concentration (7.20 mg/kg) at AS01-SS70 was the only exceedance of the survivorship and reproduction NOECs. This sample, and AS01-SS18, represented the only notable exceedances of soil screening values and the only background UTL exceedances. AS01-SS70 is located near Burn Pad 8 while AS01-SS18 is located along the access road south of Burn Pads 5 and 6 (Figure 2-2). Lead was elevated (soil screening value HQ > 5) in two areas. The first was in the southwestern corner of the ABG area (AS01-SS02) where the site maximum of 1,730 mg/kg occurred (the only exceedance of the toxicity test NOECs). The second area was in the northeastern corner of the ABG area near Burn Pad 8 (AS01-SS70).

The site is covered in periodically-mowed grasses and other herbaceous plants, providing habitat of limited diversity and quality. Except for unpaved roads and the areas immediately around some of the active burn pans, areas of bare soil are uncommon and no obvious phytotoxic effects (e.g., large areas of bare soil, dead or dying plants) were

observed. Given the limited habitat quality of the ABG area, these relatively small areas of elevated concentrations of inorganics are not likely to result in adverse impacts to populations of ecological receptors.

**Surface Soils – Organics.** Two individual PAH compounds (chrysene and phenanthrene), two other SVOCs (2-nitroaniline and caprolactam), seven explosives (HMX, perchlorate, RDX, nitroglycerin, 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, and 2,6-DNT), and two VOCs (acetone and methyl acetate) were identified as COPCs in upland surface soils (Table G-49). Background UTLs are not available for these organic constituents. The two PAHs (chrysene and phenanthrene) were consistent with reference concentrations based upon maximum and mean ratios (Table G-53). The remaining constituents were either not detected in reference soils or were detected at lower concentrations (Table G-53).

RDX exceeded soil screening values at multiple locations throughout the ABG area, in particular at AS01-SS-64 and HCS-BP-6. HMX notably (HQ > 5) exceeded soil screening values only at AS01-SS64. The exceedances for these two explosives occurred at or very near the burn pan locations. The only exceedance of soil screening values for perchlorate, and the only detected concentration of nitroglycerin, also occurred at AS01-SS64. The highest concentrations of 2-nitroaniline and 1,3,5-trinitrobenzene (which did not have soil screening values) were located at HCS-BP-7. These six constituents were identified as COCs but are restricted, spatially, to the immediate vicinity of the burn pans. Given the limited habitat quality of the ABG area, particularly in the vicinity of the burn pans (which are still actively used), concentrations of these constituents are not likely to result in adverse impacts to populations of ecological receptors.

Caprolactam was detected at only a limited number of locations (2 of 11 samples) and at low concentrations (maximum of 46.0 µg/kg) relative to soil screening values for other, similar SVOCs. Maximum concentrations of 2,4-dinitrotoluene and 2,6-DNT (720 and 130 µg/kg, respectively) were considerable less than soil screening values (30,000 to 140,000 µg/kg) for the structurally similar 2,4,6-TNT (Talmage et al., 1999). Thus, these three constituents were not identified as COCs for upland surface soils.

In comparison to the survivorship and reproduction NOECs developed for the floodplain, acetone and methyl acetate had maximum concentrations that were below survivorship and reproduction NOECs (Table G-54). Therefore, these VOCs were not identified as COCs for upland surface soils.

**Food Web Exposures.** Baseline risk estimates using area-wide averages indicate low to negligible risks for upper trophic level receptors in upland habitats. HQs based upon the LOAEL or MATC did not exceed one for any constituent except dioxin/furans, which exceeded based upon the MATC for the short-tailed shrew (HQ of 1.36). However, as discussed in Section 7.3.4.2, the risk estimates for dioxin/furans were heavily influenced by relatively high detection limits for some non-detected congeners (representing the more toxic congeners) in a few samples. Estimates based solely upon detected congeners (generally representing the least toxic congeners) indicate negligible risk.

**Subsurface Soils.** Among inorganics, only antimony and selenium were notably higher in subsurface upland soils relative to surface upland soils (Table G-55). Concentrations of SVOCs were similar between surface and subsurface soils, while concentrations of

explosives were higher in surface soils. Concentrations of VOCs and dioxin/furans were generally higher in subsurface soils.

### 7.3.6 Transport Potential to Riverine Habitats

The North Branch Potomac River borders Site 1 to the north. Complete, current transport pathways via surface runoff potentially link the Site 1 source areas in soil located in the 100-year floodplain (i.e., OABG area but not the ABG and FDP areas) with the river based upon topography and proximity. In addition, groundwater transport from the FDP area was historically a complete pathway but is not currently complete because of the groundwater capture and treatment system.

In order to qualitatively evaluate the potential transport of surface soil COCs associated with Site 1 source areas in the OABG area to the river, floodplain surface soil samples were assigned to the nearest of the nine river transects (Figure 7-2). The maximum and mean surface soil concentrations were calculated for eight transects (Transect 5 had no associated surface soil samples) for the surface soil COCs listed in Table G-56. Exceptions included: (1) 1,2-DCE, whose low frequencies of detection in surface soil made such an evaluation problematic, and (2) methyl acetate and the explosive COCs, which were not detected in sediments, indicating that observable transport to the river is not occurring. Total PAHs, rather than individual PAHs, were included in this evaluation because the ERA suggested a potential for localized areas with elevated concentrations of both total and individual PAHs. Mean and maximum sediment concentrations for these COCs were also calculated for each of the eight transects. Surface water was not included in this evaluation due to the low detection frequency for many of the surface soil COCs and because of the transient nature of surface water concentrations.

The maximum surface soil concentrations for each constituent at each transect were then ranked (from 1 to 8), with a rank of 1 representing the highest maximum concentration for the eight transects and a rank of 8 the lowest concentration. This was repeated for mean soil concentrations, and mean and maximum sediment concentrations. Ties were assigned the same rank. The results of this analysis are summarized in Table G-57.

For the metal COCs, surface soil concentrations were generally highest at or near Transects 2 and 8/9, while for sediment the highest concentrations were generally at Transects 2, 6, and 8. Thus, there is some correlation between soil and sediment concentrations for these metals, particularly at or near Transect 2. Sediment concentrations of these metals at Transect 9 were among the lowest, suggesting a low correlation with soil concentrations in this area.

Analytical results indicate that surface soil and sediment concentrations for PAHs and dioxin/furans are somewhat spatially related. The highest PAH concentrations were associated with Transect 2, particularly the Western Drainage Ditch, for sediment (Table G-57). Although the highest soil PAH concentrations were associated with Transect 7, these results are biased by one high concentration, at AS01-SS57. If this sample is not included in the analysis, the highest soil concentrations for PAHs are associated with Transects 2 and 3. For dioxin/furans, surface soil concentrations were highest near Transect 9 and sediment concentrations were highest at Transects 8 and 9, near the former inert burn area.

Analytical results indicate that surface soil and sediment concentrations for TCE are not spatially related. In sediment, VOC concentrations have been decreasing steadily over time since the groundwater capture and treatment system began operation. This suggests that transport of VOCs via groundwater from the FDP was the main contributor of VOC concentrations in river sediment, not overland runoff from source areas within the river floodplain.

## 7.4 Risk Assessment for Riverine Habitats

This subsection contains a quantitative risk assessment (through Step 3A of the ERA process) of the surface water and sediment in the portions of the North Branch Potomac River directly adjacent to Site 1. This assessment was conducted because the evaluation of transport potential (Section 7.3.6) indicated a possible correlation between surface soil concentrations at source areas within the floodplain and sediment concentrations in adjacent portions of the river for some site-related constituents.

### 7.4.1 Problem Formulation

Much of the problem formulation contained in Section 7.3.1 is applicable to the evaluation of river surface water and sediment. This subsection outlines specific differences in the problem formulation for the river evaluation.

#### 7.4.1.1 Environmental Setting

The environmental setting was described in Section 7.3.1.1.

#### 7.4.1.2 Summary of Analytical Data

The analytical data selected for use in this ERA were described in Section 7.3.1.2.

#### 7.4.1.3 Conceptual Model

Source areas, transport pathways, exposure media, exposure pathways, and exposure routes were described in Section 7.3.1.3. These components of the conceptual model (Figure 7-4) are also applicable to the river evaluation.

**Receptors.** The following semi-aquatic upper trophic level receptors have been chosen for exposure modeling in riverine habitats:

- Belted kingfisher (*Ceryle alcyon*) - semi-aquatic avian piscivore/invertivore
- Great blue heron (*Ardea herodias*) - semi-aquatic avian piscivore
- Mallard (*Anas platyrhynchos*) - semi-aquatic avian omnivore
- Tree swallow (*Tachycineta bicolor*) - avian aerial insectivore
- Mink (*Mustela vison*) - semi-aquatic mammalian piscivore
- Raccoon (*Procyon lotor*) - semi-aquatic mammalian omnivore

Upper trophic level receptor species quantitatively evaluated in the ERA were limited to birds and mammals, the taxonomic groups with the most available information regarding exposure and toxicological effects. Lower trophic level receptor species were evaluated in the ERA based upon those taxonomic groupings for which screening values have been developed (see Section 7.4.3); these groupings and screening values are used in most ERAs.

As such, specific species of aquatic biota (benthic invertebrates and fish) were not chosen as receptors because of the limited information available for specific species and because these receptors are evaluated on a community level via a comparison to surface water and sediment screening values.

Amphibians and reptiles are also applicable receptor groups. Individual species of amphibians and reptiles are not, however, selected for evaluation because of the general lack of available toxicological information for these taxonomic groups for direct effects (reptiles) and effects from exposures via food webs (reptiles and amphibians). Potential risks to amphibians and reptiles from food web exposures are evaluated using other fauna (birds and mammals) as surrogates. Similarly, potential risks to these groups from direct exposures to surface water and sediment are evaluated using screening values developed for other taxonomic groups (described above).

**Endpoints and Risk Hypotheses.** Table G-58 shows the assessment endpoints, risk hypotheses, and measurement endpoints used in the ERA for riverine habitats. Table G-58 also shows the receptors associated with each endpoint.

## 7.4.2 Exposure Assessment

Much of the exposure assessment methodology described in Section 7.3.2 is applicable to the evaluation of river surface water and sediment. This subsection outlines specific differences in the exposure assessment for the river evaluation.

### 7.4.2.1 Selection Criteria for Analytical Data

The selection criteria for analytical data are described in Section 7.3.2.1 and, with the exception that soil samples do not apply to the evaluation of riverine habitats, these criteria were also applicable to the river evaluation.

### 7.4.2.2 Data Groupings

Surface water and sediment analytical data were partitioned as follows:

- **Upgradient.** Surface water and sediment samples collected from Transect 1 (Figure 7-2), which is located upgradient of Site 1.
- **Adjacent and Downgradient.** Surface water and sediment samples collected from Transects 2 through 9 (Figure 7-2).

### 7.4.2.3 Exposure Point Concentrations

EPCs were calculated following the procedures outlined in Section 7.3.2.3. Medium-specific EPCs were used in bioaccumulation and food web models to estimate exposures to upper trophic level receptors. Dietary items for which tissue concentrations were modeled included aquatic plants, benthic invertebrates, and fish. Incidental ingestion of sediment and ingestion of drinking water were included when calculating the total exposure. The models and parameter values used for calculating these tissue concentrations are outlined in the following subsections.

For direct exposures, individual PAHs were evaluated but PAHs in sediment were also evaluated based upon the sum total concentration of the individual constituents (one-half of the reporting limit was used for non-detects). For both direct exposures and exposure via

food webs, dioxins and furans were evaluated as a single group using the TEQ approach and the TEFs listed in Table G-28. Fish TEFs were used to calculate sediment concentrations for comparison to sediment screening values. Mammalian and bird TEFs were used to calculate the sediment concentrations used in the food web models.

**Aquatic Plants.** Tissue concentrations in aquatic plants were estimated using the same methodologies described in Section 7.3.2.3 for terrestrial plants except that sediment (not soil) concentrations were used in the calculation.

**Benthic Invertebrates.** Tissue concentrations in benthic invertebrates were estimated by multiplying the sediment concentration for each constituent by constituent-specific sediment-to-invertebrate BAFs obtained from the literature. These BCFs are listed in Table G-59.

The BAF values used were based upon the ratio between dry-weight sediment and dry-weight invertebrate tissue. BAFs based upon depurated analyses (sediment was purged from the gut of the organism prior to analysis) were given preference over undepurated analyses when selecting BAF values because direct ingestion of sediment is accounted for separately in the food web model.

Literature values based upon the ratio between dry-weight sediment and wet-weight invertebrate tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for aquatic invertebrates (21 percent [0.21]; EPA, 1993b). For constituents without literature-based sediment-to-invertebrate BAFs, a BAF of 1.0 was assumed.

**Fish.** Tissue concentrations in whole-body fish were estimated by multiplying the sediment concentration for each constituent by constituent-specific sediment-to-fish BAFs obtained from the literature. These BCFs are listed in Table G-60.

The BAF values used were based upon the ratio between dry-weight sediment and dry-weight fish tissue. Literature values based upon the ratio between dry-weight sediment and wet-weight fish tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for fish (25 percent [0.25]; EPA, 1993b). For constituents without literature-based sediment-to-fish BAFs, a BAF of 1.0 was assumed.

#### 7.4.2.4 Dietary Intakes

Upper trophic level receptor exposures via food webs to constituents present in surface water and sediment were determined using estimated constituent concentrations in each relevant dietary component for each receptor, as described in Section 7.4.2.3. Incidental ingestion of sediment and ingestion of drinking water were included when calculating the total exposure.

Dietary intakes for each upper trophic level receptor were calculated using the formula described in Section 7.3.2.4 except that sediment concentrations were used in place of surface soil concentrations. Incidental ingestion of sediment was modeled as a dietary component rather than using a separate sediment ingestion rate. Parameter values for the selected receptors are listed in Tables G-61 (screening) and G-62 (baseline). When measured food and water ingestion rates were not available for a receptor from the literature, the rates were estimated using allometric equations from EPA (1993b).

The exposure parameter values were selected to provide for a conservative evaluation in the initial screening, as described in Section 7.3.2.4.

### 7.4.3 Effects Assessment

The effects assessment defines the methods and data used to define an adverse ecological effect. For the river portion of this ERA, effects data are available from multiple lines of evidence, as follows:

- **Screening Values for Surface Water and Sediment** - Analytical data are compared to available surface water and sediment screening values for freshwater habitats.
- **Screening Values for Ingestion Exposures** - Food web exposure estimates are compared to available ingestion-based screening values for upper trophic level receptors.
- **Bioavailability Measures** - Additional data were collected to help evaluate constituent-specific bioavailability in abiotic media.

#### 7.4.3.1 Medium-Specific Screening Values

The screening values used in the ERA were based upon Region 3 BTAG screening values (EPA, 1995) and additional screening values available in the literature. When more than one screening value was available (e.g., fauna and flora) for a constituent, the lowest of these values was selected. Screening values were adjusted based upon modifying factors as follows:

- Surface water screening values for several divalent metals were adjusted using a mean measured water hardness value of 158 mg/L.
- The surface water screening value for pentachlorophenol was adjusted using a mean measured pH value of 7.8.
- Equilibrium-partitioning based sediment values (used as a measure of bioavailability) were adjusted using a mean measured TOC value of 4.89 percent.

The surface water and sediment screening values used in this ERA are summarized, by medium, in Table G-63.

#### 7.4.3.2 Ingestion Screening Values

Ingestion screening values for mammals and birds were described in Section 7.3.3.2 and are summarized in Tables G-35 and G-36, respectively.

#### 7.4.3.3 Bioavailability Measures

Data collected to evaluate the potential constituent-specific bioavailability in surface water included hardness and pH, and for sediment included TOC, pH, and grain size.

### 7.4.4 Risk Characterization

The risk characterization portion of the ERA uses the information generated during the three previous parts of the ERA (problem formulation, exposure assessment, and effects assessment) to estimate potential risks to ecological receptors. In addition to the lines of

evidence that were described in Section 7.4.3, the following additional factors were considered during the risk characterization:

- **Essential Nutrients.** Calcium, magnesium, potassium, and sodium were excluded from consideration as described in Section 7.3.4.
- **Frequency of Detection.** Constituents that were detected in less than five percent of the samples in a medium were considered for exclusion as described in Section 7.3.4.
- **Upgradient Concentrations.** Site-specific upgradient surface water and sediment concentrations were derived from sampling locations that were upgradient of Site 1 (1SD/1SW-1 and 1SD/1SW-1A; Figure 7-2). Concentrations from samples collected adjacent to, and downgradient of, Site 1 were directly compared with samples collected upgradient of the site.

Step 7 (baseline risk characterization) consists of the documentation and synthesis of the information and data identified in Steps 1 through 6. In the river portion of this ERA, risk was characterized using both quantitative and qualitative methods and a weight-of-evidence approach.

#### 7.4.4.1 Comparison with Screening Values

Surface water and sediment exposure concentrations are compared with the corresponding screening values to derive risk estimates using the HQ method, as explained in Section 7.3.4.1.

**River Surface Water.** Maximum surface water concentrations for samples collected adjacent to, or downgradient of, Site 1 are compared to screening values in Table G-64. Based upon this comparison for unfiltered samples, four metals (aluminum, cadmium, iron, and manganese) had HQs exceeding one based upon detected concentrations and were retained. Aluminum, manganese, and silver exceeded screening values in filtered samples based upon detected concentrations. No organic constituent exceeded screening values based upon a detected concentration (Table G-64).

Mean concentrations in river surface water are compared with screening values in Table G-65. Only aluminum (HQ of 4.68) and manganese (HQ of 2.20) exceeded screening values based upon detected total concentrations. Aluminum (HQ of 3.73), manganese (HQ of 1.27), and silver (HQ of 1.25) exceeded screening values based upon dissolved concentrations. Thus, aluminum, manganese, and silver were identified as COPCs.

**River Sediment.** Maximum sediment concentrations for samples collected adjacent to, or downgradient of, Site 1 are compared to screening values in Table G-66. Based upon this comparison, 11 metals (arsenic, cadmium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, and zinc) had HQs exceeding one based upon detected concentrations and were retained. Beryllium and thallium were retained because they were detected and screening values were not available.

Twenty SVOCs (1,1-biphenyl, 3- and 4-methylphenol, carbazole, dibenzofuran, and 16 PAHs) and dioxin/furans had HQs exceeding one based upon detected concentrations and were retained. Total PAHs also exceeded screening values and were retained. Benzaldehyde, 1,1-dichloroethane, 1,2-DCE, acetone, methylene chloride, and vinyl chloride were retained because they were detected and screening values were not available.

Mean concentrations in river sediment are compared with screening values in Table G-67. Based upon this comparison, seven metals (arsenic, copper, manganese, mercury, nickel, silver, and zinc) had mean HQs exceeding one based upon detected concentrations. Twelve individual PAH compounds, total PAHs, and dioxin/furans also had mean HQs exceeding one based upon detected concentrations. These constituents were identified as COPCs. Although the mean HQ for pyrene did not exceed one, this constituent was also identified as a COPC based upon the magnitude of the maximum HQ. Beryllium, thallium, benzaldehyde, 1,1-dichloroethane, 1,2-DCE, acetone, methylene chloride, and vinyl chloride were identified as COPCs because they were detected but lacked screening values (Table G-67).

#### 7.4.4.2 Aquatic Food Web Exposures

Exposure doses for upper trophic level receptors from exposures via the food web are compared with the corresponding ingestion-based screening values to derive risk estimates using the HQ method as explained in Section 7.3.4.2.

HQs based upon maximum exposure doses for each semi-aquatic upper trophic level receptor are listed in Table G-68. Based upon a comparison to NOAELs, seven metals (arsenic, cadmium, copper, lead, mercury, selenium, zinc) and hexachlorobenzene had HQs exceeding one for one or more receptors. The exceedance for hexachlorobenzene was based upon maximum reporting limits. Ingestion screening values were not available for any receptor for 4-bromophenyl-phenylether and 4-chlorophenyl-phenylether, neither of which was detected in river surface water or sediment.

HQs based upon mean exposure doses for semi-aquatic upper trophic level receptors are listed in Table G-69. Based upon a comparison to NOAELs, only mercury (belted kingfisher and great blue heron) had HQs exceeding one. HQs exceeded one based upon the LOAEL for mercury exposures to the belted kingfisher (HQ of 1.29) and the great blue heron (HQ of 2.09). Thus, mercury was selected as a COPC for river food web exposures.

#### 7.4.5 Risk Evaluation

In this subsection, the various lines of evidence discussed in the previous section are integrated in order to evaluate the potential for unacceptable risks.

The North Branch Potomac River borders Site 1 to the north. Complete, current transport pathways via surface runoff potentially link the Site 1 source areas located in the 100-year floodplain (i.e., OABG area but not the ABG and FDP areas) with the river based upon topography and proximity. In addition, groundwater transport from the FDP area was historically a complete pathway but is not currently complete because of the groundwater capture and treatment system. This subsection evaluates the potential for direct effects, and indirect effects via food web exposures, for ecological receptors that may utilize river habitats adjacent to the site.

##### 7.4.5.1 Surface Water and Sediment

Three metals (aluminum, manganese, and silver) were identified as COPCs in river surface water (Table G-70). To evaluate the potential significance of the screening value exceedances for these metals, surface water concentrations adjacent to, and downgradient of, the site were compared with upgradient concentrations. Upgradient surface water concentrations

are summarized in Table G-71 and are compared to site surface water concentrations in Table G-72. Based upon this comparison, mean concentrations of aluminum and manganese are similar to mean upgradient concentrations (Table G-72). Although silver was not detected in the upgradient samples, it exceeded in only one site sample and the mean HQ was only marginally over one (1.25). Thus, no constituents were identified as COCs in surface water.

Nine metals (arsenic, beryllium, copper, manganese, mercury, nickel, silver, thallium, and zinc), 14 SVOCs (benzaldehyde and 13 PAHs), total PAHs, dioxin/furans, and five VOCs (1,1-dichloroethane, 1,2-DCE, acetone, methylene chloride, and vinyl chloride) were identified as COPCs in river sediment (Table G-70). As for surface water, sediment concentrations adjacent to, and downgradient of, the site were compared with upgradient concentrations. Upgradient sediment concentrations are summarized in Table G-73 and are compared to site sediment concentrations in Table G-74.

The metals except arsenic and manganese exceeded upgradient concentrations by a factor of 1.5 or more based upon mean concentrations (Table G-74). Arsenic and manganese concentrations were fairly uniform along the river and the mean HQs were only 1.30 and 1.68, respectively (Table G-70). Concentrations of beryllium and thallium in sediment were relatively uniform along the portion of the river adjacent to the site but were slightly higher than in upgradient sediment samples. The five remaining metals (copper, mercury, nickel, silver, and zinc) were identified as COCs in sediment. The maximum concentrations for these five metals occurred at Transect 2, except for nickel (nickel occurred at Transect 3). HQs exceeding five also occurred at Transect 3 for copper, Transect 6 for mercury, and Transects 7 and 8 for nickel. Except for methylene chloride (maximum and mean) and benzaldehyde (mean), the organic sediment COPCs were either not detected in upgradient sediment samples or were detected at lower concentrations (Table G-74).

The mean HQ for total PAHs was 1.75. However, high magnitude exceedances for total PAHs were largely confined to Transect 2 (HQs were less than two at the other transects), especially sample AS01-SD02D. AS01-SD02D was situated in the Western Drainage Ditch that enters the river at the location of Transect 2. The highest surface soil concentrations for PAHs also occurred in this area. Without sample AS01-SD02D, the mean HQ for total PAHs is 1.10 (0.18 based upon detects). A comparison of sediment concentrations to equilibrium partitioning-based sediment values, which provide a measure of bioavailability, for the eight PAHs with available values (Table G-75) indicates that bioavailability and potential risks are low for PAHs except at the location of the maximum concentrations (sample AS01-SD02D). This suggests that the spatial extent of potential PAH sediment contamination is localized. The coarse nature of the substrate (low percentages of fine sand, silt, and clay; Table G-3) at Transect 2 does not suggest that this is a depositional area, although TOC is reasonably high (3.9 to 6.7 percent; Table G-3). The likely source of these PAHs is flow from the Western Drainage Ditch and/or soil in the surrounding area. PAH concentrations, except at Transect 2, are generally similar to upgradient concentrations (based upon a qualitative comparison), also suggesting that the source of the PAHs is the Western Drainage Ditch or surrounding soil. Thus, PAHs are identified as COCs in sediment only for the area near Transect 2.

Dioxin/furans also exceeded sediment screening values. However, this was due largely to using one-half the reporting limit for undetected congeners when calculating the TEQ concentrations. Using only detected concentrations, the TEQ-based maximum HQ would be

only 0.07. Thus, dioxin/furans were not identified as COCs. Although floodplain surface soil showed high concentrations of dioxins and furans at some locations, analytical results indicate that very little of this material has migrated to the river.

A comparison of sediment concentrations with equilibrium partitioning-based sediment values, which provide a measure of bioavailability, for 1,1-dichloroethane, methylene chloride, and 1,2-DCE (Table G-75) indicates that potential risks are low for these constituents in river sediment. Acetone and vinyl chloride were only detected in one of 39 samples. Thus, none of these VOCs were identified as COCs.

#### 7.4.5.2 Aquatic Food Web Exposures

Except for mercury, there were no exceedances (based upon LOAELs) for aquatic-based food web exposures in river habitats. Both piscivorous bird species (belted kingfisher and great blue heron) had LOAEL-based HQs exceeding one for mercury (Table G-70). However, there is a large amount of uncertainty concerning the fish tissue concentrations for mercury, which were modeled from sediment concentrations, on which these risk estimates were based. At Site 5, located upstream of Site 1, mercury sediment concentrations (maximum of 4.80 mg/kg and mean of 0.38 mg/kg) were similar to those at Site 1 (maximum of 2.30 mg/kg and mean of 0.28 mg/kg). However, measured mercury concentrations in whole-body fish at Site 5 were several orders of magnitude lower than modeled concentrations, suggesting that the model inputs were very conservative. If this is also true at Site 1, ingestion-based HQs for these piscivorous receptors would not exceed one. Until this can be confirmed, however, mercury is identified as a COC. The highest concentrations of mercury in sediments occurred at Transects 2 and 6.

#### 7.4.5.3 Benthic Invertebrate Surveys

LTM of benthic macroinvertebrates is being conducted as part of the existing remedy at Site 1. The primary purpose of this biomonitoring is to assess the health of the aquatic community (represented by benthic macroinvertebrates) present in the river near Site 1. The 1998 baseline survey was completed prior to the start-up of the groundwater capture and treatment system. Three post-remedy surveys (in 2000, 2002, and 2004) have also been conducted to date.

The results of the biomonitoring are summarized in Table G-76. During the baseline (1998) bioassessment, slight impairment in benthic macroinvertebrate communities was noted at two locations (relative to a reference station), one at the upstream end of Site 1 (Station 2) and the other (Station 4) directly adjacent to Site 1 (locations are shown on Figure 7-3). The 2000 bioassessment indicated slight impairment in benthic macroinvertebrate communities at all stations relative to the reference station, with bioassessment scores lowest at Station 2 and at the two most downgradient stations (Stations 5 and 6). The 2002 bioassessment indicated slight impairment at Stations 2, 3, and 6, and moderate impairment at Stations 4 and 5. The 2004 bioassessment indicated slight impairment at Stations 2 and 3, and moderate impairment at Station 4B.

A comparison of the 1998 and 2000-2004 data indicates increased impairment in 2000 and 2002 relative to 1998, with some recovery in 2004. Relative to 1998 and 2000, the 2002 bioassessment scores at Station 1 (reference) and Station 2 remained essentially unchanged, decreased at Stations 3, 4, and 5, and remained stable relative to 2000 (after decreasing from 1998) at Station 6. These changes are not related to habitat or physical factors based upon a

comparison of habitat suitability scores to bioassessment scores. However, for 2002, this may not be entirely the case. The physical nature of the river segment between Stations 3 and 5 is more pool-like than the reaches upstream and downstream of this area. The low flows noted in 2002 during sampler colonization suggest that this river segment experienced a reduction in flow during the 2002 survey. The loss of several key invertebrate groups within this stream reach suggests reduced flow is the cause, rather than water quality issues. Species from the family Hydropsychidae and the midge *Rheotanytarsus* spp., organisms that prefer higher current velocities, disappeared from Stations 3, 4, and 5, but reappeared at Station 6. In addition, the loss of the group *Cricotopus* at these stations suggests that water quality was not the cause; this particular group is generally considered pollution tolerant.

A comparison of the 2004 bioassessment scores to the scores from the baseline (1998), 2000, and 2002 studies indicates that, relative to 1998, bioscores at downstream stations were generally lower (bioscores at the reference station were generally consistent among the four sampling events). However, most of these stations were considered only slightly impaired. There was an improvement in bioscores at Stations 2, 4, 5, and 6 in 2004, with bioscores exceeding (Stations 2 and 4), equaling (Station 6), or approaching (Station 5) baseline (1998) levels. Station 3 still exhibited a slight decrease in biological condition (relative to 1998 levels) but the 2004 bioscore was improved relative to 2002. The two new 2004 stations indicated no impairment (Station 1B) and moderate impairment (Station 4B). The latter station was immediately downstream of the treated effluent discharge.

Analytical results indicate that there is no clear correlation with constituent concentrations in sediment, although the biological and sediment sampling stations are not optimally located for such a comparison. For example, Transect 2, with some of the highest constituent concentrations in sediment, has not significantly impacted biota at Station 3, located just downstream; Station 3 consistently had among the highest scores of the non-reference stations. The lack of correlations may also be due to temporal factors since the sediment samples represent point estimates of exposure (in both time and space) while invertebrate samples represent integrated exposures over long periods of time.

## 7.5 Uncertainties

Uncertainties are present in risk assessments because of the limitations of the available data and the need to make certain assumptions and extrapolations based upon incomplete information. The uncertainty in this ERA is mainly attributable to the following factors:

- **Reporting Limits** - Reporting limits for some undetected analytes exceeded applicable screening values in some media. Table G-78 summarize these constituents, by area and medium, and reports both the ratio of the minimum and maximum reporting limits to the screening value as well as the ratio of the mean value (calculated using one-half of the reporting limit for each sample) to the screening value. Because these constituents were not detected, they are not known to be present on the site but the potential for unacceptable risks cannot be totally discounted because the reporting limits are higher than the screening values. The magnitude of the ratios can be used to qualitatively evaluate the magnitude of the associated uncertainty (e.g., there is more uncertainty in terms of the potential for risk for a ratio of 100 relative to a ratio of 10). There were relatively few constituents with very high mean ratios, suggesting that the associated uncertainties are relatively low. Because standard analytical methods were used and the

sample reporting limits were not elevated relative to the method reporting limits for the vast majority of samples and analytes, these uncertainties are considered acceptable.

Reporting limits were elevated in some sediment and surface soil samples for individual dioxin and furan congeners. This resulted in the TEQ-based concentrations for total dioxins/furans (based upon one-half the reporting limit for undetected congeners) to be biased high.

- **Duplicate Analyses** - When evaluating samples with field duplicates, the value used in the ERA was always the detect when one result was a detect and the duplicate was a non-detect, regardless of whether or not the non-detected value was higher. In these cases, the use of the detect has less uncertainty since it represents an actual measured value (versus an upper limit bound) and the two samples will have identical or similar reporting limits.
- **Selection of COPCs** - Constituents without available screening values for a medium were not retained as COPCs unless they were detected. This was particularly an issue for the sediment and surface soil screens (most constituents had water screening values).
- **Evaluation of Soil** - The quantitative evaluation of constituent concentrations in soils was generally restricted to surface soils from the 0 to 12 inch depth range, where the highest exposures for most ecological receptors would be expected to occur. Some ecological receptors may be exposed to deeper soils (e.g., down to 2 feet below the ground surface) at least periodically. Soil data down to a depth of 24 inches (36 inches in a few samples) was considered in the ERA, but only qualitatively.
- **Sediment Screening Values** - Most of the sediment screening values used in the ERA do not consider site-specific bioavailability to ecological receptors and are typically based upon correlational studies (termed the Screening Level Concentration [SLC] approach). These factors tend to make the resulting screening values very conservative and likely overestimate potential risk.
- **Ingestion Screening Values** - Data on the toxicity of many constituents to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with non-wildlife species. This is a typical limitation and extrapolation for ERAs because so few wildlife species have been tested directly for most constituents. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet.

A second uncertainty related to the derivation of ingestion screening values applies to metals. Most of the toxicological studies on which the ingestion screening values for metals were based used forms of the metal (such as salts) that have high water solubility and high bioavailability to receptors. Because the analytical samples on which site-specific exposure estimates were based measured total metal, regardless of form, and these highly bioavailable forms are expected to compose only a fraction of the total metal concentration, this is likely to result in an overestimation of potential risks for these constituents.

A third source of uncertainty associated with the derivation of ingestion screening values concerns the use of UFs. For example, NOAELs were extrapolated to LOAELs using an UF of 10. This approach is likely to be conservative because Dourson and Stara (1983) determined that 96 percent of the constituents included in a data review had LOAEL/NOAEL ratios of five or less. The use of an UF of 10, although potentially conservative, also serves to counter some of the uncertainty associated with interspecies extrapolations, for which a specific UF was not used.

- **Constituent Mixtures** - Information on the ecotoxicological effects of constituent interactions is generally lacking, which required (as is standard for ERAs) that the constituents be evaluated on a compound-by-compound basis during the comparison to screening values. This could result in an underestimation of risk (if there are additive or synergistic effects among constituents) or an overestimation of risks (if there are antagonistic effects among constituents). However, the toxicity testing that was conducted in floodplain habitats does account for the constituent mixtures that are present in these surface soil samples.
- **Receptor Species Selection** - Reptiles and amphibians were selected as receptors in the ERA, but were not evaluated quantitatively even when exposure pathways were likely to be complete. For food web exposures, these taxa were evaluated using other fauna (birds and mammals) as surrogates due to the general lack of taxon-specific toxicological data. This represents an uncertainty in the ERA.

It was also assumed that any reptiles and amphibians present in the river or in the river floodplain at Site 1 were not exposed to significantly higher concentrations of constituents and were not more sensitive to constituents than other receptor species evaluated in the ERA. This assumption was a source of uncertainty in the ERA. In addition, there is some uncertainty associated with the use of specific receptor species to represent larger groups of organisms (e.g., guilds).

- **Food Web Exposure Modeling** - Except for earthworms in floodplain habitats, constituent concentrations in terrestrial and aquatic food items (plants, small mammals, benthic invertebrates, and fish) were modeled from measured media concentrations and were not directly measured. The use of generic, literature-derived exposure models and BAFs introduces some uncertainty into the resulting estimates. The values selected and methodology employed were intended to provide a conservative (SERA) or reasonable (BERA) estimate of potential food web exposure concentrations.

Another source of uncertainty is the use of default assumptions for exposure parameters such as BCFs and BAFs. Although BCFs or BAFs for many bioaccumulative constituents were readily available from the literature and were used in the ERA, the use of a default factor of 1.0 to estimate the concentration of some constituents in receptor prey items is a source of uncertainty.

Area use factors were assumed to equal one. This is a conservative assumption since a significant percentage of each upper trophic level receptor species time could be spent foraging off-site in unimpacted areas or areas where constituent concentrations are expected to be significantly lower.

- **Mercury Fish Tissue Concentrations** - There is much uncertainty concerning the fish tissue concentrations for mercury, which were modeled from sediment concentrations. At Site 5, located upstream of Site 1, mercury sediment concentrations (maximum of 4.80 mg/kg and mean of 0.38 mg/kg) were similar to those at Site 1 (maximum of 2.30 mg/kg and mean of 0.28 mg/kg). However, measured mercury concentrations in whole-body fish at Site 5 were several orders of magnitude lower than modeled concentrations, suggesting that the model inputs were very conservative. If this is also true at Site 1, ingestion-based HQs for piscivorous receptors would not exceed one.
- **Total Versus Dissolved Metals** - EPA guidance (EPA, 1996e) indicates that the dissolved metal fraction should be preferentially used to the total metal fraction in surface water screening. Both total and dissolved concentrations were used in the ERA for the surface water screen. High levels of suspended solids and sediment-adsorbed metals would result in overstating bioavailable surface water concentrations and thus potential exposures and risks.
- **Mean Versus Maximum Media Concentrations** - As is typical in an ERA, a finite number of samples of environmental media are used to develop the exposure estimates. The maximum measured concentration provides a conservative estimate for immobile biota or those with a limited home range. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based upon the mean constituent concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the *Wildlife Exposure Factors Handbook* (EPA, 1993b), which specify the use of average media concentrations. Given the mobility of the upper trophic level receptor species used in the ERA, the use of maximum constituent concentrations (rather than mean concentrations) in the SERA to estimate the exposure via food webs is very conservative. This conservatism was reduced to more realistic levels in the values selected for use in the BERA evaluation.

Arithmetic means were used quantitatively in this ERA to represent the average exposure scenarios. The results of these evaluations were also compared with those based upon the 95 percent UCL of the arithmetic mean, the geometric mean, and the 95 percent UCL of the geometric mean. Use of these other point estimates would not result in significant changes to the conclusions of this ERA.

- **Comparisons to Background Concentrations** - Background concentrations were used to judge the site-relatedness of individual constituents in surface soils. If site concentrations were consistent with background levels, it was assumed that the concentrations were not related to known site-related source areas. There exists the possibility that concentrations below background were indeed site-related, rendering the assumption false. However the potential impact of this possibility is minimal since constituents at concentrations consistent with background should exhibit no different ecological effects than commonly occurring in areas not affected by releases, regardless of their source.
- **Comparisons to Upgradient Concentrations** - Upgradient surface water and sediment concentrations were used to judge the site-relatedness of individual constituents. If site constituent concentrations were consistent with upgradient concentrations, it was assumed that the constituents were not site-related. There exists the possibility that

concentrations were indeed site-related, rendering the assumption false. However the impact of this possibility is minimal as it related to Site 1 since constituents at levels consistent with upgradient concentrations should exhibit no different ecological effects than commonly occurring at areas not affected by site-specific releases.

- **Spatial Distribution of Samples** - The number of surface water, sediment, and surface soil samples from the site, and their spatial distribution, were sufficient to evaluate potential ecological risks. Twenty-six surface water and sediment sampling locations were available, including two upstream of the site, covering the near bank, mid-channel, and far bank areas of the river. Surface water and sediment data from LTM Rounds 4, 5 (including the supplemental RI sampling), and 6 from these locations were used quantitatively in the ERA. More recent data from LTM Rounds 7 through 9 are evaluated, qualitatively, in Tables G-79 through G-82. The results of this evaluation indicate that the LTM Rounds 7 through 9 data would not significantly change the risk conclusions or COCs of this ERA.

In upland habitats, 46 surface soil and 19 subsurface soil samples were available. For floodplain habitats, 69 surface soil and 25 subsurface soil samples were available, as were four surface soil and one subsurface soil reference samples. The locations of the 2001 and 2004 soil samples were selected based upon historical data and the visual presence of debris. The number and location of media samples (except some of the historical soil samples) were jointly scoped with the ABL Partnering Team and the Region 3 BTAG.

- **Frequency of Detection** - Frequency of detection was identified as a potential screening criterion when sample size and spatial distribution were adequate. Very few constituents were quantitatively screened out based solely upon this criterion.
- **Reference Area Suitability** - The performance of bioassay organisms was poor (relative to controls) for some endpoints in samples collected from the reference area, although the results were only statistically significant for one of the two reference samples. The statistical comparisons were conducted for each bioassay test endpoint (e.g., survival) between site and reference samples as well as between site/reference samples and laboratory controls. In general, the comparison of site samples to reference samples is more meaningful in evaluating the potential for biological impacts than the control comparison because the control is run with formulated (artificial) test media that is not generally comparable to site media in physical attributes. The purposes of the control samples are to evaluate test organism viability and the proper functioning of the test apparatus, not to reflect field conditions or exposures. The test results indicate whether organism performance is significantly different when exposed to media collected from the site relative to the reference area and/or control. Because of the reduced responses in the reference samples (particularly for survival) relative to controls, only the control comparisons to site samples were used in evaluating the bioassay data. This could result in inaccurate conclusions concerning bioassay results, and introduce uncertainty into the overall risk conclusions, if the unidentified factors that reduced the response in the reference samples also influenced the site samples.

## 7.6 ERA Conclusions

### 7.6.1 Floodplain Habitats

The following constituents were identified as COCs for floodplain surface soil, which comprises the OABG area (Table 4-2):

- **Metals:** Cadmium, chromium, copper, lead, mercury, nickel, silver, vanadium, and zinc.
- **VOCs:** 1,2-DCE, methyl acetate, and TCE.
- **SVOCs:** Total PAHs.
- **Explosives:** HMX, RDX, and nitroglycerin.

The following constituents were identified as COCs for floodplain food web exposures:

- **Metals:** Cadmium, lead, mercury, and zinc.
- **Dioxin/Furans:** Total dioxin/furans based upon 2,3,7,8-TCDD equivalents.

Nine metals were identified as COCs for the floodplain surface soil based upon a comparison to soil screening values and background/reference concentrations. Spatial representations for the metal COCs in the floodplain are presented in Figure 4-5. The highest concentrations of these metals generally occurred in the vicinity of the former open burn area and associated disposal area that is located near Transect 2 and the Western Drainage Ditch (e.g., HCS-B2-10 and HCS-B2-7-S), and between Transects 8 and 9 in the vicinity of the former inert burn area (e.g., AS01-SS22, AS01-SS72, HCS-B1-4-S, and HCS-B1-11-S). Several of these samples (HCS-B2-7-S, HCS-B1-4-S, and HCS-B1-11-S) consist mostly of ash rather than soil.

PAH concentrations were elevated in a few samples (AS01-SS24, AS01-SS25, HCS-B2-4-4, and HCS-B2-5-3) clustered on or near the banks of the Western Drainage Ditch that enters the river at Transect 2 and adjacent to Transects 3 (AS01-SS49) and 7 (AS01-SS57). At two of these locations (AS01-SS49 and AS01-SS57), PAHs were identified as potentially responsible for soil invertebrate toxicity. A localized area of elevated PAH concentrations is present near sample locations AS01-SS49 and AS01-SS57. Figure 4-2 presents the elevated areas of PAHs in the floodplain.

HMX and RDX each exceeded its screening value at one sample location (AS01-SS72), but by a factor of 106 and 7.30, respectively. Nitroglycerin, which does not have a screening value, was also detected only at this location. Thus, the area defined by this sample represents a localized area of elevated concentrations for these explosives.

TCE exceeded screening values in four samples (AS01-SS21, AS01-SS22, AS01-SS53, and AS01-SS73) located between Transects 8 and 9 in the vicinity of the former inert burn area and in samples near Transects 3 (HCS-BG-98S) and 4 (HCS-BG-110S). 1,2-DCE also exceeded screening values (maximum HQ of 53) near Transect 4 (HCS-BG-110S). Thus, the areas defined by these samples represent localized areas of elevated concentrations for these VOCs. Methyl acetate was identified as a COC because its maximum concentration exceeded the survivorship and reproduction NOECs from the earthworm toxicity tests. The highest exceedance for this contaminant occurred at AS01-SS72. Figure 4-1 presents the elevated areas of VOC COCs in the floodplain as represented by TCE.

Mercury was the only constituent with an exceedance based upon the LOAEL for terrestrial-based food web exposures in floodplain habitats. The mean HQ (based upon the LOAEL) for the short-tailed shrew was 1.30 for mercury. In addition to mercury, HQs exceeded one based upon the MATC for cadmium (short-tailed shrew), lead (American robin), zinc (American robin), and dioxin/furans (long-tailed weasel). The highest concentrations of these constituents generally occurred in the vicinity of the former open burn area and associated disposal area that is located near Transect 2 and the Western Drainage Ditch (e.g., HCS-B2-10 and HCS-B2-C) and between Transects 8 and 9 in the vicinity of the former inert burn area (e.g., AS01-SS72, HCS-B1-C, HCS-B1-4-S, and HCS-B1-11-S). Several of these samples (HCS-B2-C, HCS-B1-C, HCS-B1-4-S, and HCS-B1-11-S) consist mostly of ash rather than soil.

No surface soil toxicity test sample from floodplain habitats showed reduced responses for all endpoints (survival, growth, and reproduction) relative to the control. Seven samples had mean survival of less than 25 percent (and four of these showed no signs of reproduction) and can be considered the most impacted samples. Except for AS01-SS55, which was one of the reference samples, these samples fell into two groups: (1) samples from the vicinity of the former open burn area and associated disposal area that is located near Transect 2 and the Western Drainage Ditch (AS01-SS46, AS01-SS47, and AS01-SS48), and (2) samples located near Transects 8 and 9 in the vicinity of the former inert burn area (AS01-SS51, AS01-SS53, and AS01-SS54). These results are generally consistent with the results from the surface soil screening. The four samples that did not differ from the control for any endpoint included AS01-SS45 (reference), AS01-SS50 (located near Transect 4), and AS01-SS52 and AS01-SS58 (located near Transects 8 and 9 in the vicinity of the former inert burn area). The area near Transect 2 appears to be the most impacted based upon the toxicity tests because the three samples from this area fell into the most impacted group. The area near Transects 8 and 9, from which six samples were collected, showed variable results as it included three of the most impacted samples and two of the least impacted samples. Other areas of the floodplain were intermediate in their response but showed signs of reproduction.

Analytical results indicate that there is some correlation between surface soil and sediment concentrations for the metal surface soil COCs, particularly at or near Transect 2. Analytical results indicate that surface soil and sediment concentrations for PAHs and dioxin/furans are somewhat spatially related. The highest PAH concentrations were associated with Transect 2, particularly the Western Drainage Ditch, for sediment. Although the highest soil PAH concentrations were associated with Transect 7, these results are biased by one high concentration, at AS01-SS57. If this sample is not included in the analysis, the highest concentrations of PAHs are associated with Transects 2 and 3. For dioxin/furans, surface soil concentrations were highest near Transect 9 and sediment concentrations were highest at Transects 8 and 9, near the former inert burn area. Analytical results indicate that surface soil and sediment concentrations for TCE are not spatially related.

## 7.6.2 Upland Habitats

The following constituents were identified as COCs for upland surface soil, which constitutes the ABG and FDP areas (Table 4-2).

- **Metals:** Copper, lead, and mercury.

- **SVOCs:** 2-Nitroaniline.
- **Explosives:** 1,3,5-Trinitrobenzene, HMX, nitroglycerin, perchlorate, and RDX.

No constituents were identified as COCs for upland food web exposures.

Figure 4-6 presents the elevated areas of the three metal COCs in the upland area, as represented by lead. However, widespread, high-magnitude exceedances of soil screening values, earthworm NOECs, and background UTLs did not occur for any of these metals. The maximum copper concentration (1,820 mg/kg) at AS01-SS67 was the only exceedance of the survivorship and reproduction NOECs and the only notable exceedance of soil screening values and background UTLs. This sample is located near Burn Pad 5. The maximum mercury concentration (7.20 mg/kg) at AS01-SS70 was the only exceedance of the survivorship and reproduction NOECs. This sample, and AS01-SS18, represented the only notable exceedances of soil screening values and the only background UTL exceedances. AS01-SS70 is located near Burn Pad 8 while AS01-SS18 is located along the access road south of Burn Pads 5 and 6. Lead was elevated (soil screening value HQ > 5) in two areas. The first was in the southwestern corner of the ABG area (AS01-SS02) where the site maximum of 1,730 mg/kg occurred (the only exceedance of the toxicity test NOECs). The second area was in the northeastern corner of the ABG area near Burn Pad 8 (AS01-SS70).

RDX exceeded soil screening values at multiple locations throughout the ABG area, in particular at AS01-SS64 and HCS-BP-6. HMX notably (HQ > 5) exceeded soil screening values only at AS01-SS64. The exceedances for these two explosives were at or very near the burn pan locations. The only exceedance of soil screening values for perchlorate, and the only detected concentration of nitroglycerin, also occurred at AS01-SS64. The highest concentrations of 2-nitroaniline and 1,3,5-trinitrobenzene (which did not have soil screening values) were located at HCS-BP-7. These six constituents were identified as COCs but are restricted, spatially, to the immediate vicinity of the former burn pans. Spatial representations for the explosive COCs in the upland area are presented in Figure 4-4.

Baseline risk estimates using area-wide averages indicate low to negligible risks for upper trophic level receptors in upland habitats. HQs based upon the LOAEL or MATC did not exceed one for any constituent except dioxin/furans, which exceeded based upon the MATC for the short-tailed shrew (HQ of 1.36). However, the risk estimates for dioxin/furans were heavily influenced by relatively high detection limits for some non-detected congeners (representing the more toxic congeners) in a few samples. Estimates based solely upon detected congeners (generally representing the least toxic congeners) indicate negligible risk.

The upland portion of Site 1 (ABG and FDP areas) is covered in periodically-mowed grasses and other herbaceous plants, providing habitat of limited diversity and quality. Except for unpaved roads and the areas immediately around some of the active burn pans, areas of bare soil are uncommon and no obvious phytotoxic effects (e.g., large areas of bare soil, dead or dying plants) were observed. Given the limited habitat quality of the ABG area, particularly in the vicinity of the burn pans (which are still actively used) where most of the significant exceedances were found, concentrations of the metal and explosive COCs are not likely to result in adverse impacts to populations of ecological receptors.

### 7.6.3 Riverine Habitats

No COCs were identified for surface water exposures in the portions of the river adjacent to Site 1. The following COCs were identified for sediment:

- **Metals:** Copper, mercury, nickel, silver, and zinc.
- **SVOCs:** Total PAHs (localized at Transect 2).

The following constituents were identified as COCs for river food web exposures:

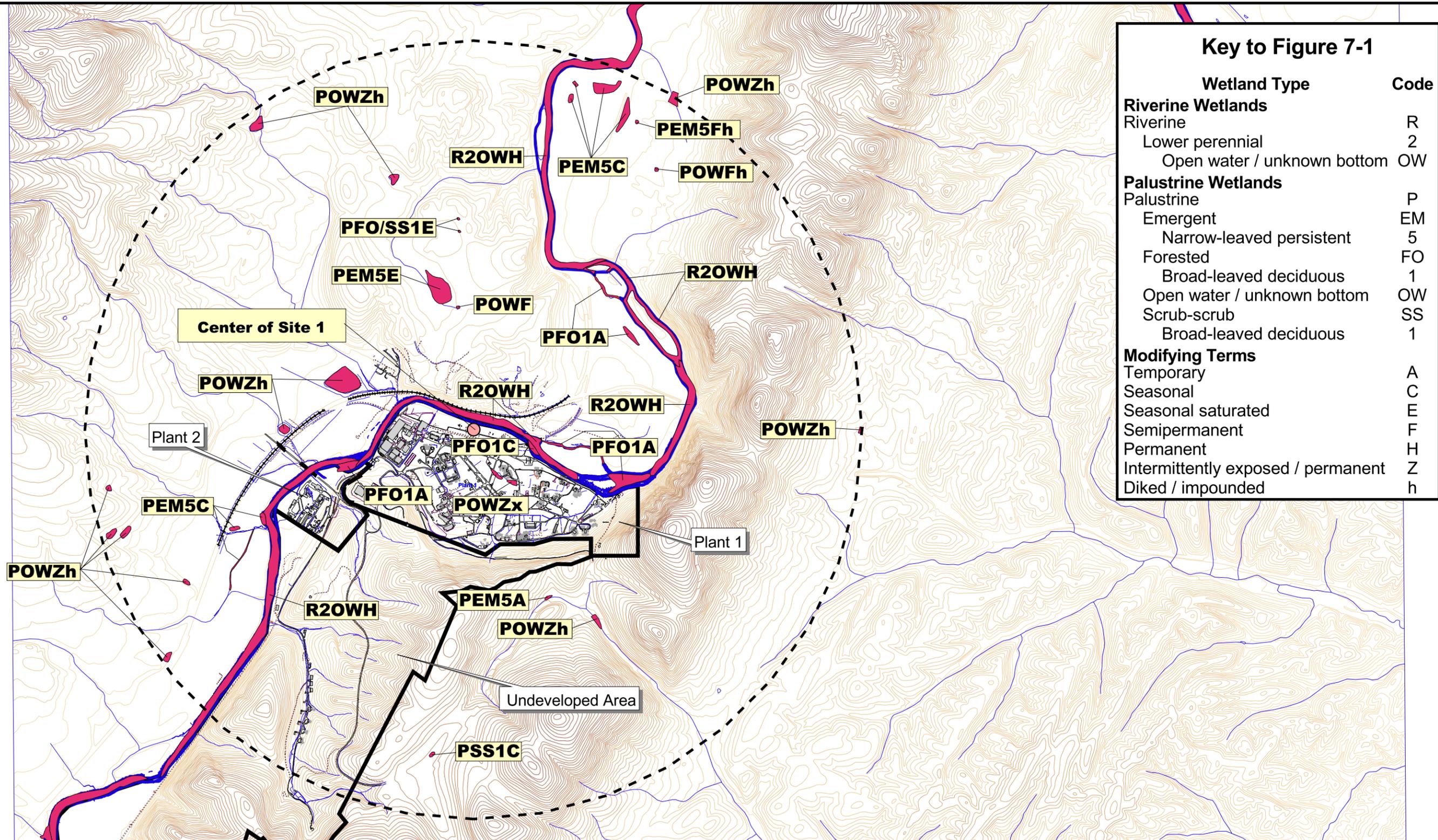
- **Metals:** Mercury.

The maximum concentrations for the five metal COCs occurred at Transect 2, except for nickel, which occurred at Transect 3. HQs exceeding five also occurred at Transect 3 for copper, Transect 6 for mercury, and Transects 7 and 8 for nickel.

The mean HQ for total PAHs was 1.75. However, high magnitude exceedances for total PAHs were largely confined to Transect 2 (HQs were less than two at the other transects), especially sample AS01-SD02D. AS01-SD02D was situated in the Western Drainage Ditch that enters the river at the location of Transect 2. The highest surface soil concentrations for PAHs also occurred in this area. Without sample AS01-SD02D, the mean HQ for total PAHs is 1.10 (0.18 based upon detects). A comparison of sediment concentrations to equilibrium partitioning-based sediment values for the eight individual PAH compounds with available values indicates that bioavailability and potential risks are low for PAHs except at the location of the maximum concentrations (sample AS01-SD02D). This suggests that the spatial extent of potential PAH sediment contamination is localized. The likely source of these PAHs is flow from the Western Drainage Ditch and/or soil in the surrounding area. PAH concentrations, except at Transect 2, are generally similar to upgradient concentrations (based upon a qualitative comparison), also suggesting that the source of the PAHs is the Western Drainage Ditch or surrounding soil. Thus, PAHs were identified as COCs in sediment only for the area near Transect 2.

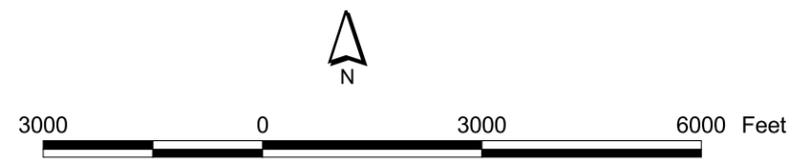
Mercury was the only constituent with an exceedance based upon the LOAEL for aquatic-based food web exposures in river habitats. Both piscivorous bird species (belted kingfisher and great blue heron) had LOAEL-based HQs exceeding one for mercury (Table G-70). Mercury was identified as a COC for food web exposures. The highest concentrations of mercury in sediments occurred at Transects 2 and 6.

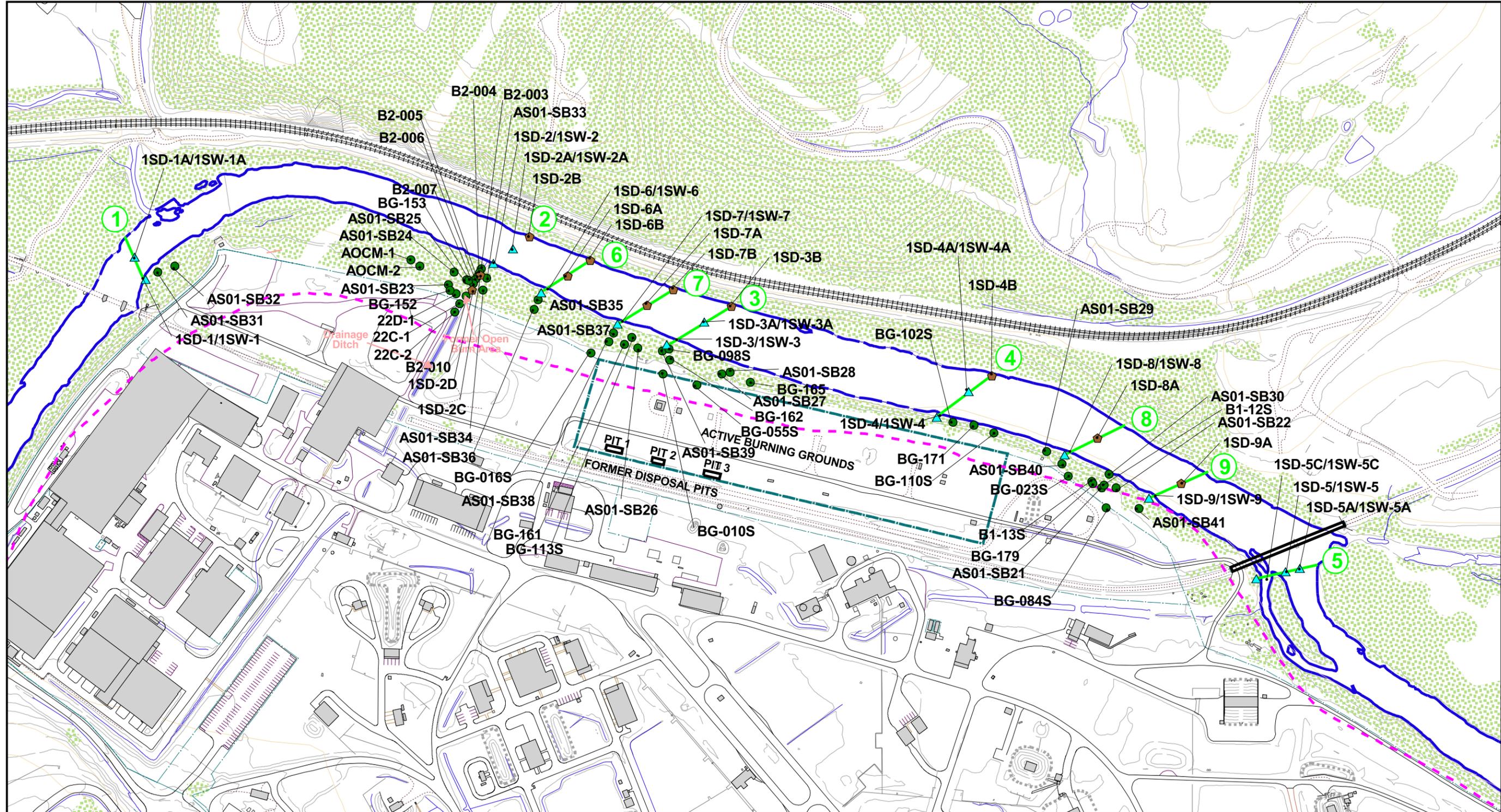
Data from a bioassessment monitoring program (using benthic macroinvertebrates) in the river indicates slight to moderate impairment of the invertebrate community at some of the stations located adjacent to, or downgradient of, Site 1 relative to an upstream reference station. However, data from the most recent survey (2004) indicates an improvement in bioassessment scores relative to 2000 and 2002 surveys, with bioscores exceeding, equaling, or approaching baseline (1998) levels. Analytical results do not indicate a clear correlation with constituent concentrations in sediment, although the biological and sediment sampling stations are not optimally located for such a comparison and these two sampling programs also measure different time scales of exposure.



Key to Figure 7-1	
Wetland Type	Code
<b>Riverine Wetlands</b>	
Riverine	R
Lower perennial	2
Open water / unknown bottom	OW
<b>Palustrine Wetlands</b>	
Palustrine	P
Emergent	EM
Narrow-leaved persistent	5
Forested	FO
Broad-leaved deciduous	1
Open water / unknown bottom	OW
Scrub-scrub	SS
Broad-leaved deciduous	1
<b>Modifying Terms</b>	
Temporary	A
Seasonal	C
Seasonal saturated	E
Semipermanent	F
Permanent	H
Intermittently exposed / permanent	Z
Diked / impounded	h

Figure 7-1  
 Wetland Areas Within 2 Miles (3 Kilometers) of Site 1  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory  
 Rocket Center, West Virginia





**LEGEND**

- ▲ Surface Water and Sediment Sample Location
- Sediment Sample Location
- Soil Sample Location
- Vegetation
- Buildings
- 100-Year Flood Plain
- Transects
- Roads
- Water Bodies

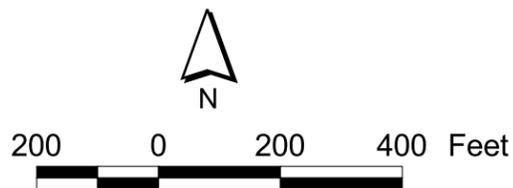
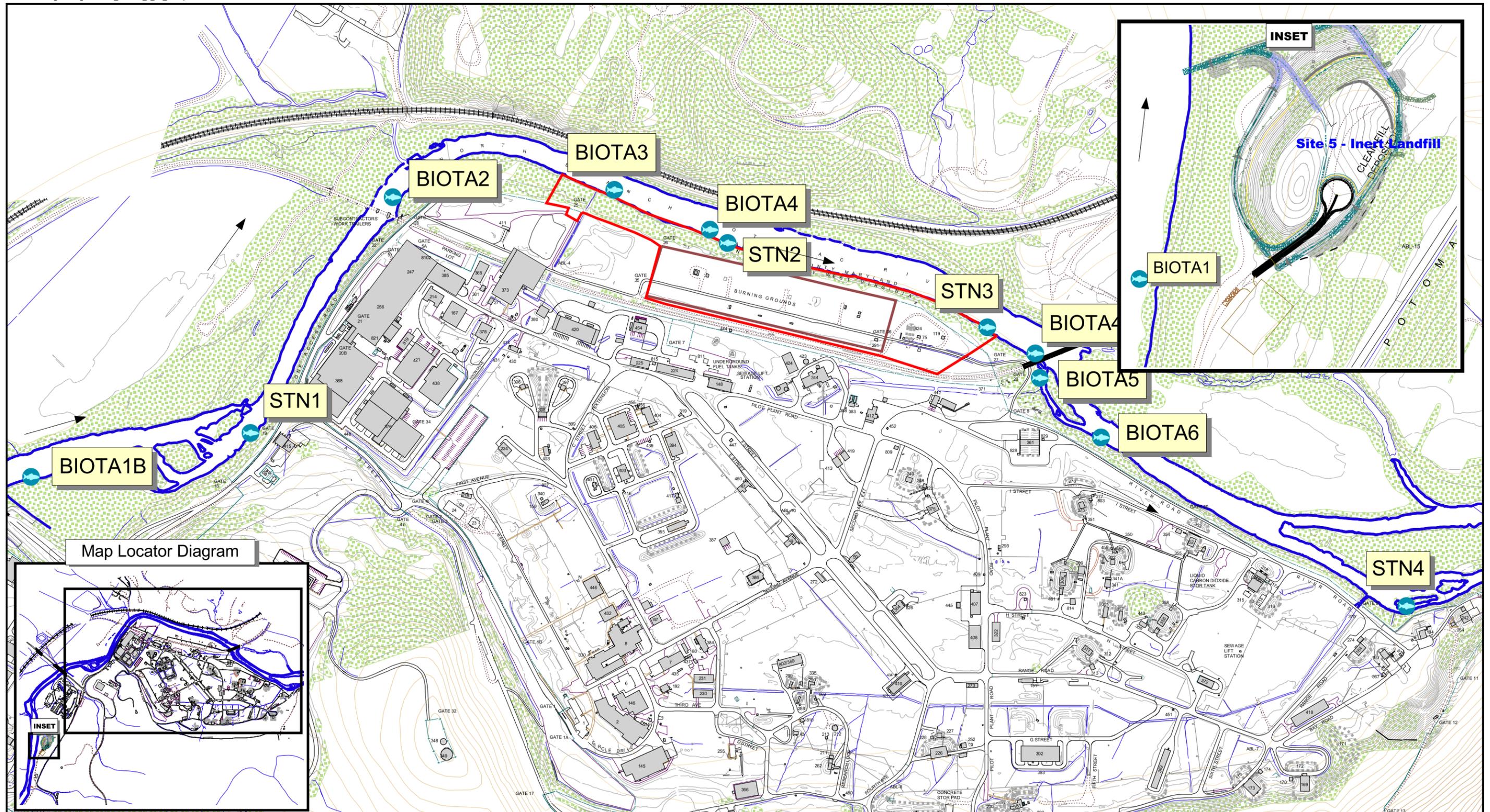


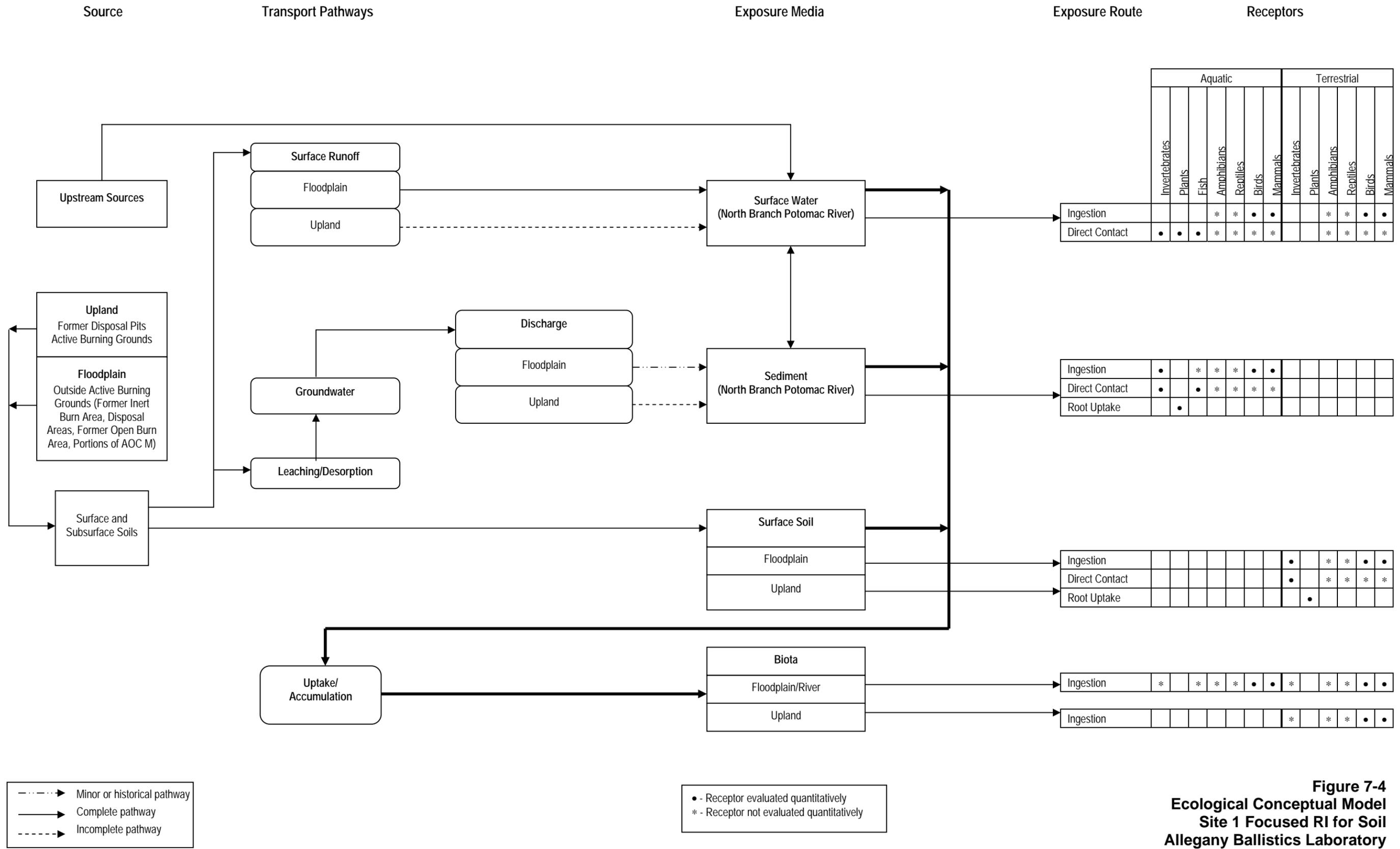
Figure 7-2  
Soil, Surface Water, and Sediment Sampling Locations  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



- LEGEND**
-  Biota 1-6, 1B, 4B (July/August 2004)
  -  Stn 1-4 (July 1994)
  -  Boundary of Burning Grounds
  -  Boundary of IR Site 1
  -  Flow Direction



Figure 7-3  
Locations of Biota Sampling  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory  
Rocket Center, West Virginia



**Figure 7-4**  
**Ecological Conceptual Model**  
**Site 1 Focused RI for Soil**  
**Allegheny Ballistics Laboratory**  
**Rocket Center, West Virginia**

# Summary, Conclusions, and Recommendations

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## 8.1 Summary and Conclusions

Site 1 is an 11-acre area situated adjacent to the North Branch Potomac River along the northern border of the developed portion of ABL Plant 1. Site 1 is 11-acre area, consisting of several historical disposal units and the 8-acre Active Burning Grounds (ABG), which is currently permitted under RCRA (Figure 2-1). The Former Disposal Pits (FDP) are located within the 8-acre ABG. However, the FDP are considered to be a CERCLA issue due to the past disposal associated with these pits. The area Outside the Active Burning Grounds (OABG) comprises several areas that are being addressed under CERCLA. Because of the different disposal history and current use, the RCRA and CERCLA portions of the site are discussed independently below.

This Focused RI and previous investigations evaluated the nature and extent of contamination in Site 1 soil and characterize the potential human health and ecological risks posed by the contamination.

### 8.1.1 Outside the Active Burning Grounds (CERCLA Portion of Site 1)

The HHRA identified the following as COCs for the OABG:

- VOCs: TCE and PCE.
- SVOCs: Benzo(a)pyrene, benzo(b)fluoranthene, benzo(a)anthracene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
- Dioxins: 2,3,7,8-TCDD (dioxin)
- Metals: Antimony, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, thallium, and vanadium.

The ERA identified the following as COCs for the OABG area (defined as the floodplain in the ERA):

- VOCs: 1,2-DCE, methyl acetate, and TCE.
- SVOCs: Total PAHs.
- Dioxins: Total dioxin/furans (TEQ).
- Explosives: HMX, nitroglycerin, and RDX.
- Metals: Cadmium, chromium, copper, lead, mercury, nickel, silver, vanadium, and zinc.

For the OABG area, TCE, PCE, 1,2-DCE, and methyl acetate were the VOC contaminants identified by the HHRA and ERA as COCs, as listed above. For surface soil, analytical results indicate that areas of elevated TCE concentrations are localized in the former inert burn area and associated disposal area, and the former open burn disposal area along the western Site 1 river border. These areas generally coincide with debris (for example drums and ash), which was deposited during historical burning activities and historical solvent

disposal activities. Elevated levels of PCE were not detected in surface soil, but were detected above screening criteria in the subsurface soil. For subsurface soil, analytical results indicate that areas of elevated TCE concentrations are localized within the former open burn disposal area, in the vicinity of the former inert burn area and associated disposal area. The greatest concentrations of TCE in the OABG area were detected in five areas: two in the former inert burn disposal area and three in the former open burn disposal area.

The greatest concentrations of benzo(a)pyrene in surface and subsurface soils occur in the former open burn disposal area, along the banks of the western drainage ditch, and in two localized areas of the former inert burn disposal area. The greatest concentrations of the other SVOC COCs coincide with the benzo(a)pyrene.

The greatest concentrations of calculated dioxin TEQ concentrations in the OABG surface soil are present in both the former inert and open burn areas and associated disposal areas. Dioxins in the subsurface soil are generally located in the same areas. Burning operations and ash and other debris disposal in these areas may have contributed to the presence of dioxin in the soil.

Several metals were identified as COCs. Arsenic, iron, manganese, and vanadium were consistently encountered at elevated concentrations throughout Site 1 surface and subsurface soil. Elevated concentrations of the other metal COCs were found intermittently throughout the site, co-located with the arsenic, iron, manganese, and vanadium exceedances. The debris buried in the vicinity of the western drainage ditch may be the source of the elevated metals concentrations in that area. Based on a comparison to background metals concentrations, manganese may be attributable to background conditions.

A study of the spatial correlation between constituents detected in surface soil and surface water/sediment was conducted based on the results of the October 2001 Supplemental Investigation, to assess whether runoff is a significant transport mechanism for soil-related contaminants to the North Branch Potomac River. Analytical results indicate that there is some correlation between surface soil and sediment concentrations for the metal COCs, particularly at or near the western drainage ditch and inert burn area. Analytical results indicate that surface soil and sediment concentrations of PAHs and dioxin/furans are also somewhat spatially related. A potential correlation was identified between runoff from the western drainage ditch and SVOC concentrations in sediment collected directly downstream. In summary, a current transport pathways via surface runoff potentially link to selected source areas in the OABG area to the North Branch Potomac River.

### 8.1.2 Former Disposal Pits (CERCLA Portion of Site 1)

The HHRA identified the following as COCs for the FDP:

- VOCs: TCE.
- Dioxins: 2,3,7,8-TCDD (dioxin)
- Metals: Arsenic, iron, manganese, thallium, and vanadium.

The ERA identified the following as COCs for the FDP area (defined as upland in the ERA):

- SVOC: 2-nitroaniline.
- Explosives: 1,3,5-trinitrobenzene, HMX, nitroglycerin, perchlorate, and RDX.
- Metals: Copper, lead, mercury.

For the FDP area, TCE was the only VOC identified by the HHRA as a COC. For surface soil, analytical results indicate that areas of elevated TCE concentrations are localized in Pit 1. For subsurface soil, analytical results indicate that areas of elevated TCE concentrations are localized within Pits 1 and 3. The pits were reportedly backfilled with more than 2 feet of soil, but are presumed to be the primary source of groundwater contamination at Site 1.

Elevated concentrations of dioxin occurred in the surface and subsurface in the FDP area.

### 8.1.3 Active Burning Grounds (RCRA Portion of Site 1)

The HHRA identified the following as COCs for potential residential receptors the ABG area:

- Explosives: Perchlorate.
- Metals: Arsenic, iron, manganese, thallium, and vanadium.

The ERA identified the following as COCs for the ABG area (defined as upland in the ERA):

- SVOC: 2-nitroaniline.
- Explosives: 1,3,5-trinitrobenzene, HMX, nitroglycerin, perchlorate, and RDX.
- Metals: Copper, lead, mercury.

The ABG is currently permitted under RCRA. Potential risks to future residential receptors were identified for perchlorate and selected metals in the ABG. Potential risks to ecological receptors were also determined for the ABG. Additional assessment of the RCRA unit will be conducted upon closure.

## 8.2 Recommendations

Based on the results of the risk assessments, it is recommended that remedial alternatives be evaluated to address areas where unacceptable levels of potential risk were identified for soil within Site 1.

Both the human health and ecological risks identified in the OABG area should be evaluated to reduce these risks to potential receptors. It is recommended that preliminary remediation goals be developed for the OABG area to determine the appropriate remedial actions. To facilitate the execution of the remedial actions, a phased approach is recommended, where sections of the OABG area would be treated sequentially.

Risks to future residents exposed to soils in the FDPs were identified for TCE, dioxin, and selected metals. Although FDPs are located within the ABG, which is currently permitted under RCRA, the past releases associated with the FDPs are considered as CERCLA releases, and consequently will be addressed as a CERCLA action.

For these reasons, it is recommended that a feasibility study (FS) be prepared to evaluate remedial alternatives for the solvent disposal pits (FDPs) and the OABG areas. Due to the complex nature of the OABG area, the FS will likely need to evaluate various remedial alternatives for different portions of this area.

## SECTION 9

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**Appendix A**  
**Technical Memorandum – November 2004:**  
**Approach for Revised Human Health and**  
**Ecological Risk Assessments for Site 1 Soil**

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# Approach for Revised Human Health and Ecological Risk Assessments for Site 1 Soil at Allegany Ballistics Laboratory

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FROM: CH2M HILL

DATE: November 9, 2004

This technical memorandum presents the Navy's approach for performing human health and ecological risk assessments for soil at Site 1, Allegany Ballistics Laboratory (ABL) in Rocket Center, West Virginia. This is an update to the previous version of this memorandum, dated March 30, 2004. The purpose of this memorandum is to obtain Partnering Team concurrence on the data sets and approach to be used for the ecological and human health risk assessments for Site 1 soil. These risk assessments will be presented in the Remedial Investigation for Site 1 soil. This version of the Technical Memorandum reflects the addition of supplemental surface soil samples that were collected in July 2004 (as part of the Step 4 ERA studies) and additional soil samples that were collected in September 2004. These data were collected in accordance with the following two work plans:

- *Final Work Plan for Site 1 Soils Baseline Ecological Risk Assessment - Step 4* (CH2M HILL, March 2004)
- *Final Work Plan Addendum for Supplemental Investigation of Site 1 Soil in Support of Human Health and Ecological Risk Assessment* (CH2M HILL, September 2004)

Other data collected in July 2004 as part of the Step 4 ERA studies (including earthworm tissue samples and soil toxicity tests using earthworms), while not listed in this memorandum, will be evaluated in the ERA.

## Site Description

For discussion purposes in this technical memorandum, Site 1 is divided into three primary geographical areas:

- Active Burning Grounds
- Former Solvent Disposal Pits
- Area Outside of Burning Grounds

Figure 1 displays boundaries for each of these geographical areas. As shown in the figure, the active Burning Grounds is a RCRA unit located within the boundaries of Site 1, and the

three former solvent disposal pits lie in the southern portion of the active Burning Grounds.

The area outside of the Burning Grounds comprises roughly 3 acres, or 25 percent of Site 1. Several waste disposal areas have been identified within this area:

- Inert Burning Ground - This area, where inert material was burned and buried, is located along the river in the northeastern portion of the site. Ash from burning in this area was spread and buried during successive disposal events. The area is currently covered by vegetation.
- Debris Areas - These intermittent areas, located along the river to the north of the Burning Grounds, are believed to be where construction materials and other debris were buried, and potentially isolated dumping or spilling of TCE from drums.
- Former Open Burn Area and Associated Landfill - This area is located in the northwest portion of the site. It consists of the Open Burn Area, associated landfill, former burn cages and ash landfill, the Open Burn Area drainage ditch, and a former hazardous waste storage area. The Open Burn Area drainage ditch is an enhanced earthen drainage culvert that cuts through the landfill and drains surface/storm water from Plant 1. Landfill material, including ash buried during successive disposal events, and other debris are visible in the walls of this ditch and in the Open Burn Area landfill. All drums were removed from the drum storage area. The ash landfill is covered with vegetation.
- Area of Concern (AOC) M - The AOC M areas are located adjacent to the east and west ends of Site 1, outside of the boundaries of Site 1. Surficial features suggest these areas contain construction debris. As discussed during the March 2004 Partnering meeting, the areas of AOC M that are located outside of the 11 acre Site 1 area will not be included in the Site 1 soil risk assessment.

In May 2003 a draft risk assessment report for Site 1 soil was submitted to regulators for review (*Draft Risk Assessment Report for Site 1 Soil at the Allegany Ballistics Laboratory in Rocket Center, West Virginia* (CH2M HILL, May 2003). The Navy requested that this report not be considered for further review, as the regulatory agencies expressed concern over the data sets used in the evaluation.

The report utilized data from the following investigations:

- Remedial Investigation (1992)
- Focused Remedial Investigation (1994)
- Site 1 Soil Level Delineation (1998)
- Supplemental Soil Investigation (2001)

Data from these investigations were obtained from the former solvent disposal pit area and from the area outside of the active Burning Grounds. Separate RCRA HHRA and ERA were conducted for soil within the active Burning Grounds as part of the *Draft RCRA Part A and B Draft Permit Application for ABL Burning Grounds and Hazardous Waste Container Storage* (CH2M HILL, May 2002). Because the area within the active Burning Grounds is regulated under RCRA, data collected from this area were not included in the CERCLA HHRA or ERA.

## Proposed Risk Assessment Approach

The Navy will revise the human health and ecological risk assessments for Site 1 soil by considering analytical data obtained from within the 8-acre active Burning Grounds with the data previously evaluated under CERCLA (i.e., former solvent disposal pit area and area outside the active Burning Grounds), as well as data collected at Site 1 in July and September 2004. In this section, the proposed data selection process for the revised risk assessments is described. Any data to be excluded from the revised risk assessments are noted, along with supporting rationale.

Because both CERCLA and RCRA activities are taking place at Site 1, analytical data were divided among the three primary geographical areas of Site 1: Active Burning Grounds, Solvent Pits, and Area Outside of Burning Grounds. Within each of the three geographical areas, all soil analytical data collected over the course of current and previous investigations, dating back to the 1992 Remedial Investigation, were compiled and considered for inclusion in the human health and ecological risk assessments. The following investigations provide the analytical data considered for the HHRA and ERA:

- Remedial Investigation (1992)
- Focused Remedial Investigation (1994)
- Site 1 Soil Level Delineation (1998)
- Supplemental Soil Investigation (2001)
- Soil Investigation at Active Burning Grounds (2001)
- Step 4 Soil and Tissue Sampling in support of the Baseline ERA (July 2004)
- Supplemental Investigation of Site 1 Soil in support of Human Health and Ecological Risk Assessment (September 2004)

Human health and ecological risk assessments for Site 1 will be revised in accordance with applicable guidance. Based on the constituent concentrations present at Site 1, the data will be evaluated in the HHRA for each of the three geographical areas defined earlier in this document (i.e., former solvent disposal pits, active Burning Grounds, and area outside of Burning Grounds). For the ERA, data from the Active Burning Grounds and the Solvent Disposal Pits will be combined for the initial evaluation but may be evaluated separately in later steps of the ERA.

It is anticipated that the cleanup criteria will vary based on different future land use and habitat types. The area within the Burning Grounds is expected to remain an active RCRA unit; therefore, industrial cleanup criteria will likely apply.

The data selection screening criteria used for the ERA and HHRA are discussed below.

### Ecological Risk Assessment

The compiled soil data set was evaluated to select specific samples that are applicable to the ERA. The evaluation criteria that were applied consisted of the following:

- **Validation Status** – Unvalidated data were generally excluded from quantitative consideration in the ERA because the quality of these data could not be confirmed. Excluding these data is consistent with applicable risk assessment guidance (e.g., USEPA 1992).

- **Sample Depth** – Samples collected 2 or more feet below ground surface (bgs) were generally excluded because ecological exposures at these depths are generally minimal.
- **Duplicate Samples** – For samples with duplicate analyses, the higher of the two concentrations will be used when both values are detects or when both values are non-detects. In cases where one result is a detection and the other is a non-detect, the detected value will be used in the assessment.
- **Reference Samples** - Site soil concentrations of the selected COPCs will be compared to facility-wide background soil concentrations. Because the background soil data set does not include samples taken from floodplain areas, COPC concentrations will also be compared, qualitatively, with site-specific reference soil samples (SS31, SS32, SS45, and SS55) collected in the river floodplain adjacent to the up gradient river transect (Transect 1). The locations of the reference samples were selected during a site visit, attended by the Tier I and BTAG, to scope the 2001 supplemental sampling. In addition, as part of the ERA Step 4 studies conducted in July 2004, samples were collected at the reference location near Transect 1 (SS45 and SS55) for earthworm bioassays and earthworm tissue residues (split surface soil samples were also collected for analytical chemistry). The data from these samples will be used as the reference for the bioassay statistical comparisons (in addition to comparisons to laboratory control samples) as well as for a qualitative comparison of earthworm tissue residues with samples collected within the Site 1 boundaries. Table 7 lists the reference samples and locations are depicted on figure 4.

The data that have been selected to be included in the ERA are provided in Attachment 1. Figures 2, 3, and 4 depict the locations of the samples for each of the three geographic that will be included in the ERA based on the criteria outlined above.

A qualitative evaluation of the data associated with the excluded ERA samples was completed following the March 2004 Partnering Meeting, as part of a “data gaps” assessment. The results of this evaluation were provided in the March 30, 2004 version of this technical memorandum. The proposed changes from the ecological data gaps evaluation, along with the additional data collected in July and September 2004, are reflected in this version of the Technical Memorandum.

A total of 115 surface soil samples (defined as 0 to 12 inches bgs), 44 subsurface soil samples (greater than 12 inches bgs) satisfied all of the criteria listed above, or were added based upon the recent data evaluation, and were retained for inclusion in the Site 1 soil ERA. These totals do not include field duplicates, although these samples will also be used in the ERA. The breakdown is as follows:

- **Former Solvent Disposal Pits** – 5 surface soil and 6 subsurface soil samples (Figure 2).
- **Active Burning Grounds** – 41 surface soil and 13 subsurface soil samples (Figure 3).
- **Outside Active Burning Grounds** – 69 surface soil 25 subsurface soil samples (Figure 4).

The results of earthworm tissue sampling (5 locations) and earthworm toxicity testing (10 locations), conducted in July 2004, will also be evaluated in the ERA.

## Human Health Risk Assessment

The compiled soil data set was evaluated to select specific samples that are applicable to the HHRA. The evaluation criteria that were applied consisted of the following:

- **Validation Status** – Unvalidated data were excluded from quantitative consideration in the HHRA because the quality of these data could not be confirmed. Excluding these data is consistent with applicable risk assessment guidance (USEPA, 1989).
- **Sample Depth** – Soil samples collected from all depths were included in the human evaluation. Generally, for human-health risk assessment purposes, surface soil is defined as samples collected from depths of 0 to 6 inches bgs. However, due to the fact that some soil borings were collected from 0 to 12 inches bgs, surface soil in this HHRA were also defined as samples collected from 0 to 12 inches bgs. Subsurface soil samples were defined as samples that were collected from greater than 12 inches bgs.
- **Duplicate Samples** – The maximum concentration between the two samples will be used. In calculating the frequency of detection and the 95 percent upper confidence limit (UCL), the duplicates will be counted as a single sample.
- **Reference Samples** – Reference samples will not be used in the HHRA.

A list of the data selected to include in the HHRA is provided in Attachment 1. Figures 5, 6, and 7 depict the locations of the samples for each of the three geographic areas that will be included in the HHRA according to the above criteria. The proposed changes from the HHRA data gaps evaluation, along with the additional data collected in July and September 2004, are reflected in this version of the Technical Memorandum.

A total of 113 surface soil samples (defined as 0 to 12 inches bgs) and 163 subsurface soil samples (defined as greater than 12 inches bgs) satisfied all of the criteria listed above and were retained for inclusion in the Site 1 soils HHRA. These totals do not include field duplicates, although these samples will be compared with the primary sample in support of the HHRA. The breakdown is as follows:

- **Former Solvent Disposal Pits** – 5 surface soil and 29 subsurface soil samples (Figure 5).
- **Active Burning Grounds** – 41 surface soil and 65 subsurface soil samples (Figure 6).
- **Outside Active Burning Grounds** – 67 surface soil and 69 subsurface soil samples (Figure 7).

The current USEPA method for evaluating dioxin risk will be used (*Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin [TCDD] and Related Compounds National Academy Sciences Review Draft, EPA/600/P-00/001Cb, December 2003*). As discussed during the March 2004 ABL Partnering Meeting, it is not appropriate to evaluate non-cancer risks for dioxin at Site 1 for the human health risk assessment. The risk assessment approach regarding dioxin will involve using cancer slope factors and the Toxicity Equivalency Factors (TEFs) based on the World Health Organization (WHO) or EPA guidance values. In addition to performing the risk assessment with the published levels, a qualitative evaluation will be made against the dioxin action levels (based on a 1998 USEPA memo).

The risk assessment will provide a rationale (qualitative discussion) explaining why the vapor intrusion pathway is not considered to be a complete exposure pathway.

The data for the human health assessment will be evaluated as three discrete sets. One set will comprise the former solvent pits data, the second will comprise the active Burning Grounds data, and the third set will comprise the area outside the active Burning Grounds data. For the ecological risk assessment, the data will initially be evaluated as two discrete sets. One set will comprise data collected from within the active Burning Grounds (including the former solvent pit area) and the second set will comprise data from the area outside the active Burning Grounds. The data for the former solvent pits and the active Burning Grounds may be split up, as appropriate, in later steps of the ecological risk assessment.

### **"Hot Spot" Evaluation**

During the HHRA each of the three data sets identified above will be reviewed to determine if potential "hot spots," or sub areas with higher constituent concentrations, can be identified. If potential sub areas with higher contamination are identified, then those areas will be evaluated separately in the risk assessments. However, if the constituent concentrations appear relatively uniform across each of the three data sets, then it is appropriate to consider exposure across the entire area and calculate UCLs as exposure point concentrations for the risk assessments as prescribed in RAGS Volume I Part A, Section 6.5.3 (USEPA 1989).

In the ERA, the spatial distribution of exceedances will be evaluated, along with the magnitude of those exceedances. This process will be sufficient to identify any "hot spots" for the identified COCs.

## References

CH2M HILL. September 2004. *Final Work Plan Addendum for Supplemental Investigation of Site 1 Soil in Support of Human Health and Ecological Risk Assessment, Allegany Ballistics Laboratory, Rocket Center, West Virginia.*

CH2M HILL. March 2004. *Final Work Plan for Site 1 Soils Baseline Ecological Risk Assessment - Step 4, Allegany Ballistics Laboratory, Rocket Center, West Virginia.*

CH2M HILL. May 2003. *Draft Risk Assessment Report for Site 1 Soil at the Allegany Ballistics Laboratory in Rocket Center, West Virginia.*

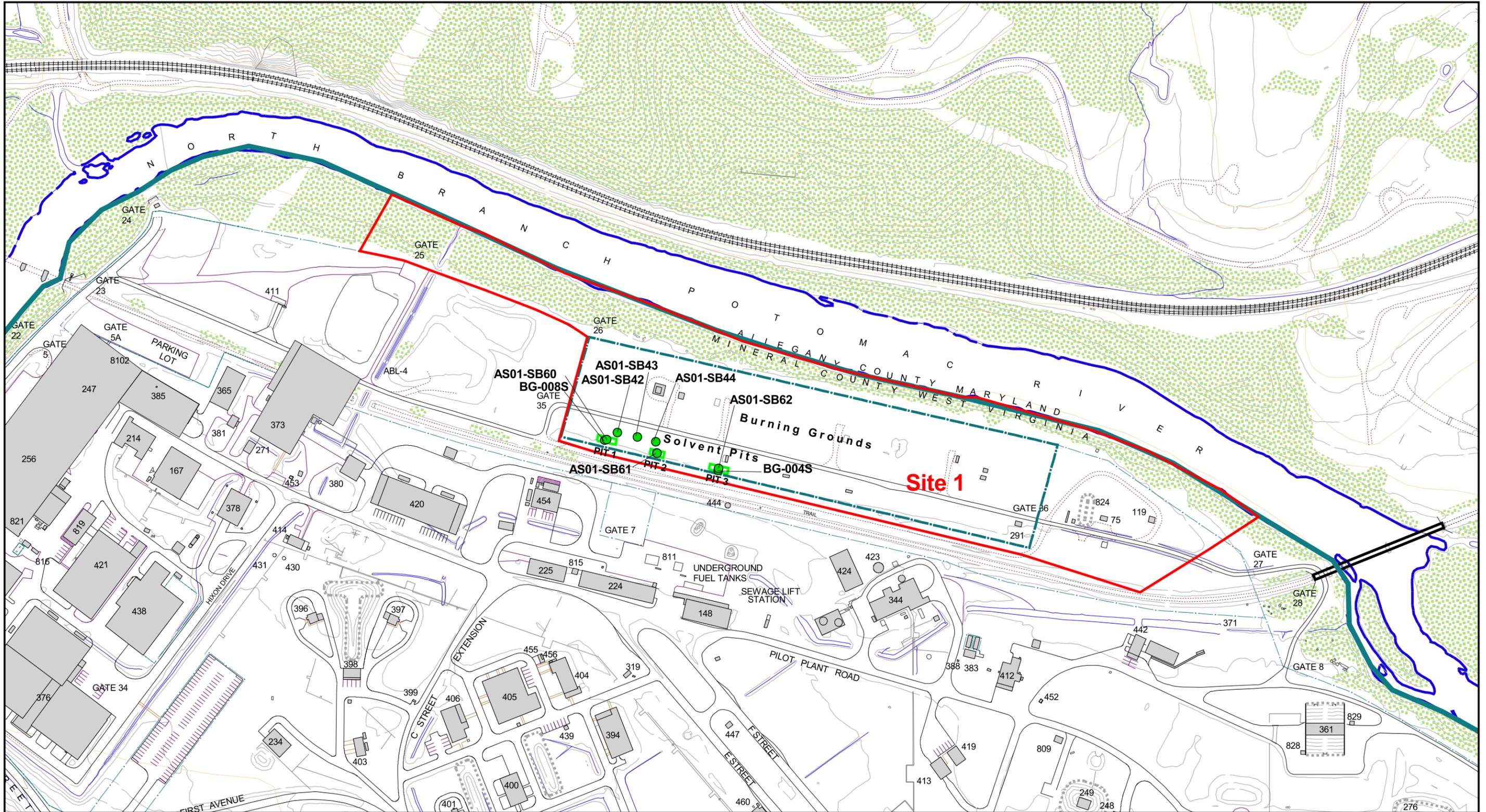
CH2M HILL. May 2002. *Draft RCRA Part A and B Draft Permit Application for ABL Burning Grounds and Hazardous Waste Container Storage.*

U.S. Environmental Protection Agency (USEPA). 1992. *Guidance for data usability in risk assessment (Part A).* Publication 9285.7-09A.

U.S. Environmental Protection Agency (USEPA). 1989. *Risk Assessment Guidance for Superfund (RAGS), Volume 1, Human Health Evaluation Manual, Part A.*

## FIGURES





- LEGEND**
- Included in ERA Risk Assessment
  - ▭ Site 1 Boundary
  - ▭ Burning Ground Boundary
  - ▭ Disposal Pits
  - ▭ Buildings
  - ▭ Paved Road
  - ▭ Dirt Road
  - ▭ Vegetation

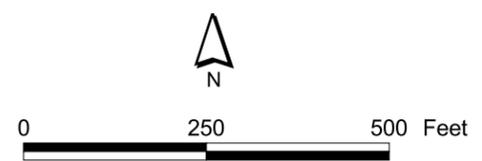
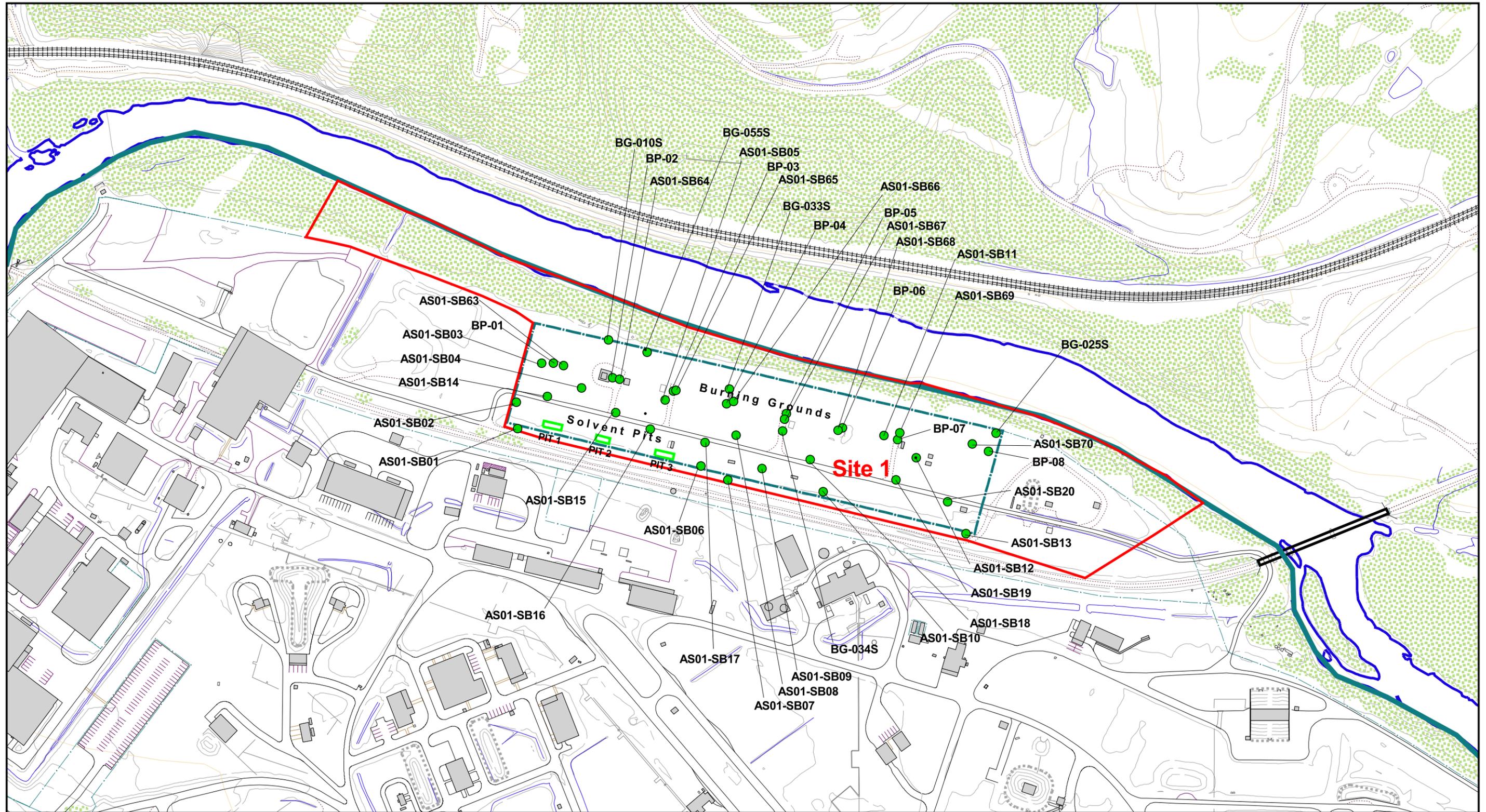


Figure 2  
 Solvent Pits Data for Ecological Risk Assessment  
 Site 1 Risk Assessment Tech Memo  
 Allegany Ballistics Laboratory



- LEGEND**
- Included in ERA Risk Assessment
  - ▭ Site 1 Boundary
  - ▭ Burning Ground Boundary
  - ▭ Disposal Pits
  - ▭ Buildings
  - ▭ Dirt Road
  - ▭ Paved Road
  - ▭ Vegetation

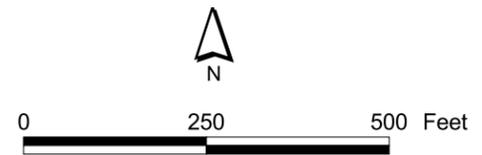
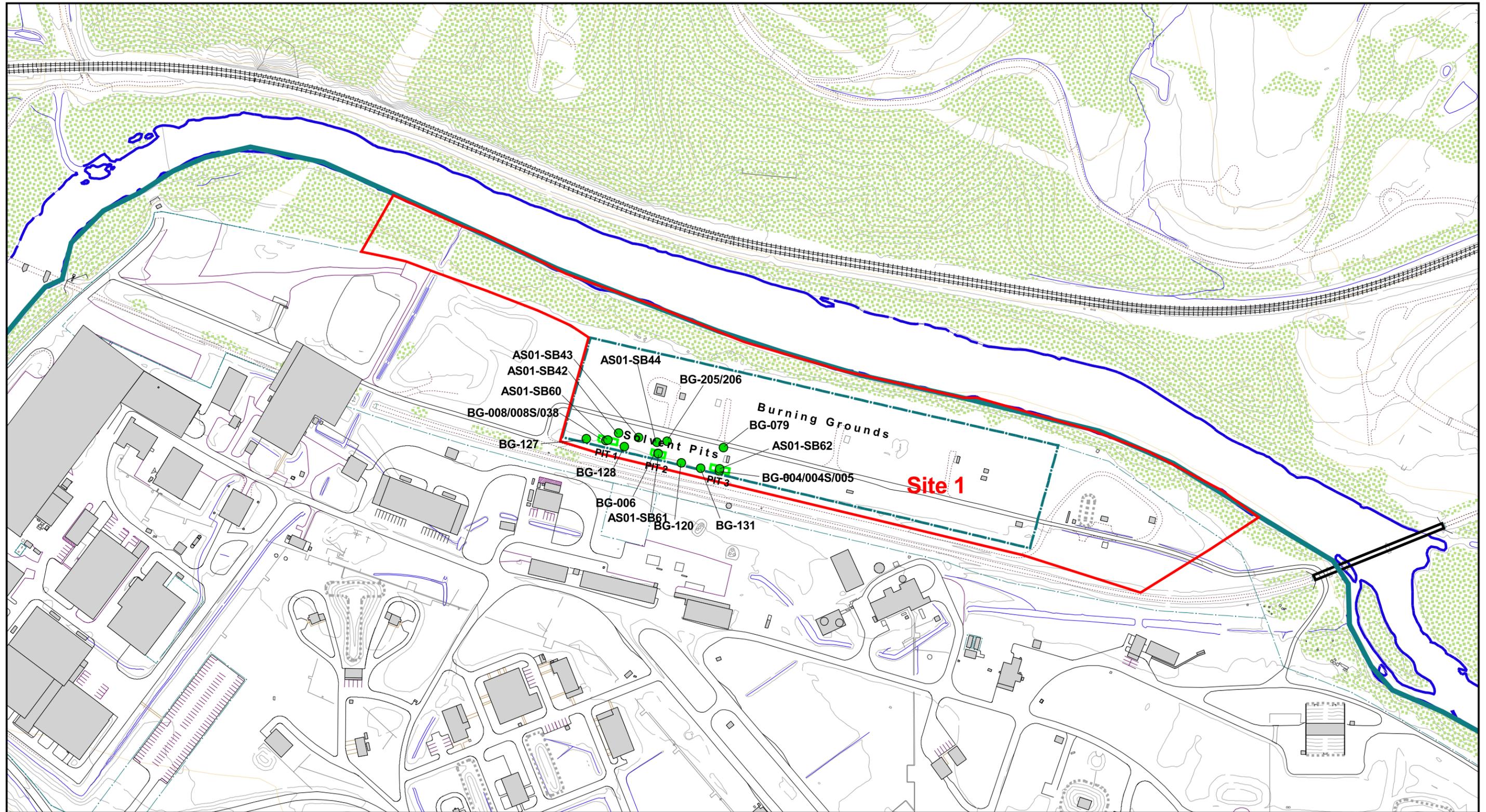


Figure 3  
Active Burning Grounds Data for Ecological Risk Assessment  
Site 1 Risk Assessment Tech Memo  
Allegany Ballistics Laboratory





- LEGEND**
- Included in HHRA Risk Assessment
  - ▭ Site 1 Boundary
  - ▭ Burning Ground Boundary
  - ▭ Disposal Pits
  - ▭ Buildings
  - ▭ Paved Road
  - ▭ Dirt Road
  - ▭ Vegetation

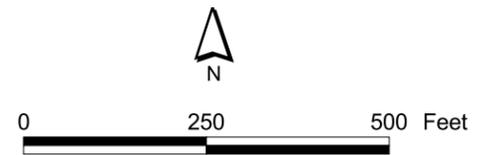
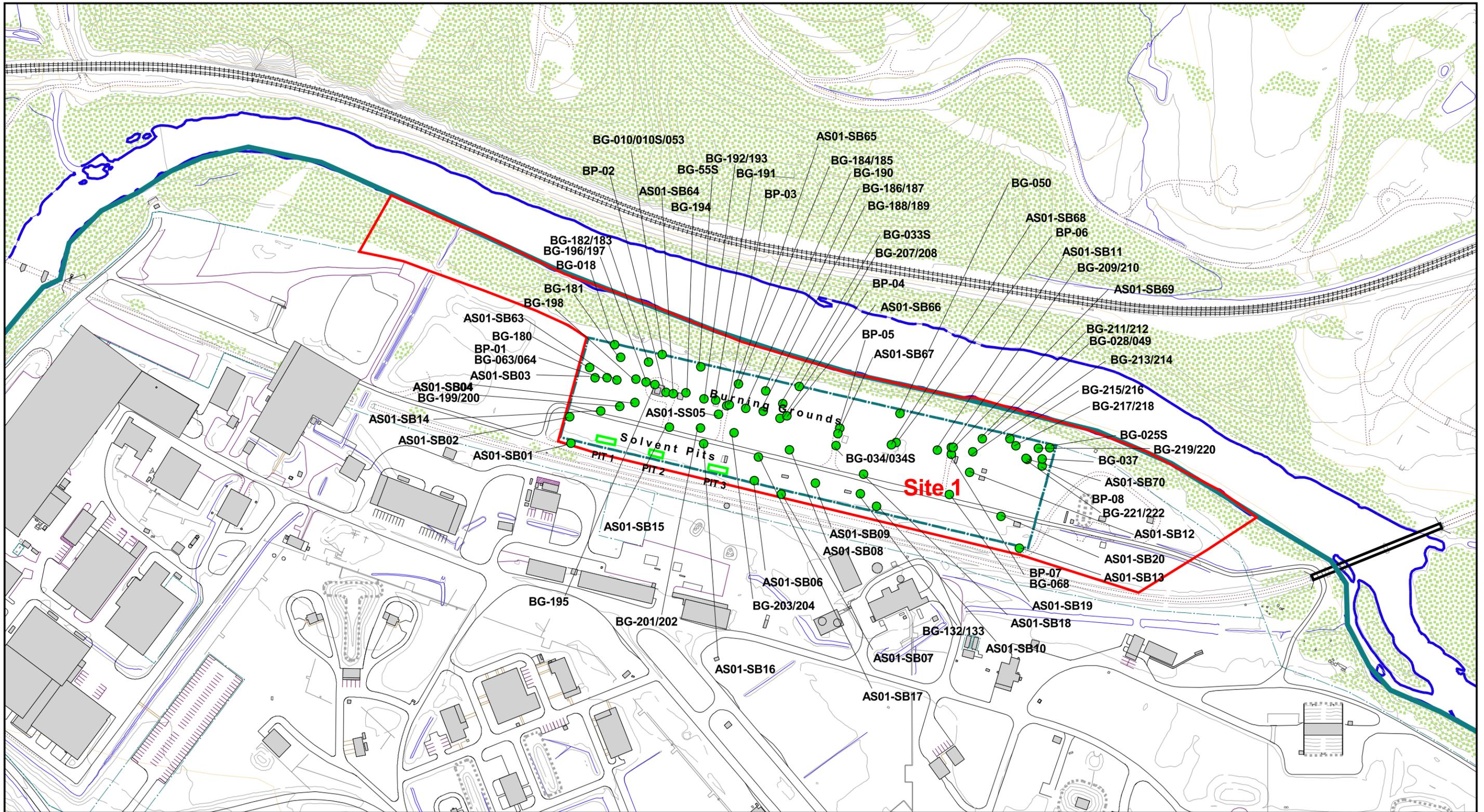


Figure 5  
Solvent Pits Data for Human Health Risk Assessment  
Site 1 Risk Assessment Tech Memo  
Allegany Ballistics Laboratory



- LEGEND**
- Included in HHRA Risk Assessment
  - ▭ Site 1 Boundary
  - ▭ Burning Ground Boundary
  - ▭ Disposal Pits
  - ▭ Buildings
  - ▭ Dirt Road
  - ▭ Paved Road
  - ▭ Vegetation



Figure 6  
 Active Burning Grounds Data for Human Health Risk Assessment  
 Site 1 Risk Assessment Tech Memo  
 Allegany Ballistics Laboratory



ATTACHMENT 1

**Attachment 1**

**TABLE 1 - Data to be included in ERA from Solvent Pits Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
AS01-SB42-(1-2)		10/24/01	1	2	T	SB	None
AS01-SB43-(1-2)		10/24/01	1	2	T	SB	None
AS01-SB44-(1-2)		10/24/01	1	2	T	SB	None
HCS-BG-4S		06/20/94	0	1	T	SS	None
HCS-BG-8S		06/20/94	0	1	T	SS	None
AS01-SS60-0-0.5		09/21/04	0	0.5	T	SS	None
AS01-SB60-1-3		09/22/04	1	3	T	SB	None
AS01-SS61-0-0.5		09/21/04	0	0.5	T	SS	None
AS01-SB61-1-3		09/22/04	1	3	T	SB	None
AS01-SB61P-1-3	Yes	09/22/04	1	3	T	SB	None
AS01-SS62-0-0.5		09/21/04	0	0.5	T	SS	None
AS01-SB62-1-3		09/22/04	1	3	T	SB	None

**Number of Samples included in ERA for Solvent Pits Area:**

Total Samples = 11  
 Surface Soil Samples = 5  
 Subsurface Soil Samples = 6  
 Duplicates included (not in sample totals) = 1

**Notes:**

SS = Surface Soil (defined as 0 to 12 inches)  
 SB = Subsurface Soil (defined as greater than 12 inches)  
 T = Samples were validated  
 Duplicate samples are not included in total sample count

**Attachment 1**

**TABLE 2 - Data to be included in ERA from Active Burning Grounds Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
AS01-SB14P-R01X	Yes	02/21/01	1	2	T	SB	RCRA
AS01-SB14-R01X		02/21/01	1	2	T	SB	RCRA
AS01-SB15-R01X		02/21/01	1	2	T	SB	RCRA
AS01-SB16-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB17-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB18-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB19-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB20-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SS01-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS02-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS03-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS04-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS05-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS06-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS07-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS08-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS09P-R01X	Yes	02/22/01	0	1	T	SS	RCRA
AS01-SS09-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS10-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS11-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS12-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS13-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS14-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS15-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS16P-R01X	Yes	02/22/01	0	1	T	SS	RCRA
AS01-SS16-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS17-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS18-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS19-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS20-R01X		02/22/01	0	1	T	SS	RCRA
HCS-BG-10S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-25S		06/20/94	0	1	T	SS	None
HCS-BG-33S		06/20/94	0	1	T	SS	None
HCS-BG-34S		06/20/94	0	1	T	SS	None
HCS-BG-55S		06/20/94	0	1	T	SS	CERCLA
HCS-BP-1		07/13/92	0.5	1	T	SS	None
HCS-BP-2		07/13/92	0.5	1	T	SS	None
HCS-BP-3		07/13/92	0.5	1	T	SS	None
HCS-BP-4		07/13/92	0.5	1	T	SS	None
HCS-BP-4/DUP	Yes	07/13/92	0.5	1	T	SS	None
HCS-BP-5		07/13/92	0.5	1	T	SS	None
HCS-BP-6		07/13/92	0.5	1	T	SS	None
HCS-BP-7		07/13/92	0.5	1	T	SS	None
HCS-BP-8		07/13/92	0.5	1	T	SS	None
AS01-SS63-0-0.5		09/22/04	0	0.5	T	SS	None
AS01-SS64-0-0.5		09/22/04	0	0.5	T	SS	None
AS01-SS65-0-0.5		09/22/04	0	0.5	T	SS	None
AS01-SB65-1.5-2		09/22/04	1.5	2	T	SB	None
AS01-SS66-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB66-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS67-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB67-1.5-2		09/23/04	1.5	2	T	SB	None

**Attachment 1**

**TABLE 2 - Data to be included in ERA from Active Burning Grounds Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
AS01-SS68-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB68-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS69-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SS69P-0-0.5	Yes	09/23/04	0	0.5	T	SS	None
AS01-SB69-1-1.5		09/23/04	1	1.5	T	SB	None
AS01-SS70-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB70-2.5-3		09/23/04	2.5	3	T	SB	None

**is included in ERA for Active Burning Grounds Area:**

Total Samples = 54  
 Surface Soil Samples = 41  
 Subsurface Soil Samples = 13  
 Duplicates included (not in sample totals) = 5

**Notes:**

SS = Surface Soil (defined as 0 to 12)  
 SB = Subsurface Soil (defined as greater than 12 inches)  
 T = Samples were validated  
 Duplicate samples are not included in total sample count

**Attachment 1**

**TABLE 3 - Data to be included in ERA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
AOCM-1-T		10/26/01	0	1	T	SS	CERCLA
AOCM-2-T		10/26/01	0	1	T	SS	CERCLA
22C-1-T		10/26/95	0	1	F	SS	CERCLA
22C-2-T		10/26/95	0	1	F	SS	CERCLA
22D-1-T		10/26/95	0	1	F	SS	CERCLA
AS01-SB24-(1-2)		10/24/01	1	2	T	SB	None
AS01-SB25-(1-2)		10/24/01	1	2	T	SB	None
AS01-SB26-(1-2)		10/23/01	1	2	T	SB	None
AS01-SB27-(1-2)		10/23/01	1	2	T	SB	None
AS01-SB30-(1-2)		10/24/01	1	2	T	SB	None
AS01-SB34-(1-2)		10/25/01	1	2	T	SB	None
AS01-SB34P-(1-2)	Yes	10/25/01	1	2	T	SB	None
AS01-SB36-(1-2)		10/25/01	1	2	T	SB	None
AS01-SB38-(1-2)		10/26/01	1	2	T	SB	None
AS01-SB38P-(1-2)	Yes	10/26/01	1	2	T	SB	None
AS01-SB39-(1-2)		10/23/01	1	2	T	SB	None
AS01-SB40-(1-2)		10/24/01	1	2	T	SB	None
AS01-SB41-(1-2)		10/24/01	1	2	T	SB	None
AS01-SS21-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS21P-(0-1)	Yes	10/25/01	0	1	T	SS	CERCLA
AS01-SS22-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS23-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS24-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS25-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS26-(0-1)		10/23/01	0	1	T	SS	CERCLA
AS01-SS27-(0-1)		10/23/01	0	1	T	SS	CERCLA
AS01-SS28-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS29-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS30-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS33-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS34-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS34P-(0-1)	Yes	10/25/01	0	1	T	SS	CERCLA
AS01-SS35-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS36-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS37-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS38-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS38P-(0-1)	Yes	10/26/01	0	1	T	SS	CERCLA
AS01-SS39-(0-1)		10/23/01	0	1	T	SS	CERCLA
AS01-SS40-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS41-(0-1)		10/24/01	0	1	T	SS	CERCLA
HCS-B1-11-2		07/17/92	2	2	T	SB	None
HCS-B1-12-1		11/16/94	0	1	T	SS	CERCLA
HCS-B1-13-1		11/16/94	0	1	T	SS	CERCLA
HCS-B1-3-1		07/17/92	1	2	T	SB	None
HCS-B1-3-1/DUP	Yes	07/17/92	1	2	T	SB	None
HCS-B1-CS		06/20/94	1	2	T	SB	None
HCS-B2-10		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-3-4		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-4-4		01/01/92	0	0.5	T	SS	CERCLA

**Attachment 1**

**TABLE 3 - Data to be included in ERA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
HCS-B2-5-3		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-6-3		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-7-3		07/17/92	0	0.5	T	SS	CERCLA
HCS-BG-16S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-102		07/13/92	2	2	T	SB	None
HCS-BG-102S		11/16/94	0	1	T	SS	CERCLA
HCS-BG-110		07/13/92	2	3	T	SB	None
HCS-BG-110S		11/16/94	0	1	T	SS	CERCLA
HCS-BG-113		07/13/92	2	3	T	SB	None
HCS-BG-113S		11/15/94	0	1	T	SS	CERCLA
HCS-BG-113S/DUP	Yes	11/15/94	0	1	T	SS	CERCLA
HCS-BG-146		11/16/94	2	3	T	SB	None
HCS-BG-147		11/16/94	2	3	T	SB	None
HCS-BG-148		11/16/94	2	3	T	SB	None
HCS-BG-149		11/16/94	2	3	T	SB	None
HCS-BG-150		11/15/94	2	3	T	SB	None
HCS-BG-152		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-153		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-161		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-162		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-165		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-166		10/27/98	2	3	T	SB	None
HCS-BG-171		10/21/98	0	0.5	T	SS	CERCLA
HCS-BG-179		10/21/98	0	0.5	T	SS	CERCLA
HCS-BG-179/DUP	Yes	10/21/98	0	0.5	T	SS	CERCLA
HCS-BG-23S		06/21/94	0	1	T	SS	CERCLA
HCS-BG-23S/DUP	Yes	06/21/94	0	1	T	SS	CERCLA
HCS-BG-84S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-98S		11/16/94	0	1	T	SS	CERCLA
HCS-B1-11-S		07/17/92	0.5	1	T	SS	None
HCS-B1-3-S		07/17/92	0.5	1	T	SS	None
HCS-B1-4-S		07/17/92	0.5	1	T	SS	None
HCS-B1-C		07/17/92	0.5	1	T	SS	None
HCS-B2-7-S		07/17/92	0	0.5	T	SS	None
HCS-B2-C		07/17/92	0	0.5	T	SS	None
AS01-SS46-0-1		07/20/04	0	1	T	SS	None
AS01-SS47-0-1		07/20/04	0	1	T	SS	None
AS01-SS48-0-1		07/20/04	0	1	T	SS	None
AS01-SS49-0-1		07/20/04	0	1	T	SS	None
AS01-SS50-0-1		07/21/04	0	1	T	SS	None
AS01-SS50P-0-1	Yes	07/21/04	0	1	T	SS	None
AS01-SS51-0-1		07/21/04	0	1	T	SS	None
AS01-SS52-0-1		07/21/04	0	1	T	SS	None
AS01-SS53-0-1		07/21/04	0	1	T	SS	None
AS01-SS54-0-1		07/21/04	0	1	T	SS	None
AS01-SS55P-0-1	Yes	07/21/04	0	1	T	SS	None
AS01-SS56-0-1		07/21/04	0	1	T	SS	None
AS01-SS57-0-1		07/21/04	0	1	T	SS	None
AS01-SS58-0-1		07/21/04	0	1	T	SS	None
AS01-SS59-0-1		07/21/04	0	1	T	SS	None
AS01-SS71-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB71-1.5-2		09/23/04	1.5	2	T	SB	None

**Attachment 1**

**TABLE 3 - Data to be included in ERA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
AS01-SS72-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SS72P-0-0.5	Yes	09/23/04	0	0.5	T	SS	None
AS01-SS73-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB73-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS74-0-0.5		09/23/04	0	0.5	T	SS	None

**Number of Samples included in ERA for Area Outside of Burning Grounds:**

Total Samples = 94  
Surface Soil Samples = 69  
Subsurface Soil Samples = 25  
Duplicates included (not in sample totals) = 12

**Notes:**

SS = Surface Soil (defined as 0 to 12 inches)  
SB = Subsurface Soil (defined as greater than 12 inches)  
F = Samples were not validated  
T = Samples were validated  
Duplicate samples are not included in total sample count

**Attachment 1**

**TABLE 4 - Data to be included in HHRA from Solvent Pits Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
AS01-SB42-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SB43-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SB44-(1-2)		10/24/01	1	2	T	SB	CERCLA
HCS-BG-120		06/21/94	3	5	T	SB	CERCLA
HCS-BG-120/DUP	Yes	06/21/94	3	5	T	SB	CERCLA
HCS-BG-127		06/22/94	9	11	T	SB	CERCLA
HCS-BG-128		06/22/94	3	5	T	SB	CERCLA
HCS-BG-131		06/22/94	9	11	T	SB	CERCLA
HCS-BG-205		10/27/98	2	3	T	SB	CERCLA
HCS-BG-206		10/27/98	4	6	T	SB	CERCLA
HCS-BG-38		07/13/92	12.5	13.5	T	SB	CERCLA
HCS-BG-4(92)		07/13/92	3	4	T	SB	CERCLA
HCS-BG-4(92)/DUP	Yes	07/13/92	3	4	T	SB	CERCLA
HCS-BG-4(94)		06/20/94	3	5	T	SB	CERCLA
HCS-BG-4S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-5(92)		07/13/92	10	11	T	SB	CERCLA
HCS-BG-6(92)		07/13/92	3	4	T	SB	CERCLA
HCS-BG-6(94)		06/21/94	3	5	T	SB	CERCLA
HCS-BG-79		07/13/92	11	12	T	SB	CERCLA
HCS-BG-8		06/21/94	3	5	T	SB	CERCLA
HCS-BG-8S		06/20/94	0	1	T	SS	CERCLA
AS01-SS60-0-0.5		09/21/04	0	0.5	T	SS	None
AS01-SB60-1-3		09/22/04	1	3	T	SB	None
AS01-SB60-3-5		09/22/04	3	5	T	SB	None
AS01-SB60-5-7		09/22/04	5	7	T	SB	None
AS01-SB60-7-8		09/22/04	7	8	T	SB	None
AS01-SS61-0-0.5		09/21/04	0	0.5	T	SS	None
AS01-SB61-1-3		09/22/04	1	3	T	SB	None
AS01-SB61P-1-3	Yes	09/22/04	1	3	T	SB	None
AS01-SB61-3-5		09/22/04	3	5	T	SB	None
AS01-SB61-5-7		09/22/04	5	7	T	SB	None
AS01-SB61-7-8		09/22/04	7	8	T	SB	None
AS01-SS62-0-0.5		09/21/04	0	0.5	T	SS	None
AS01-SB62-1-3		09/22/04	1	3	T	SB	None
AS01-SB62-3-5		09/22/04	3	5	T	SB	None
AS01-SB62-5-7		09/22/04	5	7	T	SB	None
AS01-SB62-7-8		09/22/04	7	8	T	SB	None

**Number of Samples included in HHRA for Solvent Pits Area:**

Total Samples = 34  
 Surface Soil Samples = 5  
 Subsurface Soil Samples = 29  
 Duplicates included (not in sample totals) = 3

**Notes:**

SS = Surface Soil (defined as 0 to 12)  
 SB = Subsurface Soil (defined as greater than 12 inches)  
 T = Samples were validated  
 Duplicate samples are not included in total sample count

**Attachment 1**

**TABLE 5 - Data to be included in HHRA for Active Burning Grounds Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
AS01-SB14P-R01X	Yes	02/21/01	1	2	T	SB	RCRA
AS01-SB14-R01X		02/21/01	1	2	T	SB	RCRA
AS01-SB15-R01X		02/21/01	1	2	T	SB	RCRA
AS01-SB16-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB17-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB18-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB19-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SB20-R01X		02/22/01	1	2	T	SB	RCRA
AS01-SS01-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS02-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS03-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS04-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS05-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS06-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS07-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS08-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS09P-R01X	Yes	02/22/01	0	1	T	SS	RCRA
AS01-SS09-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS10-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS11-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS12-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS13-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS14-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS15-R01X		02/21/01	0	1	T	SS	RCRA
AS01-SS16P-R01X	Yes	02/22/01	0	1	T	SS	RCRA
AS01-SS16-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS17-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS18-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS19-R01X		02/22/01	0	1	T	SS	RCRA
AS01-SS20-R01X		02/22/01	0	1	T	SS	RCRA
HCS-BG-10		07/13/92	3	4	T	SB	None
HCS-BG-10S		06/20/94	0	1	T	SS	None
HCS-BG-132		06/22/94	3	5	T	SB	CERCLA
HCS-BG-133		11/15/94	2	3	T	SB	CERCLA
HCS-BG-18		07/13/92	10	11	T	SB	None
HCS-BG-180		10/27/98	2	3	T	SB	None
HCS-BG-181		10/27/98	2	3	T	SB	None
HCS-BG-182		10/27/98	2	3	T	SB	None
HCS-BG-183		10/27/98	4	6	T	SB	None
HCS-BG-184		10/27/98	2	3	T	SB	None
HCS-BG-185		10/27/98	4	6	T	SB	None
HCS-BG-186		10/27/98	2	3	T	SB	None
HCS-BG-187		10/27/98	4	6	T	SB	None
HCS-BG-188		10/27/98	2	3	T	SB	None
HCS-BG-189		10/27/98	4	6	T	SB	None
HCS-BG-190		10/27/98	2	3	T	SB	None
HCS-BG-191		10/27/98	2	3	T	SB	None
HCS-BG-192		10/27/98	2	3	T	SB	None
HCS-BG-193		10/27/98	4	6	T	SB	None
HCS-BG-194		10/27/98	2	3	T	SB	None
HCS-BG-195		10/27/98	2	3	T	SB	None

**Attachment 1**

**TABLE 5 - Data to be included in HHRA for Active Burning Grounds Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
HCS-BG-196		10/27/98	2	3	T	SB	None
HCS-BG-197		10/27/98	4	6	T	SB	None
HCS-BG-198		10/27/98	2	3	T	SB	None
HCS-BG-199		10/27/98	2	3	T	SB	None
HCS-BG-200		10/27/98	4	6	T	SB	None
HCS-BG-201		10/27/98	2	3	T	SB	None
HCS-BG-202		10/27/98	4	6	T	SB	None
HCS-BG-203		10/27/98	2	3	T	SB	None
HCS-BG-204		10/27/98	4	6	T	SB	None
HCS-BG-207		10/27/98	2	3	T	SB	None
HCS-BG-208		10/27/98	4	6	T	SB	None
HCS-BG-209		10/27/98	2	3	T	SB	None
HCS-BG-210		10/27/98	4	6	T	SB	None
HCS-BG-211		10/27/98	2	3	T	SB	None
HCS-BG-212		10/27/98	4	6	T	SB	None
HCS-BG-213		10/27/98	2	3	T	SB	None
HCS-BG-214		10/27/98	4	6	T	SB	None
HCS-BG-215		10/27/98	2	3	T	SB	None
HCS-BG-216		10/27/98	4	6	T	SB	None
HCS-BG-217		10/27/98	2	3	T	SB	None
HCS-BG-218		10/27/98	4	6	T	SB	None
HCS-BG-219		10/27/98	2	3	T	SB	None
HCS-BG-220		10/27/98	4	6	T	SB	None
HCS-BG-221		10/27/98	2	3	T	SB	None
HCS-BG-222		10/27/98	4	6	T	SB	None
HCS-BG-25S		06/20/94	0	1	T	SS	None
HCS-BG-33S		06/20/94	0	1	T	SS	None
HCS-BG-34		07/13/92	3	4	T	SB	None
HCS-BG-34S		06/20/94	0	1	T	SS	None
HCS-BG-37		07/13/92	3	4	T	SB	None
HCS-BG-50		07/13/92	11	12	T	SB	None
HCS-BG-53		07/13/92	13	14	T	SB	None
HCS-BG-55S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-68		07/13/92	11	12	T	SB	None
HCS-BP-1		07/13/92	0.5	1	T	SS	None
HCS-BP-2		07/13/92	0.5	1	T	SS	None
HCS-BP-3		07/13/92	0.5	1	T	SS	None
HCS-BP-4		07/13/92	0.5	1	T	SS	None
HCS-BP-4/DUP	Yes	07/13/92	0.5	1	T	SS	None
HCS-BP-5		07/13/92	0.5	1	T	SS	None
HCS-BP-6		07/13/92	0.5	1	T	SS	None
HCS-BP-7		07/13/92	0.5	1	T	SS	None
HCS-BP-8		07/13/92	0.5	1	T	SS	None
AS01-SS63-0-0.5		09/22/04	0	0.5	T	SS	None
AS01-SB63-6.5-7		09/22/04	6.5	7	T	SB	None
AS01-SS64-0-0.5		09/22/04	0	0.5	T	SS	None
AS01-SB64-7.5-8		09/22/04	7.5	8	T	SB	None
AS01-SB64P-7.5-8	Yes	09/22/04	7.5	8	T	SB	None
AS01-SS65-0-0.5		09/22/04	0	0.5	T	SS	None
AS01-SB65-1.5-2		09/22/04	1.5	2	T	SB	None
AS01-SS66-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB66-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS67-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB67-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS68-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB68-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS69-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SS69P-0-0.5	Yes	09/23/04	0	0.5	T	SS	None

**Attachment 1**

**TABLE 5 - Data to be included in HHRA for Active Burning Grounds Area**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
AS01-SB69-1-1.5		09/23/04	1	1.5	T	SB	None
AS01-SS70-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB70-1-1.5		09/23/04	1	1.5	T	SB	None

**Number of Samples included in HHRA for Active Burning Grounds Area:**

Total Samples = 106  
Surface Soil Samples = 41  
Subsurface Soil Samples = 65  
Duplicates included (not in sample totals) = 6

**Notes:**

SS = Surface Soil (defined as 0 to 12 inches)  
SB = Subsurface Soil (defined as greater than 12 inches)  
T = Samples were validated  
Duplicate samples are not included in total sample count

**Attachment 1**

**TABLE 6 - Data to be included in HHRA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
AOCM-1-T		10/26/01	0	1	T	SS	CERCLA
AOCM-2-T		10/26/01	0	1	T	SS	CERCLA
AS01-SB24-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SB25-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SB26-(1-2)		10/23/01	1	2	T	SB	CERCLA
AS01-SB27-(1-2)		10/23/01	1	2	T	SB	CERCLA
AS01-SB30-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SB31-(1-2)		10/25/01	1	2	T	SB	CERCLA**
AS01-SB34-(1-2)		10/25/01	1	2	T	SB	CERCLA
AS01-SB34P-(1-2)	Yes	10/25/01	1	2	T	SB	CERCLA
AS01-SB36-(1-2)		10/25/01	1	2	T	SB	CERCLA
AS01-SB38-(1-2)		10/26/01	1	2	T	SB	CERCLA
AS01-SB38P-(1-2)	Yes	10/26/01	1	2	T	SB	CERCLA
AS01-SB39-(1-2)		10/23/01	1	2	T	SB	CERCLA
AS01-SB40-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SB41-(1-2)		10/24/01	1	2	T	SB	CERCLA
AS01-SS21-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS21P-(0-1)	Yes	10/25/01	0	1	T	SS	CERCLA
AS01-SS22-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS23-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS24-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS25-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS26-(0-1)		10/23/01	0	1	T	SS	CERCLA
AS01-SS27-(0-1)		10/23/01	0	1	T	SS	CERCLA
AS01-SS28-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS29-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS30-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS33-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS34-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS34P-(0-1)	Yes	10/25/01	0	1	T	SS	CERCLA
AS01-SS35-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS36-(0-1)		10/25/01	0	1	T	SS	CERCLA
AS01-SS37-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS38-(0-1)		10/26/01	0	1	T	SS	CERCLA
AS01-SS38P-(0-1)	Yes	10/26/01	0	1	T	SS	CERCLA
AS01-SS39-(0-1)		10/23/01	0	1	T	SS	CERCLA
AS01-SS40-(0-1)		10/24/01	0	1	T	SS	CERCLA
AS01-SS41-(0-1)		10/24/01	0	1	T	SS	CERCLA
HCS-B1-11-2		07/17/92	2	2	T	SB	CERCLA
HCS-B1-12-1		11/16/94	0	1	T	SS	CERCLA
HCS-B1-13-1		11/16/94	0	1	T	SS	CERCLA
HCS-B1-3-1		07/17/92	1	2	T	SB	CERCLA
HCS-B1-3-1/DUP	Yes	07/17/92	1	2	T	SB	CERCLA
HCS-B1-CS		06/20/94	1	2	T	SB	CERCLA
HCS-B2-10		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-3-4		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-4-4		01/01/92	0	0.5	T	SS	CERCLA
HCS-B2-5-3		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-6-3		07/17/92	0	0.5	T	SS	CERCLA
HCS-B2-7-3		07/17/92	0	0.5	T	SS	CERCLA
HCS-BG-102		07/13/92	2	2	T	SB	CERCLA
HCS-BG-102S		11/16/94	0	1	T	SS	CERCLA

**Attachment 1**

**TABLE 6 - Data to be included in HHRA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
HCS-BG-106		07/13/92	11	12	T	SB	CERCLA
HCS-BG-110		07/13/92	2	3	T	SB	CERCLA
HCS-BG-110S		11/16/94	0	1	T	SS	CERCLA
HCS-BG-112		07/13/92	2	3	T	SB	CERCLA
HCS-BG-112/DUP	Yes	07/13/92	2	3	T	SB	CERCLA
HCS-BG-112R		07/13/92	2	3	T	SB	CERCLA
HCS-BG-113		07/13/92	2	3	T	SB	CERCLA
HCS-BG-113S		11/15/94	0	1	T	SS	CERCLA
HCS-BG-113S/DUP	Yes	11/15/94	0	1	T	SS	CERCLA
HCS-BG-134		11/16/94	2	3	T	SB	CERCLA
HCS-BG-135		11/16/94	2	3	T	SB	CERCLA
HCS-BG-136		11/16/94	2	3	T	SB	CERCLA
HCS-BG-137		11/16/94	2	3	T	SB	CERCLA
HCS-BG-138		11/16/94	2	3	T	SB	CERCLA
HCS-BG-138/DUP	Yes	11/16/94	2	3	T	SB	CERCLA
HCS-BG-139		11/15/94	2	3	T	SB	CERCLA
HCS-BG-140		11/15/94	2	3	T	SB	CERCLA
HCS-BG-141		11/16/94	2	3	T	SB	CERCLA
HCS-BG-142		11/16/94	2	3	T	SB	CERCLA
HCS-BG-143		11/16/94	2	3	T	SB	CERCLA
HCS-BG-144		11/16/94	2	3	T	SB	CERCLA
HCS-BG-145		11/16/94	2	3	T	SB	CERCLA
HCS-BG-146		11/16/94	2	3	T	SB	CERCLA
HCS-BG-147		11/16/94	2	3	T	SB	CERCLA
HCS-BG-148		11/16/94	2	3	T	SB	CERCLA
HCS-BG-149		11/16/94	2	3	T	SB	CERCLA
HCS-BG-15		07/13/92	3	4	T	SB	None
HCS-BG-150		11/15/94	2	3	T	SB	CERCLA
HCS-BG-151		03/04/95	2	3	T	SB	CERCLA
HCS-BG-152		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-153		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-154		10/27/98	2	3	T	SB	CERCLA
HCS-BG-155		10/27/98	2	3	T	SB	CERCLA
HCS-BG-156		10/27/98	2	3	T	SB	CERCLA
HCS-BG-157		10/27/98	2	3	T	SB	CERCLA
HCS-BG-158		10/27/98	2	3	T	SB	CERCLA
HCS-BG-159		10/27/98	2	3	T	SB	None
HCS-BG-160		10/27/98	4	6	T	SB	None
HCS-BG-161		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-162		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-163		10/27/98	2	3	T	SB	None
HCS-BG-164		10/27/98	4	6	T	SB	None
HCS-BG-165		10/20/98	0	0.5	T	SS	CERCLA
HCS-BG-166		10/27/98	2	3	T	SB	CERCLA
HCS-BG-167		10/27/98	2	3	T	SB	CERCLA
HCS-BG-168		10/27/98	4	6	T	SB	CERCLA
HCS-BG-169		10/27/98	2	3	T	SB	CERCLA
HCS-BG-16S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-170		10/27/98	2	3	T	SB	CERCLA
HCS-BG-171		10/21/98	0	0.5	T	SS	CERCLA
HCS-BG-172		10/27/98	2	3	T	SB	CERCLA
HCS-BG-173		10/27/98	2	3	T	SB	CERCLA

**Attachment 1**

**TABLE 6 - Data to be included in HHRA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
HCS-BG-174		10/27/98	2	3	T	SB	CERCLA
HCS-BG-175		10/27/98	2	3	T	SB	CERCLA
HCS-BG-176		10/27/98	4	6	T	SB	CERCLA
HCS-BG-177		10/27/98	2	3	T	SB	CERCLA
HCS-BG-178		10/27/98	4	6	T	SB	CERCLA
HCS-BG-179		10/21/98	0	0.5	T	SS	CERCLA
HCS-BG-179/DUP	Yes	10/21/98	0	0.5	T	SS	CERCLA
HCS-BG-23S		06/21/94	0	1	T	SS	CERCLA
HCS-BG-23S/DUP	Yes	06/21/94	0	1	T	SS	CERCLA
HCS-BG-3		07/13/92	3	4	T	SB	CERCLA
HCS-BG-84		07/13/92	3	4	T	SB	CERCLA
HCS-BG-84S		06/20/94	0	1	T	SS	CERCLA
HCS-BG-98S		11/16/94	0	1	T	SS	CERCLA
HCS-BG-99		07/13/92	2	3	T	SB	CERCLA
HCS-BG-99R		07/13/92	2	3	T	SB	CERCLA
HCS-B1-11-S		07/17/92	0.5	1	T	SS	None
HCS-B1-3-S		07/17/92	0.5	1	T	SS	None
HCS-B1-4-S		07/17/92	0.5	1	T	SS	None
HCS-B1-C		07/17/92	0.5	1	T	SS	None
HCS-B2-7-S		07/17/92	0	0.5	T	SS	None
HCS-B2-C		07/17/92	0	0.5	T	SS	None
AS01-SS46-0-1		07/20/04	0	1	T	SS	None
AS01-SS47-0-1		07/20/04	0	1	T	SS	None
AS01-SS48-0-1		07/20/04	0	1	T	SS	None
AS01-SS49-0-1		07/20/04	0	1	T	SS	None
AS01-SS50-0-1		07/21/04	0	1	T	SS	None
AS01-SS50P-0-1		07/21/04	0	1	T	SS	None
AS01-SS51-0-1		07/21/04	0	1	T	SS	None
AS01-SS52-0-1		07/21/04	0	1	T	SS	None
AS01-SS53-0-1		07/21/04	0	1	T	SS	None
AS01-SS54-0-1		07/21/04	0	1	T	SS	None
AS01-SS56-0-1		07/21/04	0	1	T	SS	None
AS01-SS57-0-1		07/21/04	0	1	T	SS	None
AS01-SS58-0-1		07/21/04	0	1	T	SS	None
AS01-SS59-0-1		07/21/04	0	1	T	SS	None
AS01-SS71-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB71-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS72-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SS72P-0-0.5	Yes	09/23/04	0	0.5	T	SS	None
AS01-SB72-4.5-5		09/23/04	4.5	5	T	SB	None
AS01-SS73-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB73-1.5-2		09/23/04	1.5	2	T	SB	None
AS01-SS74-0-0.5		09/23/04	0	0.5	T	SS	None
AS01-SB74-4-4.5		09/23/04	4	4.5	T	SB	None

**Number of Samples included in HHRA for Area Outside of Burning Grounds:**

Total Samples = 136  
 Surface Soil Samples = 67  
 Subsurface Soil Samples = 69  
 Duplicates included (not in sample totals) = 12

**Attachment 1**

**TABLE 6 - Data to be included in HHRA from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	HHRA Media	HHRA Previous Use
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**Notes:**  
SS = Surface Soil (defined as 0 to 12 inches)  
SB = Subsurface Soil (defined as greater than 12 inches)  
T = Samples were validated  
Duplicate samples are not included in total sample count

**Attachment 1**

**TABLE 7 - Reference Samples from Area Outside of Burning Grounds**

Sample ID	Duplicate	Date Sampled	Depth From	Depth To	Validation Status	ERA Media	ERA Previous Use
AS01-SB31-1-2		10/25/01	1	2	T	SB	None
AS01-SS31-0-1		10/25/01	0	1	T	SS	CERCLA
AS01-SS32-0-1		10/25/01	0	1	T	SS	CERCLA
AS01-SS45-0-1		07/20/04	0	1	T	SS	None
AS01-SS55-0-1		07/21/04	0	1	T	SS	None

**Number of Reference Samples evaluated in ERA for Area Outside of Burning Grounds:**

Total Samples = 5  
Surface Soil Samples = 4  
Subsurface Soil Samples = 1

**Notes:**

SS = Surface Soil (defined as 0 to 12 inches)  
SB = Subsurface Soil (defined as greater than 12 inches)  
T = Samples were validated

**Appendix B**  
**DPT Soil Boring Logs**

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**Appendix C**  
**Raw Soil Data and Sample Map - 1998 Site 1 Soil**  
**Level Delineation**

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## Site 1 Soil Level Delineation - Final

TO: Dawn Hayes/LANTDIV  
Tom Bass/WVDEP  
Bruce Beach/USEPA  
Dave McBride/Alliant  
Lou Williams/NAVSEA

FROM: G. Brett Doerr

DATE: October 16, 1998

This memorandum updates the *Site 1 Soil Sampling* memorandum (September 21, 1998) and finalizes the scope and objectives of the sampling effort, which are threefold. The first objective is to address the question of whether polychlorinated biphenyls (PCBs) were disposed of at Site 1. The second objective is to better delineate the area of volatile organic carbon (VOC)-contaminated soil above the cleanup level in an effort to more accurately quantify the volume of soil requiring remediation. This information will be used during preparation of the Site 1 Feasibility Study. The third objective is to provide site-specific total organic carbon (TOC) data that will be used in establishing the soil clean-up level for VOCs and finalizing the *Preliminary Remediation Goals for Site 1 Soil and Establishment of Background Conditions* memorandum (October 18, 1996).

Table 1-1 summarizes the number of soil samples and associated analyses selected to satisfy the objectives stated above. Figures 1-1, 1-2, and 1-3 display the proposed sample locations as well as the estimated areas of soil concentrations above preliminary remediation goals (PRGs).

Table 1-1 Soil Sample Analyses Site 1 Soil Level Delineation Allegany Ballistics Laboratory Rocket Center, West Virginia			
Constituent	Analytical Method	Number of Samples	QA/QC Samples
TCL VOCs	USEPA CLP Organics SOW, OLM03 or latest version	64	0
TCL PCBs	USEPA CLP Organics SOW, OLM03 or latest version	7	5*
TOC	415.2/9060	12	0

\* one duplicate (soil), one MS/MSD (soil), one field blank (aqueous), one equipment blank (aqueous)

The following laboratories will be considered for providing analytical services for the Site 1 Soil Level Delineation. The laboratory location and current certification or approval are also listed:

Quanterra Incorporated; North Canton, Ohio; current Naval Facilities Engineering Service Center (NFESC) approval and current EPA contract laboratory program (CLP) certification

CEMIC Corporation; Narragansett, Rhode Island; current NFESC approval and EPA CLP certification

Envirosystems; Columbia, Maryland; current EPA CLP certification and current Army Corps of Engineers certification

In addition, the analytical method for TCL PCBs used by each laboratory achieves a detection limit below the minimum residential risk-based concentration (RBC) of PCBs in soil of 0.32 mg/kg. The standard detection limit for PCBs under the method listed in Table 1-1 is 0.033 mg/kg. This detection limit may change with increasing moisture content.

Background information on Site 1 and soil sampling rationale are presented in the *Work Plan for the Focused Remedial Investigation/Feasibility Study for Site 1 at the Allegany Ballistics Laboratory Superfund Site* (October 1994). All Site 1 Soil Level Delineation sampling activities will be conducted in accordance with the *Sampling and Analysis Plan for the Focused Remedial Investigation/Feasibility Study for Site 1 at the Allegany Ballistics Laboratory Superfund Site* (October 1994).

To satisfy the first objective of the sampling effort, seven soil samples will be collected at several Site 1 locations and analyzed for Target Compound List (TCL) PCBs. The samples are located within known or suspected waste disposal areas along the river where previous sampling has indicated the presence of VOCs. Because no documentation exists indicating the use or disposal of PCBs at Site 1, the areas of high soil-VOC concentrations are believed to be the most likely locations to detect PCBs, if present. As shown in figures 1-1 through 1-3, three samples are proposed in the vicinity of the west end of the burning ground, one in the vicinity of the east end of the burning ground, two adjacent to the former drum storage area, and one within the inert burn area. All seven samples will be collected from 0.5 to 1 foot below ground surface (bgs) because it is assumed that if present, the PCBs likely were released to the ground surface and because they are stable compounds which do not readily degrade.

In order to satisfy the second sampling effort objective, a total of 64 samples will be collected from 41 locations for TCL VOC analysis. The proposed sampling locations were selected to be adjacent to the estimated areas above the VOC PRG of 152 µg/kg in order to better delineate these areas and volumes of soil potentially requiring remediation. As shown in figures 1-1 through 1-3, surficial soil samples will be collected for VOC analysis from all 41 locations. It is proposed that the surficial samples be collected from 2 to 3 feet bgs because the samples are to be analyzed for volatiles. At 23 of the 41 locations, an additional VOC soil sample will be collected from 4 to 6 feet bgs and at 4 of the locations, a deep soil sample will be collected from 8 to 10 feet bgs.

Twelve soil samples for TOC analysis are proposed for addressing the third objective. The twelve samples will be collected from four locations, as shown in Figure 1-1. The four

locations were selected from areas anticipated to be close to the cleanup level (i.e., 150 to 200  $\mu\text{g}/\text{kg}$ ), because these areas will be representative of soil containing the highest levels of VOCs. Three samples will be collected at each location from depths of 1 to 2 feet bgs, 4 to 6 feet bgs, and 8 to 10 feet bgs). The analytical results will be averaged for each borehole to provide a representative TOC value for the vadose zone.

All soil samples for PCBs analysis will be collected using a stainless-steel hand auger. All other soil samples will be collected using direct-push sampling techniques (i.e., Geoprobe®). Dedicated equipment (e.g., acetate liners) and proper decontamination procedures will be employed between sampling locations to ensure generation of representative data.

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
1,2-DCE	2.3	0.828	0-6

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	230	0.152	0-6

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	230	0.152	0-6

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
1,2-DCE	24	0.828	0-4

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	64	0.152	0-4

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	0.310	0.152	0-10

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	0.152	0.152	0-10

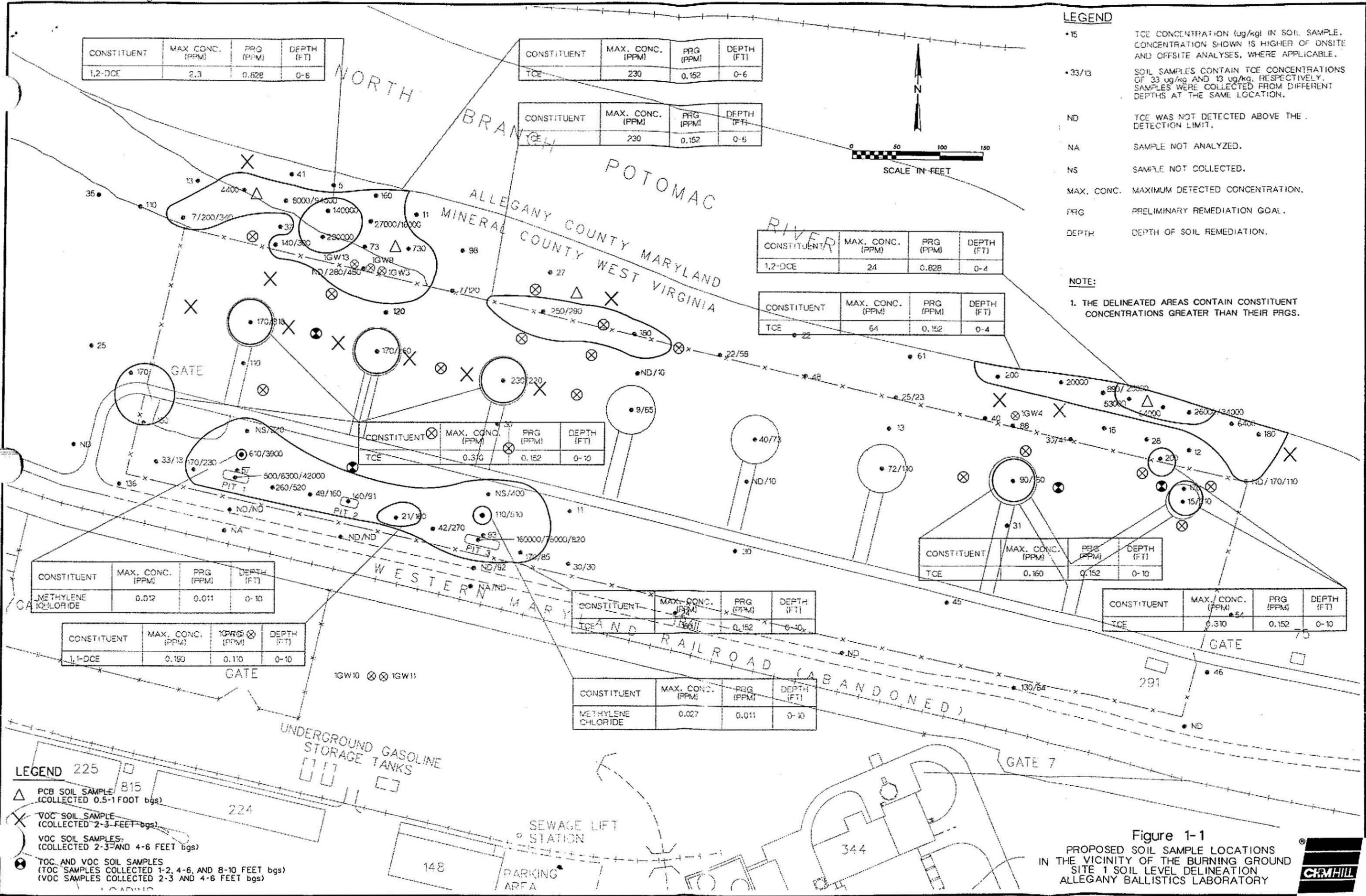
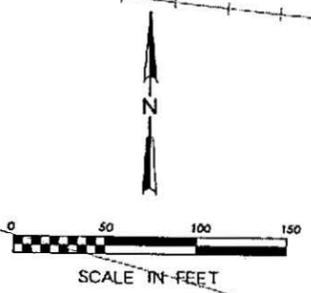
CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
METHYLENE CHLORIDE	0.027	0.011	0-10

**LEGEND**

- 15 TCE CONCENTRATION (ug/kg) IN SOIL SAMPLE. CONCENTRATION SHOWN IS HIGHER OF ONSITE AND OFFSITE ANALYSES, WHERE APPLICABLE.
- 33/13 SOIL SAMPLES CONTAIN TCE CONCENTRATIONS OF 33 ug/kg AND 13 ug/kg, RESPECTIVELY. SAMPLES WERE COLLECTED FROM DIFFERENT DEPTHS AT THE SAME LOCATION.
- ND TCE WAS NOT DETECTED ABOVE THE DETECTION LIMIT.
- NA SAMPLE NOT ANALYZED.
- NS SAMPLE NOT COLLECTED.
- MAX. CONC. MAXIMUM DETECTED CONCENTRATION.
- PRG PRELIMINARY REMEDIATION GOAL.
- DEPTH DEPTH OF SOIL REMEDIATION.

**NOTE:**

1. THE DELINEATED AREAS CONTAIN CONSTITUENT CONCENTRATIONS GREATER THAN THEIR PRGs.



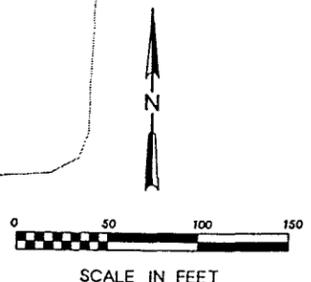
**LEGEND**

- △ PCB SOIL SAMPLE (COLLECTED 0.5-1 FOOT bgs)
- ⊗ VOC SOIL SAMPLE (COLLECTED 2-3 FEET bgs)
- ⊗ VOC SOIL SAMPLES (COLLECTED 2-3 AND 4-6 FEET bgs)
- ⊗ TOC AND VOC SOIL SAMPLES (TOC SAMPLES COLLECTED 1-2, 4-6, AND 8-10 FEET bgs) (VOC SAMPLES COLLECTED 2-3 AND 4-6 FEET bgs)

**Figure 1-1**  
PROPOSED SOIL SAMPLE LOCATIONS  
IN THE VICINITY OF THE BURNING GROUND  
SITE 1 SOIL LEVEL DELINEATION  
ALLEGANY BALLISTICS LABORATORY



01141FBIZ



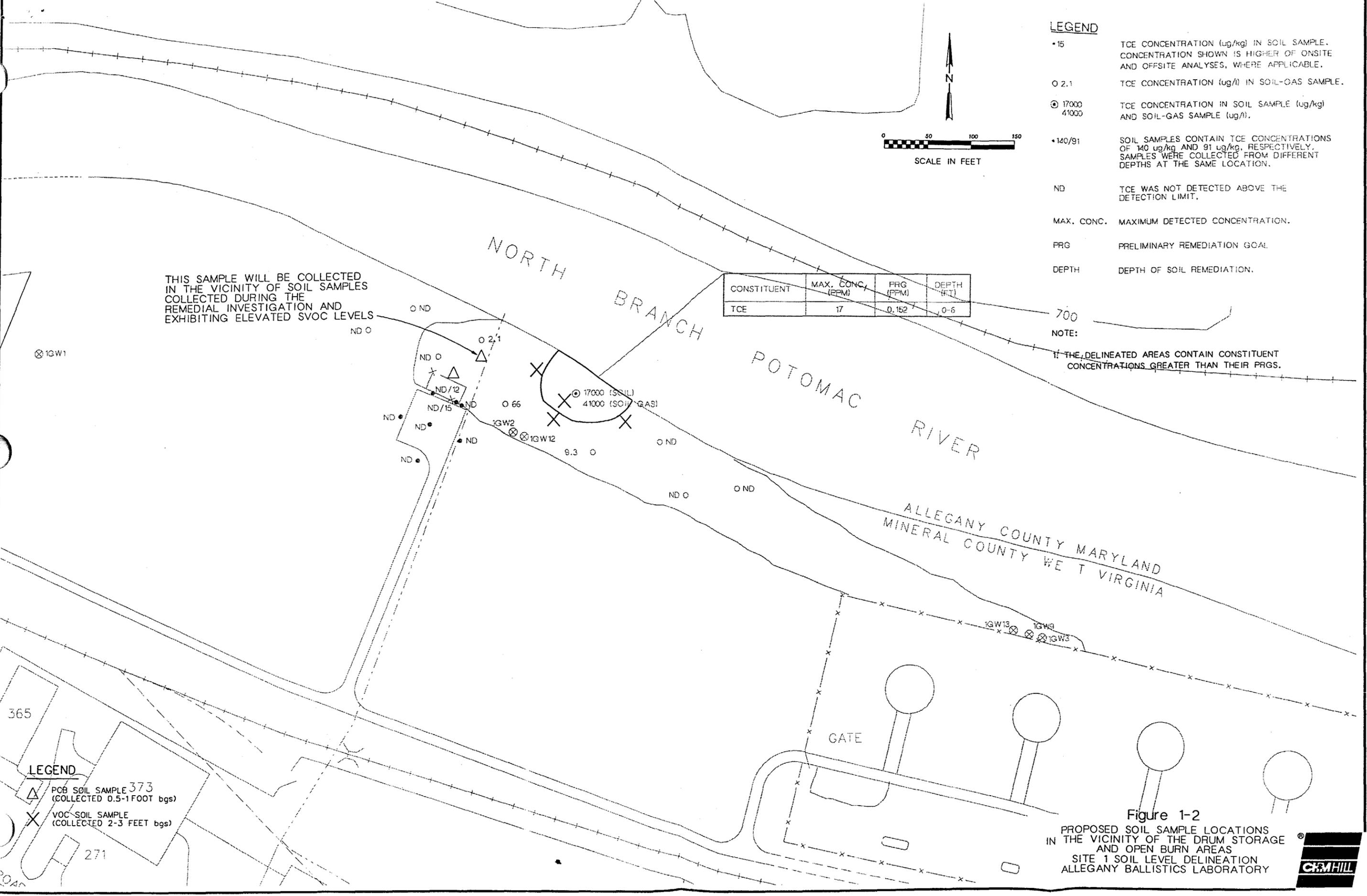
**LEGEND**

- 15 TCE CONCENTRATION (ug/kg) IN SOIL SAMPLE. CONCENTRATION SHOWN IS HIGHER OF ONSITE AND OFFSITE ANALYSES, WHERE APPLICABLE.
- 2.1 TCE CONCENTRATION (ug/l) IN SOIL-GAS SAMPLE.
- ⊙ 17000  
41000 TCE CONCENTRATION IN SOIL SAMPLE (ug/kg) AND SOIL-GAS SAMPLE (ug/l).
- 140/91 SOIL SAMPLES CONTAIN TCE CONCENTRATIONS OF 140 ug/kg AND 91 ug/kg, RESPECTIVELY. SAMPLES WERE COLLECTED FROM DIFFERENT DEPTHS AT THE SAME LOCATION.
- ND TCE WAS NOT DETECTED ABOVE THE DETECTION LIMIT.
- MAX. CONC. MAXIMUM DETECTED CONCENTRATION.
- PRG PRELIMINARY REMEDIATION GOAL
- DEPTH DEPTH OF SOIL REMEDIATION.

THIS SAMPLE WILL BE COLLECTED IN THE VICINITY OF SOIL SAMPLES COLLECTED DURING THE REMEDIAL INVESTIGATION AND EXHIBITING ELEVATED SVOC LEVELS

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT.)
TCE	17	0.152	0-6

700  
NOTE:  
IF THE DELINEATED AREAS CONTAIN CONSTITUENT CONCENTRATIONS GREATER THAN THEIR PRGS.



**LEGEND**  
 △ PCB SOIL SAMPLE 373 (COLLECTED 0.5-1 FOOT bgs)  
 × VOC SOIL SAMPLE (COLLECTED 2-3 FEET bgs)

**Figure 1-2**  
 PROPOSED SOIL SAMPLE LOCATIONS IN THE VICINITY OF THE DRUM STORAGE AND OPEN BURN AREAS  
 SITE 1 SOIL LEVEL DELINEATION ALLEGANY BALLISTICS LABORATORY

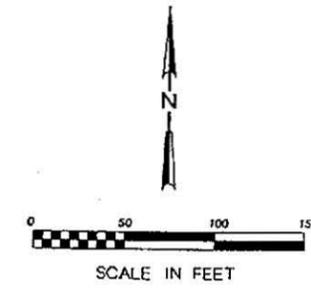


**LEGEND**

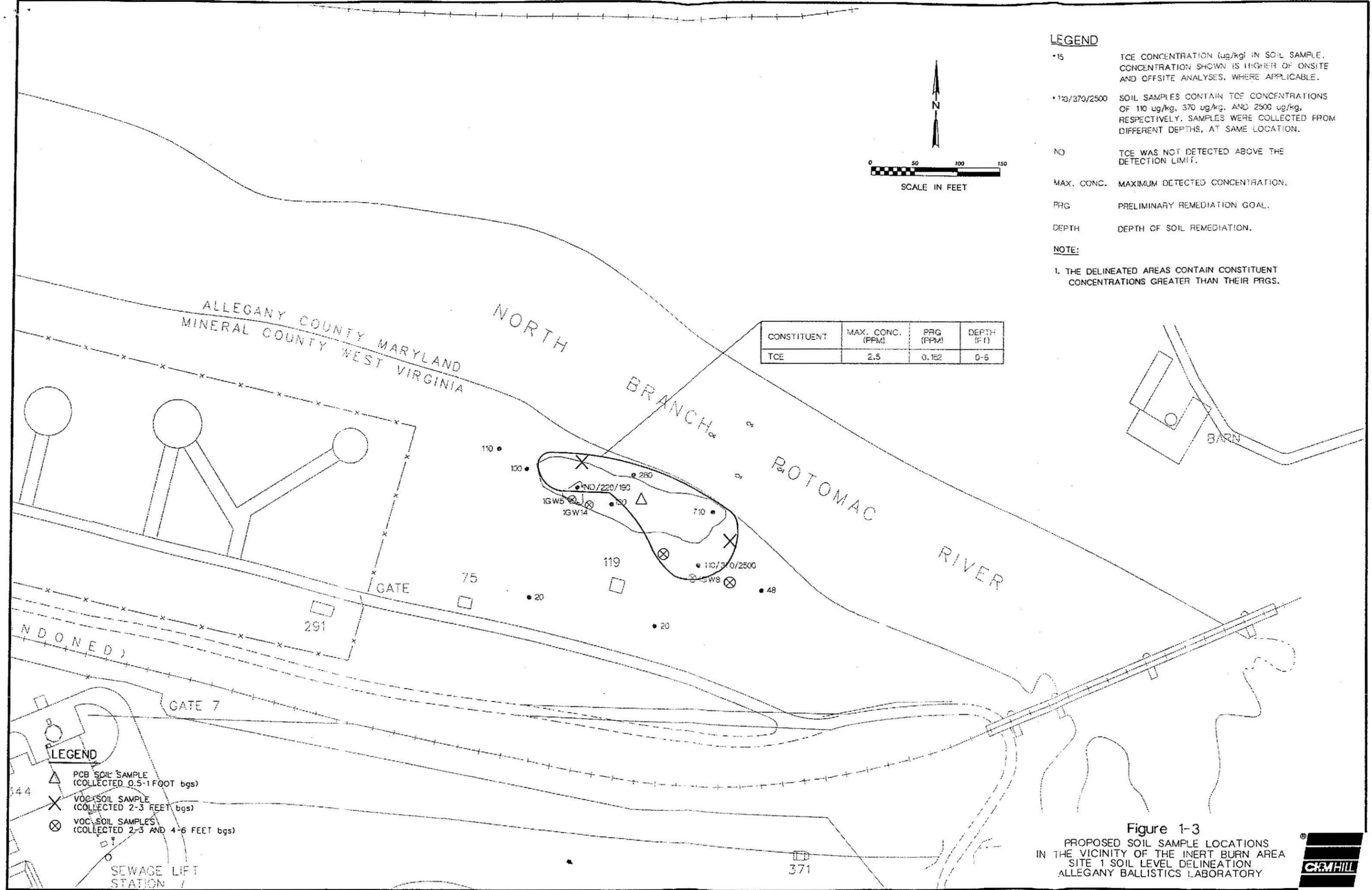
- 15 TCE CONCENTRATION (ug/kg) IN SOIL SAMPLE. CONCENTRATION SHOWN IS HIGHER OF ONSITE AND OFFSITE ANALYSES, WHERE APPLICABLE.
- 110/370/2500 SOIL SAMPLES CONTAIN TCE CONCENTRATIONS OF 110 ug/kg, 370 ug/kg, AND 2500 ug/kg, RESPECTIVELY. SAMPLES WERE COLLECTED FROM DIFFERENT DEPTHS, AT SAME LOCATION.
- ND TCE WAS NOT DETECTED ABOVE THE DETECTION LIMIT.
- MAX. CONC. MAXIMUM DETECTED CONCENTRATION.
- PRG PRELIMINARY REMEDIATION GOAL.
- DEPTH DEPTH OF SOIL REMEDIATION.

**NOTE:**

1. THE DELINEATED AREAS CONTAIN CONSTITUENT CONCENTRATIONS GREATER THAN THEIR PRGS.



CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	2.5	0.182	0-6



**Figure 1-3**  
 PROPOSED SOIL SAMPLE LOCATIONS  
 IN THE VICINITY OF THE INERT BURN AREA  
 SITE 1 SOIL LEVEL DELINEATION  
 ALLEGANY BALLISTICS LABORATORY





**Appendix D**  
**Raw Soil Data - 2001 and 2004 Supplemental**  
**Investigations**

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Table D-1  
Raw Data, Surface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB60		AS01-SB61		AS01-SB62		BG-004/004S/005/039		BG-008/008S/009/038	
Sample ID	AS01-SS60-0-0.5		AS01-SS61-0-0.5		AS01-SS62-0-0.5		HCS-BG-4S		HCS-BG-8S	
Sample Date	09/21/04		09/21/04		09/21/04		06/20/94		06/20/94	
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	910	UJ	18	U	710	U	12	U	11	U
1,1,2,2-Tetrachloroethane	910	UJ	18	UJ	710	U	12	U	11	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	910	UJ	18	U	710	U	NA		NA	
1,1,2-Trichloroethane	910	UJ	18	U	710	U	12	U	11	U
1,1-Dichloroethane	910	UJ	18	U	710	U	12	U	11	U
1,1-Dichloroethene	910	UJ	18	U	710	U	12	U	11	U
1,2,4-Trichlorobenzene	910	UJ	18	U	710	U	NA		NA	
1,2-Dibromo-3-chloropropane	910	R	18	U	710	R	NA		NA	
1,2-Dibromoethane	910	UJ	18	U	710	U	NA		NA	
1,2-Dichlorobenzene	910	UJ	18	U	710	U	NA		NA	
1,2-Dichloroethane	910	UJ	18	U	710	U	12	U	11	U
1,2-Dichloroethene (total)	NA		NA		NA		12	U	11	U
1,2-Dichloropropane	910	UJ	18	U	710	U	12	U	11	U
1,3-Dichlorobenzene	910	UJ	18	U	710	U	NA		NA	
1,4-Dichlorobenzene	910	UJ	18	U	710	U	NA		NA	
2-Butanone	910	UJ	18	U	710	U	12	U	11	U
2-Hexanone	910	UJ	18	UJ	710	U	12	U	11	U
4-Methyl-2-pentanone	910	UJ	18	UJ	710	U	12	U	11	U
Acetone	160	B	52	J	140	B	12	U	11	U
Benzene	910	UJ	18	U	710	U	12	U	11	U
Bromodichloromethane	910	UJ	18	U	710	U	12	U	11	U
Bromoform	910	UJ	18	U	710	U	12	U	11	U
Bromomethane	910	UJ	18	U	710	U	12	U	11	U
Carbon disulfide	910	UJ	18	U	710	U	12	U	11	U
Carbon tetrachloride	910	UJ	18	U	710	U	12	U	11	U
Chlorobenzene	910	UJ	18	UJ	710	U	6	J	11	U
Chloroethane	910	UJ	18	U	710	U	12	U	11	U
Chloroform	910	UJ	18	U	710	U	12	U	11	U
Chloromethane	910	UJ	18	U	710	U	12	U	11	U
Cumene	910	UJ	18	U	710	U	NA		NA	
Cyclohexane	910	UJ	18	U	710	U	NA		NA	
Dibromochloromethane	910	UJ	18	U	710	U	12	U	11	U
Dichlorodifluoromethane (Freon-12)	910	UJ	18	U	710	U	NA		NA	

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-1  
Raw Data, Surface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB60		AS01-SB61		AS01-SB62		BG-004/004S/005/039		BG-008/008S/009/038	
Sample ID	AS01-SS60-0-0.5		AS01-SS61-0-0.5		AS01-SS62-0-0.5		HCS-BG-4S		HCS-BG-8S	
Sample Date	09/21/04		09/21/04		09/21/04		06/20/94		06/20/94	
Chemical Name										
Ethylbenzene	910	UJ	18	UJ	710	U	5	J	11	U
Methyl acetate	910	UJ	18		180	J	NA		NA	
Methyl-tert-butyl ether (MTBE)	910	UJ	18	U	710	U	NA		NA	
Methylcyclohexane	910	UJ	18	U	710	U	NA		NA	
Methylene chloride	430	B	5.9	B	400	B	12	U	11	U
Styrene	910	UJ	18	UJ	710	U	3	J	1	J
Tetrachloroethene	910	UJ	18	UJ	710	U	12	U	11	U
Toluene	910	UJ	18	UJ	710	U	4	J	11	U
Trichloroethene	1,800	J	18	U	1,100		93		57	
Trichlorofluoromethane(Freon-11)	910	UJ	18	U	710	U	NA		NA	
Vinyl chloride	910	UJ	18	U	710	U	12	U	11	U
Xylene, total	910	UJ	18	UJ	710	U	15		11	U
cis-1,2-Dichloroethene	910	UJ	18	U	710	U	NA		NA	
cis-1,3-Dichloropropene	910	UJ	18	U	710	U	12	U	11	U
trans-1,2-Dichloroethene	910	UJ	18	U	710	U	NA		NA	
trans-1,3-Dichloropropene	910	UJ	18	U	710	U	12	U	11	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	450	U	440	U	420	U	NA		NA	
2,4,5-Trichlorophenol	1,100	U	1,100	U	1,100	U	NA		NA	
2,4,6-Trichlorophenol	450	U	440	U	420	U	NA		NA	
2,4-Dichlorophenol	450	U	440	U	420	U	NA		NA	
2,4-Dimethylphenol	450	U	440	U	420	U	NA		NA	
2,4-Dinitrophenol	1,100	U	1,100	U	1,100	U	NA		NA	
2-Chloronaphthalene	450	U	440	U	420	U	NA		NA	
2-Chlorophenol	450	U	440	U	420	U	NA		NA	
2-Methylnaphthalene	450	U	440	U	420	U	NA		NA	
2-Methylphenol	450	U	440	U	420	U	NA		NA	
2-Nitroaniline	1,100	U	1,100	U	1,100	U	NA		NA	
2-Nitrophenol	450	U	440	U	420	U	NA		NA	
3,3'-Dichlorobenzidine	450	U	440	U	420	U	NA		NA	
3-Nitroaniline	1,100	U	1,100	U	1,100	U	NA		NA	
4,6-Dinitro-2-methylphenol	1,100	U	1,100	U	1,100	U	NA		NA	
4-Bromophenyl-phenylether	450	U	440	U	420	U	NA		NA	
4-Chloro-3-methylphenol	450	U	440	U	420	U	NA		NA	

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result

U - Undetected  
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UL - Undetected, limit biased low

Table D-1  
 Raw Data, Surface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
Chemical Name					
4-Chloroaniline	450 U	440 U	420 U	NA	NA
4-Chlorophenyl-phenylether	450 U	440 U	420 U	NA	NA
4-Methylphenol	450 U	440 U	420 U	NA	NA
4-Nitroaniline	1,100 U	1,100 U	1,100 U	NA	NA
4-Nitrophenol	1,100 U	1,100 U	1,100 U	NA	NA
Acenaphthene	450 U	440 U	420 U	NA	NA
Acenaphthylene	450 U	440 U	420 U	NA	NA
Acetophenone	450 U	440 U	420 U	NA	NA
Anthracene	450 U	440 U	420 U	NA	NA
Atrazine	450 U	440 U	420 U	NA	NA
Benzaldehyde	450 U	440 U	420 U	NA	NA
Benzo(a)anthracene	450 U	440 U	420 U	NA	NA
Benzo(a)pyrene	450 U	440 U	420 U	NA	NA
Benzo(b)fluoranthene	67 J	440 U	45 J	NA	NA
Benzo(g,h,i)perylene	450 U	440 U	420 U	NA	NA
Benzo(k)fluoranthene	450 U	440 U	420 U	NA	NA
Butylbenzylphthalate	450 U	440 U	420 U	NA	NA
Caprolactam	450 U	440 U	420 U	NA	NA
Carbazole	450 U	440 U	420 U	NA	NA
Chrysene	49 J	440 U	420 U	NA	NA
Di-n-butylphthalate	450 U	440 U	420 U	NA	NA
Di-n-octylphthalate	450 U	440 U	420 U	NA	NA
Dibenz(a,h)anthracene	450 U	440 U	420 U	NA	NA
Dibenzofuran	450 U	440 U	420 U	NA	NA
Diethylphthalate	450 U	440 U	420 U	NA	NA
Dimethyl phthalate	450 U	440 U	420 U	NA	NA
Fluoranthene	77 J	440 U	93 J	NA	NA
Fluorene	450 U	440 U	420 U	NA	NA
Hexachlorobenzene	450 U	440 U	420 U	NA	NA
Hexachlorobutadiene	450 U	440 U	420 U	NA	NA
Hexachlorocyclopentadiene	450 U	440 U	420 U	NA	NA
Hexachloroethane	450 U	440 U	420 U	NA	NA
Indeno(1,2,3-cd)pyrene	450 U	440 U	420 U	NA	NA
Isophorone	450 U	440 U	420 U	NA	NA
Naphthalene	450 U	440 U	420 U	NA	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 R - Unusable result

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-1  
Raw Data, Surface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
Chemical Name					
Pentachlorophenol	1,100 U	1,100 U	1,100 U	NA	NA
Phenanthrene	64 J	440 U	78 J	NA	NA
Phenol	450 U	440 U	420 U	NA	NA
Pyrene	60 J	440 U	67 J	NA	NA
bis(2-Chloro-1-methylethyl) ether	450 U	440 U	420 U	NA	NA
bis(2-Chloroethoxy)methane	450 U	440 U	420 U	NA	NA
bis(2-Chloroethyl)ether	450 U	440 U	420 U	NA	NA
bis(2-Ethylhexyl)phthalate	450 U	440 U	66 J	NA	NA
n-Nitroso-di-n-propylamine	450 U	440 U	420 U	NA	NA
n-Nitrosodiphenylamine	450 U	440 U	420 U	NA	NA
Dioxin/Furans (UG/KG)					
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.11	0.031	0.039	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.032	0.01	0.032	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0056 J	0.0012 U	0.0061 J	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0029 U	8.60E-04 U	0.0014 U	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.012	0.0024 U	0.011	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0054 J	0.0017 U	0.0022 U	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0079	0.0015 U	0.0081	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0058 J	0.0025 U	0.0022 U	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.0016 U	4.00E-04 U	8.90E-04 U	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.002 U	8.80E-04 U	0.0012 U	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.0082	0.0018 U	0.0075	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0043 J	0.0013 U	0.0056 J	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0071	0.0015 U	0.0079	NA	NA
2,3,7,8-TCDD (dioxin)	7.70E-04 J	5.60E-04 U	4.50E-04 U	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.0078	0.0023	0.0057	NA	NA
Octachlorodibenzo-p-dioxin	0.97	0.46	0.3	NA	NA
Octachlorodibenzofuran	0.056	0.016	0.035	NA	NA
Total heptachlorodibenzo-p-dioxin	0.23	0.065	0.078	NA	NA
Total heptachlorodibenzofuran	0.067	0.019	0.058	NA	NA
Total hexachlorodibenzo-p-dioxin	0.052	0.0083	0.018	NA	NA
Total hexachlorodibenzofuran	0.05	0.0029 U	0.057	NA	NA
Total pentachlorodibenzo-p-dioxin	0.0086	9.40E-04 U	0.0035	NA	NA
Total pentachlorodibenzofuran	0.046	0.0024 U	0.069	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-1  
Raw Data, Surface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
Chemical Name					
Total tetrachlorodibenzo-p-dioxin	0.015	8.60E-04 U	0.011	NA	NA
Total tetrachlorodibenzofuran	0.071	0.011	0.094	NA	NA
<b>Explosives (UG/KG)</b>					
1,3,5-Trinitrobenzene	250 U	250 U	250 U	NA	NA
1,3-Dinitrobenzene	250 U	250 U	250 U	NA	NA
2,4,6-Trinitrotoluene	250 U	250 U	250 U	NA	NA
2,4-Dinitrotoluene	250 U	250 U	250 U	NA	NA
2,6-Dinitrotoluene	250 U	250 U	250 U	NA	NA
2-Amino-4,6-dinitrotoluene	250 U	250 U	250 U	NA	NA
2-Nitrotoluene	250 U	250 U	250 U	NA	NA
3-Nitrotoluene	250 U	250 U	250 U	NA	NA
4-Amino-2,6-dinitrotoluene	250 U	250 U	250 U	NA	NA
4-Nitrotoluene	250 U	250 U	250 U	NA	NA
HMX	250 J	500 U	3,300	NA	NA
Nitrobenzene	250 U	250 U	250 U	NA	NA
Nitroglycerin	2,500 U	2,500 U	2,500 U	NA	NA
PETN	2,500 U	2,500 U	2,500 U	NA	NA
Perchlorate	54.9 U	106 U	74	NA	NA
RDX	130 J	96 J	1,000	NA	NA
Tetryl	650 U	650 U	650 U	NA	NA
<b>Total Metals (MG/KG)</b>					
Aluminum	7,020	6,910	3,940	NA	NA
Antimony	0.74 UL	0.72 UL	0.69 UL	NA	NA
Arsenic	8	7	3.2	NA	NA
Barium	151	125	53.7	NA	NA
Beryllium	0.97 J	0.92 B	0.32 B	NA	NA
Cadmium	0.45 J	0.11 B	0.095 B	NA	NA
Calcium	1,870	1,450	266,000	NA	NA
Chromium	12.2	11.9	5.1	NA	NA
Cobalt	13.3 J	13 J	4 J	NA	NA
Copper	24.1	18.5	10.5	NA	NA
Cyanide	0.27 J	0.91	0.26 J	NA	NA
Iron	24,900	24,900	9,950	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-1  
 Raw Data, Surface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB60	AS01-SB61	AS01-SB62	BG-004/004S/005/039	BG-008/008S/009/038
Sample ID	AS01-SS60-0-0.5	AS01-SS61-0-0.5	AS01-SS62-0-0.5	HCS-BG-4S	HCS-BG-8S
Sample Date	09/21/04	09/21/04	09/21/04	06/20/94	06/20/94
Chemical Name					
Lead	42.5	25	16.3	NA	NA
Magnesium	930 J	939 J	3,960 J	NA	NA
Manganese	810	762	228	NA	NA
Mercury	0.12 J	0.11 J	0.067 J	NA	NA
Nickel	22.5	20	9.3 J	NA	NA
Potassium	1,030 J	912 J	852 J	NA	NA
Selenium	1.1 L	0.61 UL	0.65 L	NA	NA
Silver	0.27 U	0.27 U	0.25 U	NA	NA
Sodium	70.3 U	67.9 U	139 J	NA	NA
Thallium	1.3 U	1.3 U	1.2 U	NA	NA
Vanadium	18.8	18.8	11.9 J	NA	NA
Zinc	95.4	66.5	26.4	NA	NA
Wet Chemistry (MG/KG)					
% Moisture	27.1	24.6	21.4	NA	NA
Total organic carbon (TOC)	30,000	24,000	25,000	NA	NA
pH	6.1	5.7	8	NA	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 R - Unusable result

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1,2-Tetrachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,1-Trichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2,2-Tetrachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA						
1,1,2-Trichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1-Dichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1-Dichloroethene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2,3-Trichloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2,4-Trichlorobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1,2-Dibromo-3-chloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dibromoethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichlorobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1,2-Dichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloroethene (total)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,3-Dichlorobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1,4-Dichlorobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1,4-Dioxane	660 U	570 R	610 R	620 R	590 R	620 R	580 R
2-Butanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Chloro-1,3-butadiene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Chloroethyl vinyl ether	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Hexanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
4-Methyl-2-pentanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Acetone	6 U	6 U	6 U	5 J	10	16	6 U
Acetonitrile	260 U	230 U	240 U	250 U	240 U	250 U	230 U
Acrolein	66 U	57 R	61 R	62 R	59 R	62 R	58 R
Acrylonitrile	66 U	57 U	61 U	62 U	59 U	62 U	58 U
Allyl chloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Benzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromodichloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromoform	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Carbon disulfide	6 U	6 U	6 U	6 U	6 U	6 U	6 U

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result  
U - Undetected

K - Value biased high  
L - Value biased low  
UJ - Undetected, estimated limit  
UL - Undetected, limit biased low

Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
Carbon tetrachloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chlorobenzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chloroform	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Cumene	NA						
Cyclohexane	NA						
Dibromochloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Dibromomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Dichlorodifluoromethane (Freon-12)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Ethyl methacrylate	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Ethylbenzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Iodomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 UL
Isobutanol	260 U	230 R	240 R	250 R	240 R	250 R	230 R
Methacrylonitrile	130 U	110 U	120 U				
Methyl acetate	NA						
Methyl methacrylate	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Methyl methanesulfonate	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
Methyl-tert-butyl ether (MTBE)	NA						
Methylcyclohexane	NA						
Methylene chloride	3 B	4 B	4 B	5 B	9 B	2 B	6 B
Pentachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Propionitrile	130 U	110 R	120 R				
Styrene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Tetrachloroethene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Toluene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Trichloroethene	6 U	28	6 U	9	6 U	6 U	6 U
Trichlorofluoromethane(Freon-11)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Vinyl acetate	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Vinyl chloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Xylene, total	6 U	6 U	6 U	6 U	6 U	6 U	6 U
cis-1,2-Dichloroethene	NA						
cis-1,3-Dichloropropene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
trans-1,2-Dichloroethene	NA						
trans-1,3-Dichloropropene	6 U	6 U	6 U	6 U	6 U	6 U	6 U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
trans-1,4-Dichloro-2-butene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1,2,4,5-Tetrachlorobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1,4-Naphthoquinone	420 U	340 U	370 U	400 U	370 U	410 U	380 U
1-Naphthylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,3,4,6-Tetrachlorophenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,4,5-Trichlorophenol	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
2,4,6-Trichlorophenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,4-Dichlorophenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,4-Dimethylphenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,4-Dinitrophenol	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
2,6-Dichlorophenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Acetylaminofluorene	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
2-Chloronaphthalene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Chlorophenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Methyl-5-nitroaniline	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Methylaniline	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Methylnaphthalene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Methylphenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Naphthylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Nitroaniline	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
2-Nitrophenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Picoline	420 U	340 U	370 U	400 U	370 U	410 U	380 U
3,3'-Dichlorobenzidine	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
3,3'-Dimethylbenzidine	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
3-Methylcholanthrene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
3-Methylphenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
3-Nitroaniline	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
4,6-Dinitro-2-methylphenol	1,000 U	860 UJ	920 U	1,000 U	920 U	1,000 U	960 U
4-Aminobiphenyl	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
4-Bromophenyl-phenylether	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
4-Chloro-3-methylphenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
4-Chloroaniline	420 U	340 U	370 U	400 U	370 U	410 U	380 U

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
4-Chlorophenyl-phenylether	420 U	340 U	370 U	400 U	370 U	410 U	380 U
4-Methylphenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
4-Nitroaniline	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
4-Nitrophenol	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
4-Nitroquinoline-1-oxide	1,000 R	860 R	920 U	1,000 U	920 U	1,000 U	960 U
7,12-Dimethylbenz(a)anthracene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Acenaphthene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Acenaphthylene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Acetophenone	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Aniline	330 U						
Anthracene	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Aramite	1,000 U	860 UJ	920 U	1,000 U	920 U	1,000 U	960 U
Atrazine	NA						
Benzaldehyde	NA						
Benzo(a)anthracene	66 J	340 UJ	370 U	400 U	370 U	24 J	380 U
Benzo(a)pyrene	54 J	340 U	370 U	400 U	370 U	23 J	380 U
Benzo(b)fluoranthene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Benzo(g,h,i)perylene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Benzo(k)fluoranthene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Benzoic acid	200 B	860 U	920 U	1,000 U	920 U	1,000 U	960 U
Benzyl alcohol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Butylbenzylphthalate	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Caprolactam	NA						
Carbazole	330 U						
Chlorobenzilate	420 R	340 R	370 U	400 U	370 U	410 U	380 U
Chrysene	110 J	340 UJ	26 J	400 U	370 U	43 J	33 J
Di-n-butylphthalate	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Di-n-octylphthalate	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Diallate	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Dibenz(a,h)anthracene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Dibenzofuran	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Diethylphthalate	420 U	160 J	370 U	400 U	370 U	410 U	380 U
Dimethoate	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Dimethyl phthalate	420 U	2,300	370 U	400 U	370 U	410 U	380 U
Dinoseb	420 U	340 U	370 U	400 U	370 U	410 U	380 U

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Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
Diphenylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Disulfoton	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Ethyl methanesulfonate	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Famphur	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Fluoranthene	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Fluorene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Hexachlorobenzene	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Hexachlorobutadiene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Hexachlorocyclopentadiene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Hexachloroethane	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Hexachlorophene	17,000 U	14,000 U	15,000 U	16,000 U	15,000 U	16,000 U	15,000 U
Hexachloropropene	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
Indeno(1,2,3-cd)pyrene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Isodrin	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Isophorone	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Isosafrole	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Kepone	1,000 U	860 UJ	920 U	1,000 U	920 U	1,000 U	960 U
Methapyrilene	1,000 U	860 UJ	920 U	1,000 U	920 U	1,000 U	960 U
Methyl parathion	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
N-Nitrosomorpholine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
N-Nitrosopiperidine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Naphthalene	40 J	340 U	370 U	400 U	370 U	410 U	380 U
O,O,O-Triethyl phosphorothioate	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Parathion	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Pentachlorobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Pentachloronitrobenzene	1,000 U	860 UJ	920 U	1,000 U	920 U	1,000 U	960 U
Pentachlorophenol	1,000 U	860 UJ	920 U	1,000 U	920 U	1,000 U	960 U
Phenacetin	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Phenanthrene	140 J	340 UJ	39 J	400 U	370 U	60 J	50 J
Phenol	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Phorate	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Pronamide	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Pyrene	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Pyridine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Safrole	420 U	340 U	370 U	400 U	370 U	410 U	380 U

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
Sulfotepp	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
Thionazin	420 U	340 U	370 U	400 U	370 U	410 U	380 U
a,a-Dimethylphenethylamine	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
bis(2-Chloro-1-methylethyl) ether	420 U	340 U	370 U	400 U	370 U	410 U	380 U
bis(2-Chloroethoxy)methane	420 U	340 U	370 U	400 U	370 U	410 U	380 U
bis(2-Chloroethyl)ether	420 U	340 U	370 U	400 U	370 U	410 U	380 U
bis(2-Ethylhexyl)phthalate	420 U	97 J	1,300	400 U	370 U	74 J	150 J
n-Nitroso-di-n-butylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
n-Nitroso-di-n-propylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
n-Nitroso-n-methylethylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
n-Nitrosodiethylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
n-Nitrosodimethylamine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
n-Nitrosodiphenylamine	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
n-Nitrosopyrrolidine	420 U	340 U	370 U	400 U	370 U	410 U	380 U
p-Dimethylaminoazobenzene	420 U	340 UJ	370 U	400 U	370 U	410 U	380 U
p-Phenylenediamine	1,000 U	860 U	920 U	1,000 U	920 U	1,000 U	960 U
Dioxin/Furans (UG/KG)							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.054 J	0.056 J	0.121 U	0.126 U	0.105 U	0.116 U	0.095 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.046 U	0.039	0.062 U	0.064 U	0.039 U	0.056 U	0.04 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.056 U	0.018 U	0.074 U	0.077 U	0.047 U	0.068 U	0.047 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.132 U	0.168 U	0.136 U	0.104 U	0.087 U	0.127 U	0.11 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.023 U	0.028 U	0.032 U	0.032 U	0.019 U	0.012 U	0.021 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.116 U	0.147 U	0.119 U	0.091 U	0.076 U	0.111 U	0.099 U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.02 U	0.024 U	0.028 U	0.027 U	0.016 U	0.01 U	0.018 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.111 U	0.146 U	0.114 U	0.123 U	0.103 U	0.106 U	0.093 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.023 U	0.028 U	0.03 U	0.031 U	0.019 U	0.013 U	0.019 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.074 U	0.088 U	0.066 U	0.068 U	0.089 U	0.069 U	0.033 U
1,2,3,7,8-Pentachlorodibenzofuran	0.082 U	0.102 U	0.068 U	0.078 U	0.074 U	0.077 U	0.074 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.023 U	0.028 U	0.03 U	0.032 U	0.019 U	0.013 U	0.02 U
2,3,4,7,8-Pentachlorodibenzofuran	0.071 U	0.088 U	0.059 U	0.068 U	0.065 U	0.067 U	0.064 U
2,3,7,8-TCDD (dioxin)	0.008 U	0.01 U	0.007 U	0.008 U	0.007 U	0.008 U	0.007 U
2,3,7,8-Tetrachlorodibenzofuran	0.007 U	0.008 U	0.005 U	0.006 U	0.006 U	0.006 U	0.006 U
Octachlorodibenzo-p-dioxin	0.722	0.411	0.307	0.109	0.09	0.366	0.347
Octachlorodibenzofuran	0.073 U	0.08	0.114 U	0.078 U	0.09 U	0.1 U	0.085 U

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 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
Total heptachlorodibenzo-p-dioxin	0.012 U	0.056	0.121 U	0.126 U	0.105 U	0.116 U	0.095 U
Total heptachlorodibenzofuran	0.046 U	0.039	0.067 U	0.064 U	0.039 U	0.056 U	0.04 U
Total hexachlorodibenzo-p-dioxin	0.116 U	0.147 U	0.119 U	0.091 U	0.076 U	0.111 U	0.099 U
Total hexachlorodibenzofuran	0.02 U	0.024 U	0.028 U	0.027 U	0.016 U	0.01 U	0.018 U
Total pentachlorodibenzo-p-dioxin	NA						
Total pentachlorodibenzofuran	NA						
Total tetrachlorodibenzo-p-dioxin	NA						
Total tetrachlorodibenzofuran	NA						
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	420 U	340 U	476 R	454 R	454 R	476 R	417 R
1,3-Dinitrobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,4,6-Trinitrotoluene	454 U	454 U	476 U	454 U	454 U	476 U	417 U
2,4-Dinitrotoluene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2,6-Dinitrotoluene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
2-Amino-4,6-dinitrotoluene	454 U	454 U	476 U	454 U	454 U	476 U	417 U
2-Nitrotoluene	454 U	454 U	476 U	454 U	454 U	476 U	417 U
3-Nitrotoluene	454 U	454 U	476 U	454 U	454 U	476 U	417 U
4-Amino-2,6-dinitrotoluene	454 U	454 U	476 U	454 U	454 U	476 U	417 U
4-Nitrotoluene	454 U	454 U	476 U	454 U	454 U	476 U	417 U
HMX	454 U	1,190	2,400	454 U	2,250	476 U	417 U
Nitrobenzene	420 U	340 U	370 U	400 U	370 U	410 U	380 U
Nitroglycerin	454 U	476 U	476 U	476 U	454 U	454 U	435 U
PETN	NA						
Perchlorate	66 U	56 U	68	96	880	95	58 U
RDX	454 U	735	476 U	454 U	784	476 U	417 U
Tetryl	454 U	454 U	476 U	454 U	454 U	476 U	417 U
Total Metals (MG/KG)							
Aluminum	7,800	4,680	7,490	7,540	7,590	7,410	6,280
Antimony	1.7 L	1.2 L	0.98 L	1.3 L	1.4 L	1.1 L	0.49 L
Arsenic	9.5	5	7.6	6.8	7.2	7.6	6.1
Barium	165	77.6	154	134	176	153	136
Beryllium	1.2 K	0.54 K	1.1 K	1 K	1.1 K	1 K	0.88 K
Cadmium	0.71	0.7	0.57 J	0.56 J	1.3	0.63	0.79

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Station ID	AS01-SB01	AS01-SB02	AS01-SB03	AS01-SB04	AS01-SB05	AS01-SB06	AS01-SB07
Sample ID	AS01-SS01-R01X	AS01-SS02-R01X	AS01-SS03-R01X	AS01-SS04-R01X	AS01-SS05-R01X	AS01-SS06-R01X	AS01-SS07-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/21/01	02/22/01
Chemical Name							
Calcium	NA						
Chromium	14.7	8.8	13.4	13.5	13.5	14.8	23.8
Cobalt	15.1	6.9	15	14.1	15	14.7	11.5
Copper	27.5	22.5	22.4	19.2	19.3	19.3	20.5
Cyanide	0.26 J	0.19 J	0.46 J	0.19 J	0.54 J	0.28 J	0.24 J
Iron	30,800	15,800	32,700	31,600	32,400	30,200	24,800
Lead	39.3	1,730	25.2	34.3	55.2	26.9	25.9
Magnesium	NA						
Manganese	954	419	912	797	1,010	928	783
Mercury	0.09	0.08	0.05	0.05	0.04	0.05	0.05
Nickel	24.1 K	16 K	20.9 K	20.6 K	22 K	23.1 K	20.8 K
Potassium	NA						
Selenium	0.47 J	0.33 U	0.35 U	0.36 U	0.33 U	0.44 J	0.33 U
Silver	0.23 J	0.54 J	0.12 U	0.12 U	0.11 U	0.12 U	0.11 U
Sodium	NA						
Thallium	0.29 J	0.22 U	0.82 J	0.34 J	0.54 J	0.79 J	0.34 J
Tin	8 J	7.6 J	4.4 J	5.6 J	4.5 J	5.6 J	4.7 J
Vanadium	22.1	14.6	19.8	20.2	19.9	23.5	21.9
Zinc	108 K	271 K	73.6 K	100 K	75.6 K	98.9 K	86.3 K
Wet Chemistry (MG/KG)							
% Moisture	NA						
Nitrate	3.5	1.1 U	1.2 U	1.5	4.5	1.2 U	1.2 U
Nitrite	1.3 U	1.1 U	1.2 U				
Total organic carbon (TOC)	78,400	35,300	23,400	21,200	19,000	42,100	32,700
pH	7.3	7.5	7.1	6.3	7.1	5.7	7.5

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09			AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13	
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X	AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X	
Sample Date	02/21/01		02/22/01	02/22/01		02/22/01		02/22/01		02/22/01		02/22/01	
Chemical Name													
<b>Volatile Organic Compounds (UG/KG)</b>													
1,1,1,2-Tetrachloroethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,1,1-Trichloroethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,1,2,2-Tetrachloroethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA		NA		NA		NA		NA		NA		NA
1,1,2-Trichloroethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,1-Dichloroethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,1-Dichloroethene	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,2,3-Trichloropropane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,2,4-Trichlorobenzene	400 U		390 U		410 U		400 U		360 U		380 U		410 U
1,2-Dibromo-3-chloropropane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,2-Dibromoethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,2-Dichlorobenzene	400 U		390 U		410 U		400 U		360 U		380 U		410 U
1,2-Dichloroethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,2-Dichloroethene (total)	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,2-Dichloropropane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
1,3-Dichlorobenzene	400 U		390 U		410 U		400 U		360 U		380 U		410 U
1,4-Dichlorobenzene	400 U		390 U		410 U		400 U		360 U		380 U		410 U
1,4-Dioxane	630 R		600 R		630 R		610 R		590 R		620 R		630 R
2-Butanone	6 U		6 U		6 U		6 U		6 U		6 U		6 U
2-Chloro-1,3-butadiene	6 U		6 U		6 U		6 U		6 U		6 U		6 U
2-Chloroethyl vinyl ether	6 U		6 U		6 U		6 U		6 U		6 U		6 U
2-Hexanone	6 U		6 U		6 U		6 U		6 U		6 U		6 U
4-Methyl-2-pentanone	6 U		6 U		6 U		6 U		6 U		6 U		6 U
Acetone	12		12 B		6 U		8 B		6 B		6 U		6 U
Acetonitrile	250 U		240 U		250 U		240 U		240 U		250 U		250 U
Acrolein	63 R		60 R		63 R		61 R		59 R		62 R		63 R
Acrylonitrile	63 U		60 U		63 U		61 U		59 U		62 U		63 U
Allyl chloride	6 U		6 U		6 U		6 U		6 U		6 U		6 U
Benzene	6 U		6 U		6 U		6 U		6 U		6 U		6 U
Bromodichloromethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
Bromoform	6 U		6 U		6 U		6 U		6 U		6 U		6 U
Bromomethane	6 U		6 U		6 U		6 U		6 U		6 U		6 U
Carbon disulfide	6 U		6 U		6 U		6 U		6 U		6 U		6 U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09			AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13		
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X	AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X		
Sample Date	02/21/01		02/22/01	02/22/01		02/22/01		02/22/01		02/22/01		02/22/01		
Chemical Name														
Carbon tetrachloride	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Chlorobenzene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Chloroethane	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Chloroform	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Chloromethane	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Cumene	NA		NA		NA		NA		NA		NA		NA	
Cyclohexane	NA		NA		NA		NA		NA		NA		NA	
Dibromochloromethane	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Dibromomethane	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Dichlorodifluoromethane (Freon-12)	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Ethyl methacrylate	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Ethylbenzene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Iodomethane	6	U	6	UL	6	UL	6	UL	6	UL	6	UL	6	UL
Isobutanol	250	R	240	R	250	R	240	R	240	R	250	R	250	R
Methacrylonitrile	130	U	120	U	130	U	120	U	120	U	120	U	130	U
Methyl acetate	NA		NA		NA		NA		NA		NA		NA	
Methyl methacrylate	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Methyl methanesulfonate	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Methyl-tert-butyl ether (MTBE)	NA		NA		NA		NA		NA		NA		NA	
Methylcyclohexane	NA		NA		NA		NA		NA		NA		NA	
Methylene chloride	9	B	8	B	9	B	4	B	15	B	10	B	3	B
Pentachloroethane	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Propionitrile	130	R	120	R	130	R	120	R	120	R	120	R	130	R
Styrene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Tetrachloroethene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Toluene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Trichloroethene	6	U	6	U	6	U	6	U	3	J	6	U	6	U
Trichlorofluoromethane(Freon-11)	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Vinyl acetate	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Vinyl chloride	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Xylene, total	6	U	6	U	6	U	6	U	6	U	6	U	6	U
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
cis-1,3-Dichloropropene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
trans-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA		NA	
trans-1,3-Dichloropropene	6	U	6	U	6	U	6	U	6	U	6	U	6	U

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Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09			AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13		
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X	AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X		
Sample Date	02/21/01		02/22/01	02/22/01		02/22/01		02/22/01		02/22/01		02/22/01		
Chemical Name														
trans-1,4-Dichloro-2-butene	6	U	6	U	6	U	6	U	6	U	6	U	6	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>														
1,1-Biphenyl	400	U	390	U	410	U	400	U	360	U	380	U	410	U
1,2,4,5-Tetrachlorobenzene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
1,4-Naphthoquinone	400	U	390	U	410	U	400	U	360	U	380	U	410	U
1-Naphthylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,3,4,6-Tetrachlorophenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,4,5-Trichlorophenol	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
2,4,6-Trichlorophenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,4-Dichlorophenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,4-Dimethylphenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,4-Dinitrophenol	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
2,6-Dichlorophenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Acetylaminofluorene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Chloronaphthalene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Chlorophenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Methyl-5-nitroaniline	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Methylaniline	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Methylnaphthalene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Methylphenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Naphthylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Nitroaniline	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
2-Nitrophenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Picoline	400	U	390	U	410	U	400	U	360	U	380	U	410	U
3,3'-Dichlorobenzidine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
3,3'-Dimethylbenzidine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
3-Methylcholanthrene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
3-Methylphenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
3-Nitroaniline	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
4,6-Dinitro-2-methylphenol	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
4-Aminobiphenyl	400	U	390	U	410	U	400	U	360	U	380	U	410	U
4-Bromophenyl-phenylether	400	U	390	U	410	U	400	U	360	U	380	U	410	U
4-Chloro-3-methylphenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
4-Chloroaniline	400	U	390	U	410	U	400	U	360	U	380	U	410	U

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09		AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13			
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X		AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X	
Sample Date	02/21/01		02/22/01		02/22/01		02/22/01		02/22/01		02/22/01		02/22/01	
Chemical Name														
4-Chlorophenyl-phenylether	400	U	390	U	410	U	400	U	360	U	380	U	410	U
4-Methylphenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
4-Nitroaniline	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
4-Nitrophenol	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
4-Nitroquinoline-1-oxide	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
7,12-Dimethylbenz(a)anthracene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Acenaphthene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Acenaphthylene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Acetophenone	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Aniline	330	U	330	U	330	U	330	U	330	U	330	U	330	U
Anthracene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Aramite	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Atrazine	NA		NA		NA		NA		NA		NA		NA	
Benzaldehyde	NA		NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	400	U	390	U	24	J	400	U	360	U	380	U	410	U
Benzo(a)pyrene	400	U	24	J	410	U	400	U	360	U	380	U	410	U
Benzo(b)fluoranthene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Benzo(g,h,i)perylene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Benzo(k)fluoranthene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Benzoic acid	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Benzyl alcohol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Butylbenzylphthalate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Caprolactam	NA		NA		NA		NA		NA		NA		NA	
Carbazole	330	U	330	U	330	U	330	U	330	U	330	U	330	U
Chlorobenzilate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Chrysene	24	J	47	J	43	J	42	J	360	U	26	J	37	J
Di-n-butylphthalate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Di-n-octylphthalate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Diallate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Dibenz(a,h)anthracene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Dibenzofuran	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Diethylphthalate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Dimethoate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Dimethyl phthalate	400	U	1,100		410	U	400	U	360	U	380	U	410	U
Dinoseb	400	U	390	U	410	U	400	U	360	U	380	U	410	U

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Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09		AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13			
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X		AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X	
Sample Date	02/21/01		02/22/01		02/22/01		02/22/01		02/22/01		02/22/01		02/22/01	
Chemical Name														
Diphenylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Disulfoton	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Ethyl methanesulfonate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Famphur	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Fluoranthene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Fluorene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Hexachlorobenzene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Hexachlorobutadiene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Hexachlorocyclopentadiene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Hexachloroethane	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Hexachlorophene	16,000	U	15,000	U	16,000	U	16,000	U	14,000	U	15,000	U	16,000	U
Hexachloropropene	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Indeno(1,2,3-cd)pyrene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Isodrin	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Isophorone	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Isosafrole	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Kepone	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Methapyrilene	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Methyl parathion	400	U	390	U	410	U	400	U	360	U	380	U	410	U
N-Nitrosomorpholine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
N-Nitrosopiperidine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Naphthalene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
O,O,O-Triethyl phosphorothioate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Parathion	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Pentachlorobenzene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Pentachloronitrobenzene	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Pentachlorophenol	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
Phenacetin	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Phenanthrene	31	J	57	J	58	J	48	J	360	U	39	J	52	J
Phenol	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Phorate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Pronamide	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Pyrene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Pyridine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Safrole	400	U	390	U	410	U	400	U	360	U	380	U	410	U

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result  
U - Undetected

K - Value biased high  
L - Value biased low  
UJ - Undetected, estimated limit  
UL - Undetected, limit biased low

Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09			AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13		
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X	AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X		
Sample Date	02/21/01		02/22/01	02/22/01		02/22/01		02/22/01		02/22/01		02/22/01		
Chemical Name														
Sulfotepp	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Thionazin	400	U	390	U	410	U	400	U	360	U	380	U	410	U
a,a-Dimethylphenethylamine	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
bis(2-Chloro-1-methylethyl) ether	400	U	390	U	410	U	400	U	360	U	380	U	410	U
bis(2-Chloroethoxy)methane	400	U	390	U	410	U	400	U	360	U	380	U	410	U
bis(2-Chloroethyl)ether	400	U	390	U	410	U	400	U	360	U	380	U	410	U
bis(2-Ethylhexyl)phthalate	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitroso-di-n-butylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitroso-di-n-propylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitroso-n-methylethylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitrosodiethylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitrosodimethylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitrosodiphenylamine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
n-Nitrosopyrrolidine	400	U	390	U	410	U	400	U	360	U	380	U	410	U
p-Dimethylaminoazobenzene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
p-Phenylenediamine	1,000	U	970	U	1,000	U	990	U	890	U	950	U	1,000	U
<b>Dioxin/Furans (UG/KG)</b>														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.102	U	0.066	U	0.085	U	0.07	U	0.076	U	0.087	U	0.074	U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.051	U	0.03	U	0.049	U	0.033	U	0.034	U	0.033	U	0.036	U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.061	U	0.035	U	0.057	U	0.038	U	0.04	U	0.039	U	0.042	U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.115	U	0.051	U	0.08	U	0.081	U	0.087	U	0.068	U	0.055	U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.01	U	0.015	U	0.025	U	0.018	U	0.009	U	0.009	U	0.008	U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.1	U	0.046	U	0.073	U	0.073	U	0.079	U	0.062	U	0.05	U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.009	U	0.013	U	0.022	U	0.015	U	0.008	U	0.008	U	0.007	U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.099	U	0.066	U	0.081	U	0.071	U	0.076	U	0.086	U	0.072	U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.01	U	0.014	U	0.024	U	0.016	U	0.009	U	0.016	U	0.017	U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.032	U	0.044	U	0.048	U	0.047	U	0.026	U	0.035	U	0.026	U
1,2,3,7,8-Pentachlorodibenzofuran	0.068	U	0.037	U	0.033	U	0.049	U	0.054	U	0.073	U	0.031	U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.01	U	0.015	U	0.024	U	0.017	U	0.009	U	0.017	U	0.018	U
2,3,4,7,8-Pentachlorodibenzofuran	0.059	U	0.031	U	0.029	U	0.042	U	0.046	U	0.063	U	0.027	U
2,3,7,8-TCDD (dioxin)	0.007	U	0.005	U	0.006	U	0.005	U	0.006	U	0.007	U	0.006	U
2,3,7,8-Tetrachlorodibenzofuran	0.008	U	0.007	U	0.006	U	0.005	U	0.004	U	0.006	U	0.006	U
Octachlorodibenzo-p-dioxin	0.345		0.427		0.402		0.39		0.1		0.284		0.414	
Octachlorodibenzofuran	0.086	U	0.066	U	0.092	U	0.069	U	0.049	U	0.07	U	0.073	U

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UL - Undetected, limit biased low

Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08		AS01-SB09			AS01-SB10		AS01-SB11		AS01-SB12		AS01-SB13		
Sample ID	AS01-SS08-R01X		AS01-SS09-R01X	AS01-SS09P-R01X		AS01-SS10-R01X		AS01-SS11-R01X		AS01-SS12-R01X		AS01-SS13-R01X		
Sample Date	02/21/01		02/22/01	02/22/01		02/22/01		02/22/01		02/22/01		02/22/01		
Chemical Name														
Total heptachlorodibenzo-p-dioxin	0.102	U	0.066	U	0.085	U	0.07	U	0.076	U	0.087	U	0.074	U
Total heptachlorodibenzofuran	0.051	U	0.03	U	0.049	U	0.033	U	0.034	U	0.033	U	0.036	U
Total hexachlorodibenzo-p-dioxin	0.1	U	0.046	U	0.073	U	0.073	U	0.079	U	0.062	U	0.05	U
Total hexachlorodibenzofuran	0.009	U	0.013	U	0.022	U	0.015	U	0.008	U	0.008	U	0.007	U
Total pentachlorodibenzo-p-dioxin	NA		NA		NA		NA		NA		NA		NA	
Total pentachlorodibenzofuran	NA		NA		NA		NA		NA		NA		NA	
Total tetrachlorodibenzo-p-dioxin	NA		NA		NA		NA		NA		NA		NA	
Total tetrachlorodibenzofuran	NA		NA		NA		NA		NA		NA		NA	
<b>Explosives (UG/KG)</b>														
1,3,5-Trinitrobenzene	435	R	417	R	454	R	417	R	417	R	454	R	417	R
1,3-Dinitrobenzene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,4,6-Trinitrotoluene	435	U	417	U	454	U	417	U	417	U	454	U	417	U
2,4-Dinitrotoluene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2,6-Dinitrotoluene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
2-Amino-4,6-dinitrotoluene	435	U	417	U	454	U	417	U	417	U	454	U	417	U
2-Nitrotoluene	435	U	417	U	454	U	417	U	417	U	454	U	417	U
3-Nitrotoluene	435	U	417	U	454	U	417	U	417	U	454	U	417	U
4-Amino-2,6-dinitrotoluene	435	U	417	U	454	U	417	U	417	U	454	U	417	U
4-Nitrotoluene	435	U	417	U	454	U	417	U	417	U	454	U	417	U
HMX	258	J	417	U	454	U	124	J	506		130	J	417	U
Nitrobenzene	400	U	390	U	410	U	400	U	360	U	380	U	410	U
Nitroglycerin	454	U	417	U	476	U	435	U	435	U	435	U	417	U
PETN	NA		NA		NA		NA		NA		NA		NA	
Perchlorate	63	U	60	U	63	U	61	U	58	U	62	U	64	U
RDX	435	U	417	U	454	U	417	U	417	U	454	U	417	U
Tetryl	435	U	417	U	454	U	417	U	417	U	454	U	417	U
<b>Total Metals (MG/KG)</b>														
Aluminum	7,320		9,240		9,800		8,350		9,510		7,950		10,400	
Antimony	0.96	L	1.1	L	0.87	L	1.4	L	0.81	L	1.9	L	0.82	L
Arsenic	6.9		7.4		7.4		6.8		6.6		7.3		7.8	
Barium	185		219		239		208		161		213		181	
Beryllium	1.1	K	1.2	K	1.2	K	1.1	K	0.99	K	1.1	K	1.2	K
Cadmium	0.63		1		0.77		0.67		0.71		0.81		0.72	

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB08	AS01-SB09		AS01-SB10	AS01-SB11	AS01-SB12	AS01-SB13
Sample ID	AS01-SS08-R01X	AS01-SS09-R01X	AS01-SS09P-R01X	AS01-SS10-R01X	AS01-SS11-R01X	AS01-SS12-R01X	AS01-SS13-R01X
Sample Date	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	12.7	14.6	15	13.2	15.7	14	16
Cobalt	13.6	14.5 K	14.4 K	15 K	15 K	14.6	16.5 K
Copper	18.1	21.5	21.6	17.9	17.6	19.7	20.7
Cyanide	0.37 J	0.26 J	0.35 J	0.35 J	0.06 U	0.33 J	0.23 J
Iron	28,200	28,900	29,200	30,100	33,200	30,700	33,200
Lead	30	38	31.3	29.5	96.9	53.4	25
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	982	1,080	1,120	999	730	1,120	1,050
Mercury	0.05	0.07	0.08	0.05	0.04	0.05	0.06
Nickel	21.1 K	25	25.6	22.3	33.4	22.8 K	28.1
Potassium	NA	NA	NA	NA	NA	NA	NA
Selenium	0.37 J	0.36 U	0.38 U	0.36 U	0.33 U	0.5 J	0.38 U
Silver	0.12 U	0.12 U	0.13 U	0.12 U	0.26 J	0.12 U	0.13 U
Sodium	NA	NA	NA	NA	NA	NA	NA
Thallium	0.68 J	0.68 J	0.46 J	0.78 J	1.1 J	0.24 U	0.88 J
Tin	4.7 J	5.6 J	6 J	4.3 J	4.1 J	4.7 J	4.9 J
Vanadium	19.7	24.6	25	22.5	21.4	20.1	33.1
Zinc	74.8 K	116 K	103 K	78 K	92.5 K	83.3 K	93.4 K
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	NA
Nitrate	1.3 U	1.5	1.3 U	4.2	1.2 U	1.6	1.7
Nitrite	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.2 U	1.3 U
Total organic carbon (TOC)	31,300	42,800	42,800	30,400	7,420	29,300	23,900
pH	6.5	7	6.8	7.6	6.9	6.9	7.5

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14	AS01-SB15	AS01-SB16		AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SS14-R01X	AS01-SS15-R01X	AS01-SS16-R01X	AS01-SS16P-R01X	AS01-SS17-R01X	AS01-SS18-R01X	AS01-SS19-R01X
Sample Date	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1,2-Tetrachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,1-Trichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2,2-Tetrachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1-Dichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1-Dichloroethene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2,3-Trichloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2,4-Trichlorobenzene	410 U	380 U	380 U	380 U	380 U	380 UL	400 U
1,2-Dibromo-3-chloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dibromoethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichlorobenzene	410 U	380 U	380 UL	380 U	380 U	380 U	400 U
1,2-Dichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloroethene (total)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,3-Dichlorobenzene	410 U	380 U	380 UL	380 U	380 U	380 U	400 U
1,4-Dichlorobenzene	410 U	380 U	380 UL	380 U	380 U	380 U	400 U
1,4-Dioxane	620 R	600 R	590 R	600 R	610 R	620 R	620 R
2-Butanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Chloro-1,3-butadiene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Chloroethyl vinyl ether	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Hexanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
4-Methyl-2-pentanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Acetone	8 B	6 U	6 U	6 U	6 U	6 U	6 U
Acetonitrile	250 U	240 U	240 U	240 U	240 U	250 U	250 U
Acrolein	62 R	60 R	59 R	60 R	61 R	62 R	62 R
Acrylonitrile	62 U	60 U	59 U	60 U	61 U	62 U	62 U
Allyl chloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Benzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromodichloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromoform	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Carbon disulfide	6 U	6 U	6 U	6 U	6 U	6 U	6 U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15		AS01-SB16		AS01-SB17		AS01-SB18		AS01-SB19	
Sample ID	AS01-SS14-R01X		AS01-SS15-R01X		AS01-SS16-R01X		AS01-SS17-R01X		AS01-SS18-R01X		AS01-SS19-R01X	
Sample Date	02/21/01		02/21/01		02/22/01		02/22/01		02/22/01		02/22/01	
Chemical Name												
Carbon tetrachloride	6	U	6	U	6	U	6	U	6	U	6	U
Chlorobenzene	6	U	6	U	6	U	6	U	6	U	6	U
Chloroethane	6	U	6	U	6	U	6	U	6	U	6	U
Chloroform	6	U	6	U	6	U	6	U	6	U	6	U
Chloromethane	6	U	6	U	6	U	6	U	6	U	6	U
Cumene	NA											
Cyclohexane	NA											
Dibromochloromethane	6	U	6	U	6	U	6	U	6	U	6	U
Dibromomethane	6	U	6	U	6	U	6	U	6	U	6	U
Dichlorodifluoromethane (Freon-12)	6	U	6	U	6	U	6	U	6	U	6	U
Ethyl methacrylate	6	U	6	U	6	U	6	U	6	U	6	U
Ethylbenzene	6	U	6	U	6	U	6	U	6	U	6	U
Iodomethane	6	UL										
Isobutanol	250	R	240	R	240	R	240	R	240	R	250	R
Methacrylonitrile	120	U										
Methyl acetate	NA											
Methyl methacrylate	6	U	6	U	6	R	6	U	6	U	6	U
Methyl methanesulfonate	1,000	U	960	U	940	UL	950	U	960	U	950	U
Methyl-tert-butyl ether (MTBE)	NA											
Methylcyclohexane	NA											
Methylene chloride	6	B	3	B	5	B	8	B	6	B	4	B
Pentachloroethane	6	U	6	U	6	U	6	U	6	U	6	U
Propionitrile	120	R										
Styrene	6	U	6	U	6	U	6	U	6	U	6	U
Tetrachloroethene	6	U	6	U	6	U	6	U	6	U	6	U
Toluene	6	U	6	U	6	U	6	U	6	U	6	U
Trichloroethene	6	U	6	U	6	U	6	U	6	U	6	U
Trichlorofluoromethane(Freon-11)	6	U	6	U	6	U	6	U	6	U	6	U
Vinyl acetate	6	U	6	U	6	U	6	U	6	U	6	U
Vinyl chloride	6	U	6	U	6	U	6	U	6	U	6	U
Xylene, total	6	U	6	U	6	U	6	U	6	U	6	U
cis-1,2-Dichloroethene	NA											
cis-1,3-Dichloropropene	6	U	6	U	6	U	6	U	6	U	6	U
trans-1,2-Dichloroethene	NA											
trans-1,3-Dichloropropene	6	U	6	U	6	U	6	U	6	U	6	U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15		AS01-SB16		AS01-SB17		AS01-SB18		AS01-SB19			
Sample ID	AS01-SS14-R01X		AS01-SS15-R01X		AS01-SS16-R01X		AS01-SS17-R01X		AS01-SS18-R01X		AS01-SS19-R01X			
Sample Date	02/21/01		02/21/01		02/22/01		02/22/01		02/22/01		02/22/01			
Chemical Name														
trans-1,4-Dichloro-2-butene	6	U	6	U	6	U	6	U	6	U	6	U		
<b>Semi-volatile Organic Compounds (UG/KG)</b>														
1,1-Biphenyl	410	U	380	UJ	380	U	380	U	380	U	380	UL	20	J
1,2,4,5-Tetrachlorobenzene	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
1,4-Naphthoquinone	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
1-Naphthylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
2,3,4,6-Tetrachlorophenol	410	U	380	U	380	U	380	U	380	U	380	U	400	UJ
2,4,5-Trichlorophenol	1,000	U	960	U	940	U	950	U	960	U	950	U	990	UJ
2,4,6-Trichlorophenol	410	U	380	U	380	U	380	U	380	U	380	U	400	UJ
2,4-Dichlorophenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2,4-Dimethylphenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2,4-Dinitrophenol	1,000	U	960	U	940	U	950	U	960	U	950	U	990	UJ
2,6-Dichlorophenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2-Acetylaminofluorene	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
2-Chloronaphthalene	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
2-Chlorophenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2-Methyl-5-nitroaniline	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2-Methylaniline	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2-Methylnaphthalene	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
2-Methylphenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2-Naphthylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
2-Nitroaniline	1,000	U	960	U	940	U	950	U	960	U	950	UL	990	UJ
2-Nitrophenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2-Picoline	410	U	380	U	380	U	380	U	380	U	380	U	400	U
3,3'-Dichlorobenzidine	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
3,3'-Dimethylbenzidine	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
3-Methylcholanthrene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
3-Methylphenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
3-Nitroaniline	1,000	U	960	U	940	U	950	U	960	U	950	UL	990	UJ
4,6-Dinitro-2-methylphenol	1,000	UJ	960	UJ	940	U	950	U	960	U	950	U	990	UJ
4-Aminobiphenyl	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
4-Bromophenyl-phenylether	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
4-Chloro-3-methylphenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
4-Chloroaniline	410	U	380	U	380	U	380	U	380	U	380	U	400	U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15		AS01-SB16		AS01-SB17		AS01-SB18		AS01-SB19			
Sample ID	AS01-SS14-R01X		AS01-SS15-R01X		AS01-SS16-R01X		AS01-SS17-R01X		AS01-SS18-R01X		AS01-SS19-R01X			
Sample Date	02/21/01		02/21/01		02/22/01		02/22/01		02/22/01		02/22/01			
Chemical Name														
4-Chlorophenyl-phenylether	410	U	380	U	380	U	380	U	380	U	380	U	400	UJ
4-Methylphenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
4-Nitroaniline	1,000	U	960	U	940	U	950	U	960	U	950	UL	990	UJ
4-Nitrophenol	1,000	U	960	U	940	U	950	U	960	U	950	U	990	UJ
4-Nitroquinoline-1-oxide	1,000	R	960	R	940	U	950	U	960	U	950	UL	990	R
7,12-Dimethylbenz(a)anthracene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
Acenaphthene	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Acenaphthylene	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Acetophenone	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Aniline	330	U	330	U	330	U	330	U	330	U	330	UL	330	U
Anthracene	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Aramite	1,000	UJ	960	UJ	940	U	950	U	960	U	950	U	990	UJ
Atrazine	NA		NA		NA		NA		NA		NA		NA	
Benzaldehyde	NA		NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	30	J	380	UJ	29	J	380	U	380	U	380	U	49	J
Benzo(a)pyrene	27	J	380	UJ	29	J	24	J	380	U	380	UL	40	J
Benzo(b)fluoranthene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
Benzo(g,h,i)perylene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
Benzo(k)fluoranthene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
Benzoic acid	1,000	U	960	U	940	U	950	U	960	U	950	U	990	U
Benzyl alcohol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Butylbenzylphthalate	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Caprolactam	NA		NA		NA		NA		NA		NA		NA	
Carbazole	330	U	330	U	330	U	330	U	330	U	330	U	330	U
Chlorobenzilate	410	R	380	R	380	U	380	U	380	U	380	UL	400	R
Chrysene	51	J	38	J	47	J	40	J	380	U	380	U	78	J
Di-n-butylphthalate	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Di-n-octylphthalate	410	UJ	380	UJ	380	UJ	380	U	380	U	380	U	400	UJ
Diallate	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Dibenz(a,h)anthracene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
Dibenzofuran	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Diethylphthalate	410	U	380	U	380	U	380	U	380	U	380	U	400	UJ
Dimethoate	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Dimethyl phthalate	1,600		380	U	380	U	380	U	380	U	380	U	400	UJ
Dinoseb	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ

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Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15		AS01-SB16		AS01-SB17		AS01-SB18		AS01-SB19			
Sample ID	AS01-SS14-R01X		AS01-SS15-R01X		AS01-SS16-R01X		AS01-SS17-R01X		AS01-SS18-R01X		AS01-SS19-R01X			
Sample Date	02/21/01		02/21/01		02/22/01		02/22/01		02/22/01		02/22/01			
Chemical Name														
Diphenylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Disulfoton	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Ethyl methanesulfonate	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Famphur	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Fluoranthene	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Fluorene	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Hexachlorobenzene	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Hexachlorobutadiene	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
Hexachlorocyclopentadiene	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Hexachloroethane	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Hexachlorophene	16,000	UJ	15,000	UJ	15,000	UJ	15,000	U	15,000	U	15,000	UL	16,000	UJ
Hexachloropropene	1,000	U	960	U	940	U	950	U	960	U	950	UL	990	UJ
Indeno(1,2,3-cd)pyrene	410	UJ	380	UJ	380	UJ	380	U	380	U	380	UL	400	UJ
Isodrin	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Isophorone	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Isosafrole	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
Kepone	1,000	UJ	960	UJ	940	U	950	U	960	U	950	UL	990	UJ
Methapyrilene	1,000	UJ	960	UJ	940	U	950	U	960	U	950	UL	990	U
Methyl parathion	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
N-Nitrosomorpholine	410	U	380	U	380	U	380	U	380	U	380	U	400	U
N-Nitrosopiperidine	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
Naphthalene	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
O,O,O-Triethyl phosphorothioate	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Parathion	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Pentachlorobenzene	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
Pentachloronitrobenzene	1,000	UJ	960	UJ	940	U	950	U	960	U	950	UL	990	UJ
Pentachlorophenol	1,000	UJ	960	UJ	940	U	950	U	960	U	950	U	990	UJ
Phenacetin	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Phenanthrene	53	J	45	J	62	J	49	J	380	U	380	UL	120	J
Phenol	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Phorate	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Pronamide	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Pyrene	410	UJ	380	UJ	380	U	380	U	380	U	380	U	400	UJ
Pyridine	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Safrole	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ

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Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15		AS01-SB16		AS01-SB17		AS01-SB18		AS01-SB19			
Sample ID	AS01-SS14-R01X		AS01-SS15-R01X		AS01-SS16-R01X		AS01-SS16P-R01X		AS01-SS17-R01X		AS01-SS18-R01X		AS01-SS19-R01X	
Sample Date	02/21/01		02/21/01		02/22/01		02/22/01		02/22/01		02/22/01		02/22/01	
Chemical Name														
Sulfotepp	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
Thionazin	410	U	380	U	380	U	380	U	380	U	380	UL	400	UJ
a,a-Dimethylphenethylamine	1,000	U	960	U	940	U	950	U	960	U	950	UL	990	U
bis(2-Chloro-1-methylethyl) ether	410	U	380	U	380	U	380	U	380	U	380	U	400	U
bis(2-Chloroethoxy)methane	410	U	380	U	380	U	380	U	380	U	380	U	400	U
bis(2-Chloroethyl)ether	410	U	380	U	380	U	380	U	380	U	380	U	400	U
bis(2-Ethylhexyl)phthalate	870	J	74	J	250	J	380	U	380	U	380	U	1,100	J
n-Nitroso-di-n-butylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
n-Nitroso-di-n-propylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
n-Nitroso-n-methylethylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
n-Nitrosodiethylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
n-Nitrosodimethylamine	410	U	380	U	380	U	380	U	380	U	380	UL	400	U
n-Nitrosodiphenylamine	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
n-Nitrosopyrrolidine	410	U	380	U	380	U	380	U	380	U	380	U	400	U
p-Dimethylaminoazobenzene	410	UJ	380	UJ	380	U	380	U	380	U	380	UL	400	UJ
p-Phenylenediamine	1,000	U	960	U	940	U	950	U	960	U	950	UL	990	U
<b>Dioxin/Furans (UG/KG)</b>														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.071	U	0.098	U	0.795	U	0.076	U	0.081	U	0.073	U	0.072	U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.038	U	0.053	U	0.389	U	0.043	U	0.047	U	0.037	U	0.035	U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.044	U	0.061	U	0.455	U	0.05	U	0.055	U	0.044	U	0.041	U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.078	U	0.106	U	0.665	U	0.072	U	0.063	U	0.083	U	0.069	U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.019	U	0.011	U	0.208	U	0.022	U	0.024	U	0.009	U	0.019	U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.07	U	0.095	U	0.595	U	0.064	U	0.058	U	0.074	U	0.062	U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.017	U	0.01	U	0.18	U	0.019	U	0.021	U	0.008	U	0.016	U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.068	U	0.093	U	0.764	U	0.06	U	0.082	U	0.072	U	0.049	U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.019	U	0.026	U	0.19	U	0.021	U	0.023	U	0.018	U	0.017	U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.048	U	0.034	U	0.264	U	0.025	U	0.049	U	0.05	U	0.028	U
1,2,3,7,8-Pentachlorodibenzofuran	0.031	U	0.054	U	0.393	U	0.051	U	0.051	U	0.048	U	0.03	U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.019	U	0.027	U	0.196	U	0.022	U	0.024	U	0.019	U	0.018	U
2,3,4,7,8-Pentachlorodibenzofuran	0.027	U	0.047	U	0.339	U	0.044	U	0.044	U	0.041	U	0.026	U
2,3,7,8-TCDD (dioxin)	0.005	U	0.007	U	0.059	U	0.006	U	0.006	U	0.006	U	0.011	U
2,3,7,8-Tetrachlorodibenzofuran	0.005	U	0.006	U	0.045	U	0.006	U	0.004	U	0.004	U	0.005	U
Octachlorodibenzo-p-dioxin	0.354		0.215		0.303		0.297		0.309		0.358		0.515	
Octachlorodibenzofuran	0.023	J	0.063	U	0.709	U	0.072	U	0.096	U	0.061	U	0.079	U

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15		AS01-SB16		AS01-SB17		AS01-SB18		AS01-SB19			
Sample ID	AS01-SS14-R01X		AS01-SS15-R01X		AS01-SS16-R01X		AS01-SS17-R01X		AS01-SS18-R01X		AS01-SS19-R01X			
Sample Date	02/21/01		02/21/01		02/22/01		02/22/01		02/22/01		02/22/01			
Chemical Name														
Total heptachlorodibenzo-p-dioxin	0.071	U	0.098	U	0.795	U	0.076	U	0.081	U	0.073	U	0.072	U
Total heptachlorodibenzofuran	0.038	U	0.053	U	0.389	U	0.043	U	0.047	U	0.037	U	0.035	U
Total hexachlorodibenzo-p-dioxin	0.07	U	0.095	U	0.595	U	0.064	U	0.058	U	0.074	U	0.062	U
Total hexachlorodibenzofuran	0.017	U	0.01	U	0.18	U	0.019	U	0.021	U	0.008	U	0.016	U
Total pentachlorodibenzo-p-dioxin	NA		NA		NA		NA		NA		NA		NA	
Total pentachlorodibenzofuran	NA		NA		NA		NA		NA		NA		NA	
Total tetrachlorodibenzo-p-dioxin	NA		NA		NA		NA		NA		NA		NA	
Total tetrachlorodibenzofuran	NA		NA		NA		NA		NA		NA		NA	
<b>Explosives (UG/KG)</b>														
1,3,5-Trinitrobenzene	410	U	380	UJ	417	R	454	R	417	R	476	R	400	U
1,3-Dinitrobenzene	410	U	380	U	380	U	380	U	380	U	380	U	400	U
2,4,6-Trinitrotoluene	454	U	454	U	417	U	454	U	417	U	476	U	435	U
2,4-Dinitrotoluene	410	U	380	U	380	U	380	U	380	U	380	U	400	UJ
2,6-Dinitrotoluene	410	U	380	U	380	U	380	U	380	U	380	U	400	UJ
2-Amino-4,6-dinitrotoluene	454	U	454	U	417	U	454	U	417	U	476	U	435	U
2-Nitrotoluene	454	U	454	U	417	U	454	U	417	U	476	U	435	U
3-Nitrotoluene	454	U	454	U	417	U	454	U	417	U	476	U	435	U
4-Amino-2,6-dinitrotoluene	454	U	454	U	417	U	454	U	417	U	476	U	435	U
4-Nitrotoluene	454	U	454	U	417	U	454	U	417	U	476	U	435	U
HMX	454	U	454	U	417	U	454	U	417	U	269	J	123	J
Nitrobenzene	410	U	380	U	380	U	380	U	380	U	380	U	400	U
Nitroglycerin	454	U	435	U	476	U	454	U	454	U	417	U	417	U
PETN	NA		NA		NA		NA		NA		NA		NA	
Perchlorate	63	U	61	U	59	U	59	U	220		62	U	62	U
RDX	454	U	454	U	417	U	454	U	417	U	476	U	435	U
Tetryl	454	U	454	U	417	U	454	U	417	U	476	U	435	U
<b>Total Metals (MG/KG)</b>														
Aluminum	8,200		8,440		7,530		6,700		6,350		8,960		8,760	
Antimony	1.6	L	1.2	L	0.5	L	0.45	L	0.23	UL	0.88	L	0.25	L
Arsenic	6.4		6.5		6.4		6.5		6.4		6.5		6.7	
Barium	144		161		134		136		147		187		129	
Beryllium	0.9	K	0.98	K	0.89	K	0.89	K	0.91	K	1	K	0.85	K
Cadmium	0.92		10.9		0.62		0.73		0.65		0.72		0.84	

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14	AS01-SB15	AS01-SB16		AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SS14-R01X	AS01-SS15-R01X	AS01-SS16-R01X	AS01-SS16P-R01X	AS01-SS17-R01X	AS01-SS18-R01X	AS01-SS19-R01X
Sample Date	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	13.5	13.6	11.5	10.8	10.8	13	12.7
Cobalt	11.6 K	11.7 K	10.6 K	10.7 K	11.4 K	11.4 K	10
Copper	29	27.2	17.3	17.4	17	18.7	22.8
Cyanide	0.34 J	0.31 J	0.27 J	0.21 J	0.3 J	0.35 J	0.41 J
Iron	24,600	24,800	22,600	22,800	23,900	24,800	21,300
Lead	101	75.8	26.6	25.8	30.4	134	184
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	741	777	672	712	813	915	674
Mercury	0.06	0.06	0.04 J	0.04	0.06	0.38	0.09
Nickel	22.1	22.7	21	17.6	18.5	21.3	22.8 K
Potassium	NA	NA	NA	NA	NA	NA	NA
Selenium	0.37 U	0.55 J	0.35 U	0.36 U	0.35 U	0.35 U	0.37 U
Silver	0.33 J	0.33 J	0.12 U	0.12 U	0.12 U	0.12 U	0.29 J
Sodium	NA	NA	NA	NA	NA	NA	NA
Thallium	0.37 J	0.45 J	0.24 U	0.46 J	0.49 J	0.23 U	0.62 J
Tin	8.4 J	5.8 J	5.5 J	5.5 J	4.3 J	4.9 J	6 J
Vanadium	26.6	31.2	17.2	16.1	24.9	24.4	36.7
Zinc	223 K	121 K	65.5 K	64 K	68.8 K	97 K	116 K
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	NA
Nitrate	4.2	4.7	1.7	1.4	3	2.1	2.5
Nitrite	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Total organic carbon (TOC)	41,400	42,700	19,300	24,300	35,000	38,100	35,300
pH	7.5	7.6	7.8	7.9	7.6	7.7	7.6

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID	AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1,2-Tetrachloroethane	6 U	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,1,2,2-Tetrachloroethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	14 U	12 U	11 U	13 U	13 U	12 U
1,1,2-Trichloroethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,1-Dichloroethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,1-Dichloroethene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,2,3-Trichloropropane	6 U	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	400 U	14 U	12 U	11 U	13 U	13 U	12 U
1,2-Dibromo-3-chloropropane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,2-Dibromoethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,2-Dichlorobenzene	400 U	14 U	12 U	11 U	13 U	13 U	12 U
1,2-Dichloroethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,2-Dichloroethene (total)	6 U	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
1,3-Dichlorobenzene	400 U	14 U	12 U	11 U	13 U	13 U	12 U
1,4-Dichlorobenzene	400 U	14 U	12 U	11 U	13 U	13 U	12 U
1,4-Dioxane	620 R	NA	NA	NA	NA	NA	NA
2-Butanone	6 U	14 U	12 U	11 U	13 U	13 U	12 U
2-Chloro-1,3-butadiene	6 U	NA	NA	NA	NA	NA	NA
2-Chloroethyl vinyl ether	6 U	NA	NA	NA	NA	NA	NA
2-Hexanone	6 U	14 U	12 U	11 U	13 U	13 U	12 U
4-Methyl-2-pentanone	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Acetone	10 B	2.6 B	2.2 B	2.4 B	2.6 B	2 B	5.1 B
Acetonitrile	250 U	NA	NA	NA	NA	NA	NA
Acrolein	62 R	NA	NA	NA	NA	NA	NA
Acrylonitrile	62 U	NA	NA	NA	NA	NA	NA
Allyl chloride	6 U	NA	NA	NA	NA	NA	NA
Benzene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Bromodichloromethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Bromoform	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Bromomethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Carbon disulfide	6 U	14 U	12 U	11 U	13 U	13 U	12 U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID	AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Carbon tetrachloride	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Chlorobenzene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Chloroethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Chloroform	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Chloromethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Cumene	NA	14 U	12 U	11 U	13 U	13 U	12 U
Cyclohexane	NA	14 U	12 U	11 U	13 U	13 U	12 U
Dibromochloromethane	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Dibromomethane	6 U	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Ethyl methacrylate	6 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Iodomethane	6 UL	NA	NA	NA	NA	NA	NA
Isobutanol	250 R	NA	NA	NA	NA	NA	NA
Methacrylonitrile	120 U	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	14 U	12 U	1.2 J	13 U	13 U	1.7 J
Methyl methacrylate	6 U	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	1,000 U	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	14 U	12 U	11 U	13 U	13 U	12 U
Methylcyclohexane	NA	14 U	12 U	11 U	13 U	13 U	12 U
Methylene chloride	2 B	3 B	4.2 B	3 B	7.5 B	7.1 B	8.2 B
Pentachloroethane	6 U	NA	NA	NA	NA	NA	NA
Propionitrile	120 R	NA	NA	NA	NA	NA	NA
Styrene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Tetrachloroethene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Toluene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Trichloroethene	6 U	1.6 J	12 U	66	13 U	13 U	12 U
Trichlorofluoromethane(Freon-11)	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Vinyl acetate	6 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	6 U	14 U	12 U	11 U	13 U	13 U	12 U
Xylene, total	6 U	14 U	12 U	11 U	13 U	13 U	12 U
cis-1,2-Dichloroethene	NA	14 U	12 U	11 U	13 U	13 U	12 U
cis-1,3-Dichloropropene	6 U	14 U	12 U	11 U	13 U	13 U	12 U
trans-1,2-Dichloroethene	NA	14 U	12 U	11 U	13 U	13 U	12 U
trans-1,3-Dichloropropene	6 U	14 U	12 U	11 U	13 U	13 U	12 U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID	AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name							
trans-1,4-Dichloro-2-butene	6 U	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
1,2,4,5-Tetrachlorobenzene	400 U	NA	NA	NA	NA	NA	NA
1,4-Naphthoquinone	400 U	NA	NA	NA	NA	NA	NA
1-Naphthylamine	400 U	NA	NA	NA	NA	NA	NA
2,3,4,6-Tetrachlorophenol	400 U	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1,000 U	1,100 U	990 U	970 U	1,100 U	940 U	980 U
2,4,6-Trichlorophenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2,4-Dichlorophenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2,4-Dimethylphenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2,4-Dinitrophenol	1,000 U	1,100 U	990 U	970 U	1,100 U	940 U	980 U
2,6-Dichlorophenol	400 U	NA	NA	NA	NA	NA	NA
2-Acetylaminofluorene	400 UJ	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2-Chlorophenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2-Methyl-5-nitroaniline	400 U	NA	NA	NA	NA	NA	NA
2-Methylaniline	400 U	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2-Methylphenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2-Naphthylamine	400 U	NA	NA	NA	NA	NA	NA
2-Nitroaniline	1,000 U	1,100 U	990 U	970 U	1,100 U	940 U	980 U
2-Nitrophenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
2-Picoline	400 U	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	400 UJ	450 U	390 U	390 U	440 U	370 U	390 U
3,3'-Dimethylbenzidine	400 UJ	NA	NA	NA	NA	NA	NA
3-Methylcholanthrene	400 UJ	NA	NA	NA	NA	NA	NA
3-Methylphenol	400 U	NA	NA	NA	NA	NA	NA
3-Nitroaniline	1,000 U	1,100 U	990 U	970 U	1,100 U	940 U	980 U
4,6-Dinitro-2-methylphenol	1,000 U	1,100 U	990 U	970 U	1,100 U	940 U	980 U
4-Aminobiphenyl	400 U	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	400 U	450 U	390 U	390 U	440 U	370 U	390 U
4-Chloro-3-methylphenol	400 U	450 U	390 U	390 U	440 U	370 U	390 U
4-Chloroaniline	400 U	450 U	390 U	390 U	440 U	370 U	390 U

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67		AS01-SB68	
Sample ID	AS01-SS20-R01X		AS01-SS63-0-0.5		AS01-SS64-0-0.5		AS01-SS65-0-0.5		AS01-SS66-0-0.5		AS01-SS67-0-0.5		AS01-SS68-0-0.5	
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04		09/23/04	
Chemical Name														
4-Chlorophenyl-phenylether	400	U	450	U	390	U	390	U	440	U	370	U	390	U
4-Methylphenol	400	U	450	U	390	U	390	U	440	U	370	U	390	U
4-Nitroaniline	1,000	U	1,100	U	990	U	970	U	1,100	U	940	U	980	U
4-Nitrophenol	1,000	U	1,100	U	990	U	970	U	1,100	U	940	U	980	U
4-Nitroquinoline-1-oxide	1,000	R	NA											
7,12-Dimethylbenz(a)anthracene	400	UJ	NA											
Acenaphthene	400	U	450	U	390	U	390	U	440	U	370	U	390	U
Acenaphthylene	400	U	450	U	390	U	390	U	440	U	370	U	390	U
Acetophenone	400	U	450	U	390	U	390	U	440	U	370	U	390	U
Aniline	330	U	NA											
Anthracene	400	U	450	U	390	U	390	U	440	U	370	U	390	U
Aramite	1,000	UJ	NA											
Atrazine	NA		450	U	390	U	390	U	440	U	370	U	390	U
Benzaldehyde	NA		450	U	390	U	390	U	440	U	370	U	390	U
Benzo(a)anthracene	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Benzo(a)pyrene	23	J	450	U	390	U	390	U	440	U	370	U	390	U
Benzo(b)fluoranthene	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Benzo(g,h,i)perylene	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Benzo(k)fluoranthene	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Benzoic acid	1,000	U	NA											
Benzyl alcohol	400	U	NA											
Butylbenzylphthalate	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Caprolactam	NA		450	U	390	U	390	U	440	U	46	J	390	U
Carbazole	330	U	450	U	390	U	390	U	440	U	370	U	390	U
Chlorobenzilate	400	R	NA											
Chrysene	40	J	450	U	390	U	390	U	440	U	370	U	390	U
Di-n-butylphthalate	400	U	450	U	390	U	390	U	440	U	370	U	390	U
Di-n-octylphthalate	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Diallate	400	U	NA											
Dibenz(a,h)anthracene	400	UJ	450	U	390	U	390	U	440	U	370	U	390	U
Dibenzofuran	400	U	450	U	390	U	390	U	440	U	370	U	390	U
Diethylphthalate	400	U	450	U	390	U	390	U	440	U	270	J	390	U
Dimethoate	400	U	NA											
Dimethyl phthalate	400	U	450	U	390	U	390	U	440	U	520		390	U
Dinoseb	400	U	NA											

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67		AS01-SB68							
Sample ID	AS01-SS20-R01X		AS01-SS63-0-0.5		AS01-SS64-0-0.5		AS01-SS65-0-0.5		AS01-SS66-0-0.5		AS01-SS67-0-0.5		AS01-SS68-0-0.5							
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04		09/23/04							
Chemical Name																				
Diphenylamine	400	U		NA		NA		NA		NA		NA		NA						
Disulfoton	400	U		NA		NA		NA		NA		NA		NA						
Ethyl methanesulfonate	400	U		NA		NA		NA		NA		NA		NA						
Famphur	400	UJ		NA		NA		NA		NA		NA		NA						
Fluoranthene	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Fluorene	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Hexachlorobenzene	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Hexachlorobutadiene	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Hexachlorocyclopentadiene	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Hexachloroethane	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Hexachlorophene	16,000	UJ		NA		NA		NA		NA		NA		NA		NA			NA	
Hexachloropropene	1,000	U		NA		NA		NA		NA		NA		NA		NA			NA	
Indeno(1,2,3-cd)pyrene	400	UJ		450	U		390	U		390	U		440	U		370	U		390	U
Isodrin	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Isophorone	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Isosafrole	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Kepone	1,000	UJ		NA		NA		NA		NA		NA		NA		NA			NA	
Methapyrilene	1,000	U		NA		NA		NA		NA		NA		NA		NA			NA	
Methyl parathion	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
N-Nitrosomorpholine	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
N-Nitrosopiperidine	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Naphthalene	400	U		450	U		390	U		390	U		440	U		370	U		390	U
O,O,O-Triethyl phosphorothioate	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Parathion	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Pentachlorobenzene	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Pentachloronitrobenzene	1,000	U		NA		NA		NA		NA		NA		NA		NA			NA	
Pentachlorophenol	1,000	U		1,100	U		990	U		970	U		1,100	U		940	U		980	U
Phenacetin	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Phenanthrene	49	J		450	U		390	U		390	U		440	U		370	U		390	U
Phenol	400	U		450	U		390	U		390	U		440	U		370	U		390	U
Phorate	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Pronamide	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Pyrene	400	UJ		450	U		390	U		390	U		440	U		370	U		390	U
Pyridine	400	U		NA		NA		NA		NA		NA		NA		NA			NA	
Safrole	400	U		NA		NA		NA		NA		NA		NA		NA			NA	

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67		AS01-SB68	
Sample ID	AS01-SS20-R01X		AS01-SS63-0-0.5		AS01-SS64-0-0.5		AS01-SS65-0-0.5		AS01-SS66-0-0.5		AS01-SS67-0-0.5		AS01-SS68-0-0.5	
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04		09/23/04	
Chemical Name														
Sulfotepp	400	U	NA											
Thionazin	400	U	NA											
a,a-Dimethylphenethylamine	1,000	U	NA											
bis(2-Chloro-1-methylethyl) ether	400	U	450	U	390	U	390	U	440	U	370	U	390	U
bis(2-Chloroethoxy)methane	400	U	450	U	390	U	390	U	440	U	370	U	390	U
bis(2-Chloroethyl)ether	400	U	450	U	390	U	390	U	440	U	370	U	390	U
bis(2-Ethylhexyl)phthalate	400	UJ	450	U	390	U	390	U	440	U	140	B	390	U
n-Nitroso-di-n-butylamine	400	U	NA											
n-Nitroso-di-n-propylamine	400	U	450	U	390	U	390	U	440	U	370	U	390	U
n-Nitroso-n-methylethylamine	400	U	NA											
n-Nitrosodiethylamine	400	U	NA											
n-Nitrosodimethylamine	400	U	NA											
n-Nitrosodiphenylamine	400	U	450	U	390	U	390	U	440	U	370	U	390	U
n-Nitrosopyrrolidine	400	U	NA											
p-Dimethylaminoazobenzene	400	UJ	NA											
p-Phenylenediamine	1,000	U	NA											
Dioxin/Furans (UG/KG)														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.102	U	0.004	J	0.039		0.031		0.0094		0.0062		0.016	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.053	U	4.20E-04	U	0.018		0.0097		6.20E-04	U	0.0081		0.0038	J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.062	U	5.70E-04	U	0.0017	U	0.0017	U	9.50E-04	U	0.002	U	4.30E-04	U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.179	U	5.60E-04	U	0.0011	U	5.90E-04	U	0.0017	U	8.70E-04	U	8.30E-04	U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.027	U	3.60E-04	U	0.005	J	0.0026	U	0.0012	U	0.0041	J	0.0016	U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.162	U	5.60E-04	U	0.0025	U	0.0029	U	0.0015	U	9.80E-04	U	7.70E-04	U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.023	U	3.60E-04	U	0.0026	U	0.0018	U	0.0011	U	0.003	J	5.80E-04	U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.152	U	5.50E-04	U	0.0021	U	0.0021	U	0.0014	U	0.0013	U	7.50E-04	U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.026	U	3.70E-04	U	4.20E-04	U	5.60E-04	U	0.0013	U	9.20E-04	U	5.80E-04	U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.129	U	7.90E-04	U	7.70E-04	U	0.0011	U	0.0021	U	0.0013	U	0.0011	U
1,2,3,7,8-Pentachlorodibenzofuran	0.086	U	4.50E-04	U	0.0026	U	0.0015	U	8.50E-04	U	0.0032	J	8.80E-04	U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.027	U	3.10E-04	U	0.002	U	1.00E-03	U	8.60E-04	U	0.0019	U	4.00E-04	U
2,3,4,7,8-Pentachlorodibenzofuran	0.074	U	5.20E-04	U	0.0022	U	0.0011	U	8.60E-04	U	0.0031	J	7.70E-04	U
2,3,7,8-TCDD (dioxin)	0.006	U	4.00E-04	U	3.40E-04	U	6.50E-04	U	5.30E-04	U	3.30E-04	U	3.70E-04	U
2,3,7,8-Tetrachlorodibenzofuran	0.009	U	3.00E-04	U	0.0033		0.0018		6.00E-04	U	0.0026		0.0017	
Octachlorodibenzo-p-dioxin	0.369		0.13		0.49		0.38		0.28		0.05		0.47	
Octachlorodibenzofuran	0.12	U	0.0011	U	0.023		0.016		0.0017	U	0.013		0.014	

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID	AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Total heptachlorodibenzo-p-dioxin	0.102 U	0.01	0.083	0.06	0.023	0.012	0.036
Total heptachlorodibenzofuran	0.053 U	5.70E-04 U	0.031	0.019	9.50E-04 U	0.012	0.0075
Total hexachlorodibenzo-p-dioxin	0.162 U	5.60E-04 U	0.014	0.011	0.0017 U	0.0088	0.0022 U
Total hexachlorodibenzofuran	0.023 U	3.70E-04 U	0.014	0.0033	0.0013 U	0.011	0.0016 U
Total pentachlorodibenzo-p-dioxin	NA	7.90E-04 U	0.0015 U	0.0013 U	0.0021 U	0.0045	0.0011 U
Total pentachlorodibenzofuran	NA	5.20E-04 U	0.009	0.0042	9.30E-04 U	0.012	0.0012 U
Total tetrachlorodibenzo-p-dioxin	NA	4.00E-04 U	0.0051	6.90E-04 U	7.00E-04 U	0.01	5.00E-04 U
Total tetrachlorodibenzofuran	NA	3.00E-04 U	0.033	0.019	6.00E-04 U	0.019	0.0025
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	400 U	250 U	2,500 U	26 J	250 U	250 U	250 U
1,3-Dinitrobenzene	400 U	250 U	2,500 U	250 U	250 U	250 U	250 U
2,4,6-Trinitrotoluene	435 U	250 U	2,500 U	250 U	250 U	250 U	250 U
2,4-Dinitrotoluene	400 U	250 U	2,500 U	250 U	250 U	250 U	250 U
2,6-Dinitrotoluene	400 U	250 U	2,500 U	250 U	250 U	250 U	250 U
2-Amino-4,6-dinitrotoluene	435 U	250 U	2,500 U	250 U	250 U	250 U	250 U
2-Nitrotoluene	435 U	250 U	2,500 U	250 U	250 U	250 U	250 U
3-Nitrotoluene	435 U	250 U	2,500 U	250 U	250 U	250 U	250 U
4-Amino-2,6-dinitrotoluene	435 U	250 U	2,500 U	250 U	250 U	250 U	250 U
4-Nitrotoluene	435 U	250 U	2,500 U	250 U	250 U	250 U	250 U
HMX	435 U	190 J	51,000	2,200	1,300	1,300	500 U
Nitrobenzene	400 U	250 U	2,500 U	250 U	250 U	250 U	250 U
Nitroglycerin	454 U	2,500 U	98,000	2,500 U	2,500 U	2,500 U	2,500 U
PETN	NA	2,500 U	25,000 U	2,500 U	2,500 U	2,500 U	2,500 U
Perchlorate	63 U	54.7 U	31,300	47 U	52.9 U	45.4 U	47.3 U
RDX	435 U	49 J	16,000	1,700	170 J	460 J	500 U
Tetryl	435 U	650 U	6,500 U	650 U	650 U	650 U	650 U
Total Metals (MG/KG)							
Aluminum	8,130	8,040	8,220	6,580	7,670	19,000	6,100
Antimony	1.3 L	0.74 UL	0.64 UL	0.63 UL	0.71 UL	0.61 UL	0.64 UL
Arsenic	7.6	7.5	6.8	6.7	6.5	3.4	6.5
Barium	208	187	255	159	212	86	103
Beryllium	1.1 K	1 B	1.1 B	0.87 B	1.1 B	0.28 B	0.83 B
Cadmium	0.74	0.15 B	0.13 B	0.17 B	0.28 B	0.35 B	0.22 B

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64	AS01-SB65	AS01-SB66	AS01-SB67	AS01-SB68
Sample ID	AS01-SS20-R01X	AS01-SS63-0-0.5	AS01-SS64-0-0.5	AS01-SS65-0-0.5	AS01-SS66-0-0.5	AS01-SS67-0-0.5	AS01-SS68-0-0.5
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04	09/23/04
Chemical Name							
Calcium	NA	1,610	1,250	2,090	2,040	202,000	7,330
Chromium	13.7	13.2	13.5	11.4	12.7	8.1	10.4
Cobalt	13.7	13.4 J	14.3	12.4	14.4	3.6 J	11.6 J
Copper	20.7	20.7	18	19.9	17.6 L	1,820 L	17.2 L
Cyanide	0.29 J	0.25 J	0.13 J	0.21 J	0.29 L	0.17 L	0.59 UL
Iron	28,400	27,000	27,800	24,300	28,600	8,980	23,400
Lead	58.1	64.9	16.2	65.7	14.1 J	138 J	44.4 J
Magnesium	NA	947 J	1,000 J	831 J	1,070 J	15,900	1,160 J
Manganese	1,090	941	1,120	879	1,070	208	520
Mercury	0.08	0.13 J	0.067 J	0.077 J	0.066 UL	0.092 L	0.06 L
Nickel	24.3 K	23.9	24	19.2	24	9.5	17.4
Potassium	NA	985 J	1,040 J	814 J	1,010 J	837 J	762 J
Selenium	0.37 J	0.63 U	0.55 U	0.54 U	0.61 UL	0.52 UL	0.54 UL
Silver	0.12 U	0.27 U	0.24 U	0.23 U	0.26 U	0.25 J	0.26 J
Sodium	NA	70.1 U	60.8 U	60.1 U	67.7 U	170 B	60.6 U
Thallium	0.87 J	2.2 L	2.3 L	1.4 L	1.3 U	1.1 U	1.1 U
Tin	5.1 J	NA	NA	NA	NA	NA	NA
Vanadium	23.7	18.1	17.1	15.6	17.1	10.3 J	13.5
Zinc	85.6 K	77.2	72.3	62.2	65.1 K	105 K	67.3 K
Wet Chemistry (MG/KG)							
% Moisture	NA	26.9	15.8	14.9	24.4	11.8	15.5
Nitrate	9.9	NA	NA	NA	NA	NA	NA
Nitrite	1.2 U	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	47,300	11,000	12,000	13,000	9,300	2,400	11,000
pH	7.2	6.4	4.8	5.8	7.2	7.7	7.3

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name								
Volatile Organic Compounds (UG/KG)								
1,1,1,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,1,2,2-Tetrachloroethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,1-Dichloroethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,1-Dichloroethene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	540 R	680 R	12 UJ	NA	NA	NA	NA	NA
1,2-Dibromoethane	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	540 UJ	680 UJ	12 UJ	11 U	NA	NA	NA	NA
1,2-Dichloroethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,2-Dichloroethene (total)	NA	NA	NA	NA	13 U	14 U	11 UJ	11
1,2-Dichloropropane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
1,3-Dichlorobenzene	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethyl vinyl ether	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
4-Methyl-2-pentanone	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
Acetone	120 B	180 B	1.8 B	17 R	13 R	14 R	11 R	11
Acetonitrile	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA
Allyl chloride	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
Bromodichloromethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
Bromoform	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
Bromomethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11
Carbon disulfide	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11

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Table D-2  
Raw Data, Surface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70		BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S	
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94	
Chemical Name									
Carbon tetrachloride	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Chlorobenzene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Chloroethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Chloroform	540 UJ	680 UJ	12 UJ	11 R	2 R	14 R	11 R	1	
Chloromethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Cumene	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
Cyclohexane	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
Dibromochloromethane	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Dibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	
Dichlorodifluoromethane (Freon-12)	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
Ethyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	
Ethylbenzene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	
Isobutanol	NA	NA	NA	NA	NA	NA	NA	NA	
Methacrylonitrile	NA	NA	NA	NA	NA	NA	NA	NA	
Methyl acetate	540 UJ	73 J	12 UJ	NA	NA	NA	NA	NA	
Methyl methacrylate	NA	NA	NA	NA	NA	NA	NA	NA	
Methyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	
Methyl-tert-butyl ether (MTBE)	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
Methylcyclohexane	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
Methylene chloride	320 B	400 B	9.2 B	11 R	7 R	14 R	11 R	4	
Pentachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	
Propionitrile	NA	NA	NA	NA	NA	NA	NA	NA	
Styrene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Tetrachloroethene	410 J	420 J	12 UJ	11 R	13 R	14 R	11 R	11	
Toluene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Trichloroethene	870 J	1,400 J	38 J	2 R	3 R	14 R	11 R	7	
Trichlorofluoromethane(Freon-11)	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	
Vinyl chloride	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
Xylene, total	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
cis-1,2-Dichloroethene	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
cis-1,3-Dichloropropene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	
trans-1,2-Dichloroethene	540 UJ	680 UJ	12 UJ	NA	NA	NA	NA	NA	
trans-1,3-Dichloropropene	540 UJ	680 UJ	12 UJ	11 R	13 R	14 R	11 R	11	

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name								
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	390 U	390 U	410 U	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
2,4-Dichlorophenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
2,4-Dimethylphenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
2,4-Dinitrophenol	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	390 U	390 U	410 U	NA	NA	NA	NA	NA
2-Chlorophenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	390 U	390 U	410 U	NA	NA	NA	NA	NA
2-Methylphenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
2-Nitrophenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	390 U	390 U	410 U	NA	NA	NA	NA	NA
3,3'-Dimethylbenzidine	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	390 U	390 U	410 U	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
4-Chloroaniline	390 U	390 U	410 U	NA	NA	NA	NA	NA

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70		BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name									
4-Chlorophenyl-phenylether	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
4-Methylphenol	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
4-Nitroaniline	980 U	990 U	1,000 U	NA	NA	NA	NA	NA	NA
4-Nitrophenol	980 U	990 U	1,000 U	NA	NA	NA	NA	NA	NA
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Acenaphthylene	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Acetophenone	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Aramite	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Benzaldehyde	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	390 U	40 J	410 U	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	390 U	48 J	410 U	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	390 U	68 J	410 U	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	390 U	65 J	410 U	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Caprolactam	390 U	390 U	41 J	NA	NA	NA	NA	NA	NA
Carbazole	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Chlorobenzilate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	390 U	81 J	410 U	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Diallate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Dibenzofuran	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Diethylphthalate	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Dimethoate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	390 U	390 U	410 U	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name								
Diphenylamine	NA	NA	NA	NA	NA	NA	NA	NA
Disulfoton	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA
Famphur	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	390 U	87 J	410 U	NA	NA	NA	NA	NA
Fluorene	390 U	390 U	410 U	NA	NA	NA	NA	NA
Hexachlorobenzene	390 U	390 U	410 U	NA	NA	NA	NA	NA
Hexachlorobutadiene	390 U	390 U	410 U	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	390 U	390 U	410 U	NA	NA	NA	NA	NA
Hexachloroethane	390 U	390 U	410 U	NA	NA	NA	NA	NA
Hexachlorophene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	390 U	390 U	410 U	NA	NA	NA	NA	NA
Isodrin	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	390 U	390 U	410 U	NA	NA	NA	NA	NA
Isosafrole	NA	NA	NA	NA	NA	NA	NA	NA
Kepone	NA	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA	NA
Methyl parathion	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	390 U	390 U	410 U	NA	NA	NA	NA	NA
O,O,O-Triethyl phosphorothioate	NA	NA	NA	NA	NA	NA	NA	NA
Parathion	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	980 U	990 U	1,000 U	NA	NA	NA	NA	NA
Phenacetin	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	390 U	62 J	410 U	NA	NA	NA	NA	NA
Phenol	390 U	390 U	410 U	NA	NA	NA	NA	NA
Phorate	NA	NA	NA	NA	NA	NA	NA	NA
Pronamide	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	390 U	100 J	410 U	NA	NA	NA	NA	NA
Pyridine	NA	NA	NA	NA	NA	NA	NA	NA
Safrole	NA	NA	NA	NA	NA	NA	NA	NA

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Station ID	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name								
Sulfotepp	NA	NA	NA	NA	NA	NA	NA	NA
Thionazin	NA	NA	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	390 U	390 U	410 U	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	390 U	390 U	410 U	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	390 U	390 U	410 U	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	390 U	1,300	410 U	NA	NA	NA	NA	NA
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	390 U	390 U	410 U	NA	NA	NA	NA	NA
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	390 U	390 U	410 U	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.033	0.008	0.1	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.016	0.0039 J	0.013	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0021 U	0.0011 U	0.0018 U	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0013 U	0.0017 U	0.0016 U	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.007	0.0014 U	0.0049 J	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0016 U	0.0014 U	0.0041 J	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0042 J	0.0013 U	0.0033 J	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0022 U	0.0014 U	0.003 U	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	1.00E-03 U	0.0013 U	9.70E-04 U	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0021 U	0.0033 U	0.003 U	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.0049 J	0.0015 U	0.0021 U	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0037 J	9.60E-04 U	0.0023 U	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.005 J	0.0016 U	0.002 U	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	5.80E-04 U	0.0012 U	6.00E-04 U	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.0046	0.0011 J	0.0022	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	0.87	0.057	1.3	NA	NA	NA	NA	NA
Octachlorodibenzofuran	0.038	0.0038 U	0.054	NA	NA	NA	NA	NA

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 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name								
Total heptachlorodibenzo-p-dioxin	0.071	0.017	0.2	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	0.028	0.0039	0.026	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	0.017	0.014	0.037	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	0.032	0.0014 U	0.022	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	0.0028 U	0.0033 U	0.003 U	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	0.037	0.0024 U	0.012	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	0.0062	0.0064	0.0038	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	0.031	0.0077	0.012	NA	NA	NA	NA	NA
Explosives (UG/KG)								
1,3,5-Trinitrobenzene	500 U	750 U	250 U	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	500 U	750 U	250 U	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
2-Nitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
3-Nitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
4-Nitrotoluene	500 U	750 U	250 U	NA	NA	NA	NA	NA
HMX	11,000	20,000	420 J	NA	NA	NA	NA	NA
Nitrobenzene	500 U	750 U	250 U	NA	NA	NA	NA	NA
Nitroglycerin	2,500 U	2,500 U	2,500 UJ	NA	NA	NA	NA	NA
PETN	5,000 U	7,500 U	2,500 U	NA	NA	NA	NA	NA
Perchlorate	42.2	51.8	49.6 U	NA	NA	NA	NA	NA
RDX	1,400	2,100	210 J	NA	NA	NA	NA	NA
Tetryl	1,300 U	2,000 U	650 U	NA	NA	NA	NA	NA
Total Metals (MG/KG)								
Aluminum	5,280	8,010	7,190	NA	NA	NA	NA	NA
Antimony	0.64 UL	0.64 UL	2.5 L	NA	NA	NA	NA	NA
Arsenic	4.8	6.7	5.2	NA	NA	NA	NA	NA
Barium	59.9	126	91.3	NA	NA	NA	NA	NA
Beryllium	0.44 B	0.88 B	0.73 B	NA	NA	NA	NA	NA
Cadmium	0.26 B	0.58 J	0.36 B	NA	NA	NA	NA	NA

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 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB69		AS01-SB70	BG-010/010S/053	BG-025/025S/048	BG-033/033S	BG-034/034S	BG-055/055S
Sample ID	AS01-SS69-0-0.5	AS01-SS69P-0-0.5	AS01-SS70-0-0.5	HCS-BG-10S	HCS-BG-25S	HCS-BG-33S	HCS-BG-34S	HCS-BG-55S
Sample Date	09/23/04	09/23/04	09/23/04	06/20/94	06/20/94	06/20/94	06/20/94	06/20/94
Chemical Name								
Calcium	192,000	5,050	19,000	NA	NA	NA	NA	NA
Chromium	8	12.7	10.9	NA	NA	NA	NA	NA
Cobalt	6.6 J	13.3	10.2 J	NA	NA	NA	NA	NA
Copper	15.1 L	68.1 L	18.9 L	NA	NA	NA	NA	NA
Cyanide	0.59 UL	0.59 UL	0.62 UL	NA	NA	NA	NA	NA
Iron	13,400	24,800	22,500	NA	NA	NA	NA	NA
Lead	58.7 J	106 J	387 J	NA	NA	NA	NA	NA
Magnesium	18,400	1,180 J	3,480	NA	NA	NA	NA	NA
Manganese	341	665	543	NA	NA	NA	NA	NA
Mercury	0.13 L	0.16 L	7.2	NA	NA	NA	NA	NA
Nickel	12.7	23	14.5	NA	NA	NA	NA	NA
Potassium	979 J	1,020 J	720 J	NA	NA	NA	NA	NA
Selenium	0.54 UL	0.55 UL	0.57 UL	NA	NA	NA	NA	NA
Silver	0.39 J	3	0.57 J	NA	NA	NA	NA	NA
Sodium	136 B	60.9 U	63.5 U	NA	NA	NA	NA	NA
Thallium	1.1 U	1.1 U	1.2 U	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	11 J	19.9	14.7	NA	NA	NA	NA	NA
Zinc	57.2 K	96.4 K	78.4 K	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)								
% Moisture	15.5	16	19.4	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	8,700	14,000	9,100	NA	NA	NA	NA	NA
pH	7.6	7.9	7.5	NA	NA	NA	NA	NA

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Station ID	§	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	§	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1,2-Tetrachloroethane		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene		380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
1,2-Dibromo-3-chloropropane		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene		380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 UJ
1,2-Dichloroethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene		380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
1,4-Dichlorobenzene		380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
1,4-Dioxane		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloro-1,3-butadiene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloroethyl vinyl ether		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetonitrile		NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrolein		NA	NA	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile		NA	NA	NA	NA	NA	NA	NA	NA	NA
Allyl chloride		NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	U	NA	NA	NA	NA	NA	NA	NA	NA	NA

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UJ - Undetected, estimated limit  
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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	§	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	§	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name										
Carbon tetrachloride	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cumene		NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)		NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methacrylate		NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Isobutanol		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methacrylonitrile		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methacrylate		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloroethane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionitrile		NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	J	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane(Freon-11)		NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate		NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylene, total	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene		NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene		NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	U	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Station ID	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1,900 U	1,900 UJ	1,900 UJ	2,000 UJ	2,100 U	1,900 U	1,900 UJ	21,000 UJ	2,300 UJ
2,4,6-Trichlorophenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2,4-Dichlorophenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2,4-Dimethylphenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 UJ
2,4-Dinitrophenol	1,900 UJ	1,900 UJ	1,900 UJ	2,000 UJ	2,100 UJ	1,900 UJ	1,900 UJ	21,000 UJ	2,300 UJ
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2-Chlorophenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2-Methylphenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	1,900 U	1,900 U	1,900 U	2,000 U	2,100 U	94 J	1,900 U	13,000 J	2,300 U
2-Nitrophenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
2-Picoline	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	770 U	780 UJ	790 UJ	820 UJ	870 U	800 U	790 UJ	8,700 U	960 UJ
3,3'-Dimethylbenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	1,900 U	1,900 U	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	21,000 U	2,300 U
4,6-Dinitro-2-methylphenol	1,900 U	1,900 U	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	21,000 U	2,300 UJ
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
4-Chloro-3-methylphenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
4-Chloroaniline	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U

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Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
4-Chlorophenyl-phenylether	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
4-Methylphenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
4-Nitroaniline	1,900 UJ	1,900 U	1,900 U	2,000 U	2,100 UJ	1,900 UJ	1,900 U	21,000 UJ	2,300 U
4-Nitrophenol	1,900 U	1,900 UJ	1,900 UJ	2,000 UJ	2,100 U	1,900 U	1,900 UJ	21,000 UJ	2,300 UJ
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Acenaphthylene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Aramite	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(a)pyrene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(b)fluoranthene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(g,h,i)perylene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzo(k)fluoranthene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Benzoic acid	1,900 U	1,900 UJ	1,900 UJ	2,000 UJ	2,100 U	1,900 U	1,900 UJ	21,000 U	2,300 U
Benzyl alcohol	380 U	390 UJ	390 UJ	410 UJ	430 U	400 U	390 UJ	4,300 U	480 U
Butylbenzylphthalate	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzilate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Di-n-butylphthalate	4,900 B	390 UJ	390 UJ	410 UJ	430 UJ	400 UJ	390 UJ	4,300 U	480 UJ
Di-n-octylphthalate	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Diallate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Dibenzofuran	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Diethylphthalate	380 U	390 U	390 U	410 U	430 U	92 J	390 U	4,300 U	480 U
Dimethoate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Dinoseb	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
Diphenylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Disulfoton	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Famphur	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	380 U	42 J	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Fluorene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Hexachlorobenzene	380 U	390 UJ	390 UJ	410 UJ	430 U	400 U	390 UJ	4,300 UJ	480 UJ
Hexachlorobutadiene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 UJ
Hexachlorocyclopentadiene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 UJ	480 U
Hexachloroethane	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Hexachlorophene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Isodrin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isophorone	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Isosafrole	NA	NA	NA	NA	NA	NA	NA	NA	NA
Kepone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl parathion	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
O,O,O-Triethyl phosphorothioate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Parathion	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1,900 U	1,900 U	1,900 U	2,000 U	2,100 U	1,900 U	1,900 U	21,000 U	2,300 U
Phenacetin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Phenol	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Phorate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pronamide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Pyridine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Safrole	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
Sulfotepp	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thionazin	NA	NA	NA	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
bis(2-Chloroethoxy)methane	380 U	390 UJ	390 UJ	410 UJ	430 U	400 U	390 UJ	4,300 UJ	480 UJ
bis(2-Chloroethyl)ether	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
bis(2-Ethylhexyl)phthalate	1,600	390 U	390 U	410 U	59 J	290 J	41 J	1,400 J	480 U
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	160 J	390 U	390 U	410 U	430 U	400 U	390 U	3,000 J	480 U
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Station ID	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)									
1,3,5-Trinitrobenzene	250 U	250 U	250 U	30,000	250 U				
1,3-Dinitrobenzene	250 U	250 U	250 U	250 U	250 U				
2,4,6-Trinitrotoluene	250 U	250 U	250 U	250 U	250 U				
2,4-Dinitrotoluene	720 J	390 U	390 U	410 U	430 U	400 U	390 U	510 U	480 U
2,6-Dinitrotoluene	130 J	390 U	390 U	410 U	430 U	400 U	390 U	510 U	510 U
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	250 U	250 U	250 U	250 U	250 U				
3-Nitrotoluene	250 U	250 U	250 U	250 U	250 U				
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	7,600	4,600	2,200 U	2,300	2,200 U	3,900	14,000	12,000	2,200 U
Nitrobenzene	380 U	390 U	390 U	410 U	430 U	400 U	390 U	4,300 U	480 U
Nitroglycerin	NA	NA	NA	NA	NA	NA	NA	NA	NA
PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	6,600	7,300	2,600	2,100	2,100	5,100	34,000	2,800	2,800
Tetryl	650 UJ	650 UJ	650 UJ	540 J	650 UJ				
Total Metals (MG/KG)									
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
R - Unusable result  
U - Undetected

K - Value biased high  
L - Value biased low  
UJ - Undetected, estimated limit  
UL - Undetected, limit biased low

Table D-2  
 Raw Data, Surface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BP-01	BP-02	BP-03	BP-04		BP-05	BP-06	BP-07	BP-08
Sample ID	HCS-BP-1	HCS-BP-2	HCS-BP-3	HCS-BP-4	HCS-BP-4/DUP	HCS-BP-5	HCS-BP-6	HCS-BP-7	HCS-BP-8
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
% Moisture	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 B - Possible blank contamination  
 J - Estimated value  
 R - Unusable result  
 U - Undetected

K - Value biased high  
 L - Value biased low  
 UJ - Undetected, estimated limit  
 UL - Undetected, limit biased low

Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	NA	NA	NA	14 U	13 U	1.9 J	2.2 J	2 J	12 U
1,1,2,2-Tetrachloroethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,1,2-Trichloroethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,1-Dichloroethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,1-Dichloroethene	NA	NA	NA	1.8 J	2 J	12 U	12 U	11 U	12 U
1,2,4-Trichlorobenzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,2-Dibromo-3-chloropropane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,2-Dibromoethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,2-Dichlorobenzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,2-Dichloroethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,3-Dichlorobenzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
1,4-Dichlorobenzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
2-Butanone	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
2-Hexanone	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
4-Methyl-2-pentanone	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Acetone	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Benzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Bromodichloromethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Bromoform	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Bromomethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Carbon disulfide	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Carbon tetrachloride	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Chlorobenzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Chloroethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Chloroform	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Chloromethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Cumene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Cyclohexane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Dibromochloromethane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U

NA - Not analyzed  
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J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name									
Ethylbenzene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Methyl acetate	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 UJ
Methylcyclohexane	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Methylene chloride	NA	NA	NA	3.7 B	3.2 B	12 U	12 U	11 U	1.6 B
Styrene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Tetrachloroethene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Toluene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Trichloroethene	NA	NA	NA	14 U	13 U	73,000	82,000	65,000	12 U
Trichlorofluoromethane(Freon-11)	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Vinyl chloride	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Xylene, total	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
cis-1,2-Dichloroethene	NA	NA	NA	14 U	13 U	1.7 J	1.5 J	12	12 U
cis-1,3-Dichloropropene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
o-Xylene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
trans-1,2-Dichloroethene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
trans-1,3-Dichloropropene	NA	NA	NA	14 U	13 U	12 U	12 U	11 U	12 U
Semi-volatile Organic Compounds (UG/KG)									
1,1-Biphenyl	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2,4,5-Trichlorophenol	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U
2,4,6-Trichlorophenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2,4-Dichlorophenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2,4-Dimethylphenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2,4-Dinitrophenol	NA	NA	NA	1,200 U	1,100 R	980 UJ	970 UJ	940 UJ	960 U
2-Chloronaphthalene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2-Chlorophenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2-Methylnaphthalene	NA	NA	NA	58 J	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2-Methylphenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2-Nitroaniline	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U
2-Nitrophenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
3,3'-Dichlorobenzidine	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
3- and 4-Methylphenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
3-Nitroaniline	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U
4,6-Dinitro-2-methylphenol	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22		AS01-SB23	
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)		AS01-SS22-(0-1)		AS01-SS23-(0-1)	
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01		10/25/01		10/26/01	
Chemical Name											
4-Bromophenyl-phenylether	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
4-Chloro-3-methylphenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
4-Chloroaniline	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
4-Chlorophenyl-phenylether	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA		
4-Nitroaniline	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U		
4-Nitrophenol	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U		
Acenaphthene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Acenaphthylene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Acetophenone	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Anthracene	NA	NA	NA	56 J	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Atrazine	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Benzaldehyde	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 UJ		
Benzo(a)anthracene	NA	NA	NA	140 J	100 J	61 J	45 J	78 J	110 J		
Benzo(a)pyrene	NA	NA	NA	130 B	83 B	55 J	45 J	79 J	120 B		
Benzo(b)fluoranthene	NA	NA	NA	160 J	100 J	97 J	61 J	110 J	190 J		
Benzo(g,h,i)perylene	NA	NA	NA	73 B	56 B	390 UJ	390 UJ	49 J	63 B		
Benzo(k)fluoranthene	NA	NA	NA	170 B	110 B	64 J	63 J	83 J	170 B		
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Butylbenzylphthalate	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Caprolactam	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Carbazole	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Chrysene	NA	NA	NA	220 J	130 J	110 J	80 J	120 J	190 J		
Di-n-butylphthalate	NA	NA	NA	460 U	54 J	74 J	110 J	380 UJ	390 U		
Di-n-octylphthalate	NA	NA	NA	460 UJ	420 UJ	390 UJ	390 UJ	380 UJ	390 UJ		
Dibenz(a,h)anthracene	NA	NA	NA	460 UJ	420 UJ	390 UJ	390 UJ	380 UJ	390 UJ		
Dibenzofuran	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Diethylphthalate	NA	NA	NA	460 U	46 J	79 J	130 J	58 J	40 J		
Dimethyl phthalate	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Fluoranthene	NA	NA	NA	230 J	140 J	120 J	90 J	140 J	200 J		
Fluorene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Hexachlorobenzene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Hexachlorobutadiene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		
Hexachlorocyclopentadiene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U		

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name									
Hexachloroethane	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Indeno(1,2,3-cd)pyrene	NA	NA	NA	54 J	52 J	390 UJ	390 UJ	380 UJ	64 J
Isophorone	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Naphthalene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Pentachlorophenol	NA	NA	NA	1,200 U	1,100 UJ	980 UJ	970 UJ	940 UJ	960 U
Phenanthrene	NA	NA	NA	220 J	98 J	120 J	110 J	110 J	120 J
Phenol	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Pyrene	NA	NA	NA	300 J	150 J	110 J	89 J	150 J	220 J
bis(2-Chloro-1-methylethyl) ether	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
bis(2-Chloroethoxy)methane	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
bis(2-Chloroethyl)ether	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
bis(2-Ethylhexyl)phthalate	NA	NA	NA	180 B	54 B	96 J	68 J	100 J	42 B
n-Nitroso-di-n-propylamine	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
n-Nitrosodiphenylamine	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)									
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	52 U	38 U	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2,6-Dinitrotoluene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	460 U	420 UJ	390 UJ	390 UJ	380 UJ	390 U
Nitroglycerin	52 U	38 U	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
PETN	52 U	38 U	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	52 U	38 U	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name									
Total Metals (MG/KG)									
Aluminum	6,680	1,970	3,490	7,710	4,730	12,100	14,500	14,900	7,890
Antimony	11.7 U	16.3 U	7.90 U	6.9 J	17.4	9.2 J	14.2	5.6 J	2.1 U
Arsenic	6.60	1.5 B	4.30 J	16.6	9.6	13.1	12.2	19.3	10.2
Barium	64.1	24.6 B	41.5	168	125	592	646	312	121
Beryllium	0.790 B	0.390 U	0.230 B	2.1 J	1.3 J	1.1 J	0.99 J	1.2 J	1.5 J
Cadmium	2.70	0.580 U	2	0.84 U	0.76 U	11	12.4	6.5	0.69 U
Calcium	34,800	246,000	149,000	5,380	4,890	7,610 J	6,930 J	6,970 J	6,110
Chromium	19.3	7	22	15.6	13	43.3 J	42 J	224 J	22.5
Cobalt	10.6 B	1.60 B	5 B	42.8	24	23.7	21.8	34.5	18.9
Copper	25.6	5.20 B	33.9	46	33.3	526	453	1,080	57.4
Cyanide	NA	NA	NA	0.7 U	0.7	1.07	0.6 U	0.6 U	1.9
Iron	28,300	6,820	12,400	31,200	20,600	33,800	31,100	57,900	24,700
Lead	74.9	6.5	80.1	53.3	43.5	917	1,120	337	46
Magnesium	4,700	13,000	14,100	1,310 J	1,010 J	2,600	3,030	3,480	1,610
Manganese	421	161	266	1,640	1,100	1,050	1,080	1,460	719
Mercury	0.420	0.0600 B	5.30	0.34	0.31	4.7 K	4.6 K	2.5 K	0.24
Nickel	21.4	2.30 U	8.40	60.9	38.2	47.4	40.8	240	29.3
Potassium	1,190 B	634 B	603 B	1,160 J	855 J	1,060 J	1,030 J	1,070 J	1,290 J
Selenium	0.830 U	0.580 U	0.570 U	1.4 U	1.3 U	1.2 U	1.1 U	1.1 U	1.2 U
Silver	7.70	1.60 U	11.6	2.6 L	2 L	70.3 L	68.6 L	61 L	12.1 L
Sodium	71.6 B	123 B	127 B	83.1 J	89.5 J	162 J	205 J	198 J	86.7 J
Thallium	0.830 U	0.580 U	0.570 UJ	2 U	2.2 J	1.7 U	1.7 U	1.6 U	1.7 U
Vanadium	18.9	10.3 B	15.9	37.1	41.2	44.6	40.5	332	24.3
Zinc	123	23.6	261	220	144	957	1,030	1,360	235
TCLP Metals (MGL)									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	22C-1	22C-2	22D-1	AOCM-1	AOCM-2	AS01-SB21		AS01-SB22	AS01-SB23
Sample ID	22C-1-T	22C-2-T	22D-1-T	AOCM-1-T	AOCM-2-T	AS01-SS21-(0-1)	AS01-SS21P-(0-1)	AS01-SS22-(0-1)	AS01-SS23-(0-1)
Sample Date	10/26/95	10/26/95	10/26/95	10/26/01	10/26/01	10/25/01	10/25/01	10/25/01	10/26/01
Chemical Name									
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
% Moisture	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	8,300	7,100	9,000	9,500	7,000	8,600
pH	NA	NA	NA	7.06	6.65	7.96	7.38	7.04	6.88

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	11 U	12 U	2 J	14 U	12 U	13 U	14 U
1,1,2,2-Tetrachloroethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,1,2-Trichloroethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,1-Dichloroethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,1-Dichloroethene	11 U	12 U	13 U	14 U	2.6 J	13 U	14 U
1,2,4-Trichlorobenzene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,2-Dibromo-3-chloropropane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,2-Dibromoethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,2-Dichlorobenzene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,2-Dichloroethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,2-Dichloroethene (total)	NA						
1,2-Dichloropropane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,3-Dichlorobenzene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
1,4-Dichlorobenzene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
2-Butanone	11 U	12 U	13 U	14 U	12 U	13 U	14 U
2-Hexanone	11 U	12 U	13 U	14 U	12 U	13 U	14 U
4-Methyl-2-pentanone	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Acetone	11 U	12 U	13 U	14 U	9.6 J	13 U	14 U
Benzene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Bromodichloromethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Bromoform	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Bromomethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Carbon disulfide	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Carbon tetrachloride	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Chlorobenzene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Chloroethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Chloroform	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Chloromethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Cumene	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Cyclohexane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Dibromochloromethane	11 U	12 U	13 U	14 U	12 U	13 U	14 U
Dichlorodifluoromethane (Freon-12)	11 U	12 U	13 U	14 U	12 U	13 U	14 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name							
4-Bromophenyl-phenylether	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
4-Chloro-3-methylphenol	370 U	390 U	430 U	420 U	410 U	420 U	440 U
4-Chloroaniline	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
4-Chlorophenyl-phenylether	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
4-Methylphenol	NA						
4-Nitroaniline	910 U	980 U	1,100 UL	1,000 U	1,000 U	1,000 U	1,100 U
4-Nitrophenol	910 U	980 U	1,100 U	1,000 U	1,000 U	1,000 U	1,100 U
Acenaphthene	90 J	160 J	430 UL	420 U	410 U	420 U	440 U
Acenaphthylene	47 J	48 J	430 UL	420 U	410 U	420 U	440 U
Acetophenone	370 U	390 U	430 U	420 U	410 U	420 U	440 U
Anthracene	440	310 J	47 L	56 J	410 U	420 U	66 J
Atrazine	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Benzaldehyde	600	500	430 UL	420 U	410 U	420 UJ	440 U
Benzo(a)anthracene	760	680	180 L	180 J	100 J	83 J	220 J
Benzo(a)pyrene	680	750	160 L	170 J	100 B	84 B	240 J
Benzo(b)fluoranthene	840	970	240 L	260 J	120 J	98 J	290 J
Benzo(g,h,i)perylene	290 J	320 J	71 L	68 J	45 B	420 UJ	96 J
Benzo(k)fluoranthene	640	690	230 L	170 J	130 B	130 B	300 J
Benzoic acid	NA						
Benzyl alcohol	NA						
Butylbenzylphthalate	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Caprolactam	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Carbazole	120 J	210 J	430 UL	43 J	410 U	420 U	440 U
Chrysene	960	890	290 L	300 J	160 J	130 J	350 J
Di-n-butylphthalate	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Di-n-octylphthalate	370 U	390 U	430 UL	420 U	410 UJ	420 UJ	440 U
Dibenz(a,h)anthracene	51 J	390 U	430 L	420 U	410 UJ	420 UJ	440 U
Dibenzofuran	100 J	110 J	430 UL	420 U	410 U	420 U	440 U
Diethylphthalate	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Dimethyl phthalate	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Fluoranthene	1,200	1,200	310 L	380 J	190 J	150 J	360 J
Fluorene	130 J	160 J	430 UL	420 U	410 U	420 U	440 U
Hexachlorobenzene	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Hexachlorobutadiene	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Hexachlorocyclopentadiene	370 U	390 U	430 UL	420 U	410 U	420 U	440 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name							
Hexachloroethane	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Indeno(1,2,3-cd)pyrene	270 J	310 J	68 L	64 J	57 J	420 UJ	110 J
Isophorone	370 U	390 U	430 U	420 U	410 U	420 U	440 U
Naphthalene	120 J	110 J	430 UL	57 J	410 U	420 U	440 U
Pentachlorophenol	910 U	980 U	1,100 U	1,000 U	1,000 U	1,000 U	1,100 U
Phenanthrene	1,300	1,100	220 L	360 J	140 J	120 J	250 J
Phenol	370 U	390 U	430 U	420 U	410 U	420 U	440 U
Pyrene	1,800	1,400	440 L	410 J	190 J	180 J	460
bis(2-Chloro-1-methylethyl) ether	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
bis(2-Chloroethoxy)methane	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
bis(2-Chloroethyl)ether	370 U	390 U	430 U	420 U	410 U	420 U	440 U
bis(2-Ethylhexyl)phthalate	340 J	73 J	130 B	180 B	410 U	52 B	90 J
n-Nitroso-di-n-propylamine	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
n-Nitrosodiphenylamine	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
Pesticide/Polychlorinated Biphenyls (UG/KG)							
Aroclor-1016	NA						
Aroclor-1221	NA						
Aroclor-1232	NA						
Aroclor-1242	NA						
Aroclor-1248	NA						
Aroclor-1254	NA						
Aroclor-1260	NA						
Dioxin/Furans (UG/KG)							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.0427
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.0124 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	4.66E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	7.85E-04
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00346
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.00193
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00330 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.00195
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	3.04E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	2.10E-04 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00120
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00101
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00156 J
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	7.17E-04 J
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00335 J
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.780
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.0304
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.0888
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.0147
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.0102
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.0206
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	2.10E-04 U
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.00292
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.00846
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.0153
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	620 U	670 U
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	620 U	670 U
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	620 U	670 U
2,4-Dinitrotoluene	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
2,6-Dinitrotoluene	370 U	390 U	430 UL	420 U	410 U	420 U	440 U
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	620 U	670 U
2-Nitrotoluene	NA	NA	NA	NA	NA	620 U	670 U
3-Nitrotoluene	NA	NA	NA	NA	NA	620 U	670 U
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	620 U	670 U
4-Nitrotoluene	NA						
HMX	NA	NA	NA	NA	NA	620 U	670 U
Nitrobenzene	370 U	390 U	430 UL	420 U	410 U	620 U	670 U
Nitroglycerin	NA	NA	NA	NA	NA	62,000 U	67,000 U
Nitroguanidine	NA	NA	NA	NA	NA	120,000 U	130,000 U
PETN	NA	NA	NA	NA	NA	62,000 U	67,000 U
Perchlorate	NA	NA	NA	NA	NA	60 U	70 U
RDX	NA	NA	NA	NA	NA	620 U	670 U
Tetryl	NA	NA	NA	NA	NA	620 U	670 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
Chemical Name							
Total Metals (MG/KG)							
Aluminum	5,530	8,070	9,540	6,570	6,640	6,620	5,410
Antimony	2.1 U	2.2 U	2.4 U	2.4 U	2.3 U	2.3 U	2.5 U
Arsenic	14.4	18.2	18.4	11	13	14.4	10.5
Barium	166	220	231	248	220	196	176
Beryllium	1.7	1.9	1.8 J	1.5 J	1.8 J	1.9 J	1.7
Cadmium	0.77 J	0.93 J	0.77 U	0.8 U	0.74 U	0.75 U	0.82 U
Calcium	3,310	4,690	5,470	5,450	4,460	4,180	4,620
Chromium	11.6 J	15.4 J	17.9	11.4	12.6	13.4	9.5 J
Cobalt	58.2	55.6	43.9	38.7	41.8	39.7	51.1
Copper	41	48.2	55.2	40.2	37.4	35.6	36.2
Cyanide	1	0.6 U	0.7 U	0.7 U	0.6 U	1.3	0.7 U
Iron	25,800	32,300	34,500	21,900	26,800	26,800	18,900
Lead	42.4	47.6	55.1	46.7	42.2	45.3	38.1
Magnesium	951 J	1,420	1,670	1,680	1,380	1,190 J	1,130 J
Manganese	2,250	2,320	1,970	2,100	1,930	1,740	1,890
Mercury	0.29	0.28	0.18	0.14	0.69	0.16	0.14 U
Nickel	79.5	77.3	83.7	56	59.5	54	75.4
Potassium	604 J	953 J	1,150 J	809 J	812 J	818 J	592 J
Selenium	1.1 U	1.2 U	1.3 U	1.3 U	1.7	1.3 U	1.4 U
Silver	1.8 L	4 L	1.3 UL	1.3 UL	1.2 R	1.3 R	1.4 UL
Sodium	81.2 J	81.5 J	73.3 U	75.7 U	82.5 J	117 J	78.1 U
Thallium	1.6 U	1.8 U	1.8 U	1.9 U	1.8 U	1.8 U	2 U
Vanadium	16.5	22.2	25.7	16.3	18.8	23.2	13.4 J
Zinc	231	246	207	168	176	161	206
TCLP Metals (MG/L)							
Arsenic	NA						
Barium	NA						
Cadmium	NA						
Chromium	NA						
Lead	NA						
Mercury	NA						
Selenium	NA						

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB28	AS01-SB29	AS01-SB30
Sample ID	AS01-SS24-(0-1)	AS01-SS25-(0-1)	AS01-SS26-(0-1)	AS01-SS27-(0-1)	AS01-SS28-(0-1)	AS01-SS29-(0-1)	AS01-SS30-(0-1)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/26/01	10/26/01	10/24/01
<b>Chemical Name</b>							
Silver	NA						
<b>Wet Chemistry (MG/KG)</b>							
% Moisture	NA						
Total organic carbon (TOC)	7,300	8,700	9,300	8,300	9,600	7,000	8,300
pH	6.39	6.4	5.67	6.25	7.43	6.47	7.28

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	12 U	2 J	12 U	13 U	13 U	12 U	3.1 J
1,1,2,2-Tetrachloroethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,1,2-Trichloroethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,1-Dichloroethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,1-Dichloroethene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2,4-Trichlorobenzene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2-Dibromo-3-chloropropane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2-Dibromoethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2-Dichlorobenzene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2-Dichloroethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,3-Dichlorobenzene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
1,4-Dichlorobenzene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
2-Butanone	12 U	14 U	12 U	13 U	13 U	12 U	13 U
2-Hexanone	12 U	14 U	12 U	13 U	13 U	12 U	13 U
4-Methyl-2-pentanone	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Acetone	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Benzene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Bromodichloromethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Bromoform	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Bromomethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Carbon disulfide	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Carbon tetrachloride	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Chlorobenzene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Chloroethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Chloroform	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Chloromethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Cumene	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Cyclohexane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Dibromochloromethane	12 U	14 U	12 U	13 U	13 U	12 U	13 U
Dichlorodifluoromethane (Freon-12)	12 U	14 U	12 U	13 U	13 U	12 U	13 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB31		AS01-SB32		AS01-SB33		AS01-SB34				AS01-SB35		AS01-SB36	
Sample ID	AS01-SS31-(0-1)		AS01-SS32-(0-1)		AS01-SS33-(0-1)		AS01-SS34P-(0-1)		AS01-SS34-(0-1)		AS01-SS35-(0-1)		AS01-SS36-(0-1)	
Sample Date	10/25/01		10/25/01		10/26/01		10/25/01		10/25/01		10/26/01		10/25/01	
Chemical Name														
4-Bromophenyl-phenylether	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
4-Chloro-3-methylphenol	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
4-Chloroaniline	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
4-Chlorophenyl-phenylether	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
4-Methylphenol	NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	980	UJ	1,200	UJ	1,000	U	1,000	UJ	1,100	UJ	990	U	1,100	UJ
4-Nitrophenol	980	UJ	1,200	UJ	1,000	U	1,000	UJ	1,100	UJ	990	U	1,100	UJ
Acenaphthene	390	UJ	460	UJ	410	U	58	J	420	UJ	400	U	430	UJ
Acenaphthylene	53	J	460	UJ	410	U	420	UJ	420	UJ	46	J	430	UJ
Acetophenone	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Anthracene	52	J	51	J	140	J	130	J	86	J	54	J	430	UJ
Atrazine	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Benzaldehyde	390	UJ	460	UJ	410	UJ	420	UJ	420	UJ	400	UJ	260	J
Benzo(a)anthracene	130	J	200	J	250	J	340	J	230	UJ	160	J	100	J
Benzo(a)pyrene	130	J	180	J	220	B	340	J	250	J	180	B	100	J
Benzo(b)fluoranthene	140	J	260	J	270	J	380	J	270	J	120	J	150	J
Benzo(g,h,i)perylene	55	J	59	J	69	B	140	J	110	J	140	B	50	J
Benzo(k)fluoranthene	130	J	210	J	270	B	410	J	270	J	280	B	150	J
Benzoic acid	NA		NA		NA		NA		NA		NA		NA	
Benzyl alcohol	NA		NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Caprolactam	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Carbazole	46	J	460	UJ	410	U	89	J	60	J	51	J	430	UJ
Chrysene	200	J	280	J	340	J	450	J	330	J	240	J	180	J
Di-n-butylphthalate	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Di-n-octylphthalate	390	UJ	460	UJ	410	UJ	420	UJ	420	UJ	400	U	430	UJ
Dibenz(a,h)anthracene	390	UJ	460	UJ	410	UJ	420	UJ	420	UJ	400	U	430	UJ
Dibenzofuran	390	UJ	460	UJ	410	U	44	J	420	UJ	400	U	430	UJ
Diethylphthalate	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Dimethyl phthalate	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Fluoranthene	340	J	260	J	460		560	J	400	J	300	J	150	J
Fluorene	390	UJ	460	UJ	55	J	59	J	44	J	400	U	430	UJ
Hexachlorobenzene	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Hexachlorobutadiene	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Hexachlorocyclopentadiene	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB31		AS01-SB32		AS01-SB33		AS01-SB34		AS01-SB35		AS01-SB36			
Sample ID	AS01-SS31-(0-1)		AS01-SS32-(0-1)		AS01-SS33-(0-1)		AS01-SS34P-(0-1)		AS01-SS35-(0-1)		AS01-SS36-(0-1)			
Sample Date	10/25/01		10/25/01		10/26/01		10/25/01		10/25/01		10/26/01			
Chemical Name														
Hexachloroethane	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Indeno(1,2,3-cd)pyrene	61	J	56	J	76	J	140	J	120	J	120	J	46	J
Isophorone	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Naphthalene	390	UJ	460	UJ	410	U	48	J	50	J	400	U	53	J
Pentachlorophenol	980	U	1,200	UJ	1,000	U	1,000	UJ	1,100	UJ	990	U	1,100	UJ
Phenanthrene	340	J	150	J	440		470	J	320	J	240	J	210	J
Phenol	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
Pyrene	270	J	270	J	510		610	J	390	J	300	J	290	J
bis(2-Chloro-1-methylethyl) ether	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
bis(2-Chloroethoxy)methane	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
bis(2-Chloroethyl)ether	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
bis(2-Ethylhexyl)phthalate	40	J	50	J	43	B	48	J	77	J	400	U	66	J
n-Nitroso-di-n-propylamine	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
n-Nitrosodiphenylamine	390	UJ	460	UJ	410	U	420	UJ	420	UJ	400	U	430	UJ
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>														
Aroclor-1016	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1221	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1232	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1242	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1248	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1254	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1260	NA		NA		NA		NA		NA		NA		NA	
<b>Dioxin/Furans (UG/KG)</b>														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0134		0.0314		0.111		NA		NA		0.0558		0.169	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0136		0.00893	J	0.0263		NA		NA		0.0132		0.0283	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.02E-04	U	7.23E-04	J	0.00216		NA		NA		0.00139		0.00227	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.23E-04	J	6.41E-04		0.00262		NA		NA		0.00132		0.00228	
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00136		0.00292		0.0115		NA		NA		0.0117		0.00627	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	6.85E-04		0.00129		0.00536		NA		NA		0.00249		0.00746	
1,2,3,6,7,8-Hexachlorodibenzofuran	1.89E-04	J	5.62E-04		0.00267		NA		NA		0.00157		0.00556	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	6.27E-04		0.00121		0.00443		NA		NA		0.00237		0.00563	
1,2,3,7,8,9-Hexachlorodibenzofuran	1.04E-04	U	1.21E-04	U	9.91E-04	U	NA		NA		3.54E-04	U	3.88E-04	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.52E-04	U	1.77E-04	U	0.00124		NA		NA		6.63E-04		0.00132	

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Table D-3  
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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	4.42E-04 J	6.86E-04	0.00287	NA	NA	0.00380	0.00263
2,3,4,6,7,8-Hexachlorodibenzofuran	1.94E-04	3.36E-04	0.00388	NA	NA	0.00162	0.00181
2,3,4,7,8-Pentachlorodibenzofuran	2.07E-04 U	6.89E-04	0.00461	NA	NA	0.00269	0.00381
2,3,7,8-TCDD (dioxin)	4.71E-04 J	4.94E-04	0.00307	NA	NA	1.60E-04 U	0.00607 J
2,3,7,8-Tetrachlorodibenzofuran	0.00319 J	0.00448	0.0283	NA	NA	0.00615	0.0353 J
Octachlorodibenzo-p-dioxin	0.219	0.489	1.66	NA	NA	1.41	2.24
Octachlorodibenzofuran	0.0100	0.0209	0.0496	NA	NA	0.0283	0.0631
Total heptachlorodibenzo-p-dioxin	0.0264	0.0638	0.239	NA	NA	0.115	0.344
Total heptachlorodibenzofuran	0.0136	1.19E-04 U	0.0285	NA	NA	0.0146	0.0920
Total hexachlorodibenzo-p-dioxin	0.00462	0.0106	0.0450	NA	NA	0.0223	0.0362
Total hexachlorodibenzofuran	0.00612	0.0124	0.0513	NA	NA	0.0524	0.0606
Total pentachlorodibenzo-p-dioxin	1.52E-04 U	7.41E-04	0.0148	NA	NA	0.0026	0.0118
Total pentachlorodibenzofuran	0.00243	0.00656	0.0397	NA	NA	0.0613	0.0386
Total tetrachlorodibenzo-p-dioxin	0.00137	0.0163	0.0424	NA	NA	0.00178	0.161
Total tetrachlorodibenzofuran	0.00882	0.0107	0.0879	NA	NA	0.0238	0.0787
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
1,3-Dinitrobenzene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
2,4,6-Trinitrotoluene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
2,4-Dinitrotoluene	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
2,6-Dinitrotoluene	390 UJ	460 UJ	410 U	420 UJ	420 UJ	400 U	430 UJ
2-Amino-4,6-dinitrotoluene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
2-Nitrotoluene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
3-Nitrotoluene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
4-Amino-2,6-dinitrotoluene	600 U	690 U	610 U	630 U	630 U	580 U	650 U
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA
HMX	600 U	690 U	610 U	630 U	630 U	580 U	650 U
Nitrobenzene	600 R	690 U	610 U	630 U	630 R	580 R	650 U
Nitroglycerin	60,000 U	69,000 U	61,000 U	63,000 U	63,000 U	58,000 U	65,000 U
Nitroguanidine	120,000 U	140,000 U	120,000 U	130,000 U	130,000 U	120,000 U	130,000 U
PETN	60,000 U	69,000 U	61,000 U	63,000 U	63,000 U	58,000 U	65,000 U
Perchlorate	60 U	70 U	60 U	60 U	60 U	60 U	60 U
RDX	600 U	690 U	610 U	630 U	630 U	580 U	650 U
Tetryl	600 U	690 U	610 U	630 U	630 U	580 U	650 U

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name							
Total Metals (MG/KG)							
Aluminum	4,240	6,360	6,660	7,400	7,010	6,120	8,360
Antimony	2.1 U	2.5 U	2.3 U	2.3 U	2.3 U	2.2 U	2.4 U
Arsenic	11.7	15.1	17.9	16.5	15.5	13.8	17.9
Barium	80.1	152	219	203	201	188	225
Beryllium	1.5 J	1.9 J	1.9 J	2.1 J	2 J	1.9 J	1.7 J
Cadmium	0.7 U	0.81 U	0.75 U	0.9 J	0.93 J	0.72 U	0.78 U
Calcium	1,960 J	3,510 J	4,230	4,830 J	4,760 J	4,340	4,340 J
Chromium	12.4 J	15.6 J	15.3	15 J	13.8 J	13	16.5 J
Cobalt	38.4	52.3	41.7	59	60	39.3	41
Copper	23.2	34.1	45	59.2	59.8	37.5	44.9
Cyanide	0.6 U	0.7 U	0.9	0.6 U	0.6 U	0.7	0.7 U
Iron	31,300	35,600	33,600	32,300	29,800	27,800	34,800
Lead	26.7	32.8	40.8	48.3	49.7	47.2	48.3
Magnesium	561 J	1,030 J	1,280	1,210 J	1,140 J	1,200 J	1,440
Manganese	1,480	2,090	1,770	2,240	2,250	1,650	1,700
Mercury	0.11 U	0.14 U	0.18	0.41 K	0.39 K	0.18	0.18 K
Nickel	60.1	78.4	58.3	78.9	78.7	54.5	56.7
Potassium	399 J	784 J	906 J	912 J	847 J	746 J	1,160 J
Selenium	1.2 U	1.4 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U
Silver	1.2 UL	1.4 UL	1.7 L	9.8 L	7.9 L	1.7 L	1.3 UL
Sodium	107 J	121 J	70.9 U	90.6 J	116 J	82 J	144 J
Thallium	1.7 U	2 U	1.8 U	1.8 U	1.8 U	1.7 U	1.9 U
Vanadium	15.2	27.5	20.7	21.4	19.8	18.9	22.6
Zinc	183	239	189	283	274	186	204
TCLP Metals (MG/L)							
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA

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U - Undetected  
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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB31	AS01-SB32	AS01-SB33	AS01-SB34		AS01-SB35	AS01-SB36
Sample ID	AS01-SS31-(0-1)	AS01-SS32-(0-1)	AS01-SS33-(0-1)	AS01-SS34P-(0-1)	AS01-SS34-(0-1)	AS01-SS35-(0-1)	AS01-SS36-(0-1)
Sample Date	10/25/01	10/25/01	10/26/01	10/25/01	10/25/01	10/26/01	10/25/01
Chemical Name							
Silver	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	8,400	7,600	9,000	6,100	8,300	8,300	7,400
pH	6.53	6.51	7.31	6.52	6.74	6.95	6.79

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1
Sample Date	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1-Trichloroethane	2.2 J	12 U	12 U	13 U	13 U	12 U	12 UJ
1,1,2,2-Tetrachloroethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,1,2-Trichloroethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,1-Dichloroethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,1-Dichloroethene	1 J	12 U	12 U	1.8 J	13 U	12 U	12 UJ
1,2,4-Trichlorobenzene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,2-Dibromo-3-chloropropane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,2-Dibromoethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,2-Dichlorobenzene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,2-Dichloroethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,3-Dichlorobenzene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
1,4-Dichlorobenzene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
2-Butanone	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
2-Hexanone	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
4-Methyl-2-pentanone	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Acetone	13 U	12 U	12 U	13 U	13 U	12 U	5 B
Benzene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Bromodichloromethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Bromoform	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Bromomethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Carbon disulfide	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Carbon tetrachloride	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Chlorobenzene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Chloroethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Chloroform	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Chloromethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Cumene	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Cyclohexane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Dibromochloromethane	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ
Dichlorodifluoromethane (Freon-12)	13 U	12 U	12 U	13 U	13 U	12 U	12 UJ

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37		AS01-SB38			AS01-SB39		AS01-SB40		AS01-SB41		AS01-SB45		
Sample ID	AS01-SS37-(0-1)		AS01-SS38P-(0-1)		AS01-SS38-(0-1)		AS01-SS39-(0-1)		AS01-SS40-(0-1)		AS01-SS41-(0-1)		AS01-SS45-0-1	
Sample Date	10/26/01		10/26/01		10/26/01		10/23/01		10/24/01		10/24/01		07/20/04	
Chemical Name														
Ethylbenzene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Methyl acetate	13	U	12	U	12	U	13	U	13	U	12	U	3.3	J
Methyl-tert-butyl ether (MTBE)	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Methylcyclohexane	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Methylene chloride	2.8	B	12	U	6.4	B	3.7	B	13	U	12	U	3.6	B
Styrene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Tetrachloroethene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Toluene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Trichloroethene	13	U	12	U	12	U	180		23		12	U	12	UJ
Trichlorofluoromethane(Freon-11)	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Vinyl chloride	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
Xylene, total	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
cis-1,2-Dichloroethene	13	U	12	U	12	U	11	J	13	U	12	U	12	UJ
cis-1,3-Dichloropropene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
o-Xylene	13	U	12	U	12	U	13	U	13	U	12	U	NA	
trans-1,2-Dichloroethene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
trans-1,3-Dichloropropene	13	U	12	U	12	U	13	U	13	U	12	U	12	UJ
<b>Semi-volatile Organic Compounds (UG/KG)</b>														
1,1-Biphenyl	420	U	360	U	390	U	380	U	38	J	53	J	NA	
2,4,5-Trichlorophenol	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	
2,4,6-Trichlorophenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
2,4-Dichlorophenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
2,4-Dimethylphenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
2,4-Dinitrophenol	1,100	R	910	U	980	U	960	U	940	U	990	U	NA	
2-Chloronaphthalene	420	U	360	U	390	U	380	U	370	U	400	U	NA	
2-Chlorophenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
2-Methylnaphthalene	42	J	360	U	390	U	40	J	74	J	77	J	NA	
2-Methylphenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
2-Nitroaniline	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	
2-Nitrophenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
3,3'-Dichlorobenzidine	420	U	360	U	390	U	380	U	370	U	400	U	NA	
3- and 4-Methylphenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
3-Nitroaniline	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	
4,6-Dinitro-2-methylphenol	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37		AS01-SB38			AS01-SB39		AS01-SB40		AS01-SB41		AS01-SB45		
Sample ID	AS01-SS37-(0-1)		AS01-SS38P-(0-1)		AS01-SS38-(0-1)		AS01-SS39-(0-1)		AS01-SS40-(0-1)		AS01-SS41-(0-1)		AS01-SS45-0-1	
Sample Date	10/26/01		10/26/01		10/26/01		10/23/01		10/24/01		10/24/01		07/20/04	
Chemical Name														
4-Bromophenyl-phenylether	420	U	360	U	390	U	380	U	370	U	400	U	NA	
4-Chloro-3-methylphenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
4-Chloroaniline	420	U	360	U	390	U	380	U	370	U	400	U	NA	
4-Chlorophenyl-phenylether	420	U	360	U	390	U	380	U	370	U	400	U	NA	
4-Methylphenol	NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	
4-Nitrophenol	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	
Acenaphthene	420	U	360	U	390	U	380	U	370	U	400	U	11	J
Acenaphthylene	420	U	360	U	390	U	380	U	370	U	41	J	400	U
Acetophenone	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Anthracene	50	J	48	J	390	U	380	U	49	J	99	J	12	J
Atrazine	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Benzaldehyde	420	R	360	U	390	U	380	U	370	U	300	J	NA	
Benzo(a)anthracene	160	J	150	J	100	J	120	J	140	J	180	J	9.5	J
Benzo(a)pyrene	150	B	150	J	110	J	110	J	140	J	180	J	83	J
Benzo(b)fluoranthene	260	J	200	J	130	J	170	J	170	J	240	J	150	J
Benzo(g,h,i)perylene	130	B	60	J	54	J	44	J	71	J	89	J	52	J
Benzo(k)fluoranthene	170	B	200	J	83	J	140	J	150	J	210	J	47	J
Benzoic acid	NA		NA		NA		NA		NA		NA		NA	
Benzyl alcohol	NA		NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Caprolactam	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Carbazole	420	U	360	U	390	U	380	U	370	U	43	J	NA	
Chrysene	230	J	210	J	160	J	190	J	250	J	280	J	110	J
Di-n-butylphthalate	420	U	360	U	390	U	380	U	370	U	150	J	NA	
Di-n-octylphthalate	420	U	360	UJ	390	U	380	UJ	370	U	400	U	NA	
Dibenz(a,h)anthracene	420	U	360	UJ	390	U	380	UJ	370	U	400	U	NA	
Dibenzofuran	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Diethylphthalate	420	U	360	U	390	U	380	U	370	U	99	J	NA	
Dimethyl phthalate	420	U	360	U	390	U	380	U	370	U	1,100		NA	
Fluoranthene	320	J	270	J	200	J	200	J	310	J	310	J	190	J
Fluorene	420	U	360	U	390	U	380	U	370	U	400	U	8.3	J
Hexachlorobenzene	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Hexachlorobutadiene	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Hexachlorocyclopentadiene	420	R	360	U	390	U	380	U	370	U	400	U	NA	

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37		AS01-SB38			AS01-SB39		AS01-SB40		AS01-SB41		AS01-SB45		
Sample ID	AS01-SS37-(0-1)		AS01-SS38P-(0-1)		AS01-SS38-(0-1)		AS01-SS39-(0-1)		AS01-SS40-(0-1)		AS01-SS41-(0-1)		AS01-SS45-0-1	
Sample Date	10/26/01		10/26/01		10/26/01		10/23/01		10/24/01		10/24/01		07/20/04	
Chemical Name														
Hexachloroethane	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Indeno(1,2,3-cd)pyrene	95	J	58	J	57	J	52	J	66	J	86	J	52	J
Isophorone	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Naphthalene	420	U	360	U	390	U	380	U	52	J	51	J	NA	
Pentachlorophenol	1,100	U	910	U	980	U	960	U	940	U	990	U	NA	
Phenanthrene	230	J	190	J	130	J	150	J	300	J	260	J	130	J
Phenol	420	U	360	U	390	U	380	U	370	U	400	U	NA	
Pyrene	280	J	280	J	190	J	270	J	260	J	410		130	J
bis(2-Chloro-1-methylethyl) ether	420	U	360	U	390	U	380	U	370	U	400	U	NA	
bis(2-Chloroethoxy)methane	420	U	360	U	390	U	380	U	370	U	400	U	NA	
bis(2-Chloroethyl)ether	420	U	360	U	390	U	380	U	370	U	400	U	NA	
bis(2-Ethylhexyl)phthalate	420	U	160	B	68	B	93	B	100	J	940		NA	
n-Nitroso-di-n-propylamine	420	U	360	U	390	U	380	U	370	U	400	U	NA	
n-Nitrosodiphenylamine	420	U	360	U	390	U	380	U	370	U	440		NA	
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>														
Aroclor-1016	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1221	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1232	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1242	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1248	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1254	NA		NA		NA		NA		NA		NA		NA	
Aroclor-1260	NA		NA		NA		NA		NA		NA		NA	
<b>Dioxin/Furans (UG/KG)</b>														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.466		0.0846		0.0737		NA		0.214		0.142		NA	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0573		0.0174		0.0224		NA		0.240		0.0351		NA	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00400		0.00114	U	0.00686		NA		0.0175		0.00271		NA	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00758		0.00236		0.00792		NA		0.00672		0.00266		NA	
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0156		0.00551		0.0107		NA		0.103		0.00698		NA	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0170		0.00324		0.00748		NA		0.0148		0.00652		NA	
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00537		0.00105		0.00623		NA		0.0429	J	0.00705	J	NA	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0162		0.00406		0.00857		NA		0.0173		0.00434		NA	
1,2,3,7,8,9-Hexachlorodibenzofuran	5.55E-04	U	5.60E-04	J	0.00582		NA		0.00221		1.75E-04	U	NA	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00297		7.31E-04		0.00528	J	NA		0.00557		0.00105		NA	

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1
Sample Date	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	0.00591	0.00113	0.00676	NA	0.0213	0.00223	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00859 J	0.00123	0.00809	NA	0.0425	0.00213	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.00902	0.00153	0.00767	NA	0.0448	0.00266	NA
2,3,7,8-TCDD (dioxin)	0.00251	6.98E-04	0.00323	NA	0.00340	0.00203 J	NA
2,3,7,8-Tetrachlorodibenzofuran	0.0155 J	0.00316 J	0.00592 J	NA	0.0227 J	0.00759 J	NA
Octachlorodibenzo-p-dioxin	3.87	1.04	1.07	NA	1.67	1.96	NA
Octachlorodibenzofuran	0.0991	0.0298	0.0523	NA	0.214	0.116	NA
Total heptachlorodibenzo-p-dioxin	0.903	0.158	0.156	NA	0.442	0.272	NA
Total heptachlorodibenzofuran	0.115	0.0174	0.0666	NA	0.379	0.113	NA
Total hexachlorodibenzo-p-dioxin	0.181	0.0397	0.0474	NA	0.207	0.0311	NA
Total hexachlorodibenzofuran	0.107	0.0282	0.0532	NA	0.426	0.0576	NA
Total pentachlorodibenzo-p-dioxin	0.0335	0.00486	0.00998	NA	0.0709	0.00901	NA
Total pentachlorodibenzofuran	0.111	0.0210	0.0344	NA	0.536	0.0269	NA
Total tetrachlorodibenzo-p-dioxin	0.0555	0.0121	0.0151	NA	0.0721	0.154	NA
Total tetrachlorodibenzofuran	0.188	0.0269	0.0349	NA	0.625	0.0381	NA
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	620 U	580 U	590 U	NA	630 U	620 U	NA
1,3-Dinitrobenzene	620 U	580 U	590 U	NA	630 U	620 U	NA
2,4,6-Trinitrotoluene	620 U	580 U	590 U	NA	630 U	620 U	NA
2,4-Dinitrotoluene	420 U	360 U	390 U	380 U	370 U	400 U	NA
2,6-Dinitrotoluene	420 U	360 U	390 U	380 U	370 U	400 U	NA
2-Amino-4,6-dinitrotoluene	620 U	580 U	590 U	NA	630 U	620 U	NA
2-Nitrotoluene	620 U	580 U	590 U	NA	630 U	620 U	NA
3-Nitrotoluene	620 U	580 U	590 U	NA	630 U	620 U	NA
4-Amino-2,6-dinitrotoluene	620 U	580 U	590 U	NA	630 U	620 U	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA
HMX	620 U	580 U	590 U	NA	630 U	620 U	NA
Nitrobenzene	620 R	580 U	590 R	380 U	630 R	620 U	NA
Nitroglycerin	62,000 U	58,000 U	59,000 U	NA	63,000 U	62,000 U	NA
Nitroguanidine	120,000 U	120,000 U	120,000 U	NA	130,000 U	120,000 U	NA
PETN	62,000 U	58,000 U	59,000 U	NA	63,000 U	62,000 U	NA
Perchlorate	60 U	60 U	60 U	NA	60 U	60 U	NA
RDX	620 U	580 U	590 U	NA	630 U	620 U	NA
Tetryl	620 U	580 U	590 U	NA	630 U	620 U	NA

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1
Sample Date	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04
Chemical Name							
Total Metals (MG/KG)							
Aluminum	6,570	6,370	5,540	6,730	15,600	6,930	5,740
Antimony	2.3 U	2.1 U	2.1 U	2.4 U	6.7 J	2.2 U	0.64 UL
Arsenic	12.9	8.8	9.1	13.1	24.9	16.3	8.6 L
Barium	185	182	187	235	351	219	92.8 K
Beryllium	1.5 J	1 J	1.1 J	1.5 J	1.2 J	1.6	1.3
Cadmium	0.75 U	0.69 U	0.7 U	0.78 U	84.7	0.81 J	0.047 U
Calcium	5,560	3,690	4,200	5,110	5,800	4,700	2,770
Chromium	20.7	13.5	11.4	12.3	29.8 J	14.3 J	12.1 K
Cobalt	29.5	20.5	21.5	38.3	43	44	35.6
Copper	161	27.2	27.8	37.5	972	43.7	24.1 J
Cyanide	1.3	1	0.8	0.7 U	0.6 U	0.6 U	0.2 B
Iron	25,000	20,700	19,500	23,100	70,900	29,500	29,500 J
Lead	103	37	37.1	43.3	416	51.8	24.5
Magnesium	1,460	1,120 J	1,110 J	1,530	1,690	1,390	859 J
Manganese	1,310	1,120	1,160	1,940	1,510	1,960	1,200
Mercury	0.28	0.11 U	0.12 U	0.12 U	0.17	0.17	0.077 J
Nickel	47	30.4	31.8	54.5	79.4	63.3	56.6
Potassium	848 J	812 J	796 J	870 J	1,370 J	870 J	691 J
Selenium	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1 B
Silver	3 L	1.2 UL	1.2 UL	1.3 UL	1.2 UL	1.2 UL	0.24 U
Sodium	119 J	65.8 U	66.6 U	74.4 U	227 J	74.1 J	60.8 U
Thallium	1.8 U	1.7 U	1.7 U	1.9 U	1.8 U	1.8 U	2.6 B
Vanadium	32.2	21.8	20.8	16.1	29.7	22.2	15.5
Zinc	362	107	108	165	1,400	192	163
TCLP Metals (MG/L)							
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA

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 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB37	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41	AS01-SB45
Sample ID	AS01-SS37-(0-1)	AS01-SS38P-(0-1)	AS01-SS38-(0-1)	AS01-SS39-(0-1)	AS01-SS40-(0-1)	AS01-SS41-(0-1)	AS01-SS45-0-1
Sample Date	10/26/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01	07/20/04
Chemical Name							
Silver	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	15.7
Total organic carbon (TOC)	7,900	7,700	8,200	7,500	7,300	7,700	43,900
pH	7	6.6	6.11	6.56	8.23	6.76	6.8

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46		AS01-SB47		AS01-SB48		AS01-SB49		AS01-SB50		AS01-SB51		AS01-SB52		
Sample ID	AS01-SS46-0-1		AS01-SS47-0-1		AS01-SS48-0-1		AS01-SS49-0-1		AS01-SS50-0-1		AS01-SS51-0-1		AS01-SS52-0		
Sample Date	07/20/04		07/20/04		07/20/04		07/20/04		07/21/04		07/21/04		07/21/04		
Chemical Name															
<b>Volatile Organic Compounds (UG/KG)</b>															
1,1,1-Trichloroethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,1,2,2-Tetrachloroethane	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,1,2-Trichloroethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,1-Dichloroethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,1-Dichloroethene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,2,4-Trichlorobenzene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,2-Dibromo-3-chloropropane	12	UJ	12	UJ	610	R	620	R	14	U	12	U	700	R	670
1,2-Dibromoethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,2-Dichlorobenzene	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
1,2-Dichloroethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,2-Dichloroethene (total)	NA		NA		NA		NA		NA		NA		NA		
1,2-Dichloropropane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
1,3-Dichlorobenzene	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
1,4-Dichlorobenzene	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
2-Butanone	2.8	J	12	U	610	UL	620	UL	14	U	1.9	J	700	U	670
2-Hexanone	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
4-Methyl-2-pentanone	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Acetone	26	B	6.8	B	120	B	150	B	17	B	30	J	120	B	110
Benzene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Bromodichloromethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Bromoform	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
Bromomethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Carbon disulfide	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Carbon tetrachloride	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Chlorobenzene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Chloroethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Chloroform	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Chloromethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Cumene	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
Cyclohexane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Dibromochloromethane	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Dichlorodifluoromethane (Freon-12)	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46		AS01-SB47		AS01-SB48		AS01-SB49		AS01-SB50		AS01-SB51		AS01-SB52		
Sample ID	AS01-SS46-0-1		AS01-SS47-0-1		AS01-SS48-0-1		AS01-SS49-0-1		AS01-SS50-0-1		AS01-SS51-0-1		AS01-SS52-0		
Sample Date	07/20/04		07/20/04		07/20/04		07/20/04		07/21/04		07/21/04		07/21/04		
Chemical Name															
Ethylbenzene	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
Methyl acetate	2.9	J	12	U	850	L	450	L	2.9	J	11	J	320	J	300
Methyl-tert-butyl ether (MTBE)	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Methylcyclohexane	1.5	J	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Methylene chloride	3.2	B	2.5	B	220	B	250	B	6	B	3.8	B	310	B	290
Styrene	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
Tetrachloroethene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	730		560
Toluene	1.2	J	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Trichloroethene	12	UJ	12	U	3,600	L	990	L	14	U	12	U	2,700		6,400
Trichlorofluoromethane(Freon-11)	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Vinyl chloride	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
Xylene, total	12	UJ	12	UJ	610	UL	620	UL	14	U	12	U	700	U	670
cis-1,2-Dichloroethene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	120
cis-1,3-Dichloropropene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
o-Xylene	NA		NA		NA		NA		NA		NA		NA		NA
trans-1,2-Dichloroethene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
trans-1,3-Dichloropropene	12	UJ	12	U	610	UL	620	UL	14	U	12	U	700	U	670
<b>Semi-volatile Organic Compounds (UG/KG)</b>															
1,1-Biphenyl	NA		NA		NA		NA		NA		NA		NA		NA
2,4,5-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA
2,4,6-Trichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA
2,4-Dichlorophenol	NA		NA		NA		NA		NA		NA		NA		NA
2,4-Dimethylphenol	NA		NA		NA		NA		NA		NA		NA		NA
2,4-Dinitrophenol	NA		NA		NA		NA		NA		NA		NA		NA
2-Chloronaphthalene	NA		NA		NA		NA		NA		NA		NA		NA
2-Chlorophenol	NA		NA		NA		NA		NA		NA		NA		NA
2-Methylnaphthalene	NA		NA		NA		NA		NA		NA		NA		NA
2-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA
2-Nitroaniline	NA		NA		NA		NA		NA		NA		NA		NA
2-Nitrophenol	NA		NA		NA		NA		NA		NA		NA		NA
3,3'-Dichlorobenzidine	NA		NA		NA		NA		NA		NA		NA		NA
3- and 4-Methylphenol	NA		NA		NA		NA		NA		NA		NA		NA
3-Nitroaniline	NA		NA		NA		NA		NA		NA		NA		NA
4,6-Dinitro-2-methylphenol	NA		NA		NA		NA		NA		NA		NA		NA

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0
Sample Date	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	410 U	10 J	420 U	8,900 U	370 U	370 U	400 UL	440
Acenaphthylene	410 U	430 U	420 U	630 J	370 U	370 U	400 UL	440
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	12 J	24 J	10 J	920 J	370 U	370 U	400 UL	440
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	78 J	130 J	64 J	7,500 J	24 J	21 J	31 L	46
Benzo(a)pyrene	88 J	140 J	81 J	9,000	24 J	24 J	36 L	55
Benzo(b)fluoranthene	150 J	230 J	150 J	21,000 J	45 J	45 J	63 L	91
Benzo(g,h,i)perylene	53 J	81 J	51 J	3,700 J	18 J	11 J	21 L	34
Benzo(k)fluoranthene	42 J	80 J	45 J	8,600 J	11 J	11 J	17 L	36
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	110 J	150 J	98 J	10,000	37 J	33 J	45 L	63
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	160 J	260 J	120 J	4,000 J	53 J	49 J	56 L	93
Fluorene	410 U	10 J	420 U	8,900 U	370 U	370 U	400 UL	440
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0
Sample Date	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	57 J	93 J	54 J	5,000 J	19 J	14 J	21 L	33
Isophorone	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	100 J	140 J	74 J	310 J	46 J	37 J	30 L	53
Phenol	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	140 J	190 J	110 J	7,500 J	42 J	34 J	46 L	68
bis(2-Chloro-1-methylethyl) ether	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)								
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0073 J	0.015 J	0.079 J	0.21
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	0.0024 J	0.0044 J	0.11 J	0.45
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	4.20E-04 J	9.00E-04 J	0.012	0.058
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	2.70E-04 J	4.90E-04 J	0.0045 J	0.014
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	0.0028 J	0.004 J	0.076	0.25
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	5.70E-04 J	7.00E-04 J	0.011	0.034
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	7.50E-04 J	0.0013 J	0.031	0.097
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	7.00E-04 J	0.0012 J	0.012 J	0.036
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	7.60E-05 U	1.60E-04 U	0.0018 J	0.0068
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	2.90E-04 J	3.40E-04 J	0.0063	0.017

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UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0
Sample Date	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	0.0026 J	0.003 J	0.03	0.098
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	5.30E-04 J	5.90E-04 J	0.025	0.065
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	0.0012 J	0.0018 J	0.039	0.095
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	2.70E-04 U	4.20E-04 U	0.0023 J	0.005
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	0.0025 J	0.0032 J	0.03 J	0.089
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.13 J	0.3 J	0.66	1.2
Octachlorodibenzofuran	NA	NA	NA	NA	0.012	0.016	0.11	0.57
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.021 J	0.04 J	0.19 J	0.49
Total heptachlorodibenzofuran	NA	NA	NA	NA	0.0054 J	0.0095 J	0.17 J	0.67
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0061 J	0.0099 J	0.11 J	0.33
Total hexachlorodibenzofuran	NA	NA	NA	NA	0.0072 J	0.011 J	0.29 J	0.84
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0033 J	0.0041 J	0.099 J	0.26
Total pentachlorodibenzofuran	NA	NA	NA	NA	0.013 J	0.018 J	0.49 J	1.1
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0042 J	0.0044 J	0.13 J	0.29
Total tetrachlorodibenzofuran	NA	NA	NA	NA	0.02 J	0.027 J	0.83 J	1.5
Explosives (UG/KG)								
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	NA	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA
PETN	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0
Sample Date	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Total Metals (MG/KG)								
Aluminum	7,090	8,490	7,270	9,160	6,190	6,230	14,000	23,400
Antimony	0.67 UL	0.7 UL	0.68 UL	0.72 UL	0.72 J	0.6 UL	1.1 J	2.6
Arsenic	11.1 L	11.9 L	8.5 L	12.4 L	5.9 L	5.8 L	8.5 L	8.6
Barium	148 K	160 K	132 K	186 K	102 K	102 K	259 K	232
Beryllium	1.6	1.6	1 B	1.5	0.73 B	0.66 B	0.94 B	0.92
Cadmium	0.54 B	0.25 B	0.3 B	0.069 B	0.067 B	0.044 U	13 J	4.5
Calcium	3,150	3,470	3,130	3,910	717 J	572 J	4,180	4,630
Chromium	14.2 K	15.7 K	14.1 K	19.7 K	10.4 K	10.3 K	23.5 K	42.7
Cobalt	46.8	41.8	23.4	34.6	10.7 J	10.4 J	23.9	20.3
Copper	37.8 J	46.6 J	43.1 J	43.5 J	17.3 J	17.4 J	123 J	253
Cyanide	0.33 B	0.36 B	0.23 B	0.28 B	0.25 B	1.5	0.34 B	1
Iron	29,500 J	31,300 J	28,000 J	32,300 J	21,000 J	20,800 J	31,100 J	57,100
Lead	39.7	43.6	44.3	44.9	73	62	223	591
Magnesium	970 J	1,120 J	1,130 J	1,370	700 J	687 J	1,430	1,940
Manganese	1,650	1,580	1,060	1,480	591	586	990	771
Mercury	0.17 J	0.96 J	1 J	0.36 J	0.091 J	0.091 J	0.26 J	2.1
Nickel	64.4	60.2	36.6	54.5	15.1	15.3	37	50
Potassium	874 J	1,030 J	1,060 J	1,160 J	711 J	725 J	1,380 J	1,010
Selenium	1.1 B	1 B	0.86 B	1.1 B	0.88 B	0.95 B	1.1 B	0.61
Silver	0.97 B	2.9	3.3	0.54 B	0.22 U	0.22 U	1 B	2.4
Sodium	63.2 U	66 U	64 U	68.6 U	56.4 U	56.4 U	86.3 B	67.4
Thallium	1.4 B	3.3 B	2.5 B	5.2 B	2 B	1.6 B	1.7 B	2.7
Vanadium	18.3	21.3	21.8	21.8	16.1	16	26.5	22.4
Zinc	191	217	161	181	61.9	63.2	845	1,170
TCLP Metals (MG/L)								
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB46	AS01-SB47	AS01-SB48	AS01-SB49	AS01-SB50		AS01-SB51	AS01-SB52
Sample ID	AS01-SS46-0-1	AS01-SS47-0-1	AS01-SS48-0-1	AS01-SS49-0-1	AS01-SS50-0-1	AS01-SS50P-0-1	AS01-SS51-0-1	AS01-SS52-0
Sample Date	07/20/04	07/20/04	07/20/04	07/20/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)								
% Moisture	19	22.4	20.1	25.3	9.2	9.3	17.4	24
Total organic carbon (TOC)	114,500	82,800	64,800	98,400	67,900	29,700	64,100	82,500
pH	6.8	6.9	6.9	6.8	5.1	5	7	6.8

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	-1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
1,1-Dichloroethane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
1,1-Dichloroethene	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	R	1,800 R	13 UJ	NA	NA	NA	NA	NA
1,2-Dibromoethane	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
1,2-Dichloroethane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)		NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
2-Butanone	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
2-Hexanone	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Acetone	B	250 B	4.2 B	NA	NA	NA	NA	NA
Benzene	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Bromodichloromethane	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Bromoform	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Bromomethane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Carbon disulfide	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Carbon tetrachloride	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Chlorobenzene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Chloroethane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Chloroform	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Chloromethane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Cumene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Cyclohexane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Dibromochloromethane	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	UJ	1,800 U	13 U	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	-1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Ethylbenzene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Methyl acetate	J	1,800 U	13 U	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Methylcyclohexane	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Methylene chloride	B	760 B	4 B	NA	NA	NA	NA	NA
Styrene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Tetrachloroethene	J	1,800 U	13 UJ	NA	NA	NA	NA	NA
Toluene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Trichloroethene	J	36,000	13 U	NA	NA	NA	NA	NA
Trichlorofluoromethane(Freon-11)	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Vinyl chloride	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
Xylene, total	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	J	1,800 U	13 U	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
o-Xylene		NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	UJ	1,800 U	13 U	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	UJ	1,800 U	13 UJ	NA	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)								
1,1-Biphenyl		NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol		NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol		NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol		NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol		NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol		NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene		NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol		NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene		NA	NA	NA	NA	NA	NA	NA
2-Methylphenol		NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline		NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol		NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine		NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol		NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline		NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol		NA	NA	NA	NA	NA	NA	NA

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 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	-1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
4-Bromophenyl-phenylether		NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol		NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline		NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether		NA	NA	NA	NA	NA	NA	NA
4-Methylphenol		NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline		NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol		NA	NA	NA	NA	NA	NA	NA
Acenaphthene	U	400 U	420 U	400 U	400 U	450 U	4,100 J	400 U
Acenaphthylene	U	400 U	420 U	400 U	400 U	450 U	4,400 U	400 U
Acetophenone		NA	NA	NA	NA	NA	NA	NA
Anthracene	U	400 U	14 J	8.4 J	69 J	15 J	8,300	12 J
Atrazine		NA	NA	NA	NA	NA	NA	NA
Benzaldehyde		NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	J	34 J	99 J	80 J	74 J	87 J	8,100	70 J
Benzo(a)pyrene	J	40 J	120 J	82 J	79 J	100 J	12,000 J	88 J
Benzo(b)fluoranthene	J	75 J	240 J	170 J	130 J	160 J	16,000 J	170 J
Benzo(g,h,i)perylene	J	22 J	63 J	41 J	46 J	69 J	4,200 J	53 J
Benzo(k)fluoranthene	J	25 J	75 J	45 J	49 J	61 J	7,300	55 J
Benzoic acid		NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol		NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate		NA	NA	NA	NA	NA	NA	NA
Caprolactam		NA	NA	NA	NA	NA	NA	NA
Carbazole		NA	NA	NA	NA	NA	NA	NA
Chrysene	J	48 J	150 J	120 J	120 J	130 J	8,500	110 J
Di-n-butylphthalate		NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate		NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene		NA	NA	NA	NA	NA	NA	NA
Dibenzofuran		NA	NA	NA	NA	NA	NA	NA
Diethylphthalate		NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate		NA	NA	NA	NA	NA	NA	NA
Fluoranthene	J	87 J	190 J	170 J	190 J	150 J	12,000	140 J
Fluorene	U	400 U	420 U	400 U	8.5 J	450 U	5,500	400 U
Hexachlorobenzene		NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene		NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene		NA	NA	NA	NA	NA	NA	NA

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	-1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Hexachloroethane		NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	J	23 J	75 J	46 J	58 J	69 J	5,400	53 J
Isophorone		NA	NA	NA	NA	NA	NA	NA
Naphthalene		NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol		NA	NA	NA	NA	NA	NA	NA
Phenanthrene	J	72 J	120 J	60 J	86 J	120 J	31,000	91 J
Phenol		NA	NA	NA	NA	NA	NA	NA
Pyrene	J	50 J	150 J	130 J	120 J	150 J	21,000	110 J
bis(2-Chloro-1-methylethyl) ether		NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane		NA	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether		NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate		NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine		NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine		NA	NA	NA	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)								
Aroclor-1016		NA	NA	NA	NA	NA	NA	NA
Aroclor-1221		NA	NA	NA	NA	NA	NA	NA
Aroclor-1232		NA	NA	NA	NA	NA	NA	NA
Aroclor-1242		NA	NA	NA	NA	NA	NA	NA
Aroclor-1248		NA	NA	NA	NA	NA	NA	NA
Aroclor-1254		NA	NA	NA	NA	NA	NA	NA
Aroclor-1260		NA	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	J	1.1 J	0.21 J	0.045 J	0.021	0.16	0.33 J	0.12 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	J	0.13	0.044	0.0088	0.0031 J	0.028	0.032 K	0.039
1,2,3,4,7,8,9-Heptachlorodibenzofuran	L	0.0081	0.0028 J	7.20E-04 J	3.10E-04 U	0.002 J	0.0027 J	0.005 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin		0.032	0.0062 J	9.20E-04 J	2.50E-04 U	0.0034 J	0.01	0.0048 J
1,2,3,4,7,8-Hexachlorodibenzofuran	J	0.082 J	0.013 J	0.0016 J	0.0018 J	0.0082 J	0.0083 J	0.035 J
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin		0.11	0.011	0.002 J	8.00E-04 J	0.0081	0.02 K	0.008
1,2,3,6,7,8-Hexachlorodibenzofuran	J	0.037 J	0.0066	4.30E-04 J	4.90E-04 J	0.0036 J	0.0051 J	0.0093
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	J	0.13	0.0067	0.0019 J	7.10E-04 J	0.0068	0.027 J	0.0052 J
1,2,3,7,8,9-Hexachlorodibenzofuran		0.0014 J	4.10E-04 J	1.90E-04 U	1.80E-04 U	4.30E-04 J	3.80E-04 J	5.60E-04 J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin		0.044	0.0026 J	2.90E-04 U	2.70E-04 U	0.0024 J	0.0081	0.0027 J

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UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	-1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
1,2,3,7,8-Pentachlorodibenzofuran	L	0.024 J	0.0045 J	8.10E-04 J	2.90E-04 J	0.0032 J	0.0077	0.04
2,3,4,6,7,8-Hexachlorodibenzofuran	L	0.036	0.0036 J	4.90E-04 J	1.90E-04 J	0.003 J	0.0045 J	0.0071
2,3,4,7,8-Pentachlorodibenzofuran	L	0.045	0.0056 J	8.50E-04 J	9.40E-04 J	0.004 J	0.01	0.046
2,3,7,8-TCDD (dioxin)	J	0.016	0.0035 J	0.0011 J	5.00E-04 U	0.0043 J	0.0019	0.0049
2,3,7,8-Tetrachlorodibenzofuran	J	0.038 J	0.021 J	0.0049 J	0.0023 J	0.024 J	0.015 J	0.12 J
Octachlorodibenzo-p-dioxin	L	3.8 J	3.2 J	0.78 J	0.27 J	2.3 J	2 K	1.5 J
Octachlorodibenzofuran	L	0.093	0.096	0.019	0.0091 J	0.046	0.055 K	0.059
Total heptachlorodibenzo-p-dioxin	J	2.6 J	0.57 J	0.09 J	0.092	0.31	0.86 J	0.31 J
Total heptachlorodibenzofuran	J	0.21	0.12 J	0.025 J	0.0092 J	0.071 J	0.084	0.083 J
Total hexachlorodibenzo-p-dioxin	J	1.3	0.088 J	0.017 J	0.0094 J	0.076	0.25 J	0.062 J
Total hexachlorodibenzofuran	J	0.36 J	0.081 J	0.015 J	0.0071 J	0.056 J	0.092 J	0.11 J
Total pentachlorodibenzo-p-dioxin	J	0.69 J	0.042 J	0.0043 J	5.30E-04 J	0.034 J	0.13 J	0.033 J
Total pentachlorodibenzofuran	J	0.66 J	0.094 J	0.015 J	0.0094 J	0.057 J	0.13 J	0.24 J
Total tetrachlorodibenzo-p-dioxin	J	0.53 J	0.11 J	0.0094 J	0.0018	0.071 J	0.083 J	0.046 J
Total tetrachlorodibenzofuran	J	1 J	0.13 J	0.017 J	0.0069 J	0.14 J	0.35 J	0.46 J
<b>Explosives (UG/KG)</b>								
1,3,5-Trinitrobenzene		NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene		NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene		NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene		NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene		NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene		NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene		NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA
HMX		NA	NA	NA	NA	NA	NA	NA
Nitrobenzene		NA	NA	NA	NA	NA	NA	NA
Nitroglycerin		NA	NA	NA	NA	NA	NA	NA
Nitroguanidine		NA	NA	NA	NA	NA	NA	NA
PETN		NA	NA	NA	NA	NA	NA	NA
Perchlorate		NA	NA	NA	NA	NA	NA	NA
RDX		NA	NA	NA	NA	NA	NA	NA
Tetryl		NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	-1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Total Metals (MG/KG)								
Aluminum		26,000	8,790	5,680	5,940	8,500	11,600	7,060
Antimony	J	3.6 J	0.68 UL	0.65 UL	0.66 UL	0.72 UL	3 J	0.64 UL
Arsenic	L	12.5 L	12.8 L	9.5 L	9.7 L	11.8 L	11.2 L	11.2 L
Barium	K	316 K	181 K	113 K	107 K	166 K	188 K	147 K
Beryllium	B	0.71 B	1.5	1.4	1.4	1.5	0.76 B	1.5
Cadmium	J	11 J	0.3 B	0.085 B	0.049 U	0.4 B	5.2 J	0.46 B
Calcium		22,500	3,800	2,910	2,490	3,520	11,800	2,770
Chromium	K	63.8 K	17.1 K	11.2 K	11.5 K	15.6 K	59.5 K	14 K
Cobalt		20	37.1	39.4	41.5	42.8	15.8	39.7
Copper	J	284 J	44.1 J	26.7 J	26.6 J	41 J	517 J	39.8 J
Cyanide		0.16 B	0.26 B	0.28 B	0.24 B	0.36 B	0.66 U	0.3 B
Iron	J	28,700 J	32,400 J	28,200 J	29,000 J	31,600 J	30,400 J	28,700 J
Lead		1,310	47.4	26.9	35.7	38	939	43.7
Magnesium		5,040	1,310	863 J	866 J	1,300 J	4,540	938 J
Manganese		1,240	1,520	1,360	1,390	1,710	919	1,420
Mercury	J	1 J	0.3 J	0.079 J	0.11 J	0.25 J	0.44 J	0.23 J
Nickel		70.5	56.6	63.6	66.7	59.7	45.5	57.4
Potassium	J	1,700 J	1,300 J	637 J	728 J	1,200 J	1,430 J	919 J
Selenium	U	0.69 B	2.1 B	0.83 B	0.85 B	1.6 B	0.6 U	1.6 B
Silver	J	42.6	0.45 B	0.24 U	0.24 U	1.2 B	5.5	0.24 U
Sodium	U	217 B	64.3 U	61.7 U	62.2 U	68.4 U	149 B	60.7 U
Thallium	B	5.1 B	3.5 B	1.2 UL	3.3 B	3.1	1.8 B	3.1 B
Vanadium		173	25.4	15.4	16	21.9	58.3	22.1
Zinc		1,400	176	181	180	200	841	180
TCLP Metals (MG/L)								
Arsenic		NA	NA	NA	NA	NA	NA	NA
Barium		NA	NA	NA	NA	NA	NA	NA
Cadmium		NA	NA	NA	NA	NA	NA	NA
Chromium		NA	NA	NA	NA	NA	NA	NA
Lead		NA	NA	NA	NA	NA	NA	NA
Mercury		NA	NA	NA	NA	NA	NA	NA
Selenium		NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		AS01-SB53	AS01-SB54	AS01-SB55		AS01-SB56	AS01-SB57	AS01-SB58
Sample ID	.1	AS01-SS53-0-1	AS01-SS54-0-1	AS01-SS55-0-1	AS01-SS55P-0-1	AS01-SS56-0-1	AS01-SS57-0-1	AS01-SS58-0-1
Sample Date		07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04	07/21/04
Chemical Name								
Silver		NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)								
% Moisture		16.8	20.4	17.1	17.6	25.1	23.8	15.7
Total organic carbon (TOC)		58,700	113,200	62,000	50,200	103,600	45,800	110,600
pH		7.9	7	6.9	6.9	6.9	7.5	6.5

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59		AS01-SB71		AS01-SB72				AS01-SB73		AS01-SB74		HCS-B1-3-S
Sample ID	AS01-SS59-0-1		AS01-SS71-0-0.5		AS01-SS72-0-0.5		AS01-SS72P-0-0.5		AS01-SS73-0-0.5		AS01-SS74-0-0.5		
Sample Date	07/21/04		09/23/04		09/23/04		09/23/04		09/23/04		09/23/04		07/17/92
Chemical Name													
<b>Volatile Organic Compounds (UG/KG)</b>													
1,1,1-Trichloroethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,1,2,2-Tetrachloroethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,1,2-Trichloroethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,1-Dichloroethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,1-Dichloroethene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,2,4-Trichlorobenzene	NA		15 UJ		79 J		880 UL		1,300 UL		12 U		NA
1,2-Dibromo-3-chloropropane	NA		15 UJ		750 R		880 R		1,300 R		12 U		NA
1,2-Dibromoethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,2-Dichlorobenzene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,2-Dichloroethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,2-Dichloroethene (total)	NA	NA		NA		NA		NA		NA		NA	NA
1,2-Dichloropropane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,3-Dichlorobenzene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
1,4-Dichlorobenzene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
2-Butanone	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
2-Hexanone	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
4-Methyl-2-pentanone	NA		15 UJ		750 UJ		430 L		1,300 UL		12 U		NA
Acetone	NA		3.2 B		180 B		190 B		220 B		2.8 B		NA
Benzene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Bromodichloromethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Bromoform	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Bromomethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Carbon disulfide	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Carbon tetrachloride	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Chlorobenzene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Chloroethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Chloroform	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Chloromethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Cumene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Cyclohexane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Dibromochloromethane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA
Dichlorodifluoromethane (Freon-12)	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U		NA

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59		AS01-SB71		AS01-SB72		AS01-SB73		AS01-SB74		HCS-B1-3-S	
Sample ID	AS01-SS59-0-1		AS01-SS71-0-0.5		AS01-SS72-0-0.5		AS01-SS72P-0-0.5		AS01-SS73-0-0.5		AS01-SS74-0-0.5	
Sample Date	07/21/04		09/23/04		09/23/04		09/23/04		09/23/04		09/23/04	
Chemical Name												
Ethylbenzene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
Methyl acetate	NA		15 UJ		180 J		1,600 L		1,300 UL		12 U	NA
Methyl-tert-butyl ether (MTBE)	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
Methylcyclohexane	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
Methylene chloride	NA		6.4 B		460 B		590 B		770 B		5.1 B	NA
Styrene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
Tetrachloroethene	NA		15 UJ		420 J		300 L		1,300 UL		12 U	NA
Toluene	NA		15 UJ		750 UJ		150 L		1,300 UL		12 U	NA
Trichloroethene	NA		15 UJ		4,400 J		4,100 L		22,000 L		4.9 J	NA
Trichlorofluoromethane(Freon-11)	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
Vinyl chloride	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
Xylene, total	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
cis-1,2-Dichloroethene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
cis-1,3-Dichloropropene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
o-Xylene	NA		NA		NA		NA		NA		NA	NA
trans-1,2-Dichloroethene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
trans-1,3-Dichloropropene	NA		15 UJ		750 UJ		880 UL		1,300 UL		12 U	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>												
1,1-Biphenyl	NA		500 U		450 U		440 U		390 U		430 U	NA
2,4,5-Trichlorophenol	NA		1,300 U		1,100 U		1,100 U		990 U		1,100 U	NA
2,4,6-Trichlorophenol	NA		500 U		450 U		440 U		390 U		430 U	NA
2,4-Dichlorophenol	NA		500 U		450 U		440 U		390 U		430 U	NA
2,4-Dimethylphenol	NA		500 U		450 U		440 U		390 U		430 U	NA
2,4-Dinitrophenol	NA		1,300 U		1,100 U		1,100 U		990 U		1,100 U	NA
2-Chloronaphthalene	NA		500 U		450 U		440 U		390 U		430 U	NA
2-Chlorophenol	NA		500 U		450 U		440 U		390 U		430 U	NA
2-Methylnaphthalene	NA		500 U		450 U		440 U		390 U		430 U	NA
2-Methylphenol	NA		500 U		450 U		440 U		390 U		430 U	NA
2-Nitroaniline	NA		1,300 U		1,100 U		1,100 U		990 U		1,100 U	NA
2-Nitrophenol	NA		500 U		450 U		440 U		390 U		430 U	NA
3,3'-Dichlorobenzidine	NA		500 U		450 U		440 U		390 U		430 U	NA
3- and 4-Methylphenol	NA		NA		NA		NA		NA		NA	NA
3-Nitroaniline	NA		1,300 U		1,100 U		1,100 U		990 U		1,100 U	NA
4,6-Dinitro-2-methylphenol	NA		1,300 U		1,100 U		1,100 U		990 U		1,100 U	NA

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74	
Sample ID	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5	HCS-B1-3-S
Sample Date	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92
Chemical Name							
4-Bromophenyl-phenylether	NA	500 U	450 U	440 U	390 U	430 U	NA
4-Chloro-3-methylphenol	NA	500 U	450 U	440 U	390 U	430 U	NA
4-Chloroaniline	NA	500 U	450 U	440 U	390 U	430 U	NA
4-Chlorophenyl-phenylether	NA	500 U	450 U	440 U	390 U	430 U	NA
4-Methylphenol	NA	500 U	450 U	440 U	390 U	430 U	NA
4-Nitroaniline	NA	1,300 U	1,100 U	1,100 U	990 U	1,100 U	NA
4-Nitrophenol	NA	1,300 U	1,100 U	1,100 U	990 U	1,100 U	NA
Acenaphthene	410 U	500 U	450 U	440 U	390 U	430 U	NA
Acenaphthylene	410 U	500 U	450 U	440 U	390 U	430 U	NA
Acetophenone	NA	500 U	55 J	440 U	390 U	430 U	NA
Anthracene	21 J	500 U	450 U	440 U	390 U	430 U	NA
Atrazine	NA	500 U	450 U	440 U	390 U	430 U	NA
Benzaldehyde	NA	500 U	450 U	440 U	390 U	430 U	NA
Benzo(a)anthracene	99 J	500 U	450 U	440 U	390 U	430 U	NA
Benzo(a)pyrene	110 J	500 U	450 U	440 U	390 U	430 U	NA
Benzo(b)fluoranthene	200 J	500 U	450 U	440 U	390 U	430 U	NA
Benzo(g,h,i)perylene	57 J	500 U	450 U	440 U	390 U	430 U	NA
Benzo(k)fluoranthene	61 J	500 U	450 U	440 U	390 U	430 U	NA
Benzoic acid	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	500 U	450 U	440 U	390 U	430 U	NA
Caprolactam	NA	68 J	450 U	440 U	390 U	430 U	NA
Carbazole	NA	500 U	450 U	440 U	390 U	430 U	NA
Chrysene	120 J	500 U	450 U	440 U	390 U	430 U	NA
Di-n-butylphthalate	NA	500 U	450 U	440 U	390 U	430 U	NA
Di-n-octylphthalate	NA	500 U	450 U	440 U	390 U	430 U	NA
Dibenz(a,h)anthracene	NA	500 U	450 U	440 U	390 U	430 U	NA
Dibenzofuran	NA	500 U	450 U	440 U	390 U	430 U	NA
Diethylphthalate	NA	500 U	1,300	53 J	390 U	430 U	NA
Dimethyl phthalate	NA	500 U	450 U	440 U	390 U	430 U	NA
Fluoranthene	220 J	50 J	450 U	440 U	390 U	51 J	NA
Fluorene	410 U	500 U	450 U	440 U	390 U	430 U	NA
Hexachlorobenzene	NA	500 U	450 U	440 U	390 U	430 U	NA
Hexachlorobutadiene	NA	500 U	450 U	440 U	390 U	430 U	NA
Hexachlorocyclopentadiene	NA	500 U	450 U	440 U	390 U	430 U	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74	
Sample ID	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5	HCS-B1-3-S
Sample Date	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92
Chemical Name							
Hexachloroethane	NA	500 U	450 U	440 U	390 U	430 U	NA
Indeno(1,2,3-cd)pyrene	58 J	500 U	450 U	440 U	390 U	430 U	NA
Isophorone	NA	500 U	450 U	440 U	390 U	430 U	NA
Naphthalene	NA	500 U	450 U	440 U	390 U	430 U	NA
Pentachlorophenol	NA	1,300 U	1,100 U	1,100 U	990 U	1,100 U	NA
Phenanthrene	120 J	500 U	450 U	440 U	390 U	43 J	NA
Phenol	NA	500 U	450 U	440 U	390 U	430 U	NA
Pyrene	160 J	500 U	450 U	440 U	390 U	430 U	NA
bis(2-Chloro-1-methylethyl) ether	NA	500 U	450 U	440 U	390 U	430 U	NA
bis(2-Chloroethoxy)methane	NA	500 U	450 U	440 U	390 U	430 U	NA
bis(2-Chloroethyl)ether	NA	500 U	450 U	440 U	390 U	430 U	NA
bis(2-Ethylhexyl)phthalate	NA	76 B	99 B	440 U	390 U	82 B	NA
n-Nitroso-di-n-propylamine	NA	500 U	450 U	440 U	390 U	430 U	NA
n-Nitrosodiphenylamine	NA	500 U	450 U	440 U	390 U	430 U	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)							
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.14 J	0.02	0.35	0.84	0.11	0.045	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.027	0.011	0.81	1.4	0.079	0.024	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0022 J	0.0011 U	0.12	0.24	0.0064	0.0016 U	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0038 J	0.0017 U	0.023	0.054	0.005 J	0.0015 U	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0079 J	0.0032 U	0.18	0.36	0.02	0.006 J	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0069	0.0016 U	0.047	0.13	0.0098	0.0029 U	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0025 J	0.0036 U	0.21	0.42	0.018	0.0038 J	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0038 J	0.0019 U	0.069	0.11	0.0092	0.0028 U	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	2.70E-04 U	0.0013 U	0.015	0.031	0.0013 U	0.0015 U	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0018 J	0.0031 U	0.031	0.053	0.0037 J	0.0021 U	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74	
Sample ID	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5	HCS-B1-3-S
Sample Date	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92
Chemical Name							
1,2,3,7,8-Pentachlorodibenzofuran	0.0024 J	0.004 J	0.19	0.25	0.012	0.0028 U	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.002 J	0.003 U	0.16	0.33	0.023	0.0035 J	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.0029 J	0.005 J	0.19	0.3	0.02	0.0047 J	NA
2,3,7,8-TCDD (dioxin)	0.0028	7.10E-04 U	0.01	0.01	0.0015	9.30E-04 J	NA
2,3,7,8-Tetrachlorodibenzofuran	0.013 J	0.005	0.19	0.19	0.016	0.0057	NA
Octachlorodibenzo-p-dioxin	2.3 J	0.36	1.2	1.2	1.1	0.56	NA
Octachlorodibenzofuran	0.068	0.02	0.68	0.73	0.047	0.022	NA
Total heptachlorodibenzo-p-dioxin	0.37 J	0.043	0.63	1.4	0.23	0.094	NA
Total heptachlorodibenzofuran	0.076 J	0.019	1.3	2.3	0.12	0.038	NA
Total hexachlorodibenzo-p-dioxin	0.051 J	0.017	0.5	1.1	0.18	0.076	NA
Total hexachlorodibenzofuran	0.046 J	0.0069 U	1.5	3.1	0.16	0.029	NA
Total pentachlorodibenzo-p-dioxin	0.02 J	0.0036 U	0.36	0.62	0.066	0.026	NA
Total pentachlorodibenzofuran	0.051 J	0.025	1.7	2.8	0.17	0.022	NA
Total tetrachlorodibenzo-p-dioxin	0.042 J	0.011	0.33	0.37	0.051	0.022	NA
Total tetrachlorodibenzofuran	0.072 J	0.03	2.3	2.9	0.21	0.048	NA
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
1,3-Dinitrobenzene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
2,4,6-Trinitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
2,4-Dinitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
2,6-Dinitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
2-Amino-4,6-dinitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
2-Nitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
3-Nitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
4-Amino-2,6-dinitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
4-Nitrotoluene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
HMX	NA	500	520,000	530,000	120 J	500 U	NA
Nitrobenzene	NA	250 U	25,000 U	25,000 U	250 U	250 U	NA
Nitroglycerin	NA	2,500 UJ	500 J	2,500 UJ	2,500 UJ	2,500 UJ	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA
PETN	NA	2,500 U	250,000 U	250,000 U	2,500 U	2,500 U	NA
Perchlorate	NA	60.6 U	311	120	47.8 U	52.2 U	NA
RDX	NA	82 J	7,300 J	50,000 U	500 U	500 U	NA
Tetryl	NA	650 U	65,000 U	65,000 U	650 U	650 U	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59		AS01-SB71		AS01-SB72		AS01-SB73		AS01-SB74		HCS-B1-3-S
Sample ID	AS01-SS59-0-1		AS01-SS71-0-0.5		AS01-SS72-0-0.5		AS01-SS73-0-0.5		AS01-SS74-0-0.5		
Sample Date	07/21/04		09/23/04		09/23/04		09/23/04		09/23/04		07/17/92
Chemical Name											
<b>Total Metals (MG/KG)</b>											
Aluminum	8,420		7,620		53,700		23,300		7,410		17,500 J
Antimony	0.67	UL	0.82	UL	1	L	3.4	L	0.65	UL	4.30 J
Arsenic	12.7 L		9.5		7.2		6.8		8.7		14.4 J
Barium	184 K		150		263		225		198		338
Beryllium	1.5		1.2 B		0.75 B		0.021 U		0.86 B		0.910
Cadmium	0.37 B		1.8		373		38		2.1		21.6 J
Calcium	3,630		3,410		6,580		4,940		2,750		5,800
Chromium	16.4 K		15.1		72.6		319		37.6		46.1 J
Cobalt	42		27		18.1		27.7		16.3		18.3
Copper	44.1 J		35.6 L		248 L		139 L		172 L		226 J
Cyanide	0.16 B		0.76 UL		1.4 L		0.67 UL		0.6 UL		NA
Iron	32,400 J		28,700		53,300		54,200		40,700		26,200
Lead	45.3		61.5 J		687 J		814 J		111 J		607
Magnesium	1,250		1,290 J		4,510		3,970		1,310		1,870
Manganese	1,750		1,250		415		878		888		588
Mercury	0.24 J		0.23		56.3		1.5		0.42		0.310
Nickel	62.9		42.8		43.9		56		37		44.2
Potassium	1,070 J		1,180 J		690 J		973 J		934 J		1,460
Selenium	0.81 B		0.83 L		1 L		1.7 L		0.81 L		0.710 J
Silver	0.25 U		0.7 J		12.3		10		41.2		4.20
Sodium	63.7 U		77.5 U		258 B		498 J		61.2 U		467 UJ
Thallium	2.9 B		1.5 U		1.3 U		1.3 U		1.1 U		0.640 U
Vanadium	24.9		23.4		14.1		17.8		30.2		34.7
Zinc	181		179 K		2,060 K		958 K		311 K		1,010 J
<b>TCLP Metals (MG/L)</b>											
Arsenic	NA		NA		NA		NA		NA		NA
Barium	NA		NA		NA		NA		NA		NA
Cadmium	NA		NA		NA		NA		NA		NA
Chromium	NA		NA		NA		NA		NA		NA
Lead	NA		NA		NA		NA		NA		NA
Mercury	NA		NA		NA		NA		NA		NA
Selenium	NA		NA		NA		NA		NA		NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB59	AS01-SB71	AS01-SB72		AS01-SB73	AS01-SB74	
Sample ID	AS01-SS59-0-1	AS01-SS71-0-0.5	AS01-SS72-0-0.5	AS01-SS72P-0-0.5	AS01-SS73-0-0.5	AS01-SS74-0-0.5	HCS-B1-3-S
Sample Date	07/21/04	09/23/04	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92
Chemical Name							
Silver	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)							
% Moisture	19.6	34	27.3	25.2	16.4	23.4	NA
Total organic carbon (TOC)	98,700	27,000	23,000	25,000	19,000	10,000	NA
pH	6.4	7.6	6.5	7.2	7.2	7.9	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	B1-003	B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005	B2-006
Sample ID	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3	HCS-B2-6
Sample Date	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92	07/17/92
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
1,4-Dichlorobenzene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cumene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	B1-003	B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005	B2-006
Sample ID	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3	HCS-B2-6
Sample Date	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92	07/17/92
Chemical Name										
4-Bromophenyl-phenylether	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
4-Chloro-3-methylphenol	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
4-Chloroaniline	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
4-Chlorophenyl-phenylether	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
4-Methylphenol	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
4-Nitroaniline	NA	NA	NA	930 U	910 U	NA	NA	2,000 U	1,900 U	2,400
4-Nitrophenol	NA	NA	NA	930 U	910 U	NA	NA	2,000 UJ	1,900 UJ	2,400
Acenaphthene	NA	NA	NA	380 U	370 U	NA	NA	400 U	67 J	490
Acenaphthylene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	380 U	370 U	NA	NA	730	190 J	490
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	380 U	88 J	NA	NA	1,700	700	95
Benzo(a)pyrene	NA	NA	NA	380 U	70 J	NA	NA	1,400	690	83
Benzo(b)fluoranthene	NA	NA	NA	380 U	82 J	NA	NA	1,500	730	100
Benzo(g,h,i)perylene	NA	NA	NA	380 U	57 J	NA	NA	910	440	84
Benzo(k)fluoranthene	NA	NA	NA	380 U	56 J	NA	NA	1,100	580	130
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	2,000 UJ	1,900 UJ	2,400
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	400 U	390 U	490
Butylbenzylphthalate	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	380 U	370 U	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	380 U	87 J	NA	NA	1,600	870	160
Di-n-butylphthalate	NA	NA	NA	380 U	55 J	NA	NA	400 UJ	390 UJ	490
Di-n-octylphthalate	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Dibenz(a,h)anthracene	NA	NA	NA	380 U	370 U	NA	NA	230 J	390 U	490
Dibenzofuran	NA	NA	NA	380 U	370 U	NA	NA	260 J	52 J	490
Diethylphthalate	NA	NA	NA	380 U	300 J	NA	NA	400 U	390 U	490
Dimethyl phthalate	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Fluoranthene	NA	NA	NA	380 U	64 J	NA	NA	2,900	1,200	200
Fluorene	NA	NA	NA	380 U	370 U	NA	NA	410	81 J	490
Hexachlorobenzene	NA	NA	NA	380 U	370 U	NA	NA	400 UJ	390 UJ	490
Hexachlorobutadiene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Hexachlorocyclopentadiene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	B1-003	B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005	B2-006
Sample ID	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3	HCS-B2-6
Sample Date	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92	07/17/92
Chemical Name										
Hexachloroethane	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Indeno(1,2,3-cd)pyrene	NA	NA	NA	380 U	51 J	NA	NA	790	390 J	60
Isophorone	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Naphthalene	NA	NA	NA	380 U	370 U	NA	NA	76 J	390 U	490
Pentachlorophenol	NA	NA	NA	930 U	910 U	NA	NA	2,000 U	1,900 U	2,400
Phenanthrene	NA	NA	NA	380 U	370 U	NA	NA	2,300	720	180
Phenol	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Pyrene	NA	NA	NA	380 U	61 J	NA	NA	2,300	970	170
bis(2-Chloro-1-methylethyl) ether	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
bis(2-Chloroethoxy)methane	NA	NA	NA	380 U	370 U	NA	NA	400 UJ	390 UJ	490
bis(2-Chloroethyl)ether	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
bis(2-Ethylhexyl)phthalate	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	82
n-Nitroso-di-n-propylamine	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
n-Nitrosodiphenylamine	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
<b>Pesticide/Polychlorinated Biphenyls (UG/KG)</b>										
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.340 J	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	1.10 J	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	0.0790 J	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.0990 UJ	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	0.410 UJ	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.120 UJ	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	0.360 UJ	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.0180 UJ	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	0.0400 UJ	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.0560 J	NA	NA	NA	NA

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 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	B1-003	B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005	B2-006
Sample ID	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3	HCS-B2-6
Sample Date	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92	07/17/92
Chemical Name										
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	0.220 J	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	0.0310 UJ	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	0.240 J	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	0.00650 UJ	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	0.140 J	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.150 J	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	1.70 J	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.850 J	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	1.5 J	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	1.10 J	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	1.70 J	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.830 J	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	1.20 J	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	0.660 J	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	3.30 J	NA	NA	NA	NA
Explosives (UG/KG)										
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
2,6-Dinitrotoluene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	380 U	370 U	NA	NA	400 U	390 U	490
Nitroglycerin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	B1-003	B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005	B2-006
Sample ID	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3	HCS-B2-6-3
Sample Date	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92	07/17/92
Chemical Name										
Total Metals (MG/KG)										
Aluminum	37,100 J	96,900 J	51,700 J	NA	NA	7,510 J	6,110 J	NA	NA	NA
Antimony	12.3 J	12.9 J	16.4 J	NA	NA	3.10 J	3.40 J	NA	NA	NA
Arsenic	13.9	8.40 J	14.2 J	NA	NA	7.30 J	7.70 J	NA	NA	NA
Barium	389	758	425	NA	NA	94.8	132	NA	NA	NA
Beryllium	0.830	0.530	0.810	NA	NA	0.180	1.40	NA	NA	NA
Cadmium	22.9 J	57.1 J	154 J	NA	NA	3.30 J	0.740 UJ	NA	NA	NA
Calcium	4,900	8,790	3,600	NA	NA	1,070	4,460	NA	NA	NA
Chromium	51.4 J	100 J	103 J	NA	NA	10 J	31.5 J	NA	NA	NA
Cobalt	28.4	39.8	31.6	NA	NA	5.5	21.1	NA	NA	NA
Copper	309 J	780 J	855 J	NA	NA	81.9 J	136 J	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	27,200	122,000	45,700	NA	NA	10,500	28,500	NA	NA	NA
Lead	793 J	12,100	6,680	NA	NA	4,990	68.6	NA	NA	NA
Magnesium	2,010	8,810	4,230	NA	NA	737	2,190	NA	NA	NA
Manganese	1,030	592	681	NA	NA	147	501	NA	NA	NA
Mercury	0.560	1	2.5	NA	NA	2.10	0.320	NA	NA	NA
Nickel	39.4	107	74.1	NA	NA	11.4	55.1	NA	NA	NA
Potassium	1,510	1,520	1,110	NA	NA	151 U	620	NA	NA	NA
Selenium	0.5 J	3.90 J	0.470 R	NA	NA	0.470 R	0.940 J	NA	NA	NA
Silver	5.80	12.6	24.8	NA	NA	8.90	6.5	NA	NA	NA
Sodium	335 UJ	9,740	373 UJ	NA	NA	342 UJ	298 UJ	NA	NA	NA
Thallium	0.550 U	0.560 U	0.520 U	NA	NA	0.510 U	0.560 U	NA	NA	NA
Vanadium	22.3	18.1	30.3	NA	NA	5.60	108	NA	NA	NA
Zinc	1,290 J	3,860 J	2,160 J	NA	NA	291 J	408 J	NA	NA	NA
TCLP Metals (MG/L)										
Arsenic	NA	NA	NA	NA	NA	0.0253 U	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	2.43	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	0.216	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	0.00890 B	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	6.01	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	0.0002 B	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	0.0313 U	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	B1-003	B1-004	B1-011	B1-12S/12	B1-13S/13	B1-C	B2-003	B2-004	B2-005	B2-006
Sample ID	HCS-B1-3-S/DUP	HCS-B1-4-S	HCS-B1-11-S	HCS-B1-12-1	HCS-B1-13-1	HCS-B1-C	HCS-B2-3-4	HCS-B2-4-4	HCS-B2-5-3	HCS-B2-6-3
Sample Date	07/17/92	07/17/92	07/17/92	11/16/94	11/16/94	07/17/92	07/17/92	01/01/92	07/17/92	07/17/92
<b>Chemical Name</b>										
Silver	NA	NA	NA	NA	NA	0.002 B	NA	NA	NA	NA
<b>Wet Chemistry (MG/KG)</b>										
% Moisture	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		BG-084/084S/106
Sample ID	-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	HCS-BG-84S
Sample Date	?	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	06/20/94
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
1,1,2,2-Tetrachloroethane		NA	NA	NA	NA	12 UJ	11 U	11 U	11 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)		NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
1,1-Dichloroethane		NA	NA	NA	NA	12 U	11 U	11 U	11 U
1,1-Dichloroethene		NA	NA	NA	NA	12 U	11 U	11 U	11 U
1,2,4-Trichlorobenzene	U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane		NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane		NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	U	NA	NA	NA	NA	12 U	NA	NA	NA
1,2-Dichloroethane		NA	NA	NA	NA	12 U	11 U	11 U	11 U
1,2-Dichloroethene (total)		NA	NA	NA	NA	NA	11 U	11 U	11 U
1,2-Dichloropropane		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
1,3-Dichlorobenzene	U	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	U	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone		NA	NA	NA	NA	12 U	11 U	11 U	11 U
2-Hexanone		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
4-Methyl-2-pentanone		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Acetone		NA	NA	NA	NA	12 U	11 U	11 U	11 U
Benzene		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Bromodichloromethane		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Bromoform		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Bromomethane		NA	NA	NA	NA	12 U	11 U	11 U	11 U
Carbon disulfide		NA	NA	NA	NA	12 U	11 U	11 U	11 U
Carbon tetrachloride		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Chlorobenzene		NA	NA	NA	NA	12 UJ	11 U	11 U	11 UJ
Chloroethane		NA	NA	NA	NA	12 U	11 U	11 U	11 U
Chloroform		NA	NA	NA	NA	12 U	11 U	11 U	1 J
Chloromethane		NA	NA	NA	NA	12 U	11 U	11 U	11 U
Cumene		NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane		NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Dichlorodifluoromethane (Freon-12)		NA	NA	NA	NA	NA	NA	NA	NA

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Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		BG-084/084S/106
Sample ID	-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	HCS-BG-84S
Sample Date	?	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	06/20/94
Chemical Name									
Ethylbenzene		NA	NA	NA	NA	12 UJ	11 U	11 U	11 UJ
Methyl acetate		NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)		NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane		NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride		NA	NA	NA	NA	12 U	11 U	11 U	5 J
Styrene		NA	NA	NA	NA	12 UJ	11 U	11 U	11 UJ
Tetrachloroethene		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Toluene		NA	NA	NA	NA	12 UJ	11 U	11 U	11 UJ
Trichloroethene		NA	NA	NA	NA	7 J	14 U	11 U	110 J
Trichlorofluoromethane(Freon-11)		NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride		NA	NA	NA	NA	12 U	11 U	11 U	11 U
Xylene, total		NA	NA	NA	NA	12 UJ	11 U	11 U	11 UJ
cis-1,2-Dichloroethene		NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
o-Xylene		NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene		NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene		NA	NA	NA	NA	12 U	11 U	11 U	11 UJ
Semi-volatile Organic Compounds (UG/KG)									
1,1-Biphenyl		NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	UJ	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	U	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	U	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	U	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	UJ	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	U	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	U	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	J	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	U	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	U	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	U	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	UJ	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol		NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	U	NA	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	U	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		BG-084/084S/106
Sample ID	-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	HCS-BG-84S
Sample Date	?	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	06/20/94
Chemical Name									
4-Bromophenyl-phenylether	U	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	U	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	U	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	U	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	U	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	U	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	UJ	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	U	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	U	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone		NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	U	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine		NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde		NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	J	NA	NA	NA	NA	NA	NA	NA	NA
Benzoic acid	UJ	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	U	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	U	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam		NA	NA	NA	NA	NA	NA	NA	NA
Carbazole		NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	J	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	UJ	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	U	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	U	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	U	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	U	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	U	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	J	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	U	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	UJ	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	U	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	U	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
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 J - Estimated value  
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 L - Value biased low

R - Unusable result  
 U - Undetected  
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 UL - Undetected, limit biased low



Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		BG-084/084S/106
Sample ID	-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	HCS-BG-84S
Sample Date	?	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	06/20/94
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran		NA	NA	NA	0.0760	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran		NA	NA	NA	0.140 U	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran		NA	NA	NA	0.0580 U	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)		NA	NA	NA	0.100 U	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran		NA	NA	NA	0.120 U	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin		NA	NA	NA	3.30	NA	NA	NA	NA
Octachlorodibenzofuran		NA	NA	NA	0.430	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin		NA	NA	NA	1.30	NA	NA	NA	NA
Total heptachlorodibenzofuran		NA	NA	NA	0.440	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin		NA	NA	NA	1.80	NA	NA	NA	NA
Total hexachlorodibenzofuran		NA	NA	NA	0.780	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin		NA	NA	NA	0.410	NA	NA	NA	NA
Total pentachlorodibenzofuran		NA	NA	NA	0.150	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin		NA	NA	NA	0.320	NA	NA	NA	NA
Total tetrachlorodibenzofuran		NA	NA	NA	0.360	NA	NA	NA	NA
Explosives (UG/KG)									
1,3,5-Trinitrobenzene		NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene		NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	U	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	U	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA
HMX		NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	U	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin		NA	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine		NA	NA	NA	NA	NA	NA	NA	NA
PETN		NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate		NA	NA	NA	NA	NA	NA	NA	NA
RDX		NA	NA	NA	NA	NA	NA	NA	NA
Tetryl		NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		BG-084/084S/106
Sample ID	-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	HCS-BG-84S
Sample Date	?	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	06/20/94
Chemical Name									
<b>Total Metals (MG/KG)</b>									
Aluminum		5,000 J	8,430 J	34,700 J	11,100 J	NA	NA	NA	NA
Antimony		3.20 J	4.5 J	25.1 J	5 J	NA	NA	NA	NA
Arsenic		6.90 J	14.3 J	11 J	12.9 J	NA	NA	NA	NA
Barium		72.3	195	695	248	NA	NA	NA	NA
Beryllium		1.20	1.10	0.930	1.5	NA	NA	NA	NA
Cadmium		0.710 UJ	1.90 J	37.5 J	6.80 J	NA	NA	NA	NA
Calcium		2,180	6,520	20,500	11,500	NA	NA	NA	NA
Chromium		15.3 J	29.8 J	110 J	34 J	NA	NA	NA	NA
Cobalt		18.9	25.6	30.6 J	25.5	NA	NA	NA	NA
Copper		54.5 J	2,150 J	1,970 J	348 J	NA	NA	NA	NA
Cyanide		NA	NA	NA	NA	NA	NA	NA	NA
Iron		30,400	25,100	31,300	31,900	NA	NA	NA	NA
Lead		74.6	272	472	200	NA	NA	NA	NA
Magnesium		662	2,110	9,840	1,940	NA	NA	NA	NA
Manganese		559	552	926	770	NA	NA	NA	NA
Mercury		0.400	2.70	16.8	3.20	NA	NA	NA	NA
Nickel		38	40.3	185	66.4	NA	NA	NA	NA
Potassium		558	885	1,710	781	NA	NA	NA	NA
Selenium		0.780 J	0.790 J	0.610 J	0.540 J	NA	NA	NA	NA
Silver		2.10	121	106	64.5	NA	NA	NA	NA
Sodium		315 UJ	244 UJ	1,290	439 UJ	NA	NA	NA	NA
Thallium		0.540 U	0.460 U	0.520 U	0.490 U	NA	NA	NA	NA
Vanadium		14.6	82.7	100	75.8	NA	NA	NA	NA
Zinc		163 J	636 J	4,230 J	849 J	NA	NA	NA	NA
<b>TCLP Metals (MG/L)</b>									
Arsenic		NA	NA	NA	0.0273 B	NA	NA	NA	NA
Barium		NA	NA	NA	0.971	NA	NA	NA	NA
Cadmium		NA	NA	NA	0.0633	NA	NA	NA	NA
Chromium		NA	NA	NA	0.004 B	NA	NA	NA	NA
Lead		NA	NA	NA	0.128	NA	NA	NA	NA
Mercury		NA	NA	NA	0.0002 B	NA	NA	NA	NA
Selenium		NA	NA	NA	0.0313 U	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID		B2-007		B2-010	B2-C	BG-016/016S/054	BG-023/023S/083		BG-084/084S/106
Sample ID	-3	HCS-B2-7-3	HCS-B2-7-S	HCS-B2-10	HCS-B2-C	HCS-BG-16S	HCS-BG-23S	HCS-BG-23S/DUP	HCS-BG-84S
Sample Date	?	07/17/92	07/17/92	07/17/92	07/17/92	06/20/94	06/21/94	06/21/94	06/20/94
Chemical Name									
Silver		NA	NA	NA	0.00160 B	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
% Moisture		NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)		NA	NA	NA	NA	NA	NA	NA	NA
pH		NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
Volatile Organic Compounds (UG/KG)									
1,1,1-Trichloroethane	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,1,1,2,2-Tetrachloroethane	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,1-Dichloroethane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,1-Dichloroethene	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,2,4-Trichlorobenzene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
1,2-Dichloroethane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,2-Dichloroethene (total)	1,800 U	71 U	16,000	1,700 U	1,800 U	NA	NA	NA	NA
1,2-Dichloropropane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
1,3-Dichlorobenzene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
1,4-Dichlorobenzene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2-Butanone	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
2-Hexanone	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
4-Methyl-2-pentanone	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Acetone	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Benzene	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Bromodichloromethane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Bromoform	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Bromomethane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Carbon disulfide	1,800 UJ	71 R	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Carbon tetrachloride	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Chlorobenzene	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Chloroethane	1,800 UJ	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Chloroform	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Chloromethane	370 J	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Cumene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 UL - Undetected, limit biased low

Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
Ethylbenzene	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	1,800 U	99 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Styrene	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Tetrachloroethene	1,800 U	29 J	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Toluene	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Trichloroethene	27,000	890	26,000	8,000	7,300	NA	NA	NA	NA
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Xylene, total	1,800 U	71 UJ	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	1,800 U	71 U	1,600 U	1,700 U	1,800 U	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)									
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1,100 U	NA	NA	NA	NA				
2,4,6-Trichlorophenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2,4-Dichlorophenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2,4-Dimethylphenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2,4-Dinitrophenol	1,100 U	NA	NA	NA	NA				
2-Chloronaphthalene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2-Chlorophenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2-Methylnaphthalene	460 U	47 J	440 U	440 U	440 U	NA	NA	NA	NA
2-Methylphenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
2-Nitroaniline	1,100 U	NA	NA	NA	NA				
2-Nitrophenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
3,3'-Dichlorobenzidine	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	1,100 U	NA	NA	NA	NA				
4,6-Dinitro-2-methylphenol	1,100 U	NA	NA	NA	NA				

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Table D-3  
Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
4-Bromophenyl-phenylether	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
4-Chloro-3-methylphenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
4-Chloroaniline	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
4-Chlorophenyl-phenylether	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
4-Methylphenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
4-Nitroaniline	1,100 U	NA	NA	NA	NA				
4-Nitrophenol	1,100 U	NA	NA	NA	NA				
Acenaphthene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Acenaphthylene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	110 J	100 J	85 J	100 J	100 J	NA	NA	NA	NA
Benzo(a)pyrene	71 J	80 J	61 J	85 J	85 J	NA	NA	NA	NA
Benzo(b)fluoranthene	99 J	120 J	84 J	150 J	170 J	NA	NA	NA	NA
Benzo(g,h,i)perylene	63 J	67 J	56 J	83 J	440 U	NA	NA	NA	NA
Benzo(k)fluoranthene	61 J	46 J	58 J	61 J	46 J	NA	NA	NA	NA
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Chrysene	100 J	130 J	89 J	160 J	130 J	NA	NA	NA	NA
Di-n-butylphthalate	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Di-n-octylphthalate	460 U	450 U	440 U	440 U	440 UJ	NA	NA	NA	NA
Dibenz(a,h)anthracene	460 U	450 U	440 U	57 J	440 U	NA	NA	NA	NA
Dibenzofuran	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Diethylphthalate	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Dimethyl phthalate	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Fluoranthene	190 J	230 J	160 J	210 J	200 J	NA	NA	NA	NA
Fluorene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Hexachlorobenzene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Hexachlorobutadiene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Hexachlorocyclopentadiene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
Hexachloroethane	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	59 J	62 J	52 J	83 J	440 U	NA	NA	NA	NA
Isophorone	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Naphthalene	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Pentachlorophenol	1,100 U	NA	NA	NA	NA				
Phenanthrene	140 J	220 J	100 J	150 J	140 J	NA	NA	NA	NA
Phenol	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Pyrene	130 J	150 J	100 J	150 J	140 J	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
bis(2-Chloroethyl)ether	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
n-Nitrosodiphenylamine	460 U	450 U	440 U	440 U	440 U	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor-1016	NA	NA	NA	NA	NA	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1221	NA	NA	NA	NA	NA	67 UJ	67 UJ	67 UJ	67 UJ
Aroclor-1232	NA	NA	NA	NA	NA	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1242	NA	NA	NA	NA	NA	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1248	NA	NA	NA	NA	NA	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1254	NA	NA	NA	NA	NA	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1260	NA	NA	NA	NA	NA	33 UJ	33 UJ	33 UJ	33 UJ
Dioxin/Furans (UG/KG)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)									
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	460 U	450 U	440 U	440 U	440 U	440 U	NA	NA	NA
2,6-Dinitrotoluene	460 U	450 U	440 U	440 U	440 U	440 U	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	460 U	450 U	440 U	440 U	440 U	440 U	NA	NA	NA
Nitroglycerin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
Total Metals (MG/KG)									
Aluminum	9,910	7,800	6,600	7,860	8,000	NA	NA	NA	NA
Antimony	7.60 U	7.40 U	7 U	7.60 UJ	7.80 UJ	NA	NA	NA	NA
Arsenic	15.8	11.4	10.2	13.4 J	14.8 J	NA	NA	NA	NA
Barium	179	120	118	154	159	NA	NA	NA	NA
Beryllium	1.90	1.90	1.80	1.90	1.70	NA	NA	NA	NA
Cadmium	3.5 U	2.90 U	2.30 U	2.30 U	3.10	NA	NA	NA	NA
Calcium	3,800	2,890	3,230	2,820	2,750	NA	NA	NA	NA
Chromium	23.6	13.1	11.9	15.1	19.9	NA	NA	NA	NA
Cobalt	31.2	38.6	55.2	37.2	26.8	NA	NA	NA	NA
Copper	75.5	37.3	33.7	48	49.8	NA	NA	NA	NA
Cyanide	1.40 U	1.20 U	1.10 U	1.30 U	1.20 U	NA	NA	NA	NA
Iron	38,600	32,600	28,700	30,400	35,200	NA	NA	NA	NA
Lead	53.3	37.1	38.5	57.6	53.3	NA	NA	NA	NA
Magnesium	1,230	914 B	1,010 B	997 B	1,110 B	NA	NA	NA	NA
Manganese	1,060	1,080	1,820	1,460	962	NA	NA	NA	NA
Mercury	0.460	0.140	0.100	0.360	0.480	NA	NA	NA	NA
Nickel	50.8	58.8	76.1	53.3	42.3	NA	NA	NA	NA
Potassium	1,020 B	722 B	755 B	702 B	824 B	NA	NA	NA	NA
Selenium	1.40	0.470 U	0.440 U	1.10 B	1.30	NA	NA	NA	NA
Silver	3.30	1.5 B	1.10 B	1.70 J	2.70 J	NA	NA	NA	NA
Sodium	53.6 B	59 B	59.9 B	35.6 U	43.3 U	NA	NA	NA	NA
Thallium	0.710 U	0.700 U	0.660 U	0.720 U	0.730 U	NA	NA	NA	NA
Vanadium	26.2	20.1	18.8	23.2	24.5	NA	NA	NA	NA
Zinc	206	210	233	192 J	187 J	NA	NA	NA	NA
TCLP Metals (MGL)									
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-098/098S	BG-102/102S	BG-110/110S	BG-113		BG-152	BG-153	BG-161	BG-162
Sample ID	HCS-BG-98S	HCS-BG-102S	HCS-BG-110S	HCS-BG-113S	HCS-BG-113S/DUP	HCS-BG-152	HCS-BG-153	HCS-BG-161	HCS-BG-162
Sample Date	11/16/94	11/16/94	11/16/94	11/15/94	11/15/94	10/20/98	10/20/98	10/20/98	10/20/98
Chemical Name									
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
% Moisture	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name				
<b>Volatile Organic Compounds (UG/KG)</b>				
1,1,1-Trichloroethane	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA
1,1,2-Trichloroethane	NA	NA	NA	NA
1,1-Dichloroethane	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA	NA	NA	NA
1,2-Dichloropropane	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA
Acetone	NA	NA	NA	NA
Benzene	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA
Cumene	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA

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Raw Data, Surface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name				
Ethylbenzene	NA	NA	NA	NA
Methyl acetate	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA
Methylene chloride	NA	NA	NA	NA
Styrene	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA
Toluene	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA
Xylene, total	NA	NA	NA	NA
cis-1,2-Dichloroethene	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA
o-Xylene	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA
Semi-volatile Organic Compounds (UG/KG)				
1,1-Biphenyl	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name				
4-Bromophenyl-phenylether	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA
Benzoic acid	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name				
Hexachloroethane	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA
Phenol	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA
Pesticide/Polychlorinated Biphenyls (UG/KG)				
Aroclor-1016	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1221	67 UJ	67 UJ	67 UJ	67 UJ
Aroclor-1232	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1242	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1248	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1254	33 UJ	33 UJ	33 UJ	33 UJ
Aroclor-1260	33 UJ	33 UJ	33 UJ	33 UJ
Dioxin/Furans (UG/KG)				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name				
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA
Explosives (UG/KG)				
1,3,5-Trinitrobenzene	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA
HMX	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA
Nitroglycerin	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA
PETN	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA
RDX	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA

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 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
<b>Chemical Name</b>				
<b>Total Metals (MG/KG)</b>				
Aluminum	NA	NA	NA	NA
Antimony	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA
Barium	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Calcium	NA	NA	NA	NA
Chromium	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA
Copper	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA
Iron	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA
Manganese	NA	NA	NA	NA
Mercury	NA	NA	NA	NA
Nickel	NA	NA	NA	NA
Potassium	NA	NA	NA	NA
Selenium	NA	NA	NA	NA
Silver	NA	NA	NA	NA
Sodium	NA	NA	NA	NA
Thallium	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
<b>TCLP Metals (MG/L)</b>				
Arsenic	NA	NA	NA	NA
Barium	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Chromium	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Mercury	NA	NA	NA	NA
Selenium	NA	NA	NA	NA

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Table D-3  
 Raw Data, Surface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-165	BG-171	BG-179	
Sample ID	HCS-BG-165	HCS-BG-171	HCS-BG-179	HCS-BG-179/DUP
Sample Date	10/20/98	10/21/98	10/21/98	10/21/98
Chemical Name				
Silver	NA	NA	NA	NA
Wet Chemistry (MG/KG)				
% Moisture	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA
pH	NA	NA	NA	NA

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 L - Value biased low

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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB42		AS01-SB43		AS01-SB44		AS01-SB60									
Sample ID	AS01-SB42-(1-2)		AS01-SB43-(1-2)		AS01-SB44-(1-2)		AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8	AS01-SB61-1-3					
Sample Date	10/24/01		10/24/01		10/24/01		09/22/04	09/22/04	09/22/04	09/22/04	09/22/04					
Chemical Name																
<b>Volatile Organic Compounds (UG/KG)</b>																
1,1,1-Trichloroethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,1,2,2-Tetrachloroethane	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,1,2-Trichloroethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,1-Dichloroethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,1-Dichloroethene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,2,4-Trichlorobenzene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,2-Dibromo-3-chloropropane	12	U	12	U	12	U	12	U	11	U	510	R	12	U	13	U
1,2-Dibromoethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,2-Dichlorobenzene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,2-Dichloroethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,2-Dichloroethene (total)	NA		NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloropropane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,3-Dichlorobenzene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
1,4-Dichlorobenzene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
2-Butanone	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
2-Hexanone	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
4-Methyl-2-pentanone	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
Acetone	12	U	12	U	12	U	3.5	B	2.5	B	79	B	2.5	B	4.5	B
Benzene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Bromodichloromethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Bromoform	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Bromomethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Carbon disulfide	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Carbon tetrachloride	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Chlorobenzene	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
Chloroethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Chloroform	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Chloromethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Cumene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Cyclohexane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Dibromochloromethane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Dichlorodifluoromethane (Freon-12)	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB42		AS01-SB43		AS01-SB44		AS01-SB60									
Sample ID	AS01-SB42-(1-2)		AS01-SB43-(1-2)		AS01-SB44-(1-2)		AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8	AS01-SB61-1-3					
Sample Date	10/24/01		10/24/01		10/24/01		09/22/04	09/22/04	09/22/04	09/22/04	09/22/04					
Chemical Name																
Ethylbenzene	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
Methyl acetate	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Methyl-tert-butyl ether (MTBE)	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Methylcyclohexane	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Methylene chloride	4.7	B	4.8	B	4.3	B	4	B	2.7	B	250	B	3.7	B	3.4	B
Styrene	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
Tetrachloroethene	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
Toluene	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
Trichloroethene	18		12	U	12	U	130		170		930		150		13	U
Trichlorofluoromethane(Freon-11)	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Vinyl acetate	NA		NA		NA		NA		NA		NA		NA		NA	
Vinyl chloride	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
Xylene, total	12	U	12	U	12	U	12	U	11	U	510	U	12	UJ	13	U
cis-1,2-Dichloroethene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
cis-1,3-Dichloropropene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
o-Xylene	12	U	12	U	12	U	NA		NA		NA		NA		NA	
trans-1,2-Dichloroethene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
trans-1,3-Dichloropropene	12	U	12	U	12	U	12	U	11	U	510	U	12	U	13	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>																
1,1-Biphenyl	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2,4,5-Trichlorophenol	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U
2,4,6-Trichlorophenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2,4-Dichlorophenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2,4-Dimethylphenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2,4-Dinitrophenol	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U
2-Chloronaphthalene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2-Chlorophenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2-Methylnaphthalene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2-Methylphenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
2-Nitroaniline	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U
2-Nitrophenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
3,3'-Dichlorobenzidine	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
3- and 4-Methylphenol	370	U	370	U	340	U	NA		NA		NA		NA		NA	
3-Nitroaniline	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB42		AS01-SB43		AS01-SB44		AS01-SB60									
Sample ID	AS01-SB42-(1-2)		AS01-SB43-(1-2)		AS01-SB44-(1-2)		AS01-SB60-1-3		AS01-SB60-3-5		AS01-SB60-5-7		AS01-SB60-7-8		AS01-SB61-1-3	
Sample Date	10/24/01		10/24/01		10/24/01		09/22/04		09/22/04		09/22/04		09/22/04		09/22/04	
Chemical Name																
4,6-Dinitro-2-methylphenol	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U
4-Bromophenyl-phenylether	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
4-Chloro-3-methylphenol	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
4-Chloroaniline	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
4-Chlorophenyl-phenylether	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
4-Methylphenol	NA		NA		NA		450	U	400	U	380	U	400	U	440	U
4-Nitroaniline	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U
4-Nitrophenol	920	U	930	U	850	U	1,100	U	1,000	U	960	U	1,000	U	1,100	U
Acenaphthene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Acenaphthylene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Acetophenone	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Anthracene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Atrazine	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzaldehyde	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzo(a)anthracene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzo(a)pyrene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzo(b)fluoranthene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzo(g,h,i)perylene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzo(k)fluoranthene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Benzoic acid	NA		NA		NA		NA		NA		NA		NA		NA	
Benzyl alcohol	NA		NA		NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Caprolactam	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Carbazole	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Chrysene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Di-n-butylphthalate	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Di-n-octylphthalate	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Dibenz(a,h)anthracene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Dibenzofuran	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Diethylphthalate	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Dimethyl phthalate	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Fluoranthene	43	J	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Fluorene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Hexachlorobenzene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U
Hexachlorobutadiene	370	U	370	U	340	U	450	U	400	U	380	U	400	U	440	U

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J - Estimated value  
L - Value biased low

R - Unusable result  
U - Undetected  
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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB42		AS01-SB43		AS01-SB44		AS01-SB60				
Sample ID	AS01-SB42-(1-2)		AS01-SB43-(1-2)		AS01-SB44-(1-2)		AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8	AS01-SB61-1-3
Sample Date	10/24/01		10/24/01		10/24/01		09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name											
Hexachlorocyclopentadiene	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Hexachloroethane	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Indeno(1,2,3-cd)pyrene	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Isophorone	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Naphthalene	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Pentachlorophenol	920 U		930 U		850 U		1,100 U	1,000 U	960 U	1,000 U	1,100 U
Phenanthrene	47 J		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Phenol	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Pyrene	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
bis(2-Chloro-1-methylethyl) ether	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
bis(2-Chloroethoxy)methane	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
bis(2-Chloroethyl)ether	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
bis(2-Ethylhexyl)phthalate	370 U		370 U		43 J		450 U	400 U	380 U	400 U	440 U
n-Nitroso-di-n-propylamine	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
n-Nitrosodiphenylamine	370 U		370 U		340 U		450 U	400 U	380 U	400 U	440 U
Dioxin/Furans (UG/KG)											
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00429		0.00205		0.00211		0.0023 U	0.0067	0.0011 U	0.0045 J	0.015
1,2,3,4,6,7,8-Heptachlorodibenzofuran	4.61E-04		0.00321		6.10E-05 U		2.50E-04 U	4.00E-04 U	3.60E-04 U	2.30E-04 U	0.003 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	9.70E-05 U		9.07E-04 J		7.40E-05 U		3.10E-04 U	5.40E-04 U	4.60E-04 U	3.10E-04 U	4.40E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	8.60E-05 U		7.40E-05 U		8.90E-05 U		2.70E-04 U	4.90E-04 U	4.40E-04 U	2.80E-04 U	4.00E-04 U
1,2,3,4,7,8-Hexachlorodibenzofuran	6.70E-05 U		0.00138		5.00E-05 U		2.00E-04 U	3.90E-04 U	3.60E-04 U	2.00E-04 U	0.0015 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	7.40E-05 U		6.30E-05 U		7.60E-05 U		2.60E-04 U	4.90E-04 U	4.50E-04 U	2.80E-04 U	5.00E-04 U
1,2,3,6,7,8-Hexachlorodibenzofuran	6.60E-05 U		5.20E-04		4.90E-05 U		2.00E-04 U	4.00E-04 U	3.60E-04 U	2.00E-04 U	4.90E-04 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	7.30E-05 U		6.20E-05 U		7.50E-05 U		2.60E-04 U	4.80E-04 U	4.40E-04 U	2.70E-04 U	9.40E-04 U
1,2,3,7,8,9-Hexachlorodibenzofuran	8.10E-05 U		6.00E-05 U		6.00E-05 U		2.20E-04 U	4.30E-04 U	3.90E-04 U	2.00E-04 U	3.60E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	7.60E-05 U		7.00E-05 U		7.50E-05 U		4.40E-04 U	7.10E-04 U	6.80E-04 U	3.70E-04 U	7.50E-04 U
1,2,3,7,8-Pentachlorodibenzofuran	9.40E-05 U		2.85E-04		6.80E-05 U		2.90E-04 U	5.30E-04 U	4.50E-04 U	2.60E-04 U	8.00E-04 U
2,3,4,6,7,8-Hexachlorodibenzofuran	7.70E-05 U		5.70E-05 U		5.80E-05 U		2.00E-04 U	3.90E-04 U	3.50E-04 U	1.80E-04 U	3.40E-04 U
2,3,4,7,8-Pentachlorodibenzofuran	9.90E-05 U		8.10E-05 U		7.10E-05 U		3.00E-04 U	5.30E-04 U	4.60E-04 U	2.70E-04 U	7.30E-04 U
2,3,7,8-TCDD (dioxin)	9.70E-05 U		8.80E-05 U		9.30E-05 U		2.00E-04 U	4.00E-04 U	3.70E-04 U	2.20E-04 U	3.80E-04 U
2,3,7,8-Tetrachlorodibenzofuran	2.07E-04 J		3.12E-04 J		8.10E-05 U		1.90E-04 U	2.80E-04 U	2.70E-04 U	1.50E-04 U	0.0017
Octachlorodibenzo-p-dioxin	0.170		0.0842		0.109		0.065	0.29	0.034	0.17	0.32
Octachlorodibenzofuran	0.0021		0.0100		1.16E-04 U		5.20E-04 U	5.70E-04 U	6.60E-04 U	7.80E-04 U	0.0095 J
Total heptachlorodibenzo-p-dioxin	0.00966		0.00396		0.00538		0.0031 U	0.014	0.0018 U	0.0088	0.035

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB42	AS01-SB43	AS01-SB44	AS01-SB60					
Sample ID	AS01-SB42-(1-2)	AS01-SB43-(1-2)	AS01-SB44-(1-2)	AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8	AS01-SB61-1-3	
Sample Date	10/24/01	10/24/01	10/24/01	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	
Chemical Name									
Total heptachlorodibenzofuran	8.10E-04	0.00471	6.10E-05 U	3.10E-04 U	5.40E-04 U	4.60E-04 U	3.10E-04 U	0.0036	
Total hexachlorodibenzo-p-dioxin	2.10E-04	6.20E-05 U	4.00E-04	3.70E-04 U	5.50E-04 U	9.40E-04 U	6.20E-04 U	0.0022 U	
Total hexachlorodibenzofuran	6.60E-05 U	0.00304	4.90E-05 U	2.20E-04 U	4.30E-04 U	3.90E-04 U	2.00E-04 U	0.0015 U	
Total pentachlorodibenzo-p-dioxin	7.60E-05 U	7.00E-05 U	7.50E-05 U	4.40E-04 U	7.10E-04 U	9.60E-04 U	3.70E-04 U	8.60E-04 U	
Total pentachlorodibenzofuran	9.40E-05 U	0.00105	6.80E-05 U	3.00E-04 U	5.30E-04 U	4.60E-04 U	2.70E-04 U	0.0046 U	
Total tetrachlorodibenzo-p-dioxin	9.70E-05 U	8.80E-05 U	9.30E-05 U	2.00E-04 U	4.00E-04 U	3.70E-04 U	2.20E-04 U	6.60E-04 U	
Total tetrachlorodibenzofuran	2.92E-04	5.48E-04	8.10E-05 U	1.90E-04 U	2.80E-04 U	2.70E-04 U	1.50E-04 U	0.0047	
Explosives (UG/KG)									
1,3,5-Trinitrobenzene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
1,3-Dinitrobenzene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
2,4,6-Trinitrotoluene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
2,4-Dinitrotoluene	370 U	370 U	340 U	250 U	250 U	250 U	250 U	250 U	
2,6-Dinitrotoluene	370 U	370 U	340 U	250 U	250 U	250 U	250 U	250 U	
2-Amino-4,6-dinitrotoluene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
2-Nitrotoluene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
3-Nitrotoluene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
4-Amino-2,6-dinitrotoluene	570 U	570 U	560 U	250 U	250 U	250 U	250 U	250 U	
4-Nitrotoluene	NA	NA	NA	250 U					
HMX	570 U	570 U	560 U	500 U	500 U	500 U	500 U	500 U	
Nitrobenzene	570 R	570 R	560 R	250 U					
Nitroglycerin	57,000 U	57,000 U	56,000 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	
Nitroguanidine	110,000 U	110,000 U	110,000 U	NA	NA	NA	NA	NA	
PETN	57,000 U	57,000 U	56,000 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	
Perchlorate	60 U	60 U	60 U	54.6 U	48.1 U	46.4 U	48.9 U	53.9 U	
RDX	570 U	570 U	560 U	500 U	58 J	53 J	500 U	500 U	
Tetryl	570 U	570 U	560 U	650 U	650 U	650 U	650 U	650 U	
Total Metals (MG/KG)									
Aluminum	7,930	4,430	5,690	7,350	7,830	7,820	8,600	7,870	
Antimony	2.1 U	2.1 U	2.1 U	0.74 UL	0.65 UL	0.63 UL	0.66 UL	0.73 UL	
Arsenic	10.6	4.4	6.7	5.8	6.4	6	6	6.2	
Barium	192	98.3	206	158	119	92.6	97.6	186	
Beryllium	1.1 J	0.63 J	0.92 J	0.94 B	0.91 B	0.72 B	0.68 B	1 B	
Cadmium	0.68 U	0.68 U	0.69 U	0.055 U	0.13 B	0.046 U	0.049 U	0.076 B	

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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB42	AS01-SB43	AS01-SB44	AS01-SB60				
Sample ID	AS01-SB42-(1-2)	AS01-SB43-(1-2)	AS01-SB44-(1-2)	AS01-SB60-1-3	AS01-SB60-3-5	AS01-SB60-5-7	AS01-SB60-7-8	AS01-SB61-1-3
Sample Date	10/24/01	10/24/01	10/24/01	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
Calcium	2,210	1,420	2,320	1,680	1,310	972 J	1,160 J	1,950
Chromium	13.6 J	8.1 J	10 J	11.9	12.8	12.3	13.6	12.8
Cobalt	15.3	11.9	13.3	13.3 J	14.6	13.7	12.4	13.6
Copper	16.9	11.1	15.5	15.8	14.6	13.3	11.8	16.7
Cyanide	0.6 U	0.6 U	0.6 U	0.68 U	0.6 U	0.58 U	0.61 U	0.67 U
Iron	30,100	14,900	20,000	26,300	28,700	26,300	26,000	27,100
Lead	16.2	13	15.1	14.2	13.8	13.4	12.3	15.3
Magnesium	1,100 J	732 J	940 J	963 J	979 J	1,030 J	1,230 J	1,030 J
Manganese	1,020	647	972	853	790	753	624	995
Mercury	0.12 U	0.12 U	0.11 U	0.068 U	0.06 U	0.099 J	0.097 J	0.071 J
Nickel	22.9	11.7	18.2	21.3	20	16.5	15.3	23.2
Potassium	1,010 J	552 J	599 J	911 J	991 J	991 J	935 J	973 J
Selenium	1.1 U	1.1 U	1.2 U	0.63 U	0.55 U	0.53 U	0.56 U	0.62 U
Silver	1.1 UL	1.1 UL	1.2 UL	0.27 U	0.24 U	0.23 U	0.24 U	0.27 U
Sodium	66.1 J	64.8 U	65.7 U	69.8 U	61.6 U	59.4 U	62.5 U	69 U
Thallium	1.6 U	1.6 U	1.7 U	1.3 UL	1.3 L	1.1 UL	1.2 UL	1.3 UL
Vanadium	19.5	10.6 J	13.3	16.3	17.6	17.2	18.7	16.8
Zinc	71.1	37.9	57.5	54.5	52.9	56	67	61.5
Wet Chemistry (MG/KG)								
% Moisture	NA	NA	NA	26.7	16.9	13.8	18.1	25.8
Total organic carbon (TOC)	NA	7,700	NA	9,100	5,200	4,400	2,500	14,000
pH	NA	NA	NA	6.7	6.4	6.4	5.8	6.7

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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB61				AS01-SB62			
	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample ID								
Sample Date	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,1,2,2-Tetrachloroethane	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,1,2-Trichloroethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,1-Dichloroethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,1-Dichloroethene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,2,4-Trichlorobenzene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,2-Dibromo-3-chloropropane	13 U	11 U	12 U	12 U	12,000 R	11,000 R	480 R	530 R
1,2-Dibromoethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,2-Dichlorobenzene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,2-Dichloroethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,3-Dichlorobenzene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
1,4-Dichlorobenzene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
2-Butanone	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
2-Hexanone	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
4-Methyl-2-pentanone	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Acetone	5 B	4.4 B	4.1 B	3.4 B	12,000 UJ	11,000 UJ	95 B	100 B
Benzene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Bromodichloromethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Bromoform	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Bromomethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Carbon disulfide	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Carbon tetrachloride	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Chlorobenzene	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Chloroethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Chloroform	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Chloromethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Cumene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Cyclohexane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Dibromochloromethane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Dichlorodifluoromethane (Freon-12)	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB61				AS01-SB62			
	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample ID	09/22/04				09/22/04			
Sample Date	09/22/04				09/22/04			
Chemical Name								
Ethylbenzene	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Methyl acetate	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Methyl-tert-butyl ether (MTBE)	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Methylcyclohexane	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Methylene chloride	3.7 B	3.3 B	4 B	3.6 B	12,000 UJ	11,000 UJ	280 B	300 B
Styrene	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Tetrachloroethene	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	55 J	530 UJ
Toluene	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Trichloroethene	13 U	11 U	12 U	12 U	25,000 J	12,000 J	6,800 J	6,300 J
Trichlorofluoromethane(Freon-11)	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
Xylene, total	13 UJ	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
cis-1,2-Dichloroethene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
cis-1,3-Dichloropropene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
trans-1,3-Dichloropropene	13 U	11 U	12 U	12 U	12,000 UJ	11,000 UJ	480 UJ	530 UJ
<b>Semi-volatile Organic Compounds (UG/KG)</b>								
1,1-Biphenyl	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2,4,5-Trichlorophenol	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
2,4,6-Trichlorophenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2,4-Dichlorophenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2,4-Dimethylphenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2,4-Dinitrophenol	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
2-Chloronaphthalene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2-Chlorophenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2-Methylnaphthalene	440 U	410 U	380 U	390 U	400 U	170 J	71 J	400 U
2-Methylphenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
2-Nitroaniline	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
2-Nitrophenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
3,3'-Dichlorobenzidine	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB61				AS01-SB62			
	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample ID	09/22/04				09/22/04			
Sample Date	09/22/04				09/22/04			
Chemical Name								
4,6-Dinitro-2-methylphenol	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
4-Bromophenyl-phenylether	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
4-Chloro-3-methylphenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
4-Chloroaniline	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
4-Chlorophenyl-phenylether	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
4-Methylphenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
4-Nitroaniline	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
4-Nitrophenol	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
Acenaphthene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Acenaphthylene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Acetophenone	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Anthracene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Atrazine	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzaldehyde	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzo(a)anthracene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzo(a)pyrene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzo(b)fluoranthene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzo(g,h,i)perylene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzo(k)fluoranthene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Caprolactam	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Carbazole	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Chrysene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Di-n-butylphthalate	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Di-n-octylphthalate	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Dibenz(a,h)anthracene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Dibenzofuran	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Diethylphthalate	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Dimethyl phthalate	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Fluoranthene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Fluorene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Hexachlorobenzene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Hexachlorobutadiene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U

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U - Undetected  
UJ - Undetected, limit estimated  
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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB61				AS01-SB62			
	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample ID								
Sample Date	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
Hexachlorocyclopentadiene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Hexachloroethane	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Indeno(1,2,3-cd)pyrene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Isophorone	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Naphthalene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Pentachlorophenol	1,100 U	1,000 U	960 U	990 U	990 U	990 U	980 U	1,000 U
Phenanthrene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Phenol	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Pyrene	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
bis(2-Chloro-1-methylethyl) ether	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
bis(2-Chloroethoxy)methane	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
bis(2-Chloroethyl)ether	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
bis(2-Ethylhexyl)phthalate	440 U	410 U	380 U	390 U	400 U	89 J	390 U	46 J
n-Nitroso-di-n-propylamine	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
n-Nitrosodiphenylamine	440 U	410 U	380 U	390 U	400 U	400 U	390 U	400 U
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0095	0.0049 J	0.0047 J	0.0037 J	1.8	0.02	0.0041 J	0.0034 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.70E-04 U	4.50E-04 U	3.60E-04 U	7.00E-04 U	1.7	0.0018 U	3.80E-04 U	7.10E-04 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	3.20E-04 U	5.70E-04 U	4.40E-04 U	7.40E-04 U	0.4	5.40E-04 U	2.80E-04 U	5.80E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	3.50E-04 U	5.90E-04 U	5.00E-04 U	0.0011 U	0.075	6.10E-04 U	2.50E-04 U	4.70E-04 U
1,2,3,4,7,8-Hexachlorodibenzofuran	2.30E-04 U	4.20E-04 U	3.30E-04 U	6.30E-04 U	1	8.50E-04 U	2.20E-04 U	5.50E-04 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	3.20E-04 U	5.80E-04 U	4.80E-04 U	9.30E-04 U	0.17	5.60E-04 U	2.40E-04 U	4.60E-04 U
1,2,3,6,7,8-Hexachlorodibenzofuran	2.30E-04 U	4.50E-04 U	3.10E-04 U	6.10E-04 U	0.76	5.00E-04 U	2.20E-04 U	4.00E-04 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	4.90E-04 U	5.70E-04 U	4.80E-04 U	9.90E-04 U	0.16	6.70E-04 U	3.20E-04 U	4.40E-04 U
1,2,3,7,8,9-Hexachlorodibenzofuran	2.40E-04 U	4.70E-04 U	3.00E-04 U	5.40E-04 U	0.056	4.90E-04 U	2.20E-04 U	4.20E-04 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	4.30E-04 U	8.30E-04 U	6.30E-04 U	0.0011 U	0.094	8.30E-04 U	3.40E-04 U	7.30E-04 U
1,2,3,7,8-Pentachlorodibenzofuran	3.10E-04 U	5.20E-04 U	3.90E-04 U	6.70E-04 U	0.71	5.70E-04 U	2.20E-04 U	4.90E-04 U
2,3,4,6,7,8-Hexachlorodibenzofuran	2.30E-04 U	4.10E-04 U	2.70E-04 U	4.50E-04 U	0.29	4.20E-04 U	2.00E-04 U	3.80E-04 U
2,3,4,7,8-Pentachlorodibenzofuran	3.20E-04 U	5.70E-04 U	5.00E-04 U	9.80E-04 U	0.6	6.60E-04 U	2.40E-04 U	5.40E-04 U
2,3,7,8-TCDD (dioxin)	2.70E-04 U	5.80E-04 U	3.30E-04 U	6.40E-04 U	0.016	3.70E-04 U	1.90E-04 U	4.30E-04 U
2,3,7,8-Tetrachlorodibenzofuran	1.60E-04 U	4.20E-04 U	2.10E-04 U	3.90E-04 U	0.38	7.80E-04 U	1.50E-04 U	5.60E-04 U
Octachlorodibenzo-p-dioxin	0.36	0.15	0.16	0.091	8.9 J	0.46	0.1	0.052
Octachlorodibenzofuran	3.50E-04 U	8.80E-04 U	7.70E-04 U	0.039	1.4	0.0036 U	8.40E-04 U	0.0012 U
Total heptachlorodibenzo-p-dioxin	0.021	0.011	0.0096	0.0078	3.4	0.041	0.0089	0.0072

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB61				AS01-SB62			
Sample ID	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample Date	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
Total heptachlorodibenzofuran	3.20E-04 U	5.70E-04 U	4.40E-04 U	7.40E-04 U	3.3	0.0029 U	4.70E-04 U	7.30E-04 U
Total hexachlorodibenzo-p-dioxin	9.20E-04 U	8.90E-04 U	5.50E-04 U	0.0027 U	1.4	0.0016 U	7.90E-04 U	1.00E-03 U
Total hexachlorodibenzofuran	2.40E-04 U	4.70E-04 U	3.30E-04 U	6.30E-04 U	4.6	8.50E-04 U	2.20E-04 U	5.50E-04 U
Total pentachlorodibenzo-p-dioxin	4.30E-04 U	8.30E-04 U	6.30E-04 U	0.0023 U	0.68	8.30E-04 U	3.40E-04 U	7.30E-04 U
Total pentachlorodibenzofuran	3.20E-04 U	7.20E-04 U	5.00E-04 U	8.00E-04 U	4.5	6.60E-04 U	2.40E-04 U	8.20E-04 U
Total tetrachlorodibenzo-p-dioxin	2.70E-04 U	5.80E-04 U	3.30E-04 U	6.40E-04 U	0.45	3.70E-04 U	1.90E-04 U	4.30E-04 U
Total tetrachlorodibenzofuran	1.60E-04 U	4.20E-04 U	2.10E-04 U	3.90E-04 U	3.9	7.80E-04 U	1.50E-04 U	5.60E-04 U
Explosives (UG/KG)								
1,3,5-Trinitrobenzene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
1,3-Dinitrobenzene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4,6-Trinitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4-Dinitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2,6-Dinitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-Amino-4,6-dinitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
2-Nitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
3-Nitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
4-Amino-2,6-dinitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
4-Nitrotoluene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
HMX	500 U	500 U	500 U	500 U	1,500	1,200	750	350 J
Nitrobenzene	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Nitroglycerin	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA
PETN	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U
Perchlorate	53.3 U	49.5 U	46.5 U	47.7 U	288	269	757	459
RDX	500 U	500 U	500 U	500 U	2,100	4,500	5,500	3,600
Tetryl	650 U	650 U	650 U	650 U	650 U	650 U	650 U	650 U
Total Metals (MG/KG)								
Aluminum	6,980	6,940	7,610	9,090	7,930	7,490	7,860	9,000
Antimony	0.72 UL	0.67 UL	0.63 UL	0.64 UL	0.65 UL	0.65 UL	0.64 UL	0.65 UL
Arsenic	5.7	5.7	6.4	8.2	6	6.2	6.6	7.3
Barium	117	111	103	117	149	72.2	86.1	202
Beryllium	0.83 B	0.82 B	0.81 B	0.81 B	1.1 B	0.81 B	0.91 B	0.91 B
Cadmium	0.053 U	0.05 U	0.046 U	0.048 U	0.048 U	0.048 U	0.047 U	0.048 U

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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB61				AS01-SB62			
Sample ID	AS01-SB61P-1-3	AS01-SB61-3-5	AS01-SB61-5-7	AS01-SB61-7-8	AS01-SB62-1-3	AS01-SB62-3-5	AS01-SB62-5-7	AS01-SB62-7-8
Sample Date	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04	09/22/04
Chemical Name								
Calcium	1,240 J	1,210 J	701 J	1,300	2,090	503 J	596 J	599 J
Chromium	10.9	11.5	12.4	13.2	12.7	12.6	11.9	13.6
Cobalt	12.3 J	13.1	14	16.2	15	10.4 J	13.9	14.5
Copper	13.2	14.7	15.4	15.8	17.3	16.3	17.3	15.3
Cyanide	0.67 U	0.62 U	0.58 U	0.6 U	0.14 J	0.6 U	0.59 U	0.6 U
Iron	24,300	25,300	27,400	29,000	27,800	27,600	28,500	31,100
Lead	12	15.4	13.2	16.5	14.5	13.8	14.6	15.1
Magnesium	870 J	878 J	974 J	1,550 J	979 J	869 J	1,010 J	1,230 J
Manganese	757	783	701	833	918	532	686	725
Mercury	0.095 J	0.12 J	0.063 J	0.06 U	0.062 J	0.06 U	0.07 J	0.086 J
Nickel	18.1	18.8	18.4	20.3	21.8	18	18.5	18.4
Potassium	940 J	858 J	934 J	909 J	1,060 J	975 J	974 J	761 J
Selenium	0.61 U	0.57 U	0.53 U	0.55 U	0.55 U	0.55 U	0.63 J	0.55 U
Silver	0.27 U	0.25 U	0.23 U	0.24 U				
Sodium	68.3 U	63.4 U	59.5 U	61 U	61.3 U	61.3 U	60.5 U	61.5 U
Thallium	1.3 UL	1.4 L	1.1 UL	1.5 L	1.6 L	1.1 UL	1.1 UL	1.2 UL
Vanadium	15.1	15.8	16.8	20.4	17.1	16.6	17.8	19.9
Zinc	47.7	52.6	53	63.6	57.3	54.7	56.9	76.4
Wet Chemistry (MG/KG)								
% Moisture	25	19.2	13.9	16.1	16.5	16.5	15.4	16.7
Total organic carbon (TOC)	6,500	7,400	4,200	3,700	8,200	7,600	5,000	2,300
pH	6.8	6.3	5.8	5.9	7.1	5.6	4.8	4

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-004/004S/005/039				BG-006/007		BG-00
	HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)	HCS-BG-38
Sample ID							
Sample Date	07/13/92	07/13/92	07/13/92	06/20/94	07/13/92	06/21/94	07/13/92
Chemical Name							
Volatile Organic Compounds (UG/KG)							
1,1,1-Trichloroethane	730 U	760 U	4,500 U	NA	6 UJ	NA	260
1,1,2,2-Tetrachloroethane	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,1-Dichloroethane	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,1-Dichloroethene	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,2,4-Trichlorobenzene	380 U	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	380 U	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,2-Dichloroethene (total)	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,2-Dichloropropane	730 U	760 U	4,500 U	NA	6 UJ	NA	740
1,3-Dichlorobenzene	380 U	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	380 U	NA	NA	NA	NA	NA	NA
2-Butanone	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
2-Hexanone	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
4-Methyl-2-pentanone	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
Acetone	1,900 UJ	1,500 UJ	8,900 U	NA	12 UJ	NA	1,500
Benzene	730 U	760 U	4,500 U	NA	6 UJ	NA	740
Bromodichloromethane	730 UJ	760 UJ	4,500 UJ	NA	6 UJ	NA	740
Bromoform	730 UJ	760 UJ	4,500 UJ	NA	6 UJ	NA	740
Bromomethane	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
Carbon disulfide	730 U	760 U	4,500 U	NA	6 UJ	NA	740
Carbon tetrachloride	730 UJ	760 UJ	4,500 UJ	NA	6 UJ	NA	740
Chlorobenzene	730 U	760 U	4,500 U	NA	6 UJ	NA	740
Chloroethane	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
Chloroform	730 U	760 U	4,500 U	NA	6 UJ	NA	740
Chloromethane	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
Cumene	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	730 U	760 U	4,500 U	NA	6 UJ	NA	740
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA

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Table D-4  
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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-004/004S/005/039				BG-006/007		BG-00
	HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)	HCS-BG-38
Sample ID							
Sample Date	07/13/92		07/13/92		06/20/94		07/13/92
Chemical Name							
Ethylbenzene	730 U	320 J	4,500 U	NA	6 UJ	NA	740
Methyl acetate	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	1,500 UJ	1,500 UJ	8,900 UJ	NA	13 UJ	NA	1,500
Styrene	730 U	760 U	4,500 U	NA	6 UJ	NA	740
Tetrachloroethene	730 U	740 J	4,500 U	NA	6 UJ	NA	330
Toluene	730 U	660 J	4,500 U	NA	6 UJ	NA	170
Trichloroethene	3,800	160,000	76,000 J	NA	5 J	NA	42,000
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
Vinyl chloride	1,500 U	1,500 U	8,900 U	NA	12 UJ	NA	1,500
Xylene, total	290 J	1,700	4,500 U	NA	2 J	NA	190
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	730 U	760 U	4,500 U	NA	6 UJ	NA	740
o-Xylene	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	730 U	760 U	4,500 U	NA	6 UJ	NA	740
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	1,900 UJ	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	380 U	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	380 U	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	380 U	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	1,900 UJ	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	380 U	NA	NA	NA	NA	NA	NA
2-Chlorophenol	380 U	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	350 J	NA	NA	NA	NA	NA	NA
2-Methylphenol	380 U	NA	NA	NA	NA	NA	NA
2-Nitroaniline	1,900 U	NA	NA	NA	NA	NA	NA
2-Nitrophenol	380 U	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	770 UJ	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	1,900 U	NA	NA	NA	NA	NA	NA

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 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-004/004S/005/039				BG-006/007		BG-00	
	HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)	HCS-BG-38	
Sample ID								
Sample Date	07/13/92		07/13/92	07/13/92	06/20/94	07/13/92	06/21/94	07/13/92
Chemical Name								
4,6-Dinitro-2-methylphenol	1,900	U	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	380	U	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	380	U	NA	NA	NA	NA	NA	NA
4-Chloroaniline	380	U	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	380	U	NA	NA	NA	NA	NA	NA
4-Methylphenol	380	U	NA	NA	NA	NA	NA	NA
4-Nitroaniline	1,900	U	NA	NA	NA	NA	NA	NA
4-Nitrophenol	1,900	U	NA	NA	NA	NA	NA	NA
Acenaphthene	380	U	NA	NA	NA	NA	NA	NA
Acenaphthylene	380	U	NA	NA	NA	NA	NA	NA
Acetophenone	NA		NA	NA	NA	NA	NA	NA
Anthracene	380	U	NA	NA	NA	NA	NA	NA
Atrazine	NA		NA	NA	NA	NA	NA	NA
Benzaldehyde	NA		NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	380	U	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	380	U	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	380	U	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	380	U	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	380	U	NA	NA	NA	NA	NA	NA
Benzoic acid	1,900	UJ	NA	NA	NA	NA	NA	NA
Benzyl alcohol	380	U	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	380	U	NA	NA	NA	NA	NA	NA
Caprolactam	NA		NA	NA	NA	NA	NA	NA
Carbazole	NA		NA	NA	NA	NA	NA	NA
Chrysene	380	U	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	150	B	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	380	U	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	380	U	NA	NA	NA	NA	NA	NA
Dibenzofuran	380	U	NA	NA	NA	NA	NA	NA
Diethylphthalate	380	U	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	380	U	NA	NA	NA	NA	NA	NA
Fluoranthene	380	U	NA	NA	NA	NA	NA	NA
Fluorene	380	U	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	380	U	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	380	U	NA	NA	NA	NA	NA	NA

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 U - Undetected  
 UJ - Undetected, limit estimated  
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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-004/004S/005/039				BG-006/007		BG-00	
	HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)	HCS-BG-38	
Sample ID								
Sample Date	07/13/92		07/13/92	07/13/92	06/20/94	07/13/92	06/21/94	07/13/92
Chemical Name								
Hexachlorocyclopentadiene	380	UJ	NA	NA	NA	NA	NA	NA
Hexachloroethane	380	U	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	380	U	NA	NA	NA	NA	NA	NA
Isophorone	380	U	NA	NA	NA	NA	NA	NA
Naphthalene	250	J	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1,900	U	NA	NA	NA	NA	NA	NA
Phenanthrene	380	U	NA	NA	NA	NA	NA	NA
Phenol	380	U	NA	NA	NA	NA	NA	NA
Pyrene	380	U	NA	NA	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	380	U	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	380	UJ	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	380	U	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	320	J	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	380	U	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	380	U	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA		NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA		NA	NA	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA		NA	NA	NA	NA	NA	NA

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-004/004S/005/039				BG-006/007		BG-00
	HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)	HCS-BG-38
Sample ID							
Sample Date	07/13/92	07/13/92	07/13/92	06/20/94	07/13/92	06/21/94	07/13/92
Chemical Name							
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	380 U	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	380 U	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	380 U	NA	NA	NA	NA	NA	NA
Nitroglycerin	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA
PETN	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)							
Aluminum	NA	NA	NA	8,610	NA	6,110	NA
Antimony	NA	NA	NA	7.5 UJ	NA	7.40 UJ	NA
Arsenic	NA	NA	NA	6.40	NA	4.30	NA
Barium	NA	NA	NA	114	NA	67.3	NA
Beryllium	NA	NA	NA	0.840 B	NA	0.640 B	NA
Cadmium	NA	NA	NA	0.780 B	NA	0.660 U	NA

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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-004/004S/005/039				BG-006/007		BG-00
Sample ID	HCS-BG-4(92)	HCS-BG-4(92)/DUP	HCS-BG-5(92)	HCS-BG-4(94)	HCS-BG-6(92)	HCS-BG-6(94)	HCS-BG-38
Sample Date	07/13/92	07/13/92	07/13/92	06/20/94	07/13/92	06/21/94	07/13/92
Chemical Name							
Calcium	NA	NA	NA	472 B	NA	91,700	NA
Chromium	NA	NA	NA	13.4	NA	9.60	NA
Cobalt	NA	NA	NA	14.6	NA	6.60 B	NA
Copper	NA	NA	NA	17	NA	492	NA
Cyanide	NA	NA	NA	1.20 U	NA	1.20 U	NA
Iron	NA	NA	NA	29,600	NA	21,400	NA
Lead	NA	NA	NA	14.8	NA	9	NA
Magnesium	NA	NA	NA	1,120	NA	24,200	NA
Manganese	NA	NA	NA	761	NA	409	NA
Mercury	NA	NA	NA	0.0800 B	NA	0.0600 U	NA
Nickel	NA	NA	NA	17.7	NA	13.3	NA
Potassium	NA	NA	NA	856 B	NA	840 B	NA
Selenium	NA	NA	NA	0.880 U	NA	0.870 U	NA
Silver	NA	NA	NA	1.10 UJ	NA	1.10 UJ	NA
Sodium	NA	NA	NA	38.1	NA	75.3 B	NA
Thallium	NA	NA	NA	0.880 U	NA	0.870 U	NA
Vanadium	NA	NA	NA	23.6	NA	15	NA
Zinc	NA	NA	NA	61.1 J	NA	43.5 J	NA
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA

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Table D-4  
Raw Data, Subsurface Soil, Former Disposal Pits  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	3/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131	BG-205/206	
Sample ID	HCS-BG-8		HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131	HCS-BG-205	HCS-BG-206
Sample Date	06/21/94		07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94	10/27/98	10/27/98
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	J	NA	6 UJ	11 U	12 U	12 U	12 U	2 J	11 U	11
1,1,2,2-Tetrachloroethane	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,1-Dichloroethane	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,1-Dichloroethene	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,2,4-Trichlorobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,2-Dichloroethene (total)	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,2-Dichloropropane	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
1,3-Dichlorobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
2-Hexanone	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
4-Methyl-2-pentanone	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Acetone	U	NA	8 UJ	11 U	12 U	15 U	12 U	14 U	11 U	11
Benzene	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Bromodichloromethane	UJ	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Bromoform	UJ	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Bromomethane	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Carbon disulfide	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Carbon tetrachloride	UJ	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Chlorobenzene	U	NA	6 UJ	11 U	12 U	4 J	2 J	12 U	11 U	11
Chloroethane	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Chloroform	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Chloromethane	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Cumene		NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	UJ	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Dichlorodifluoromethane (Freon-12)		NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	3/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131	BG-205/206	
Sample ID	HCS-BG-8		HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131	HCS-BG-205	HCS-BG-206
Sample Date	06/21/94		07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94	10/27/98	10/27/98
Chemical Name										
Ethylbenzene	U	NA	6 UJ	11 U	12 U	3 J	12 U	12 U	11 U	11
Methyl acetate		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane		NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	UJ	NA	9 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Styrene	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Tetrachloroethene	J	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Toluene	J	NA	6 UJ	11 U	12 U	3 J	2 J	12 U	11 U	11
Trichloroethene		NA	380	11 U	12 U	230	260	270	11 U	11
Trichlorofluoromethane(Freon-11)		NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	U	NA	12 UJ	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	U	NA	12 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
Xylene, total	J	NA	6 UJ	11 U	12 U	8 J	12 U	12 U	11 U	11
cis-1,2-Dichloroethene		NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
o-Xylene		NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene		NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	U	NA	6 UJ	11 U	12 U	12 U	12 U	12 U	11 U	11
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine		NA	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol		NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline		NA	NA	NA	NA	NA	NA	NA	NA	NA

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	3/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131	BG-205/206	
Sample ID	HCS-BG-8		HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131	HCS-BG-205	HCS-BG-206
Sample Date	06/21/94		07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94	10/27/98	10/27/98
Chemical Name										
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzoic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	3/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131	BG-205/206	
Sample ID	HCS-BG-8		HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131	HCS-BG-205	HCS-BG-206
Sample Date	06/21/94		07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94	10/27/98	10/27/98
Chemical Name										
Total heptachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)										
1,3,5-Trinitrobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene		NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX		NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene		NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin		NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine		NA	NA	NA	NA	NA	NA	NA	NA	NA
PETN		NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate		NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX		NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl		NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)										
Aluminum		8,100	NA	NA	NA	NA	NA	NA	NA	NA
Antimony		7 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic		5.90	NA	NA	NA	NA	NA	NA	NA	NA
Barium		76.2	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium		0.900 B	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium		1 B	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	3/008S/009/038		BG-079	BG-120/121		BG-126/127	BG-128/129	BG-130/131	BG-205/206	
Sample ID	HCS-BG-8		HCS-BG-79	HCS-BG-120	HCS-BG-120/DUP	HCS-BG-127	HCS-BG-128	HCS-BG-131	HCS-BG-205	HCS-BG-206
Sample Date	06/21/94		07/13/92	06/21/94	06/21/94	06/22/94	06/22/94	06/22/94	10/27/98	10/27/98
Chemical Name										
Calcium	826	B	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	12		NA	NA	NA	NA	NA	NA	NA	NA
Cobalt	15.7		NA	NA	NA	NA	NA	NA	NA	NA
Copper	16.7		NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	1.20	U	NA	NA	NA	NA	NA	NA	NA	NA
Iron	28,600		NA	NA	NA	NA	NA	NA	NA	NA
Lead	13.4		NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	1,050		NA	NA	NA	NA	NA	NA	NA	NA
Manganese	886		NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.0700	B	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	20.4		NA	NA	NA	NA	NA	NA	NA	NA
Potassium	911	B	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	0.820	U	NA	NA	NA	NA	NA	NA	NA	NA
Silver	1.20	J	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	49.6	U	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	0.820	U	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	20.2		NA	NA	NA	NA	NA	NA	NA	NA
Zinc	82.7	J	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)										
% Moisture	NA		NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA		NA	NA	NA	NA	NA	NA	NA	NA
pH	NA		NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	
<b>Sample ID</b>	6
<b>Sample Date</b>	
<b>Chemical Name</b>	
<b>Volatile Organic Compounds (UG/KG)</b>	
1,1,1-Trichloroethane	U
1,1,2,2-Tetrachloroethane	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	
1,1,2-Trichloroethane	U
1,1-Dichloroethane	U
1,1-Dichloroethene	U
1,2,4-Trichlorobenzene	
1,2-Dibromo-3-chloropropane	
1,2-Dibromoethane	
1,2-Dichlorobenzene	
1,2-Dichloroethane	U
1,2-Dichloroethene (total)	U
1,2-Dichloropropane	U
1,3-Dichlorobenzene	
1,4-Dichlorobenzene	
2-Butanone	U
2-Hexanone	U
4-Methyl-2-pentanone	U
Acetone	U
Benzene	U
Bromodichloromethane	U
Bromoform	U
Bromomethane	U
Carbon disulfide	U
Carbon tetrachloride	U
Chlorobenzene	U
Chloroethane	U
Chloroform	U
Chloromethane	U
Cumene	
Cyclohexane	
Dibromochloromethane	U
Dichlorodifluoromethane (Freon-12)	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	
<b>Sample ID</b>	6
<b>Sample Date</b>	
<b>Chemical Name</b>	
Ethylbenzene	U
Methyl acetate	
Methyl-tert-butyl ether (MTBE)	
Methylcyclohexane	
Methylene chloride	U
Styrene	U
Tetrachloroethene	U
Toluene	U
Trichloroethene	U
Trichlorofluoromethane(Freon-11)	
Vinyl acetate	
Vinyl chloride	U
Xylene, total	U
cis-1,2-Dichloroethene	
cis-1,3-Dichloropropene	U
o-Xylene	
trans-1,2-Dichloroethene	
trans-1,3-Dichloropropene	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>	
1,1-Biphenyl	
2,4,5-Trichlorophenol	
2,4,6-Trichlorophenol	
2,4-Dichlorophenol	
2,4-Dimethylphenol	
2,4-Dinitrophenol	
2-Chloronaphthalene	
2-Chlorophenol	
2-Methylnaphthalene	
2-Methylphenol	
2-Nitroaniline	
2-Nitrophenol	
3,3'-Dichlorobenzidine	
3- and 4-Methylphenol	
3-Nitroaniline	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	
<b>Sample ID</b>	6
<b>Sample Date</b>	
<b>Chemical Name</b>	
4,6-Dinitro-2-methylphenol	
4-Bromophenyl-phenylether	
4-Chloro-3-methylphenol	
4-Chloroaniline	
4-Chlorophenyl-phenylether	
4-Methylphenol	
4-Nitroaniline	
4-Nitrophenol	
Acenaphthene	
Acenaphthylene	
Acetophenone	
Anthracene	
Atrazine	
Benzaldehyde	
Benzo(a)anthracene	
Benzo(a)pyrene	
Benzo(b)fluoranthene	
Benzo(g,h,i)perylene	
Benzo(k)fluoranthene	
Benzoic acid	
Benzyl alcohol	
Butylbenzylphthalate	
Caprolactam	
Carbazole	
Chrysene	
Di-n-butylphthalate	
Di-n-octylphthalate	
Dibenz(a,h)anthracene	
Dibenzofuran	
Diethylphthalate	
Dimethyl phthalate	
Fluoranthene	
Fluorene	
Hexachlorobenzene	
Hexachlorobutadiene	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	
<b>Sample ID</b>	6
<b>Sample Date</b>	
<b>Chemical Name</b>	
Hexachlorocyclopentadiene	
Hexachloroethane	
Indeno(1,2,3-cd)pyrene	
Isophorone	
Naphthalene	
Pentachlorophenol	
Phenanthrene	
Phenol	
Pyrene	
bis(2-Chloro-1-methylethyl) ether	
bis(2-Chloroethoxy)methane	
bis(2-Chloroethyl)ether	
bis(2-Ethylhexyl)phthalate	
n-Nitroso-di-n-propylamine	
n-Nitrosodiphenylamine	
<b>Dioxin/Furans (UG/KG)</b>	
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,4,7,8-Hexachlorodibenzofuran	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	
1,2,3,6,7,8-Hexachlorodibenzofuran	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	
1,2,3,7,8,9-Hexachlorodibenzofuran	
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	
1,2,3,7,8-Pentachlorodibenzofuran	
2,3,4,6,7,8-Hexachlorodibenzofuran	
2,3,4,7,8-Pentachlorodibenzofuran	
2,3,7,8-TCDD (dioxin)	
2,3,7,8-Tetrachlorodibenzofuran	
Octachlorodibenzo-p-dioxin	
Octachlorodibenzofuran	
Total heptachlorodibenzo-p-dioxin	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	
<b>Sample ID</b>	6
<b>Sample Date</b>	
<b>Chemical Name</b>	
Total heptachlorodibenzofuran	
Total hexachlorodibenzo-p-dioxin	
Total hexachlorodibenzofuran	
Total pentachlorodibenzo-p-dioxin	
Total pentachlorodibenzofuran	
Total tetrachlorodibenzo-p-dioxin	
Total tetrachlorodibenzofuran	
<b>Explosives (UG/KG)</b>	
1,3,5-Trinitrobenzene	
1,3-Dinitrobenzene	
2,4,6-Trinitrotoluene	
2,4-Dinitrotoluene	
2,6-Dinitrotoluene	
2-Amino-4,6-dinitrotoluene	
2-Nitrotoluene	
3-Nitrotoluene	
4-Amino-2,6-dinitrotoluene	
4-Nitrotoluene	
HMX	
Nitrobenzene	
Nitroglycerin	
Nitroguanidine	
PETN	
Perchlorate	
RDX	
Tetryl	
<b>Total Metals (MG/KG)</b>	
Aluminum	
Antimony	
Arsenic	
Barium	
Beryllium	
Cadmium	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-4  
 Raw Data, Subsurface Soil, Former Disposal Pits  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	
<b>Sample ID</b>	6
<b>Sample Date</b>	
<b>Chemical Name</b>	
Calcium	
Chromium	
Cobalt	
Copper	
Cyanide	
Iron	
Lead	
Magnesium	
Manganese	
Mercury	
Nickel	
Potassium	
Selenium	
Silver	
Sodium	
Thallium	
Vanadium	
Zinc	
<b>Wet Chemistry (MG/KG)</b>	
% Moisture	
Total organic carbon (TOC)	
pH	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1,2-Tetrachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,1-Trichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2,2-Tetrachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1-Dichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,1-Dichloroethene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2,3-Trichloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2,4-Trichlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,2-Dibromo-3-chloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dibromoethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,2-Dichloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloroethene (total)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,2-Dichloropropane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
1,3-Dichlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,4-Dichlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,4-Dioxane	600 R	600 R	620 R	600 R	590 R	610 R	600 R
2-Butanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Chloro-1,3-butadiene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Chloroethyl vinyl ether	6 U	6 U	6 U	6 U	6 U	6 U	6 U
2-Hexanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
4-Methyl-2-pentanone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Acetone	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Acetonitrile	240 U	240 U	250 U	240 U	240 U	240 U	240 U
Acrolein	60 R	60 R	62 R	60 R	59 R	61 R	60 R
Acrylonitrile	60 U	60 U	62 U	60 U	59 U	61 U	60 U
Allyl chloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Benzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromodichloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromoform	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Bromomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Carbon disulfide	6 U	6 U	6 U	6 U	6 U	6 U	6 U

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
Carbon tetrachloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chlorobenzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chloroform	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Chloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Cumene	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Dibromomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Dichlorodifluoromethane (Freon-12)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Ethyl methacrylate	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Ethylbenzene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Iodomethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Isobutanol	240 R	240 R	250 R	240 R	240 R	240 R	240 R
Methacrylonitrile	120 U	120 U	120 U	120 U	120 U	120 U	120 U
Methyl acetate	NA	NA	NA	NA	NA	NA	NA
Methyl methacrylate	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Methyl methanesulfonate	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	3 B	6 B	4 B	4 B	6 B	9 B	10 B
Pentachloroethane	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Propionitrile	120 R	120 R	120 R	120 R	120 R	120 R	120 R
Styrene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Tetrachloroethene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Toluene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Trichloroethene	6 U	6 U	6 U	5 J	6 U	6 U	6 U
Trichlorofluoromethane(Freon-11)	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Vinyl acetate	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Vinyl chloride	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Xylene, total	6 U	6 U	6 U	6 U	6 U	6 U	6 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	6 U	6 U	6 U	6 U	6 U	6 U	6 U

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit low

Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
trans-1,4-Dichloro-2-butene	6 U	6 U	6 U	6 U	6 U	6 U	6 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>							
1,1-Biphenyl	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,2,4,5-Tetrachlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,4-Naphthoquinone	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1-Naphthylamine	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,3,4,6-Tetrachlorophenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,4,5-Trichlorophenol	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
2,4,6-Trichlorophenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,4-Dichlorophenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,4-Dimethylphenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,4-Dinitrophenol	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
2,6-Dichlorophenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Acetylaminofluorene	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
2-Chloronaphthalene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Chlorophenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Methyl-5-nitroaniline	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Methylaniline	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Methylnaphthalene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Methylphenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Naphthylamine	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Nitroaniline	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
2-Nitrophenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Picoline	380 U	400 U	390 U	390 U	370 U	400 U	380 U
3,3'-Dichlorobenzidine	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
3,3'-Dimethylbenzidine	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
3-Methylcholanthrene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
3-Methylphenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
3-Nitroaniline	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
4,6-Dinitro-2-methylphenol	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
4-Aminobiphenyl	380 U	400 U	390 U	390 U	370 U	400 U	380 U
4-Bromophenyl-phenylether	380 U	400 U	390 U	390 U	370 U	400 U	380 U
4-Chloro-3-methylphenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
4-Chloroaniline	380 U	400 U	390 U	390 U	370 U	400 U	380 U

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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
4-Chlorophenyl-phenylether	380 U	400 U	390 U	390 U	370 U	400 U	380 U
4-Methylphenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
4-Nitroaniline	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
4-Nitrophenol	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
4-Nitroquinoline-1-oxide	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
7,12-Dimethylbenz(a)anthracene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Acenaphthene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Acenaphthylene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Acetophenone	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Aniline	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Anthracene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Aramite	960 U	990 U	980 U	980 U	930 UJ	1,000 U	960 U
Atrazine	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
Benzo(a)pyrene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Benzo(b)fluoranthene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Benzo(g,h,i)perylene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Benzo(k)fluoranthene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Benzoic acid	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
Benzyl alcohol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Butylbenzylphthalate	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
Caprolactam	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA
Chlorobenzilate	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
Chrysene	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
Di-n-butylphthalate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Di-n-octylphthalate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Diallate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Dibenz(a,h)anthracene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Dibenzofuran	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Diethylphthalate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Dimethoate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Dimethyl phthalate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Dinoseb	380 U	400 U	390 U	390 U	370 U	400 U	380 U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
Diphenylamine	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Disulfoton	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Ethyl methanesulfonate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Famphur	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
Fluoranthene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Fluorene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Hexachlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Hexachlorobutadiene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Hexachlorocyclopentadiene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Hexachloroethane	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Hexachlorophene	15,000 U	16,000 U	16,000 U	16,000 U	15,000 U	16,000 U	15,000 U
Hexachloropropene	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
Indeno(1,2,3-cd)pyrene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Isodrin	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Isophorone	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Isosafrole	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Kepone	960 U	990 U	980 U	980 U	930 UJ	1,000 U	960 U
Methapyrilene	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
Methyl parathion	380 U	400 U	390 U	390 U	370 U	400 U	380 U
N-Nitrosomorpholine	380 U	400 U	390 U	390 U	370 U	400 U	380 U
N-Nitrosopiperidine	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Naphthalene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
O,O,O-Triethyl phosphorothioate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Parathion	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Pentachlorobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Pentachloronitrobenzene	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
Pentachlorophenol	960 U	990 U	980 U	980 U	930 U	1,000 U	960 U
Phenacetin	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Phenanthrene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Phenol	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Phorate	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Pronamide	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Pyrene	380 U	400 U	390 U	390 U	370 UJ	400 U	380 U
Pyridine	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Safrole	380 U	400 U	390 U	390 U	370 U	400 U	380 U

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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
Total heptachlorodibenzo-p-dioxin	0.292 U	0.084 U	0.356 U	0.321 U	0.395 U	0.317 U	0.359 U
Total heptachlorodibenzofuran	0.145 U	0.044 U	0.2 U	0.159 U	0.196 U	0.169 U	0.172 U
Total hexachlorodibenzo-p-dioxin	0.254 U	0.071 U	0.328 U	0.288 U	0.364 U	0.284 U	0.313 U
Total hexachlorodibenzofuran	0.059 U	0.02 U	0.08 U	0.064 U	0.078 U	0.068 U	0.07 U
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
1,3-Dinitrobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,4,6-Trinitrotoluene	454 U	435 U	454 U	454 U	454 U	476 U	435 U
2,4-Dinitrotoluene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2,6-Dinitrotoluene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
2-Amino-4,6-dinitrotoluene	454 U	435 U	454 U	454 U	454 U	476 U	435 U
2-Nitrotoluene	454 U	435 U	454 U	454 U	454 U	476 U	435 U
3-Nitrotoluene	454 U	435 U	454 U	454 U	454 U	476 U	435 U
4-Amino-2,6-dinitrotoluene	454 U	435 U	454 U	454 U	454 U	476 U	435 U
4-Nitrotoluene	454 U	435 U	454 U	454 U	454 U	476 U	435 U
HMX	276 J	340 J	454 U	454 U	454 U	476 U	435 U
Nitrobenzene	380 U	400 U	390 U	390 U	370 U	400 U	380 U
Nitroglycerin	435 U	454 U	454 U	476 U	476 U	454 U	435 U
PETN	NA	NA	NA	NA	NA	NA	NA
Perchlorate	120	92	61 U	62	2,500	61 U	60 U
RDX	454 U	435 U	454 U	454 U	454 U	476 U	435 U
Tetryl	454 U	435 U	454 U	454 U	454 U	476 U	435 U
Total Metals (MG/KG)							
Aluminum	9,160	9,280	9,330	9,120	10,200	10,200	9,820
Antimony	2.1 L	1.3 L	1.5 L	1.6 B	1.9 L	1.3 L	0.24 UL
Arsenic	6.5	6.6	7.2	7	6.9	7	7.6
Barium	151	154	183	207	195	203	194
Beryllium	1.1	1.1	1.2	1.1	1.2	1.3	1.2
Cadmium	0.23 U	0.23 U	0.24 U	0.23 U	0.22 U	0.24 U	0.24 U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB14		AS01-SB15	AS01-SB16	AS01-SB17	AS01-SB18	AS01-SB19
Sample ID	AS01-SB14-R01X	AS01-SB14P-R01X	AS01-SB15-R01X	AS01-SB16-R01X	AS01-SB17-R01X	AS01-SB18-R01X	AS01-SB19-R01X
Sample Date	02/21/01	02/21/01	02/21/01	02/22/01	02/22/01	02/22/01	02/22/01
Chemical Name							
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	14.5 J	14.8 J	15.6 J	15.3 J	15.7 J	15.2 J	16.1 J
Cobalt	14.3	14.7	15.2	15.6	15.9	16.4	15.9
Copper	15.5	16.2	17.1	17.5	16.8	16.9	18.6
Cyanide	0.15 B	0.24 B	0.19 B	0.22 B	0.12 B	0.3 B	0.28 B
Iron	31,300	32,300	31,600	32,700	32,700	32,800	33,100
Lead	14.9 K	15.9 K	20.1 K	16 K	16.7 K	22.1 K	25 K
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	911	926	1,030	1,010	1,070	1,170	1,080
Mercury	0.03 B	0.04 B	0.04 B	0.03 B	0.03 B	0.04 B	0.04 B
Nickel	22.4 J	23.7 J	24.2 J	24.1 J	25.1 J	27.1 J	25.3 J
Potassium	NA	NA	NA	NA	NA	NA	NA
Selenium	1.4 K	1.2 K	1.3 K	1.3 K	1.2 K	1.3 K	1.4 K
Silver	0.12 U	0.12 U	0.12 U	0.11 U	0.12 U	0.12 U	0.12 U
Sodium	NA	NA	NA	NA	NA	NA	NA
Thallium	1.9	2.1	1.7	1.6	1.5	1.7	2.1
Tin	4 B	3.9 B	4.1 B	3.9 B	4 B	4 B	3.8 B
Vanadium	20.9	21.1	22	21.4	23	23.3	24.8
Zinc	66.3	65.6	71.3	70.5	70.2	73.5	75.2
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	NA
Nitrate	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Nitrite	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Total organic carbon (TOC)	9,050	9,370	9,930	9,410	8,940	11,900	12,300
pH	7	7.1	7.3	7.3	7.5	7.4	7.4

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65	AS01-SB66	AS01-SB67
Sample ID	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2	AS01-SB66-1.5-2	AS01-SB67-1.5-2
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04
Chemical Name							
<b>Volatile Organic Compounds (UG/KG)</b>							
1,1,1,2-Tetrachloroethane	6 U	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,1,2,2-Tetrachloroethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	11 U	530 U	480 U	11 U	14 U	12 U
1,1,2-Trichloroethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,1-Dichloroethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,1-Dichloroethene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,2,3-Trichloropropane	6 U	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	380 U	11 U	530 U	480 U	11 U	14 U	12 U
1,2-Dibromo-3-chloropropane	6 U	11 U	530 R	480 R	11 U	14 U	12 U
1,2-Dibromoethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,2-Dichlorobenzene	380 U	11 U	530 U	480 U	11 U	14 U	12 U
1,2-Dichloroethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,2-Dichloroethene (total)	6 U	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
1,3-Dichlorobenzene	380 U	11 U	530 U	480 U	11 U	14 U	12 U
1,4-Dichlorobenzene	380 U	11 U	530 U	480 U	11 U	14 U	12 U
1,4-Dioxane	600 R	NA	NA	NA	NA	NA	NA
2-Butanone	6 U	11 U	530 U	480 U	11 U	14 U	12 U
2-Chloro-1,3-butadiene	6 U	NA	NA	NA	NA	NA	NA
2-Chloroethyl vinyl ether	6 U	NA	NA	NA	NA	NA	NA
2-Hexanone	6 U	11 U	530 U	480 U	11 U	14 U	12 U
4-Methyl-2-pentanone	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Acetone	6 U	4.1 B	97 B	95 B	2.2 B	2.8 B	5.3 B
Acetonitrile	240 U	NA	NA	NA	NA	NA	NA
Acrolein	60 R	NA	NA	NA	NA	NA	NA
Acrylonitrile	60 U	NA	NA	NA	NA	NA	NA
Allyl chloride	6 U	NA	NA	NA	NA	NA	NA
Benzene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Bromodichloromethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Bromoform	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Bromomethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Carbon disulfide	6 U	11 U	530 U	480 U	11 U	14 U	12 U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65	AS01-SB66	AS01-SB67
Sample ID	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2	AS01-SB66-1.5-2	AS01-SB67-1.5-2
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04
Chemical Name							
Carbon tetrachloride	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Chlorobenzene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Chloroethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Chloroform	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Chloromethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Cumene	NA	11 U	530 U	480 U	11 U	14 U	12 U
Cyclohexane	NA	11 U	530 U	480 U	11 U	14 U	12 U
Dibromochloromethane	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Dibromomethane	6 U	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Ethyl methacrylate	6 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Iodomethane	6 U	NA	NA	NA	NA	NA	NA
Isobutanol	240 R	NA	NA	NA	NA	NA	NA
Methacrylonitrile	120 U	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	11 U	530 U	480 U	11 U	14 U	12 U
Methyl methacrylate	6 U	NA	NA	NA	NA	NA	NA
Methyl methanesulfonate	960 U	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	11 U	530 U	480 U	11 U	14 U	12 U
Methylcyclohexane	NA	11 U	530 U	480 U	11 U	14 U	12 U
Methylene chloride	5 B	3 B	320 B	270 B	2.5 B	10 B	10 B
Pentachloroethane	6 U	NA	NA	NA	NA	NA	NA
Propionitrile	120 R	NA	NA	NA	NA	NA	NA
Styrene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Tetrachloroethene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Toluene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Trichloroethene	6 U	13	600	520	140	14 U	11 J
Trichlorofluoromethane(Freon-11)	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Vinyl acetate	6 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	6 U	11 U	530 U	480 U	11 U	14 U	12 U
Xylene, total	6 U	11 U	530 U	480 U	11 U	14 U	12 U
cis-1,2-Dichloroethene	NA	11 U	530 U	480 U	11 U	14 U	12 U
cis-1,3-Dichloropropene	6 U	11 U	530 U	480 U	11 U	14 U	12 U
trans-1,2-Dichloroethene	NA	11 U	530 U	480 U	11 U	14 U	12 U
trans-1,3-Dichloropropene	6 U	11 U	530 U	480 U	11 U	14 U	12 U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67			
Sample ID	AS01-SB20-R01X		AS01-SB63-6.5-7		AS01-SB64-7.5-8		AS01-SB64P-7.5-8		AS01-SB65-1.5-2		AS01-SB66-1.5-2		AS01-SB67-1.5-2	
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04	
Chemical Name														
trans-1,4-Dichloro-2-butene	6	U	NA		NA		NA		NA		NA		NA	
<b>Semi-volatile Organic Compounds (UG/KG)</b>														
1,1-Biphenyl	380	U	400	U	380	U	380	U	400	U	400	U	400	U
1,2,4,5-Tetrachlorobenzene	380	U	NA		NA		NA		NA		NA		NA	
1,4-Naphthoquinone	380	U	NA		NA		NA		NA		NA		NA	
1-Naphthylamine	380	U	NA		NA		NA		NA		NA		NA	
2,3,4,6-Tetrachlorophenol	380	U	NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
2,4,6-Trichlorophenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2,4-Dichlorophenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2,4-Dimethylphenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2,4-Dinitrophenol	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
2,6-Dichlorophenol	380	U	NA		NA		NA		NA		NA		NA	
2-Acetylaminofluorene	380	U	NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2-Chlorophenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2-Methyl-5-nitroaniline	380	U	NA		NA		NA		NA		NA		NA	
2-Methylaniline	380	U	NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2-Methylphenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2-Naphthylamine	380	U	NA		NA		NA		NA		NA		NA	
2-Nitroaniline	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
2-Nitrophenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
2-Picoline	380	U	NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	380	U	400	U	380	U	380	U	400	U	400	U	400	U
3,3'-Dimethylbenzidine	380	U	NA		NA		NA		NA		NA		NA	
3-Methylcholanthrene	380	U	NA		NA		NA		NA		NA		NA	
3-Methylphenol	380	U	NA		NA		NA		NA		NA		NA	
3-Nitroaniline	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
4,6-Dinitro-2-methylphenol	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
4-Aminobiphenyl	380	U	NA		NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	380	U	400	U	380	U	380	U	400	U	400	U	400	U
4-Chloro-3-methylphenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
4-Chloroaniline	380	U	400	U	380	U	380	U	400	U	400	U	400	U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67			
Sample ID	AS01-SB20-R01X		AS01-SB63-6.5-7		AS01-SB64-7.5-8		AS01-SB64P-7.5-8		AS01-SB65-1.5-2		AS01-SB66-1.5-2		AS01-SB67-1.5-2	
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04	
Chemical Name														
4-Chlorophenyl-phenylether	380	U	400	U	380	U	380	U	400	U	400	U	400	U
4-Methylphenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
4-Nitroaniline	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
4-Nitrophenol	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
4-Nitroquinoline-1-oxide	960	U	NA		NA		NA		NA		NA		NA	
7,12-Dimethylbenz(a)anthracene	380	U	NA		NA		NA		NA		NA		NA	
Acenaphthene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Acenaphthylene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Acetophenone	380	U	400	U	380	U	380	U	55	J	400	U	400	U
Aniline	380	U	NA		NA		NA		NA		NA		NA	
Anthracene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Aramite	960	U	NA		NA		NA		NA		NA		NA	
Atrazine	NA		400	U	380	U	380	U	400	U	400	U	400	U
Benzaldehyde	NA		400	U	380	U	380	U	400	U	400	U	400	U
Benzo(a)anthracene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Benzo(a)pyrene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Benzo(b)fluoranthene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Benzo(g,h,i)perylene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Benzo(k)fluoranthene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Benzoic acid	960	U	NA		NA		NA		NA		NA		NA	
Benzyl alcohol	380	U	NA		NA		NA		NA		NA		NA	
Butylbenzylphthalate	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Caprolactam	NA		400	U	380	U	380	U	400	U	400	U	400	U
Carbazole	NA		400	U	380	U	380	U	400	U	400	U	400	U
Chlorobenzilate	380	U	NA		NA		NA		NA		NA		NA	
Chrysene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Di-n-butylphthalate	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Di-n-octylphthalate	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Diallylate	380	U	NA		NA		NA		NA		NA		NA	
Dibenz(a,h)anthracene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Dibenzofuran	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Diethylphthalate	380	U	400	U	380	U	380	U	400	U	400	U	220	J
Dimethoate	380	U	NA		NA		NA		NA		NA		NA	
Dimethyl phthalate	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Dinoseb	380	U	NA		NA		NA		NA		NA		NA	

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 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67			
Sample ID	AS01-SB20-R01X		AS01-SB63-6.5-7		AS01-SB64-7.5-8		AS01-SB64P-7.5-8		AS01-SB65-1.5-2		AS01-SB66-1.5-2		AS01-SB67-1.5-2	
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04	
Chemical Name														
Diphenylamine	380	U	NA		NA		NA		NA		NA		NA	
Disulfoton	380	U	NA		NA		NA		NA		NA		NA	
Ethyl methanesulfonate	380	U	NA		NA		NA		NA		NA		NA	
Famphur	380	U	NA		NA		NA		NA		NA		NA	
Fluoranthene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Fluorene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Hexachlorobenzene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Hexachlorobutadiene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Hexachlorocyclopentadiene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Hexachloroethane	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Hexachlorophene	15,000	U	NA		NA		NA		NA		NA		NA	
Hexachloropropene	960	U	NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Isodrin	380	U	NA		NA		NA		NA		NA		NA	
Isophorone	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Isosafrole	380	U	NA		NA		NA		NA		NA		NA	
Kepone	960	U	NA		NA		NA		NA		NA		NA	
Methapyrilene	960	U	NA		NA		NA		NA		NA		NA	
Methyl parathion	380	U	NA		NA		NA		NA		NA		NA	
N-Nitrosomorpholine	380	U	NA		NA		NA		NA		NA		NA	
N-Nitrosopiperidine	380	U	NA		NA		NA		NA		NA		NA	
Naphthalene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
O,O,O-Triethyl phosphorothioate	380	U	NA		NA		NA		NA		NA		NA	
Parathion	380	U	NA		NA		NA		NA		NA		NA	
Pentachlorobenzene	380	U	NA		NA		NA		NA		NA		NA	
Pentachloronitrobenzene	960	U	NA		NA		NA		NA		NA		NA	
Pentachlorophenol	960	U	1,000	U	950	U	960	U	1,000	U	1,000	U	1,000	U
Phenacetin	380	U	NA		NA		NA		NA		NA		NA	
Phenanthrene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Phenol	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Phorate	380	U	NA		NA		NA		NA		NA		NA	
Pronamide	380	U	NA		NA		NA		NA		NA		NA	
Pyrene	380	U	400	U	380	U	380	U	400	U	400	U	400	U
Pyridine	380	U	NA		NA		NA		NA		NA		NA	
Safrole	380	U	NA		NA		NA		NA		NA		NA	

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Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20		AS01-SB63		AS01-SB64		AS01-SB65		AS01-SB66		AS01-SB67			
Sample ID	AS01-SB20-R01X		AS01-SB63-6.5-7		AS01-SB64-7.5-8		AS01-SB64P-7.5-8		AS01-SB65-1.5-2		AS01-SB66-1.5-2		AS01-SB67-1.5-2	
Sample Date	02/22/01		09/22/04		09/22/04		09/22/04		09/22/04		09/23/04		09/23/04	
Chemical Name														
Sulfotepp	380	U	NA		NA		NA		NA		NA		NA	
Thionazin	380	U	NA		NA		NA		NA		NA		NA	
a,a-Dimethylphenethylamine	960	U	NA		NA		NA		NA		NA		NA	
bis(2-Chloro-1-methylethyl) ether	380	U	400	U	380	U	380	U	400	U	400	U	400	U
bis(2-Chloroethoxy)methane	380	U	400	U	380	U	380	U	400	U	400	U	400	U
bis(2-Chloroethyl)ether	380	U	400	U	380	U	380	U	400	U	400	U	400	U
bis(2-Ethylhexyl)phthalate	380	U	400	U	380	U	380	U	400	U	400	U	71	B
n-Nitroso-di-n-butylamine	380	U	NA		NA		NA		NA		NA		NA	
n-Nitroso-di-n-propylamine	380	U	400	U	380	U	380	U	400	U	400	U	400	U
n-Nitroso-n-methylethylamine	380	U	NA		NA		NA		NA		NA		NA	
n-Nitrosodiethylamine	380	U	NA		NA		NA		NA		NA		NA	
n-Nitrosodimethylamine	380	U	NA		NA		NA		NA		NA		NA	
n-Nitrosodiphenylamine	380	U	400	U	380	U	380	U	400	U	400	U	400	U
n-Nitrosopyrrolidine	380	U	NA		NA		NA		NA		NA		NA	
p-Dimethylaminoazobenzene	380	U	NA		NA		NA		NA		NA		NA	
p-Phenylenediamine	960	U	NA		NA		NA		NA		NA		NA	
<b>Dioxin/Furans (UG/KG)</b>														
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.089	U	0.0017	U	0.003	J	0.0029	J	0.004	J	0.0067		0.058	
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.048	U	2.10E-04	U	2.40E-04	U	1.50E-04	U	4.90E-04	U	4.70E-04	U	0.11	
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.056	U	2.70E-04	U	3.00E-04	U	1.70E-04	U	6.00E-04	U	6.60E-04	U	0.027	
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.033	U	3.50E-04	U	3.20E-04	U	2.20E-04	U	7.10E-04	U	0.0014	U	0.0051	J
1,2,3,4,7,8-Hexachlorodibenzofuran	0.01	U	2.40E-04	U	2.20E-04	U	1.50E-04	U	5.30E-04	U	0.0011	U	0.06	
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.03	U	3.10E-04	U	3.00E-04	U	2.10E-04	U	6.70E-04	U	0.0013	U	0.012	
1,2,3,6,7,8-Hexachlorodibenzofuran	0.009	U	2.30E-04	U	2.10E-04	U	1.40E-04	U	4.90E-04	U	1.00E-03	U	0.039	
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.055	U	3.30E-04	U	3.00E-04	U	2.10E-04	U	6.70E-04	U	0.0013	U	0.012	
1,2,3,7,8,9-Hexachlorodibenzofuran	0.024	U	2.30E-04	U	2.30E-04	U	1.40E-04	U	4.80E-04	U	0.0011	U	0.0034	J
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.035	U	4.20E-04	U	4.80E-04	U	2.80E-04	U	0.0012	U	0.0019	U	0.0084	
1,2,3,7,8-Pentachlorodibenzofuran	0.05	U	2.50E-04	U	2.30E-04	U	1.60E-04	U	6.90E-04	U	7.70E-04	U	0.035	
2,3,4,6,7,8-Hexachlorodibenzofuran	0.025	U	1.90E-04	U	2.10E-04	U	1.30E-04	U	4.60E-04	U	7.30E-04	U	0.031	
2,3,4,7,8-Pentachlorodibenzofuran	0.043	U	3.00E-04	U	2.60E-04	U	1.70E-04	U	7.70E-04	U	8.20E-04	U	0.038	
2,3,7,8-TCDD (dioxin)	0.006	U	2.10E-04	U	2.00E-04	U	1.50E-04	U	5.50E-04	U	4.90E-04	U	0.0026	
2,3,7,8-Tetrachlorodibenzofuran	0.004	U	1.70E-04	U	1.60E-04	U	1.10E-04	U	5.00E-04	U	4.90E-04	U	0.032	
Octachlorodibenzo-p-dioxin	0.048		0.056		0.098		0.089		0.14		0.32		0.23	
Octachlorodibenzofuran	0.086	U	4.20E-04	U	3.90E-04	U	5.70E-04	U	9.10E-04	U	0.0013	U	0.15	

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65	AS01-SB66	AS01-SB67
Sample ID	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2	AS01-SB66-1.5-2	AS01-SB67-1.5-2
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04
Chemical Name							
Total heptachlorodibenzo-p-dioxin	0.089 U	0.0018 U	0.0077	0.0065	0.0094	0.015	0.11
Total heptachlorodibenzofuran	0.048 U	2.70E-04 U	3.00E-04 U	1.70E-04 U	6.00E-04 U	6.60E-04 U	0.2
Total hexachlorodibenzo-p-dioxin	0.03 U	3.50E-04 U	9.80E-04 U	9.10E-04 U	7.10E-04 U	0.0014 U	0.17
Total hexachlorodibenzofuran	0.009 U	2.40E-04 U	2.30E-04 U	1.50E-04 U	5.30E-04 U	0.0011 U	0.29
Total pentachlorodibenzo-p-dioxin	NA	4.20E-04 U	4.80E-04 U	2.80E-04 U	0.0012 U	0.0019 U	0.14
Total pentachlorodibenzofuran	NA	3.00E-04 U	2.60E-04 U	1.70E-04 U	7.70E-04 U	8.20E-04 U	0.28
Total tetrachlorodibenzo-p-dioxin	NA	2.10E-04 U	2.00E-04 U	1.50E-04 U	5.50E-04 U	4.90E-04 U	0.13
Total tetrachlorodibenzofuran	NA	1.70E-04 U	1.60E-04 U	1.10E-04 U	5.00E-04 U	4.90E-04 U	0.23
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	380 U	250 U	250 U	250 U	250 U	250 U	250 U
1,3-Dinitrobenzene	380 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4,6-Trinitrotoluene	417 U	250 U	250 U	250 U	250 U	250 U	250 U
2,4-Dinitrotoluene	380 U	250 U	250 U	250 U	250 U	250 U	250 U
2,6-Dinitrotoluene	380 U	250 U	250 U	250 U	250 U	250 U	250 U
2-Amino-4,6-dinitrotoluene	417 U	250 U	250 U	250 U	250 U	250 U	250 U
2-Nitrotoluene	417 U	250 U	250 U	250 U	250 U	250 U	250 U
3-Nitrotoluene	417 U	250 U	250 U	250 U	250 U	250 U	250 U
4-Amino-2,6-dinitrotoluene	417 U	250 U	250 U	250 U	250 U	250 U	250 U
4-Nitrotoluene	417 U	250 U	250 U	250 U	250 U	250 U	250 U
HMX	417 U	500 U	310 J	1,300	1,500	810	4,600
Nitrobenzene	380 U	250 U	250 U	250 U	250 U	250 U	250 U
Nitroglycerin	454 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U
PETN	NA	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U	2,500 U
Perchlorate	59 U	48.5 U	18,800	16,800	29.7 J	48.2 U	438
RDX	417 U	500 U	1,100	1,100	940	96 J	69 J
Tetryl	417 U	650 U	650 U	650 U	650 U	650 U	650 U
Total Metals (MG/KG)							
Aluminum	10,200	8,050	7,450	7,300	7,620	7,300	10,100
Antimony	2 L	0.65 UL	0.62 UL	0.63 UL	0.65 UL	0.65 UL	0.66 UL
Arsenic	7	6.8	6.7	6.3	6.1	5.6	5.3
Barium	196	102	81.3	102	167	186	196
Beryllium	1.2	0.75 B	0.79 B	0.77 B	1 B	0.98 B	0.85 B
Cadmium	0.23 U	0.048 U	0.046 U	0.046 U	0.091 B	0.27 B	0.46 J

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB20	AS01-SB63	AS01-SB64		AS01-SB65	AS01-SB66	AS01-SB67
Sample ID	AS01-SB20-R01X	AS01-SB63-6.5-7	AS01-SB64-7.5-8	AS01-SB64P-7.5-8	AS01-SB65-1.5-2	AS01-SB66-1.5-2	AS01-SB67-1.5-2
Sample Date	02/22/01	09/22/04	09/22/04	09/22/04	09/22/04	09/23/04	09/23/04
Chemical Name							
Calcium	NA	874 J	679 J	675 J	1,640	2,010	93,200
Chromium	15.8 J	12.6	13.7	12.1	12.9	12	10.7
Cobalt	16	14.9	12	13.1	14.1	13.1	8.4 J
Copper	17.6	15.4	13.7	13.5	17	16.3 L	24.1 L
Cyanide	0.14 B	0.61 U	0.57 U	0.58 U	0.6 U	0.6 UL	0.61 UL
Iron	33,500	28,900	29,900	28,400	28,100	26,600	20,700
Lead	16.6 K	13.7	11.9	12.9	13.7	12.8 J	269 J
Magnesium	NA	1,030 J	1,040 J	1,010 J	1,010 J	1,020 J	2,040
Manganese	1,100	579	500	600	932	922	546
Mercury	0.03 B	0.061 J	0.057 U	0.066 J	0.075 J	0.06 UL	0.44
Nickel	25.9 J	17.4	17.2	16.5	22.7	21.9	18.9
Potassium	NA	959 J	832 J	743 J	979 J	931 J	1,030 J
Selenium	0.98 K	0.56 U	0.53 U	0.53 U	0.55 U	0.55 UL	9 L
Silver	0.12 U	0.24 U	0.23 U	0.23 U	0.24 U	0.24 U	0.29 J
Sodium	NA	62 U	58.8 U	59.5 U	61.6 U	61.7 U	82.2 B
Thallium	1.8	1.2 UL	1.1 UL	1.1 UL	1.2 UL	1.2 U	1.2 U
Tin	4 B	NA	NA	NA	NA	NA	NA
Vanadium	23.5	18.2	17.6	17	16.9	15.9	13.9
Zinc	78.7	58.4	64.1	63.4	60.3	59.7 K	108 K
Wet Chemistry (MG/KG)							
% Moisture	NA	17.5	12.9	13.9	16.8	17	18.4
Nitrate	1.2 U	NA	NA	NA	NA	NA	NA
Nitrite	1.2 U	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	11,400	3,400	2,400	2,700	8,600	9,100	11,000
pH	7.6	5.6	4.9	4.8	6.9	6.8	6.3

NA - Not analyzed  
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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68		AS01-SB69		AS01-SB70		BG-010/010S/053		BG-017/018	BG-034/034S	BG-037
Sample ID	AS01-SB68-1.5-2		AS01-SB69-1-1.5		AS01-SB70-2.5-3		HCS-BG-10	HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04		09/23/04		09/23/04		07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name											
<b>Volatile Organic Compounds (UG/KG)</b>											
1,1,1,2-Tetrachloroethane	NA		NA		NA		NA	NA	NA	NA	NA
1,1,1-Trichloroethane	610 UJ		800 UL		660 U		6 UJ	5 J	6 UJ	6 UJ	6 UJ
1,1,2,2-Tetrachloroethane	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	610 UJ		800 UL		660 U		NA	NA	NA	NA	NA
1,1,2-Trichloroethane	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
1,1-Dichloroethane	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
1,1-Dichloroethene	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
1,2,3-Trichloropropane	NA		NA		NA		NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	610 UJ		800 UL		660 U		NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	610 R		800 R		660 R		NA	NA	NA	NA	NA
1,2-Dibromoethane	610 UJ		800 UL		660 U		NA	NA	NA	NA	NA
1,2-Dichlorobenzene	610 UJ		800 UL		660 U		NA	NA	NA	NA	NA
1,2-Dichloroethane	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
1,2-Dichloroethene (total)	NA		NA		NA		6 UJ	16	6 UJ	6 UJ	6 UJ
1,2-Dichloropropane	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
1,3-Dichlorobenzene	610 UJ		800 UL		660 U		NA	NA	NA	NA	NA
1,4-Dichlorobenzene	610 UJ		800 UL		660 U		NA	NA	NA	NA	NA
1,4-Dioxane	NA		NA		NA		NA	NA	NA	NA	NA
2-Butanone	610 UJ		800 UL		660 U		11 UJ	12 UJ	12 UJ	12 UJ	12 UJ
2-Chloro-1,3-butadiene	NA		NA		NA		NA	NA	NA	NA	NA
2-Chloroethyl vinyl ether	NA		NA		NA		NA	NA	NA	NA	NA
2-Hexanone	610 UJ		800 UL		660 U		11 UJ	12 UJ	12 UJ	12 UJ	12 UJ
4-Methyl-2-pentanone	610 UJ		800 UL		660 U		11 UJ	12 UJ	12 UJ	12 UJ	12 UJ
Acetone	610 UJ		160 B		170 B		11 UJ	15 UJ	8 UJ	13 UJ	18 UJ
Acetonitrile	NA		NA		NA		NA	NA	NA	NA	NA
Acrolein	NA		NA		NA		NA	NA	NA	NA	NA
Acrylonitrile	NA		NA		NA		NA	NA	NA	NA	NA
Allyl chloride	NA		NA		NA		NA	NA	NA	NA	NA
Benzene	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
Bromodichloromethane	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
Bromoform	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	6 UJ
Bromomethane	610 UJ		800 UL		660 U		11 UJ	12 UJ	12 UJ	12 UJ	12 UJ
Carbon disulfide	610 UJ		800 UL		660 U		6 UJ	6 UJ	6 UJ	6 UJ	2 J

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68		AS01-SB69		AS01-SB70		BG-010/010S/053		BG-017/018	BG-034/034S	BG-037	
Sample ID	AS01-SB68-1.5-2		AS01-SB69-1-1.5		AS01-SB70-2.5-3		HCS-BG-10		HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04		09/23/04		09/23/04		07/13/92		07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name												
Carbon tetrachloride	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Chlorobenzene	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Chloroethane	610	UJ	800	UL	660	U	11	UJ	12	UJ	12	UJ
Chloroform	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Chloromethane	610	UJ	800	UL	660	U	11	UJ	12	UJ	12	UJ
Cumene	610	UJ	800	UL	660	U	NA		NA		NA	
Cyclohexane	610	UJ	800	UL	660	U	NA		NA		NA	
Dibromochloromethane	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Dibromomethane	NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane (Freon-12)	610	UJ	800	UL	660	U	NA		NA		NA	
Ethyl methacrylate	NA		NA		NA		NA		NA		NA	
Ethylbenzene	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Iodomethane	NA		NA		NA		NA		NA		NA	
Isobutanol	NA		NA		NA		NA		NA		NA	
Methacrylonitrile	NA		NA		NA		NA		NA		NA	
Methyl acetate	610	UJ	82	L	660	U	NA		NA		NA	
Methyl methacrylate	NA		NA		NA		NA		NA		NA	
Methyl methanesulfonate	NA		NA		NA		NA		NA		NA	
Methyl-tert-butyl ether (MTBE)	610	UJ	800	UL	660	U	NA		NA		NA	
Methylcyclohexane	610	UJ	800	UL	660	U	NA		NA		NA	
Methylene chloride	370	B	480	B	370	B	12	UJ	13	UJ	23	UJ
Pentachloroethane	NA		NA		NA		NA		NA		NA	
Propionitrile	NA		NA		NA		NA		NA		NA	
Styrene	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Tetrachloroethene	610	UJ	5,800	L	660	U	6	UJ	6	UJ	6	UJ
Toluene	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
Trichloroethene	940	J	12,000	L	1,800		5	J	480		48	J
Trichlorofluoromethane(Freon-11)	610	UJ	800	UL	660	U	NA		NA		NA	
Vinyl acetate	NA		NA		NA		11	UJ	12	UJ	12	UJ
Vinyl chloride	610	UJ	800	UL	660	U	11	UJ	12	UJ	12	UJ
Xylene, total	610	UJ	800	UL	660	U	2	J	6	UJ	3	J
cis-1,2-Dichloroethene	610	UJ	800	UL	660	U	NA		NA		NA	
cis-1,3-Dichloropropene	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ
trans-1,2-Dichloroethene	610	UJ	800	UL	660	U	NA		NA		NA	
trans-1,3-Dichloropropene	610	UJ	800	UL	660	U	6	UJ	6	UJ	6	UJ

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68		AS01-SB69		AS01-SB70		BG-010/010S/053		BG-017/018	BG-034/034S	BG-037	
Sample ID	AS01-SB68-1.5-2		AS01-SB69-1-1.5		AS01-SB70-2.5-3		HCS-BG-10		HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04		09/23/04		09/23/04		07/13/92		07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name												
trans-1,4-Dichloro-2-butene	NA		NA		NA		NA		NA		NA	
<b>Semi-volatile Organic Compounds (UG/KG)</b>												
1,1-Biphenyl	420	U	390	U	450	U	NA		NA		NA	
1,2,4,5-Tetrachlorobenzene	NA		NA		NA		NA		NA		NA	
1,4-Naphthoquinone	NA		NA		NA		NA		NA		NA	
1-Naphthylamine	NA		NA		NA		NA		NA		NA	
2,3,4,6-Tetrachlorophenol	NA		NA		NA		NA		NA		NA	
2,4,5-Trichlorophenol	1,100	U	990	U	1,100	U	NA		NA		NA	
2,4,6-Trichlorophenol	420	U	390	U	450	U	NA		NA		NA	
2,4-Dichlorophenol	420	U	390	U	450	U	NA		NA		NA	
2,4-Dimethylphenol	420	U	390	U	450	U	NA		NA		NA	
2,4-Dinitrophenol	1,100	U	990	U	1,100	U	NA		NA		NA	
2,6-Dichlorophenol	NA		NA		NA		NA		NA		NA	
2-Acetylaminofluorene	NA		NA		NA		NA		NA		NA	
2-Chloronaphthalene	420	U	390	U	450	U	NA		NA		NA	
2-Chlorophenol	420	U	390	U	450	U	NA		NA		NA	
2-Methyl-5-nitroaniline	NA		NA		NA		NA		NA		NA	
2-Methylaniline	NA		NA		NA		NA		NA		NA	
2-Methylnaphthalene	420	U	390	U	450	U	NA		NA		NA	
2-Methylphenol	420	U	390	U	450	U	NA		NA		NA	
2-Naphthylamine	NA		NA		NA		NA		NA		NA	
2-Nitroaniline	1,100	U	990	U	1,100	U	NA		NA		NA	
2-Nitrophenol	420	U	390	U	450	U	NA		NA		NA	
2-Picoline	NA		NA		NA		NA		NA		NA	
3,3'-Dichlorobenzidine	420	U	390	U	450	U	NA		NA		NA	
3,3'-Dimethylbenzidine	NA		NA		NA		NA		NA		NA	
3-Methylcholanthrene	NA		NA		NA		NA		NA		NA	
3-Methylphenol	NA		NA		NA		NA		NA		NA	
3-Nitroaniline	1,100	U	990	U	1,100	U	NA		NA		NA	
4,6-Dinitro-2-methylphenol	1,100	U	990	U	1,100	U	NA		NA		NA	
4-Aminobiphenyl	NA		NA		NA		NA		NA		NA	
4-Bromophenyl-phenylether	420	U	390	U	450	U	NA		NA		NA	
4-Chloro-3-methylphenol	420	U	390	U	450	U	NA		NA		NA	
4-Chloroaniline	420	U	390	U	450	U	NA		NA		NA	

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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68		AS01-SB69		AS01-SB70		BG-010/010S/053			BG-017/018	BG-034/034S	BG-037
Sample ID	AS01-SB68-1.5-2		AS01-SB69-1-1.5		AS01-SB70-2.5-3		HCS-BG-10		HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04		09/23/04		09/23/04		07/13/92		07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name												
4-Chlorophenyl-phenylether	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
4-Methylphenol	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
4-Nitroaniline	1,100	U	990	U	1,100	U	NA	NA	NA	NA	NA	NA
4-Nitrophenol	1,100	U	990	U	1,100	U	NA	NA	NA	NA	NA	NA
4-Nitroquinoline-1-oxide	NA		NA		NA		NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA		NA		NA		NA	NA	NA	NA	NA	NA
Acenaphthene	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Acenaphthylene	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Acetophenone	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Aniline	NA		NA		NA		NA	NA	NA	NA	NA	NA
Anthracene	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Aramite	NA		NA		NA		NA	NA	NA	NA	NA	NA
Atrazine	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzaldehyde	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	51	J	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	44	J	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	67	J	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Benzoic acid	NA		NA		NA		NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA		NA		NA		NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Caprolactam	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Carbazole	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Chlorobenzilate	NA		NA		NA		NA	NA	NA	NA	NA	NA
Chrysene	69	J	390	U	450	U	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Diallate	NA		NA		NA		NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Dibenzofuran	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Diethylphthalate	280	J	390	U	340	J	NA	NA	NA	NA	NA	NA
Dimethoate	NA		NA		NA		NA	NA	NA	NA	NA	NA
Dimethyl phthalate	420	U	390	U	450	U	NA	NA	NA	NA	NA	NA
Dinoseb	NA		NA		NA		NA	NA	NA	NA	NA	NA

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 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68		AS01-SB69		AS01-SB70		BG-010/010S/053			BG-017/018	BG-034/034S	BG-037
Sample ID	AS01-SB68-1.5-2		AS01-SB69-1-1.5		AS01-SB70-2.5-3		HCS-BG-10		HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04		09/23/04		09/23/04		07/13/92		07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name												
Diphenylamine	NA		NA		NA		NA		NA		NA	
Disulfoton	NA		NA		NA		NA		NA		NA	
Ethyl methanesulfonate	NA		NA		NA		NA		NA		NA	
Famphur	NA		NA		NA		NA		NA		NA	
Fluoranthene	150 J		390 U		450 U		NA		NA		NA	
Fluorene	420 U		390 U		450 U		NA		NA		NA	
Hexachlorobenzene	420 U		390 U		450 U		NA		NA		NA	
Hexachlorobutadiene	420 U		390 U		450 U		NA		NA		NA	
Hexachlorocyclopentadiene	420 U		390 U		450 U		NA		NA		NA	
Hexachloroethane	420 U		390 U		450 U		NA		NA		NA	
Hexachlorophene	NA		NA		NA		NA		NA		NA	
Hexachloropropene	NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	420 U		390 U		450 U		NA		NA		NA	
Isodrin	NA		NA		NA		NA		NA		NA	
Isophorone	420 U		390 U		450 U		NA		NA		NA	
Isosafrole	NA		NA		NA		NA		NA		NA	
Kepone	NA		NA		NA		NA		NA		NA	
Methapyrilene	NA		NA		NA		NA		NA		NA	
Methyl parathion	NA		NA		NA		NA		NA		NA	
N-Nitrosomorpholine	NA		NA		NA		NA		NA		NA	
N-Nitrosopiperidine	NA		NA		NA		NA		NA		NA	
Naphthalene	420 U		390 U		450 U		NA		NA		NA	
O,O,O-Triethyl phosphorothioate	NA		NA		NA		NA		NA		NA	
Parathion	NA		NA		NA		NA		NA		NA	
Pentachlorobenzene	NA		NA		NA		NA		NA		NA	
Pentachloronitrobenzene	NA		NA		NA		NA		NA		NA	
Pentachlorophenol	1,100 U		990 U		1,100 U		NA		NA		NA	
Phenacetin	NA		NA		NA		NA		NA		NA	
Phenanthrene	120 J		390 U		450 U		NA		NA		NA	
Phenol	420 U		390 U		450 U		NA		NA		NA	
Phorate	NA		NA		NA		NA		NA		NA	
Pronamide	NA		NA		NA		NA		NA		NA	
Pyrene	95 J		390 U		450 U		NA		NA		NA	
Pyridine	NA		NA		NA		NA		NA		NA	
Safrole	NA		NA		NA		NA		NA		NA	

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68	AS01-SB69	AS01-SB70	BG-010/010S/053		BG-017/018	BG-034/034S	BG-037
Sample ID	AS01-SB68-1.5-2	AS01-SB69-1-1.5	AS01-SB70-2.5-3	HCS-BG-10	HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04	09/23/04	09/23/04	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name								
Total heptachlorodibenzo-p-dioxin	0.014	0.023	0.05	NA	NA	NA	NA	NA
Total heptachlorodibenzofuran	5.50E-04 U	0.0011 U	0.0042	NA	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	9.10E-04 U	0.0016 U	0.016	NA	NA	NA	NA	NA
Total hexachlorodibenzofuran	5.20E-04 U	0.0012 U	0.0031 U	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	0.0012 U	0.002 U	0.0032 U	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	5.00E-04 U	9.90E-04 U	0.0067	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	3.90E-04 U	7.20E-04 U	0.013	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	5.30E-04 U	5.50E-04 U	0.026	NA	NA	NA	NA	NA
Explosives (UG/KG)								
1,3,5-Trinitrobenzene	250 U	250 U	250 U	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	250 U	250 U	250 U	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
2-Nitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
3-Nitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
4-Nitrotoluene	250 U	250 U	250 U	NA	NA	NA	NA	NA
HMX	5,200	570	2,100	NA	NA	NA	NA	NA
Nitrobenzene	250 U	250 U	250 U	NA	NA	NA	NA	NA
Nitroglycerin	2,000 J	2,500 UJ	4,500 J	NA	NA	NA	NA	NA
PETN	2,500 U	2,500 U	2,500 U	NA	NA	NA	NA	NA
Perchlorate	26.6	91.2	65	NA	NA	NA	NA	NA
RDX	74 J	5,200	730	NA	NA	NA	NA	NA
Tetryl	650 U	650 U	650 U	NA	NA	NA	NA	NA
Total Metals (MG/KG)								
Aluminum	50,500	6,100	19,100	NA	NA	NA	NA	NA
Antimony	0.69 UL	0.64 UL	17.2 L	NA	NA	NA	NA	NA
Arsenic	7	7.6	5.6	NA	NA	NA	NA	NA
Barium	150	156	152	NA	NA	NA	NA	NA
Beryllium	0.87 B	0.89 B	0.72 B	NA	NA	NA	NA	NA
Cadmium	0.47 J	0.31 B	11.9	NA	NA	NA	NA	NA

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB68	AS01-SB69	AS01-SB70	BG-010/010S/053		BG-017/018	BG-034/034S	BG-037
Sample ID	AS01-SB68-1.5-2	AS01-SB69-1-1.5	AS01-SB70-2.5-3	HCS-BG-10	HCS-BG-53	HCS-BG-18	HCS-BG-34	HCS-BG-37
Sample Date	09/23/04	09/23/04	09/23/04	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name								
Calcium	2,030	3,230	14,600	NA	NA	NA	NA	NA
Chromium	19.9	11.3	11.9	NA	NA	NA	NA	NA
Cobalt	15.1	12.5	10.2 J	NA	NA	NA	NA	NA
Copper	36.4 L	20.1 L	136 L	NA	NA	NA	NA	NA
Cyanide	0.64 UL	0.59 UL	0.21 L	NA	NA	NA	NA	NA
Iron	24,500	23,700	20,200	NA	NA	NA	NA	NA
Lead	914 J	24.6 J	1,760 J	NA	NA	NA	NA	NA
Magnesium	923 J	980 J	2,790	NA	NA	NA	NA	NA
Manganese	692	783	687	NA	NA	NA	NA	NA
Mercury	2	0.45	0.068 UL	NA	NA	NA	NA	NA
Nickel	21.6	18.8	20.5	NA	NA	NA	NA	NA
Potassium	1,050 J	935 J	1,180 J	NA	NA	NA	NA	NA
Selenium	0.58 UL	0.55 UL	0.62 UL	NA	NA	NA	NA	NA
Silver	2.8	0.24 U	4.1	NA	NA	NA	NA	NA
Sodium	65 U	60.8 U	69.4 U	NA	NA	NA	NA	NA
Thallium	1.2 U	1.1 U	1.3 U	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	19.4	14.7	15.4	NA	NA	NA	NA	NA
Zinc	222 K	62.8 K	202 K	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)								
% Moisture	21.3	15.8	26.2	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	14,000	13,000	11,000	NA	NA	NA	NA	NA
pH	7.2	6.6	7.4	NA	NA	NA	NA	NA

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Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1,2-Tetrachloroethane	NA									
1,1,1-Trichloroethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,1,2,2-Tetrachloroethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA									
1,1,2-Trichloroethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,1-Dichloroethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,1-Dichloroethene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,2,3-Trichloropropane	NA									
1,2,4-Trichlorobenzene	NA									
1,2-Dibromo-3-chloropropane	NA									
1,2-Dibromoethane	NA									
1,2-Dichlorobenzene	NA									
1,2-Dichloroethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,2-Dichloroethene (total)	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	3 J	12 U	11 U
1,2-Dichloropropane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
1,3-Dichlorobenzene	NA									
1,4-Dichlorobenzene	NA									
1,4-Dioxane	NA									
2-Butanone	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
2-Chloro-1,3-butadiene	NA									
2-Chloroethyl vinyl ether	NA									
2-Hexanone	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
4-Methyl-2-pentanone	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Acetone	18 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Acetonitrile	NA									
Acrolein	NA									
Acrylonitrile	NA									
Allyl chloride	NA									
Benzene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Bromodichloromethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Bromoform	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Bromomethane	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Carbon disulfide	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U

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Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Carbon tetrachloride	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Chlorobenzene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Chloroethane	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Chloroform	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Chloromethane	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Cumene	NA									
Cyclohexane	NA									
Dibromochloromethane	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Dibromomethane	NA									
Dichlorodifluoromethane (Freon-12)	NA									
Ethyl methacrylate	NA									
Ethylbenzene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Iodomethane	NA									
Isobutanol	NA									
Methacrylonitrile	NA									
Methyl acetate	NA									
Methyl methacrylate	NA									
Methyl methanesulfonate	NA									
Methyl-tert-butyl ether (MTBE)	NA									
Methylcyclohexane	NA									
Methylene chloride	21 UJ	16 UJ	11 U	4 J	12 U	11 U	11 U	12 U	12 U	11 U
Pentachloroethane	NA									
Propionitrile	NA									
Styrene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Tetrachloroethene	6 UJ	12 J	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Toluene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Trichloroethene	2 J	30	89	37	12 U	34	63	140	26	30
Trichlorofluoromethane(Freon-11)	NA									
Vinyl acetate	11 UJ	11 UJ	NA							
Vinyl chloride	11 UJ	11 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
Xylene, total	4 J	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
cis-1,2-Dichloroethene	NA									
cis-1,3-Dichloropropene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U
trans-1,2-Dichloroethene	NA									
trans-1,3-Dichloropropene	6 UJ	6 UJ	11 U	12 U	12 U	11 U	11 U	12 U	12 U	11 U

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Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
trans-1,4-Dichloro-2-butene	NA									
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	NA									
1,2,4,5-Tetrachlorobenzene	NA									
1,4-Naphthoquinone	NA									
1-Naphthylamine	NA									
2,3,4,6-Tetrachlorophenol	NA									
2,4,5-Trichlorophenol	NA									
2,4,6-Trichlorophenol	NA									
2,4-Dichlorophenol	NA									
2,4-Dimethylphenol	NA									
2,4-Dinitrophenol	NA									
2,6-Dichlorophenol	NA									
2-Acetylaminofluorene	NA									
2-Chloronaphthalene	NA									
2-Chlorophenol	NA									
2-Methyl-5-nitroaniline	NA									
2-Methylaniline	NA									
2-Methylnaphthalene	NA									
2-Methylphenol	NA									
2-Naphthylamine	NA									
2-Nitroaniline	NA									
2-Nitrophenol	NA									
2-Picoline	NA									
3,3'-Dichlorobenzidine	NA									
3,3'-Dimethylbenzidine	NA									
3-Methylcholanthrene	NA									
3-Methylphenol	NA									
3-Nitroaniline	NA									
4,6-Dinitro-2-methylphenol	NA									
4-Aminobiphenyl	NA									
4-Bromophenyl-phenylether	NA									
4-Chloro-3-methylphenol	NA									
4-Chloroaniline	NA									

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Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
4-Chlorophenyl-phenylether	NA									
4-Methylphenol	NA									
4-Nitroaniline	NA									
4-Nitrophenol	NA									
4-Nitroquinoline-1-oxide	NA									
7,12-Dimethylbenz(a)anthracene	NA									
Acenaphthene	NA									
Acenaphthylene	NA									
Acetophenone	NA									
Aniline	NA									
Anthracene	NA									
Aramite	NA									
Atrazine	NA									
Benzaldehyde	NA									
Benzo(a)anthracene	NA									
Benzo(a)pyrene	NA									
Benzo(b)fluoranthene	NA									
Benzo(g,h,i)perylene	NA									
Benzo(k)fluoranthene	NA									
Benzoic acid	NA									
Benzyl alcohol	NA									
Butylbenzylphthalate	NA									
Caprolactam	NA									
Carbazole	NA									
Chlorobenzilate	NA									
Chrysene	NA									
Di-n-butylphthalate	NA									
Di-n-octylphthalate	NA									
Diallate	NA									
Dibenz(a,h)anthracene	NA									
Dibenzofuran	NA									
Diethylphthalate	NA									
Dimethoate	NA									
Dimethyl phthalate	NA									
Dinoseb	NA									

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Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Diphenylamine	NA									
Disulfoton	NA									
Ethyl methanesulfonate	NA									
Famphur	NA									
Fluoranthene	NA									
Fluorene	NA									
Hexachlorobenzene	NA									
Hexachlorobutadiene	NA									
Hexachlorocyclopentadiene	NA									
Hexachloroethane	NA									
Hexachlorophene	NA									
Hexachloropropene	NA									
Indeno(1,2,3-cd)pyrene	NA									
Isodrin	NA									
Isophorone	NA									
Isosafrole	NA									
Kepone	NA									
Methapyrilene	NA									
Methyl parathion	NA									
N-Nitrosomorpholine	NA									
N-Nitrosopiperidine	NA									
Naphthalene	NA									
O,O,O-Triethyl phosphorothioate	NA									
Parathion	NA									
Pentachlorobenzene	NA									
Pentachloronitrobenzene	NA									
Pentachlorophenol	NA									
Phenacetin	NA									
Phenanthrene	NA									
Phenol	NA									
Phorate	NA									
Pronamide	NA									
Pyrene	NA									
Pyridine	NA									
Safrole	NA									

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 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Sulfotepp	NA									
Thionazin	NA									
a,a-Dimethylphenethylamine	NA									
bis(2-Chloro-1-methylethyl) ether	NA									
bis(2-Chloroethoxy)methane	NA									
bis(2-Chloroethyl)ether	NA									
bis(2-Ethylhexyl)phthalate	NA									
n-Nitroso-di-n-butylamine	NA									
n-Nitroso-di-n-propylamine	NA									
n-Nitroso-n-methylethylamine	NA									
n-Nitrosodiethylamine	NA									
n-Nitrosodimethylamine	NA									
n-Nitrosodiphenylamine	NA									
n-Nitrosopyrrolidine	NA									
p-Dimethylaminoazobenzene	NA									
p-Phenylenediamine	NA									
Dioxin/Furans (UG/KG)										
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA									
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA									
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA									
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA									
1,2,3,4,7,8-Hexachlorodibenzofuran	NA									
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA									
1,2,3,6,7,8-Hexachlorodibenzofuran	NA									
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA									
1,2,3,7,8,9-Hexachlorodibenzofuran	NA									
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA									
1,2,3,7,8-Pentachlorodibenzofuran	NA									
2,3,4,6,7,8-Hexachlorodibenzofuran	NA									
2,3,4,7,8-Pentachlorodibenzofuran	NA									
2,3,7,8-TCDD (dioxin)	NA									
2,3,7,8-Tetrachlorodibenzofuran	NA									
Octachlorodibenzo-p-dioxin	NA									
Octachlorodibenzofuran	NA									

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
<b>Chemical Name</b>										
Total heptachlorodibenzo-p-dioxin	NA									
Total heptachlorodibenzofuran	NA									
Total hexachlorodibenzo-p-dioxin	NA									
Total hexachlorodibenzofuran	NA									
Total pentachlorodibenzo-p-dioxin	NA									
Total pentachlorodibenzofuran	NA									
Total tetrachlorodibenzo-p-dioxin	NA									
Total tetrachlorodibenzofuran	NA									
<b>Explosives (UG/KG)</b>										
1,3,5-Trinitrobenzene	NA									
1,3-Dinitrobenzene	NA									
2,4,6-Trinitrotoluene	NA									
2,4-Dinitrotoluene	NA									
2,6-Dinitrotoluene	NA									
2-Amino-4,6-dinitrotoluene	NA									
2-Nitrotoluene	NA									
3-Nitrotoluene	NA									
4-Amino-2,6-dinitrotoluene	NA									
4-Nitrotoluene	NA									
HMX	NA									
Nitrobenzene	NA									
Nitroglycerin	NA									
PETN	NA									
Perchlorate	NA									
RDX	NA									
Tetryl	NA									
<b>Total Metals (MG/KG)</b>										
Aluminum	NA									
Antimony	NA									
Arsenic	NA									
Barium	NA									
Beryllium	NA									
Cadmium	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-059/050	BG-067/068	BG-132/133	BG-133	BG-180	BG-181	BG-182/183		BG-184/185	
Sample ID	HCS-BG-50	HCS-BG-68	HCS-BG-132	HCS-BG-133	HCS-BG-180	HCS-BG-181	HCS-BG-182	HCS-BG-183	HCS-BG-184	HCS-BG-185
Sample Date	07/13/92	07/13/92	06/22/94	11/15/94	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Calcium	NA									
Chromium	NA									
Cobalt	NA									
Copper	NA									
Cyanide	NA									
Iron	NA									
Lead	NA									
Magnesium	NA									
Manganese	NA									
Mercury	NA									
Nickel	NA									
Potassium	NA									
Selenium	NA									
Silver	NA									
Sodium	NA									
Thallium	NA									
Tin	NA									
Vanadium	NA									
Zinc	NA									
Wet Chemistry (MG/KG)										
% Moisture	NA									
Nitrate	NA									
Nitrite	NA									
Total organic carbon (TOC)	NA									
pH	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1,2-Tetrachloroethane	NA									
1,1,1-Trichloroethane	11 U	11 U	12 U							
1,1,2,2-Tetrachloroethane	11 U	11 U	12 U							
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA									
1,1,2-Trichloroethane	11 U	11 U	12 U							
1,1-Dichloroethane	11 U	11 U	12 U							
1,1-Dichloroethene	11 U	11 U	12 U							
1,2,3-Trichloropropane	NA									
1,2,4-Trichlorobenzene	NA									
1,2-Dibromo-3-chloropropane	NA									
1,2-Dibromoethane	NA									
1,2-Dichlorobenzene	NA									
1,2-Dichloroethane	11 U	11 U	12 U							
1,2-Dichloroethene (total)	11 U	11 U	12 U							
1,2-Dichloropropane	11 U	11 U	12 U							
1,3-Dichlorobenzene	NA									
1,4-Dichlorobenzene	NA									
1,4-Dioxane	NA									
2-Butanone	11 U	11 U	12 U							
2-Chloro-1,3-butadiene	NA									
2-Chloroethyl vinyl ether	NA									
2-Hexanone	11 U	11 U	12 U							
4-Methyl-2-pentanone	11 U	11 U	12 U							
Acetone	11 U	11 U	12 U							
Acetonitrile	NA									
Acrolein	NA									
Acrylonitrile	NA									
Allyl chloride	NA									
Benzene	11 U	11 U	12 U							
Bromodichloromethane	11 U	11 U	12 U							
Bromoform	11 U	11 U	12 U							
Bromomethane	11 U	11 U	12 U							
Carbon disulfide	11 U	11 U	12 U							

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Carbon tetrachloride	11 U	11 U	12 U							
Chlorobenzene	11 U	11 U	12 U							
Chloroethane	11 U	11 U	12 U							
Chloroform	11 U	11 U	12 U							
Chloromethane	11 U	11 U	12 U							
Cumene	NA									
Cyclohexane	NA									
Dibromochloromethane	11 U	11 U	12 U							
Dibromomethane	NA									
Dichlorodifluoromethane (Freon-12)	NA									
Ethyl methacrylate	NA									
Ethylbenzene	11 U	11 U	12 U							
Iodomethane	NA									
Isobutanol	NA									
Methacrylonitrile	NA									
Methyl acetate	NA									
Methyl methacrylate	NA									
Methyl methanesulfonate	NA									
Methyl-tert-butyl ether (MTBE)	NA									
Methylcyclohexane	NA									
Methylene chloride	11 U	11 U	12 U							
Pentachloroethane	NA									
Propionitrile	NA									
Styrene	11 U	11 U	12 U							
Tetrachloroethene	11 U	11 U	12 U							
Toluene	11 U	11 U	12 U							
Trichloroethene	2 J	10 J	18	10 J	53	12 U	12 U	12 U	12 U	74
Trichlorofluoromethane(Freon-11)	NA									
Vinyl acetate	NA									
Vinyl chloride	11 U	11 U	12 U							
Xylene, total	11 U	11 U	12 U							
cis-1,2-Dichloroethene	NA									
cis-1,3-Dichloropropene	11 U	11 U	12 U							
trans-1,2-Dichloroethene	NA									
trans-1,3-Dichloropropene	11 U	11 U	12 U							

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
trans-1,4-Dichloro-2-butene	NA									
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	NA									
1,2,4,5-Tetrachlorobenzene	NA									
1,4-Naphthoquinone	NA									
1-Naphthylamine	NA									
2,3,4,6-Tetrachlorophenol	NA									
2,4,5-Trichlorophenol	NA									
2,4,6-Trichlorophenol	NA									
2,4-Dichlorophenol	NA									
2,4-Dimethylphenol	NA									
2,4-Dinitrophenol	NA									
2,6-Dichlorophenol	NA									
2-Acetylaminofluorene	NA									
2-Chloronaphthalene	NA									
2-Chlorophenol	NA									
2-Methyl-5-nitroaniline	NA									
2-Methylaniline	NA									
2-Methylnaphthalene	NA									
2-Methylphenol	NA									
2-Naphthylamine	NA									
2-Nitroaniline	NA									
2-Nitrophenol	NA									
2-Picoline	NA									
3,3'-Dichlorobenzidine	NA									
3,3'-Dimethylbenzidine	NA									
3-Methylcholanthrene	NA									
3-Methylphenol	NA									
3-Nitroaniline	NA									
4,6-Dinitro-2-methylphenol	NA									
4-Aminobiphenyl	NA									
4-Bromophenyl-phenylether	NA									
4-Chloro-3-methylphenol	NA									
4-Chloroaniline	NA									

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high

U - Undetected  
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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
4-Chlorophenyl-phenylether	NA									
4-Methylphenol	NA									
4-Nitroaniline	NA									
4-Nitrophenol	NA									
4-Nitroquinoline-1-oxide	NA									
7,12-Dimethylbenz(a)anthracene	NA									
Acenaphthene	NA									
Acenaphthylene	NA									
Acetophenone	NA									
Aniline	NA									
Anthracene	NA									
Aramite	NA									
Atrazine	NA									
Benzaldehyde	NA									
Benzo(a)anthracene	NA									
Benzo(a)pyrene	NA									
Benzo(b)fluoranthene	NA									
Benzo(g,h,i)perylene	NA									
Benzo(k)fluoranthene	NA									
Benzoic acid	NA									
Benzyl alcohol	NA									
Butylbenzylphthalate	NA									
Caprolactam	NA									
Carbazole	NA									
Chlorobenzilate	NA									
Chrysene	NA									
Di-n-butylphthalate	NA									
Di-n-octylphthalate	NA									
Diallate	NA									
Dibenz(a,h)anthracene	NA									
Dibenzofuran	NA									
Diethylphthalate	NA									
Dimethoate	NA									
Dimethyl phthalate	NA									
Dinoseb	NA									

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 UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Diphenylamine	NA									
Disulfoton	NA									
Ethyl methanesulfonate	NA									
Famphur	NA									
Fluoranthene	NA									
Fluorene	NA									
Hexachlorobenzene	NA									
Hexachlorobutadiene	NA									
Hexachlorocyclopentadiene	NA									
Hexachloroethane	NA									
Hexachlorophene	NA									
Hexachloropropene	NA									
Indeno(1,2,3-cd)pyrene	NA									
Isodrin	NA									
Isophorone	NA									
Isosafrole	NA									
Kepone	NA									
Methapyrilene	NA									
Methyl parathion	NA									
N-Nitrosomorpholine	NA									
N-Nitrosopiperidine	NA									
Naphthalene	NA									
O,O,O-Triethyl phosphorothioate	NA									
Parathion	NA									
Pentachlorobenzene	NA									
Pentachloronitrobenzene	NA									
Pentachlorophenol	NA									
Phenacetin	NA									
Phenanthrene	NA									
Phenol	NA									
Phorate	NA									
Pronamide	NA									
Pyrene	NA									
Pyridine	NA									
Safrole	NA									

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
<b>Chemical Name</b>										
Total heptachlorodibenzo-p-dioxin	NA									
Total heptachlorodibenzofuran	NA									
Total hexachlorodibenzo-p-dioxin	NA									
Total hexachlorodibenzofuran	NA									
Total pentachlorodibenzo-p-dioxin	NA									
Total pentachlorodibenzofuran	NA									
Total tetrachlorodibenzo-p-dioxin	NA									
Total tetrachlorodibenzofuran	NA									
<b>Explosives (UG/KG)</b>										
1,3,5-Trinitrobenzene	NA									
1,3-Dinitrobenzene	NA									
2,4,6-Trinitrotoluene	NA									
2,4-Dinitrotoluene	NA									
2,6-Dinitrotoluene	NA									
2-Amino-4,6-dinitrotoluene	NA									
2-Nitrotoluene	NA									
3-Nitrotoluene	NA									
4-Amino-2,6-dinitrotoluene	NA									
4-Nitrotoluene	NA									
HMX	NA									
Nitrobenzene	NA									
Nitroglycerin	NA									
PETN	NA									
Perchlorate	NA									
RDX	NA									
Tetryl	NA									
<b>Total Metals (MG/KG)</b>										
Aluminum	NA									
Antimony	NA									
Arsenic	NA									
Barium	NA									
Beryllium	NA									
Cadmium	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-186/187		BG-188/189		BG-190	BG-191	BG-192/193		BG-194	BG-195
Sample ID	HCS-BG-186	HCS-BG-187	HCS-BG-189	HCS-BG-188	HCS-BG-190	HCS-BG-191	HCS-BG-192	HCS-BG-193	HCS-BG-194	HCS-BG-195
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Calcium	NA									
Chromium	NA									
Cobalt	NA									
Copper	NA									
Cyanide	NA									
Iron	NA									
Lead	NA									
Magnesium	NA									
Manganese	NA									
Mercury	NA									
Nickel	NA									
Potassium	NA									
Selenium	NA									
Silver	NA									
Sodium	NA									
Thallium	NA									
Tin	NA									
Vanadium	NA									
Zinc	NA									
Wet Chemistry (MG/KG)										
% Moisture	NA									
Nitrate	NA									
Nitrite	NA									
Total organic carbon (TOC)	NA									
pH	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-207
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Volatile Organic Compounds (UG/KG)										
1,1,1,2-Tetrachloroethane	NA									
1,1,1-Trichloroethane	12 U	11 U	12 U	11 U	11 U	11 U				
1,1,2,2-Tetrachloroethane	12 U	11 U	12 U	11 U	11 U	11 U				
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA									
1,1,2-Trichloroethane	12 U	11 U	12 U	11 U	11 U	11 U				
1,1-Dichloroethane	12 U	11 U	12 U	11 U	11 U	11 U				
1,1-Dichloroethene	12 U	11 U	12 U	11 U	11 U	11 U				
1,2,3-Trichloropropane	NA									
1,2,4-Trichlorobenzene	NA									
1,2-Dibromo-3-chloropropane	NA									
1,2-Dibromoethane	NA									
1,2-Dichlorobenzene	NA									
1,2-Dichloroethane	12 U	11 U	12 U	11 U	11 U	11 U				
1,2-Dichloroethene (total)	12 U	11 U	12 U	11 U	11 U	11 U				
1,2-Dichloropropane	12 U	11 U	12 U	11 U	11 U	11 U				
1,3-Dichlorobenzene	NA									
1,4-Dichlorobenzene	NA									
1,4-Dioxane	NA									
2-Butanone	12 U	11 U	12 U	11 U	11 U	11 U				
2-Chloro-1,3-butadiene	NA									
2-Chloroethyl vinyl ether	NA									
2-Hexanone	12 U	11 U	12 U	11 U	11 U	11 U				
4-Methyl-2-pentanone	12 U	11 U	12 U	11 U	11 U	11 U				
Acetone	12 U	11 U	12 U	11 U	11 U	11 U				
Acetonitrile	NA									
Acrolein	NA									
Acrylonitrile	NA									
Allyl chloride	NA									
Benzene	12 U	11 U	12 U	11 U	11 U	11 U				
Bromodichloromethane	12 U	11 U	12 U	11 U	11 U	11 U				
Bromoform	12 U	11 U	12 U	11 U	11 U	11 U				
Bromomethane	12 U	11 U	12 U	11 U	11 U	11 U				
Carbon disulfide	12 U	11 U	12 U	11 U	11 U	11 U				

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-20
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Carbon tetrachloride	12 U	11 U	12 U	11 U	11 U	11 U				
Chlorobenzene	12 U	11 U	12 U	11 U	11 U	11 U				
Chloroethane	12 U	11 U	12 U	11 U	11 U	11 U				
Chloroform	12 U	11 U	12 U	11 U	11 U	11 U				
Chloromethane	12 U	11 U	12 U	11 U	11 U	11 U				
Cumene	NA									
Cyclohexane	NA									
Dibromochloromethane	12 U	11 U	12 U	11 U	11 U	11 U				
Dibromomethane	NA									
Dichlorodifluoromethane (Freon-12)	NA									
Ethyl methacrylate	NA									
Ethylbenzene	12 U	11 U	12 U	11 U	11 U	11 U				
Iodomethane	NA									
Isobutanol	NA									
Methacrylonitrile	NA									
Methyl acetate	NA									
Methyl methacrylate	NA									
Methyl methanesulfonate	NA									
Methyl-tert-butyl ether (MTBE)	NA									
Methylcyclohexane	NA									
Methylene chloride	12 U	11 U	12 U	11 U	11 U	11 U				
Pentachloroethane	NA									
Propionitrile	NA									
Styrene	12 U	11 U	12 U	11 U	11 U	11 U				
Tetrachloroethene	12 U	11 U	12 U	11 U	11 U	11 U				
Toluene	12 U	11 U	12 U	11 U	11 U	11 U				
Trichloroethene	12 U	12 U	2 J	29	55	11 U	12 U	11 U	11 U	10 J
Trichlorofluoromethane(Freon-11)	NA									
Vinyl acetate	NA									
Vinyl chloride	12 U	11 U	12 U	11 U	11 U	11 U				
Xylene, total	12 U	11 U	12 U	11 U	11 U	11 U				
cis-1,2-Dichloroethene	NA									
cis-1,3-Dichloropropene	12 U	11 U	12 U	11 U	11 U	11 U				
trans-1,2-Dichloroethene	NA									
trans-1,3-Dichloropropene	12 U	11 U	12 U	11 U	11 U	11 U				

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit low

Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-205
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
trans-1,4-Dichloro-2-butene	NA									
<b>Semi-volatile Organic Compounds (UG/KG)</b>										
1,1-Biphenyl	NA									
1,2,4,5-Tetrachlorobenzene	NA									
1,4-Naphthoquinone	NA									
1-Naphthylamine	NA									
2,3,4,6-Tetrachlorophenol	NA									
2,4,5-Trichlorophenol	NA									
2,4,6-Trichlorophenol	NA									
2,4-Dichlorophenol	NA									
2,4-Dimethylphenol	NA									
2,4-Dinitrophenol	NA									
2,6-Dichlorophenol	NA									
2-Acetylaminofluorene	NA									
2-Chloronaphthalene	NA									
2-Chlorophenol	NA									
2-Methyl-5-nitroaniline	NA									
2-Methylaniline	NA									
2-Methylnaphthalene	NA									
2-Methylphenol	NA									
2-Naphthylamine	NA									
2-Nitroaniline	NA									
2-Nitrophenol	NA									
2-Picoline	NA									
3,3'-Dichlorobenzidine	NA									
3,3'-Dimethylbenzidine	NA									
3-Methylcholanthrene	NA									
3-Methylphenol	NA									
3-Nitroaniline	NA									
4,6-Dinitro-2-methylphenol	NA									
4-Aminobiphenyl	NA									
4-Bromophenyl-phenylether	NA									
4-Chloro-3-methylphenol	NA									
4-Chloroaniline	NA									

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high

U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-205
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
4-Chlorophenyl-phenylether	NA									
4-Methylphenol	NA									
4-Nitroaniline	NA									
4-Nitrophenol	NA									
4-Nitroquinoline-1-oxide	NA									
7,12-Dimethylbenz(a)anthracene	NA									
Acenaphthene	NA									
Acenaphthylene	NA									
Acetophenone	NA									
Aniline	NA									
Anthracene	NA									
Aramite	NA									
Atrazine	NA									
Benzaldehyde	NA									
Benzo(a)anthracene	NA									
Benzo(a)pyrene	NA									
Benzo(b)fluoranthene	NA									
Benzo(g,h,i)perylene	NA									
Benzo(k)fluoranthene	NA									
Benzoic acid	NA									
Benzyl alcohol	NA									
Butylbenzylphthalate	NA									
Caprolactam	NA									
Carbazole	NA									
Chlorobenzilate	NA									
Chrysene	NA									
Di-n-butylphthalate	NA									
Di-n-octylphthalate	NA									
Diallate	NA									
Dibenz(a,h)anthracene	NA									
Dibenzofuran	NA									
Diethylphthalate	NA									
Dimethoate	NA									
Dimethyl phthalate	NA									
Dinoseb	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-205
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Diphenylamine	NA									
Disulfoton	NA									
Ethyl methanesulfonate	NA									
Famphur	NA									
Fluoranthene	NA									
Fluorene	NA									
Hexachlorobenzene	NA									
Hexachlorobutadiene	NA									
Hexachlorocyclopentadiene	NA									
Hexachloroethane	NA									
Hexachlorophene	NA									
Hexachloropropene	NA									
Indeno(1,2,3-cd)pyrene	NA									
Isodrin	NA									
Isophorone	NA									
Isosafrole	NA									
Kepone	NA									
Methapyrilene	NA									
Methyl parathion	NA									
N-Nitrosomorpholine	NA									
N-Nitrosopiperidine	NA									
Naphthalene	NA									
O,O,O-Triethyl phosphorothioate	NA									
Parathion	NA									
Pentachlorobenzene	NA									
Pentachloronitrobenzene	NA									
Pentachlorophenol	NA									
Phenacetin	NA									
Phenanthrene	NA									
Phenol	NA									
Phorate	NA									
Pronamide	NA									
Pyrene	NA									
Pyridine	NA									
Safrole	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-205
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Total heptachlorodibenzo-p-dioxin	NA									
Total heptachlorodibenzofuran	NA									
Total hexachlorodibenzo-p-dioxin	NA									
Total hexachlorodibenzofuran	NA									
Total pentachlorodibenzo-p-dioxin	NA									
Total pentachlorodibenzofuran	NA									
Total tetrachlorodibenzo-p-dioxin	NA									
Total tetrachlorodibenzofuran	NA									
Explosives (UG/KG)										
1,3,5-Trinitrobenzene	NA									
1,3-Dinitrobenzene	NA									
2,4,6-Trinitrotoluene	NA									
2,4-Dinitrotoluene	NA									
2,6-Dinitrotoluene	NA									
2-Amino-4,6-dinitrotoluene	NA									
2-Nitrotoluene	NA									
3-Nitrotoluene	NA									
4-Amino-2,6-dinitrotoluene	NA									
4-Nitrotoluene	NA									
HMX	NA									
Nitrobenzene	NA									
Nitroglycerin	NA									
PETN	NA									
Perchlorate	NA									
RDX	NA									
Tetryl	NA									
Total Metals (MG/KG)										
Aluminum	NA									
Antimony	NA									
Arsenic	NA									
Barium	NA									
Beryllium	NA									
Cadmium	NA									

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-196/197		BG-198	BG-199/200		BG-201/202		BG-203/204		BG-205
Sample ID	HCS-BG-196	HCS-BG-197	HCS-BG-198	HCS-BG-199	HCS-BG-200	HCS-BG-201	HCS-BG-202	HCS-BG-203	HCS-BG-204	HCS-BG-207
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Calcium	NA									
Chromium	NA									
Cobalt	NA									
Copper	NA									
Cyanide	NA									
Iron	NA									
Lead	NA									
Magnesium	NA									
Manganese	NA									
Mercury	NA									
Nickel	NA									
Potassium	NA									
Selenium	NA									
Silver	NA									
Sodium	NA									
Thallium	NA									
Tin	NA									
Vanadium	NA									
Zinc	NA									
Wet Chemistry (MG/KG)										
% Moisture	NA									
Nitrate	NA									
Nitrite	NA									
Total organic carbon (TOC)	NA									
pH	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208	BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208	HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name											
Volatile Organic Compounds (UG/KG)											
1,1,1,2-Tetrachloroethane	NA										
1,1,1-Trichloroethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,1,2,2-Tetrachloroethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA										
1,1,2-Trichloroethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,1-Dichloroethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,1-Dichloroethene	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,2,3-Trichloropropane	NA										
1,2,4-Trichlorobenzene	NA										
1,2-Dibromo-3-chloropropane	NA										
1,2-Dibromoethane	NA										
1,2-Dichlorobenzene	NA										
1,2-Dichloroethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,2-Dichloroethene (total)	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,2-Dichloropropane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
1,3-Dichlorobenzene	NA										
1,4-Dichlorobenzene	NA										
1,4-Dioxane	NA										
2-Butanone	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
2-Chloro-1,3-butadiene	NA										
2-Chloroethyl vinyl ether	NA										
2-Hexanone	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
4-Methyl-2-pentanone	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
Acetone	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
Acetonitrile	NA										
Acrolein	NA										
Acrylonitrile	NA										
Allyl chloride	NA										
Benzene	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
Bromodichloromethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
Bromoform	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
Bromomethane	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	
Carbon disulfide	11 U	11 U	12 U	11 U	11 U	11 U	12 U	11 U	11 U	11 U	

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208		BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208		HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98		10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name												
Carbon tetrachloride	11	U	11	U	12	U	11	U	11	U	11	U
Chlorobenzene	11	U	11	U	12	U	11	U	11	U	11	U
Chloroethane	11	U	11	U	12	U	11	U	11	U	11	U
Chloroform	11	U	11	U	12	U	11	U	11	U	11	U
Chloromethane	11	U	11	U	12	U	11	U	11	U	11	U
Cumene	NA		NA		NA		NA		NA		NA	
Cyclohexane	NA		NA		NA		NA		NA		NA	
Dibromochloromethane	11	U	11	U	12	U	11	U	11	U	11	U
Dibromomethane	NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane (Freon-12)	NA		NA		NA		NA		NA		NA	
Ethyl methacrylate	NA		NA		NA		NA		NA		NA	
Ethylbenzene	11	U	11	U	12	U	11	U	11	U	11	U
Iodomethane	NA		NA		NA		NA		NA		NA	
Isobutanol	NA		NA		NA		NA		NA		NA	
Methacrylonitrile	NA		NA		NA		NA		NA		NA	
Methyl acetate	NA		NA		NA		NA		NA		NA	
Methyl methacrylate	NA		NA		NA		NA		NA		NA	
Methyl methanesulfonate	NA		NA		NA		NA		NA		NA	
Methyl-tert-butyl ether (MTBE)	NA		NA		NA		NA		NA		NA	
Methylcyclohexane	NA		NA		NA		NA		NA		NA	
Methylene chloride	11	U	11	U	12	U	11	U	11	U	11	U
Pentachloroethane	NA		NA		NA		NA		NA		NA	
Propionitrile	NA		NA		NA		NA		NA		NA	
Styrene	11	U	11	U	12	U	11	U	11	U	11	U
Tetrachloroethene	11	U	32		60		3	J	6	J	5	J
Toluene	11	U	11	U	12	U	11	U	11	U	11	U
Trichloroethene	9	J	44		120		4	J	11	J	46	
Trichlorofluoromethane(Freon-11)	NA		NA		NA		NA		NA		NA	
Vinyl acetate	NA		NA		NA		NA		NA		NA	
Vinyl chloride	11	U	11	U	12	U	11	U	11	U	11	U
Xylene, total	11	U	11	U	12	U	11	U	11	U	11	U
cis-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA	
cis-1,3-Dichloropropene	11	U	11	U	12	U	11	U	11	U	11	U
trans-1,2-Dichloroethene	NA		NA		NA		NA		NA		NA	
trans-1,3-Dichloropropene	11	U	11	U	12	U	11	U	11	U	11	U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208	BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208	HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name											
trans-1,4-Dichloro-2-butene	NA										
<b>Semi-volatile Organic Compounds (UG/KG)</b>											
1,1-Biphenyl	NA										
1,2,4,5-Tetrachlorobenzene	NA										
1,4-Naphthoquinone	NA										
1-Naphthylamine	NA										
2,3,4,6-Tetrachlorophenol	NA										
2,4,5-Trichlorophenol	NA										
2,4,6-Trichlorophenol	NA										
2,4-Dichlorophenol	NA										
2,4-Dimethylphenol	NA										
2,4-Dinitrophenol	NA										
2,6-Dichlorophenol	NA										
2-Acetylaminofluorene	NA										
2-Chloronaphthalene	NA										
2-Chlorophenol	NA										
2-Methyl-5-nitroaniline	NA										
2-Methylaniline	NA										
2-Methylnaphthalene	NA										
2-Methylphenol	NA										
2-Naphthylamine	NA										
2-Nitroaniline	NA										
2-Nitrophenol	NA										
2-Picoline	NA										
3,3'-Dichlorobenzidine	NA										
3,3'-Dimethylbenzidine	NA										
3-Methylcholanthrene	NA										
3-Methylphenol	NA										
3-Nitroaniline	NA										
4,6-Dinitro-2-methylphenol	NA										
4-Aminobiphenyl	NA										
4-Bromophenyl-phenylether	NA										
4-Chloro-3-methylphenol	NA										
4-Chloroaniline	NA										

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208	BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208	HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name											
4-Chlorophenyl-phenylether	NA										
4-Methylphenol	NA										
4-Nitroaniline	NA										
4-Nitrophenol	NA										
4-Nitroquinoline-1-oxide	NA										
7,12-Dimethylbenz(a)anthracene	NA										
Acenaphthene	NA										
Acenaphthylene	NA										
Acetophenone	NA										
Aniline	NA										
Anthracene	NA										
Aramite	NA										
Atrazine	NA										
Benzaldehyde	NA										
Benzo(a)anthracene	NA										
Benzo(a)pyrene	NA										
Benzo(b)fluoranthene	NA										
Benzo(g,h,i)perylene	NA										
Benzo(k)fluoranthene	NA										
Benzoic acid	NA										
Benzyl alcohol	NA										
Butylbenzylphthalate	NA										
Caprolactam	NA										
Carbazole	NA										
Chlorobenzilate	NA										
Chrysene	NA										
Di-n-butylphthalate	NA										
Di-n-octylphthalate	NA										
Diallate	NA										
Dibenz(a,h)anthracene	NA										
Dibenzofuran	NA										
Diethylphthalate	NA										
Dimethoate	NA										
Dimethyl phthalate	NA										
Dinoseb	NA										

NA - Not analyzed  
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 J - Estimated value  
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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208	BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208	HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name											
Diphenylamine	NA										
Disulfoton	NA										
Ethyl methanesulfonate	NA										
Famphur	NA										
Fluoranthene	NA										
Fluorene	NA										
Hexachlorobenzene	NA										
Hexachlorobutadiene	NA										
Hexachlorocyclopentadiene	NA										
Hexachloroethane	NA										
Hexachlorophene	NA										
Hexachloropropene	NA										
Indeno(1,2,3-cd)pyrene	NA										
Isodrin	NA										
Isophorone	NA										
Isosafrole	NA										
Kepone	NA										
Methapyrilene	NA										
Methyl parathion	NA										
N-Nitrosomorpholine	NA										
N-Nitrosopiperidine	NA										
Naphthalene	NA										
O,O,O-Triethyl phosphorothioate	NA										
Parathion	NA										
Pentachlorobenzene	NA										
Pentachloronitrobenzene	NA										
Pentachlorophenol	NA										
Phenacetin	NA										
Phenanthrene	NA										
Phenol	NA										
Phorate	NA										
Pronamide	NA										
Pyrene	NA										
Pyridine	NA										
Safrole	NA										

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208	BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208	HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name											
Total heptachlorodibenzo-p-dioxin	NA										
Total heptachlorodibenzofuran	NA										
Total hexachlorodibenzo-p-dioxin	NA										
Total hexachlorodibenzofuran	NA										
Total pentachlorodibenzo-p-dioxin	NA										
Total pentachlorodibenzofuran	NA										
Total tetrachlorodibenzo-p-dioxin	NA										
Total tetrachlorodibenzofuran	NA										
Explosives (UG/KG)											
1,3,5-Trinitrobenzene	NA										
1,3-Dinitrobenzene	NA										
2,4,6-Trinitrotoluene	NA										
2,4-Dinitrotoluene	NA										
2,6-Dinitrotoluene	NA										
2-Amino-4,6-dinitrotoluene	NA										
2-Nitrotoluene	NA										
3-Nitrotoluene	NA										
4-Amino-2,6-dinitrotoluene	NA										
4-Nitrotoluene	NA										
HMX	NA										
Nitrobenzene	NA										
Nitroglycerin	NA										
PETN	NA										
Perchlorate	NA										
RDX	NA										
Tetryl	NA										
Total Metals (MG/KG)											
Aluminum	NA										
Antimony	NA										
Arsenic	NA										
Barium	NA										
Beryllium	NA										
Cadmium	NA										

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	07/208	BG-209/210			BG-211/212		BG-213/214		BG-215/216		BG-217
Sample ID	HCS-BG-208	HCS-BG-209	HCS-BG-210	HCS-BG-211	HCS-BG-212	HCS-BG-213	HCS-BG-214	HCS-BG-215	HCS-BG-216	HCS-BG-217	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name											
Calcium	NA										
Chromium	NA										
Cobalt	NA										
Copper	NA										
Cyanide	NA										
Iron	NA										
Lead	NA										
Magnesium	NA										
Manganese	NA										
Mercury	NA										
Nickel	NA										
Potassium	NA										
Selenium	NA										
Silver	NA										
Sodium	NA										
Thallium	NA										
Tin	NA										
Vanadium	NA										
Zinc	NA										
Wet Chemistry (MG/KG)											
% Moisture	NA										
Nitrate	NA										
Nitrite	NA										
Total organic carbon (TOC)	NA										
pH	NA										

NA - Not analyzed  
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 J - Estimated value  
 K - Value biased high

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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218		BG-219/220		BG-221/222					
Sample ID	HCS-BG-218		HCS-BG-219		HCS-BG-220		HCS-BG-221		HCS-BG-222	
Sample Date	10/27/98		10/27/98		10/27/98		10/27/98		10/27/98	
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1,2-Tetrachloroethane		NA								
1,1,1-Trichloroethane		11 U		11 U		13 U		11 U		11 U
1,1,2,2-Tetrachloroethane		11 U		11 U		13 U		11 U		11 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)		NA								
1,1,2-Trichloroethane		11 U		11 U		13 U		11 U		11 U
1,1-Dichloroethane		11 U		11 U		13 U		11 U		11 U
1,1-Dichloroethene		11 U		11 U		13 U		11 U		11 U
1,2,3-Trichloropropane		NA								
1,2,4-Trichlorobenzene		NA								
1,2-Dibromo-3-chloropropane		NA								
1,2-Dibromoethane		NA								
1,2-Dichlorobenzene		NA								
1,2-Dichloroethane		11 U		11 U		13 U		11 U		11 U
1,2-Dichloroethene (total)		11 U		11 U		13 U		11 U		11 U
1,2-Dichloropropane		11 U		11 U		13 U		11 U		11 U
1,3-Dichlorobenzene		NA								
1,4-Dichlorobenzene		NA								
1,4-Dioxane		NA								
2-Butanone		11 U		11 U		13 U		11 U		11 U
2-Chloro-1,3-butadiene		NA								
2-Chloroethyl vinyl ether		NA								
2-Hexanone		11 U		11 U		13 U		11 U		11 U
4-Methyl-2-pentanone		11 U		11 U		13 U		11 U		11 U
Acetone		11 U		11 U		13 U		11 U		11 U
Acetonitrile		NA								
Acrolein		NA								
Acrylonitrile		NA								
Allyl chloride		NA								
Benzene		11 U		11 U		13 U		11 U		11 U
Bromodichloromethane		11 U		11 U		13 U		11 U		11 U
Bromoform		11 U		11 U		13 U		11 U		11 U
Bromomethane		11 U		11 U		13 U		11 U		11 U
Carbon disulfide		11 U		11 U		13 U		11 U		11 U

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218		BG-219/220		BG-221/222	
Sample ID	HCS-BG-218		HCS-BG-219		HCS-BG-220	
Sample Date	10/27/98		10/27/98		10/27/98	
Chemical Name						
Carbon tetrachloride	11 U		11 U		13 U	
Chlorobenzene	11 U		11 U		13 U	
Chloroethane	11 U		11 U		13 U	
Chloroform	11 U		11 U		13 U	
Chloromethane	11 U		11 U		13 U	
Cumene	NA		NA		NA	
Cyclohexane	NA		NA		NA	
Dibromochloromethane	11 U		11 U		13 U	
Dibromomethane	NA		NA		NA	
Dichlorodifluoromethane (Freon-12)	NA		NA		NA	
Ethyl methacrylate	NA		NA		NA	
Ethylbenzene	11 U		11 U		13 U	
Iodomethane	NA		NA		NA	
Isobutanol	NA		NA		NA	
Methacrylonitrile	NA		NA		NA	
Methyl acetate	NA		NA		NA	
Methyl methacrylate	NA		NA		NA	
Methyl methanesulfonate	NA		NA		NA	
Methyl-tert-butyl ether (MTBE)	NA		NA		NA	
Methylcyclohexane	NA		NA		NA	
Methylene chloride	11 U		11 U		13 U	
Pentachloroethane	NA		NA		NA	
Propionitrile	NA		NA		NA	
Styrene	11 U		11 U		13 U	
Tetrachloroethene	7 J		11 U		13 U	
Toluene	11 U		11 U		13 U	
Trichloroethene	3 J		23		37 J	
Trichlorofluoromethane(Freon-11)	NA		NA		NA	
Vinyl acetate	NA		NA		NA	
Vinyl chloride	11 U		11 U		13 U	
Xylene, total	11 U		11 U		13 U	
cis-1,2-Dichloroethene	NA		NA		NA	
cis-1,3-Dichloropropene	11 U		11 U		13 U	
trans-1,2-Dichloroethene	NA		NA		NA	
trans-1,3-Dichloropropene	11 U		11 U		13 U	

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218	BG-219/220			BG-221/222	
Sample ID	HCS-BG-218	HCS-BG-219	HCS-BG-220	HCS-BG-221	HCS-BG-222	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name						
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	
<b>Semi-volatile Organic Compounds (UG/KG)</b>						
1,1-Biphenyl	NA	NA	NA	NA	NA	
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	
1,4-Naphthoquinone	NA	NA	NA	NA	NA	
1-Naphthylamine	NA	NA	NA	NA	NA	
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	
2,4-Dichlorophenol	NA	NA	NA	NA	NA	
2,4-Dimethylphenol	NA	NA	NA	NA	NA	
2,4-Dinitrophenol	NA	NA	NA	NA	NA	
2,6-Dichlorophenol	NA	NA	NA	NA	NA	
2-Acetylaminofluorene	NA	NA	NA	NA	NA	
2-Chloronaphthalene	NA	NA	NA	NA	NA	
2-Chlorophenol	NA	NA	NA	NA	NA	
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	
2-Methylaniline	NA	NA	NA	NA	NA	
2-Methylnaphthalene	NA	NA	NA	NA	NA	
2-Methylphenol	NA	NA	NA	NA	NA	
2-Naphthylamine	NA	NA	NA	NA	NA	
2-Nitroaniline	NA	NA	NA	NA	NA	
2-Nitrophenol	NA	NA	NA	NA	NA	
2-Picoline	NA	NA	NA	NA	NA	
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	
3,3'-Dimethylbenzidine	NA	NA	NA	NA	NA	
3-Methylcholanthrene	NA	NA	NA	NA	NA	
3-Methylphenol	NA	NA	NA	NA	NA	
3-Nitroaniline	NA	NA	NA	NA	NA	
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	
4-Aminobiphenyl	NA	NA	NA	NA	NA	
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	
4-Chloroaniline	NA	NA	NA	NA	NA	

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218	BG-219/220			BG-221/222	
Sample ID	HCS-BG-218	HCS-BG-219	HCS-BG-220	HCS-BG-221	HCS-BG-222	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name						
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA
Aramite	NA	NA	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA
Benzoic acid	NA	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA
Chlorobenzilate	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA
Diallate	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA
Dimethoate	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA	NA

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218	BG-219/220			BG-221/222	
Sample ID	HCS-BG-218	HCS-BG-219	HCS-BG-220	HCS-BG-221	HCS-BG-222	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name						
Diphenylamine	NA	NA	NA	NA	NA	NA
Disulfoton	NA	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA	NA
Famphur	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA
Hexachlorophene	NA	NA	NA	NA	NA	NA
Hexachloropropene	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA
Isodrin	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA
Isosafrole	NA	NA	NA	NA	NA	NA
Kepone	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA
Methyl parathion	NA	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA
O,O,O-Triethyl phosphorothioate	NA	NA	NA	NA	NA	NA
Parathion	NA	NA	NA	NA	NA	NA
Pentachlorobenzene	NA	NA	NA	NA	NA	NA
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA
Phenacetin	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA
Phorate	NA	NA	NA	NA	NA	NA
Pronamide	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA
Pyridine	NA	NA	NA	NA	NA	NA
Safrole	NA	NA	NA	NA	NA	NA

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Table D-5  
Raw Data, Subsurface Soil, Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218	BG-219/220			BG-221/222	
Sample ID	HCS-BG-218	HCS-BG-219	HCS-BG-220	HCS-BG-221	HCS-BG-222	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name						
Sulfotepp	NA	NA	NA	NA	NA	NA
Thionazin	NA	NA	NA	NA	NA	NA
a,a-Dimethylphenethylamine	NA	NA	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	NA	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA	NA	NA
n-Nitroso-n-methylethylamine	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA
p-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA
p-Phenylenediamine	NA	NA	NA	NA	NA	NA
Dioxin/Furans (UG/KG)						
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA

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 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218	BG-219/220			BG-221/222	
Sample ID	HCS-BG-218	HCS-BG-219	HCS-BG-220	HCS-BG-221	HCS-BG-222	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
<b>Chemical Name</b>						
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	
<b>Explosives (UG/KG)</b>						
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	
2-Nitrotoluene	NA	NA	NA	NA	NA	
3-Nitrotoluene	NA	NA	NA	NA	NA	
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	
4-Nitrotoluene	NA	NA	NA	NA	NA	
HMX	NA	NA	NA	NA	NA	
Nitrobenzene	NA	NA	NA	NA	NA	
Nitroglycerin	NA	NA	NA	NA	NA	
PETN	NA	NA	NA	NA	NA	
Perchlorate	NA	NA	NA	NA	NA	
RDX	NA	NA	NA	NA	NA	
Tetryl	NA	NA	NA	NA	NA	
<b>Total Metals (MG/KG)</b>						
Aluminum	NA	NA	NA	NA	NA	
Antimony	NA	NA	NA	NA	NA	
Arsenic	NA	NA	NA	NA	NA	
Barium	NA	NA	NA	NA	NA	
Beryllium	NA	NA	NA	NA	NA	
Cadmium	NA	NA	NA	NA	NA	

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Table D-5  
 Raw Data, Subsurface Soil, Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	7/218	BG-219/220			BG-221/222	
Sample ID	HCS-BG-218	HCS-BG-219	HCS-BG-220	HCS-BG-221	HCS-BG-222	
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	
Chemical Name						
Calcium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)						
% Moisture	NA	NA	NA	NA	NA	NA
Nitrate	NA	NA	NA	NA	NA	NA
Nitrite	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high

U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24		AS01-SB25		AS01-SB26		AS01-SB27		AS01-SB30		AS01-SB31		AS01-SB34	
Sample ID	AS01-SB24-(1-2)		AS01-SB25-(1-2)		AS01-SB26-(1-2)		AS01-SB27-(1-2)		AS01-SB30-(1-2)		AS01-SB31-(1-2)		AS01-SB34-(1-2)	
Sample Date	10/24/01		10/24/01		10/23/01		10/23/01		10/24/01		10/25/01		10/25/01	
Chemical Name														
<b>Volatile Organic Compounds (UG/KG)</b>														
1,1,1-Trichloroethane	11	U	11	U	9	J	2.6	J	12	U	13	U	11	U
1,1,2,2-Tetrachloroethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,1,2-Trichloroethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,1-Dichloroethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,1-Dichloroethene	11	U	11	U	1	J	12	U	12	U	13	U	11	U
1,2,4-Trichlorobenzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,2-Dibromo-3-chloropropane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,2-Dibromoethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,2-Dichlorobenzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,2-Dichloroethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,2-Dichloroethene (total)	NA													
1,2-Dichloropropane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,3-Dichlorobenzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
1,4-Dichlorobenzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
2-Butanone	11	U	11	U	12	U	12	U	12	U	13	U	11	U
2-Hexanone	11	U	11	U	12	U	12	U	12	U	13	U	11	U
4-Methyl-2-pentanone	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Acetone	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Benzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Bromodichloromethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Bromoform	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Bromomethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Carbon disulfide	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Carbon tetrachloride	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Chlorobenzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Chloroethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Chloroform	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Chloromethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Cumene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Cyclohexane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Dibromochloromethane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Dichlorodifluoromethane (Freon-12)	11	U	11	U	12	U	12	U	12	U	13	U	11	U

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R - Unusable result  
U - Undetected  
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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24		AS01-SB25		AS01-SB26		AS01-SB27		AS01-SB30		AS01-SB31		AS01-SB34	
Sample ID	AS01-SB24-(1-2)		AS01-SB25-(1-2)		AS01-SB26-(1-2)		AS01-SB27-(1-2)		AS01-SB30-(1-2)		AS01-SB31-(1-2)		AS01-SB34-(1-2)	
Sample Date	10/24/01		10/24/01		10/23/01		10/23/01		10/24/01		10/25/01		10/25/01	
Chemical Name														
Ethylbenzene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Methyl acetate	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Methyl-tert-butyl ether (MTBE)	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Methylcyclohexane	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Methylene chloride	1.8	B	4	B	5.9	B	3.9	B	12	U	1.6	J	11	U
Styrene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Tetrachloroethene	11	U	11	U	12	U	12	U	6.1	J	13	U	11	U
Toluene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Trichloroethene	11	U	11	U	25,000		12	U	13,000		13	U	8.4	J
Trichlorofluoromethane(Freon-11)	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Vinyl acetate	NA		NA											
Vinyl chloride	11	U	11	U	12	U	12	U	12	U	13	U	11	U
Xylene, total	11	U	11	U	12	U	12	U	12	U	13	U	11	U
cis-1,2-Dichloroethene	11	U	11	U	80		12	U	38		13	U	11	U
cis-1,3-Dichloropropene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
o-Xylene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
trans-1,2-Dichloroethene	11	U	11	U	2	J	12	U	12	U	13	U	11	U
trans-1,3-Dichloropropene	11	U	11	U	12	U	12	U	12	U	13	U	11	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>														
1,1-Biphenyl	350	U	890		400	U	46	J	51	J	420	UJ	380	UJ
2,4,5-Trichlorophenol	870	U	800	U	1,000	U	900	U	960	U	1,100	UJ	960	UJ
2,4,6-Trichlorophenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
2,4-Dichlorophenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
2,4-Dimethylphenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
2,4-Dinitrophenol	870	U	800	U	1,000	U	900	U	960	U	1,100	UJ	960	UJ
2-Chloronaphthalene	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
2-Chlorophenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
2-Methylnaphthalene	350	U	1,900		50	J	87	J	170	J	420	UJ	380	UJ
2-Methylphenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
2-Nitroaniline	870	U	800	U	1,000	U	900	U	960	U	1,100	UJ	960	UJ
2-Nitrophenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
3,3'-Dichlorobenzidine	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
3- and 4-Methylphenol	350	U	320	U	400	U	360	U	390	U	420	UJ	380	UJ
3-Nitroaniline	870	U	800	U	1,000	U	900	U	960	U	1,100	UJ	960	UJ

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 K - Value biased high  
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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31	AS01
Sample ID	AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)	AS01-SB34-(1-2)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01	10/25/01
Chemical Name							
4,6-Dinitro-2-methylphenol	870 U	800 U	1,000 U	900 U	960 U	1,100 UJ	960 UJ
4-Bromophenyl-phenylether	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
4-Chloro-3-methylphenol	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
4-Chloroaniline	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
4-Chlorophenyl-phenylether	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
4-Methylphenol	NA						
4-Nitroaniline	870 U	800 U	1,000 U	900 U	960 U	1,100 UJ	960 UJ
4-Nitrophenol	870 U	800 U	1,000 U	900 U	960 U	1,100 UJ	960 UJ
Acenaphthene	350 U	12,000	400 U	360 U	59 J	420 UJ	380 UJ
Acenaphthylene	350 U	350	400 U	46 J	50 J	420 UJ	380 UJ
Acetophenone	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Anthracene	350 U	21,000	400 U	49 J	170 J	72 J	380 UJ
Atrazine	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Benzaldehyde	350 U	320 U	400 U	360 U	390	420 UJ	380 UJ
Benzo(a)anthracene	350 U	58,000	130 J	180 J	370 J	170 J	75 J
Benzo(a)pyrene	350 U	55,000	130 J	190 J	330 J	150 J	85 J
Benzo(b)fluoranthene	350 U	65,000	170 J	330 J	320 J	150 J	110 J
Benzo(g,h,i)perylene	350 U	17,000	56 J	72 J	130 J	55 J	62 J
Benzo(k)fluoranthene	350 U	54,000	130 J	210 J	390	170 J	82 J
Butylbenzylphthalate	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Caprolactam	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Carbazole	350 U	9,500	400 U	360 U	58 J	420 UJ	380 UJ
Chrysene	350 U	63,000	220 J	290 J	520	200 J	110 J
Di-n-butylphthalate	350 U	57 J	400 U	360 U	390 U	420 UJ	380 UJ
Di-n-octylphthalate	350 U	320 U	400 UJ	360 UJ	390 U	420 UJ	380 UJ
Dibenz(a,h)anthracene	350 U	2,100	400 UJ	360 UJ	390 U	420 UJ	380 UJ
Dibenzofuran	350 U	6,800	400 U	360 U	69 J	420 UJ	380 UJ
Diethylphthalate	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Dimethyl phthalate	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Fluoranthene	48 J	97,000	270 J	310 J	740	310 J	140 J
Fluorene	350 U	11,000	400 U	360 U	80 J	420 UJ	380 UJ
Hexachlorobenzene	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Hexachlorobutadiene	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Hexachlorocyclopentadiene	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Hexachloroethane	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31	AS01
Sample ID	AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)	AS01-SB34-(1-2)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01	10/25/01
Chemical Name							
Indeno(1,2,3-cd)pyrene	350 U	18,000	52 J	84 J	130 J	44 J	53 J
Isophorone	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Naphthalene	47 J	650	400 U	52 J	100 J	420 UJ	380 UJ
Pentachlorophenol	870 U	800 U	1,000 U	900 U	960 U	1,100 UJ	960 UJ
Phenanthrene	50 J	96,000	240 J	230 J	750	220 J	100 J
Phenol	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Pyrene	350 U	160,000	250 J	380	780	350 J	120 J
bis(2-Chloro-1-methylethyl) ether	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
bis(2-Chloroethoxy)methane	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
bis(2-Chloroethyl)ether	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
bis(2-Ethylhexyl)phthalate	350 U	320 U	69 B	120 B	54 J	120 J	53 J
n-Nitroso-di-n-propylamine	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
n-Nitrosodiphenylamine	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
Dioxin/Furans (UG/KG)							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0681	0.0433	0.191
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	0.0856	0.0292	0.255
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	0.00525	0.00343	0.0168
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.00216	0.00165	0.0130
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	0.0260	0.0194	0.177
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.00539	0.00291	0.0225
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	0.0111 J	0.00473	0.0458
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.00542	0.00317	0.0310
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	5.69E-04	3.21E-04 U	0.0028
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.00119	7.94E-04 J	0.00692
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	0.00464	0.00689	0.0533
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	0.0104	0.00523	0.0670
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	0.00782	0.00693	0.0633
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	5.39E-04 U	4.52E-04	0.00139
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	0.00364 J	0.00809 J	0.0303 J
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.547	0.488	0.907
Octachlorodibenzofuran	NA	NA	NA	NA	0.150	0.0531	0.113
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.123	0.0879	0.435
Total heptachlorodibenzofuran	NA	NA	NA	NA	0.147	0.0326	0.271
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0476	0.0636	0.671

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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31	AS01
Sample ID	AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)	AS01-SB34-(1-2)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01	10/25/01
Chemical Name							
Total hexachlorodibenzofuran	NA	NA	NA	NA	0.116	0.0644	0.524
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0118	0.0154	0.194
Total pentachlorodibenzofuran	NA	NA	NA	NA	0.0922	0.0563	0.571
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	0.0143	0.0289	0.296
Total tetrachlorodibenzofuran	NA	NA	NA	NA	0.0977	0.0755	0.705
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	NA	NA	NA	NA	590 U	640 U	570 U
1,3-Dinitrobenzene	NA	NA	NA	NA	590 U	640 U	570 U
2,4,6-Trinitrotoluene	NA	NA	NA	NA	590 U	640 U	570 U
2,4-Dinitrotoluene	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
2,6-Dinitrotoluene	350 U	320 U	400 U	360 U	390 U	420 UJ	380 UJ
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	590 U	640 U	570 U
2-Nitrotoluene	NA	NA	NA	NA	590 U	640 U	570 U
3-Nitrotoluene	NA	NA	NA	NA	590 U	640 U	570 U
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	590 U	640 U	570 U
4-Nitrotoluene	NA						
HMX	NA	NA	NA	NA	590 U	640 U	570 U
Nitrobenzene	350 U	320 U	400 U	360 U	590 R	640 U	570 R
Nitroglycerin	NA	NA	NA	NA	59,000 U	64,000 U	57,000 U
Nitroguanidine	NA	NA	NA	NA	120,000 U	130,000 U	110,000 U
PETN	NA	NA	NA	NA	59,000 U	64,000 U	57,000 U
Perchlorate	NA	NA	NA	NA	60 U	60 U	60 U
RDX	NA	NA	NA	NA	590 U	640 U	570 U
Tetryl	NA	NA	NA	NA	590 U	640 U	570 U
Total Metals (MG/KG)							
Aluminum	5,320	3,130	8,540	7,920	18,100	4,330	13,000
Antimony	2 U	2 U	2.2 U	2.2 U	6.6 J	2.3 U	4.9 J
Arsenic	11.9	7.3	20.6	14.7	31	10.5	14.7
Barium	141	59.8	208	194	647	81.9	328
Beryllium	1.5	1 J	1.9 J	1.4 J	1.3	1.6 J	1.3 J
Cadmium	0.67 U	0.64 U	0.72 U	0.72 U	12.4	0.76 U	12.6
Calcium	3,730	1,220	4,560	3,510	6,100	2,150 J	4,760 J
Chromium	12.3 J	10 J	20.8	16.8	112 J	11.2 J	37.1 J

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Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB24	AS01-SB25	AS01-SB26	AS01-SB27	AS01-SB30	AS01-SB31	AS01
Sample ID	AS01-SB24-(1-2)	AS01-SB25-(1-2)	AS01-SB26-(1-2)	AS01-SB27-(1-2)	AS01-SB30-(1-2)	AS01-SB31-(1-2)	AS01-SB34-(1-2)
Sample Date	10/24/01	10/24/01	10/23/01	10/23/01	10/24/01	10/25/01	10/25/01
Chemical Name							
Cobalt	24.3	16.2	28	20.4	40.3	25.3	28.6
Copper	50.7	27.8	64.9	37.3	332	32.9	999
Cyanide	0.6 U	0.5 U	0.6 U				
Iron	20,900	16,900	36,500	31,500	122,000	26,100	40,900
Lead	59.1	21.8	73.4	38.7	2,540	27.9	210
Magnesium	655 J	538 J	1,130 J	1,110 J	3,600	677 J	1,930
Manganese	631	382	836	884	1,060	672	1,130
Mercury	0.26	0.45	0.7	0.35	4.5	0.13 K	0.57 K
Nickel	34.1	25	42.1	28.7	63.6	41.8	73.7
Potassium	417 J	312 J	906 J	939 J	1,120 J	419 J	1,080 J
Selenium	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	1.3 U	1.1 U
Silver	1.1 UL	1.9 L	1.2 UL	1.2 UL	43.1 L	1.3 UL	95.3 L
Sodium	73.8 J	60.8 U	80.2 J	68.3 U	155 J	120 J	268 J
Thallium	1.6 U	1.5 U	1.7 U	1.7 U	1.7 U	1.8 U	1.6 U
Vanadium	12.6	10.4 J	21.4	19.7	26.6	12.5 J	80.3
Zinc	148	131	212	127	999	149	1,080
Wet Chemistry (MG/KG)							
% Moisture	NA						
Total organic carbon (TOC)	7,500	NA	8,200	6,800	6,700	7,800	7,000
pH	NA	NA	NA	6.58	NA	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
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UJ - Undetected, limit estimated  
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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	-SB34		AS01-SB36		AS01-SB38		AS01-SB39		AS01-SB40		AS01-SB41			
Sample ID	AS01-SB34P-(1-2)		AS01-SB36-(1-2)		AS01-SB38-(1-2)		AS01-SB39-(1-2)		AS01-SB40-(1-2)		AS01-SB41-(1-2)			
Sample Date	10/25/01		10/25/01		10/26/01		10/26/01		10/23/01		10/24/01			
Chemical Name														
<b>Volatile Organic Compounds (UG/KG)</b>														
1,1,1-Trichloroethane		12 U		11 U		1.9 J		11 U		11 J		12 U		11 U
1,1,1,2-Tetrachloroethane		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,1,2-Trichloroethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,1-Dichloroethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,1-Dichloroethene		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,2,4-Trichlorobenzene		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
1,2-Dibromo-3-chloropropane		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
1,2-Dibromoethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,2-Dichlorobenzene		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
1,2-Dichloroethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,2-Dichloroethene (total)		NA		NA		NA		NA		NA		NA		NA
1,2-Dichloropropane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
1,3-Dichlorobenzene		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
1,4-Dichlorobenzene		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
2-Butanone		12 U		11 U		11 U		11 U		12 U		12 U		11 U
2-Hexanone		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
4-Methyl-2-pentanone		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
Acetone		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Benzene		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Bromodichloromethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Bromoform		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Bromomethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Carbon disulfide		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Carbon tetrachloride		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Chlorobenzene		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
Chloroethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Chloroform		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Chloromethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Cumene		12 U		11 U		11 U		11 U		12 UJ		12 U		11 U
Cyclohexane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Dibromochloromethane		12 U		11 U		11 U		11 U		12 U		12 U		11 U
Dichlorodifluoromethane (Freon-12)		12 U		11 U		11 U		11 U		12 U		12 U		11 U

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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	-SB34		AS01-SB36		AS01-SB38		AS01-SB39		AS01-SB40		AS01-SB41			
Sample ID	AS01-SB34P-(1-2)		AS01-SB36-(1-2)		AS01-SB38-(1-2)		AS01-SB39-(1-2)		AS01-SB40-(1-2)		AS01-SB41-(1-2)			
Sample Date	10/25/01		10/25/01		10/26/01		10/26/01		10/23/01		10/24/01			
Chemical Name														
Ethylbenzene	12	U	11	U	11	U	11	U	12	UJ	12	U	11	U
Methyl acetate	12	U	11	U	11	U	11	U	12	U	12	U	11	U
Methyl-tert-butyl ether (MTBE)	12	U	11	U	11	U	11	U	12	U	12	U	11	U
Methylcyclohexane	12	U	11	U	11	U	11	U	12	U	12	U	11	U
Methylene chloride	12	U	11	U	4.1	B	7	B	5	B	12	U	4	B
Styrene	12	U	11	U	11	U	11	U	12	UJ	12	U	11	U
Tetrachloroethene	12	U	11	U	11	U	11	U	12	UJ	8.9	J	11	U
Toluene	12	U	11	U	11	U	11	U	12	UJ	12	U	11	U
Trichloroethene	23		11	U	11	U	11	U	16,000		15		29	
Trichlorofluoromethane(Freon-11)	12	U	11	U	11	U	11	U	12	U	12	U	11	U
Vinyl acetate	NA		NA		NA		NA		NA		NA		NA	
Vinyl chloride	12	U	11	U	11	U	11	U	12	U	12	U	11	U
Xylene, total	12	U	11	U	11	U	11	U	12	UJ	12	U	11	U
cis-1,2-Dichloroethene	12	U	11	U	11	U	11	U	38		12	U	11	U
cis-1,3-Dichloropropene	12	U	11	U	11	U	11	U	12	U	12	U	11	U
o-Xylene	12	U	11	U	11	U	11	U	12	UJ	12	U	11	U
trans-1,2-Dichloroethene	12	U	11	U	11	U	11	U	12	U	12	U	11	U
trans-1,3-Dichloropropene	12	U	11	U	11	U	11	U	12	U	12	U	11	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>														
1,1-Biphenyl	390	UJ	360	UJ	370	U	340	U	46	J	69	J	49	J
2,4,5-Trichlorophenol	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U
2,4,6-Trichlorophenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
2,4-Dichlorophenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
2,4-Dimethylphenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
2,4-Dinitrophenol	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U
2-Chloronaphthalene	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
2-Chlorophenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
2-Methylnaphthalene	66	J	360	UJ	370	U	340	U	200	J	110	J	96	J
2-Methylphenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
2-Nitroaniline	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U
2-Nitrophenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
3,3'-Dichlorobenzidine	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
3- and 4-Methylphenol	390	UJ	360	UJ	370	U	340	U	380	U	64	J	350	U
3-Nitroaniline	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U

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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	SB34		AS01-SB36		AS01-SB38		AS01-SB39		AS01-SB40		AS01-SB41			
Sample ID	AS01-SB34P-(1-2)		AS01-SB36-(1-2)		AS01-SB38-(1-2)		AS01-SB38P-(1-2)		AS01-SB39-(1-2)		AS01-SB40-(1-2)		AS01-SB41-(1-2)	
Sample Date	10/25/01		10/25/01		10/26/01		10/26/01		10/23/01		10/24/01		10/24/01	
Chemical Name														
4,6-Dinitro-2-methylphenol	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U
4-Bromophenyl-phenylether	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
4-Chloro-3-methylphenol	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
4-Chloroaniline	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
4-Chlorophenyl-phenylether	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
4-Methylphenol	NA		NA		NA		NA		NA		NA		NA	
4-Nitroaniline	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U
4-Nitrophenol	980	UJ	890	UJ	930	U	840	U	960	U	920	U	870	U
Acenaphthene	390	UJ	360	UJ	370	U	340	U	380	U	66	J	41	J
Acenaphthylene	390	UJ	360	UJ	370	U	340	U	75	J	91	J	350	U
Acetophenone	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Anthracene	87	J	360	UJ	370	U	340	U	110	J	110	J	120	J
Atrazine	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Benzaldehyde	130	J	360	UJ	370	U	340	U	380	U	370	U	350	U
Benzo(a)anthracene	210	J	60	J	370	U	170	J	310	J	300	J	220	J
Benzo(a)pyrene	190	J	62	J	370	U	170	J	310	J	310	J	220	J
Benzo(b)fluoranthene	280	J	55	J	370	U	190	J	360	J	440		250	J
Benzo(g,h,i)perylene	96	J	41	J	370	U	97	J	140	J	140	J	110	J
Benzo(k)fluoranthene	200	J	62	J	370	U	180	J	370	J	380		190	J
Butylbenzylphthalate	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Caprolactam	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Carbazole	59	J	360	UJ	370	U	340	U	79	J	99	J	91	J
Chrysene	290	J	82	J	370	U	190	J	460		510		330	J
Di-n-butylphthalate	390	UJ	360	UJ	370	U	280	J	380	U	370	U	350	U
Di-n-octylphthalate	390	UJ	360	UJ	370	U	340	U	380	UJ	370	U	350	U
Dibenz(a,h)anthracene	390	UJ	360	UJ	370	U	340	U	380	UJ	370	U	350	U
Dibenzofuran	390	UJ	360	UJ	370	U	340	U	81	J	58	J	63	J
Diethylphthalate	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Dimethyl phthalate	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Fluoranthene	290	J	120	J	370	U	250	J	570		810		450	
Fluorene	47	J	360	UJ	370	U	340	U	53	J	82	J	70	J
Hexachlorobenzene	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Hexachlorobutadiene	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Hexachlorocyclopentadiene	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U
Hexachloroethane	390	UJ	360	UJ	370	U	340	U	380	U	370	U	350	U

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	-SB34	AS01-SB36	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41
Sample ID	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)	AS01-SB40-(1-2)	AS01-SB41-(1-2)
Sample Date	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01
Chemical Name							
Indeno(1,2,3-cd)pyrene	75 J	360 UJ	370 U	99 J	140 J	140 J	110 J
Isophorone	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
Naphthalene	46 J	360 UJ	370 U	340 U	140 J	84 J	98 J
Pentachlorophenol	980 UJ	890 UJ	930 U	840 U	960 U	920 U	870 U
Phenanthrene	350 J	86 J	370 U	89 J	590	710	520
Phenol	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
Pyrene	580 J	95 J	370 U	240 J	700	790	370
bis(2-Chloro-1-methylethyl) ether	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
bis(2-Chloroethoxy)methane	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
bis(2-Chloroethyl)ether	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
bis(2-Ethylhexyl)phthalate	90 J	360 UJ	60 B	7,000	150 B	84 J	350 U
n-Nitroso-di-n-propylamine	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
n-Nitrosodiphenylamine	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
Dioxin/Furans (UG/KG)							
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.262	0.142	0.00887	0.0103	NA	0.0594	0.0106
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.242	0.0254	0.00202	0.00191	NA	0.0223	0.00195
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0108	0.00214	8.40E-05 U	8.90E-05 U	NA	5.53E-04 U	1.39E-04 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0147	0.00273	2.47E-04 J	1.85E-04 U	NA	0.00166	2.50E-04
1,2,3,4,7,8-Hexachlorodibenzofuran	0.116	0.0101	9.24E-04	9.33E-04	NA	0.00602	9.82E-04
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0291	0.00678	4.58E-04	5.17E-04	NA	0.00318	3.70E-04
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0380	0.00191	2.22E-04 J	1.35E-04 U	NA	0.00563 J	5.52E-04 J
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0390	0.00618	6.80E-04 J	6.58E-04 J	NA	0.00241	6.45E-04
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00144	3.52E-04 U	9.60E-05 U	1.57E-04 U	NA	2.35E-04 U	8.40E-05 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00798	0.00107	8.50E-05 U	1.33E-04 U	NA	8.48E-04	7.80E-05 U
1,2,3,7,8-Pentachlorodibenzofuran	0.0201	0.00232	3.11E-04 J	3.34E-04	NA	0.00289	5.40E-04
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0447	0.00207	2.02E-04	1.54E-04 U	NA	0.00188	2.62E-04
2,3,4,7,8-Pentachlorodibenzofuran	0.0395	0.00311	3.32E-04 J	2.18E-04 U	NA	0.00307	4.61E-04
2,3,7,8-TCDD (dioxin)	0.00244	0.00381	1.20E-04 U	1.32E-04 U	NA	8.39E-04 U	9.60E-05 U
2,3,7,8-Tetrachlorodibenzofuran	0.0196 J	0.0314	8.26E-04 J	8.07E-04 J	NA	0.00448 J	0.00186
Octachlorodibenzo-p-dioxin	1.08	2.02	0.202	0.173	NA	0.731	0.479
Octachlorodibenzofuran	0.103	0.0541	0.00354	0.00267	NA	0.0442	0.00468
Total heptachlorodibenzo-p-dioxin	0.582	0.341	0.0192	0.0189	NA	0.113	0.0221
Total heptachlorodibenzofuran	0.286	0.0622	0.00483	0.00427	NA	0.0506	0.00424
Total hexachlorodibenzo-p-dioxin	0.987	0.0689	0.00396	0.00351	NA	0.0254	0.00254

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 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	SB34	AS01-SB36	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41
Sample ID	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)	AS01-SB40-(1-2)	AS01-SB41-(1-2)
Sample Date	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01
Chemical Name							
Total hexachlorodibenzofuran	0.380	0.0557	0.00348	0.00359	NA	0.0304	0.00271
Total pentachlorodibenzo-p-dioxin	0.262	0.00746	8.50E-05 U	1.33E-04 U	NA	0.00427	7.80E-05 U
Total pentachlorodibenzofuran	0.481	0.0332	0.00141	0.00114	NA	0.0216	0.00313
Total tetrachlorodibenzo-p-dioxin	0.362	0.0435	1.20E-04 U	6.66E-04	NA	0.0110	0.00179
Total tetrachlorodibenzofuran	0.440	0.0826	0.00275	0.00379	NA	0.0268	0.00617
Explosives (UG/KG)							
1,3,5-Trinitrobenzene	600 U	540 U	560 U	560 U	NA	580 U	570 U
1,3-Dinitrobenzene	600 U	540 U	560 U	560 U	NA	580 U	570 U
2,4,6-Trinitrotoluene	600 U	540 U	560 U	560 U	NA	580 U	570 U
2,4-Dinitrotoluene	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
2,6-Dinitrotoluene	390 UJ	360 UJ	370 U	340 U	380 U	370 U	350 U
2-Amino-4,6-dinitrotoluene	600 U	540 U	560 U	560 U	NA	580 U	570 U
2-Nitrotoluene	600 U	540 U	560 U	560 U	NA	580 U	570 U
3-Nitrotoluene	600 U	540 U	560 U	560 U	NA	580 U	570 U
4-Amino-2,6-dinitrotoluene	600 U	540 U	560 U	560 U	NA	580 U	570 U
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA
HMX	600 U	540 U	560 U	560 U	NA	580 U	570 U
Nitrobenzene	600 U	540 R	560 R	340 U	380 U	580 U	570 R
Nitroglycerin	60,000 U	54,000 U	56,000 U	56,000 U	NA	58,000 U	57,000 U
Nitroguanidine	120,000 U	110,000 U	110,000 U	110,000 U	NA	120,000 U	110,000 U
PETN	60,000 U	54,000 U	56,000 U	56,000 U	NA	58,000 U	57,000 U
Perchlorate	60 U	50 U	60 U	60 U	NA	60 U	60 U
RDX	600 U	540 U	560 U	560 U	NA	580 U	570 U
Tetryl	600 U	540 U	560 U	560 U	NA	580 U	570 U
Total Metals (MG/KG)							
Aluminum	6,460	4,080	7,650	7,120	8,630	5,870	5,820
Antimony	2.2 U	2 U	2 U	2.1 U	2.2 U	2.1 U	2.1 U
Arsenic	15	10	10.7	9	21.5	10	14.2
Barium	167	93.9	152	163	228	153	124
Beryllium	1.8 J	0.89 J	1 J	0.99 J	1.9 J	1 J	1.2
Cadmium	0.76 J	1.3	0.66 U	0.67 U	0.8 J	0.69 U	0.68 U
Calcium	3,660 J	2,410 J	1,410	1,710	5,330	12,400	3,670
Chromium	14 J	12.5 J	14	12.6	23.9	13.1 J	11.9 J

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	SB34	AS01-SB36	AS01-SB38		AS01-SB39	AS01-SB40	AS01-SB41
Sample ID	AS01-SB34P-(1-2)	AS01-SB36-(1-2)	AS01-SB38-(1-2)	AS01-SB38P-(1-2)	AS01-SB39-(1-2)	AS01-SB40-(1-2)	AS01-SB41-(1-2)
Sample Date	10/25/01	10/25/01	10/26/01	10/26/01	10/23/01	10/24/01	10/24/01
Chemical Name							
Cobalt	40.7	15.6	15.2	13.8	28.4	19.6	21
Copper	82.9	46.5	22.4	23.1	72	32	38.7
Cyanide	0.6 U	0.5 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Iron	29,600	24,400	28,300	24,100	34,200	21,000	26,800
Lead	53.2	44.3	18.8	28.2	88.6	56.2	44.8
Magnesium	937 J	780 J	1,080 J	1,070 J	1,060 J	2,350	865 J
Manganese	1,450	585	843	831	791	829	666
Mercury	0.52 K	0.14 K	0.1 U	0.11 U	0.79	0.36	0.26
Nickel	53.8	22.9	18	18.8	43.1	25.1	30.9
Potassium	664 J	519 J	889 J	926 J	936 J	788 J	830 J
Selenium	1.2 U	1.1 U	1.1 U	1.1 U	1.3	1.2 U	1.1 U
Silver	9.3 L	6 L	1.1 UL	1.1 UL	1.2 UL	1.2 UL	1.1 UL
Sodium	96.7 J	106 J	62.7 U	64 U	92.9 J	115 J	70.8 J
Thallium	1.7 U	1.6 U	1.6 U	1.6 U	1.7 U	1.7 U	1.6 U
Vanadium	22.6	13.5	19.1	19.5	20.7	13.5	15.2
Zinc	290	220	76.5	78.1	226	110	160
Wet Chemistry (MG/KG)							
% Moisture	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	6,100	8,000	6,000	9,500	7,300	7,300	8,000
pH	NA	NA	NA	NA	NA	NA	NA

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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB71		AS01-SB72		AS01-SB73		AS01-SB74		B1-003		B1-011	B1-CS
Sample ID	AS01-SB71-1.5-2		AS01-SB72-4.5-5		AS01-SB73-1.5-2		AS01-SB74-4-4.5		HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS
Sample Date	09/23/04		09/23/04		09/23/04		09/23/04		07/17/92	07/17/92	07/17/92	06/20/94
Chemical Name												
<b>Volatile Organic Compounds (UG/KG)</b>												
1,1,1-Trichloroethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,1,2-Trichloroethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,1-Dichloroethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,1-Dichloroethene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,2,4-Trichlorobenzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	380 U
1,2-Dibromo-3-chloropropane	14	U	4,300	R	12,000	R	15	U	NA	NA	NA	NA
1,2-Dibromoethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,2-Dichlorobenzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	380 U
1,2-Dichloroethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,2-Dichloroethene (total)	NA		NA		NA		NA		NA	NA	NA	NA
1,2-Dichloropropane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
1,3-Dichlorobenzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	380 U
1,4-Dichlorobenzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	380 U
2-Butanone	14	U	4,300	UL	12,000	UL	2	J	NA	NA	NA	NA
2-Hexanone	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
4-Methyl-2-pentanone	14	U	4,300	UL	12,000	UL	3.7	J	NA	NA	NA	NA
Acetone	2.6	B	4,300	UL	1,800	B	16	B	NA	NA	NA	NA
Benzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Bromodichloromethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Bromoform	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Bromomethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Carbon disulfide	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Carbon tetrachloride	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Chlorobenzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Chloroethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Chloroform	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Chloromethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Cumene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Cyclohexane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Dibromochloromethane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Dichlorodifluoromethane (Freon-12)	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB71		AS01-SB72		AS01-SB73		AS01-SB74		B1-003		B1-011	B1-CS
Sample ID	AS01-SB71-1.5-2		AS01-SB72-4.5-5		AS01-SB73-1.5-2		AS01-SB74-4-4.5		HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS
Sample Date	09/23/04		09/23/04		09/23/04		09/23/04		07/17/92	07/17/92	07/17/92	06/20/94
Chemical Name												
Ethylbenzene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Methyl acetate	14	U	2,800	L	12,000	UL	15	U	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Methylcyclohexane	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Methylene chloride	7.8	B	2,700	B	7,400	B	12	B	NA	NA	NA	NA
Styrene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Tetrachloroethene	26		11,000	L	12,000	UL	3.3	J	NA	NA	NA	NA
Toluene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Trichloroethene	13	J	77,000	L	170,000	L	57		NA	NA	NA	NA
Trichlorofluoromethane(Freon-11)	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Vinyl acetate	NA		NA		NA		NA		NA	NA	NA	NA
Vinyl chloride	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
Xylene, total	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
cis-1,2-Dichloroethene	14	U	2,600	L	12,000	UL	15	U	NA	NA	NA	NA
cis-1,3-Dichloropropene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
o-Xylene	NA		NA		NA		NA		NA	NA	NA	NA
trans-1,2-Dichloroethene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
trans-1,3-Dichloropropene	14	U	4,300	UL	12,000	UL	15	U	NA	NA	NA	NA
<b>Semi-volatile Organic Compounds (UG/KG)</b>												
1,1-Biphenyl	440	U	470	U	400	U	460	U	NA	NA	NA	NA
2,4,5-Trichlorophenol	1,100	U	1,200	U	1,000	U	1,200	U	NA	NA	NA	920 U
2,4,6-Trichlorophenol	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2,4-Dichlorophenol	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2,4-Dimethylphenol	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2,4-Dinitrophenol	1,100	U	1,200	U	1,000	U	1,200	U	NA	NA	NA	920 U
2-Chloronaphthalene	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2-Chlorophenol	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2-Methylnaphthalene	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2-Methylphenol	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
2-Nitroaniline	1,100	U	1,200	U	1,000	U	1,200	U	NA	NA	NA	920 U
2-Nitrophenol	440	U	470	U	400	U	460	U	NA	NA	NA	380 U
3,3'-Dichlorobenzidine	440	U	470	U	400	U	460	U	NA	NA	NA	380 UJ
3- and 4-Methylphenol	NA		NA		NA		NA		NA	NA	NA	NA
3-Nitroaniline	1,100	U	1,200	U	1,000	U	1,200	U	NA	NA	NA	920 UJ

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74	B1-003		B1-011	B1-CS
Sample ID	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5	HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS
Sample Date	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92	07/17/92	07/17/92	06/20/94
Chemical Name								
4,6-Dinitro-2-methylphenol	1,100 U	1,200 U	1,000 U	1,200 U	NA	NA	NA	920 U
4-Bromophenyl-phenylether	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
4-Chloro-3-methylphenol	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
4-Chloroaniline	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
4-Chlorophenyl-phenylether	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
4-Methylphenol	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
4-Nitroaniline	1,100 U	1,200 U	1,000 U	1,200 U	NA	NA	NA	920 U
4-Nitrophenol	1,100 U	1,200 U	1,000 U	1,200 U	NA	NA	NA	920 U
Acenaphthene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Acenaphthylene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Acetophenone	440 U	51 J	400 U	460 U	NA	NA	NA	NA
Anthracene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Atrazine	440 U	470 U	400 U	460 U	NA	NA	NA	NA
Benzaldehyde	440 U	470 U	400 U	460 U	NA	NA	NA	NA
Benzo(a)anthracene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Benzo(a)pyrene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Benzo(b)fluoranthene	51 J	470 U	400 U	460 U	NA	NA	NA	380 U
Benzo(g,h,i)perylene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Benzo(k)fluoranthene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Butylbenzylphthalate	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Caprolactam	66 J	470 U	400 U	460 U	NA	NA	NA	NA
Carbazole	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Chrysene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Di-n-butylphthalate	440 U	170 J	400 U	460 U	NA	NA	NA	380 U
Di-n-octylphthalate	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Dibenz(a,h)anthracene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Dibenzofuran	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Diethylphthalate	440 U	3,400	400 U	460 U	NA	NA	NA	51 J
Dimethyl phthalate	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Fluoranthene	71 J	470 U	400 U	460 U	NA	NA	NA	380 U
Fluorene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Hexachlorobenzene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Hexachlorobutadiene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Hexachlorocyclopentadiene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Hexachloroethane	440 U	470 U	400 U	460 U	NA	NA	NA	380 U

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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74	B1-003		B1-011	B1-CS
Sample ID	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5	HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS
Sample Date	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92	07/17/92	07/17/92	06/20/94
Chemical Name								
Indeno(1,2,3-cd)pyrene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Isophorone	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Naphthalene	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Pentachlorophenol	1,100 U	1,200 U	1,000 U	1,200 U	NA	NA	NA	920 U
Phenanthrene	54 J	470 U	400 U	460 U	NA	NA	NA	380 U
Phenol	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Pyrene	48 J	470 U	400 U	460 U	NA	NA	NA	380 U
bis(2-Chloro-1-methylethyl) ether	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
bis(2-Chloroethoxy)methane	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
bis(2-Chloroethyl)ether	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
bis(2-Ethylhexyl)phthalate	440 U	120 B	75 B	57 B	NA	NA	NA	380 U
n-Nitroso-di-n-propylamine	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
n-Nitrosodiphenylamine	440 U	470 U	400 U	460 U	NA	NA	NA	380 U
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0093	0.33	0.014	0.011	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0022 U	0.72	0.0022 U	0.052	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.00E-03 U	0.085	4.50E-04 U	1.00E-03 U	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0012 U	0.025	0.0013 U	0.0011 U	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	9.80E-04 U	0.21	0.0012 U	0.011	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1.00E-03 U	0.045	0.0012 U	0.0014 U	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	9.20E-04 U	0.18	0.0011 U	0.0058 J	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1.00E-03 U	0.039	0.0012 U	0.002 U	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	9.80E-04 U	0.0092	0.0011 U	0.0014 U	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0022 U	0.031	0.0015 U	0.0017 U	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	8.00E-04 U	0.15	7.90E-04 U	0.0037 J	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	6.80E-04 U	0.14	8.30E-04 U	0.0049 J	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	9.10E-04 U	0.16	9.00E-04 U	0.0057 J	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	5.20E-04 U	0.0088	5.70E-04 U	9.60E-04 U	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	8.60E-04 J	0.16	0.0018	0.0054	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	0.4	1	0.58	0.067	NA	NA	NA	NA
Octachlorodibenzofuran	0.0076 J	0.62	0.0079 J	0.021	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	0.021	0.62	0.03	0.023	NA	NA	NA	NA
Total heptachlorodibenzofuran	0.0022 U	1.1	0.0029 U	0.064	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	0.0015 U	0.56	0.0013 U	0.012	NA	NA	NA	NA

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74	B1-003		B1-011	B1-CS
Sample ID	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5	HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS
Sample Date	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92	07/17/92	07/17/92	06/20/94
Chemical Name								
Total hexachlorodibenzofuran	0.0013 U	1.3	0.0012 U	0.054	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	0.0022 U	0.35	0.0015 U	0.0047	NA	NA	NA	NA
Total pentachlorodibenzofuran	0.0018 U	1.4	0.0016 U	0.051	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	5.20E-04 U	0.3	5.70E-04 U	0.0064	NA	NA	NA	NA
Total tetrachlorodibenzofuran	8.60E-04	1.7	0.012	0.093	NA	NA	NA	NA
Explosives (UG/KG)								
1,3,5-Trinitrobenzene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
1,3-Dinitrobenzene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
2,4,6-Trinitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
2,4-Dinitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	380 U
2,6-Dinitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	380 U
2-Amino-4,6-dinitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
2-Nitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
3-Nitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
4-Nitrotoluene	250 U	2,500 U	250 U	250 U	NA	NA	NA	NA
HMX	1,500	75,000	76 J	100 J	NA	NA	NA	NA
Nitrobenzene	250 U	2,500 U	250 U	250 U	NA	NA	NA	380 U
Nitroglycerin	2,500 UJ	30,000 J	2,500 UJ	2,500 UJ	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA
PETN	2,500 U	25,000 U	2,500 U	2,500 U	NA	NA	NA	NA
Perchlorate	53.6 U	199	48.1 U	55.8 U	NA	NA	NA	NA
RDX	140 J	1,800 J	500 U	500 U	NA	NA	NA	NA
Tetryl	650 U	6,500 U	650 U	650 U	NA	NA	NA	NA
Total Metals (MG/KG)								
Aluminum	6,380	66,300	6,670	39,900	8,120 J	18,800 J	19,900 J	NA
Antimony	0.72 UL	2.5 L	0.65 UL	1.4 L	2.80 J	2.90 J	12.9 J	NA
Arsenic	7	3.9	7.1	7	4.5	4.5 J	12.8 J	NA
Barium	96.5	307	128	72.2	109	138	1,510	NA
Beryllium	0.89 B	0.46 B	0.98 B	1 B	0.900	0.870	0.860	NA
Cadmium	0.44 J	143	0.35 B	11.6	0.670 J	3.40 J	46.8 J	NA
Calcium	6,800	5,040	1,620	10,500	2,480	2,980	20,400	NA
Chromium	14.2	38.1	12.6	282	13.2 J	46.9 J	99.8 J	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	AS01-SB71	AS01-SB72	AS01-SB73	AS01-SB74	B1-003		B1-011	B1-CS
Sample ID	AS01-SB71-1.5-2	AS01-SB72-4.5-5	AS01-SB73-1.5-2	AS01-SB74-4-4.5	HCS-B1-3-1	HCS-B1-3-1/DUP	HCS-B1-11-2	HCS-B1-CS
Sample Date	09/23/04	09/23/04	09/23/04	09/23/04	07/17/92	07/17/92	07/17/92	06/20/94
Chemical Name								
Cobalt	13.4 J	20.2	15	53.9	14.3	14.5	26.8	NA
Copper	22.5 L	436 L	21.8 L	13,600 L	28.8 J	79.9 J	1,390 J	NA
Cyanide	0.67 UL	0.79 L	0.6 UL	0.7 UL	NA	NA	NA	NA
Iron	23,600	29,800	27,700	33,500	27,500	28,400	81,100	NA
Lead	39.2 J	810 J	20.5 J	865 J	6.5 J	173	993	NA
Magnesium	1,530	4,310	1,030 J	30,400	1,600	1,630	9,160	NA
Manganese	558	462	747	822	686	597	1,920	NA
Mercury	0.27	22.7	0.17 L	0.17 L	0.230	0.280	4.60	NA
Nickel	20.8	38.7	22.5	347	19.4	25.7	102	NA
Potassium	1,010 J	722 J	747 J	862 J	911	882	1,750	NA
Selenium	1 L	0.95 L	0.6 L	1.2 L	0.420 UJ	0.550 J	0.710 J	NA
Silver	0.69 J	13.3	0.38 J	19.5	0.420	1.10	104	NA
Sodium	68.6 U	603 J	61.6 U	225 B	210 UJ	251 UJ	1,290 B	NA
Thallium	1.3 U	1.4 U	1.2 U	1.3 U	0.470 U	0.490	0.560 U	NA
Vanadium	14.2	14.3	16.5	53.4	17.6	17.9	97.5	NA
Zinc	78.9 K	2,060 K	79.2 K	1,010 K	95 J	383 J	3,350 J	NA
Wet Chemistry (MG/KG)								
% Moisture	25.3	29.6	16.9	28.4	NA	NA	NA	NA
Total organic carbon (TOC)	12,000	28,000	11,000	2,800	NA	NA	NA	NA
pH	7.4	6.8	6.9	7.8	NA	NA	NA	NA

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 J - Estimated value  
 K - Value biased high  
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R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-003	BG-015	BG-084/084S/106		BG-099		BG-102/102S	BG-110/110S	
Sample ID	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84	HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,1,2,2-Tetrachloroethane	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,1-Dichloroethane	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,1-Dichloroethene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,2-Dichloroethene (total)	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	260 J	27,000	33 J
1,2-Dichloropropane	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	12 UJ	11 UJ	1,500 U	12 U	13 UJ	13 U	1,800 U	1,400 J	13 UJ
2-Hexanone	12 UJ	11 UJ	1,500 U	12 U	13 UJ	13 U	1,800 U	1,600 U	13 UJ
4-Methyl-2-pentanone	12 UJ	11 UJ	1,500 U	12 U	13 UJ	13 U	1,800 U	1,600 U	13 UJ
Acetone	12 UJ	11 UJ	430 J	12 U	13 UJ	13 U	1,800 U	1,600 U	13 UJ
Benzene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Bromodichloromethane	6 UJ	6 UJ	750 UJ	6 U	6 UJ	6 U	880 UJ	820 UJ	7 UJ
Bromoform	6 UJ	6 UJ	750 UJ	6 U	6 UJ	6 U	880 UJ	820 UJ	7 UJ
Bromomethane	12 UJ	11 UJ	1,500 UJ	12 UJ	13 UJ	13 U	1,800 UJ	1,600 UJ	13 UJ
Carbon disulfide	6 UJ	2 J	750 U	6 U	3 J	6 U	880 U	820 U	6 J
Carbon tetrachloride	6 UJ	6 UJ	750 UJ	6 U	6 UJ	6 U	880 UJ	820 UJ	7 UJ
Chlorobenzene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Chloroethane	12 UJ	11 UJ	1,500 U	12 UJ	13 UJ	13 U	1,800 U	1,600 U	13 UJ
Chloroform	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Chloromethane	12 UJ	11 UJ	1,500 U	12 U	13 UJ	13 U	1,800 U	1,600 U	13 UJ
Cumene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	6 UJ	6 UJ	750 UJ	6 U	6 UJ	6 U	880 UJ	820 UJ	7 UJ
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-003	BG-015	BG-084/084S/106		BG-099		BG-102/102S	BG-110/110S	
Sample ID	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84	HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
Ethylbenzene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	17 UJ	22 UJ	1,500 UJ	12 UJ	20 UJ	14 B	1,800 UJ	1,600 UJ	31 UJ
Styrene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Tetrachloroethene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	1,400	820 U	7 UJ
Toluene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Trichloroethene	8 J	26 J	2,500 J	100 J	8 J	5 J	25,000 J	34,000	56 J
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	12 UJ	11 UJ	1,500 U	12 U	13 UJ	13 U	1,800 U	1,600 U	13 UJ
Vinyl chloride	12 UJ	11 UJ	1,500 U	12 U	13 UJ	13 U	1,800 U	1,600 U	13 UJ
Xylene, total	2 J	2 J	750 U	6 U	6 UJ	6 U	880 U	820 U	6 J
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	6 UJ	6 UJ	750 U	6 U	6 UJ	6 U	880 U	820 U	7 UJ
Semi-volatile Organic Compounds (UG/KG)									
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-003	BG-015	BG-084/084S/106		BG-099		BG-102/102S	BG-110/110S	
Sample ID	HCS-BG-3	HCS-BG-15	HCS-BG-106	HCS-BG-84	HCS-BG-99	HCS-BG-99R	HCS-BG-102	HCS-BG-110	HCS-BG-112
Sample Date	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92	07/13/92
Chemical Name									
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-112		BG-113	BG-134	BG-135	BG-136	BG-137	BG-138	
Sample ID	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP
Sample Date	07/13/92	07/13/92	07/13/92	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name									
<b>Volatile Organic Compounds (UG/KG)</b>									
1,1,1-Trichloroethane	7 U	7 UJ	410 J	440 J	11 UJ	56 U	190 J	460 J	470 J
1,1,2,2-Tetrachloroethane	7 U	7 UJ	880 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
1,1-Dichloroethane	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
1,1-Dichloroethene	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
1,2-Dichloroethene (total)	7 U	7 UJ	880 U	2,300	11 U	11 J	12 UJ	1,300 J	1,200 J
1,2-Dichloropropane	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	13 U	13 UJ	1,800 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
2-Hexanone	13 UJ	13 UJ	1,800 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
4-Methyl-2-pentanone	13 U	13 UJ	1,800 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
Acetone	13 UJ	24 J	820 J	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Benzene	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Bromodichloromethane	7 U	7 UJ	880 UJ	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Bromoform	7 U	7 UJ	880 UJ	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Bromomethane	13 U	13 UJ	1,800 UJ	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Carbon disulfide	2 J	2 J	880 U	1,500 U	11 U	56 R	12 UJ	1,700 U	1,600 U
Carbon tetrachloride	7 U	7 UJ	880 UJ	1,500 U	11 U	56 U	12 U	1,700 U	1,600 U
Chlorobenzene	7 U	7 UJ	880 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
Chloroethane	13 U	13 UJ	1,800 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Chloroform	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Chloromethane	13 UJ	13 UJ	1,800 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Cumene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	7 U	7 UJ	880 UJ	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
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 J - Estimated value  
 K - Value biased high  
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 U - Undetected  
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 UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-112		BG-113	BG-134	BG-135	BG-136	BG-137	BG-138	
Sample ID	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP
Sample Date	07/13/92	07/13/92	07/13/92	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name									
Ethylbenzene	7 U	7 UJ	880 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
Methyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	17 UJ	29 UJ	1,800 UJ	1,500 U	11 U	57 U	12 UJ	1,700 U	1,600 U
Styrene	7 U	7 UJ	880 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
Tetrachloroethene	7 U	7 UJ	880 U	1,500 U	2 J	56 U	12 UJ	1,700 U	1,600 U
Toluene	7 U	7 UJ	880 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
Trichloroethene	11 J	14 J	94,000	230,000	73	730	7 J	140,000	120,000
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	13 UJ	13 UJ	1,800 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	13 U	13 UJ	1,800 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
Xylene, total	7 U	7 UJ	880 U	1,500 U	11 UJ	56 U	12 UJ	1,700 U	1,600 U
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	7 U	7 UJ	880 U	1,500 U	11 U	56 U	12 UJ	1,700 U	1,600 U
<b>Semi-volatile Organic Compounds (UG/KG)</b>									
1,1-Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-112		BG-113	BG-134	BG-135	BG-136	BG-137	BG-138	
Sample ID	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP
Sample Date	07/13/92	07/13/92	07/13/92	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name									
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-112		BG-113	BG-134	BG-135	BG-136	BG-137	BG-138	
Sample ID	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP
Sample Date	07/13/92	07/13/92	07/13/92	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name									
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA	NA
Explosives (UG/KG)									
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
HMX	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA	NA	NA	NA	NA	NA
PETN	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Metals (MG/KG)									
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-112		BG-113	BG-134	BG-135	BG-136	BG-137	BG-138	
Sample ID	HCS-BG-112/DUP	HCS-BG-112R	HCS-BG-113	HCS-BG-134	HCS-BG-135	HCS-BG-136	HCS-BG-137	HCS-BG-138	HCS-BG-138/DUP
Sample Date	07/13/92	07/13/92	07/13/92	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name									
Cobalt	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
Wet Chemistry (MG/KG)									
% Moisture	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-139	BG-140	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148
Sample ID	HCS-BG-139	HCS-BG-140	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148
Sample Date	11/15/94	11/15/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	1,800 U	3 J	2 J	30 J	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
1,1,2,2-Tetrachloroethane	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA									
1,1,2-Trichloroethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
1,1-Dichloroethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
1,1-Dichloroethene	1,800 U	4 J	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
1,2,4-Trichlorobenzene	NA									
1,2-Dibromo-3-chloropropane	NA									
1,2-Dibromoethane	NA									
1,2-Dichlorobenzene	NA									
1,2-Dichloroethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
1,2-Dichloroethene (total)	1,800 U	2 J	12 UJ	12 J	12 U	12 U	1 J	1,600 U	840 J	24,000
1,2-Dichloropropane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
1,3-Dichlorobenzene	NA									
1,4-Dichlorobenzene	NA									
2-Butanone	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
2-Hexanone	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
4-Methyl-2-pentanone	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
Acetone	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12	1,600 U	1,800 U	1,600 U
Benzene	1,800 U	5 J	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Bromodichloromethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Bromoform	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Bromomethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Carbon disulfide	1,800 U	12 UJ	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Carbon tetrachloride	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Chlorobenzene	1,800 U	2 J	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
Chloroethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Chloroform	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Chloromethane	570 J	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Cumene	NA									
Cyclohexane	NA									
Dibromochloromethane	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Dichlorodifluoromethane (Freon-12)	NA									

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-139	BG-140	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148
Sample ID	HCS-BG-139	HCS-BG-140	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148
Sample Date	11/15/94	11/15/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
Ethylbenzene	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
Methyl acetate	NA									
Methyl-tert-butyl ether (MTBE)	NA									
Methylcyclohexane	NA									
Methylene chloride	1,800 U	12 U	17 J	8 J	2 J	12 U	12 U	1,600 U	1,800 U	1,600 U
Styrene	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
Tetrachloroethene	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	2,200	480 J	160 J
Toluene	1,800 U	2 J	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	210 J
Trichloroethene	4,400	41	5 J	160 J	15	28	12	20,000	53,000	64,000
Trichlorofluoromethane(Freon-11)	NA									
Vinyl acetate	NA									
Vinyl chloride	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Xylene, total	1,800 U	12 UJ	12 UJ	12 UJ	12 UJ	12 U	12 U	1,600 U	1,800 U	1,600 U
cis-1,2-Dichloroethene	NA									
cis-1,3-Dichloropropene	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
o-Xylene	NA									
trans-1,2-Dichloroethene	NA									
trans-1,3-Dichloropropene	1,800 U	12 U	12 UJ	12 UJ	12 U	12 U	12 U	1,600 U	1,800 U	1,600 U
Semi-volatile Organic Compounds (UG/KG)										
1,1-Biphenyl	NA									
2,4,5-Trichlorophenol	NA									
2,4,6-Trichlorophenol	NA									
2,4-Dichlorophenol	NA									
2,4-Dimethylphenol	NA									
2,4-Dinitrophenol	NA									
2-Chloronaphthalene	NA									
2-Chlorophenol	NA									
2-Methylnaphthalene	NA									
2-Methylphenol	NA									
2-Nitroaniline	NA									
2-Nitrophenol	NA									
3,3'-Dichlorobenzidine	NA									
3- and 4-Methylphenol	NA									
3-Nitroaniline	NA									

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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-139	BG-140	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148
Sample ID	HCS-BG-139	HCS-BG-140	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148
Sample Date	11/15/94	11/15/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
4,6-Dinitro-2-methylphenol	NA									
4-Bromophenyl-phenylether	NA									
4-Chloro-3-methylphenol	NA									
4-Chloroaniline	NA									
4-Chlorophenyl-phenylether	NA									
4-Methylphenol	NA									
4-Nitroaniline	NA									
4-Nitrophenol	NA									
Acenaphthene	NA									
Acenaphthylene	NA									
Acetophenone	NA									
Anthracene	NA									
Atrazine	NA									
Benzaldehyde	NA									
Benzo(a)anthracene	NA									
Benzo(a)pyrene	NA									
Benzo(b)fluoranthene	NA									
Benzo(g,h,i)perylene	NA									
Benzo(k)fluoranthene	NA									
Butylbenzylphthalate	NA									
Caprolactam	NA									
Carbazole	NA									
Chrysene	NA									
Di-n-butylphthalate	NA									
Di-n-octylphthalate	NA									
Dibenz(a,h)anthracene	NA									
Dibenzofuran	NA									
Diethylphthalate	NA									
Dimethyl phthalate	NA									
Fluoranthene	NA									
Fluorene	NA									
Hexachlorobenzene	NA									
Hexachlorobutadiene	NA									
Hexachlorocyclopentadiene	NA									
Hexachloroethane	NA									

NA - Not analyzed  
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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-139	BG-140	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148
Sample ID	HCS-BG-139	HCS-BG-140	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148
Sample Date	11/15/94	11/15/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
Total hexachlorodibenzofuran	NA									
Total pentachlorodibenzo-p-dioxin	NA									
Total pentachlorodibenzofuran	NA									
Total tetrachlorodibenzo-p-dioxin	NA									
Total tetrachlorodibenzofuran	NA									
Explosives (UG/KG)										
1,3,5-Trinitrobenzene	NA									
1,3-Dinitrobenzene	NA									
2,4,6-Trinitrotoluene	NA									
2,4-Dinitrotoluene	NA									
2,6-Dinitrotoluene	NA									
2-Amino-4,6-dinitrotoluene	NA									
2-Nitrotoluene	NA									
3-Nitrotoluene	NA									
4-Amino-2,6-dinitrotoluene	NA									
4-Nitrotoluene	NA									
HMX	NA									
Nitrobenzene	NA									
Nitroglycerin	NA									
Nitroguanidine	NA									
PETN	NA									
Perchlorate	NA									
RDX	NA									
Tetryl	NA									
Total Metals (MG/KG)										
Aluminum	NA									
Antimony	NA									
Arsenic	NA									
Barium	NA									
Beryllium	NA									
Cadmium	NA									
Calcium	NA									
Chromium	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-139	BG-140	BG-141	BG-142	BG-143	BG-144	BG-145	BG-146	BG-147	BG-148
Sample ID	HCS-BG-139	HCS-BG-140	HCS-BG-141	HCS-BG-142	HCS-BG-143	HCS-BG-144	HCS-BG-145	HCS-BG-146	HCS-BG-147	HCS-BG-148
Sample Date	11/15/94	11/15/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94	11/16/94
Chemical Name										
Cobalt	NA									
Copper	NA									
Cyanide	NA									
Iron	NA									
Lead	NA									
Magnesium	NA									
Manganese	NA									
Mercury	NA									
Nickel	NA									
Potassium	NA									
Selenium	NA									
Silver	NA									
Sodium	NA									
Thallium	NA									
Vanadium	NA									
Zinc	NA									
Wet Chemistry (MG/KG)										
% Moisture	NA									
Total organic carbon (TOC)	NA									
pH	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-149	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID	HCS-BG-149	HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date	11/16/94	11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	1,500 U	1,500 U	12 U	11 U						
1,1,2,2-Tetrachloroethane	1,500 U	1,500 U	12 U	11 U						
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA									
1,1,2-Trichloroethane	1,500 U	1,500 U	12 U	11 U						
1,1-Dichloroethane	1,500 U	1,500 U	12 U	11 U						
1,1-Dichloroethene	1,500 U	1,500 U	12 U	11 U						
1,2,4-Trichlorobenzene	NA	360 U	NA							
1,2-Dibromo-3-chloropropane	NA									
1,2-Dibromoethane	NA									
1,2-Dichlorobenzene	NA	360 U	NA							
1,2-Dichloroethane	1,500 U	1,500 U	12 U	11 U						
1,2-Dichloroethene (total)	1,500 U	1,500 U	12 U	11 U	11 U	52	11 U	7,100	11 U	11 U
1,2-Dichloropropane	1,500 U	1,500 U	12 U	11 U						
1,3-Dichlorobenzene	NA	360 U	NA							
1,4-Dichlorobenzene	NA	360 U	NA							
2-Butanone	1,500 U	1,500 U	12 U	11 U						
2-Hexanone	1,500 U	1,500 U	12 U	11 U						
4-Methyl-2-pentanone	1,500 U	1,500 U	12 U	11 U						
Acetone	1,500 U	1,500 U	12 U	11 U	11 U	11 U	3 J	11 U	11 U	11 U
Benzene	1,500 U	1,500 U	12 U	11 U						
Bromodichloromethane	1,500 U	1,500 U	12 U	11 U						
Bromoform	1,500 U	1,500 U	12 U	11 U						
Bromomethane	1,500 U	1,500 U	3 J	11 U						
Carbon disulfide	1,500 U	1,500 U	12 U	11 U						
Carbon tetrachloride	1,500 U	1,500 U	12 U	11 U						
Chlorobenzene	1,500 U	1,500 U	12 U	11 U						
Chloroethane	1,500 U	1,500 U	12 U	11 U						
Chloroform	1,500 U	1,500 U	12 U	11 U						
Chloromethane	1,500 U	1,300 J	12 U	11 U						
Cumene	NA									
Cyclohexane	NA									
Dibromochloromethane	1,500 U	1,500 U	12 U	11 U						
Dichlorodifluoromethane (Freon-12)	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-149	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID	HCS-BG-149	HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date	11/16/94	11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Ethylbenzene	1,500 U	1,500 U	12 U	11 U						
Methyl acetate	NA									
Methyl-tert-butyl ether (MTBE)	NA									
Methylcyclohexane	NA									
Methylene chloride	1,500 U	1,500 U	12 U	11 U	3 J	6 J	4 J	11 U	11 U	11 U
Styrene	1,500 U	1,500 U	12 U	11 U						
Tetrachloroethene	1,500 U	1,500 U	1 J	11 U						
Toluene	1,500 U	1,500 U	12 U	11 U						
Trichloroethene	6,400	17,000	12 U	11 U	11 U	900	11 U	46,000	21	57
Trichlorofluoromethane(Freon-11)	NA									
Vinyl acetate	NA									
Vinyl chloride	1,500 U	1,500 U	12 U	11 U						
Xylene, total	1,500 U	1,500 U	12 U	11 U						
cis-1,2-Dichloroethene	NA									
cis-1,3-Dichloropropene	1,500 U	1,500 U	12 U	11 U						
o-Xylene	NA									
trans-1,2-Dichloroethene	NA									
trans-1,3-Dichloropropene	1,500 U	1,500 U	12 U	11 U						
Semi-volatile Organic Compounds (UG/KG)										
1,1-Biphenyl	NA									
2,4,5-Trichlorophenol	NA	880 U	NA							
2,4,6-Trichlorophenol	NA	360 U	NA							
2,4-Dichlorophenol	NA	360 U	NA							
2,4-Dimethylphenol	NA	360 U	NA							
2,4-Dinitrophenol	NA	880 U	NA							
2-Chloronaphthalene	NA	360 U	NA							
2-Chlorophenol	NA	360 U	NA							
2-Methylnaphthalene	NA	360 U	NA							
2-Methylphenol	NA	360 U	NA							
2-Nitroaniline	NA	880 U	NA							
2-Nitrophenol	NA	360 U	NA							
3,3'-Dichlorobenzidine	NA	360 U	NA							
3- and 4-Methylphenol	NA									
3-Nitroaniline	NA	880 U	NA							

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-149	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID	HCS-BG-149	HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date	11/16/94	11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
4,6-Dinitro-2-methylphenol	NA	880 U	NA							
4-Bromophenyl-phenylether	NA	360 U	NA							
4-Chloro-3-methylphenol	NA	360 U	NA							
4-Chloroaniline	NA	360 U	NA							
4-Chlorophenyl-phenylether	NA	360 U	NA							
4-Methylphenol	NA	360 U	NA							
4-Nitroaniline	NA	880 U	NA							
4-Nitrophenol	NA	880 U	NA							
Acenaphthene	NA	360 U	NA							
Acenaphthylene	NA	360 U	NA							
Acetophenone	NA									
Anthracene	NA	360 U	NA							
Atrazine	NA									
Benzaldehyde	NA									
Benzo(a)anthracene	NA	77 J	NA							
Benzo(a)pyrene	NA	74 J	NA							
Benzo(b)fluoranthene	NA	360 U	NA							
Benzo(g,h,i)perylene	NA	360 U	NA							
Benzo(k)fluoranthene	NA	180 J	NA							
Butylbenzylphthalate	NA	360 U	NA							
Caprolactam	NA									
Carbazole	NA	360 U	NA							
Chrysene	NA	110 J	NA							
Di-n-butylphthalate	NA	360 U	NA							
Di-n-octylphthalate	NA	360 UJ	NA							
Dibenz(a,h)anthracene	NA	360 U	NA							
Dibenzofuran	NA	360 U	NA							
Diethylphthalate	NA	360 U	NA							
Dimethyl phthalate	NA	360 U	NA							
Fluoranthene	NA	190 J	NA							
Fluorene	NA	360 U	NA							
Hexachlorobenzene	NA	360 U	NA							
Hexachlorobutadiene	NA	360 U	NA							
Hexachlorocyclopentadiene	NA	360 U	NA							
Hexachloroethane	NA	360 U	NA							

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low





Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-149	BG-150	BG-151	BG-154	BG-155	BG-156	BG-157	BG-158	BG-159/160	
Sample ID	HCS-BG-149	HCS-BG-150	HCS-BG-151	HCS-BG-154	HCS-BG-155	HCS-BG-156	HCS-BG-157	HCS-BG-158	HCS-BG-159	HCS-BG-160
Sample Date	11/16/94	11/15/94	03/04/95	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Cobalt	NA	20.2	NA							
Copper	NA	31.3	NA							
Cyanide	NA	1.10 U	NA							
Iron	NA	25,200	NA							
Lead	NA	30.4	NA							
Magnesium	NA	642 B	NA							
Manganese	NA	534	NA							
Mercury	NA	0.220	NA							
Nickel	NA	31.3	NA							
Potassium	NA	481 B	NA							
Selenium	NA	0.470 B	NA							
Silver	NA	2.10 J	NA							
Sodium	NA	31.3 U	NA							
Thallium	NA	0.560 U	NA							
Vanadium	NA	17.3	NA							
Zinc	NA	124 J	NA							
Wet Chemistry (MG/KG)										
% Moisture	NA									
Total organic carbon (TOC)	NA									
pH	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172	BG-173	BG-174
Sample ID	HCS-BG-163	HCS-BG-164	HCS-BG-166	HCS-BG-167	HCS-BG-168	HCS-BG-169	HCS-BG-170	HCS-BG-172	HCS-BG-173	HCS-BG-174
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
<b>Volatile Organic Compounds (UG/KG)</b>										
1,1,1-Trichloroethane	11 U	11 U	11 U	11 U	13 U	11 U				
1,1,2,2-Tetrachloroethane	11 U	11 U	11 U	11 U	13 U	11 U				
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA									
1,1,2-Trichloroethane	11 U	11 U	11 U	11 U	13 U	11 U				
1,1-Dichloroethane	11 U	11 U	11 U	11 U	13 U	11 U				
1,1-Dichloroethene	11 U	11 U	11 U	11 U	13 U	11 U				
1,2,4-Trichlorobenzene	NA									
1,2-Dibromo-3-chloropropane	NA									
1,2-Dibromoethane	NA									
1,2-Dichlorobenzene	NA									
1,2-Dichloroethane	11 U	11 U	11 U	11 U	13 U	11 U				
1,2-Dichloroethene (total)	11 U	11 U	3 J	11 U	3 J	11 U	11 U	11 U	11 U	6 J
1,2-Dichloropropane	11 U	11 U	11 U	11 U	13 U	11 U				
1,3-Dichlorobenzene	NA									
1,4-Dichlorobenzene	NA									
2-Butanone	11 U	11 U	11 U	11 U	13 U	11 U				
2-Hexanone	11 U	11 U	11 U	11 U	13 U	11 U				
4-Methyl-2-pentanone	11 U	11 U	11 U	11 U	13 U	11 U				
Acetone	11 U	11 U	11 U	11 U	13 U	11 U				
Benzene	11 U	11 U	11 U	11 U	13 U	11 U				
Bromodichloromethane	11 U	11 U	11 U	11 U	13 U	11 U				
Bromoform	11 U	11 U	11 U	11 U	13 U	11 U				
Bromomethane	11 U	11 U	11 U	11 U	13 U	11 U				
Carbon disulfide	11 U	11 U	11 U	11 U	13 U	11 U				
Carbon tetrachloride	11 U	11 U	11 U	11 U	13 U	11 U				
Chlorobenzene	11 U	11 U	11 U	11 U	13 U	11 U				
Chloroethane	11 U	11 U	11 U	11 U	13 U	11 U				
Chloroform	11 U	11 U	11 U	11 U	13 U	11 U				
Chloromethane	11 U	11 U	11 U	11 U	13 U	11 U				
Cumene	NA									
Cyclohexane	NA									
Dibromochloromethane	11 U	11 U	11 U	11 U	13 U	11 U				
Dichlorodifluoromethane (Freon-12)	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172	BG-173	BG-174
Sample ID	HCS-BG-163	HCS-BG-164	HCS-BG-166	HCS-BG-167	HCS-BG-168	HCS-BG-169	HCS-BG-170	HCS-BG-172	HCS-BG-173	HCS-BG-174
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Ethylbenzene	11 U	11 U	11 U	11 U	13 U	11 U				
Methyl acetate	NA									
Methyl-tert-butyl ether (MTBE)	NA									
Methylcyclohexane	NA									
Methylene chloride	3 J	11 U	7 J	4 J	13 U	11 U	11 U	12	3 J	2 J
Styrene	11 U	11 U	11 U	11 U	13 U	11 U				
Tetrachloroethene	11 U	11 U	11 U	11 U	13 U	11 U	11 U	41	4 J	11 U
Toluene	11 U	11 U	11 U	11 U	13 U	11 U				
Trichloroethene	21	4 J	92,000	51,000	720	11 U	8 J	700	390	360,000
Trichlorofluoromethane(Freon-11)	NA									
Vinyl acetate	NA									
Vinyl chloride	11 U	11 U	11 U	11 U	13 U	11 U				
Xylene, total	11 U	11 U	11 U	11 U	13 U	11 U				
cis-1,2-Dichloroethene	NA									
cis-1,3-Dichloropropene	11 U	11 U	11 U	11 U	13 U	11 U				
o-Xylene	NA									
trans-1,2-Dichloroethene	NA									
trans-1,3-Dichloropropene	11 U	11 U	11 U	11 U	13 U	11 U				
Semi-volatile Organic Compounds (UG/KG)										
1,1-Biphenyl	NA									
2,4,5-Trichlorophenol	NA									
2,4,6-Trichlorophenol	NA									
2,4-Dichlorophenol	NA									
2,4-Dimethylphenol	NA									
2,4-Dinitrophenol	NA									
2-Chloronaphthalene	NA									
2-Chlorophenol	NA									
2-Methylnaphthalene	NA									
2-Methylphenol	NA									
2-Nitroaniline	NA									
2-Nitrophenol	NA									
3,3'-Dichlorobenzidine	NA									
3- and 4-Methylphenol	NA									
3-Nitroaniline	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172	BG-173	BG-174
Sample ID	HCS-BG-163	HCS-BG-164	HCS-BG-166	HCS-BG-167	HCS-BG-168	HCS-BG-169	HCS-BG-170	HCS-BG-172	HCS-BG-173	HCS-BG-174
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
4,6-Dinitro-2-methylphenol	NA									
4-Bromophenyl-phenylether	NA									
4-Chloro-3-methylphenol	NA									
4-Chloroaniline	NA									
4-Chlorophenyl-phenylether	NA									
4-Methylphenol	NA									
4-Nitroaniline	NA									
4-Nitrophenol	NA									
Acenaphthene	NA									
Acenaphthylene	NA									
Acetophenone	NA									
Anthracene	NA									
Atrazine	NA									
Benzaldehyde	NA									
Benzo(a)anthracene	NA									
Benzo(a)pyrene	NA									
Benzo(b)fluoranthene	NA									
Benzo(g,h,i)perylene	NA									
Benzo(k)fluoranthene	NA									
Butylbenzylphthalate	NA									
Caprolactam	NA									
Carbazole	NA									
Chrysene	NA									
Di-n-butylphthalate	NA									
Di-n-octylphthalate	NA									
Dibenz(a,h)anthracene	NA									
Dibenzofuran	NA									
Diethylphthalate	NA									
Dimethyl phthalate	NA									
Fluoranthene	NA									
Fluorene	NA									
Hexachlorobenzene	NA									
Hexachlorobutadiene	NA									
Hexachlorocyclopentadiene	NA									
Hexachloroethane	NA									

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low



Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172	BG-173	BG-174
Sample ID	HCS-BG-163	HCS-BG-164	HCS-BG-166	HCS-BG-167	HCS-BG-168	HCS-BG-169	HCS-BG-170	HCS-BG-172	HCS-BG-173	HCS-BG-174
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
<b>Chemical Name</b>										
Total hexachlorodibenzofuran	NA									
Total pentachlorodibenzo-p-dioxin	NA									
Total pentachlorodibenzofuran	NA									
Total tetrachlorodibenzo-p-dioxin	NA									
Total tetrachlorodibenzofuran	NA									
<b>Explosives (UG/KG)</b>										
1,3,5-Trinitrobenzene	NA									
1,3-Dinitrobenzene	NA									
2,4,6-Trinitrotoluene	NA									
2,4-Dinitrotoluene	NA									
2,6-Dinitrotoluene	NA									
2-Amino-4,6-dinitrotoluene	NA									
2-Nitrotoluene	NA									
3-Nitrotoluene	NA									
4-Amino-2,6-dinitrotoluene	NA									
4-Nitrotoluene	NA									
HMX	NA									
Nitrobenzene	NA									
Nitroglycerin	NA									
Nitroguanidine	NA									
PETN	NA									
Perchlorate	NA									
RDX	NA									
Tetryl	NA									
<b>Total Metals (MG/KG)</b>										
Aluminum	NA									
Antimony	NA									
Arsenic	NA									
Barium	NA									
Beryllium	NA									
Cadmium	NA									
Calcium	NA									
Chromium	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-163/164		BG-166	BG-167/168		BG-169	BG-170	BG-172	BG-173	BG-174
Sample ID	HCS-BG-163	HCS-BG-164	HCS-BG-166	HCS-BG-167	HCS-BG-168	HCS-BG-169	HCS-BG-170	HCS-BG-172	HCS-BG-173	HCS-BG-174
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name										
Cobalt	NA									
Copper	NA									
Cyanide	NA									
Iron	NA									
Lead	NA									
Magnesium	NA									
Manganese	NA									
Mercury	NA									
Nickel	NA									
Potassium	NA									
Selenium	NA									
Silver	NA									
Sodium	NA									
Thallium	NA									
Vanadium	NA									
Zinc	NA									
Wet Chemistry (MG/KG)										
% Moisture	NA									
Total organic carbon (TOC)	NA									
pH	NA									

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-175/176		BG-177/178	
Sample ID	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name				
<b>Volatile Organic Compounds (UG/KG)</b>				
1,1,1-Trichloroethane	11 U	11 U	11 U	11 U
1,1,2,2-Tetrachloroethane	11 U	11 U	11 U	11 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	NA	NA	NA	NA
1,1,2-Trichloroethane	11 U	11 U	11 U	11 U
1,1-Dichloroethane	11 U	11 U	11 U	11 U
1,1-Dichloroethene	11 U	11 U	11 U	11 U
1,2,4-Trichlorobenzene	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	NA	NA	NA
1,2-Dibromoethane	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA
1,2-Dichloroethane	11 U	11 U	11 U	11 U
1,2-Dichloroethene (total)	11 U	11 U	11 U	11 U
1,2-Dichloropropane	11 U	11 U	11 U	11 U
1,3-Dichlorobenzene	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA
2-Butanone	11 U	11 U	11 U	11 U
2-Hexanone	11 U	11 U	11 U	11 U
4-Methyl-2-pentanone	11 U	11 U	11 U	11 U
Acetone	11 U	11 U	11 U	11 U
Benzene	11 U	11 U	11 U	11 U
Bromodichloromethane	11 U	11 U	11 U	11 U
Bromoform	11 U	11 U	11 U	11 U
Bromomethane	11 U	11 U	11 U	11 U
Carbon disulfide	11 U	11 U	11 U	11 U
Carbon tetrachloride	11 U	11 U	11 U	11 U
Chlorobenzene	11 U	11 U	11 U	11 U
Chloroethane	11 U	11 U	11 U	11 U
Chloroform	11 U	11 U	11 U	11 U
Chloromethane	11 U	11 U	11 U	11 U
Cumene	NA	NA	NA	NA
Cyclohexane	NA	NA	NA	NA
Dibromochloromethane	11 U	11 U	11 U	11 U
Dichlorodifluoromethane (Freon-12)	NA	NA	NA	NA

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R - Unusable result  
U - Undetected  
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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-175/176		BG-177/178	
	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample ID				
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name				
Ethylbenzene	11 U	11 U	11 U	11 U
Methyl acetate	NA	NA	NA	NA
Methyl-tert-butyl ether (MTBE)	NA	NA	NA	NA
Methylcyclohexane	NA	NA	NA	NA
Methylene chloride	11 U	11 U	11 U	11 U
Styrene	11 U	11 U	11 U	11 U
Tetrachloroethene	11 U	11 U	11 U	11 U
Toluene	11 U	11 U	11 U	11 U
Trichloroethene	99	530	42	160
Trichlorofluoromethane(Freon-11)	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA
Vinyl chloride	11 U	11 U	11 U	11 U
Xylene, total	11 U	11 U	11 U	11 U
cis-1,2-Dichloroethene	NA	NA	NA	NA
cis-1,3-Dichloropropene	11 U	11 U	11 U	11 U
o-Xylene	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA
trans-1,3-Dichloropropene	11 U	11 U	11 U	11 U
Semi-volatile Organic Compounds (UG/KG)				
1,1-Biphenyl	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA
3,3'-Dichlorobenzidine	NA	NA	NA	NA
3- and 4-Methylphenol	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
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Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-175/176		BG-177/178	
Sample ID	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name				
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA
Atrazine	NA	NA	NA	NA
Benzaldehyde	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA
Butylbenzylphthalate	NA	NA	NA	NA
Caprolactam	NA	NA	NA	NA
Carbazole	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Di-n-butylphthalate	NA	NA	NA	NA
Di-n-octylphthalate	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA
Diethylphthalate	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA

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UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-175/176		BG-177/178	
	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample ID	10/27/98	10/27/98	10/27/98	10/27/98
Sample Date				
Chemical Name				
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA
Phenol	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA
bis(2-Chloro-1-methylethyl) ether	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	NA	NA	NA	NA
bis(2-Chloroethyl)ether	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	NA	NA
n-Nitroso-di-n-propylamine	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA
<b>Dioxin/Furans (UG/KG)</b>				
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA
Octachlorodibenzofuran	NA	NA	NA	NA
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total heptachlorodibenzofuran	NA	NA	NA	NA
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA

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B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-6  
Raw Data, Subsurface Soil, Outside Active Burning Grounds  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-175/176		BG-177/178	
Sample ID	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98
<b>Chemical Name</b>				
Total hexachlorodibenzofuran	NA	NA	NA	NA
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total pentachlorodibenzofuran	NA	NA	NA	NA
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA
Total tetrachlorodibenzofuran	NA	NA	NA	NA
<b>Explosives (UG/KG)</b>				
1,3,5-Trinitrobenzene	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA
2-Nitrotoluene	NA	NA	NA	NA
3-Nitrotoluene	NA	NA	NA	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA
4-Nitrotoluene	NA	NA	NA	NA
HMX	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA
Nitroglycerin	NA	NA	NA	NA
Nitroguanidine	NA	NA	NA	NA
PETN	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA
RDX	NA	NA	NA	NA
Tetryl	NA	NA	NA	NA
<b>Total Metals (MG/KG)</b>				
Aluminum	NA	NA	NA	NA
Antimony	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA
Barium	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Calcium	NA	NA	NA	NA
Chromium	NA	NA	NA	NA

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J - Estimated value  
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Table D-6  
 Raw Data, Subsurface Soil, Outside Active Burning Grounds  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	BG-175/176		BG-177/178	
Sample ID	HCS-BG-175	HCS-BG-176	HCS-BG-177	HCS-BG-178
Sample Date	10/27/98	10/27/98	10/27/98	10/27/98
Chemical Name				
Cobalt	NA	NA	NA	NA
Copper	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA
Iron	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA
Manganese	NA	NA	NA	NA
Mercury	NA	NA	NA	NA
Nickel	NA	NA	NA	NA
Potassium	NA	NA	NA	NA
Selenium	NA	NA	NA	NA
Silver	NA	NA	NA	NA
Sodium	NA	NA	NA	NA
Thallium	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
Wet Chemistry (MG/KG)				
% Moisture	NA	NA	NA	NA
Total organic carbon (TOC)	NA	NA	NA	NA
pH	NA	NA	NA	NA

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 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-7  
 Raw Data, Surface Water, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-3/1SW-3		1SD-3A/1SW-3A
Sample ID	AS01-SW01-R05	AS01-SW01A-R05	AS01-SW02-R05	AS01-SW02A-R05	AS01-SW03-R05	AS01-SW03P-R05	AS01-SW03A-R05
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name							
<b>Volatile Organic Compounds (UG/L)</b>							
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromo-3-chloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dibromoethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon disulfide	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Carbon tetrachloride	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cumene	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dichlorodifluoromethane (Freon-12)	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U	10 U

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-7  
 Raw Data, Surface Water, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1		1SD-1A/1SW-1A		1SD-2/1SW-2		1SD-2A/1SW-2A		1SD-3/1SW-3		1SD-3A/1SW-3A			
Sample ID	AS01-SW01-R05		AS01-SW01A-R05		AS01-SW02-R05		AS01-SW02A-R05		AS01-SW03-R05		AS01-SW03P-R05		AS01-SW03A-R05	
Sample Date	06/14/01		06/14/01		06/14/01		06/14/01		06/14/01		06/14/01		06/14/01	
Chemical Name														
Methyl acetate	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Methyl-tert-butyl ether (MTBE)	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Methylcyclohexane	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Methylene chloride	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Styrene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Toluene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Trichloroethene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Trichlorofluoromethane(Freon-11)	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Vinyl chloride	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Xylene, total	10	U	10	U	10	U	10	U	10	U	10	U	10	U
cis-1,2-Dichloroethene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
o-Xylene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
trans-1,2-Dichloroethene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
trans-1,3-Dichloropropene	10	U	10	U	10	U	10	U	10	U	10	U	10	U
<b>Semi-volatile Organic Compounds (UG/L)</b>														
1,1-Biphenyl	10	U	NA		10	U	NA		10	U	10	U	NA	
2,4,5-Trichlorophenol	25	U	NA		25	U	NA		25	U	25	U	NA	
2,4,6-Trichlorophenol	10	U	NA		10	U	NA		10	U	10	U	NA	
2,4-Dichlorophenol	10	U	NA		10	U	NA		10	U	10	U	NA	
2,4-Dimethylphenol	10	U	NA		10	U	NA		10	U	10	U	NA	
2,4-Dinitrophenol	25	U	NA		25	U	NA		25	U	25	U	NA	
2-Chloronaphthalene	10	U	NA		10	U	NA		10	U	10	U	NA	
2-Chlorophenol	10	U	NA		10	U	NA		10	U	10	U	NA	
2-Methylnaphthalene	10	U	NA		10	U	NA		10	U	10	U	NA	
2-Methylphenol	10	U	NA		10	U	NA		10	U	10	U	NA	
2-Nitroaniline	25	U	NA		25	U	NA		25	U	25	U	NA	
2-Nitrophenol	10	U	NA		10	U	NA		10	U	10	U	NA	
3,3'-Dichlorobenzidine	10	U	NA		10	U	NA		10	U	10	U	NA	
3- and 4-Methylphenol	10	U	NA		10	U	NA		10	U	10	U	NA	
3-Nitroaniline	25	U	NA		25	U	NA		25	U	25	U	NA	
4,6-Dinitro-2-methylphenol	25	U	NA		25	U	NA		25	U	25	U	NA	
4-Bromophenyl-phenylether	10	U	NA		10	U	NA		10	U	10	U	NA	

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
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 UL - Undetected, limit biased low

Table D-7  
 Raw Data, Surface Water, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1		1SD-1A/1SW-1A		1SD-2/1SW-2		1SD-2A/1SW-2A		1SD-3/1SW-3		1SD-3A/1SW-3A				
Sample ID	AS01-SW01-R05		AS01-SW01A-R05		AS01-SW02-R05		AS01-SW02A-R05		AS01-SW03-R05		AS01-SW03A-R05				
Sample Date	06/14/01		06/14/01		06/14/01		06/14/01		06/14/01		06/14/01				
Chemical Name															
4-Chloro-3-methylphenol	10	U		NA	10	U		NA	10	U		10	U		NA
4-Chloroaniline	10	U		NA	10	U		NA	10	U		10	U		NA
4-Chlorophenyl-phenylether	10	U		NA	10	U		NA	10	U		10	U		NA
4-Nitroaniline	25	U		NA	25	U		NA	25	U		25	U		NA
4-Nitrophenol	25	U		NA	25	U		NA	25	U		25	U		NA
Acenaphthene	10	U		NA	10	U		NA	10	U		10	U		NA
Acenaphthylene	10	U		NA	10	U		NA	10	U		10	U		NA
Acetophenone	10	U		NA	10	U		NA	10	U		10	U		NA
Anthracene	10	U		NA	10	U		NA	10	U		10	U		NA
Atrazine	10	U		NA	10	U		NA	10	U		10	U		NA
Benzaldehyde	10	U		NA	10	U		NA	10	U		10	U		NA
Benzo(a)anthracene	10	U		NA	10	U		NA	10	U		10	U		NA
Benzo(a)pyrene	10	U		NA	10	U		NA	10	U		10	U		NA
Benzo(b)fluoranthene	10	U		NA	10	U		NA	10	U		10	U		NA
Benzo(g,h,i)perylene	10	U		NA	10	U		NA	10	U		10	U		NA
Benzo(k)fluoranthene	10	U		NA	10	U		NA	10	U		10	U		NA
Butylbenzylphthalate	10	U		NA	10	U		NA	10	U		10	U		NA
Caprolactam	10	R		NA	10	R		NA	10	R		10	R		NA
Carbazole	10	U		NA	10	U		NA	10	U		10	U		NA
Chrysene	10	U		NA	10	U		NA	10	U		10	U		NA
Di-n-butylphthalate	10	U		NA	10	U		NA	1.5	J		10	U		NA
Di-n-octylphthalate	10	U		NA	10	U		NA	10	U		10	U		NA
Dibenz(a,h)anthracene	10	U		NA	10	U		NA	10	U		10	U		NA
Dibenzofuran	10	U		NA	10	U		NA	10	U		10	U		NA
Diethylphthalate	10	U		NA	10	U		NA	10	U		10	U		NA
Dimethyl phthalate	10	U		NA	10	U		NA	10	U		10	U		NA
Fluoranthene	10	U		NA	10	U		NA	10	U		10	U		NA
Fluorene	10	U		NA	10	U		NA	10	U		10	U		NA
Hexachlorobenzene	10	U		NA	10	U		NA	10	U		10	U		NA
Hexachlorobutadiene	10	U		NA	10	U		NA	10	U		10	U		NA
Hexachlorocyclopentadiene	10	U		NA	10	U		NA	10	U		10	U		NA
Hexachloroethane	10	U		NA	10	U		NA	10	U		10	U		NA
Indeno(1,2,3-cd)pyrene	10	U		NA	10	U		NA	10	U		10	U		NA
Isophorone	10	U		NA	10	U		NA	10	U		10	U		NA
Naphthalene	10	U		NA	10	U		NA	10	U		10	U		NA

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 B - Possible blank contamination  
 J - Estimated value  
 L - Value biased low

R - Unusable result  
 U - Undetected  
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 UL - Undetected, limit biased low

Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-3/1SW-3		1SD-3A/1SW-3A
Sample ID	AS01-SW01-R05	AS01-SW01A-R05	AS01-SW02-R05	AS01-SW02A-R05	AS01-SW03-R05	AS01-SW03P-R05	AS01-SW03A-R05
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name							
Pentachlorophenol	25 U	NA	25 U	NA	25 U	25 U	NA
Phenanthrene	10 U	NA	10 U	NA	10 U	10 U	NA
Phenol	10 U	NA	10 U	NA	10 U	10 U	NA
Pyrene	10 U	NA	10 U	NA	10 U	10 U	NA
bis(2-Chloro-1-methylethyl) ether	10 U	NA	10 U	NA	10 U	10 U	NA
bis(2-Chloroethoxy)methane	10 U	NA	10 U	NA	10 U	10 U	NA
bis(2-Chloroethyl)ether	10 U	NA	10 U	NA	10 U	10 U	NA
bis(2-Ethylhexyl)phthalate	4.2 J	NA	1.4 J	NA	1.3 J	1.6 J	NA
n-Nitroso-di-n-propylamine	10 U	NA	10 U	NA	10 U	10 U	NA
n-Nitrosodiphenylamine	10 U	NA	10 U	NA	10 U	10 U	NA
Explosives (UG/L)							
2,4-Dinitrotoluene	10 U	NA	10 U	NA	10 U	10 U	NA
2,6-Dinitrotoluene	10 U	NA	10 U	NA	10 U	10 U	NA
Nitrobenzene	10 U	NA	10 U	NA	10 U	10 U	NA
Total Metals (UG/L)							
Aluminum	389	412	649	640	739	656	748
Antimony	4.9 U	6.9 J	5.9 J	4.9 U	4.9 U	4.9 U	5.2 B
Arsenic	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	4.1 J	6.8 J
Barium	55.2 J	53.2 J	51.9 J	48.4 J	54.8 J	53.1 J	49 J
Beryllium	0.1 U	0.1 U	0.13 J	0.1 J	0.18 J	0.13 J	0.14 J
Cadmium	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Calcium	47,500	45,400	43,200	40,000	44,500	44,400	38,600
Chromium	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Cobalt	1.6 J	1.7 J	2.6 J	2.2 J	2.8 J	2.9 J	2.6 J
Copper	1.1 J	1.3 J	2.7 J	1.5 J	2.6 J	1.3 J	2.9 J
Cyanide	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Iron	222	255	816	596	950	617	1,140
Lead	2 U	2 U	2 U	2 U	2.6 J	2 U	2 U
Magnesium	12,600	12,100	11,600	10,800	12,300	12,300	10,700
Manganese	247	243	265	253	286	283	255
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Potassium	3,350 J	3,190 J	2,940 J	2,690 J	2,910 J	2,820 J	2,510 J

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Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-3/1SW-3		1SD-3A/1SW-3A
Sample ID	AS01-SW01-R05	AS01-SW01A-R05	AS01-SW02-R05	AS01-SW02A-R05	AS01-SW03-R05	AS01-SW03P-R05	AS01-SW03A-R05
Sample Date	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01	06/14/01
Chemical Name							
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.7 J	2.2 U	2.2 U
Silver	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL
Sodium	27,900	26,500	21,400	19,900	21,200	20,900	18,200
Thallium	3.5 J	2.3 U	2.3 U	6.2 J	2.3 U	2.3 U	2.3 U
Vanadium	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Zinc	24.7	24.3	35.1	28.3	23.3	14.5 J	18.9 J
Dissolved Metals (UG/L)							
Aluminum	274	277	402	399	349	336	395
Antimony	4.9 U	4.9 U	6.8 J	4.9 U	4.9 U	4.9 U	6.2 B
Arsenic	4.1 J	3.7 U	4.4 J	3.7 U	3.7 U	3.7 U	5.6 J
Barium	45 J	45.6 J	41.6 J	42.2 J	47.4 J	48.1 J	44.6 J
Beryllium	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Calcium	40,400	40,800	39,000	39,000	44,000	44,700	41,200
Chromium	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Cobalt	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Copper	0.7 U	0.7 U	0.7 U	0.7 U	1.1 J	0.7 U	0.7 U
Iron	80.7 J	75 J	190	192	213	236	226
Lead	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Magnesium	10,700	10,800	10,400	10,500	12,100	12,300	11,500
Manganese	152	154	99.8	112	111	144	109
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Potassium	2,730 J	2,770 J	2,490 J	2,540 J	2,800 J	2,860 J	2,630 J
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U
Silver	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL
Sodium	23,100 J	23,600 J	19,000 J	19,300 J	21,000 J	21,300 J	19,500 J
Thallium	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Vanadium	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Zinc	3.6 J	4 J	8 J	7.2 J	10.7 J	10.8 J	1.6 J
Wet Chemistry (MG/L)							
Hardness	171	163	156	144	162	162	140

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Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-4/1SW-4		1SD-4A/1SW-4A		1SD-5/1SW-5		1SD-5C/1SW-5C		1SD-6/1SW-6		1SD-7/1SW-7		1SD-8/1SW-8			
Sample ID	AS01-SW04-R05		AS01-SW04A-R05		AS01-SW05-R05		AS01-SW05C		AS01-SW06		AS01-SW06P		AS01-SW07		AS01-SW08	
Sample Date	06/13/01		06/13/01		06/13/01		06/13/01		06/14/01		06/14/01		06/14/01		06/13/01	
Chemical Name																
<b>Volatile Organic Compounds (UG/L)</b>																
1,1,1-Trichloroethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2,4-Trichlorobenzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dibromo-3-chloropropane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dibromoethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,3-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
1,4-Dichlorobenzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Butanone	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Acetone	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Bromodichloromethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Bromoform	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Bromomethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Carbon disulfide	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	U
Carbon tetrachloride	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chlorobenzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloroethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloroform	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloromethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Cumene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Cyclohexane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Dibromochloromethane	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Dichlorodifluoromethane (Freon-12)	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Ethylbenzene	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U

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Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-4/1SW-4		1SD-4A/1SW-4A		1SD-5/1SW-5		1SD-5C/1SW-5C		1SD-6/1SW-6		1SD-7/1SW-7		1SD-8/1SW-8	
Sample ID	AS01-SW04-R05		AS01-SW04A-R05		AS01-SW05-R05		AS01-SW05C		AS01-SW06		AS01-SW06P		AS01-SW07	
Sample Date	06/13/01		06/13/01		06/13/01		06/13/01		06/14/01		06/14/01		06/14/01	
Chemical Name														
4-Chloro-3-methylphenol	10	U	NA		10	U	10	U	10	U	10	U	10	U
4-Chloroaniline	10	U	NA		10	U	10	U	10	U	10	U	10	U
4-Chlorophenyl-phenylether	10	U	NA		10	U	10	U	10	U	10	U	10	U
4-Nitroaniline	25	U	NA		25	U	25	U	25	U	25	U	25	U
4-Nitrophenol	25	U	NA		25	U	25	U	25	U	25	U	25	U
Acenaphthene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Acenaphthylene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Acetophenone	10	U	NA		10	U	10	U	10	U	10	U	10	U
Anthracene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Atrazine	10	U	NA		10	U	10	U	10	U	10	U	10	U
Benzaldehyde	10	UJ	NA		10	UJ	10	UJ	10	U	10	U	10	UJ
Benzo(a)anthracene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Benzo(a)pyrene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Benzo(b)fluoranthene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Benzo(g,h,i)perylene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Benzo(k)fluoranthene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Butylbenzylphthalate	1.2	J	NA		10	U	10	U	10	U	10	U	10	U
Caprolactam	10	R	NA		10	R	10	R	10	R	10	R	10	R
Carbazole	10	U	NA		10	U	10	U	10	U	10	U	10	U
Chrysene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Di-n-butylphthalate	1.7	B	NA		1.3	B	10	U	10	U	1.6	J	10	U
Di-n-octylphthalate	10	U	NA		10	U	10	U	10	U	10	U	10	U
Dibenz(a,h)anthracene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Dibenzofuran	10	U	NA		10	U	10	U	10	U	10	U	10	U
Diethylphthalate	10	U	NA		10	U	1.5	J	10	U	10	U	10	U
Dimethyl phthalate	10	U	NA		10	U	10	U	10	U	10	U	10	U
Fluoranthene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Fluorene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Hexachlorobenzene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Hexachlorobutadiene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Hexachlorocyclopentadiene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Hexachloroethane	10	U	NA		10	U	10	U	10	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	NA		10	U	10	U	10	U	10	U	10	U
Isophorone	10	U	NA		10	U	10	U	10	U	10	U	10	U
Naphthalene	10	U	NA		10	U	10	U	10	U	10	U	10	U

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R - Unusable result  
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Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-4/1SW-4	1SD-4A/1SW-4A	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6/1SW-6		1SD-7/1SW-7	1SD-8/1SW-8
Sample ID	AS01-SW04-R05	AS01-SW04A-R05	AS01-SW05-R05	AS01-SW05C	AS01-SW06	AS01-SW06P	AS01-SW07	AS01-SW08
Sample Date	06/13/01	06/13/01	06/13/01	06/13/01	06/14/01	06/14/01	06/14/01	06/13/01
Chemical Name								
Pentachlorophenol	25 U	NA	25 U	25 U	25 U	25 U	25 U	25 U
Phenanthrene	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Phenol	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Pyrene	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloro-1-methylethyl) ether	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	7.1 B	NA	1.9 B	10 U	1.8 J	10 U	1.9 J	1.1 B
n-Nitroso-di-n-propylamine	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
n-Nitrosodiphenylamine	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Explosives (UG/L)								
2,4-Dinitrotoluene	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Nitrobenzene	10 U	NA	10 U	10 U	10 U	10 U	10 U	10 U
Total Metals (UG/L)								
Aluminum	357	381	346	555	732	998	758	370
Antimony	5.2 B	4.9 U	4.9 U	4.9 U	5.8 J	5.6 J	4.9 U	4.9 U
Arsenic	6.2 B	3.7 U	3.7 U	7 B	3.7 U	3.7 U	3.7 U	4.5 B
Barium	48 J	49.8 J	49.8 J	51.5 J	54.9 J	59.5 J	52.8 J	49 J
Beryllium	0.1 U	0.1 U	0.1 U	0.12 J	0.18 J	0.2 J	0.14 J	0.1 U
Cadmium	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Calcium	43,400	44,800	45,400	43,200	44,900	46,600	42,600	44,100
Chromium	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Cobalt	1.3 J	1.1 U	1.6 J	4.1 J	2.7 J	3.1 J	2.8 J	1.1 U
Copper	1.6 J	1.3 J	1.4 J	2.6 J	2.1 J	3.2 J	1.8 J	1.6 J
Cyanide	10 U	10 U	10 U	10 U	NA	NA	NA	NA
Iron	159	198	194	514	897	1,460	1,330	209
Lead	2 U	2 U	2 U	2 U	2 U	2.6 J	2 U	2.1 J
Magnesium	11,400	11,900	12,000	11,400	12,200	12,700	11,600	11,500
Manganese	264	268	271	383	291	315	270	258
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Potassium	2,790 J	2,880 J	2,900 J	2,620 J	2,890 J	3,240 J	2,780 J	2,790 J

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-4/1SW-4	1SD-4A/1SW-4A	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6/1SW-6		1SD-7/1SW-7	1SD-8/1SW-8
Sample ID	AS01-SW04-R05	AS01-SW04A-R05	AS01-SW05-R05	AS01-SW05C	AS01-SW06	AS01-SW06P	AS01-SW07	AS01-SW08
Sample Date	06/13/01	06/13/01	06/13/01	06/13/01	06/14/01	06/14/01	06/14/01	06/13/01
Chemical Name								
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	3.2 J
Silver	0.6 UL	0.6 U	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL	0.6 UL
Sodium	21,300 J	21,900	22,200 J	20,600 J	21,500	22,600	20,700	21,600 J
Thallium	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Vanadium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Zinc	10.8 B	12.4 B	11.6 B	18.9 B	30.3	38.3	27.2	12.8 B
Dissolved Metals (UG/L)								
Aluminum	258	274	273	276	373	325	408	246
Antimony	4.9 U	6.8 J	5.5 J	6.8 J	4.9 U	4.9 U	4.9 U	4.9 U
Arsenic	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Barium	45.7 J	50.1 J	49.3 J	53.3 J	45.3 J	46.1 J	44.1 J	45.6 J
Beryllium	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cadmium	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Calcium	42,300	46,100	45,600	49,200	41,400	43,400	41,100	42,200
Chromium	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U
Cobalt	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Copper	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	1.2 J	0.7 U
Iron	65.6 J	78.9 J	74 J	97.9 J	184	190	204	61.8 J
Lead	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Magnesium	11,100	12,300	12,100	13,000	11,200	11,800	11,200	11,000
Manganese	188	209	195	216	97.3	96.7	98.4	186
Mercury	0.2 U	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Potassium	2,600 J	2,890 J	2,860 J	3,070 J	2,600 J	2,760 J	2,730 J	2,570 J
Selenium	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.6 J	2.2 U	2.2 U
Silver	0.6 UL	0.6 UL	0.6 UL	0.6 UL	2.1 L	0.6 UL	0.6 UL	0.6 UL
Sodium	20,500 J	22,600 J	22,300 J	24,300 J	19,600 J	20,700 J	19,800 J	20,600 J
Thallium	8.7 J	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
Vanadium	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Zinc	3.2 J	2 B	6.8 B	9.9 B	5.6 J	7.6 J	13.1 J	4.4 B
Wet Chemistry (MG/L)								
Hardness	155	161	163	155	162	169	154	158

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
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UL - Undetected, limit biased low

Table D-7  
 Raw Data, Surface Water, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	1SD-9/1SW-9
<b>Sample ID</b>	AS01-SW09
<b>Sample Date</b>	06/13/01
<b>Chemical Name</b>	
<b>Volatile Organic Compounds (UG/L)</b>	
1,1,1-Trichloroethane	10 U
1,1,2,2-Tetrachloroethane	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10 U
1,1,2-Trichloroethane	10 U
1,1-Dichloroethane	10 U
1,1-Dichloroethene	10 U
1,2,4-Trichlorobenzene	10 U
1,2-Dibromo-3-chloropropane	10 U
1,2-Dibromoethane	10 U
1,2-Dichlorobenzene	10 U
1,2-Dichloroethane	10 U
1,2-Dichloropropane	10 U
1,3-Dichlorobenzene	10 U
1,4-Dichlorobenzene	10 U
2-Butanone	10 U
2-Hexanone	10 U
4-Methyl-2-pentanone	10 U
Acetone	10 U
Benzene	10 U
Bromodichloromethane	10 U
Bromoform	10 U
Bromomethane	10 U
Carbon disulfide	10 U
Carbon tetrachloride	10 U
Chlorobenzene	10 U
Chloroethane	10 U
Chloroform	10 U
Chloromethane	10 U
Cumene	10 U
Cyclohexane	10 U
Dibromochloromethane	10 U
Dichlorodifluoromethane (Freon-12)	10 U
Ethylbenzene	10 U

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 B - Possible blank contamination  
 J - Estimated value  
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 UL - Undetected, limit biased low

Table D-7  
 Raw Data, Surface Water, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	1SD-9/1SW-9	
<b>Sample ID</b>	AS01-SW09	
<b>Sample Date</b>	06/13/01	
<b>Chemical Name</b>		
Methyl acetate	10	U
Methyl-tert-butyl ether (MTBE)	10	U
Methylcyclohexane	10	U
Methylene chloride	10	U
Styrene	10	U
Tetrachloroethene	10	U
Toluene	10	U
Trichloroethene	10	U
Trichlorofluoromethane(Freon-11)	10	U
Vinyl chloride	10	U
Xylene, total	10	U
cis-1,2-Dichloroethene	10	U
cis-1,3-Dichloropropene	10	U
o-Xylene	10	U
trans-1,2-Dichloroethene	10	U
trans-1,3-Dichloropropene	10	U
<b>Semi-volatile Organic Compounds (UG/L)</b>		
1,1-Biphenyl	10	U
2,4,5-Trichlorophenol	25	U
2,4,6-Trichlorophenol	10	U
2,4-Dichlorophenol	10	U
2,4-Dimethylphenol	10	U
2,4-Dinitrophenol	25	U
2-Chloronaphthalene	10	U
2-Chlorophenol	10	U
2-Methylnaphthalene	10	U
2-Methylphenol	10	U
2-Nitroaniline	25	U
2-Nitrophenol	10	U
3,3'-Dichlorobenzidine	10	U
3- and 4-Methylphenol	10	U
3-Nitroaniline	25	U
4,6-Dinitro-2-methylphenol	25	U
4-Bromophenyl-phenylether	10	U

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Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	1SD-9/1SW-9	
<b>Sample ID</b>	AS01-SW09	
<b>Sample Date</b>	06/13/01	
<b>Chemical Name</b>		
4-Chloro-3-methylphenol	10	U
4-Chloroaniline	10	U
4-Chlorophenyl-phenylether	10	U
4-Nitroaniline	25	U
4-Nitrophenol	25	U
Acenaphthene	10	U
Acenaphthylene	10	U
Acetophenone	10	U
Anthracene	10	U
Atrazine	10	U
Benzaldehyde	10	UJ
Benzo(a)anthracene	10	U
Benzo(a)pyrene	10	U
Benzo(b)fluoranthene	10	U
Benzo(g,h,i)perylene	10	U
Benzo(k)fluoranthene	10	U
Butylbenzylphthalate	10	U
Caprolactam	10	R
Carbazole	10	U
Chrysene	10	U
Di-n-butylphthalate	10	U
Di-n-octylphthalate	10	U
Dibenz(a,h)anthracene	10	U
Dibenzofuran	10	U
Diethylphthalate	10	U
Dimethyl phthalate	10	U
Fluoranthene	10	U
Fluorene	10	U
Hexachlorobenzene	10	U
Hexachlorobutadiene	10	U
Hexachlorocyclopentadiene	10	U
Hexachloroethane	10	U
Indeno(1,2,3-cd)pyrene	10	U
Isophorone	10	U
Naphthalene	10	U

NA - Not analyzed  
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J - Estimated value  
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Table D-7  
Raw Data, Surface Water, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	1SD-9/1SW-9
<b>Sample ID</b>	AS01-SW09
<b>Sample Date</b>	06/13/01
<b>Chemical Name</b>	
Pentachlorophenol	25 U
Phenanthrene	10 U
Phenol	10 U
Pyrene	10 U
bis(2-Chloro-1-methylethyl) ether	10 U
bis(2-Chloroethoxy)methane	10 U
bis(2-Chloroethyl)ether	10 U
bis(2-Ethylhexyl)phthalate	10 U
n-Nitroso-di-n-propylamine	10 U
n-Nitrosodiphenylamine	10 U
<b>Explosives (UG/L)</b>	
2,4-Dinitrotoluene	10 U
2,6-Dinitrotoluene	10 U
Nitrobenzene	10 U
<b>Total Metals (UG/L)</b>	
Aluminum	377
Antimony	7.8 B
Arsenic	6.8 B
Barium	50.6 J
Beryllium	0.1 U
Cadmium	0.4 U
Calcium	45,300
Chromium	0.7 U
Cobalt	1.1 U
Copper	0.7 U
Cyanide	NA
Iron	243
Lead	2 U
Magnesium	11,900
Manganese	291
Mercury	0.2 U
Nickel	2 U
Potassium	2,820 J

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Table D-7  
 Raw Data, Surface Water, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

<b>Station ID</b>	1SD-9/1SW-9
<b>Sample ID</b>	AS01-SW09
<b>Sample Date</b>	06/13/01
<b>Chemical Name</b>	
Selenium	4.1 J
Silver	0.6 UL
Sodium	22,100 J
Thallium	2.3 U
Vanadium	1 U
Zinc	15.2 B
<b>Dissolved Metals (UG/L)</b>	
Aluminum	243
Antimony	8 J
Arsenic	3.7 U
Barium	47.8 J
Beryllium	0.1 U
Cadmium	0.4 U
Calcium	43,900
Chromium	0.7 U
Cobalt	1.1 U
Copper	0.7 U
Iron	60.3 J
Lead	2 U
Magnesium	11,500
Manganese	175
Mercury	0.2 U
Nickel	2 U
Potassium	2,730 J
Selenium	2.2 U
Silver	0.6 UL
Sodium	21,700 J
Thallium	2.3 U
Vanadium	1 U
Zinc	4.8 B
<b>Wet Chemistry (MG/L)</b>	
Hardness	162

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,1,2,2-Tetrachloroethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	15 UJ	13 UJ	15 UJ	12 UJ	19 UJ	13 UJ	15 UJ	12 U
1,1,2-Trichloroethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,1-Dichloroethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,1-Dichloroethene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,2,4-Trichlorobenzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,2-Dibromo-3-chloropropane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,2-Dibromoethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,2-Dichlorobenzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,2-Dichloroethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,2-Dichloropropane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,3-Dichlorobenzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
1,4-Dichlorobenzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
2-Butanone	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
2-Hexanone	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
4-Methyl-2-pentanone	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Acetone	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Benzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Bromodichloromethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Bromoform	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Bromomethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Carbon disulfide	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Carbon tetrachloride	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Chlorobenzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Chloroethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Chloroform	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Chloromethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Cumene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Cyclohexane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Dibromochloromethane	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Dichlorodifluoromethane (Freon-12)	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U
Ethylbenzene	15 U	13 U	15 U	12 U	19 U	13 U	15 U	12 U

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low



Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
4-Chloro-3-methylphenol	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
4-Chloroaniline	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
4-Chlorophenyl-phenylether	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
4-Nitroaniline	1,300 U	1,100 U	1,200 U	1,000 U	1,500 U	1,100 U	1,200 U	1,000 U
4-Nitrophenol	1,300 U	1,100 U	1,200 U	1,000 U	1,500 U	1,100 U	1,200 U	1,000 U
Acenaphthene	510 U	440 U	490 U	410 U	620 U	430 U	2,300	420 U
Acenaphthylene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Acetophenone	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Anthracene	510 U	440 U	490 U	410 U	620 U	430 U	5,100	420 U
Atrazine	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Benzaldehyde	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Benzo(a)anthracene	510 U	440 U	490 U	410 U	620 U	430 U	9,500	420 U
Benzo(a)pyrene	510 U	440 U	490 U	410 U	620 U	430 U	7,600	420 U
Benzo(b)fluoranthene	510 U	440 U	490 U	410 U	620 U	430 U	11,000	47 J
Benzo(g,h,i)perylene	510 U	440 U	490 U	410 U	620 U	430 U	2,100	420 U
Benzo(k)fluoranthene	510 U	440 U	490 U	410 U	620 U	430 U	1,900	420 U
Butylbenzylphthalate	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Caprolactam	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Carbazole	510 U	440 U	490 U	410 U	620 U	430 U	3,200	420 U
Chrysene	510 U	440 U	490 U	410 U	620 U	430 U	8,400	49 J
Di-n-butylphthalate	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Di-n-octylphthalate	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Dibenz(a,h)anthracene	510 U	440 U	490 U	410 U	620 U	430 U	310 J	420 U
Dibenzofuran	510 U	440 U	490 U	410 U	620 U	430 U	1,800	420 U
Diethylphthalate	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Dimethyl phthalate	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Fluoranthene	510 U	49 J	490 U	410 U	620 U	430 U	19,000	78 J
Fluorene	510 U	440 U	490 U	410 U	620 U	430 U	2,700	420 U
Hexachlorobenzene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Hexachlorobutadiene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Hexachlorocyclopentadiene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Hexachloroethane	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Indeno(1,2,3-cd)pyrene	510 U	440 U	490 U	410 U	620 U	430 U	2,500	420 U
Isophorone	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Naphthalene	510 U	440 U	490 U	410 U	620 U	430 U	800	420 U

NA - Not analyzed  
B - Possible blank contamination  
J - Estimated value  
K - Value biased high  
L - Value biased low

R - Unusable result  
U - Undetected  
UJ - Undetected, limit estimated  
UL - Undetected, limit biased low

Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
Pentachlorophenol	1,300 U	1,100 U	1,200 U	1,000 U	1,500 U	1,100 U	1,200 U	1,000 U
Phenanthrene	510 U	440 U	490 U	410 U	620 U	430 U	17,000	53 J
Phenol	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Pyrene	510 U	440 U	490 U	410 U	620 U	430 U	14,000	70 J
bis(2-Chloro-1-methylethyl) ether	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
bis(2-Chloroethoxy)methane	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
bis(2-Chloroethyl)ether	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
bis(2-Ethylhexyl)phthalate	510 U	440 U	52 J	410 U	67 J	57 J	65 J	54 J
n-Nitroso-di-n-propylamine	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
n-Nitrosodiphenylamine	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.01 U	0.009 U	0.01 U	NA	NA	0.01 U	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01 U	0.006 U	0.06	NA	NA	0.009 U	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01 U	0.007 U	0.01 U	NA	NA	0.01 U	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.02 U	0.01 U	0.01 U	NA	NA	0.01 U	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran	0.008 U	0.005 U	0.007 U	NA	NA	0.007 U	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.01 U	0.009 U	0.01 U	NA	NA	0.01 U	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran	0.007 U	0.004 U	0.006 U	NA	NA	0.006 U	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.01 U	0.009 U	0.01 U	NA	NA	0.01 U	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran	0.007 U	0.005 U	0.007 U	NA	NA	0.006 U	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.03 U	0.02 U	0.02 U	NA	NA	0.02 U	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran	0.02 U	0.01 U	0.02 U	NA	NA	0.02 U	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran	0.008 U	0.005 U	0.007 U	NA	NA	0.007 U	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran	0.02 U	0.01 U	0.02 U	NA	NA	0.02 U	NA	NA
2,3,7,8-TCDD (dioxin)	0.02 U	0.01 U	0.02 U	NA	NA	0.01 U	NA	NA
2,3,7,8-Tetrachlorodibenzofuran	0.01 U	0.008 U	0.01 U	NA	NA	0.01 U	NA	NA
Octachlorodibenzo-p-dioxin	0.3 B	0.1 B	0.4 B	NA	NA	0.3 B	NA	NA
Octachlorodibenzofuran	0.02 U	0.01 U	0.01 U	NA	NA	0.01 U	NA	NA
Total heptachlorodibenzo-p-dioxin	0.01 U	0.009 U	0.01 U	NA	NA	0.01 U	NA	NA
Total heptachlorodibenzofuran	0.01 U	0.006 U	0.06	NA	NA	0.009 U	NA	NA
Total hexachlorodibenzo-p-dioxin	0.01 U	0.009 U	0.01 U	NA	NA	0.01 U	NA	NA
Total hexachlorodibenzofuran	0.007 U	0.004 U	0.006 U	NA	NA	0.006 U	NA	NA
Total pentachlorodibenzo-p-dioxin	0.03 U	0.02 U	0.02 U	NA	NA	0.02 U	NA	NA
Total pentachlorodibenzofuran	0.02 U	0.01 U	0.02 U	NA	NA	0.02 U	NA	NA

NA - Not analyzed  
 B - Possible blank contamination  
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 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
Total tetrachlorodibenzo-p-dioxin	0.02 U	0.01 U	0.02 U	NA	NA	0.01 U	NA	NA
Total tetrachlorodibenzofuran	0.01 U	0.008 U	0.01 U	NA	NA	0.01 U	NA	NA
<b>Explosives (UG/KG)</b>								
1,3,5-Trinitrobenzene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
1,3-Dinitrobenzene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
2,4,6-Trinitrotoluene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
2,4-Dinitrotoluene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
2,6-Dinitrotoluene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
2-Amino-4,6-dinitrotoluene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
2-Nitrotoluene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
3-Nitrotoluene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
4-Amino-2,6-dinitrotoluene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
4-Nitrotoluene	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
HMX	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
Nitrobenzene	510 U	440 U	490 U	410 U	620 U	430 U	480 U	420 U
Nitroglycerin	75,000 U	65,000 U	73,000 U	61,000 U	NA	65,000 U	NA	NA
Nitroguanidine	150,000 U	130,000 U	150,000 U	120,000 U	NA	130,000 U	NA	NA
PETN	75,000 U	65,000 U	73,000 U	61,000 U	NA	65,000 U	NA	NA
Perchlorate	7 U	6 U	7 U	6 U	NA	6 U	NA	NA
RDX	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
Tetryl	750 U	650 U	730 U	610 U	NA	650 U	NA	NA
<b>Total Metals (MG/KG)</b>								
Aluminum	3,920	5,830	6,430	6,890	5,950	7,270	8,410	5,470
Antimony	1.8 B	1.3 U	3.6 B	2.7 B	2.2 B	1.3 U	3.5 B	2.5 J
Arsenic	1.3 J	6.9	4.9	15.7	9.3	7.1	9.1	10.7 K
Barium	58.6 J	73.1	65.2	108	67.4 J	60	176	83.1
Beryllium	1.1 J	1.3 J	1 J	1.6	1.8 J	0.85 J	0.93 J	1.5
Cadmium	0.12 U	0.1 U	0.33 J	0.1 U	0.15 U	0.1 U	6	0.1 U
Calcium	2,750	1,830	7,490	3,520	2,820	13,800	6,990	1,480
Chromium	3.5	8.9	8	22.8	8.8	9.5	19.6	8.3
Cobalt	24	27.5	26.9	43.8	48.4	15.3	16.5	42.9
Copper	13.3	17.8	87.2	23.3	28	29.9	203	30.4
Cyanide	NA	0.76 U	0.66 U	0.74 U	0.62 U	NA	NA	0.62 U

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Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-1/1SW-1	1SD-1A/1SW-1A	1SD-2/1SW-2	1SD-2A/1SW-2A	1SD-2B	1SD-2C	1SD-2D	1SD-3/1SW-3
Sample ID	AS01-SD01-R05	AS01-SD01A-R05	AS01-SD02-R05	AS01-SD02A-R05	AS01-SD02B	AS01-SD02C	AS01-SD02D	AS01-SD03-R05
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01
Chemical Name								
Iron	12,600	35,000	26,700	60,600	29,300	28,300	32,800	25,700
Lead	19.3	15.2	26.8	20.1	31.2	16.3	134	35.6
Magnesium	424 J	572 J	1,360 J	1,370	866 J	1,880	1,510	638 J
Manganese	617	818	980	1,550	1,160	748	730	1,350 K
Mercury	0.14 U	0.13 U	1.4 J	0.12 U	0.18	0.24 J	0.87	0.21 L
Nickel	38.9	45.1	43.5	62.3	69.6	24.2	31	45.1 J
Potassium	337 J	592 J	531 J	777 J	605 J	826 J	1,010 J	558 J
Selenium	0.67 U	0.57 U	0.64 U	0.53 U	1.6 J	0.56 U	0.62 U	0.54 U
Silver	0.18 U	0.23 J	103	0.21 J	0.25 J	3.7	89.2	0.2 L
Sodium	93.5 U	80.2 U	126 J	74.4 U	112 U	78.9 U	200 J	76.1 U
Thallium	0.7 U	0.6 U	0.64 U	0.56 U	0.84 U	0.59 U	0.65 U	0.57 U
Vanadium	7.9 J	16.1	13.9 J	33.6	16.2 J	24.4	23.5	17.8
Zinc	117	131	281	171	218	101	572	155 K
Wet Chemistry (MG/KG)								
Total organic carbon (TOC)	43,000	42,000	67,000	60,000	39,000	47,000	51,000	28,000
pH	7.13	7.3	7.36	7.35	7.33	8	7.48	5.94

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C	AS01-SD06
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01	06/15/01
Chemical Name								
<b>Volatile Organic Compounds (UG/KG)</b>								
1,1,1-Trichloroethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,1,2,2-Tetrachloroethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	12 UJ	19 UJ	21 U	17 UJ	21 U	15 U	13 U	18 U
1,1,2-Trichloroethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,1-Dichloroethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,1-Dichloroethene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,2,4-Trichlorobenzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,2-Dibromo-3-chloropropane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,2-Dibromoethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,2-Dichlorobenzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,2-Dichloroethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,2-Dichloropropane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,3-Dichlorobenzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
1,4-Dichlorobenzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
2-Butanone	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
2-Hexanone	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
4-Methyl-2-pentanone	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Acetone	12 U	19 U	21 U	17 U	13 J	15 U	13 U	18 U
Benzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Bromodichloromethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Bromoform	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Bromomethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Carbon disulfide	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Carbon tetrachloride	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Chlorobenzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Chloroethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Chloroform	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Chloromethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Cumene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Cyclohexane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Dibromochloromethane	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Dichlorodifluoromethane (Freon-12)	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U
Ethylbenzene	12 U	19 U	21 U	17 U	21 U	15 U	13 U	18 U

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Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A		1SD-3B		1SD-4/1SW-4		1SD-4B		1SD-5/1SW-5		1SD-5C/1SW-5C		1SD-6			
Sample ID	AS01-SD03A-R05		AS01-SD03B		AS01-SD04P-R05		AS01-SD04-R05		AS01-SD04B		AS01-SD05-R05		AS01-SD05C		AS01-SD06	
Sample Date	06/14/01		06/14/01		06/15/01		06/15/01		06/14/01		06/14/01		06/15/01			
Chemical Name																
4-Chloro-3-methylphenol	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
4-Chloroaniline	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
4-Chlorophenyl-phenylether	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
4-Nitroaniline	1,000	U	1,600	U	1,700	U	1,400	U	1,800	U	1,300	U	1,100	U	1,500	U
4-Nitrophenol	1,000	U	1,600	U	1,700	U	1,400	U	1,800	U	1,300	U	1,100	U	1,500	U
Acenaphthene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Acenaphthylene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Acetophenone	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Anthracene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Atrazine	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Benzaldehyde	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Benzo(a)anthracene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Benzo(a)pyrene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Benzo(b)fluoranthene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Benzo(g,h,i)perylene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Benzo(k)fluoranthene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Butylbenzylphthalate	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Caprolactam	410	U	630	U	690	U	560	U	710	R	510	R	450	R	580	U
Carbazole	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Chrysene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Di-n-butylphthalate	64	J	150	J	690	U	560	U	89	J	88	J	46	J	580	U
Di-n-octylphthalate	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Dibenz(a,h)anthracene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Dibenzofuran	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Diethylphthalate	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Dimethyl phthalate	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Fluoranthene	410	U	630	U	690	U	92	J	710	U	510	U	450	U	79	J
Fluorene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Hexachlorobenzene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Hexachlorobutadiene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Hexachlorocyclopentadiene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Hexachloroethane	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Indeno(1,2,3-cd)pyrene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Isophorone	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U
Naphthalene	410	U	630	U	690	U	560	U	710	U	510	U	450	U	580	U

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Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C	AS01-SD06
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01	06/15/01
Chemical Name								
Pentachlorophenol	1,000 U	1,600 U	1,700 U	1,400 U	1,800 U	1,300 U	1,100 U	1,500 U
Phenanthrene	410 U	630 U	690 U	67 J	710 U	510 U	450 U	580 U
Phenol	410 U	630 U	130 J	560 U	710 U	510 U	450 U	580 U
Pyrene	410 U	630 U	690 U	73 J	710 U	510 U	450 U	70 J
bis(2-Chloro-1-methylethyl) ether	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
bis(2-Chloroethoxy)methane	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
bis(2-Chloroethyl)ether	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
bis(2-Ethylhexyl)phthalate	78 J	88 J	83 J	68 J	75 J	62 J	450 U	230 J
n-Nitroso-di-n-propylamine	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
n-Nitrosodiphenylamine	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
Dioxin/Furans (UG/KG)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.007 U	0.02 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.004 U	0.01 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.005 U	0.01 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.009 U	0.02 U
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.003 U	0.009 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.008 U	0.02 U
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.003 U	0.008 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.008 U	0.02 U
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.003 U	0.009 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.02 U	0.03 U
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.01 U	0.03 U
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.003 U	0.009 U
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.01 U	0.02 U
2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	0.01 U	NA
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.008 U	0.02 U
Octachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.1 B	0.6
Octachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.007 U	0.02 U
Total heptachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.007 U	0.02 U
Total heptachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.004 U	0.01 U
Total hexachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.008 U	0.02 U
Total hexachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.003 U	0.008 U
Total pentachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.02 U	0.03 U
Total pentachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.01 U	0.02 U

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Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C	AS01-SD06
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01	06/15/01
Chemical Name								
Total tetrachlorodibenzo-p-dioxin	NA	NA	NA	NA	NA	NA	0.01 U	0.02 U
Total tetrachlorodibenzofuran	NA	NA	NA	NA	NA	NA	0.008 U	0.02 U
Explosives (UG/KG)								
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	750 U	670 U	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	750 U	670 U	NA
2,4,6-Trinitrotoluene	NA	NA	NA	NA	NA	750 U	670 U	NA
2,4-Dinitrotoluene	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
2,6-Dinitrotoluene	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
2-Amino-4,6-dinitrotoluene	NA	NA	NA	NA	NA	750 U	670 U	NA
2-Nitrotoluene	NA	NA	NA	NA	NA	750 U	670 U	NA
3-Nitrotoluene	NA	NA	NA	NA	NA	750 U	670 U	NA
4-Amino-2,6-dinitrotoluene	NA	NA	NA	NA	NA	750 U	670 U	NA
4-Nitrotoluene	NA	NA	NA	NA	NA	750 U	670 U	NA
HMX	NA	NA	NA	NA	NA	750 U	670 U	NA
Nitrobenzene	410 U	630 U	690 U	560 U	710 U	510 U	450 U	580 U
Nitroglycerin	NA	NA	NA	NA	NA	75,000 U	67,000 U	NA
Nitroguanidine	NA	NA	NA	NA	NA	150,000 U	130,000 U	NA
PETN	NA	NA	NA	NA	NA	75,000 U	67,000 U	NA
Perchlorate	NA	NA	NA	NA	NA	7 U	6 U	8 U
RDX	NA	NA	NA	NA	NA	750 U	670 U	NA
Tetryl	NA	NA	NA	NA	NA	750 U	670 U	NA
Total Metals (MG/KG)								
Aluminum	4,500	8,090	7,980	8,070	14,000	4,700	4,620	6,620
Antimony	2.9 B	2.3 B	2 B	3.4 B	2.7 J	1.5 U	1.4 J	4.2 B
Arsenic	7.8	14.4	14.2 K	11.3	17.3	7.1	8.2	13.1 K
Barium	45.1	147	137	136	183	62.5	68.2	87.6
Beryllium	1.2 J	2.2	2.2	2.2	3.4	1.4 J	1.2 J	2
Cadmium	0.07 U	0.15 U	0.22 J	0.35 J	0.29 J	0.12 U	0.11 U	0.24 J
Calcium	1,660	2,980	3,420	3,480	4,560	1,760	2,650	2,960
Chromium	9.4 J	13.8 J	8	9.6	16.8 J	8.8 J	12.8 J	9.3
Cobalt	26.6	61.1	58.4	64.6	56.7	33.9	27.4	34.8
Copper	247	37.4	38	36.3	59.6 J	22.9 J	21 J	41.9
Cyanide	0.62 U	NA	NA	1.03 U	NA	0.77 U	0.67 U	NA

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-3A/1SW-3A	1SD-3B	1SD-4/1SW-4		1SD-4B	1SD-5/1SW-5	1SD-5C/1SW-5C	1SD-6
Sample ID	AS01-SD03A-R05	AS01-SD03B	AS01-SD04P-R05	AS01-SD04-R05	AS01-SD04B	AS01-SD05-R05	AS01-SD05C	AS01-SD06
Sample Date	06/14/01	06/14/01	06/15/01	06/15/01	06/14/01	06/14/01	06/14/01	06/15/01
Chemical Name								
Iron	37,200	34,100	33,900	33,800	42,400	25,900	28,900	23,100
Lead	17	36.6	32.2	31.8	47.3	20.9	29.5	34
Magnesium	545	1,120 J	1,160 J	1,260 J	1,660 J	602 J	629 J	623 J
Manganese	560	2,350	1,450 K	1,690	2,120	920	663	663 K
Mercury	0.12 U	0.19 U	0.21 UL	0.19 J	0.19 U	0.15 U	0.15	0.62 L
Nickel	44.9	89.1	91 J	94.7	85.9	60	45.4	60.7 J
Potassium	568 J	842 J	757 J	835 J	1,140 J	484 J	505 J	462 J
Selenium	0.55 U	0.83 U	0.89 U	0.74 U	0.93 U	0.66 U	0.58 U	0.77 U
Silver	0.15 U	0.34 J	0.24 UL	0.24 J	0.25 U	0.28 J	0.16 U	0.52 L
Sodium	76.4 U	117 U	124 U	112 J	130 U	92.5 U	81.8 U	107 U
Thallium	0.57 U	0.87 U	0.93 U	0.78 U	1.2 J	0.69 U	0.61 U	3.3 B
Vanadium	15.3	19.6	21.9	20.6	27.8	13.6 J	15.3	14.4 J
Zinc	143 J	262 J	269 K	273	240 J	181 J	148 J	208 K
Wet Chemistry (MG/KG)								
Total organic carbon (TOC)	20,000	79,000	140,000	46,000	78,000	14,000	17,000	51,000
pH	7.19	6.86	7.04	7.23	6.84	6.89 R	6.69 R	6.89

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SW-6		1SD-6A		1SD-6B		1SD-7/1SW-7		1SD-7A		1SD-7B		1SD-8/1SW-8					
Sample ID	AS01-SD06P		AS01-SD06A		AS01-SD06B		AS01-SD07		AS01-SD07P		AS01-SD07A		AS01-SD07B					
Sample Date	06/15/01		06/15/01		06/15/01		06/15/01		06/15/01		06/15/01		06/14/01					
Chemical Name																		
<b>Volatile Organic Compounds (UG/KG)</b>																		
1,1,1-Trichloroethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,1,2,2-Tetrachloroethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	UJ	21	U
1,1,2-Trichloroethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,1-Dichloroethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,1-Dichloroethene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,2,4-Trichlorobenzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,2-Dibromo-3-chloropropane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,2-Dibromoethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,2-Dichlorobenzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,2-Dichloroethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,2-Dichloropropane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,3-Dichlorobenzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
1,4-Dichlorobenzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
2-Butanone	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
2-Hexanone	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
4-Methyl-2-pentanone	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Acetone	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Benzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Bromodichloromethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Bromoform	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Bromomethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Carbon disulfide	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Carbon tetrachloride	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Chlorobenzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Chloroethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Chloroform	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Chloromethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Cumene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Cyclohexane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Dibromochloromethane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Dichlorodifluoromethane (Freon-12)	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Ethylbenzene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SW-6		1SD-6A		1SD-6B		1SD-7/1SW-7		1SD-7A		1SD-7B		1SD-8/1SW-8					
Sample ID	AS01-SD06P		AS01-SD06A		AS01-SD06B		AS01-SD07		AS01-SD07P		AS01-SD07A		AS01-SD07B					
Sample Date	06/15/01		06/15/01		06/15/01		06/15/01		06/15/01		06/15/01		06/14/01					
Chemical Name																		
Methyl acetate	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Methyl-tert-butyl ether (MTBE)	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Methylcyclohexane	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Methylene chloride	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Styrene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Tetrachloroethene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Toluene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Trichloroethene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Trichlorofluoromethane(Freon-11)	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Vinyl chloride	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
Xylene, total	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
cis-1,2-Dichloroethene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
cis-1,3-Dichloropropene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
o-Xylene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
trans-1,2-Dichloroethene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
trans-1,3-Dichloropropene	18	U	11	U	23	U	19	U	17	U	13	U	20	U	23	U	21	U
<b>Semi-volatile Organic Compounds (UG/KG)</b>																		
1,1-Biphenyl	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2,4,5-Trichlorophenol	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
2,4,6-Trichlorophenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2,4-Dichlorophenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2,4-Dimethylphenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2,4-Dinitrophenol	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
2-Chloronaphthalene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2-Chlorophenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2-Methylnaphthalene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2-Methylphenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
2-Nitroaniline	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
2-Nitrophenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
3,3'-Dichlorobenzidine	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
3- and 4-Methylphenol	610	U	380	U	780	U	160	J	1,300		440	U	670	U	780	U	710	U
3-Nitroaniline	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
4,6-Dinitro-2-methylphenol	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
4-Bromophenyl-phenylether	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U

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 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SW-6		1SD-6A		1SD-6B		1SD-7/1SW-7		1SD-7A		1SD-7B		1SD-8/1SW-8					
Sample ID	AS01-SD06P		AS01-SD06A		AS01-SD06B		AS01-SD07		AS01-SD07P		AS01-SD07A		AS01-SD07B					
Sample Date	06/15/01		06/15/01		06/15/01		06/15/01		06/15/01		06/15/01		06/14/01					
Chemical Name																		
4-Chloro-3-methylphenol	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
4-Chloroaniline	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
4-Chlorophenyl-phenylether	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
4-Nitroaniline	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
4-Nitrophenol	1,500	U	960	U	1,900	U	1,600	U	1,400	U	1,100	U	1,700	U	1,900	U	1,800	U
Acenaphthene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Acenaphthylene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Acetophenone	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Anthracene	83	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Atrazine	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Benzaldehyde	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Benzo(a)anthracene	180	J	380	U	780	U	630	U	570	U	52	J	670	U	780	U	710	U
Benzo(a)pyrene	120	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Benzo(b)fluoranthene	160	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Benzo(g,h,i)perylene	62	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Benzo(k)fluoranthene	63	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Butylbenzylphthalate	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Caprolactam	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	R
Carbazole	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Chrysene	170	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Di-n-butylphthalate	610	U	380	U	780	U	630	U	570	U	440	U	670	U	98	J	120	J
Di-n-octylphthalate	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Dibenz(a,h)anthracene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Dibenzofuran	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Diethylphthalate	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Dimethyl phthalate	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Fluoranthene	360	J	380	U	84	J	630	U	62	J	120	J	670	U	780	U	710	U
Fluorene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Hexachlorobenzene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Hexachlorobutadiene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Hexachlorocyclopentadiene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Hexachloroethane	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Indeno(1,2,3-cd)pyrene	65	J	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Isophorone	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U
Naphthalene	610	U	380	U	780	U	630	U	570	U	440	U	670	U	780	U	710	U

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 J - Estimated value  
 K - Value biased high  
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R - Unusable result  
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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SW-6	1SD-6A	1SD-6B	1SD-7/1SW-7		1SD-7A	1SD-7B		1SD-8/1SW-8
Sample ID	AS01-SD06P	AS01-SD06A	AS01-SD06B	AS01-SD07	AS01-SD07P	AS01-SD07A	AS01-SD07B	AS01-SD07BP	AS01-SD08
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/14/01
Chemical Name									
Pentachlorophenol	1,500 U	960 U	1,900 U	1,600 U	1,400 U	1,100 U	1,700 U	1,900 U	1,800 U
Phenanthrene	300 J	380 U	780 U	630 U	570 U	110 J	670 U	780 U	710 U
Phenol	87 J	380 U	110 J	84 J	170 J	440 U	100 J	780 U	710 U
Pyrene	300 J	380 U	84 J	630 U	570 U	100 J	670 U	780 U	710 U
bis(2-Chloro-1-methylethyl) ether	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
bis(2-Chloroethoxy)methane	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
bis(2-Chloroethyl)ether	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
bis(2-Ethylhexyl)phthalate	93 J	78 J	79 J	69 J	74 J	440 U	110 J	100 J	710 U
n-Nitroso-di-n-propylamine	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
n-Nitrosodiphenylamine	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
Dioxin/Furans (UG/KG)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.01 U	0.01 U	NA	NA	NA	0.03 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01 U	NA	NA	0.01 U	0.007 U	NA	NA	NA	0.02 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.02 U	NA	NA	0.01 U	0.008 U	NA	NA	NA	0.02 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.02 U	0.01 U	NA	NA	NA	0.03 U
1,2,3,4,7,8-Hexachlorodibenzofuran	0.01 U	NA	NA	0.008 U	0.006 U	NA	NA	NA	0.01 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.02 U	0.01 U	NA	NA	NA	0.03 U
1,2,3,6,7,8-Hexachlorodibenzofuran	0.009 U	NA	NA	0.007 U	0.005 U	NA	NA	NA	0.01 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.02 U	0.01 U	NA	NA	NA	0.03 U
1,2,3,7,8,9-Hexachlorodibenzofuran	0.009 U	NA	NA	0.008 U	0.006 U	NA	NA	NA	0.01 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.03 U	NA	NA	0.04 U	0.02 U	NA	NA	NA	0.06 U
1,2,3,7,8-Pentachlorodibenzofuran	0.03 U	NA	NA	0.03 U	0.02 U	NA	NA	NA	0.06 U
2,3,4,6,7,8-Hexachlorodibenzofuran	0.01 U	NA	NA	0.008 U	0.006 U	NA	NA	NA	0.01 U
2,3,4,7,8-Pentachlorodibenzofuran	0.02 U	NA	NA	0.03 U	0.01 U	NA	NA	NA	0.05 U
2,3,7,8-TCDD (dioxin)	0.02 U	NA	NA	0.03 U	0.02 U	NA	NA	NA	0.04 U
2,3,7,8-Tetrachlorodibenzofuran	0.02 U	NA	NA	0.02 U	0.01 U	NA	NA	NA	0.03 U
Octachlorodibenzo-p-dioxin	2	NA	NA	0.2 B	0.2 B	NA	NA	NA	0.5 B
Octachlorodibenzofuran	0.02 U	NA	NA	0.01 U	0.01 U	NA	NA	NA	0.03 U
Total heptachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.01 U	0.01 U	NA	NA	NA	0.03 U
Total heptachlorodibenzofuran	0.01 U	NA	NA	0.01 U	0.007 U	NA	NA	NA	0.02 U
Total hexachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.02 U	0.01 U	NA	NA	NA	0.03 U
Total hexachlorodibenzofuran	0.009 U	NA	NA	0.007 U	0.005 U	NA	NA	NA	0.01 U
Total pentachlorodibenzo-p-dioxin	0.03 U	NA	NA	0.04 U	0.02 U	NA	NA	NA	0.06 U
Total pentachlorodibenzofuran	0.02 U	NA	NA	0.03 U	0.01 U	NA	NA	NA	0.05 U

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Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SW-6	1SD-6A	1SD-6B	1SD-7/1SW-7		1SD-7A	1SD-7B		1SD-8/1SW-8
Sample ID	AS01-SD06P	AS01-SD06A	AS01-SD06B	AS01-SD07	AS01-SD07P	AS01-SD07A	AS01-SD07B	AS01-SD07BP	AS01-SD08
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/14/01
Chemical Name									
Total tetrachlorodibenzo-p-dioxin	0.02 U	NA	NA	0.03 U	0.02 U	NA	NA	NA	0.04 U
Total tetrachlorodibenzofuran	0.02 U	NA	NA	0.02 U	0.01 U	NA	NA	NA	0.03 U
<b>Explosives (UG/KG)</b>									
1,3,5-Trinitrobenzene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
1,3-Dinitrobenzene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
2,4,6-Trinitrotoluene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
2,4-Dinitrotoluene	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
2,6-Dinitrotoluene	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
2-Amino-4,6-dinitrotoluene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
2-Nitrotoluene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
3-Nitrotoluene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
4-Amino-2,6-dinitrotoluene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
4-Nitrotoluene	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
HMX	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
Nitrobenzene	610 U	380 U	780 U	630 U	570 U	440 U	670 U	780 U	710 U
Nitroglycerin	NA	57,000 U	9,000 U	94,000 U	86,000 U	65,000 U	NA	NA	110,000 U
Nitroguanidine	NA	110,000 U	180,000 U	190,000 U	170,000 U	130,000 U	NA	NA	210,000 U
PETN	NA	57,000 U	9,000 U	94,000 U	86,000 U	65,000 U	NA	NA	110,000 U
Perchlorate	NA	6 U	9 U	9 U	6 U	6 U	NA	NA	10 U
RDX	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
Tetryl	NA	570 U	900 U	940 U	860 U	650 U	NA	NA	1,100 U
<b>Total Metals (MG/KG)</b>									
Aluminum	9,850	4,190	10,800	6,620	5,430	2,620	8,090	7,710	11,900
Antimony	4.4 B	2.3 B	3.7 B	3.4 B	8.8 B	1.8 B	4.2 J	2.2 U	2.1 U
Arsenic	17.2 K	7 K	17.8 K	12.9 K	16.2 K	1.9 K	14.3 K	12.4	14.7
Barium	136	146	133	93.5	65.3 J	52.1	163	169	201
Beryllium	2.6	1.3	3.1	2.4	2	0.87 J	2	2.1 J	2.7
Cadmium	0.74 J	0.09 U	0.41 J	0.37 J	0.44 J	0.1 U	0.27 J	0.18 U	0.29 J
Calcium	19,700	1,350	4,450	2,400	1,990	3,060	3,880	4,650	5,250
Chromium	23.5	6.1	16.6	8.9	10.3	0.18 U	6.3	7.8	13.8 J
Cobalt	35.7	140	36.2	89	72.9	22	60.3	61.3	80.8
Copper	73.8	21.9	74.1	46.2	37.3	10.9	35.2	37.6	46.9 J
Cyanide	NA	NA	NA	NA	0.86 U	NA	NA	0.85 U	NA

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SW-6	1SD-6A	1SD-6B	1SD-7/1SW-7		1SD-7A	1SD-7B		1SD-8/1SW-8
Sample ID	AS01-SD06P	AS01-SD06A	AS01-SD06B	AS01-SD07	AS01-SD07P	AS01-SD07A	AS01-SD07B	AS01-SD07BP	AS01-SD08
Sample Date	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/15/01	06/14/01
Chemical Name									
Iron	32,300	25,000	38,700	34,000	41,300	8,720	32,500	32,700	39,100
Lead	69.7	45.9	75	54.3	34.7	17.7	30.9	35.6	38.8
Magnesium	949 J	493 J	1,000 J	831 J	2,140	447 J	1,470 J	1,480 J	1,770 J
Manganese	376 K	1,310 K	512 K	1,030 K	1,240 K	726 K	2,130 K	2,360	2,920
Mercury	1.2 L	0.1 UL	1.5 L	0.17 UL	0.16 UL	0.13 UL	0.19 UL	0.23 U	0.2 U
Nickel	64.1 J	45.5 J	65 J	114 J	91.2 J	32.1 J	89.9 J	90.7	119
Potassium	695 J	407 J	885 J	568 J	650 J	241 J	1,020 J	830 J	1,510 J
Selenium	0.8 U	0.5 U	0.98 U	0.82 U	1.5 J	1.8	0.88 U	0.99 U	0.92 U
Silver	3.6 L	0.73 L	0.46 L	0.22 UL	1.9 L	0.16 UL	0.24 UL	0.87 J	0.62 J
Sodium	334 J	70.3 U	231 J	114 U	868 J	79.7 U	135 J	139 U	129 U
Thallium	3.7 B	2.5 B	2.8 B	3.9 B	3.9 B	0.77 B	0.92 U	1 U	2.2 J
Vanadium	20.8	11.7	22.3 J	15.6 J	18	5.6 J	20.8	19.4 J	29.7
Zinc	462 K	139 K	322 K	354 K	288 K	90.8 K	246 K	254	302 J
Wet Chemistry (MG/KG)									
Total organic carbon (TOC)	110,000	15,000	39,000	14,000	74,000	40,000	14,000	66,000	63,000
pH	7.19	7	6.51	7.12	7.09	7.26	7.17	6.98	6.81

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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01
Chemical Name			
<b>Volatile Organic Compounds (UG/KG)</b>			
1,1,1-Trichloroethane	13 U	16 U	14 U
1,1,2,2-Tetrachloroethane	13 U	16 U	14 U
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	13 U	16 U	14 U
1,1,2-Trichloroethane	13 U	16 U	14 U
1,1-Dichloroethane	13 U	16 U	14 U
1,1-Dichloroethene	13 U	16 U	14 U
1,2,4-Trichlorobenzene	13 U	16 U	14 U
1,2-Dibromo-3-chloropropane	13 U	16 U	14 U
1,2-Dibromoethane	13 U	16 U	14 U
1,2-Dichlorobenzene	13 U	16 U	14 U
1,2-Dichloroethane	13 U	16 U	14 U
1,2-Dichloropropane	13 U	16 U	14 U
1,3-Dichlorobenzene	13 U	16 U	14 U
1,4-Dichlorobenzene	13 U	16 U	14 U
2-Butanone	13 U	16 U	14 U
2-Hexanone	13 U	16 U	14 U
4-Methyl-2-pentanone	13 U	16 U	14 U
Acetone	13 U	16 U	14 U
Benzene	13 U	16 U	14 U
Bromodichloromethane	13 U	16 U	14 U
Bromoform	13 U	16 U	14 U
Bromomethane	13 U	16 U	14 U
Carbon disulfide	13 U	16 U	14 U
Carbon tetrachloride	13 U	16 U	14 U
Chlorobenzene	13 U	16 U	14 U
Chloroethane	13 U	16 U	14 U
Chloroform	13 U	16 U	14 U
Chloromethane	13 U	16 U	14 U
Cumene	13 U	16 U	14 U
Cyclohexane	13 U	16 U	14 U
Dibromochloromethane	13 U	16 U	14 U
Dichlorodifluoromethane (Freon-12)	13 U	16 U	14 U
Ethylbenzene	13 U	16 U	14 U

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 J - Estimated value  
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Table D-8  
Raw Data, Sediment, North Branch Potomac River  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01
Chemical Name			
4-Chloro-3-methylphenol	420 U	530 U	460 U
4-Chloroaniline	420 U	530 U	460 U
4-Chlorophenyl-phenylether	420 U	530 U	460 U
4-Nitroaniline	1,000 U	1,300 U	1,200 U
4-Nitrophenol	1,000 U	1,300 U	1,200 U
Acenaphthene	420 U	530 U	460 U
Acenaphthylene	420 U	530 U	460 U
Acetophenone	420 U	530 U	460 U
Anthracene	420 U	530 U	460 U
Atrazine	420 U	530 U	460 U
Benzaldehyde	420 U	530 U	460 U
Benzo(a)anthracene	420 U	530 U	460 U
Benzo(a)pyrene	420 U	530 U	460 U
Benzo(b)fluoranthene	420 U	530 U	460 U
Benzo(g,h,i)perylene	420 U	530 U	460 U
Benzo(k)fluoranthene	420 U	530 U	460 U
Butylbenzylphthalate	420 U	530 U	460 U
Caprolactam	420 R	530 R	460 R
Carbazole	420 U	530 U	460 U
Chrysene	420 U	530 U	460 U
Di-n-butylphthalate	45 J	66 J	65 J
Di-n-octylphthalate	420 U	530 U	460 U
Dibenz(a,h)anthracene	420 U	530 U	460 U
Dibenzofuran	420 U	530 U	460 U
Diethylphthalate	420 U	530 U	460 U
Dimethyl phthalate	420 U	530 U	460 U
Fluoranthene	420 U	62 J	460 U
Fluorene	420 U	530 U	460 U
Hexachlorobenzene	420 U	530 U	460 U
Hexachlorobutadiene	420 U	530 U	460 U
Hexachlorocyclopentadiene	420 U	530 U	460 U
Hexachloroethane	420 U	530 U	460 U
Indeno(1,2,3-cd)pyrene	420 U	530 U	460 U
Isophorone	420 U	530 U	460 U
Naphthalene	420 U	530 U	460 U

NA - Not analyzed  
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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01
Chemical Name			
Pentachlorophenol	1,000 U	1,300 U	1,200 U
Phenanthrene	420 U	530 U	460 U
Phenol	420 U	530 U	460 U
Pyrene	420 U	57 J	460 U
bis(2-Chloro-1-methylethyl) ether	420 U	530 U	460 U
bis(2-Chloroethoxy)methane	420 U	530 U	460 U
bis(2-Chloroethyl)ether	420 U	530 U	460 U
bis(2-Ethylhexyl)phthalate	420 U	95 J	51 J
n-Nitroso-di-n-propylamine	420 U	530 U	460 U
n-Nitrosodiphenylamine	420 U	530 U	460 U
Dioxin/Furans (UG/KG)			
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	NA	NA	0.02 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran	NA	NA	0.009 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran	NA	NA	0.01 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	0.02 U
1,2,3,4,7,8-Hexachlorodibenzofuran	NA	NA	0.008 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	NA	NA	0.02 U
1,2,3,6,7,8-Hexachlorodibenzofuran	NA	NA	0.007 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	NA	NA	0.02 U
1,2,3,7,8,9-Hexachlorodibenzofuran	NA	NA	0.007 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	NA	NA	0.03 U
1,2,3,7,8-Pentachlorodibenzofuran	NA	NA	0.03 U
2,3,4,6,7,8-Hexachlorodibenzofuran	NA	NA	0.008 U
2,3,4,7,8-Pentachlorodibenzofuran	NA	NA	0.02 U
2,3,7,8-TCDD (dioxin)	NA	NA	0.03 U
2,3,7,8-Tetrachlorodibenzofuran	NA	NA	0.02 U
Octachlorodibenzo-p-dioxin	NA	NA	0.2
Octachlorodibenzofuran	NA	NA	0.02 U
Total heptachlorodibenzo-p-dioxin	NA	NA	0.02 U
Total heptachlorodibenzofuran	NA	NA	0.009 U
Total hexachlorodibenzo-p-dioxin	NA	NA	0.02 U
Total hexachlorodibenzofuran	NA	NA	0.007 U
Total pentachlorodibenzo-p-dioxin	NA	NA	0.03 U
Total pentachlorodibenzofuran	NA	NA	0.02 U

NA - Not analyzed  
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Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01
Chemical Name			
Total tetrachlorodibenzo-p-dioxin	NA	NA	0.03 U
Total tetrachlorodibenzofuran	NA	NA	0.02 U
Explosives (UG/KG)			
1,3,5-Trinitrobenzene	620 U	780 U	680 U
1,3-Dinitrobenzene	620 U	780 U	680 U
2,4,6-Trinitrotoluene	620 U	780 U	680 U
2,4-Dinitrotoluene	420 U	530 U	460 U
2,6-Dinitrotoluene	420 U	530 U	460 U
2-Amino-4,6-dinitrotoluene	620 U	780 U	680 U
2-Nitrotoluene	620 U	780 U	680 U
3-Nitrotoluene	620 U	780 U	680 U
4-Amino-2,6-dinitrotoluene	620 U	780 U	680 U
4-Nitrotoluene	620 U	780 U	680 U
HMX	620 U	780 U	680 U
Nitrobenzene	420 U	530 U	460 U
Nitroglycerin	62,000 U	78,000 U	68,000 U
Nitroguanidine	120,000 U	160,000 U	140,000 U
PETN	62,000 U	78,000 U	68,000 U
Perchlorate	6 U	8 U	7 U
RDX	620 U	780 U	680 U
Tetryl	620 U	780 U	680 U
Total Metals (MG/KG)			
Aluminum	5,760	5,090	4,180
Antimony	2.2 J	1.5 U	1.5 J
Arsenic	10.2	8	9.2
Barium	53.1	78.8	45.5 J
Beryllium	1.6	1.6	1.3 J
Cadmium	0.1 U	0.28 J	0.11 U
Calcium	1,250	1,950	1,320 J
Chromium	16.6 J	6 J	8.2 J
Cobalt	29.7	49.8	31.2
Copper	28.8 J	27.4 J	20.3 J
Cyanide	NA	0.62 U	NA

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

Table D-8  
 Raw Data, Sediment, North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Station ID	1SD-8A	1SD-9/1SW-9	1SD-9A
Sample ID	AS01-SD08A	AS01-SD09	AS01-SD09A
Sample Date	06/14/01	06/14/01	06/14/01
<b>Chemical Name</b>			
Iron	52,000	21,100	30,200
Lead	28.7	26.4	18.1
Magnesium	534 J	637 J	601 J
Manganese	1,470	1,310	491
Mercury	0.13	0.16 U	0.14 U
Nickel	72	64.2	51.8
Potassium	748 J	429 J	442 J
Selenium	0.54 U	0.69 U	0.6 U
Silver	0.25 J	0.19 U	0.16 U
Sodium	75.7 U	96.4 U	83.4 U
Thallium	3.8	0.72 U	3.7
Vanadium	29	13.1 J	13.5 J
Zinc	152 J	217 J	174 J
<b>Wet Chemistry (MG/KG)</b>			
Total organic carbon (TOC)	3,600	28,000	23,000
pH	7.14	6.92	6.54

NA - Not analyzed  
 B - Possible blank contamination  
 J - Estimated value  
 K - Value biased high  
 L - Value biased low

R - Unusable result  
 U - Undetected  
 UJ - Undetected, limit estimated  
 UL - Undetected, limit biased low

**Appendix E**  
**Tissue Toxicity Testing Results**

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EnviroSystems, Inc.  
One Lafayette Road  
P.O. Box 778  
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(603) 926-3345 • (603) 926-3521 Fax  
www.envirosystems.com

October 19, 2004

Mr. Dan Lavoie  
CH2M Hill, Incorporated  
13921 Park Center Road  
Herndon, Virginia 20171

Dear Mr. Lavoie:

Please find attached two copies, one bound, one unbound, of our final report covering the ABL Site 1 Ecological Risk Assessment. The 28 day survival and growth evaluation was conducted using the earthworm species *E. fetida*.

Please call me or Brian Buzby should you have any questions.

Sincerely,

EnviroSystems, Incorporated



Kenneth A. Simon  
President

KAS:bc  
Attachment

Report: 12365-04-08  
Copies: 1 unbound  
1 bound

**TOXICOLOGICAL EVALUATION  
OF SOIL SAMPLES**

***Eisenia fetida* Survival, Growth and Reproduction  
Soil Toxicity Tests  
ABL Site 1 Ecological Risk Assessment**

Prepared For

CH2M Hill, Incorporated  
13921 Park Center Road  
Herndon, Virginia 20171

By

EnviroSystems, Incorporated  
1 Lafayette Road  
Hampton, New Hampshire 03842

August 2004  
Reference Number 12365-04-08

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# TOXICOLOGICAL EVALUATION OF SOIL SAMPLES AUGUST 2004

## ABL Site 1 Ecological Risk Assessment *E. fetida* 28 Day Soil Evaluation

### 1.0 INTRODUCTION

Toxicity tests expose groups of organisms to environmental samples and laboratory controls for a specified period to assess potential impacts. Endpoints evaluated as part of the assays may include survival, growth, and/or reproduction. Analysis of variance techniques are used to determine if differences in a measured endpoint for organisms exposed to a test sample are significantly different from responses obtained from organisms exposed to field reference site or laboratory control materials.

This report presents the results of chronic toxicity tests conducted on fifteen soil samples collected from ABL Site 1. The soil samples were provided by CH2M Hill staff from the Herndon, Virginia office. Testing was based on programs and protocols developed by the ASTM (2001) and US EPA (1989). The toxicity of the samples was assessed by conducting 28 day exposure assays with the earthworm, *Eisenia fetida*. Assays were performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire.

### 2.0 MATERIALS AND METHODS

#### 2.1 General Methods, Biological Evaluations

Toxicological and analytical protocols used in this program follow procedures outlined in *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition (APHA 1998), *Standard Guide For Conducting Laboratory Soil Toxicity or Bioaccumulation Tests With the Lumbricid Earthworm Eisenia Fetida*, *Aquatic Toxicology and Risk Assessment: Volume 11.05* (ASTM 2001), and *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites* (EPA 1989). These protocols provide standard approaches for physical and chemical analysis and for the evaluation of toxicological effects of soils on terrestrial organisms.

#### 2.2 Test Samples

Fifteen soil samples collected from ABL Site 1 for *E. fetida* testing were received at ESI on July 23, 2004. One of these samples, ASO1-SS45-(0-1) (ESI -1) was identified by CH2M Hill staff as a reference sample. Upon arrival at the laboratory, the samples were given an internal sample control number and logged into the project sample control system. Prior to testing, samples were placed in a secure refrigerator and stored at a temperature of 2-4°C until test initiation. Sample identification, collection and receipt information is summarized in Table 1.

### 2.3 Test Species

*E. fetida* were obtained from a single commercial supply source, Smith's Worm Supply, Boston, Georgia. Earthworms were held for a minimum of 24 hours in organic compost. Temperature during the holding period was maintained at approximately 20°C. Worms used in the assays were adults with a well-developed clitellum.

### 2.4 *Eisenia fetida* 28 Day Survival and Growth Assay

The assays were carried out following protocol provided by ASTM (2001). The 28 day earthworm assay was conducted in static exposure mode. Endpoints for the assay were survival, growth, expressed as mean wet weight per surviving worm, and reproduction, expressed as juvenile/cocoon production.

Samples were sieved through a 12-mm stainless steel screen to remove large stones, sticks, roots, and man-made material. Prior to testing, moisture content, total organic content and pH were determined for each sample. Target moisture content for the samples was 35%. If necessary, samples were either dried, at room temperature, or hydrated, using deionized water to achieve the target moisture content. As received soil moisture ranged from 9.4 to 25.0%. In cases where the sample pH was outside of the range of 4.0-10.0 SU, the pH was adjusted by the addition of calcium carbonate. Soil pH ranged from 5.13 to 7.75 SU; soils were not pH adjusted prior to testing.

Soil used as a laboratory control in the earthworm assay was an artificial soil prepared according to protocol developed by the EPA (1989). The soil consisted of 10% sphagnum peat moss, 20% kaolinite clay and 70% fine silica sand (200 mesh) by dry weight. The peat moss was blended and screened prior to use to break-up clods and remove any large sticks and twigs. The moisture content of the control soil was adjusted to approximately 35% using deionized water. The pH of the control soil was checked to insure values were within the range of 7.0±0.5 SU (ASTM 2001).

The assay utilized 4 replicates with 10 worms per replicate. Approximately 500 g of soil was added to each 500 mL glass jar. The jars were covered with laboratory film with a small hole in the top to allow ventilation. Containers were placed in an incubator at 20 ±2°C. Lighting was set at 24 hours illumination. Light intensity was approximately 50 foot candles. During the exposure period, incubator temperature was checked daily for the duration of the assay. Temperature was also monitored on a hourly basis using a data logger housed in a surrogate test vessel. The worms were not fed during the assay.

After 28 days exposure, chambers were uncovered and the contents removed onto trays. Living worms were removed from the soil and counted. Juvenile worms and cocoons recovered from the soil were enumerated. Once counted, the worms were rinsed with deionized water to remove soil particles, blotted dry, and weighed. Weight data was used for statistical comparison of growth. After weight data was recorded the worms were transferred to glass vials and stored frozen at approximately -18°C. Samples AS01-SS55-(0-1), SS56,SS57,SS58, and SS59 were placed on dry ice and shipped to STL-North Canton, Ohio as requested by CH2M Hill Staff.

## 2.5 Statistical Analysis

Survival and growth data were analyzed using CETIS® software to determine significant differences between the test sediments and the laboratory control and the test sediments and the reference sites. Survival and growth data were evaluated to determine homogeneity of sample variances and normality of distribution using Shapiro-Wilk's Test for Normality and the F-Test for Equality of Two Variances, respectively. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were based on the 2 sample t-Test. Statistical difference was evaluated at  $\alpha=0.05$ .

In cases where survival or growth in a site-related treatment was equal to or greater than that observed in the laboratory control or reference soil, no statistical evaluation was conducted.

## 2.6 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are conducted on a regular basis by ESI for the test species. These results provide relative health and response data while allowing for comparison with historic data collected from ESI-conducted reference toxicity tests. Results of these tests are presented in Table 8.

## 2.7 Protocol Deviations

Review of data generated during these assays indicated no areas where methods or results deviated from standard protocols.

## 3.0 RESULTS AND DISCUSSION

Table 1 provides sample collection and receipt information. A summary of the physical and chemical characteristics of the soils is provided in Table 2. Survival data from the *E. fetida* assay is summarized in Tables 3 and 4. Tables 5 and 6 provide a summary of *E. fetida* growth data. Table 7 provides a summary of worm reproduction data. Table 8 provides historic reference toxicant data for *E. fetida*. Support data and laboratory bench sheets are included in Appendix A.

### 3.1 *Eisenia fetida* 28 Day Survival and Growth Assay

At the end of the 28 day exposure period, the mean worm survival in the laboratory control soil was 97.5%. Worms recovered from the laboratory control soil had a mean wet weight of 236 mg/surviving worm. Worms from the laboratory control soil did exhibit signs of reproduction. The minimum acceptable criteria for survival in the laboratory control is 90%. These data indicate that the organisms were healthy and not stressed by handling. Survival in the reference soil, AS01-SS45-(0-1), was 47.5%. Mean wet weight in the reference soil was 285 mg/worm. Worms from the reference soil exhibited signs of reproduction.

Daily temperature records indicate that values ranged from 20-21°C during the assay, within the acceptable range of 20  $\pm$ 2°C. Additional temperature data from the hourly data logger is available in Appendix A.

Tables 3-4 and 5-6 provide a summary of survival and growth data, respectively, for the laboratory controls, references and project sites.

## 3.2 Summary

Review of survival data, as compared to laboratory control survival, indicates that soils AS01-SS46-(0-1), AS01-SS47-(0-1), AS01-SS48-(0-1), AS01-SS49-(0-1), AS01-SS51-(0-1), AS01-SS53-(0-1), AS01-SS54-(0-1), AS01-SS55-(0-1), AS01-SS56-(0-1), AS01-SS57-(0-1), and AS01-SS59-(0-1) exhibited a significant negative impact on worm survival. No soils exhibited a significant negative impact on worm survival when compared to survival in reference soil AS01-SS45-(0-1) (ESI -1).

Review of *E. fetida* growth data, as compared to laboratory control growth, indicates that soils, AS01-SS56-(0-1) and AS01-SS57-(0-1), exhibited a significant negative impact on worm growth. Soils AS01-SS56-(0-1), AS01-SS57-(0-1) and AS01-59-(0-1) exhibited a significant negative impact on worm growth when compared to reference soil AS01-SS45-(0-1).

Review of *E. fetida* reproduction data indicates that eleven of the fifteen tested soils, including the reference soil, indicated signs of reproduction (juvenile or cocoon production). See Table 7 for specific details.

## 4.0 REFERENCES

APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition.

ASTM. 2001. Volume 11.05. *Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests With the Lumbricid Earthworm Eisenia Fetida*. E1676-97

US EPA. 1989. *Protocol for Short Term Toxicity Screening of Hazardous Waste Sites*. EPA/600/3-88/029.

**TABLE 1. Summary of Sample Collection Information. *E. fetida* Soil Evaluation. ABL Site 1 Ecological Risk Assessment. CH2M Hill, August 2004.**

Sample Identification	ESI ID	Sample Type	Sample Collection		Sample Receipt
			Date	Time	Date
AS01-SS45-(0-1)	-1	Soil	07/20/04	1630	07/23/04
AS01-SS46-(0-1)	-2	Soil	07/20/04	1500	07/23/04
AS01-SS47-(0-1)	-3	Soil	07/20/04	1530	07/23/04
AS01-SS48-(0-1)	-4	Soil	07/20/04	1550	07/23/04
AS01-SS49-(0-1)	-5	Soil	07/20/04	1415	07/23/04
AS01-SS50-(0-1)	-6	Soil	07/21/04	0930	07/23/04
AS01-SS51-(0-1)	-7	Soil	07/21/04	1000	07/23/04
AS01-SS52-(0-1)	-8	Soil	07/21/04	1030	07/23/04
AS01-SS53-(0-1)	-9	Soil	07/21/04	1130	07/23/04
AS01-SS54-(0-1)	-10	Soil	07/21/04	1200	07/23/04
AS01-SS55-(0-1)	-11	Soil	07/21/04	1430	07/23/04
AS01-SS56-(0-1)	-12	Soil	07/21/04	1400	07/23/04
AS01-SS57-(0-1)	-13	Soil	07/21/04	1330	07/23/04
AS01-SS58-(0-1)	-14	Soil	07/21/04	1230	07/23/04
AS01-SS59-(0-1)	-15	Soil	07/21/04	1300	07/23/04

**TABLE 2. Summary of Soil Characteristics. *E. fetida* Soil Evaluation.  
 ABL Site 1 Ecological Risk Assessment. CH2M Hill. August 2004.**

Sample	ESI ID	pH	Soil Moisture	Total Organic Content
AS01-SS45-(0-1)	-1	6.74	15.7	11.6
AS01-SS46-(0-1)	-2	6.69	17.0	14.5
AS01-SS47-(0-1)	-3	6.70	21.4	13.8
AS01-SS48-(0-1)	-4	6.68	20.0	9.2
AS01-SS49-(0-1)	-5	6.86	25.0	16.5
AS01-SS50-(0-1)	-6	5.13	9.4	6.6
AS01-SS51-(0-1)	-7	6.71	17.5	9.5
AS01-SS52-(0-1)	-8	6.70	24.1	13.7
AS01-SS53-(0-1)	-9	7.49	15.5	10.4
AS01-SS54-(0-1)	-10	6.86	20.3	12.8
AS01-SS55-(0-1)	-11	6.96	14.6	10.6
AS01-SS56-(0-1)	-12	6.80	23.8	11.9
AS01-SS57-(0-1)	-13	7.75	21.3	7.2
AS01-SS58-(0-1)	-14	6.76	14.9	14.9
AS01-SS59-(0-1)	-15	6.34	18.9	13.4

**TABLE 3. Summary of Day 28 *E. fetida* Survival vs Laboratory Control. ABL Site 1 Ecological Risk Assessment. CH2M Hill. August 2004.**

Sample Description	ESI ID	Mean Survival %	Normal Distribution	Homogeneous Variance	t-Statistics			Statistically Significant Difference in Survival
					t Value	Critical t	p Value	
Lab Control	Lab	97.5	-	-	-	-	-	-
AS01-SS45-(0-1)	-1	47.5	Yes	Yes	1.9691	2.3534	0.0718	No
AS01-SS46-(0-1)	-2	10.0	Yes	Yes	10.7997	2.3534	0.0008	Yes
AS01-SS47-(0-1)	-3	7.5	Yes	Yes	9.9337	2.3534	0.0011	Yes
AS01-SS48-(0-1)	-4	12.5	Yes	Yes	10.2143	2.3534	0.0010	Yes
AS01-SS49-(0-1)	-5	45.0	Yes	Yes	3.3076	2.3534	0.0227	Yes
AS01-SS50-(0-1)	-6	87.5	Yes	Yes	1.7320	2.3534	0.0908	No
AS01-SS51-(0-1)	-7	5.0	Yes	Yes	15.4645	2.3534	0.0003	Yes
AS01-SS52-(0-1)	-8	70.0	Yes	Yes	2.0849	2.3534	0.0642	No
AS01-SS53-(0-1)	-9	17.5	Yes	Yes	7.3788	2.3534	0.0026	Yes
AS01-SS54-(0-1)	-10	7.5	Yes	Yes	17.5834	2.3534	0.0002	Yes
AS01-SS55-(0-1)	-11	12.5	Yes	Yes	22.9352	2.3534	0.0001	Yes
AS01-SS56-(0-1)	-12	70.0	Yes	Yes	3.6651	2.3534	0.0176	Yes
AS01-SS57-(0-1)	-13	72.5	Yes	Yes	5.7863	2.3534	0.0051	Yes
AS01-SS58-(0-1)	-14	92.5	Yes	Yes	1.7321	2.3534	0.0908	No
AS01-SS59-(0-1)	-15	75.0	Yes	Yes	4.8804	2.3534	0.0082	Yes

‡ - Statistical significance evaluated at  $\alpha=0.05$ ; in cases where the evaluated endpoint was equal to or greater than that experienced in the laboratory control, no statistical analysis was conducted.

**TABLE 4. Summary of Day 28 *E. fetida* Survival vs Reference Soil AS01-SS45-(0-1). ABL Site 1 Ecological Risk Assessment. CH2M Hill. August 2004.**

Sample Description	ESI ID	Mean Survival %	Normal Distribution	Homogeneous Variance	t-Statistics			Statistically Significant Difference in Survival
					t Value	Critical t	p Value	
Lab Control	Lab	97.5	-	-	-	-	-	-
AS01-SS45-(0-1)	-1	47.5	-	-	-	-	-	-
AS01-SS46-(0-1)	-2	10.0	Yes	Yes	1.4150	2.3534	0.1260	No
AS01-SS47-(0-1)	-3	7.5	Yes	Yes	2.0567	2.3534	0.0660	No
AS01-SS48-(0-1)	-4	12.5	Yes	Yes	1.2016	2.3534	0.1579	No
AS01-SS49-(0-1)	-5	45.0	Yes	Yes	0.0906	2.3534	0.4667	No
AS01-SS50-(0-1)	-6	87.5	-	-	-	-	-	No
AS01-SS51-(0-1)	-7	5.0	Yes	Yes	1.5148	2.3534	0.1135	No
AS01-SS52-(0-1)	-8	70.0	-	-	-	-	-	No
AS01-SS53-(0-1)	-9	17.5	Yes	Yes	0.9921	2.3534	0.1971	No
AS01-SS54-(0-1)	-10	7.5	Yes	Yes	1.6416	2.3534	0.0996	No
AS01-SS55-(0-1)	-11	12.5	Yes	Yes	1.2189	2.3534	0.1550	No
AS01-SS56-(0-1)	-12	70.0	-	-	-	-	-	No
AS01-SS57-(0-1)	-13	72.5	-	-	-	-	-	No
AS01-SS58-(0-1)	-14	92.5	-	-	-	-	-	No
AS01-SS59-(0-1)	-15	75.0	-	-	-	-	-	No

‡ - Statistical significance evaluated at  $\alpha=0.05$ ; in cases where the evaluated endpoint was equal to or greater than that experienced in the reference soil, no statistical analysis was conducted.

**TABLE 5. Summary of Day 28 *E. fetida* Growth vs Laboratory Control.  
ABL Site 1 Ecological Risk Assessment. CH2MHill. August 2004.**

Sample Description	ESI ID	Mean Growth (mg/worm)	Normal Distribution	Homogeneous Variance	t-Statistics			Statistically Significant Difference in Growth
					t Value	Critical t	p Value	
Lab Control	Lab	236	-	-	-	-	-	-
AS01-SS45-(0-1)	-1	285	-	-	-	-	-	No
AS01-SS46-(0-1)	-2	467	-	-	-	-	-	No
AS01-SS47-(0-1)	-3	475	-	-	-	-	-	No
AS01-SS48-(0-1)	-4	450	-	-	-	-	-	No
AS01-SS49-(0-1)	-5	409	-	-	-	-	-	No
AS01-SS50-(0-1)	-6	304	-	-	-	-	-	No
AS01-SS51-(0-1)	-7	500	-	-	-	-	-	No
AS01-SS52-(0-1)	-8	253	-	-	-	-	-	No
AS01-SS53-(0-1)	-9	489	-	-	-	-	-	No
AS01-SS54-(0-1)	-10	575	-	-	-	-	-	No
AS01-SS55-(0-1)	-11	775	-	-	-	-	-	No
AS01-SS56-(0-1)	-12	166	Yes	Yes	2.8611	1.9432	0.0144	Yes
AS01-SS57-(0-1)	-13	181	Yes	Yes	2.8997	1.9432	0.0137	Yes
AS01-SS58-(0-1)	-14	251	-	-	-	-	-	No
AS01-SS59-(0-1)	-15	205	Yes	Yes	1.2159	1.9432	0.1348	No

**TABLE 6. Summary of Day 28 *E. fetida* Growth vs Reference Soil AS01-SS45-(0-1). ABL Site 1 Ecological Risk Assessment. CH2M Hill. August 2004.**

Sample Description	ESI ID	Mean Growth (mg/worm)	Normal Distribution	Homogeneous Variance	t-Statistics			Statistically Significant Difference in Growth
					t Value	Critical t	p Value	
Lab Control	Lab	236	-	-	-	-	-	-
AS01-SS45-(0-1)	-1	285	-	-	-	-	-	-
AS01-SS46-(0-1)	-2	467	-	-	-	-	-	No
AS01-SS47-(0-1)	-3	475	-	-	-	-	-	No
AS01-SS48-(0-1)	-4	450	-	-	-	-	-	No
AS01-SS49-(0-1)	-5	409	-	-	-	-	-	No
AS01-SS50-(0-1)	-6	304	-	-	-	-	-	No
AS01-SS51-(0-1)	-7	500	-	-	-	-	-	No
AS01-SS52-(0-1)	-8	253	Yes	Yes	1.1923	2.0151	0.1433	No
AS01-SS53-(0-1)	-9	489	-	-	-	-	-	No
AS01-SS54-(0-1)	-10	575	-	-	-	-	-	No
AS01-SS55-(0-1)	-11	775	-	-	-	-	-	No
AS01-SS56-(0-1)	-12	166	Yes	Yes	4.2187	2.0151	0.0042	Yes
AS01-SS57-(0-1)	-13	181	Yes	Yes	4.8276	2.0151	0.0024	Yes
AS01-SS58-(0-1)	-14	251	Yes	Yes	1.7349	2.0151	0.0716	No
AS01-SS59-(0-1)	-15	205	Yes	Yes	2.7580	2.0151	0.0200	Yes

**TABLE 7. Summary of Day 28 *E. fetida* Reproduction Data.  
ABL Site 1 Ecological Risk Assessment. CH2M Hill. August 2004.**

Sample Description	ESI ID	Juveniles (Mean/replicate)	Cocoons (Mean/replicate)	Indication of Reproduction
Lab Control	Lab	0.25	11.50	Yes
AS01-SS45-(0-1)	-1	0.00	4.00	Yes
AS01-SS46-(0-1)	-2	0.00	0.00	No
AS01-SS47-(0-1)	-3	0.50	0.25	Yes
AS01-SS48-(0-1)	-4	0.00	0.00	No
AS01-SS49-(0-1)	-5	0.00	2.50	Yes
AS01-SS50-(0-1)	-6	0.25	0.50	Yes
AS01-SS51-(0-1)	-7	0.00	0.00	No
AS01-SS52-(0-1)	-8	0.00	0.50	Yes
AS01-SS53-(0-1)	-9	0.00	3.75	Yes
AS01-SS54-(0-1)	-10	0.50	1.50	Yes
AS01-SS55-(0-1)	-11	0.00	0.00	No
AS01-SS56-(0-1)	-12	0.25	1.50	Yes
AS01-SS57-(0-1)	-13	0.50	0.50	Yes
AS01-SS58-(0-1)	-14	0.00	3.75	Yes
AS01-SS59-(0-1)	-15	0.00	0.25	Yes

**TABLE 8. Summary of Reference Toxicant Data.  
ABL Site 1 Ecological Risk Assessment. CH2M Hill. August 2004.**

Results are Expressed as ppm Cadmium

Species	Date	Endpoint	Result	Historic Mean	Number of Tests	±1 STD Deviation	±2 STD Deviations
<i>E. fetida</i>	08/23/04	LC-50	2818	1668	23	1385	2771

**Note:** Reference toxicant testing was conducted at ESI. The historic mean for *E. fetida* survival represents the mean determined from the ESI-conducted reference toxicant testing database.

**APPENDIX A  
RAW DATA AND STATISTICAL SUPPORT**

Contents	Number of Pages
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Percent Moisture Data Sheets	2
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**Eisenia fetida Survival Assay**

STUDY NUMBER: 12365

CLIENT: CH2MHILL

START DATE: 8/4/04

DAY	DATE	TEMP (°C) INC# 5	INITIALS	GENERAL OBSERVATIONS
0	8/4/04	21	BB	
1	8/5/04	21	BB	
2	8/6/04	21	BB	
3	8/7/04	21	BB	
4	8/8/04	21	BB	
5	8/9/04	21	BB	
6	8/10/04	21	BB	
7	8/11/04	21	BB	
8	8/12/04	21	BB	
9	8/13/04	21	BB	
10	8/14/04	21	KMS	
11	8/15/04	21	KMS	
12	8/16/04	21	m	
13	8/17/04	21	BB	
14	8/18/04	21	✓	
15	8/19/04	21	✓	
16	8/20/04	21	PS	
17	8/21/04	21	CW	
18	8/22/04	21	m	
19	8/23/04	21	BB	
20	8/24/04	21	✓	
21	8/25/04	21	PS	
22	8/26/04	21	BB	
23	8/27/04	21	PS	
24	8/28/04	20	CW	
25	8/29/04	21	✓	
26	8/30/04	21	BB	
27	8/31/04	21	BB	
28	9/1/04	21	BB	

**NOTES:**

Value recorded here is incubator temperature. "Telatemp" unit is continuously recording vessel temperature.

Check parafilm covers - replace if split - provide air hole

# Eisenia fetida Survival Assay

STUDY NUMBER: 12365

CLIENT: CH2MHill

DAY 28

SAMPLE ID	TIME	# LIVE	JUVENILE	COCOON	COMMENTS
LabA	0925	10	1	19	
LabB	0930	10	0	13	
LabC	0935	10	0	3	
LabD	0950	9	0	11	
-2A	1010	0	0	0	
-2B	1012	1	0	0	
-2C	1015	1	0	0	
-2D	1018	2	0	0	
-4A	1022	0	0	0	
-4B	1024	1	0	0	
-4C	1029	2	0	0	
-4D	1033	2	0	0	
-15A	1037	8	0	0	
-15B	1045	7	0	1	
-15C	1051	7	0	0	
-15D	1055	8	0	0	

ANALYST:

BB

DATE:

9/1/04

## Eisenia fetida Survival Assay

STUDY NUMBER: 12365

CLIENT: CH2MHill

DAY 28

SAMPLE ID	TIME	# LIVE	JUVENILE	COCOON	COMMENTS
1A	1000	<del>###</del> IIII 9		<del>###</del> 5	
1B	1020	1		<del>###</del> 5	4 dead found
1C	1027	0		0	4 dead found
1D	1036	<del>###</del> IIII 9		1 6	
5A	1044	IIII 4		0	
5B	1052	<del>###</del> 5		<del>###</del> 5	cocoon hatching
5C	1059	1 1		11 2	
5D	1105	<del>###</del> IIII 8		3	
3A	1138	1 1		1 1	
3B	1143	0	1 1	0	
3C	1147	0		0	
3D	1153	11 2	1 1	0	
9A	1204	0		<del>###</del> 1 6	
9B	1208	1 1		3	
9C	1216	11 3		11 2	
9D	1223	111 3		111 4	

ANALYST: PS

DATE: 9/01/09

### Eisenia fetida Survival Assay

STUDY NUMBER: 12365

CLIENT: CH2MHill

DAY 28

SAMPLE ID	TIME	# LIVE	JUVENILE	COCOON	COMMENTS
6A	1135	8	0	0	
6B	1142	8	0	0	
6C	1146	10	0	0	
6D	1151	9	1	2	
8A	1155	3	0	0	
8B	1200	8	0	0	
8C	1205	8	0	2	
8D	1215	9	0	0	
11A	1315	1	0	0	
11B	1322	1	0	0	
11C	1325	2	0	0	
11D	1330	1	0	0	
7A	1332	0	0	0	
7B	1337	2	0	0	
7C	1338	0	0	0	
7D	1340	0	0	0	

ANALYST: BB

DATE: 9/1/04

## Eisenia fetida Survival Assay

STUDY NUMBER: 12365

CLIENT: CH2MHill

DAY 28

SAMPLE ID	TIME	# LIVE	JUVENILE	COCOON	COMMENTS
10A	1235	<del>11</del> <sup>PS</sup> 2	" 2	<del>11</del> 3 <sup>(E3)</sup> 5	
10B	1245	0	0	0	
10C	1250	1	0	1	
10D	1256	0	0	0	
14A	1355	<del>11</del> 9	0	" 2	
14B	1403	<del>11</del> 9	0	1	
14C	1413	<del>11</del> <del>11</del> 10	0	<del>11</del> <del>11</del> 12	
14D	1425	<del>11</del> 9	0	0	
12A	1431	<del>11</del> 8	0	" 2	
12B	1439	<del>11</del> 7	1 <del>0</del> <sup>(E3)</sup> <sub>PS</sub>	0	
12C	1445	<del>11</del> 5	0	" 3	
12D	1453	<del>11</del> 8	0	1	

ANALYST: PS  
 DATE: 9/01/04



STUDY: 12365  
 CLIENT: CH2M HILL  
 PROJECT: ABL Site 1  
 TASK: Eisenia fetida 28-day Exposure Assay  
 DATA: Survival Data  
 START DATE: 08/04/04

Sample Site	ESI Ref	Rep	Number Recovered	Percent Recovery	Mean Recovery	Compared Against	Normal Distribution	Homogeneous Variance	t Value	Critical t Value	p Value	Significant Difference in Survival (Less Than)	
Lab Control	0	A	10	100%	97.5%	LAB	-	-	-	-	-	-	
		B	10	100%			-	-	-	-	-		
		C	10	100%			-	-	-	-	-		
		D	9	90%			-	-	-	-	-		
AS01-SS45-(0-1)	-1	A	9	90%	47.5%	LAB	Normal	Equal	1.9691	2.3534	0.0718	NO	
		B	1	10%			Normal	Equal	1.4150	2.3534	0.1260	NO	
		C	0	0%			Normal	Equal	1.4150	2.3534	0.1260	NO	
		D	9	90%			Normal	Equal	1.4150	2.3534	0.1260	NO	
AS01-SS46-(0-1)	-2	A	0	0%	10.0%	LAB	Normal	Equal	10.7997	2.3534	0.0008	YES	
		B	1	10%			REF	Normal	Equal	1.4150	2.3534	0.1260	NO
		C	1	10%			Normal	Equal	1.4150	2.3534	0.1260	NO	
		D	2	20%			Normal	Equal	1.4150	2.3534	0.1260	NO	
AS01-SS47-(0-1)	-3	A	1	10%	7.5%	LAB	Normal	Equal	9.9337	2.3534	0.0011	YES	
		B	0	0%			REF	Normal	Equal	2.0567	2.3534	0.0660	NO
		C	0	0%			Normal	Equal	2.0567	2.3534	0.0660	NO	
		D	2	20%			Normal	Equal	2.0567	2.3534	0.0660	NO	
AS01-SS48-(0-1)	-4	A	0	0%	12.5%	LAB	Normal	Equal	10.2143	2.3534	0.0010	YES	
		B	1	10%			REF	Normal	Equal	1.2016	2.3534	0.1579	NO
		C	2	20%			Normal	Equal	1.2016	2.3534	0.1579	NO	
		D	2	20%			Normal	Equal	1.2016	2.3534	0.1579	NO	
AS01-SS49-(0-1)	-5	A	4	40%	45.0%	LAB	Normal	Equal	3.3076	2.3534	0.0227	YES	
		B	5	50%			REF	Normal	Equal	0.0906	2.3534	0.4667	NO
		C	1	10%			Normal	Equal	0.0906	2.3534	0.4667	NO	
		D	8	80%			Normal	Equal	0.0906	2.3534	0.4667	NO	
AS01-SS50-(0-1)	-6	A	8	80%	87.5%	LAB	Normal	Equal	1.7320	2.3534	0.0908	NO	
		B	8	80%			REF	Normal	Equal	-1.4362	2.3534	0.8768	NO
		C	10	100%			Normal	Equal	-1.4362	2.3534	0.8768	NO	
		D	9	90%			Normal	Equal	-1.4362	2.3534	0.8768	NO	
AS01-SS51-(0-1)	-7	A	0	0%	5.0%	LAB	Normal	Equal	15.4645	2.3534	0.0003	YES	
		B	2	20%			REF	Normal	Equal	1.5148	2.3534	0.1135	NO
		C	0	0%			Normal	Equal	1.5148	2.3534	0.1135	NO	
		D	0	0%			Normal	Equal	1.5148	2.3534	0.1135	NO	
AS01-SS52-(0-1)	-8	A	3	30%	70.0%	LAB	Normal	Equal	2.0849	2.3534	0.0642	NO	
		B	8	80%			REF	Normal	Equal	-0.7109	2.3534	0.7358	NO
		C	8	80%			Normal	Equal	-0.7109	2.3534	0.7358	NO	
		D	9	90%			Normal	Equal	-0.7109	2.3534	0.7358	NO	
AS01-SS53-(0-1)	-9	A	0	0%	17.5%	LAB	Normal	Equal	7.3788	2.3534	0.0026	YES	
		B	1	10%			REF	Normal	Equal	0.9921	2.3534	0.1971	NO
		C	3	30%			Normal	Equal	0.9921	2.3534	0.1971	NO	
		D	3	30%			Normal	Equal	0.9921	2.3534	0.1971	NO	
AS01-SS54-(0-1)	-10	A	2	20%	7.5%	LAB	Normal	Equal	17.5834	2.3534	0.0002	YES	
		B	0	0%			REF	Normal	Equal	1.6416	2.3534	0.0996	NO
		C	1	10%			Normal	Equal	1.6416	2.3534	0.0996	NO	
		D	0	0%			Normal	Equal	1.6416	2.3534	0.0996	NO	
AS01-SS55-(0-1)	-11	A	1	10%	12.5%	LAB	Normal	Equal	22.9352	2.3534	0.0001	YES	
		B	1	10%			REF	Normal	Equal	1.2189	2.3534	0.1550	NO
		C	2	20%			Normal	Equal	1.2189	2.3534	0.1550	NO	
		D	1	10%			Normal	Equal	1.2189	2.3534	0.1550	NO	
AS01-SS56-(0-1)	-12	A	8	80%	70.0%	LAB	Normal	Equal	3.6651	2.3534	0.0176	YES	
		B	7	70%			REF	Normal	Equal	-1.1090	2.3534	0.8258	NO
		C	5	50%			Normal	Equal	-1.1090	2.3534	0.8258	NO	
		D	8	80%			Normal	Equal	-1.1090	2.3534	0.8258	NO	
AS01-SS57-(0-1)	-13	A	6	60%	72.5%	LAB	Normal	Equal	5.7863	2.3534	0.0051	YES	
		B	8	80%			REF	Normal	Equal	-0.8132	2.3534	0.7622	NO
		C	8	80%			Normal	Equal	-0.8132	2.3534	0.7622	NO	
		D	7	70%			Normal	Equal	-0.8132	2.3534	0.7622	NO	
AS01-SS58-(0-1)	-14	A	9	90%	92.5%	LAB	Normal	Equal	1.7321	2.3534	0.0908	NO	
		B	9	90%			REF	Normal	Equal	-1.6946	2.3534	0.9056	NO
		C	10	100%			Normal	Equal	-1.6946	2.3534	0.9056	NO	
		D	9	90%			Normal	Equal	-1.6946	2.3534	0.9056	NO	
AS01-SS59-(0-1)	-15	A	8	80%	75.0%	LAB	Normal	Equal	4.8804	2.3534	0.0082	YES	
		B	7	70%			REF	Normal	Equal	-1.1718	2.3534	0.8371	NO
		C	7	70%			Normal	Equal	-1.1718	2.3534	0.8371	NO	
		D	8	80%			Normal	Equal	-1.1718	2.3534	0.8371	NO	

STUDY: 12365  
 CLIENT: CH2M HILL  
 PROJECT: ABL Site 1  
 TASK: Eلسenia fetلدا 28-day Exposure Assay  
 DATA: Reproduction Data  
 START DATE: 08/04/04

Sample Site	ESI Ref	Rep	Juveniles	Mean	Cocoons	Sign of	
						Mean	Reproduction
Lab Control	0	A	1	0.25	19	11.50	Yes
		B	0		13		
		C	0		3		
		D	0		11		
AS01-SS45-(0-1)	-1	A	0	0.00	5	4.00	Yes
		B	0		5		
		C	0		0		
		D	0		6		
AS01-SS46-(0-1)	-2	A	0	0.00	0	0.00	No
		B	0		0		
		C	0		0		
		D	0		0		
AS01-SS47-(0-1)	-3	A	0	0.50	1	0.25	Yes
		B	1		0		
		C	0		0		
		D	1		0		
AS01-SS48-(0-1)	-4	A	0	0.00	0	0.00	No
		B	0		0		
		C	0		0		
		D	0		0		
AS01-SS49-(0-1)	-5	A	0	0.00	0	2.50	Yes
		B	0		5		
		C	0		2		
		D	0		3		
AS01-SS50-(0-1)	-6	A	0	0.25	0	0.50	Yes
		B	0		0		
		C	0		0		
		D	1		2		
AS01-SS51-(0-1)	-7	A	0	0.00	0	0.00	No
		B	0		0		
		C	0		0		
		D	0		0		
AS01-SS52-(0-1)	-8	A	0	0.00	0	0.50	Yes
		B	0		0		
		C	0		2		
		D	0		0		
AS01-SS53-(0-1)	-9	A	0	0.00	6	3.75	Yes
		B	0		3		
		C	0		2		
		D	0		4		
AS01-SS54-(0-1)	-10	A	2	0.50	5	1.50	Yes
		B	0		0		
		C	0		1		
		D	0		0		
AS01-SS55-(0-1)	-11	A	0	0.00	0	0.00	No
		B	0		0		
		C	0		0		
		D	0		0		
AS01-SS56-(0-1)	-12	A	0	0.25	2	1.50	Yes
		B	1		0		
		C	0		3		
		D	0		1		
AS01-SS57-(0-1)	-13	A	0	0.50	0	0.50	Yes
		B	0		0		
		C	0		0		
		D	2		2		
AS01-SS58-(0-1)	-14	A	0	0.00	2	3.75	Yes
		B	0		1		
		C	0		12		
		D	0		0		
AS01-SS59-(0-1)	-15	A	0	0.00	0	0.25	Yes
		B	0		1		
		C	0		0		
		D	0		0		

# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:13 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

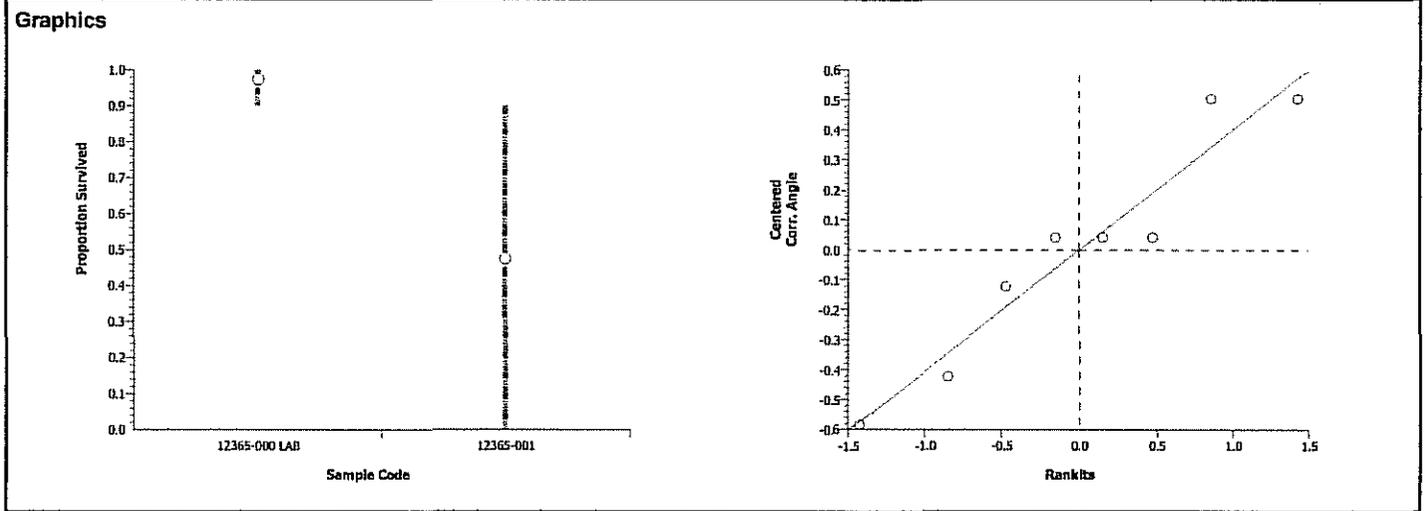
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	51.75419	47.46723	0.00881	Unequal Variances
Distribution	Shapiro-Wilk W	0.91698	0.74935	0.37948	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.7853001	0.7853001	1	4.48	0.07855	Non-Significant Effect
Error	1.050837	0.1751395	6			
Total	1.83613718	0.9604396	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-001	1.96908	2.35336	0.0718	0.74891	Non-Significant Effect

Data Summary		Original Data					Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149	
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621	

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-001	0.90000	0.10000	0.00000	0.90000				



# CETIS Analysis Detail

Comparisons: Page 27 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 19-3153-2055

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:14 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

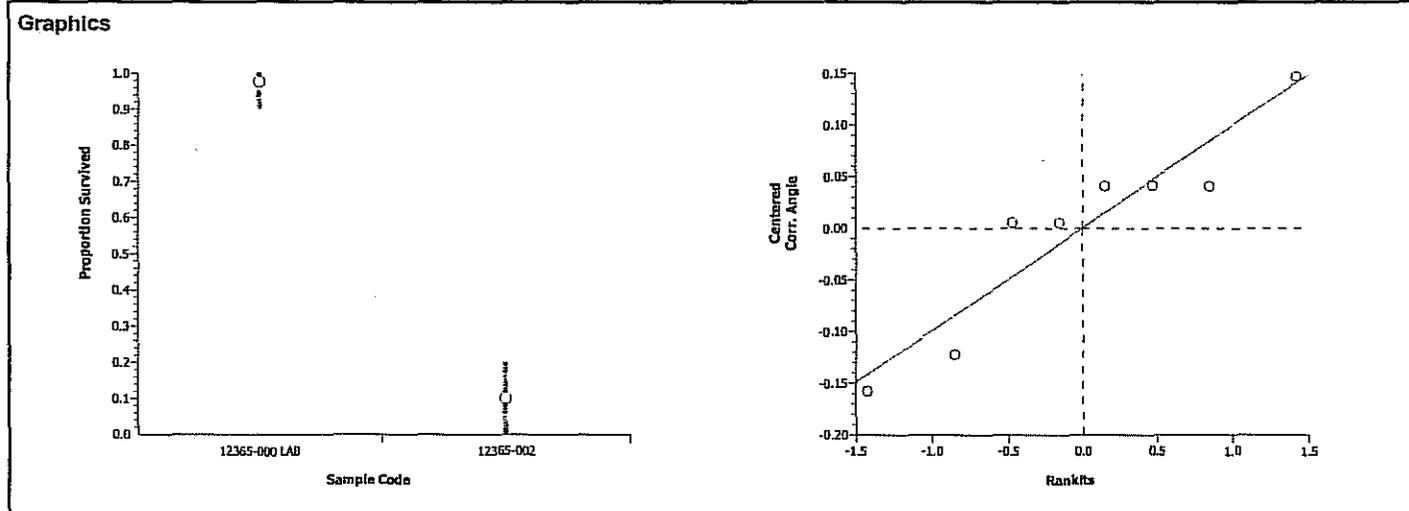
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.33857	47.46723	0.50353	Equal Variances
Distribution	Shapiro-Wilk W	0.89703	0.74935	0.25834	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.225169	2.225169	1	200.76	0.00001	Significant Effect
Error	0.0665026	0.0110838	6			
Total	2.29167201	2.2362532	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-002	10.7997	2.35336	0.0008	0.22985	Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-002	4	0.10000	0.00000	0.20000	0.08165	0.31648	0.15878	0.46365	0.12461

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-002	0.00000	0.10000	0.10000	0.20000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:14 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

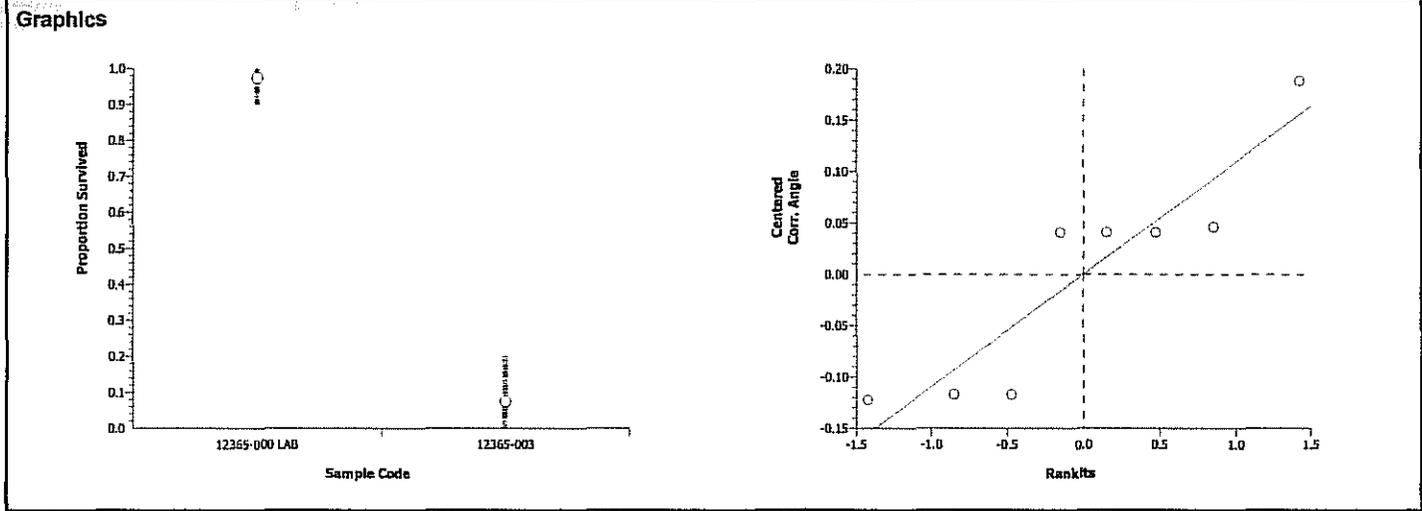
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.25236	47.46723	0.35862	Equal Variances
Distribution	Shapiro-Wilk W	0.84001	0.74935	0.08001	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.400389	2.400389	1	170.03	0.00001	Significant Effect
Error	0.0847049	0.0141175	6			
Total	2.48509388	2.4145064	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-003	9.93372	2.35336	0.0011	0.25954	Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
	12365-003	4	0.07500	0.00000	0.20000	0.09574	0.27574	0.15878	0.46365	0.14695

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-003	0.10000	0.00000	0.00000	0.20000				



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:14 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.17173	47.46723	0.36847	Equal Variances
Distribution	Shapiro-Wilk W	0.88302	0.74935	0.19544	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.078014	2.078014	1	150.04	0.00002	Significant Effect
Error	0.0830988	0.0138498	6			
Total	2.16111316	2.0918642	7			

**Group Comparisons**

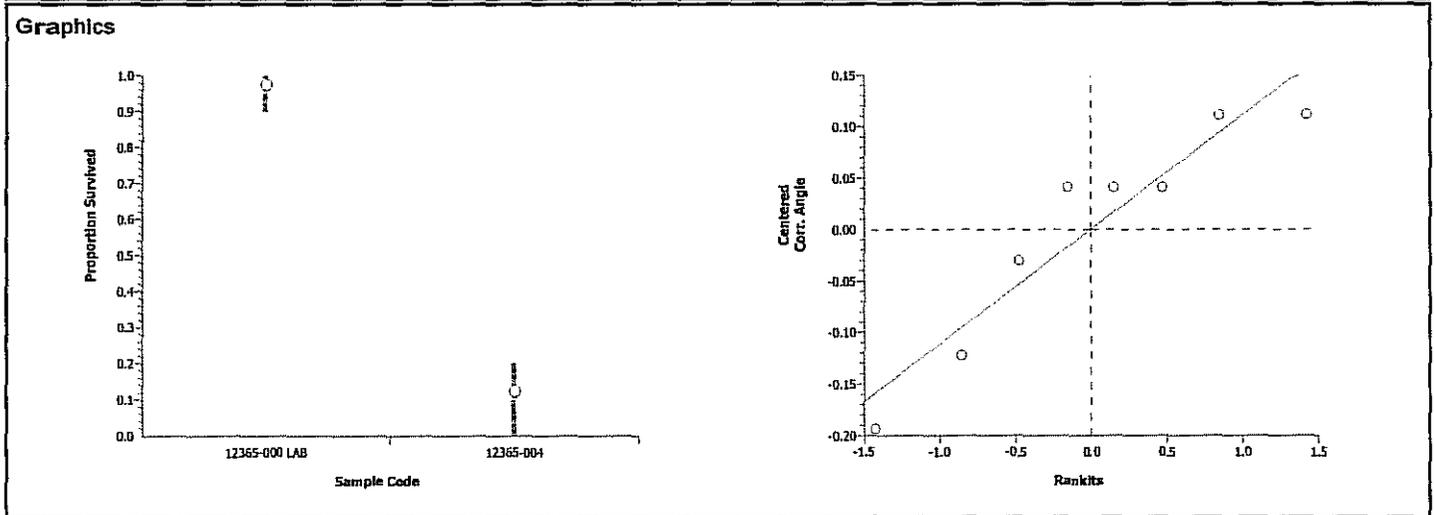
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-004	10.2143	2.35336	0.0010	0.23485	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-004	4	0.12500	0.00000	0.20000	0.09574	0.35196	0.15878	0.46365	0.14512

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-004	0.00000	0.10000	0.20000	0.20000				



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:14 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.49949	47.46723	0.33099	Equal Variances
Distribution	Shapiro-Wilk W	0.85180	0.74935	0.10272	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.582248	2.582248	1	172.87	0.00001	Significant Effect
Error	0.0896276	0.0149379	6			
Total	2.67187604	2.5971864	7			

**Group Comparisons**

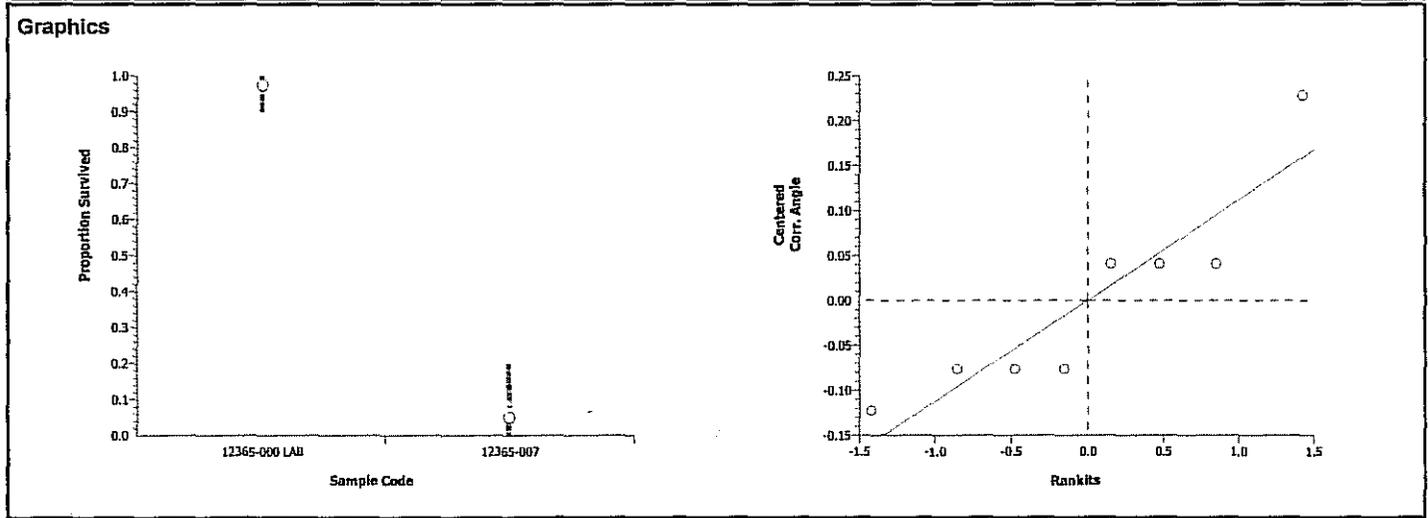
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-007	15.4645	2.35336	0.0003	0.17292	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-007	4	0.05000	0.00000	0.20000	0.10000	0.23500	0.15878	0.46365	0.15243

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-007	0.00000	0.20000	0.00000	0.00000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:14 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	13.11410	47.46723	0.06265	Equal Variances
Distribution	Shapiro-Wilk W	0.83322	0.74935	0.06917	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.2599606	0.2599606	1	5.55	0.05664	Non-Significant Effect
Error	0.2811458	0.0468576	6			
Total	0.54110640	0.3068182	7			

**Group Comparisons**

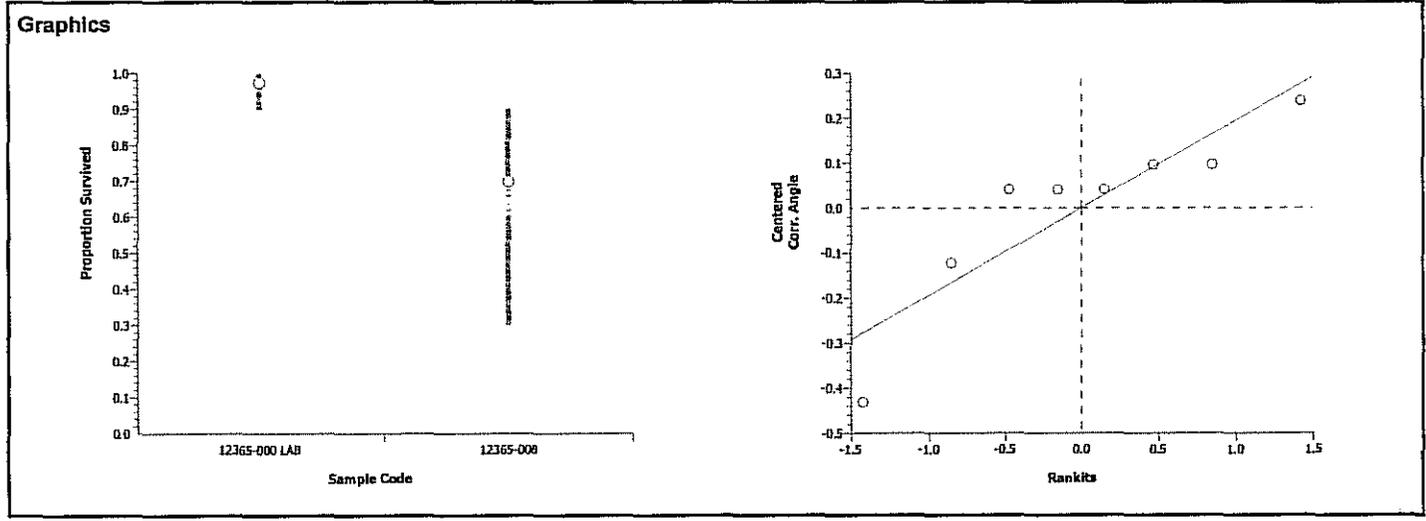
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-008	2.08494	2.35336	0.0642	0.40694	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-008	4	0.70000	0.30000	0.90000	0.27080	1.01075	0.57964	1.24905	0.29509

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-008	0.30000	0.80000	0.80000	0.90000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:14 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	6.44869	47.46723	0.16012	Equal Variances
Distribution	Shapiro-Wilk W	0.92038	0.74935	0.40436	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	1.848276	1.848276	1	74.74	0.00013	Significant Effect
Error	0.1483741	0.0247290	6			
Total	1.99665014	1.8730050	7			

**Group Comparisons**

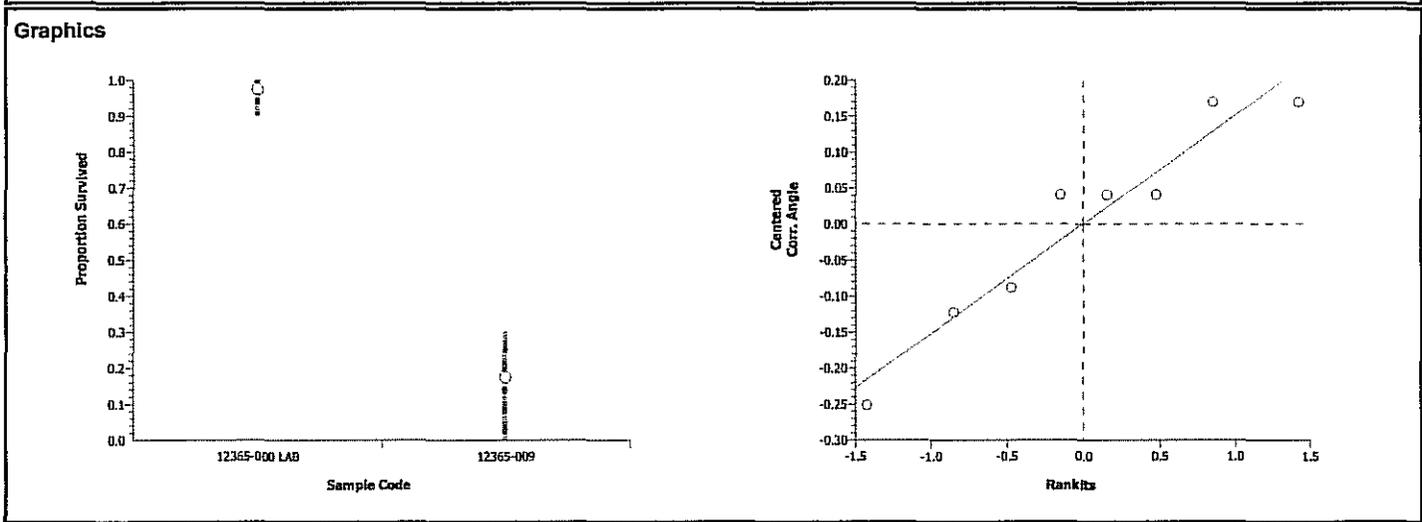
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB	12365-009	7.37875	2.35336	0.0026	0.30660	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-009	4	0.17500	0.00000	0.30000	0.15000	0.40995	0.15878	0.57964	0.20693

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-009	0.00000	0.10000	0.30000	0.30000				



# CETIS Analysis Detail

Comparisons: Page 20 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 11-3383-4146

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:15 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.25236	47.46723	0.35862	Equal Variances
Distribution	Shapiro-Wilk W	0.84001	0.74935	0.08001	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.400389	2.400389	1	170.03	0.00001	Significant Effect
Error	0.0847049	0.0141175	6			
Total	2.48509388	2.4145064	7			

**Group Comparisons**

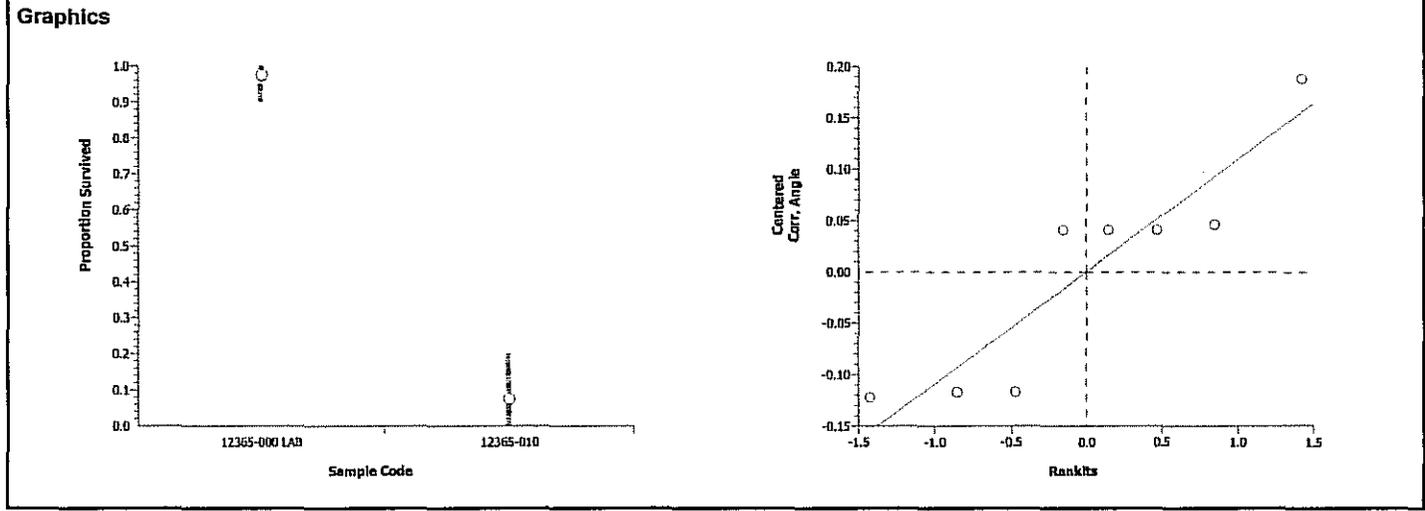
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-010	17.5834	2.35336	0.0002	0.14663	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-010	4	0.07500	0.00000	0.20000	0.09574	0.27574	0.15878	0.46365	0.14695

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-010	0.20000	0.00000	0.10000	0.00000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:15 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.31908	47.46723	0.82537	Equal Variances
Distribution	Shapiro-Wilk W	0.92573	0.74935	0.44624	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.05659	2.05659	1	352.35	0.00000	Significant Effect
Error	0.0350206	0.0058368	6			
Total	2.09161018	2.0624264	7			

**Group Comparisons**

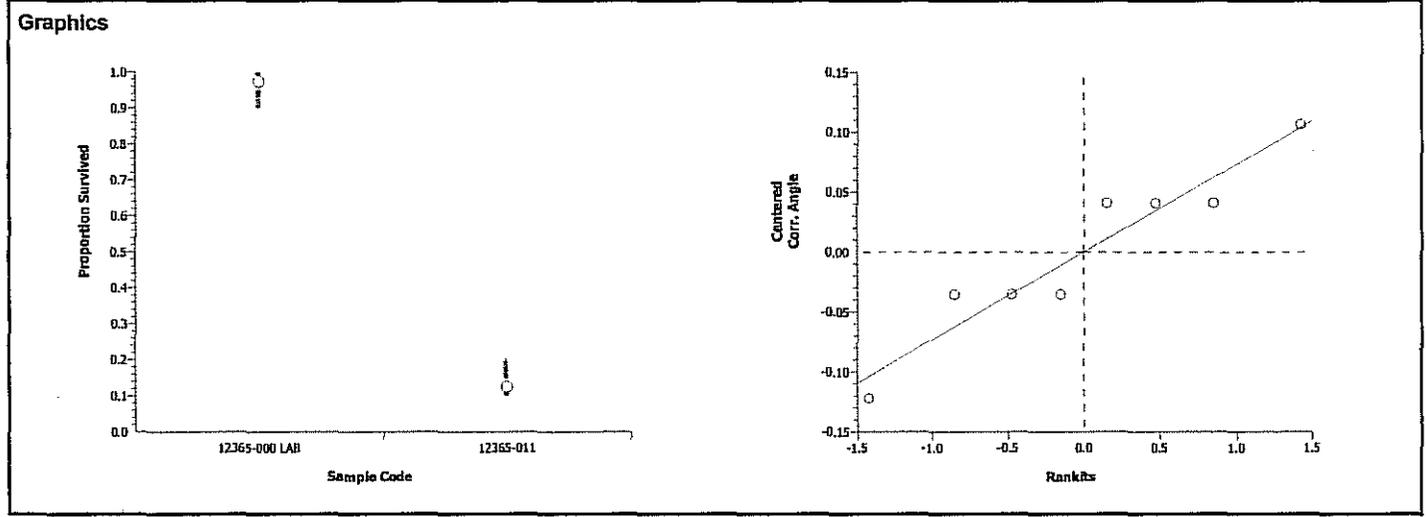
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-011	22.9352	2.35336	0.0001	0.10405	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-011	4	0.12500	0.10000	0.20000	0.05000	0.35722	0.32175	0.46365	0.07095

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-011	0.10000	0.10000	0.20000	0.10000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:15 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

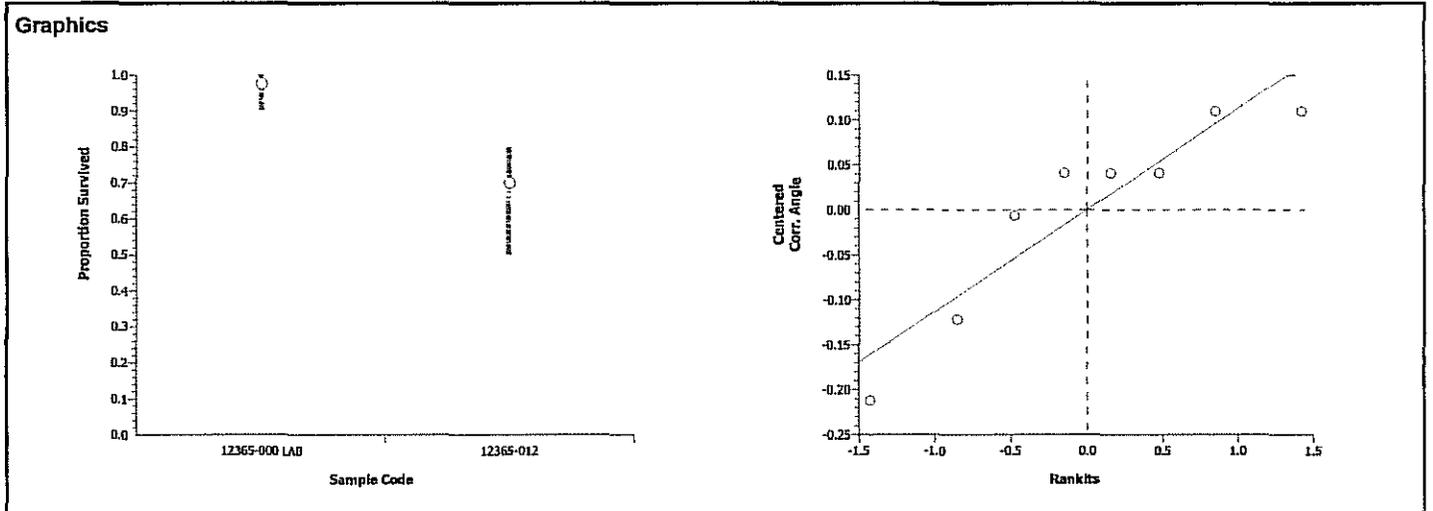
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.46760	47.46723	0.33435	Equal Variances
Distribution	Shapiro-Wilk W	0.85763	0.74935	0.11608	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.2790949	0.2790949	1	18.82	0.00489	Significant Effect
Error	0.0889924	0.0148321	6			
Total	0.3680873	0.2939269	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-012	3.66509	2.35336	0.0176	0.23986	Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-012	4	0.70000	0.50000	0.80000	0.14142	0.99771	0.78540	1.10715	0.15174

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-012	0.80000	0.70000	0.50000	0.80000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:15 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

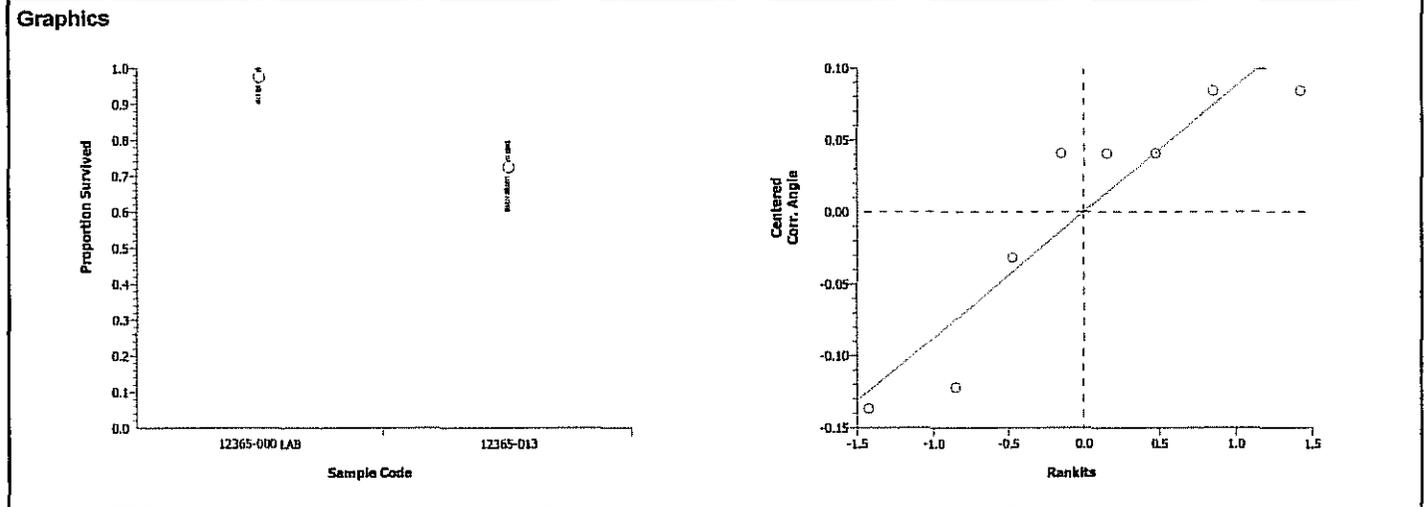
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.70305	47.46723	0.67261	Equal Variances
Distribution	Shapiro-Wilk W	0.83282	0.74935	0.06856	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.2427522	0.2427522	1	27.05	0.00201	Significant Effect
Error	0.0538433	0.0089739	6			
Total	0.29659554	0.2517261	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-013	5.78629	2.35336	0.0051	0.1417	Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
	12365-013	4	0.72500	0.60000	0.80000	0.09574	1.02288	0.88608	1.10715	0.10634

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-013	0.60000	0.80000	0.80000	0.70000				



# CETIS Analysis Detail

Comparisons: Page 9 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 06-4170-0546

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:15 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

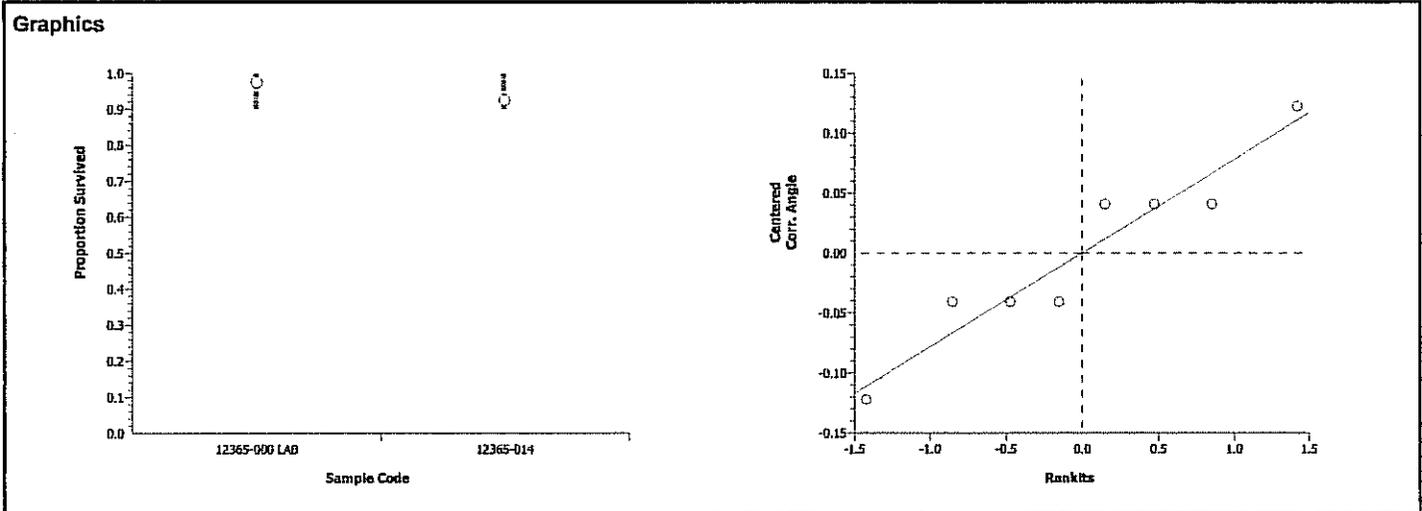
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.00000	47.46723	1.00000	Equal Variances
Distribution	Shapiro-Wilk W	0.93016	0.74935	0.48335	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0132797	0.0132797	1	2.00	0.20703	Non-Significant Effect
Error	0.039839	0.0066398	6			
Total	0.05311866	0.0199195	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-014	1.73205	2.35336	0.0908	0.11072	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
	12365-014	4	0.92500	0.90000	1.00000	0.05000	1.28979	1.24905	1.41202	0.08149

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-014	0.90000	0.90000	1.00000	0.90000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:15 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

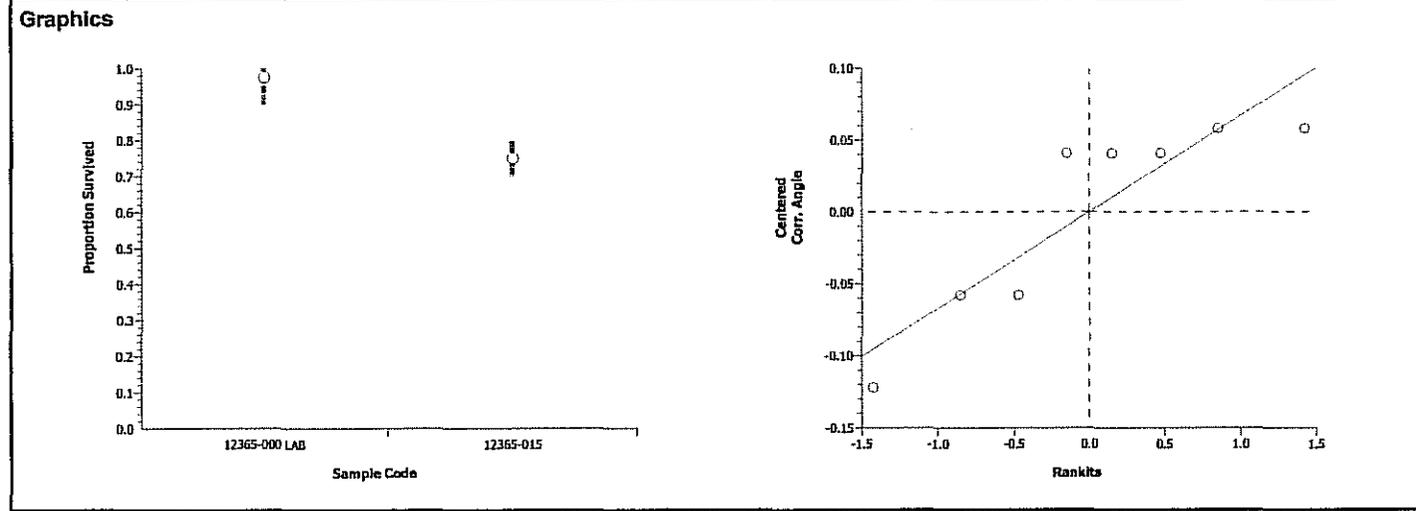
ANOVA Assumptions						
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.48054	47.46723	0.75489	Equal Variances	
Distribution	Shapiro-Wilk W	0.79593	0.74935	0.03028	Normal Distribution	

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.2075237	0.2075237	1	37.31	0.00088	Significant Effect
Error	0.0333737	0.0065623	6			
Total	0.24089739	0.213086	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-015	4.88039	2.35336	0.0082	0.15533	Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	0.97500	0.90000	1.00000	0.05000	1.37127	1.24905	1.41202	0.08149
12365-015	4	0.75000	0.70000	0.80000	0.05774	1.04915	0.99116	1.10715	0.06697

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	1.00000	1.00000	1.00000	0.90000				
12365-015	0.80000	0.70000	0.70000	0.80000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:16 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	22.13073	47.46723	0.03012	Equal Variances
Distribution	Shapiro-Wilk W	0.93992	0.74935	0.57309	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.3666648	0.3666648	1	2.04	0.20296	Non-Significant Effect
Error	1.077501	0.1795834	6			
Total	1.44416541	0.5462483	7			

**Group Comparisons**

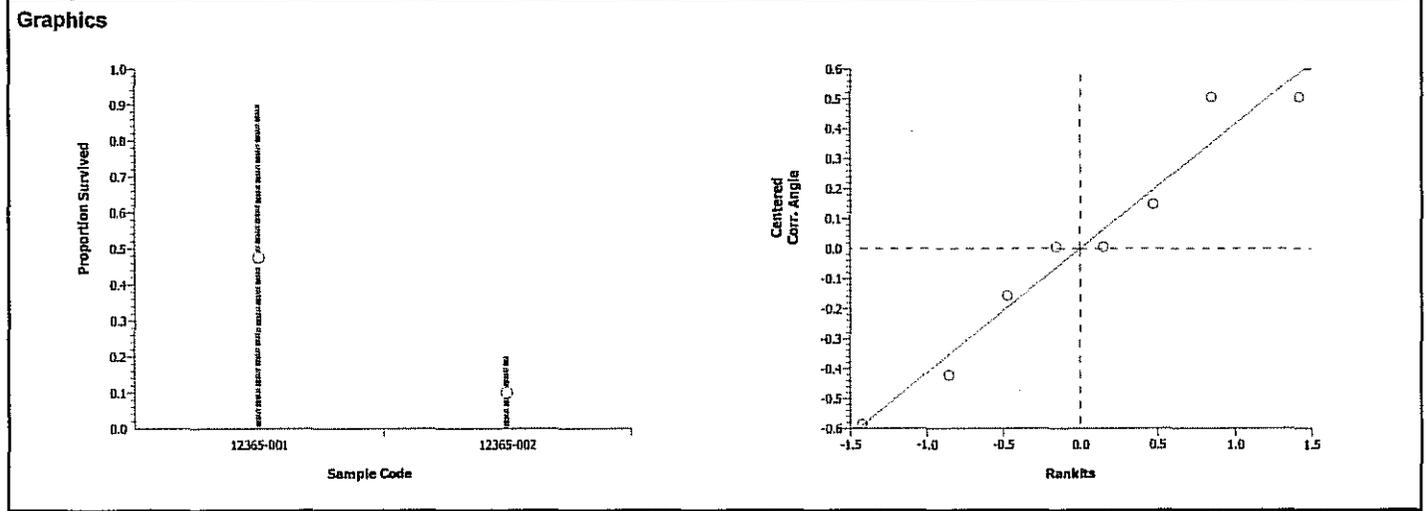
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-002	1.41501	2.35336	0.1260	0.71211	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-002	4	0.10000	0.00000	0.20000	0.08165	0.31648	0.15878	0.46365	0.12461

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-002	0.00000	0.10000	0.10000	0.20000				



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:16 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	15.91280	47.46723	0.04794	Equal Variances
Distribution	Shapiro-Wilk W	0.94118	0.74935	0.58536	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.4397643	0.4397643	1	2.41	0.17169	Non-Significant Effect
Error	1.095703	0.1826172	6			
Total	1.5354673	0.6223814	7			

**Group Comparisons**

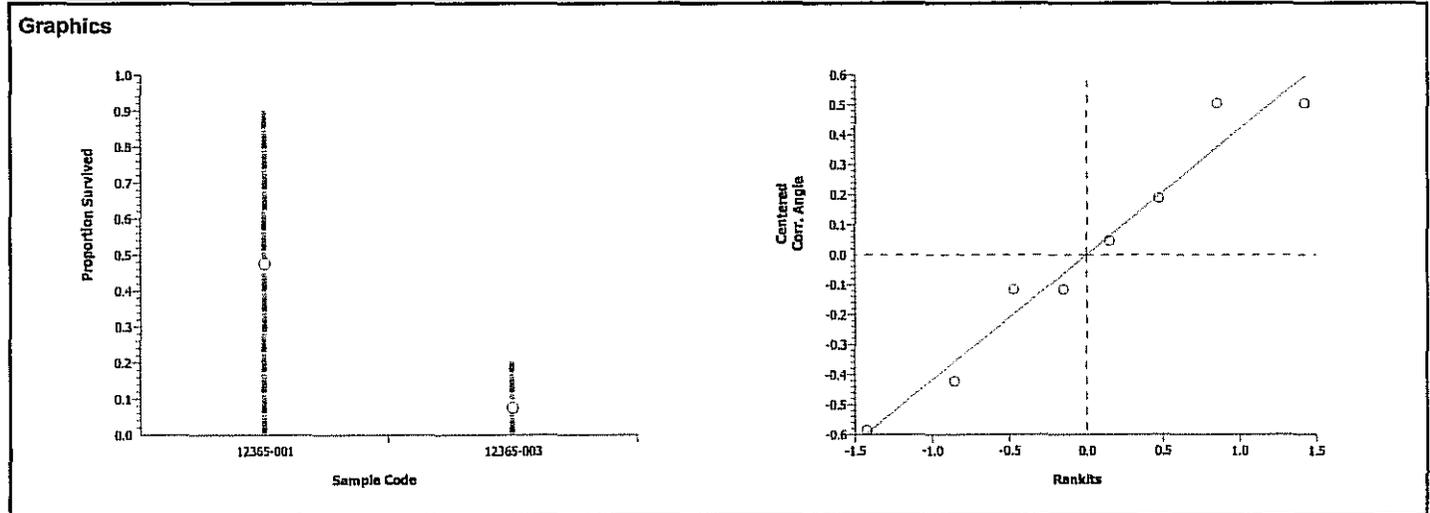
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-003	2.05673	2.35336	0.0660	0.53655	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-003	4	0.07500	0.00000	0.20000	0.09574	0.27574	0.15878	0.46365	0.14695

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-003	0.10000	0.00000	0.00000	0.20000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:16 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

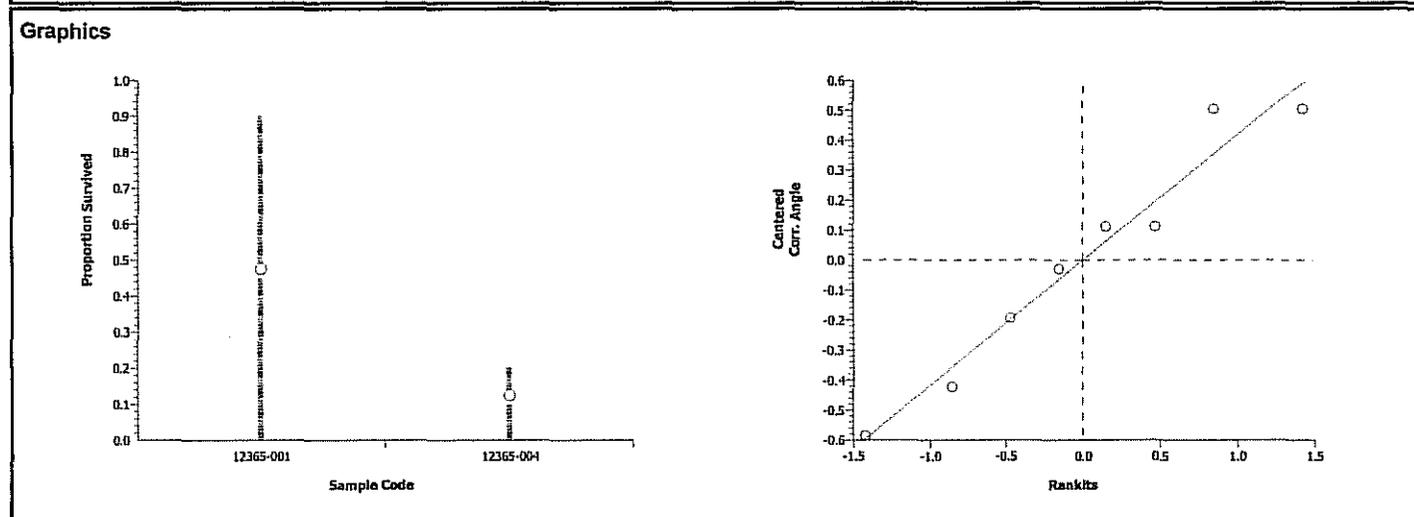
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	16.31734	47.46723	0.04629	Equal Variances
Distribution	Shapiro-Wilk W	0.94037	0.74935	0.57742	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.3084251	0.3084251	1	1.69	0.24113	Non-Significant Effect
Error	1.094097	0.1823495	6			
Total	1.40252191	0.4907746	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-004	1.20163	2.35336	0.1579	0.76909	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
	12365-004	4	0.12500	0.00000	0.20000	0.09574	0.35196	0.15878	0.46365	0.14512

Data Detail									
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
12365-001	0.90000	0.10000	0.00000	0.90000					
12365-004	0.00000	0.10000	0.20000	0.20000					



# CETIS Analysis Detail

Comparisons: Page 17 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 09-3932-4191

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:16 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.28403	47.46723	0.35486	Equal Variances
Distribution	Shapiro-Wilk W	0.89283	0.74935	0.23777	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0007921	0.0007921	1	0.00	0.95453	Non-Significant Effect
Error	1.344836	0.2241393	6			
Total	1.34562765	0.2249314	7			

**Group Comparisons**

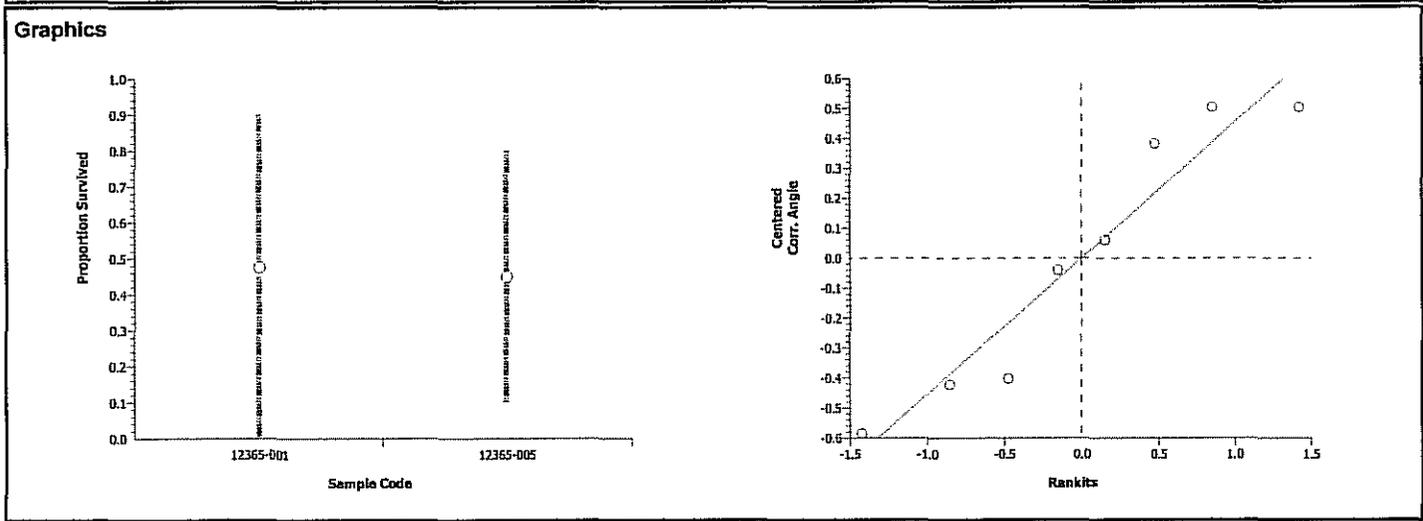
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-005	0.09064	2.35336	0.4667	0.51673	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-005	4	0.45000	0.10000	0.80000	0.28868	0.72475	0.32175	1.10715	0.32348

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-005	0.40000	0.50000	0.10000	0.80000				



# CETIS Analysis Detail

Comparisons: Page 28 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 19-3943-5024

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:16 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

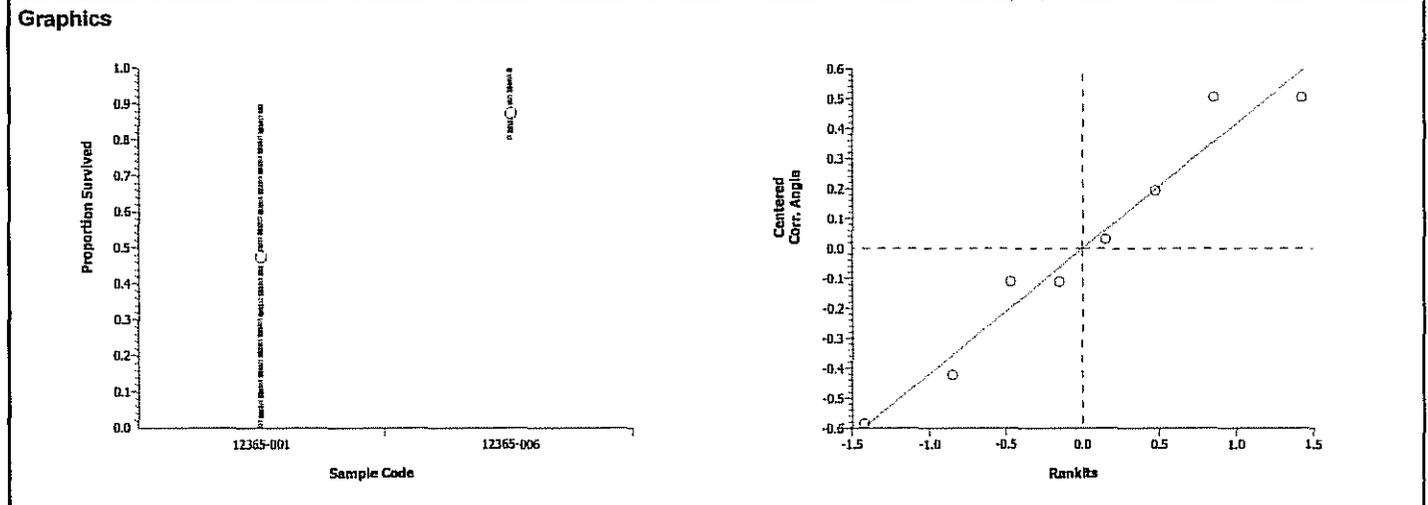
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	16.31734	47.46723	0.04629	Equal Variances
Distribution	Shapiro-Wilk W	0.94037	0.74935	0.57742	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.4497014	0.4497014	1	2.47	0.16738	Non-Significant Effect
Error	1.094097	0.1823495	6			
Total	1.54379818	0.6320509	7			

Group Comparisons						
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-006	-1.4362	2.35336	0.8768	0.77702	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
	12365-006	4	0.87500	0.80000	1.00000	0.09574	1.21884	1.10715	1.41202	0.14512

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-006	0.80000	0.80000	1.00000	0.90000				



# CETIS Analysis Detail

Comparisons: Page 10 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 07-2748-2543

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

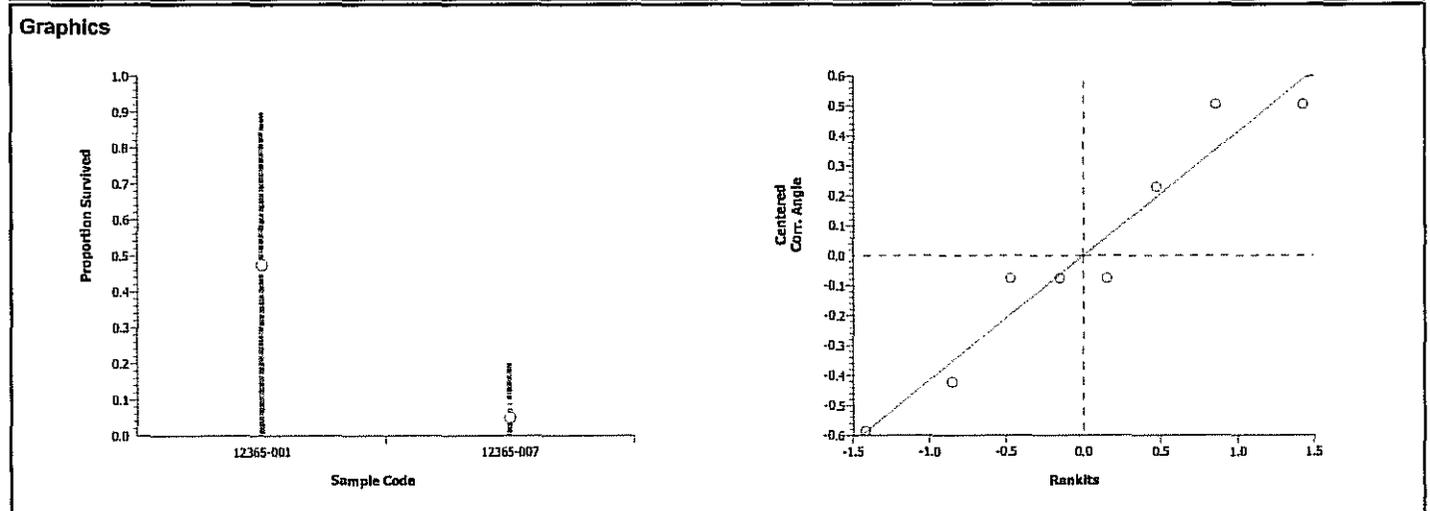
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	14.78906	47.46723	0.05308	Equal Variances
Distribution	Shapiro-Wilk W	0.92017	0.74935	0.40281	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.5195036	0.5195036	1	2.83	0.14339	Non-Significant Effect
Error	1.100626	0.1834376	6			
Total	1.62012923	0.7029412	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-007	1.51476	2.35336	0.1135	0.79182	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-007	4	0.05000	0.00000	0.20000	0.10000	0.23500	0.15878	0.46365	0.15243

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-007	0.00000	0.20000	0.00000	0.00000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

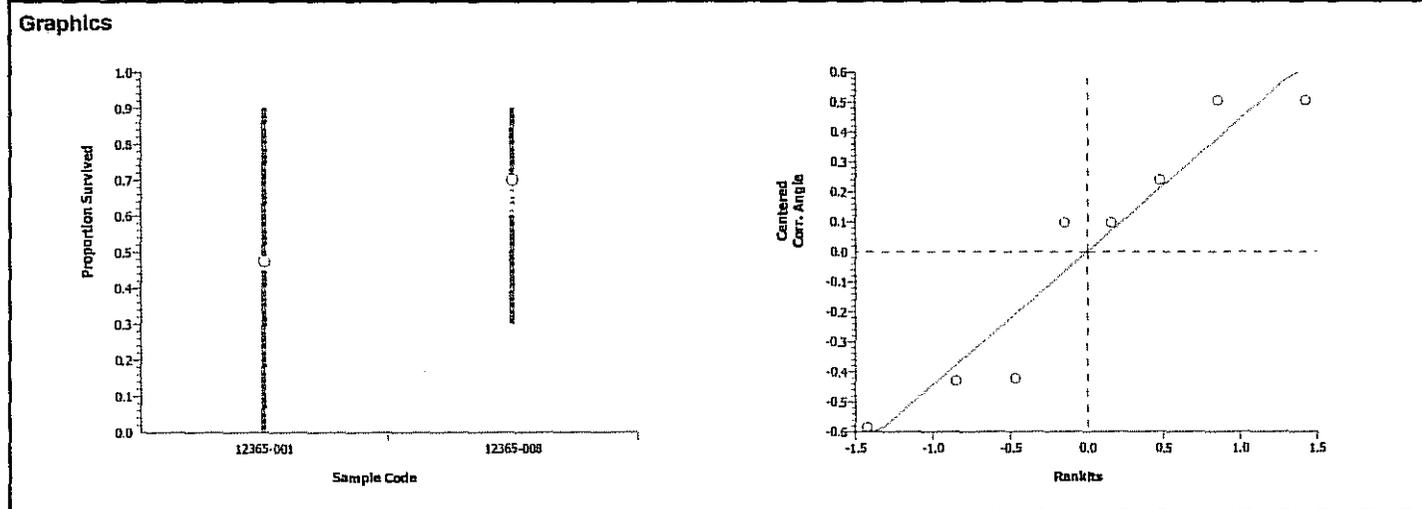
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.94645	47.46723	0.28918	Equal Variances
Distribution	Shapiro-Wilk W	0.88782	0.74935	0.21518	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.1416079	0.1416079	1	0.66	0.44839	Non-Significant Effect
Error	1.292144	0.2153573	6			
Total	1.43375188	0.3569653	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-008	-0.7109	2.35336	0.7358	0.88085	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-008	4	0.70000	0.30000	0.90000	0.27080	1.01075	0.57964	1.24905	0.29509

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.00000	0.90000	0.90000	0.10000				
12365-008	0.30000	0.80000	0.80000	0.90000				



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt. H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	8.02554	47.46723	0.12097	Equal Variances
Distribution	Shapiro-Wilk W	0.93480	0.74935	0.52473	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.2240522	0.2240522	1	1.16	0.32294	Non-Significant Effect
Error	1.159372	0.1932287	6			
Total	1.38342443	0.4172809	7			

**Group Comparisons**

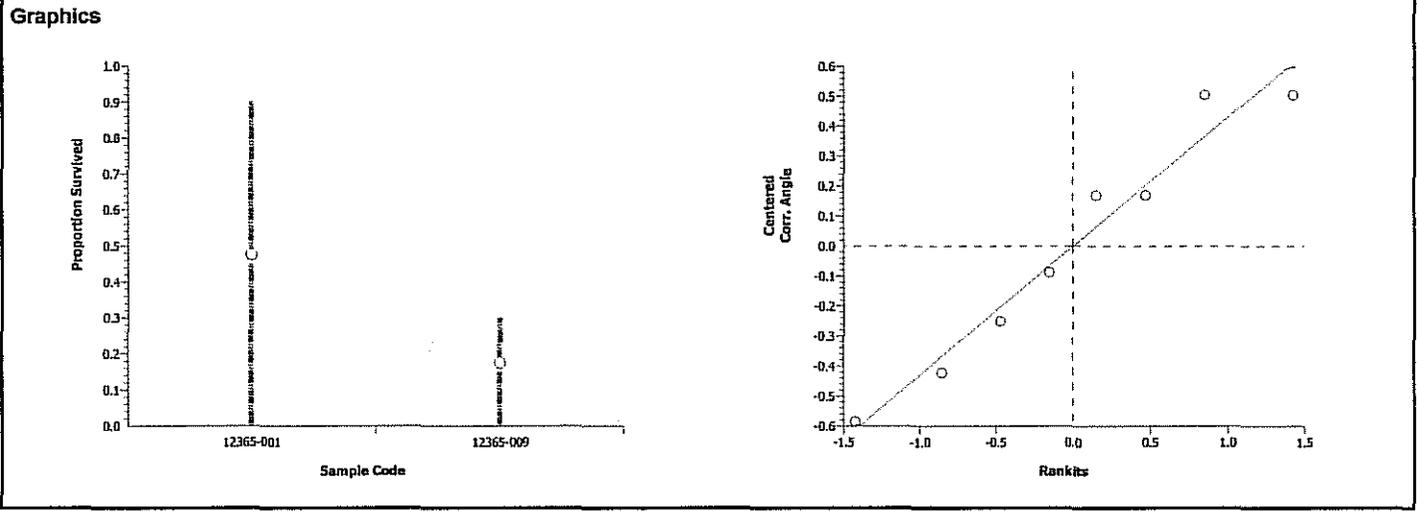
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-009	0.99210	2.35336	0.1971	0.79395	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-009	4	0.17500	0.00000	0.30000	0.15000	0.40995	0.15878	0.57964	0.20693

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-009	0.00000	0.10000	0.30000	0.30000				



# CETIS Analysis Detail

Comparisons: Page 12 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 08-2019-1756

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	15.91280	47.46723	0.04794	Equal Variances
Distribution	Shapiro-Wilk W	0.94118	0.74935	0.58536	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.4397643	0.4397643	1	2.41	0.17169	Non-Significant Effect
Error	1.095703	0.1826172	6			
Total	1.5354673	0.6223814	7			

**Group Comparisons**

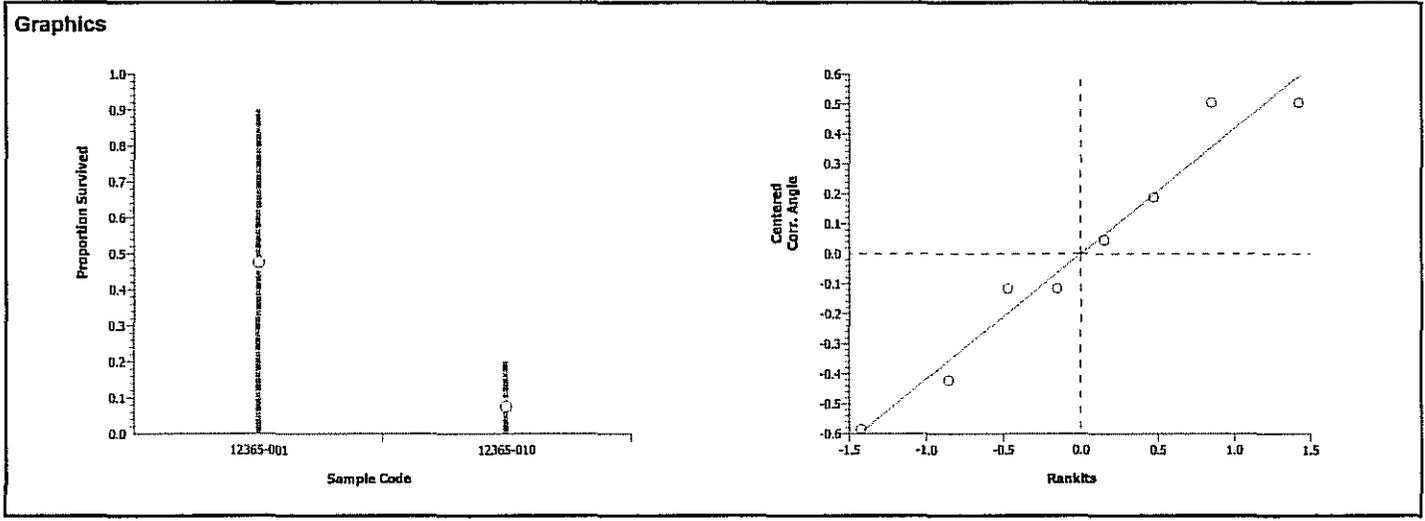
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-010	1.64160	2.35336	0.0996	0.67223	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-010	4	0.07500	0.00000	0.20000	0.09574	0.27574	0.15878	0.46365	0.14695

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-010	0.20000	0.00000	0.10000	0.00000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

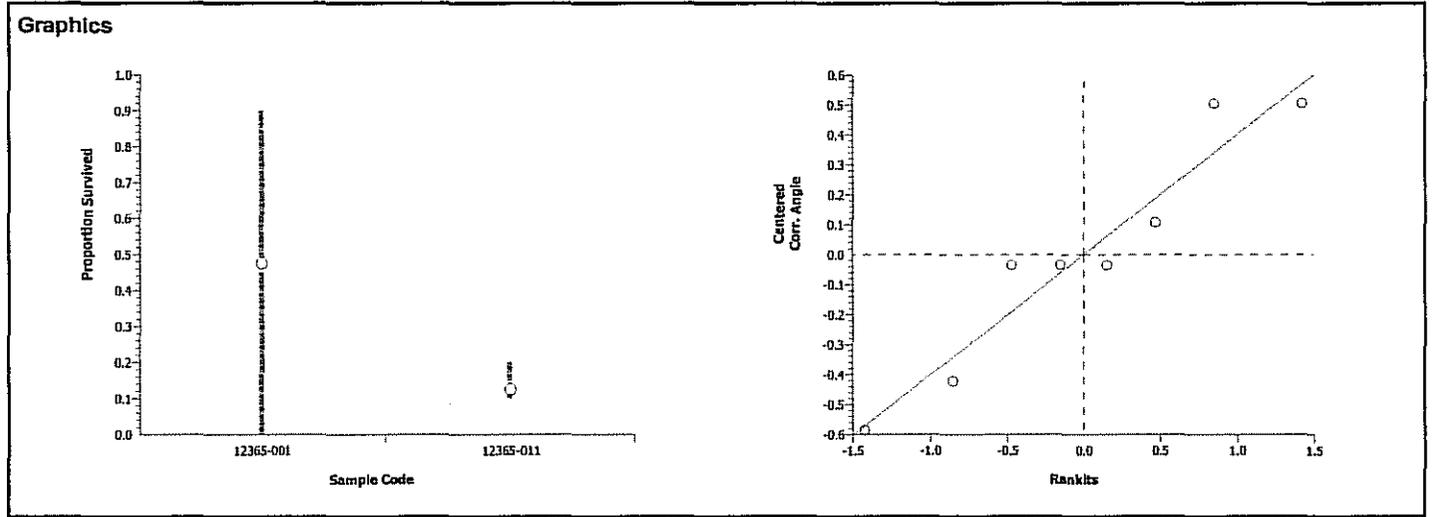
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	68.26780	47.46723	0.00586	Unequal Variances
Distribution	Shapiro-Wilk W	0.91432	0.74935	0.36093	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.3002052	0.3002052	1	1.72	0.23740	Non-Significant Effect
Error	1.046019	0.1743364	6			
Total	1.34622380	0.4745416	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-011	1.21894	2.35336	0.1550	0.748	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
	12365-011	4	0.12500	0.10000	0.20000	0.05000	0.35722	0.32175	0.46365	0.07095

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-011	0.10000	0.10000	0.20000	0.10000				



# CETIS Analysis Detail

Comparisons: Page 14 of 29  
 Report Date: 12 Oct-04 9:20 PM  
 Analysis: 08-7556-3611

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	14.92505	47.46723	0.05241	Equal Variances
Distribution	Shapiro-Wilk W	0.93808	0.74935	0.55536	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.1280762	0.1280762	1	0.70	0.43527	Non-Significant Effect
Error	1.09999	0.1833317	6			
Total	1.22806665	0.3114079	7			

**Group Comparisons**

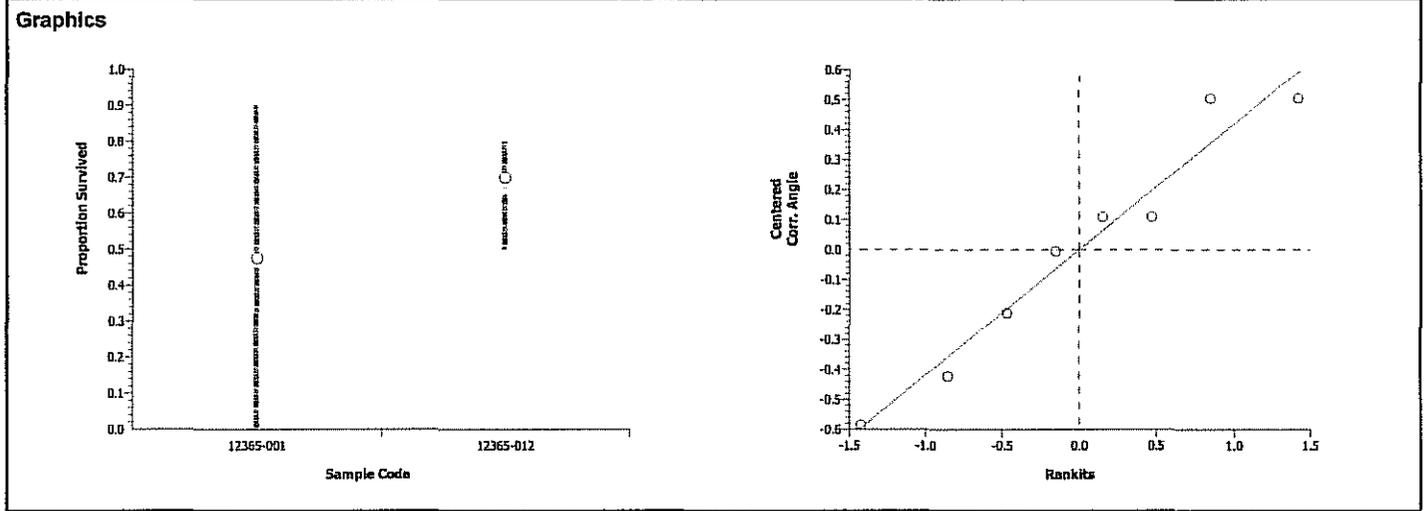
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-012	-1.109	2.35336	0.8258	0.53702	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-012	4	0.70000	0.50000	0.80000	0.14142	0.99771	0.78540	1.10715	0.15174

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-012	0.80000	0.70000	0.50000	0.80000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

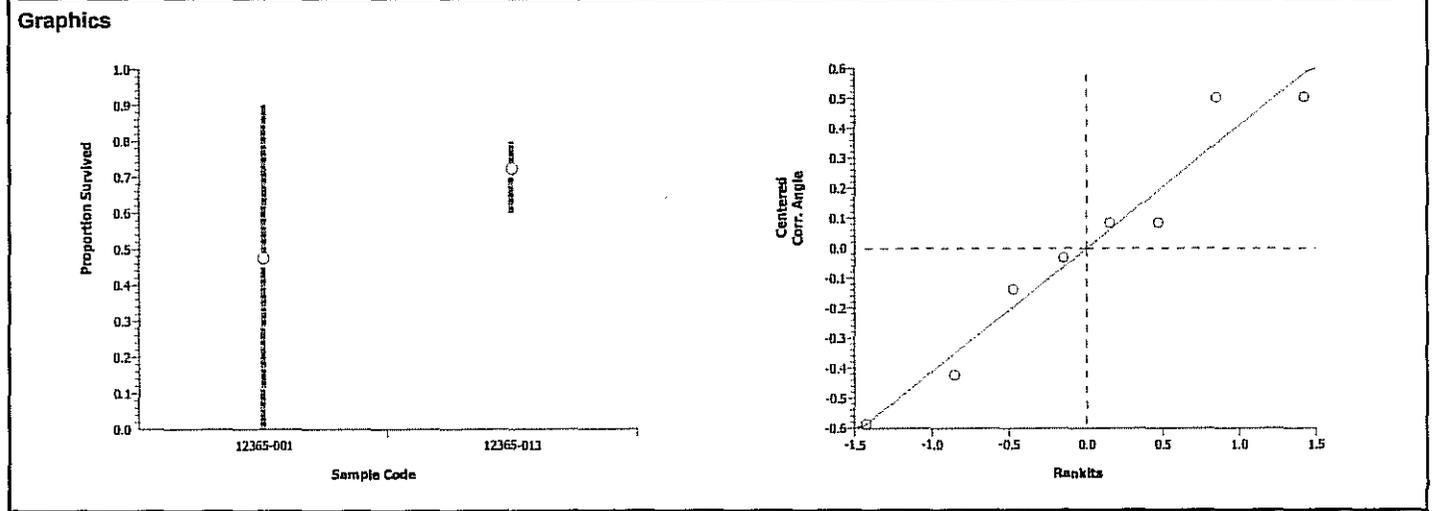
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	30.38918	47.46723	0.01912	Equal Variances
Distribution	Shapiro-Wilk W	0.93585	0.74935	0.53442	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.1548208	0.1548208	1	0.87	0.38635	Non-Significant Effect
Error	1.064841	0.1774736	6			
Total	1.21966214	0.3322943	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-013	-0.8132	2.35336	0.7622	0.80522	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-013	4	0.72500	0.60000	0.80000	0.09574	1.02288	0.88608	1.10715	0.10634

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-013	0.60000	0.80000	0.80000	0.70000				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:17 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

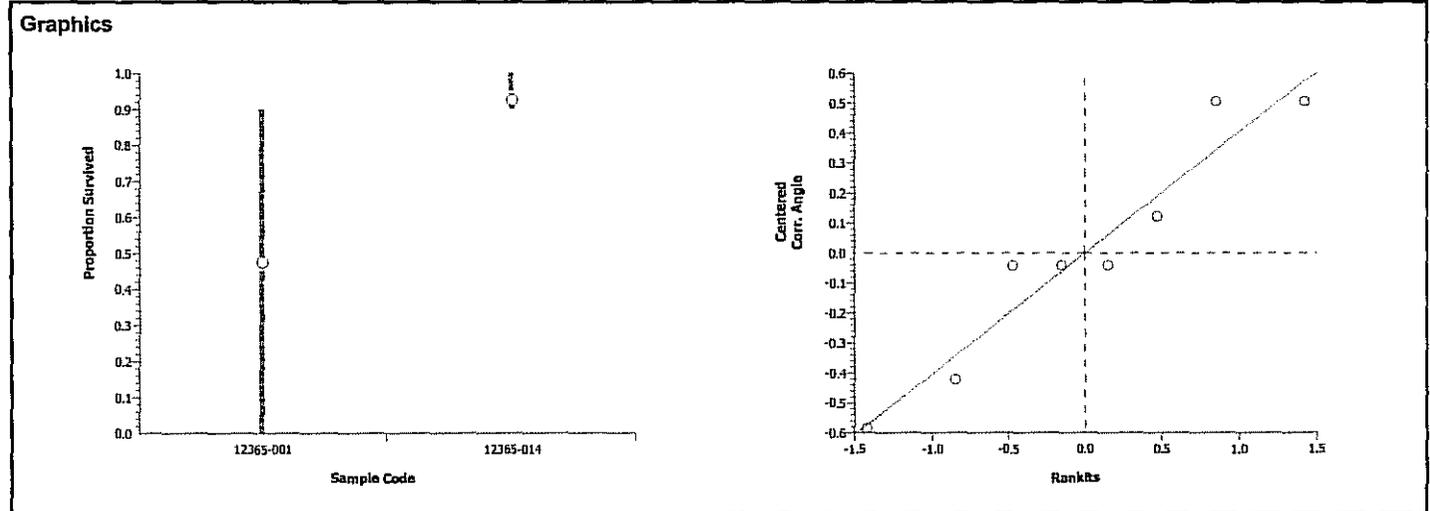
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	51.75419	47.46723	0.00881	Unequal Variances
Distribution	Shapiro-Wilk W	0.91698	0.74935	0.37948	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.5943395	0.5943395	1	3.39	0.11503	Non-Significant Effect
Error	1.050837	0.1751395	6			
Total	1.64517653	0.769479	7			

Group Comparisons						
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-014	-1.6946	2.35336	0.9056	0.75705	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
	12365-014	4	0.92500	0.90000	1.00000	0.05000	1.28979	1.24905	1.41202	0.08149

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-014	0.90000	0.90000	1.00000	0.90000				



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Survived	Comparison	12-2003-9926	12-2003-9926	12 Oct-04 9:18 PM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Paired Sample t	C > T	Angular (Corrected)				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	76.62436	47.46723	0.00495	Unequal Variances
Distribution	Shapiro-Wilk W	0.91950	0.74935	0.39780	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.1854369	0.1854369	1	1.07	0.34180	Non-Significant Effect
Error	1.044372	0.174062	6			
Total	1.22980866	0.3594989	7			

**Group Comparisons**

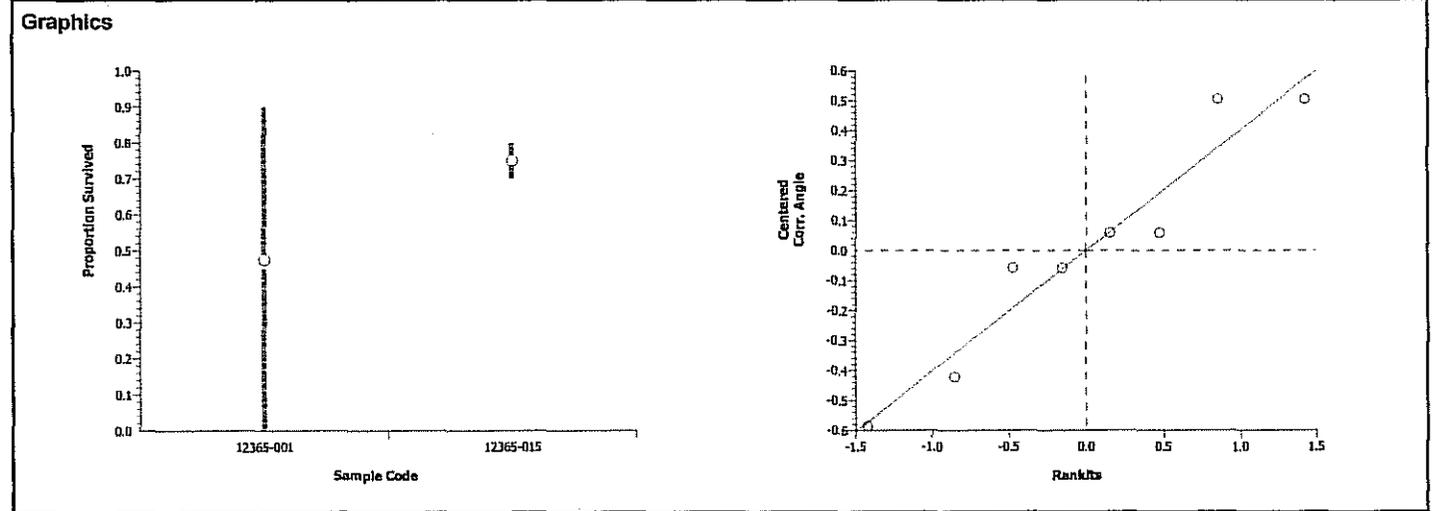
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-015	-1.1718	2.35336	0.8371	0.61155	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	4	0.47500	0.00000	0.90000	0.49244	0.74466	0.15878	1.24905	0.58621
12365-015	4	0.75000	0.70000	0.80000	0.05774	1.04915	0.99116	1.10715	0.06697

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	0.90000	0.10000	0.00000	0.90000				
12365-015	0.80000	0.70000	0.70000	0.80000				



## CETIS Test Summary

 Report Date: 06 Oct-04 10:20 PM  
 Link: 12-2003-9926

Eisenia 28-d Survival and Growth Soil Test			EnviroSystems, Inc.
<b>Test No:</b> 09-7990-8190	<b>Test Type:</b> Survival-Growth	<b>Duration:</b> 27d 23h	
<b>Start Date:</b> 04 Aug-04 12:00 PM	<b>Protocol:</b> EPA/600/R-92/183 (1992)	<b>Species:</b> Eisenia fetida	
<b>Ending Date:</b> 01 Sep-04 11:40 AM	<b>Dil Water:</b> Not Applicable	<b>Source:</b> In-House Culture	
<b>Setup Date:</b> 04 Aug-04 12:00 PM	<b>Brine:</b> Not Applicable		
<b>Sample No:</b> 16-4664-7775	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 04 Aug-04 12:00 PM	<b>Code:</b> 12365-000 LAB	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 04 Aug-04 12:00 PM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> N/A (4 °C)	<b>Station:</b> 12365 / 000		
<b>Sample No:</b> 12-2235-9606	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 20 Jul-04 04:30 PM	<b>Code:</b> 12365-001	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 19h (4 °C)	<b>Station:</b> AS01-SS45-REF / 001		
<b>Sample No:</b> 15-8881-5959	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 20 Jul-04 03:00 PM	<b>Code:</b> 12365-002	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 21h (4 °C)	<b>Station:</b> AS01-SS46 / 002		
<b>Sample No:</b> 01-8343-4957	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 20 Jul-04 03:30 PM	<b>Code:</b> 12365-003	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 20h (4 °C)	<b>Station:</b> AS01-SS47 / 003		
<b>Sample No:</b> 04-9764-2126	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 20 Jul-04 03:50 PM	<b>Code:</b> 12365-004	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 20h (4 °C)	<b>Station:</b> AS01-SS48 / 004		
<b>Sample No:</b> 07-0766-8295	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 20 Jul-04 02:15 PM	<b>Code:</b> 12365-005	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 21h (4 °C)	<b>Station:</b> AS01-SS49 / 005		
<b>Sample No:</b> 06-8784-7300	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 21 Jul-04 09:30 AM	<b>Code:</b> 12365-006	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 2h (4 °C)	<b>Station:</b> AS01-SS50 / 006		
<b>Sample No:</b> 08-1158-4819	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 21 Jul-04 10:00 AM	<b>Code:</b> 12365-007	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 2h (4 °C)	<b>Station:</b> AS01-SS51 / 007		
<b>Sample No:</b> 07-6915-8828	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 21 Jul-04 10:30 AM	<b>Code:</b> 12365-008	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 1h (4 °C)	<b>Station:</b> AS01-SS52 / 008		
<b>Sample No:</b> 07-9150-4636	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 21 Jul-04 11:30 AM	<b>Code:</b> 12365-009	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Jul-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 0h (4 °C)	<b>Station:</b> AS01-SS53 / 009		
<b>Sample No:</b> 10-2926-3793	<b>Material:</b> Soil	<b>Client:</b> CH2M Hill	
<b>Sample Date:</b> 21 Jul-04 12:00 PM	<b>Code:</b> 12365-010	<b>Project:</b> Ecological Risk Assessment	
<b>Receive Date:</b> 23 Sep-04 11:40 AM	<b>Source:</b> ABL Site 1		
<b>Sample Age:</b> 14d 0h (4 °C)	<b>Station:</b> AS01-SS54 / 010		

## CETIS Test Summary

 Report Date: 06 Oct-04 10:20 PM  
 Link: 12-2003-9926

Sample No:	11-9239-2542	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 02:30 PM	Code:	12365-011	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 21h (4 °C)	Station:	AS01-SS55 / 011		
Sample No:	10-9885-6820	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 02:00 PM	Code:	12365-012	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 22h (4 °C)	Station:	AS01-SS56 / 012		
Sample No:	09-7117-5175	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 01:30 PM	Code:	12365-013	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 22h (4 °C)	Station:	AS01-SS57 / 013		
Sample No:	11-1975-9968	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 12:30 PM	Code:	12365-014	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 23h (4 °C)	Station:	AS01-SS58 / 014		
Sample No:	14-9401-5915	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 01:00 PM	Code:	12365-015	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 23h (4 °C)	Station:	AS01-SS59 / 015		

## Proportion Survived Summary

Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV
12365-000 LAB	4	0.97500	0.90000	1.00000	0.02500	0.05000	5.13%
12365-001	4	0.47500	0.00000	0.90000	0.24622	0.49244	103.67
12365-002	4	0.10000	0.00000	0.20000	0.04082	0.08165	81.65%
12365-003	4	0.07500	0.00000	0.20000	0.04787	0.09574	127.66
12365-004	4	0.12500	0.00000	0.20000	0.04787	0.09574	76.59%
12365-005	4	0.45000	0.10000	0.80000	0.14434	0.28868	64.15%
12365-006	4	0.87500	0.80000	1.00000	0.04787	0.09574	10.94%
12365-007	4	0.05000	0.00000	0.20000	0.05000	0.10000	200.00
12365-008	4	0.70000	0.30000	0.90000	0.13540	0.27080	38.69%
12365-009	4	0.17500	0.00000	0.30000	0.07500	0.15000	85.71%
12365-010	4	0.07500	0.00000	0.20000	0.04787	0.09574	127.66
12365-011	4	0.12500	0.10000	0.20000	0.02500	0.05000	40.00%
12365-012	4	0.70000	0.50000	0.80000	0.07071	0.14142	20.20%
12365-013	4	0.72500	0.60000	0.80000	0.04787	0.09574	13.21%
12365-014	4	0.92500	0.90000	1.00000	0.02500	0.05000	5.41%
12365-015	4	0.75000	0.70000	0.80000	0.02887	0.05774	7.70%

## CETIS Test Summary

Report Date: 06 Oct-04 10:20 PM  
Link: 12-2003-9926

Proportion Survived Detail				
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
12365-000 LAB	1.00000	1.00000	1.00000	0.90000
12365-001	0.90000	0.10000	0.00000	0.90000
12365-002	0.00000	0.10000	0.10000	0.20000
12365-003	0.10000	0.00000	0.00000	0.20000
12365-004	0.00000	0.10000	0.20000	0.20000
12365-005	0.40000	0.50000	0.10000	0.80000
12365-006	0.80000	0.80000	1.00000	0.90000
12365-007	0.00000	0.20000	0.00000	0.00000
12365-008	0.30000	0.80000	0.80000	0.90000
12365-009	0.00000	0.10000	0.30000	0.30000
12365-010	0.20000	0.00000	0.10000	0.00000
12365-011	0.10000	0.10000	0.20000	0.10000
12365-012	0.80000	0.70000	0.50000	0.80000
12365-013	0.60000	0.80000	0.80000	0.70000
12365-014	0.90000	0.90000	1.00000	0.90000
12365-015	0.80000	0.70000	0.70000	0.80000

*Eisenia fetida* 28Day Bioaccumulation Assay

STUDY NUMBER: 12365  
 PROJECT: ABL

CLIENT: CH2MHill

**WET WEIGHT DATA:**

Sample Identification	Rep	Wet Weight (g)
-2	A	
	B	0.4
	C	0.5
	D	1.0
LAB	A	2.8
	B	2.3
	C	2.1
	D	2.0
-14	A	2.2
	B	2.3
	C	2.7
	D	2.1
-11	A	1.0
	B	1.1
	C	0.8
	D	0.6
-15	A	1.4
	B	1.5
	C	1.8
	D	1.4
-5	A	1.2
	B	1.3
	C	0.8
	D	2.2
-12	A	1.3
	B	1.0
	C	1.1
	D	1.1
INITIALS:		TPK
DATE:		9/2/04

*Eisenia fetida* 28Day Bioaccumulation Assay

STUDY NUMBER: 12365

CLIENT: CH2MHill

PROJECT: ABL

**WET WEIGHT DATA:**

Sample Identification	Rep	Wet Weight (g)
-4	A	
	B	0.6
	C	0.9
	D	0.6
-10	A	0.9
	B	
	C	0.7
	D	
-13	A	1.2
	B	1.2
	C	1.5
	D	1.3
-7	A	
	B	1.0
	C	
	D	
-3	A	0.7
	B	
	C	
	D	0.5
-9	A	
	B	0.7
	C	1.5
	D	0.8
-1	A	2.8
	B	0.3
	C	
	D	2.2
INITIALS:		TP F
DATE:		9/2/04

***Eisenia fetida* 28Day Bioaccumulation Assay**

STUDY NUMBER: 12365  
 PROJECT: ABL

CLIENT: CH2MHill

**WET WEIGHT DATA:**

Sample Identification	Rep	Wet Weight (g)
-6	A	2.6
	B	2.4
	C	2.9
	D	2.7
-8	A	0.7
	B	2.4
	C	1.8
	D	2.3
	A	
	B	
	C	
	D	
	A	
	B	
	C	
	D	
	A	
	B	
	C	
	D	
	A	
	B	
	C	
	D	
INITIALS:		
DATE:	9/2/04 ↙ JP ↘	

**Eisenia fetida Assay**  
**28 DAY SURVIVAL & GROWTH DATA**

STUDY NUMBER: 12365  
 PROJECT: \_\_\_\_\_

CLIENT: CH2M Hill  
 START DATE: 8/4/04

ESI SAMPLE ID	REP	WET WEIGHT (G)
Start Worms	A	3.6
	B	3.9
	C	3.8
	D	3.9
RECORDED BY:		BB
DATE:		8/6/04

**NOTES:**

Number Worms per Replicate: 10

Average wet weight per worm: 0.372 Grams

Average wet weight per replicate: 3.72 Grams

Average wet weight of soil per replicate: 400 Grams

Loading rate (g worm/kg soil): 1.49 Grams Worm / Kg Soil

## CETIS Test Summary

Report Date: 06 Oct-04 10:22 PM  
Link: 12-2003-9926

Eisenia 28-d Survival and Growth Soil Test			EnviroSystems, Inc.
Test No:	09-7990-8190	Test Type:	Survival-Growth
Start Date:	04 Aug-04 12:00 PM	Protocol:	EPA/600/R-92/183 (1992)
Ending Date:	01 Sep-04 11:40 AM	Dil Water:	Not Applicable
Setup Date:	04 Aug-04 12:00 PM	Brine:	Not Applicable
Duration:	27d 23h	Species:	Eisenia fetida
Source:	In-House Culture		
Sample No:	16-4664-7775	Material:	Soil
Sample Date:	04 Aug-04 12:00 PM	Code:	12365-000 LAB
Receive Date:	04 Aug-04 12:00 PM	Source:	ABL Site 1
Sample Age:	N/A (4 °C)	Station:	12365 / 000
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	12-2235-9606	Material:	Soil
Sample Date:	20 Jul-04 04:30 PM	Code:	12365-001
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 19h (4 °C)	Station:	AS01-SS45-REF / 001
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	15-8881-5959	Material:	Soil
Sample Date:	20 Jul-04 03:00 PM	Code:	12365-002
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 21h (4 °C)	Station:	AS01-SS46 / 002
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	01-8343-4957	Material:	Soil
Sample Date:	20 Jul-04 03:30 PM	Code:	12365-003
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 20h (4 °C)	Station:	AS01-SS47 / 003
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	04-9764-2126	Material:	Soil
Sample Date:	20 Jul-04 03:50 PM	Code:	12365-004
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 20h (4 °C)	Station:	AS01-SS48 / 004
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	07-0766-8295	Material:	Soil
Sample Date:	20 Jul-04 02:15 PM	Code:	12365-005
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 21h (4 °C)	Station:	AS01-SS49 / 005
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	06-8784-7300	Material:	Soil
Sample Date:	21 Jul-04 09:30 AM	Code:	12365-006
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 2h (4 °C)	Station:	AS01-SS50 / 006
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	08-1158-4819	Material:	Soil
Sample Date:	21 Jul-04 10:00 AM	Code:	12365-007
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 2h (4 °C)	Station:	AS01-SS51 / 007
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	07-6915-8828	Material:	Soil
Sample Date:	21 Jul-04 10:30 AM	Code:	12365-008
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 1h (4 °C)	Station:	AS01-SS52 / 008
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	07-9150-4636	Material:	Soil
Sample Date:	21 Jul-04 11:30 AM	Code:	12365-009
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 0h (4 °C)	Station:	AS01-SS53 / 009
Client:	CH2M Hill	Project:	Ecological Risk Assessment
Sample No:	10-2926-3793	Material:	Soil
Sample Date:	21 Jul-04 12:00 PM	Code:	12365-010
Receive Date:	23 Sep-04 11:40 AM	Source:	ABL Site 1
Sample Age:	14d 0h (4 °C)	Station:	AS01-SS54 / 010
Client:	CH2M Hill	Project:	Ecological Risk Assessment

## CETIS Test Summary

Report Date: 06 Oct-04 10:22 PM  
Link: 12-2003-9926

Sample No:	11-9239-2542	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 02:30 PM	Code:	12365-011	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 21h (4 °C)	Station:	AS01-SS55 / 011		
Sample No:	10-9885-6820	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 02:00 PM	Code:	12365-012	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 22h (4 °C)	Station:	AS01-SS56 / 012		
Sample No:	09-7117-5175	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 01:30 PM	Code:	12365-013	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 22h (4 °C)	Station:	AS01-SS57 / 013		
Sample No:	11-1975-9968	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 12:30 PM	Code:	12365-014	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 23h (4 °C)	Station:	AS01-SS58 / 014		
Sample No:	14-9401-5915	Material:	Soil	Client:	CH2M Hill
Sample Date:	21 Jul-04 01:00 PM	Code:	12365-015	Project:	Ecological Risk Assessment
Receive Date:	23 Jul-04 11:40 AM	Source:	ABL Site 1		
Sample Age:	13d 23h (4 °C)	Station:	AS01-SS59 / 015		

## Mean Dry Weight-mg Summary

Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV
12365-000 LAB	4	235.5	210	280	15.3921	30.7842	13.07%
12365-001	4	285	244	311	20.7445	35.9305	12.61%
12365-002	4	466.667	400	500	33.3333	57.7350	12.37%
12365-003	4	475	250	700	225	318.198	66.99%
12365-004	4	450	300	600	86.6025	150	33.33%
12365-005	4	408.75	260	800	130.677	261.355	63.94%
12365-006	4	303.75	290	325	7.4652	14.9304	4.92%
12365-007	4	500	500	500			
12365-008	4	253.5	225	300	16.835	33.67	13.28%
12365-009	4	489	267	700	125.117	216.709	44.32%
12365-010	4	575	450	700	125	176.777	30.74%
12365-011	4	775	400	1100	165.202	330.404	42.63%
12365-012	4	166	138	220	18.7927	37.5855	22.64%
12365-013	4	181	150	200	10.7858	21.5716	11.92%
12365-014	4	250.75	233	270	7.95168	15.9034	6.34%
12365-015	4	205.25	175	257	19.5464	39.0928	19.05%

## CETIS Test Summary

## Mean Dry Weight-mg Detail

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4
12365-000 LAB	280	230	210	222
12365-001	311	300	N/A	244
12365-002	N/A	400	500	500
12365-003	700	N/A	N/A	250
12365-004	N/A	600	450	300
12365-005	300	260	800	275
12365-006	325	300	290	300
12365-007	N/A	500	N/A	N/A
12365-008	233	300	225	256
12365-009	N/A	700	500	267
12365-010	450	N/A	700	N/A
12365-011	1000	1100	400	600
12365-012	163	143	220	138
12365-013	200	150	188	186
12365-014	244	256	270	233
12365-015	175	214	257	175

# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	78.42756	198.50130	0.02502	Equal Variances
Distribution	Shapiro-Wilk W	0.95707	0.68379	0.70877	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	433.2	433.2	1	1.25	0.34475	Non-Significant Effect
Error	1038.32	346.1067	3			
Total	1471.51996	779.30667	4			

**Group Comparisons**

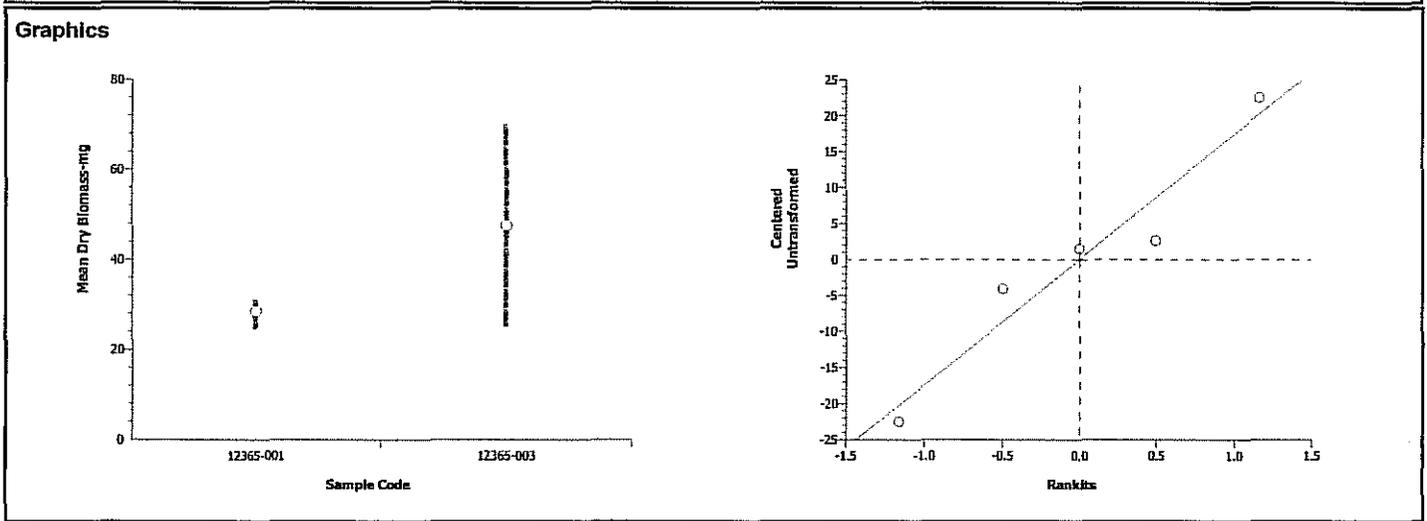
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-003	-1.1188	2.35336	0.8276	39.9672	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-003	2	47.5	25	70	31.8198				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-003	70	25						



# CETIS Analysis Detail

Comparisons: Page 21 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 14-8572-2830

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

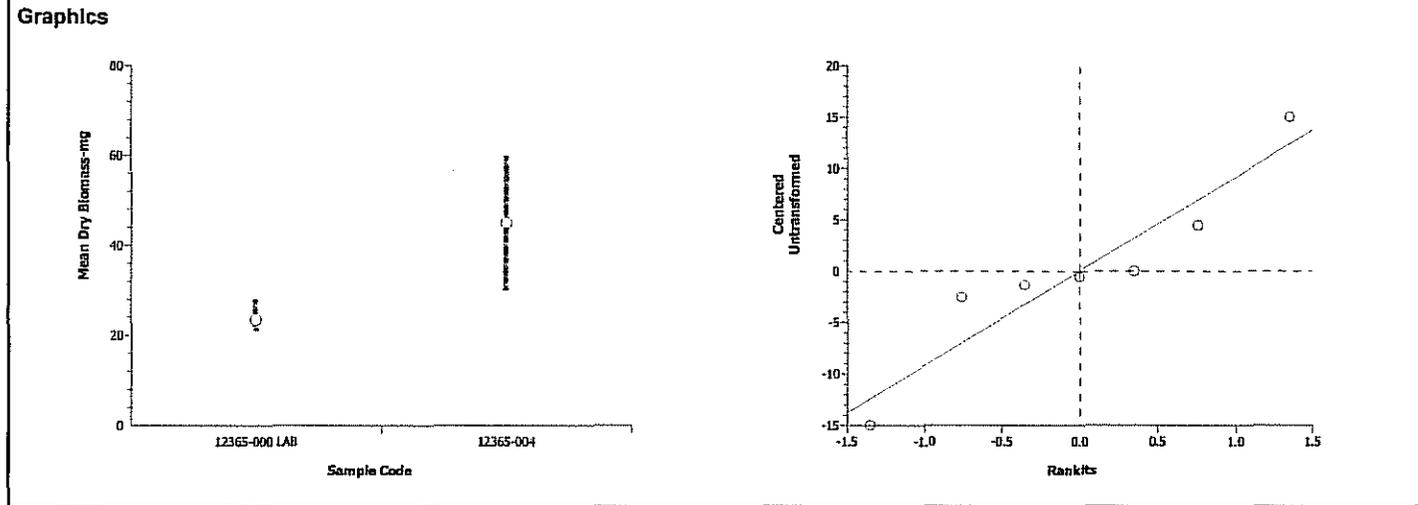
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	23.74253	49.79928	0.02897	Equal Variances
Distribution	Shapiro-Wilk W	0.92263	0.72991	0.45555	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	788.7471	788.7471	1	8.24	0.03495	Significant Effect
Error	478.43	95.686	5			
Total	1267.17712	884.43313	6			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-004	-2.8711	2.01505	0.9825	15.0546	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	23.5500	21	28	3.07842				
	12365-004	3	45	30	60	15				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-004	60	45	30					



# CETIS Analysis Detail

Comparisons: Page 22 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 15-5535-9042

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.19627	47.46723	0.88637	Equal Variances
Distribution	Shapiro-Wilk W	0.83014	0.74935	0.06471	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	6.479998	6.479998	1	0.62	0.46009	Non-Significant Effect
Error	62.44	10.40667	6			
Total	68.920006	16.886665	7			

**Group Comparisons**

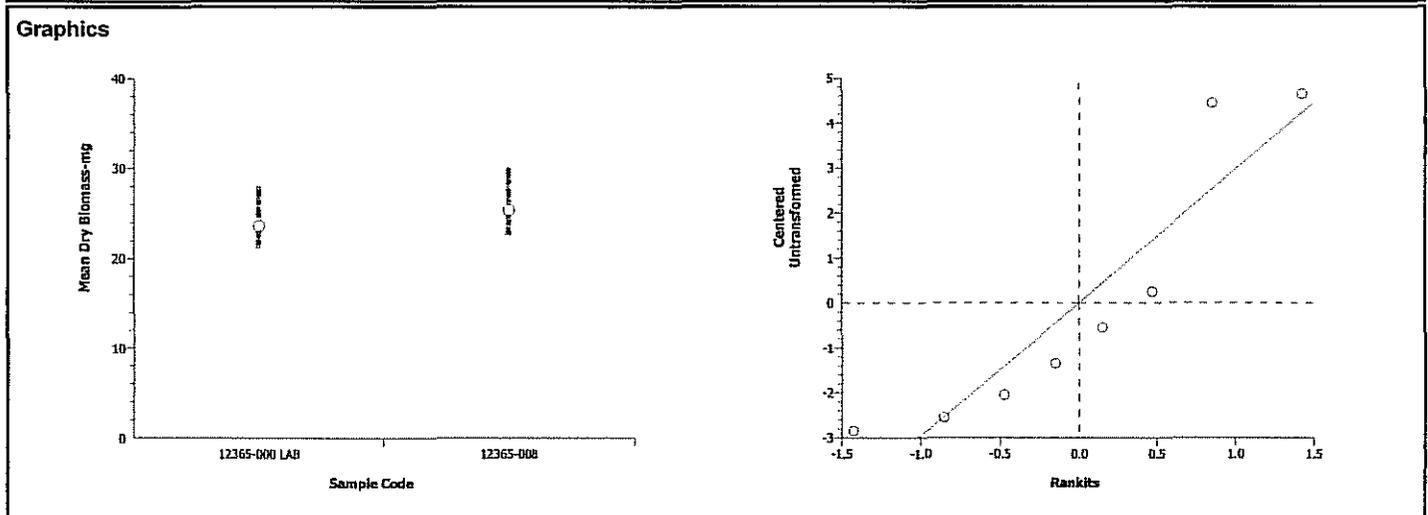
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-008	-0.7891	1.94318	0.7700	4.43255	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-008	4	25.35	22.5	30	3.367				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-008	23.3	30	22.5	25.6				



# CETIS Analysis Detail

Comparisons: Page 23 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 15-6018-9783

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C > T	Untransformed				N/A		

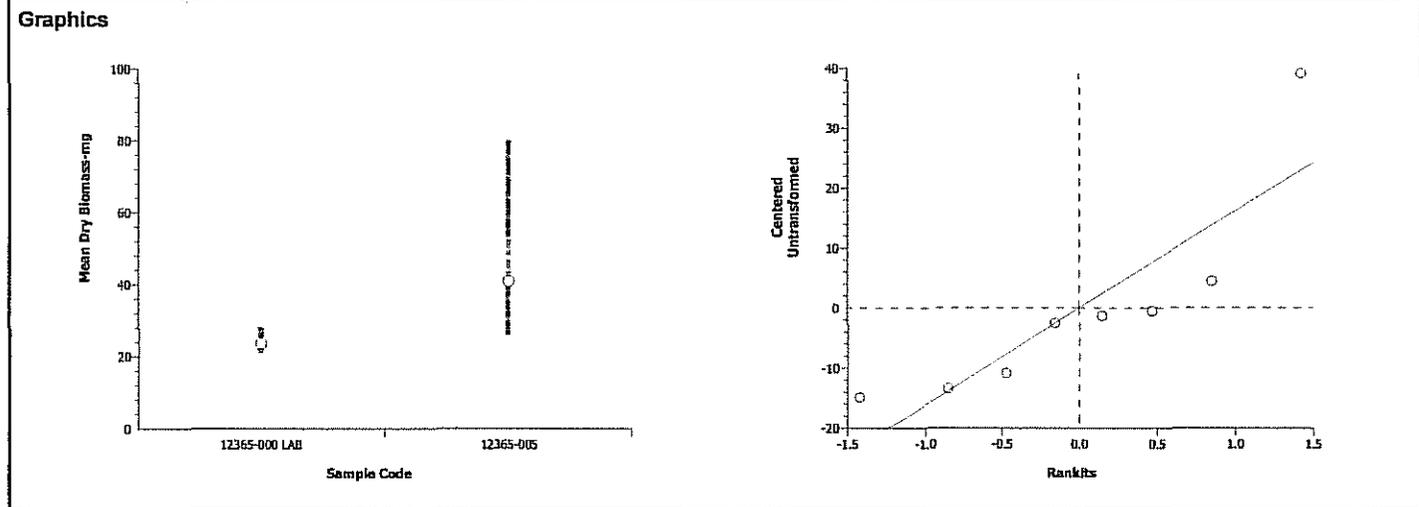
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	72.07835	47.46723	0.00541	Unequal Variances
Distribution	Shapiro-Wilk W	0.77735	0.74935	0.01969	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	600.3112	600.3112	1	1.73	0.23600	Non-Significant Effect
Error	2077.617	346.2696	6			
Total	2677.92865	946.58081	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-005	-1.3167	2.35336	0.8603	30.9657	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-005	4	40.875	26	80	26.1355				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22,2				
12365-005	30	26	80	27,5				



# CETIS Analysis Detail

Comparisons: Page 24 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 16-1786-9617

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:01 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

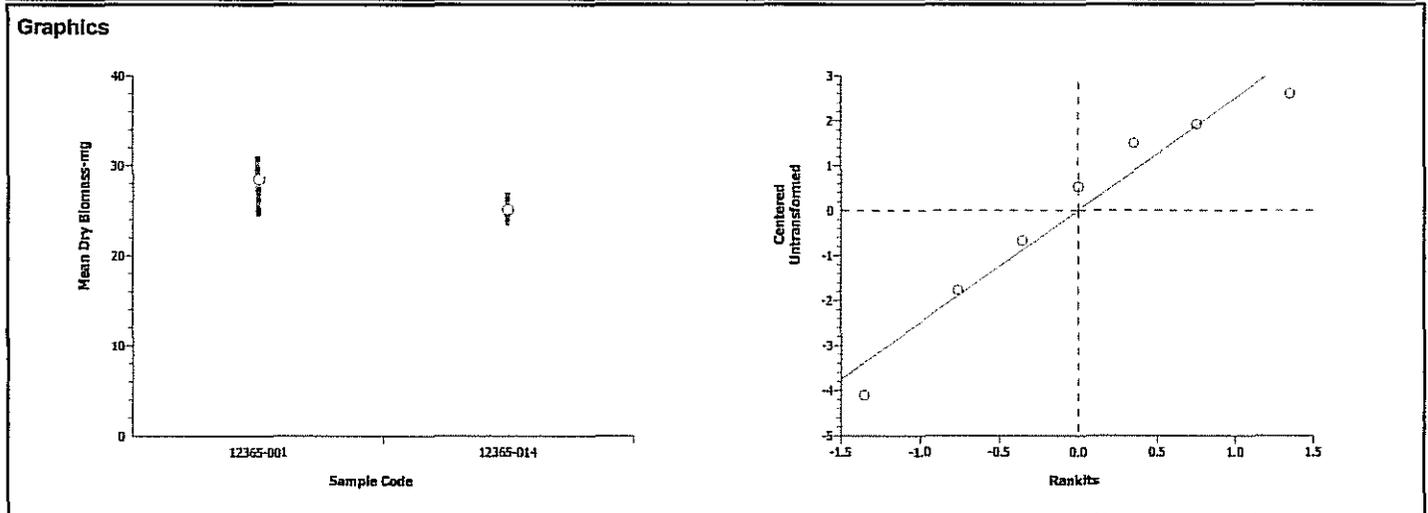
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	5.10445	49.79928	0.21648	Equal Variances
Distribution	Shapiro-Wilk W	0.93948	0.72991	0.59411	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	20.10965	20.10965	1	3.01	0.14329	Non-Significant Effect
Error	33.40751	6.681502	5			
Total	53.5171547	26.791148	6			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-014	1.73486	2.01505	0.0716	3.97815	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data			Transformed Data				
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-001	3	28.5	24.4	31.1	3.59305				
	12365-014	4	25.075	23.3	27	1.59034				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-014	24.4	25.6	27	23.3				



# CETIS Analysis Detail

Comparisons: Page 25 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 18-1661-8855

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.09424	199.16640	1.02030	Equal Variances
Distribution	Shapiro-Wilk W	0.95976	0.72991	0.78730	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	242.76	242.76	1	17.80	0.00834	Significant Effect
Error	68.2	13.64	5			
Total	310.960014	256.40001	6			

**Group Comparisons**

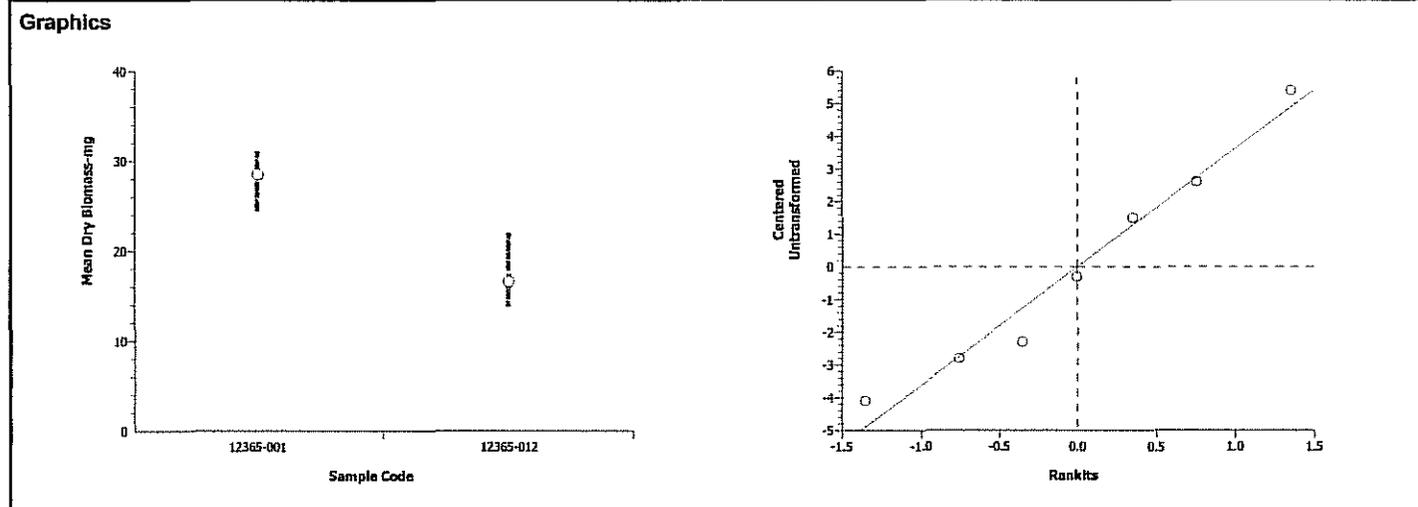
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-012	4.21873	2.01505	0.0042	5.68396	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-012	4	16.6	13.8	22	3.75855				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-012	16.3	14.3	22	13.8				



# CETIS Analysis Detail

Comparisons: Page 26 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 18-9197-8262

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

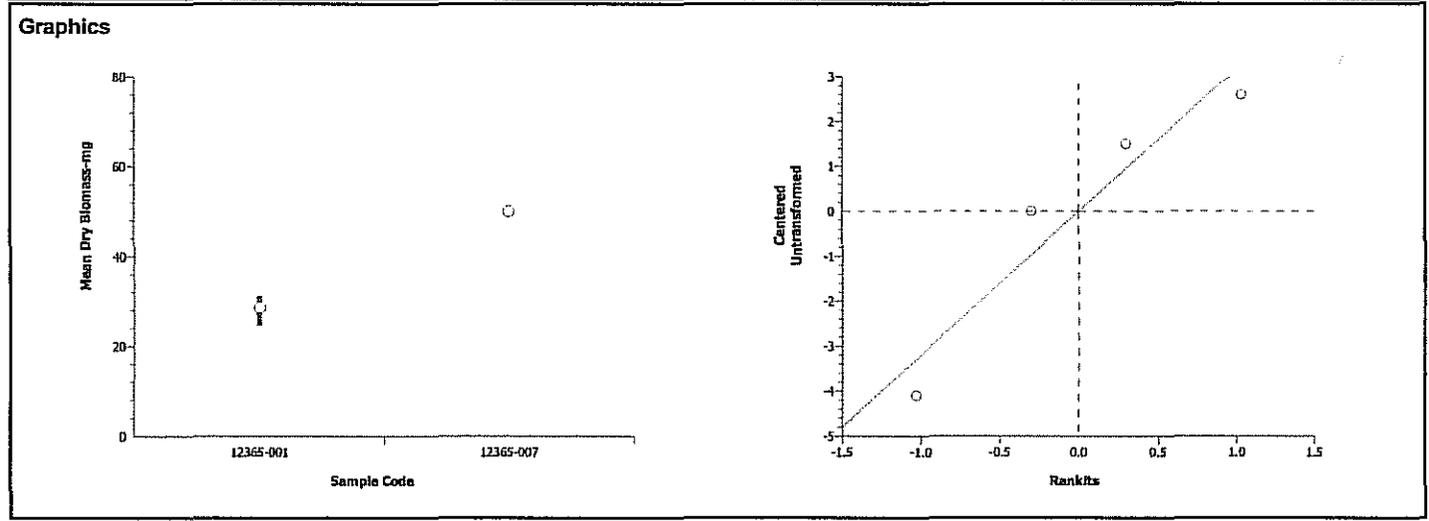
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Untransformed				N/A		

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	346.6875	346.6875	1	26.85	0.03528	Significant Effect
Error	25.82001	12.91	2			
Total	372.507505	359.59750	3			

Sample	vs Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
12365-001	12365-007	0		0.7500	0	Non-Significant Effect

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-007	1	50	50	50					

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-007	50							



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.61265	47.46723	0.70419	Equal Variances
Distribution	Shapiro-Wilk W	0.85510	0.74935	0.11008	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	18.30125	18.30125	1	1.48	0.26970	Non-Significant Effect
Error	74.2775	12.37958	6			
Total	92.5787544	30.680835	7			

**Group Comparisons**

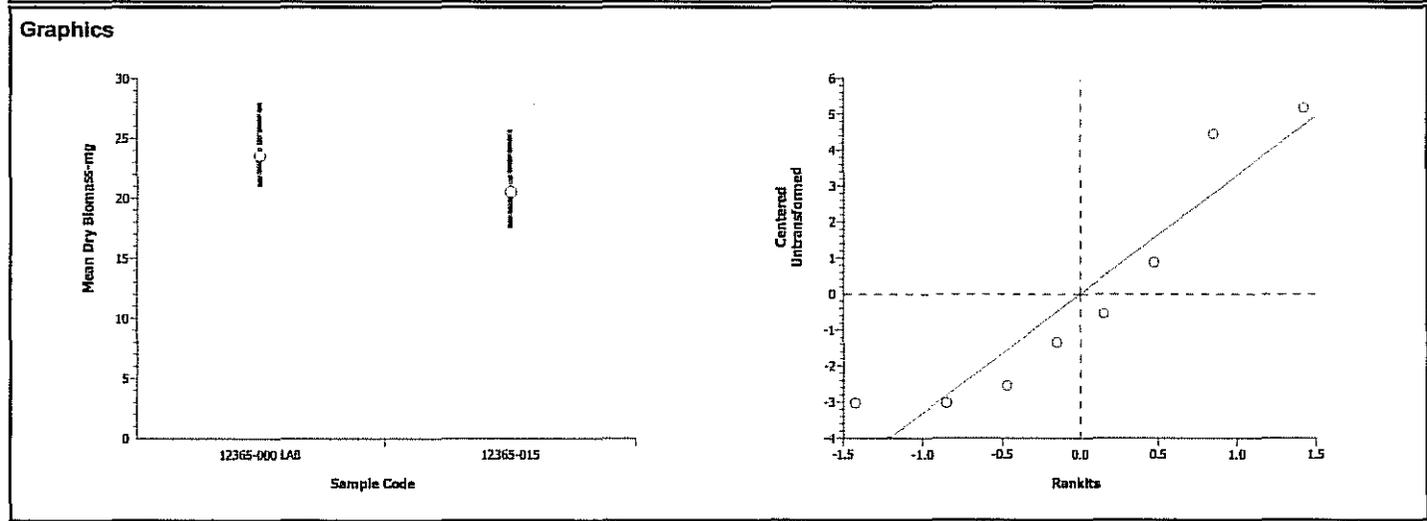
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB	12365-015	1.21587	1.94318	0.1348	4.8345	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-015	4	20.5250	17.5	25.7	3.90928				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-015	17.5	21.4	25.7	17.5				



# CETIS Analysis Detail

Comparisons: Page 28 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 19-3174-4516

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:01 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

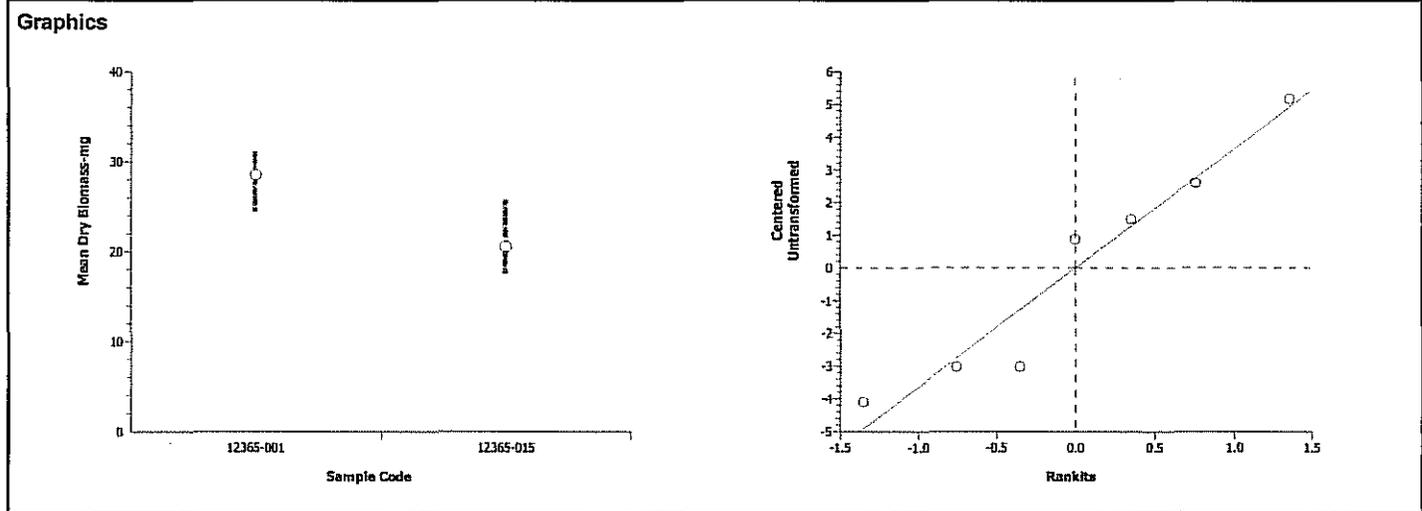
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.18377	199.16640	0.97666	Equal Variances
Distribution	Shapiro-Wilk W	0.92000	0.72991	0.43637	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	109.0296	109.0296	1	7.61	0.03993	Significant Effect
Error	71.66751	14.3335	5			
Total	180.697151	123.36314	6			

Group Comparisons						
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-015	2.75801	2.01505	0.0200	5.82667	Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-001	3	28.5	24.4	31.1	3.59305				
	12365-015	4	20.5250	17.5	25.7	3.90928				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-015	17.5	21.4	25.7	17.5				



# CETIS Analysis Detail

Comparisons: Page 29 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 19-5296-4078

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

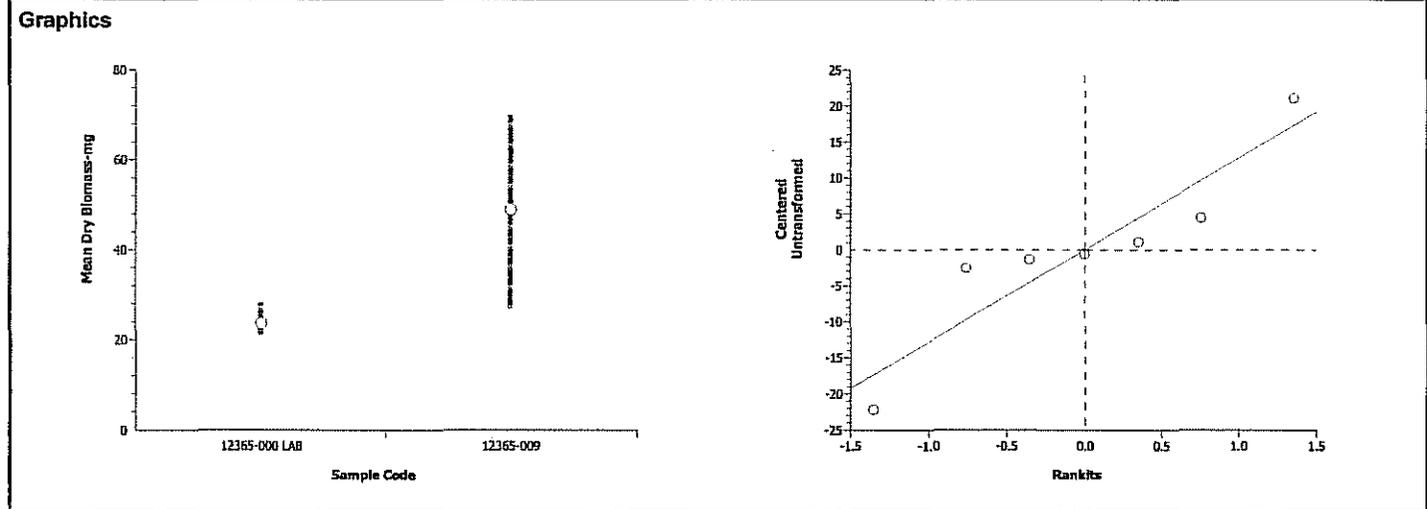
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	49.55646	49.79928	0.01007	Equal Variances
Distribution	Shapiro-Wilk W	0.89649	0.72991	0.29277	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	1101.639	1101.639	1	5.69	0.06271	Non-Significant Effect
Error	967.6899	193.538	5			
Total	2069.32849	1295.1765	6			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-009	-2.3858	2.01505	0.9686	21.4105	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-009	3	48.9000	26.7	70	21.6709				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-009	70	50	26.7					



# CETIS Analysis Detail

Comparisons: Page 10 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 07-7194-7024

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	17.42835	199.00000	0.10853	Equal Variances
Distribution	Shapiro-Wilk W	0.95387	0.71264	0.72121	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	408.375	408.375	1	3.43	0.13754	Non-Significant Effect
Error	475.82	118.955	4			
Total	884.195007	527.33000	5			

**Group Comparisons**

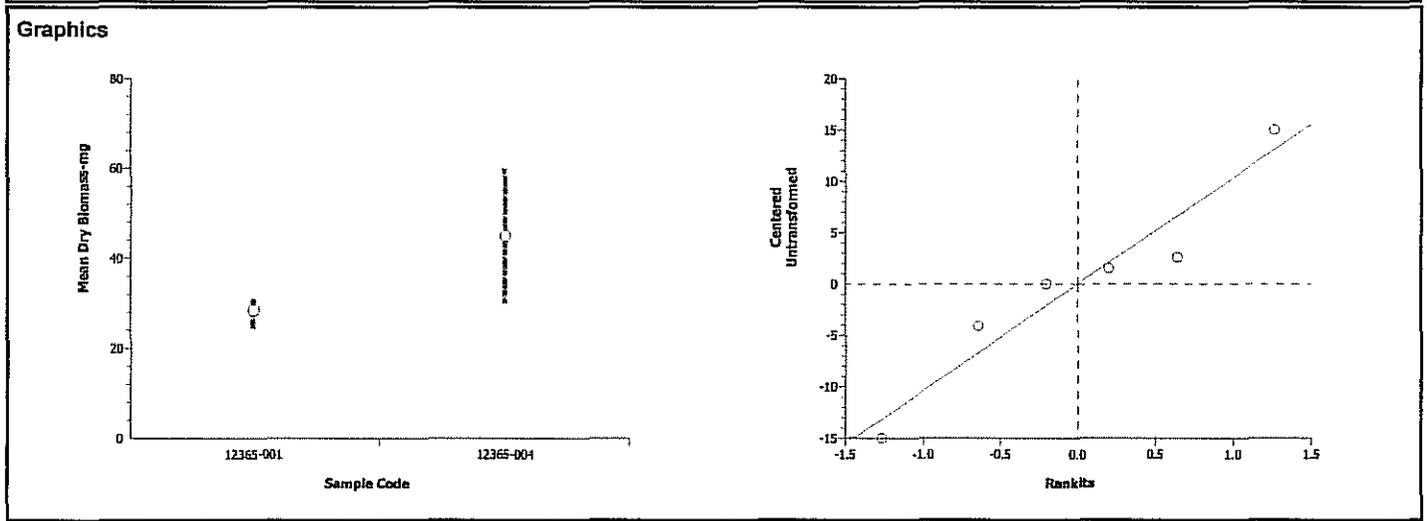
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-004	-1.8528	2.13185	0.9312	18.9846	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-004	3	45	30	60	15				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-004	60	45	30					



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C > T	Untransformed				N/A		

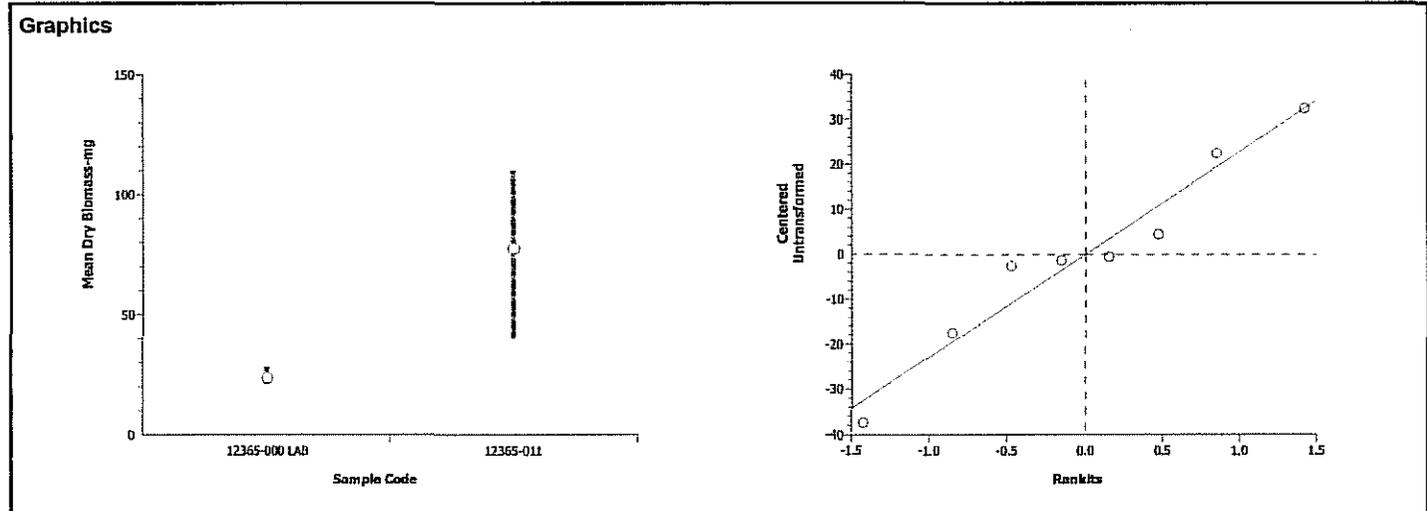
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	115.19520	47.46723	0.00270	Unequal Variances
Distribution	Shapiro-Wilk W	0.95900	0.74935	0.77082	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	5821.205	5821.205	1	10.57	0.01743	Significant Effect
Error	3303.43	550.5717	6			
Total	9124.63501	6371.7767	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-011	-3.2516	2.35336	0.9763	39.0464	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-011	4	77.5	40	110	33.0404				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-011	100	110	40	60				



# CETIS Analysis Detail

Comparisons: Page 11 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 07-8950-0421

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

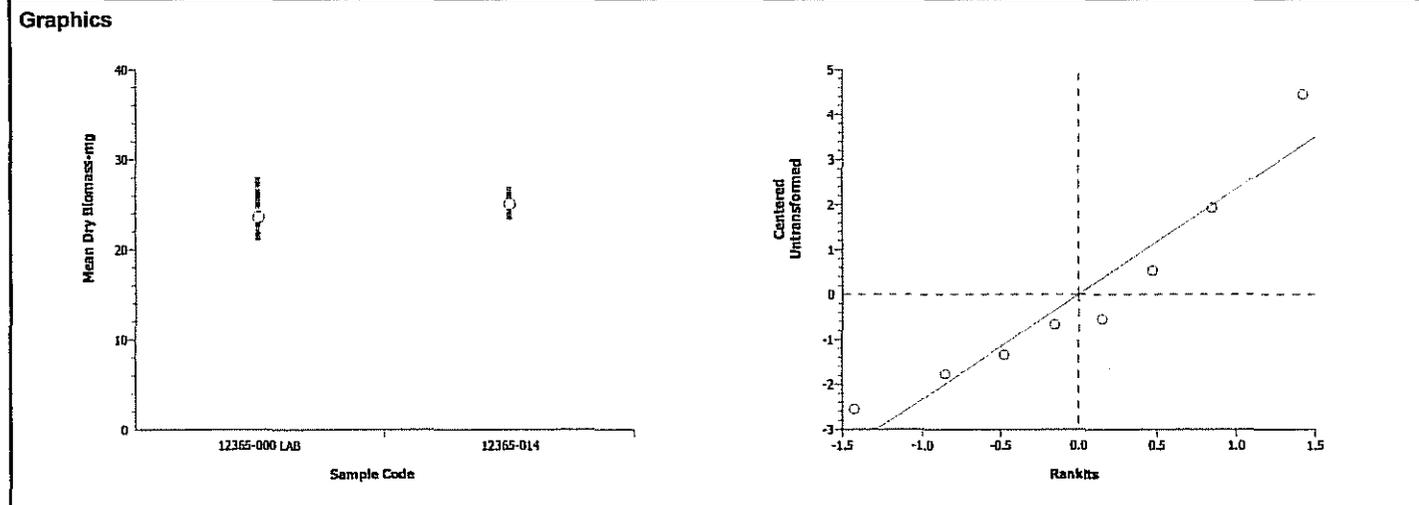
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.74695	47.46723	0.30669	Equal Variances
Distribution	Shapiro-Wilk W	0.91505	0.74935	0.36595	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	4.651248	4.651248	1	0.77	0.41259	Non-Significant Effect
Error	36.0175	6.002917	6			
Total	40.6687493	10.654164	7			

Group Comparisons						
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB	12365-014	-0.8802	1.94318	0.7937	3.36651	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data			Transformed Data				
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	23.5500	21	28	3.07842				
	12365-014	4	25.075	23.3	27	1.59034				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-014	24.4	25.6	27	23.3				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:57 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

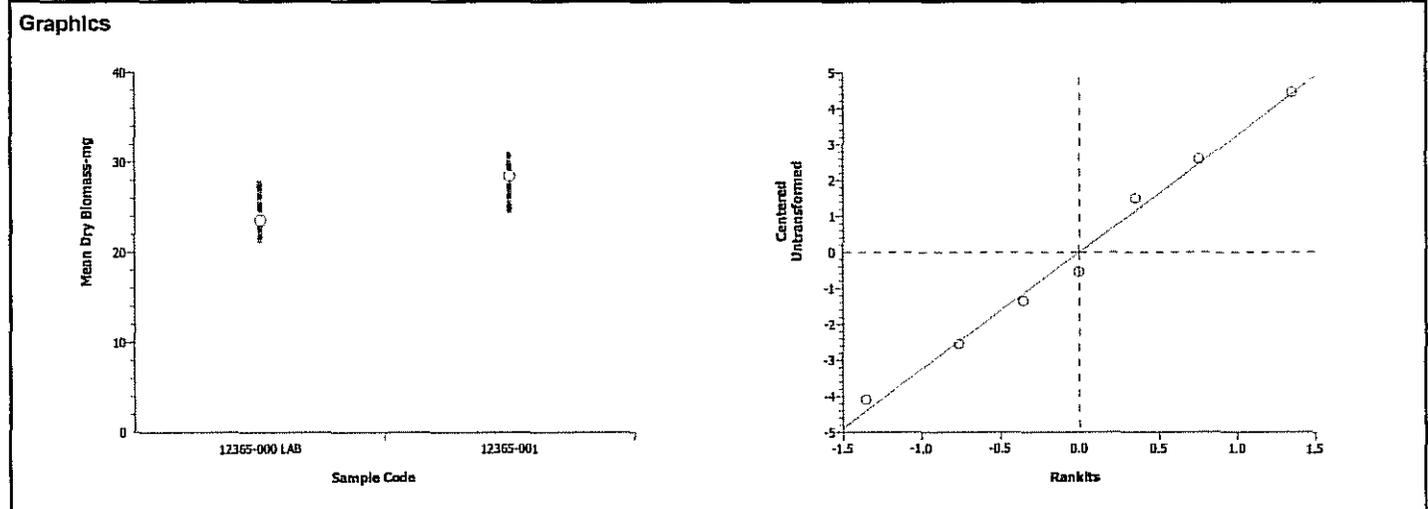
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.36229	49.79928	0.75874	Equal Variances
Distribution	Shapiro-Wilk W	0.97947	0.72991	0.95377	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	42.00428	42.00428	1	3.87	0.10625	Non-Significant Effect
Error	54.25	10.85	5			
Total	96.2542877	52.854284	6			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-001	-1.9676	2.01505	0.9469	5.06943	Non-Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	23.5500	21	28	3.07842				
	12365-001	3	28.5	24.4	31.1	3.59305				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-001	31.1	30	24.4					



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	32.97573	55.55196	0.02098	Equal Variances
Distribution	Shapiro-Wilk W	0.96217	0.71264	0.79703	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	1536.803	1536.803	1	18.03	0.01320	Significant Effect
Error	340.93	85.2325	4			
Total	1877.73334	1622.0358	5			

**Group Comparisons**

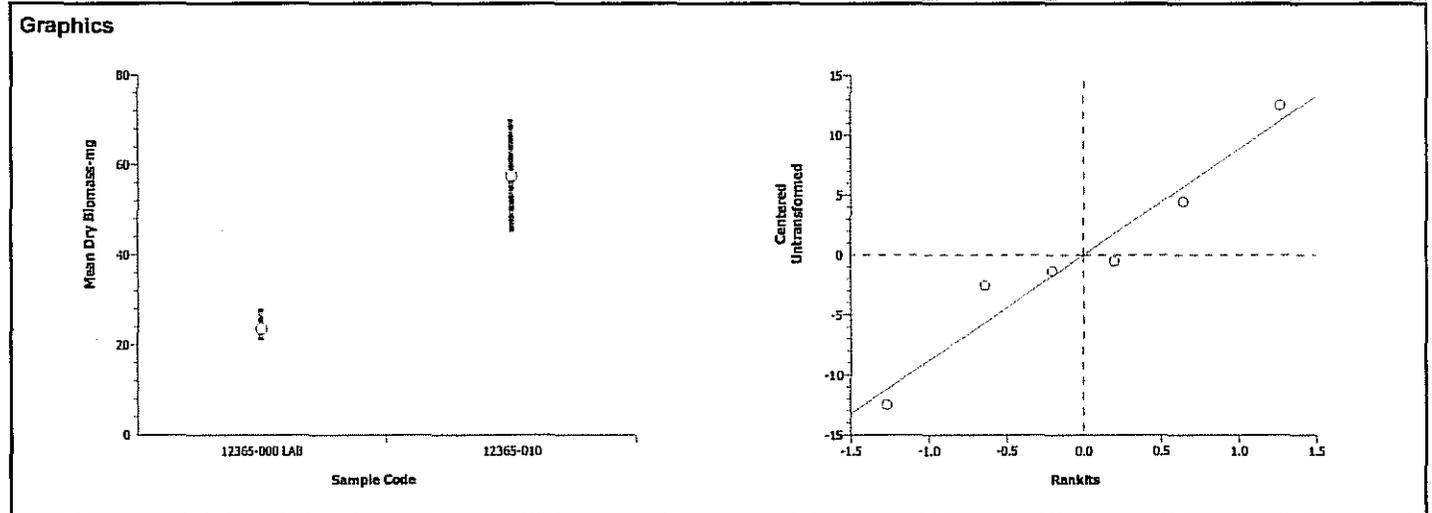
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-010	-4.2463	2.13185	0.9934	17.0447	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-010	2	57.5	45	70	17.6777				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-010	45	70						



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	4.25121	47.46723	0.26544	Equal Variances
Distribution	Shapiro-Wilk W	0.86879	0.74935	0.14626	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	93.16125	93.16125	1	15.92	0.00720	Significant Effect
Error	35.1175	5.852916	6			
Total	128.278744	99.014163	7			

**Group Comparisons**

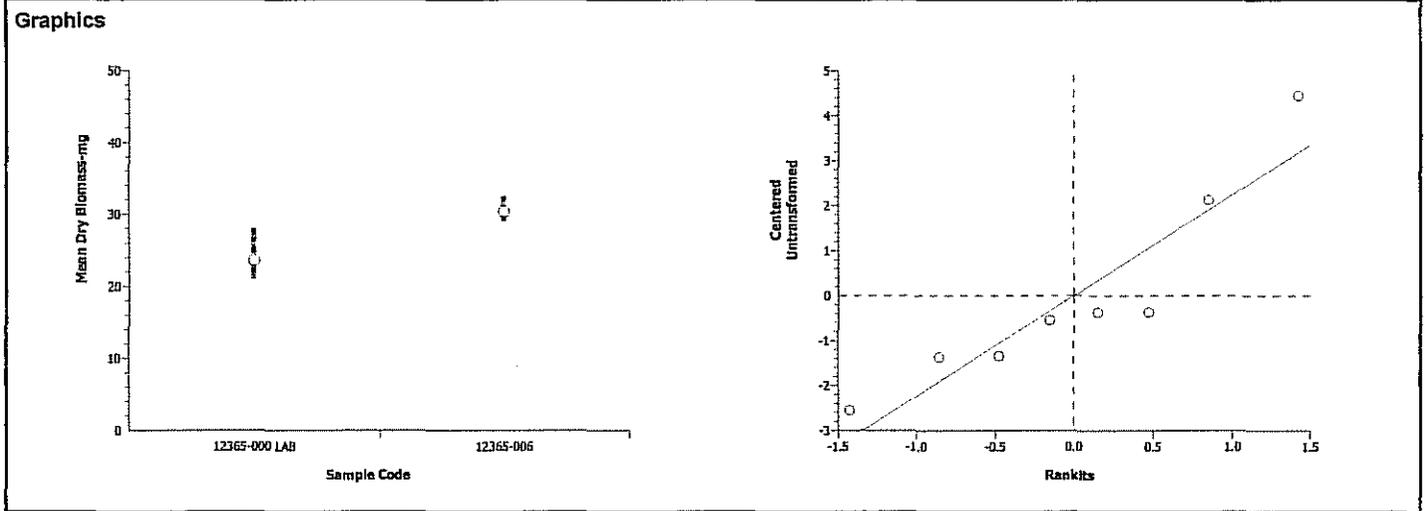
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-006	-3.9896	1.94318	0.9964	3.32418	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-006	4	30.375	29	32.5	1.49304				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-006	32.5	30	29	30				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test					EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

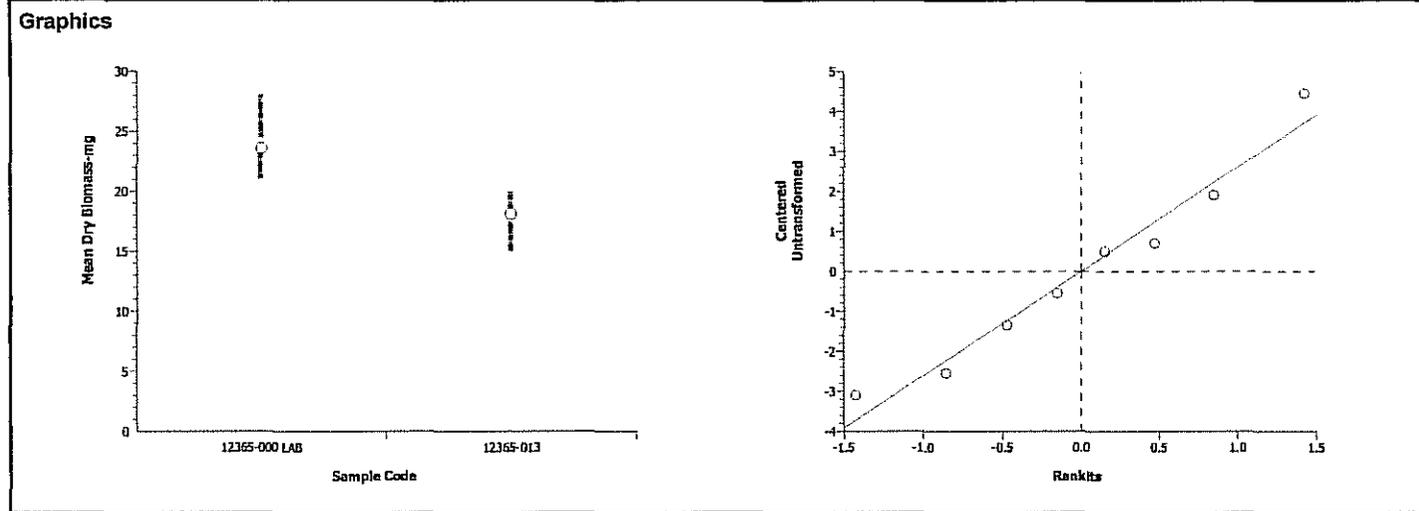
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.03653	47.46723	0.57397	Equal Variances
Distribution	Shapiro-Wilk W	0.96429	0.74935	0.82605	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	59.40501	59.40501	1	8.41	0.02734	Significant Effect
Error	42.39	7.065	6			
Total	101.795002	66.470006	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-013	2.89972	1.94318	0.0137	3.6522	Significant Effect

Data Summary	Sample Code	Count	Original Data			Transformed Data				
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	23.5500	21	28	3.07842				
	12365-013	4	18.1	15	20	2.15716				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-013	20	15	18.8	18.6				



# CETIS Analysis Detail

Comparisons: Page 17 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 12-1118-8456

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	52.90956	199.16640	0.03721	Equal Variances
Distribution	Shapiro-Wilk W	0.78013	0.72991	0.03127	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	262.5268	262.5268	1	0.63	0.46248	Non-Significant Effect
Error	2075.008	415.0015	5			
Total	2337.53436	677.52829	6			

**Group Comparisons**

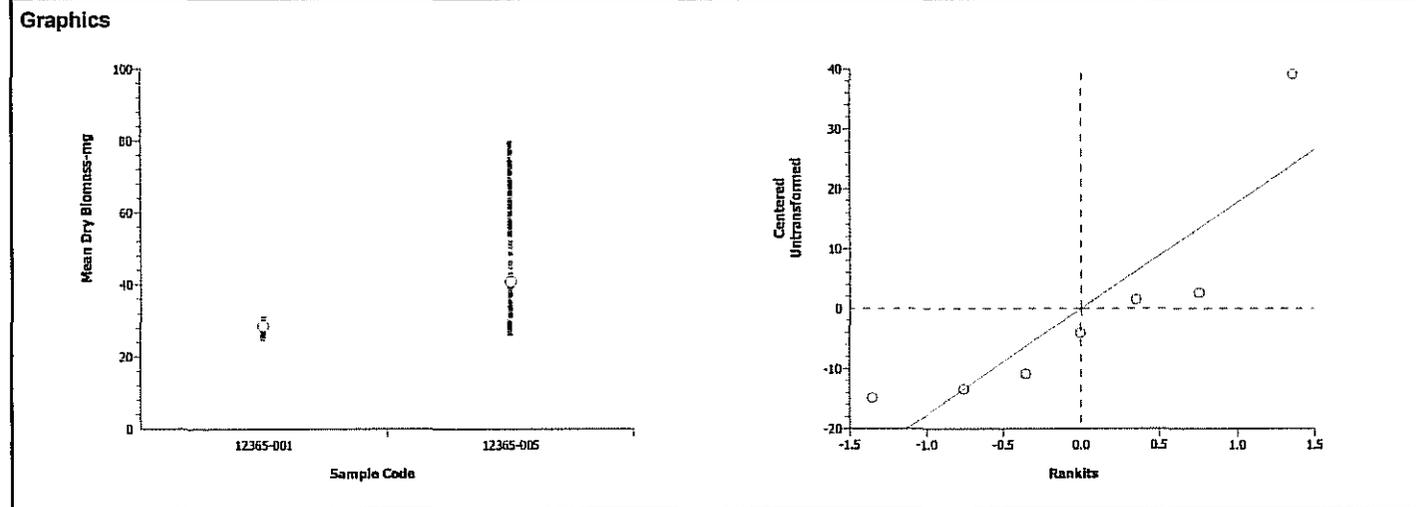
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-005	-0.7954	2.01505	0.7688	31.3523	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-005	4	40.875	26	80	26.1355				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-005	30	26	80	27.5				



# CETIS Analysis Detail

Comparisons: Page 18 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 12-3001-4385

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:57 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.51741	49.79928	0.32692	Equal Variances
Distribution	Shapiro-Wilk W	0.92292	0.72991	0.45773	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	916.0804	916.0804	1	48.17	0.00095	Significant Effect
Error	95.09666	19.01933	5			
Total	1011.17711	935.09978	6			

**Group Comparisons**

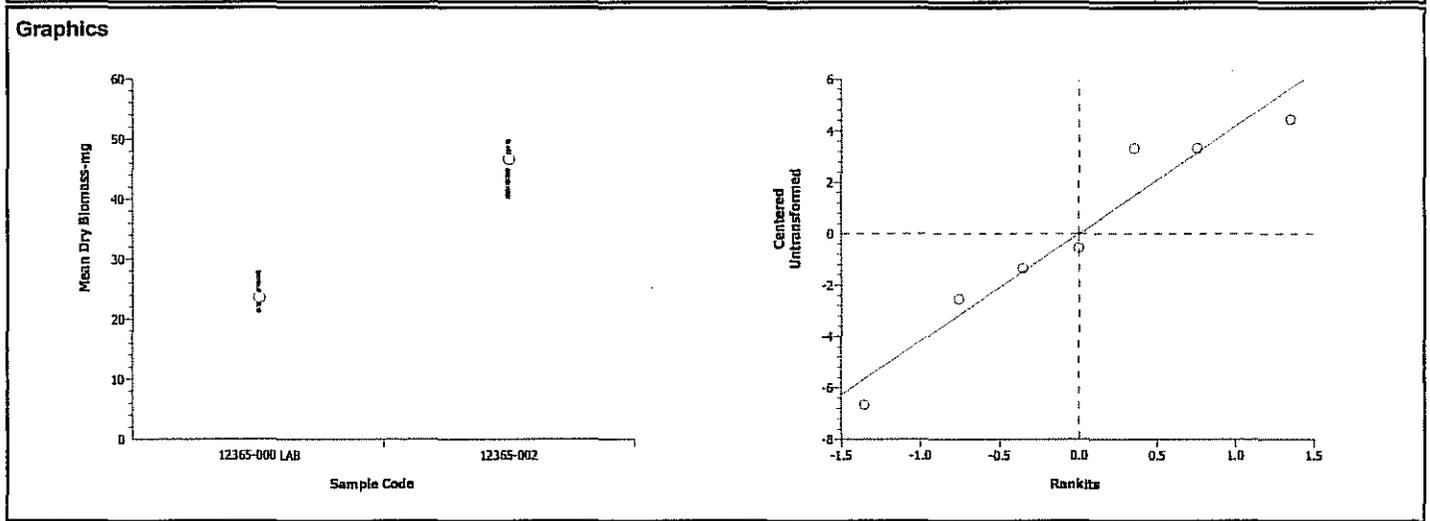
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB	12365-002	-6.9402	2.01505	0.9995	6.71184	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-002	3	46.6667	40	50	5.77350				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-002	40	50	50					



# CETIS Analysis Detail

Comparisons: Page 19 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 13-6538-5366

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

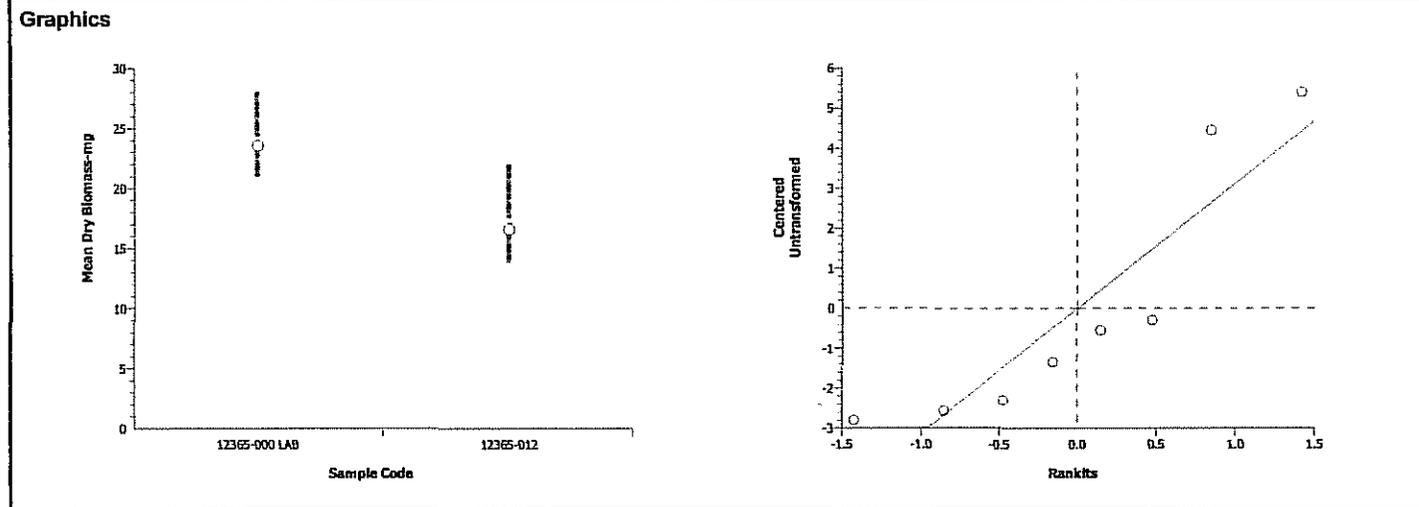
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.49068	47.46723	0.75080	Equal Variances
Distribution	Shapiro-Wilk W	0.80947	0.74935	0.04110	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	96.60501	96.60501	1	8.19	0.02876	Significant Effect
Error	70.81	11.80167	6			
Total	167.415009	108.40668	7			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-012	2.86107	1.94318	0.0144	4.72030	Significant Effect

Data Summary	Sample Code	Count	Original Data				Transformed Data			
			Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
	12365-000 LAB	4	23.5500	21	28	3.07842				
	12365-012	4	16.6	13.8	22	3.75855				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-012	16.3	14.3	22	13.8				



# CETIS Analysis Detail

Comparisons: Page 4 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 03-0026-0836

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.13878	49.79928	0.85716	Equal Variances
Distribution	Shapiro-Wilk W	0.96620	0.72991	0.84844	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	17.01	17.01	1	1.42	0.28665	Non-Significant Effect
Error	59.83001	11.966	5			
Total	76.840097	28.976002	6			

**Group Comparisons**

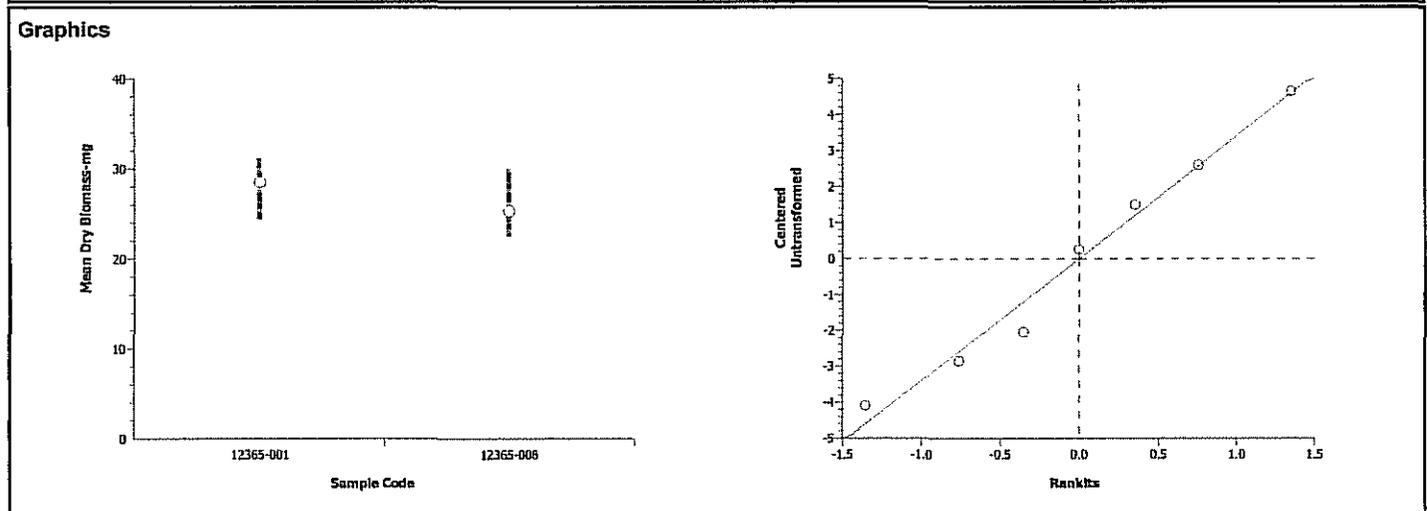
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-008	1.19228	2.01505	0.1433	5.32376	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-008	4	25.35	22.5	30	3.367				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-008	23.3	30	22.5	25.6				



# CETIS Analysis Detail

Comparisons: Page 5 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 03-3333-6010

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:01 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.77436	49.79928	0.41578	Equal Variances
Distribution	Shapiro-Wilk W	0.85492	0.72991	0.13824	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	185.4171	185.4171	1	23.31	0.00477	Significant Effect
Error	39.78	7.956001	5			
Total	225.197147	193.37315	6			

**Group Comparisons**

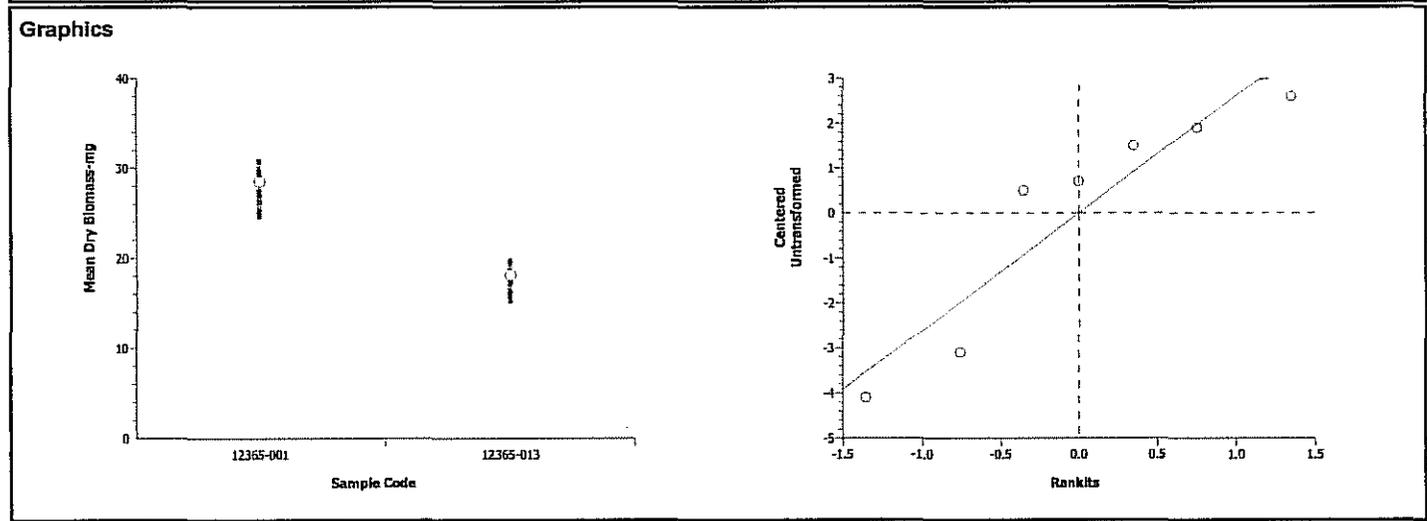
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-013	4.82756	2.01505	0.0024	4.34102	Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-013	4	18.1	15	20	2.15716				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-013	20	15	18.8	18.6				



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	36.37722	199.00000	0.05351	Equal Variances
Distribution	Shapiro-Wilk W	0.91778	0.71264	0.43650	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	624.24	624.24	1	2.59	0.18301	Non-Significant Effect
Error	965.08	241.27	4			
Total	1589.31995	865.50998	5			

**Group Comparisons**

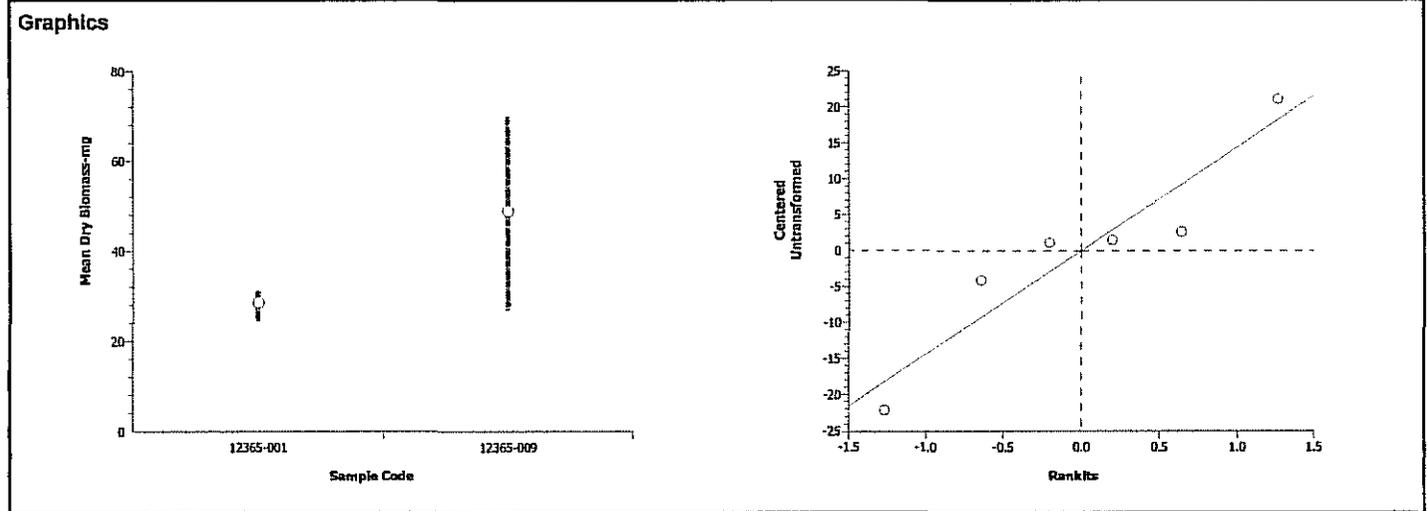
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-009	-1.6085	2.13185	0.9085	27.0372	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-009	3	48.9000	26.7	70	21.6709				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-009	70	50	26.7					



# CETIS Analysis Detail

Comparisons: Page 7 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 05-2226-9419

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Distribution	Shapiro-Wilk W	0.87162	0.68379	0.24372	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	559.682	559.682	1	59.06	0.00458	Significant Effect
Error	28.43	9.476666	3			
Total	588.112005	569.15867	4			

**Group Comparisons**

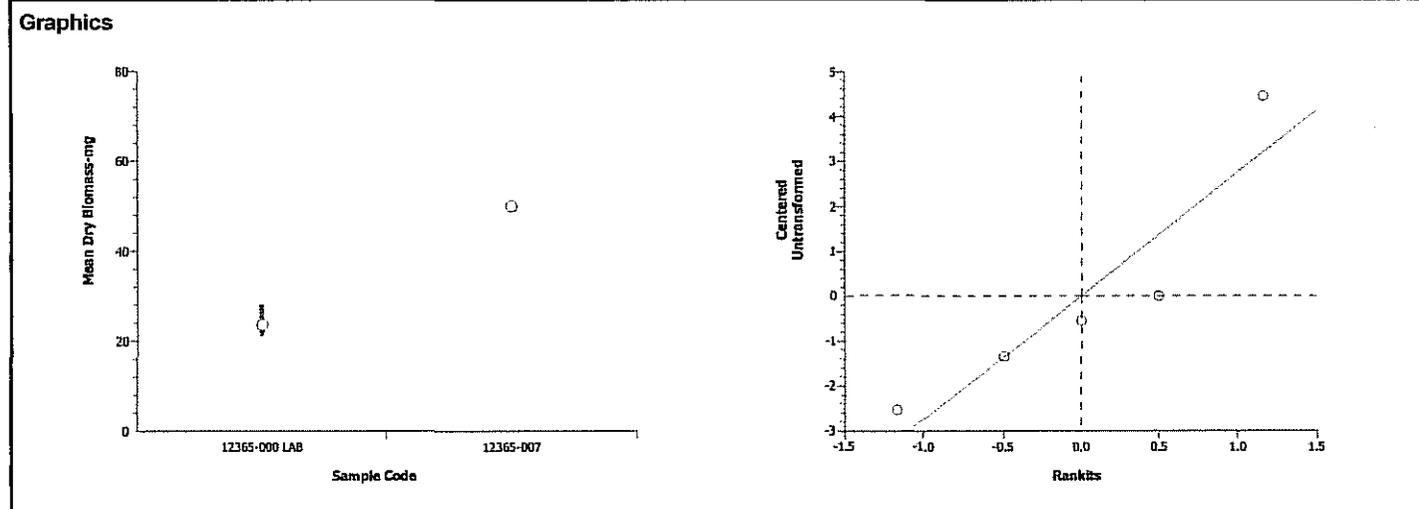
Sample	vs Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
12365-000 LAB	12365-007	0		0.8000	0	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-007	1	50	50	50					

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-007	50							



# CETIS Analysis Detail

Comparisons: Page 8 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 06-4378-5580

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:59 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

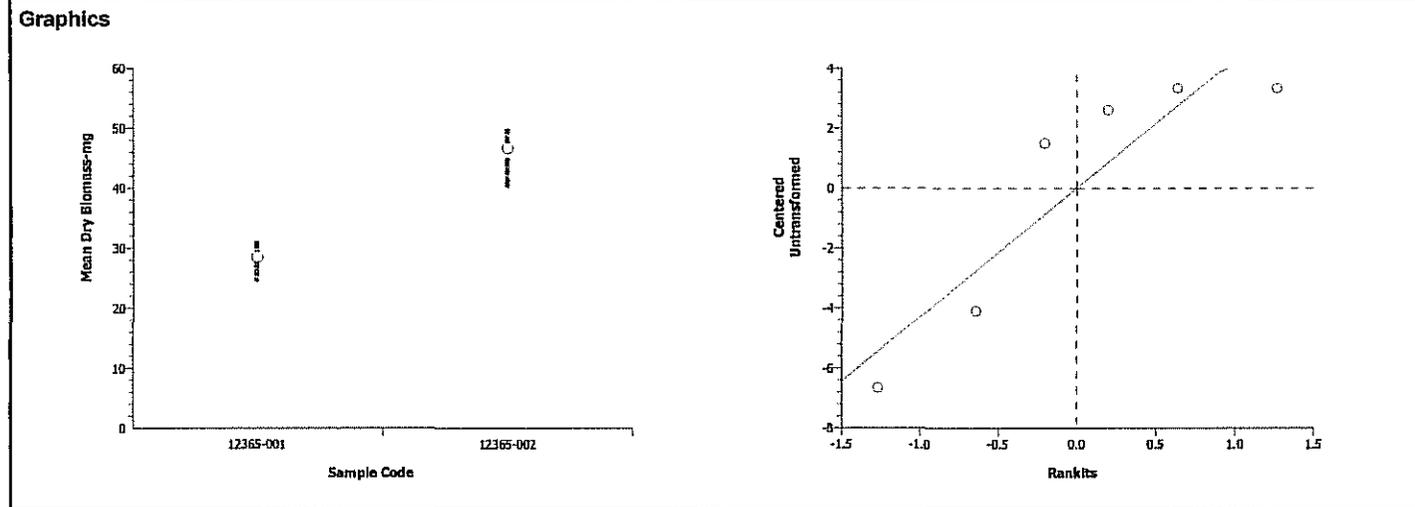
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.58198	199.00000	0.55835	Equal Variances
Distribution	Shapiro-Wilk W	0.80211	0.71264	0.06491	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	495.0417	495.0417	1	21.41	0.00983	Significant Effect
Error	92.48667	23.12167	4			
Total	587.528328	518.16332	5			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-002	-4.6271	2.13185	0.9951	8.36989	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-002	3	46.6667	40	50	5.77350				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-002	40	50	50					



# CETIS Analysis Detail

Eisenia 28-d Survival and Growth Soil Test	EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 6:58 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C > T	Untransformed				N/A		

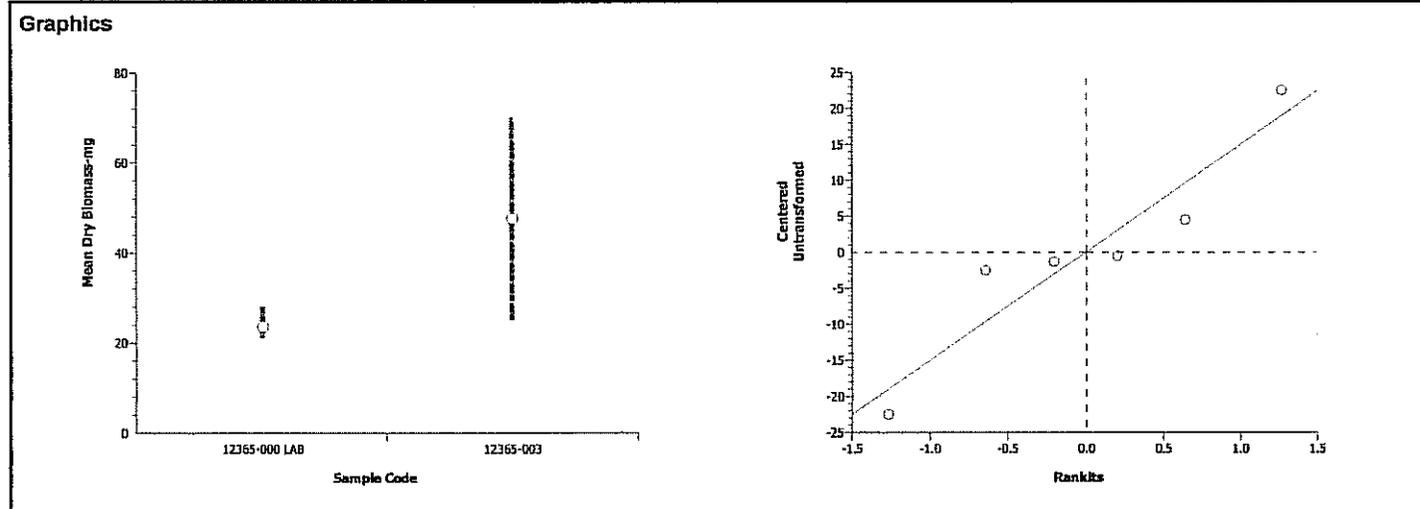
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	106.84140	55.55196	0.00386	Unequal Variances
Distribution	Shapiro-Wilk W	0.92165	0.71264	0.46212	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	764.8033	764.8033	1	2.94	0.16162	Non-Significant Effect
Error	1040.93	260.2325	4			
Total	1805.7334	1025.0359	5			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-000 LAB		12365-003	-1.062	6.31375	0.7596	142.391	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-000 LAB	4	23.5500	21	28	3.07842				
12365-003	2	47.5	25	70	31.8198				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-000 LAB	28	23	21	22.2				
12365-003	70	25						



# CETIS Analysis Detail

Comparisons: Page 2 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 02-3227-7780

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

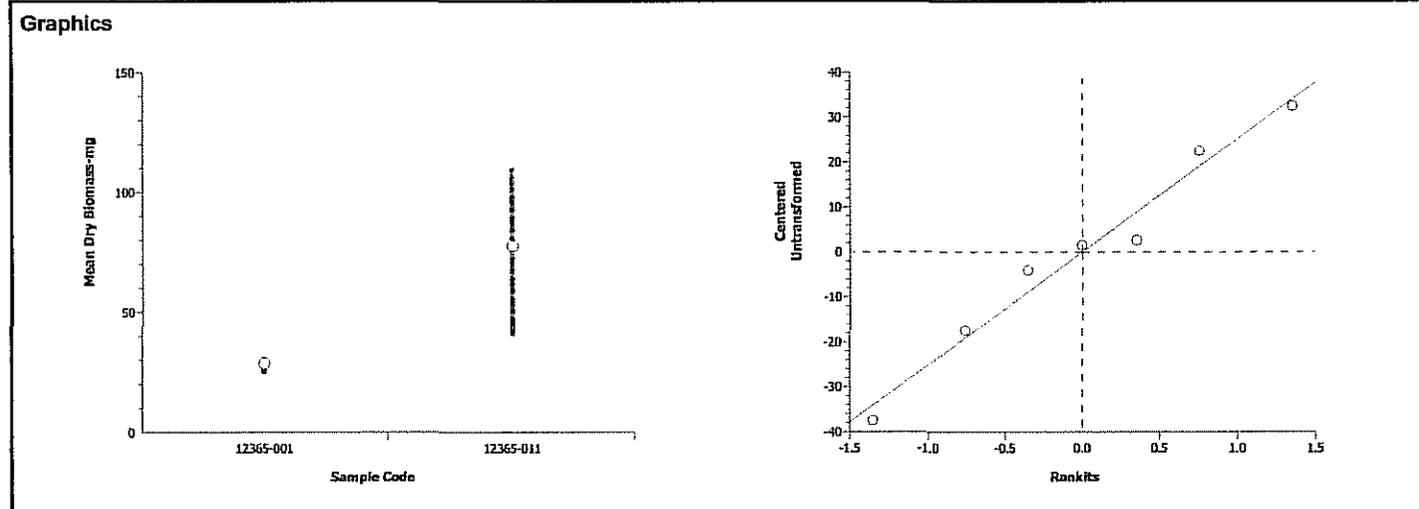
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	84.55975	199.16640	0.02342	Equal Variances
Distribution	Shapiro-Wilk W	0.97375	0.72991	0.91353	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	4116	4116	1	6.23	0.05469	Non-Significant Effect
Error	3300.82	660.164	5			
Total	7416.82007	4776.1640	6			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-011	-2.497	2.01505	0.9727	39.5430	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-011	4	77.5	40	110	33.0404				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-011	100	110	40	60				



# CETIS Analysis Detail

**Eisenia 28-d Survival and Growth Soil Test** EnviroSystems, Inc.

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

**ANOVA Assumptions**

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	5.79140	49.79928	0.18662	Equal Variances
Distribution	Shapiro-Wilk W	0.93044	0.72991	0.51647	Normal Distribution

**ANOVA Table**

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	6.026786	6.026786	1	0.93	0.37987	Non-Significant Effect
Error	32.5075	6.501501	5			
Total	38.5342894	12.528287	6			

**Group Comparisons**

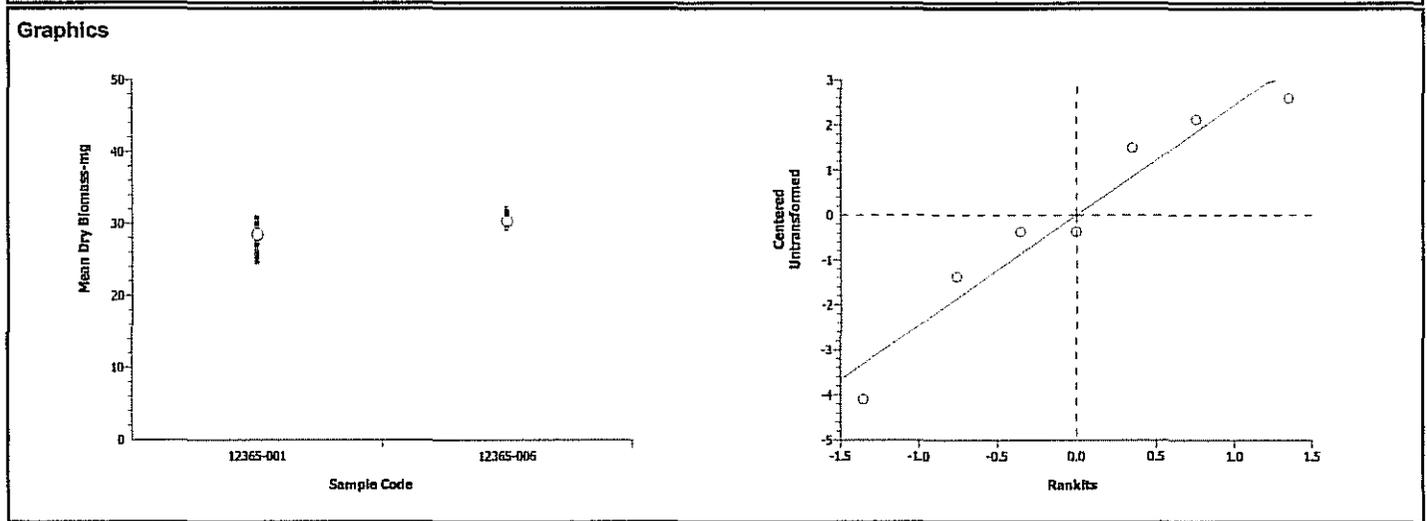
Sample	vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001	12365-006	-0.9628	2.01505	0.8101	3.9242	Non-Significant Effect

**Data Summary**

Sample Code	Count	Original Data				Transformed Data			
		Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-006	4	30.375	29	32.5	1.49304				

**Data Detail**

Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-006	32.5	30	29	30				



# CETIS Analysis Detail

Comparisons: Page 1 of 29  
 Report Date: 07 Oct-04 7:02 AM  
 Analysis: 01-0937-8265

Eisenia 28-d Survival and Growth Soil Test						EnviroSystems, Inc.
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Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	12-2003-9926	12-2003-9926	07 Oct-04 7:00 AM	CETISv1.025

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

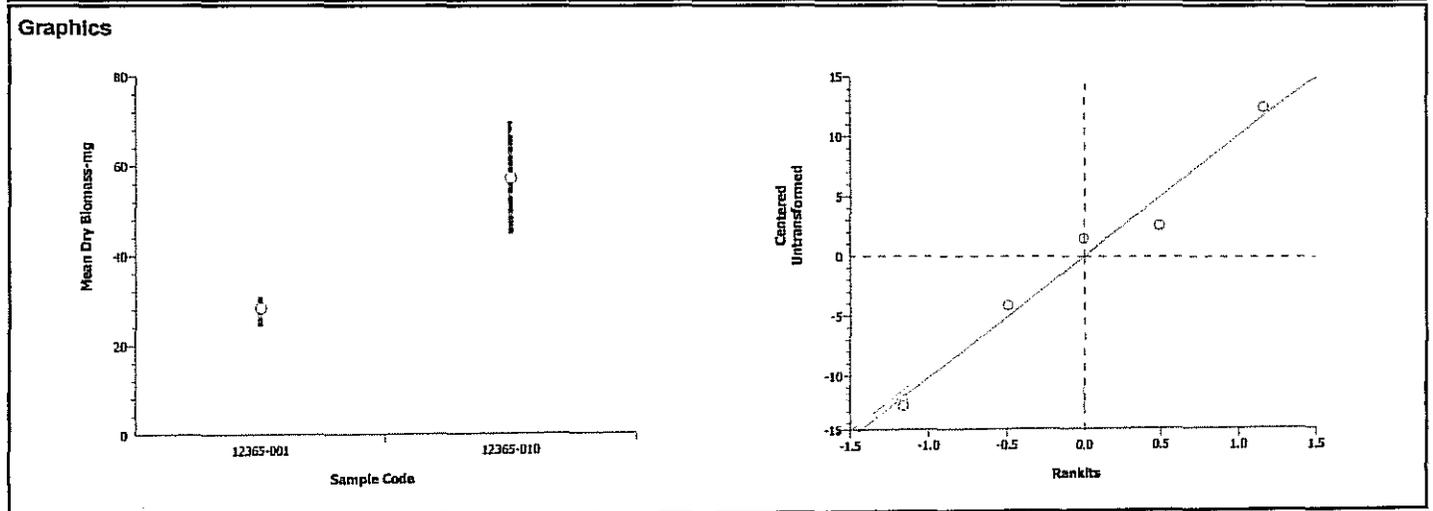
ANOVA Assumptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	24.20604	198.50130	0.07783	Equal Variances
Distribution	Shapiro-Wilk W	0.98249	0.68379	0.92612	Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	1009.2	1009.2	1	8.95	0.05806	Non-Significant Effect
Error	338.32	112.7733	3			
Total	1347.52002	1121.9734	4			

Group Comparisons							
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
12365-001		12365-010	-2.9915	2.35336	0.9710	22.8140	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
12365-001	3	28.5	24.4	31.1	3.59305				
12365-010	2	57.5	45	70	17.6777				

Data Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8
12365-001	31.1	30	24.4					
12365-010	45	70						



STUDY: 12365  
 CLIENT: CH2M Hill  
 PROJECT: ABL Site 1  
 TASK: Eisenia fetida 28-day Exposure Assay  
 DATA: Growth Data Wet Weight (g)  
 START DATE: 08/04/04

Sample Site	ESI Ref	Rep	Wet Weight (Grams)	Mean Wet Wt per worm (mg)	Site Mean (mg)	Compared Against	Normal Distribution	Homogeneous Variance	t Value	Critical t Value	p Value	Significant Difference in Growth (Less Than)							
Lab Control	0	A	2.8	280	236	LAB	-	-	-	-	-	-							
		B	2.3	230															
		C	2.1	210															
		D	2.0	222															
AS01-SS45-(0-1)	-1	A	2.8	311	285	LAB	Normal	Equal	-1.9676	2.0151	0.9469	NO							
		B	0.3	300															
		C																	
		D	2.2	244															
AS01-SS46-(0-1)	-2	A			467	LAB	Normal	Equal	-6.9402	2.0151	0.9995	NO							
		B	0.4	400									REF	Normal	Equal	-4.6271	2.1319	0.9951	NO
		C	0.5	500															
		D	1.0	500															
AS01-SS47-(0-1)	-3	A	0.7	700	475	LAB	Normal	Unequal	-1.0620	6.3138	0.7596	NO							
		B											REF	Normal	Equal	-1.1188	2.3534	0.8276	NO
		C																	
		D	0.5	250															
AS01-SS48-(0-1)	-4	A			450	LAB	Normal	Equal	-2.8711	2.0151	0.9825	NO							
		B	0.6	600									REF	Normal	Equal	-1.8528	2.1319	0.9312	NO
		C	0.9	450															
		D	0.6	300															
AS01-SS49-(0-1)	-5	A	1.2	300	409	LAB	Normal	Unequal	-1.3167	2.3534	0.8603	NO							
		B	1.3	260									REF	Normal	Equal	-0.7954	2.0151	0.7688	NO
		C	0.8	800															
		D	2.2	275															
AS01-SS50-(0-1)	-6	A	2.6	325	304	LAB	Normal	Equal	-3.9896	1.9432	0.9964	NO							
		B	2.4	300									REF	Normal	Equal	-0.9628	2.0151	0.8101	NO
		C	2.9	290															
		D	2.7	300															
AS01-SS51-(0-1)	-7	A			500	LAB	Normal	-	0.0000		0.8000	NO (Mann-Whitney U)							
		B	1.0	500									REF	Normal	-	0.0000		0.7500	NO (Mann-Whitney U)
		C																	
		D																	
AS01-SS52-(0-1)	-8	A	0.7	233	253	LAB	Normal	Equal	-0.7891	1.9432	0.7700	NO							
		B	2.4	300									REF	Normal	Equal	1.1923	2.0151	0.1433	NO
		C	1.8	225															
		D	2.3	256															
AS01-SS53-(0-1)	-9	A			489	LAB	Normal	Equal	-2.3858	2.0151	0.9686	NO							
		B	0.7	700									REF	Normal	Equal	-1.6085	2.1319	0.9085	NO
		C	1.5	500															
		D	0.8	267															
AS01-SS54-(0-1)	-10	A	0.9	450	575	LAB	Normal	Equal	-4.2463	2.1319	0.9934	NO							
		B											REF	Normal	Equal	-2.9915	2.3534	0.9710	NO
		C	0.7	700															
		D																	
AS01-SS55-(0-1)	-11	A	1.0	1000	775	LAB	Normal	Unequal	-3.2516	2.3534	0.9763	NO							
		B	1.1	1100									REF	Normal	Equal	-2.4970	2.0151	0.9727	NO
		C	0.8	400															
		D	0.6	600															
AS01-SS56-(0-1)	-12	A	1.3	163	166	LAB	Normal	Equal	2.8611	1.9432	0.0144	YES							
		B	1.0	143									REF	Normal	Equal	4.2187	2.0151	0.0042	YES
		C	1.1	220															
		D	1.1	138															
AS01-SS57-(0-1)	-13	A	1.2	200	181	LAB	Normal	Equal	2.8997	1.9432	0.0137	YES							
		B	1.2	160									REF	Normal	Equal	4.8276	2.0151	0.0024	YES
		C	1.5	188															
		D	1.3	186															
AS01-SS58-(0-1)	-14	A	2.2	244	251	LAB	Normal	Equal	-0.8802	1.9432	0.7937	NO							
		B	2.3	256									REF	Normal	Equal	1.7349	2.0151	0.0716	NO
		C	2.7	270															
		D	2.1	233															
AS01-SS59-(0-1)	-15	A	1.4	175	205	LAB	Normal	Equal	1.2159	1.9432	0.1348	NO							
		B	1.5	214									REF	Normal	Equal	2.7580	2.0151	0.0200	YES
		C	1.8	257															
		D	1.4	175															





**STUDY: 12365**  
**CLIENT: CH2MHill**  
**PROJECT: E. fetida 28 Day Survival and Growth**  
**TASK: TOC by Loss on Ignition**  
**REVIEWED: BY: LEVEL: 100%**

ESI Sample ID	Crucible ID	Crucible Weight (g)	Crucible + Pre-Ignition Weight (g)	Soil Weight (g)	Crucible + Post-Ignition Weight (g)	Net Ignition Weight (g)	Total Loss On Ignition
Blank	8E	29.1759	35.7259	6.5500	35.7256	0.0003	0.00%
AS	as	25.9644	30.6929	4.7285	30.3111	0.3818	8.07%
1	9e	29.0182	31.3575	2.3393	31.0861	0.2714	11.60%
2	c	30.7921	32.3395	1.5474	32.1158	0.2237	14.46%
3	2c	29.8766	32.1822	2.3056	31.8652	0.3170	13.75%
4	2b	26.5238	30.1633	3.6395	29.8304	0.3329	9.15%
5	cc	32.8112	36.0889	3.2777	35.5489	0.5400	16.47%
6	1b	28.4396	32.3572	3.9176	32.0980	0.2592	6.62%
7	48	28.4497	31.0893	2.6396	30.8385	0.2508	9.50%
8	8	28.8730	32.4029	3.5299	31.9207	0.4822	13.66%
9	1h	28.3788	33.1734	4.7946	32.6746	0.4988	10.40%
10	1	27.6622	31.4716	3.8094	30.9834	0.4882	12.82%
11	114	30.3279	33.6108	3.2829	33.2628	0.3480	10.60%
12	1g	29.8273	33.1905	3.3632	32.7901	0.4004	11.91%
13	cb	27.2822	31.9485	4.6663	31.6125	0.3360	7.20%
14	86	27.7924	30.5040	2.7116	30.0991	0.4049	14.93%
15	2h	32.7941	34.7541	1.9600	34.4908	0.2633	13.43%
15	8b	27.9037	32.1270	4.2233	31.5383	0.5887	13.94%
Blank	9d	29.9213	36.7248	6.8035	36.7246	0.0002	0.00%



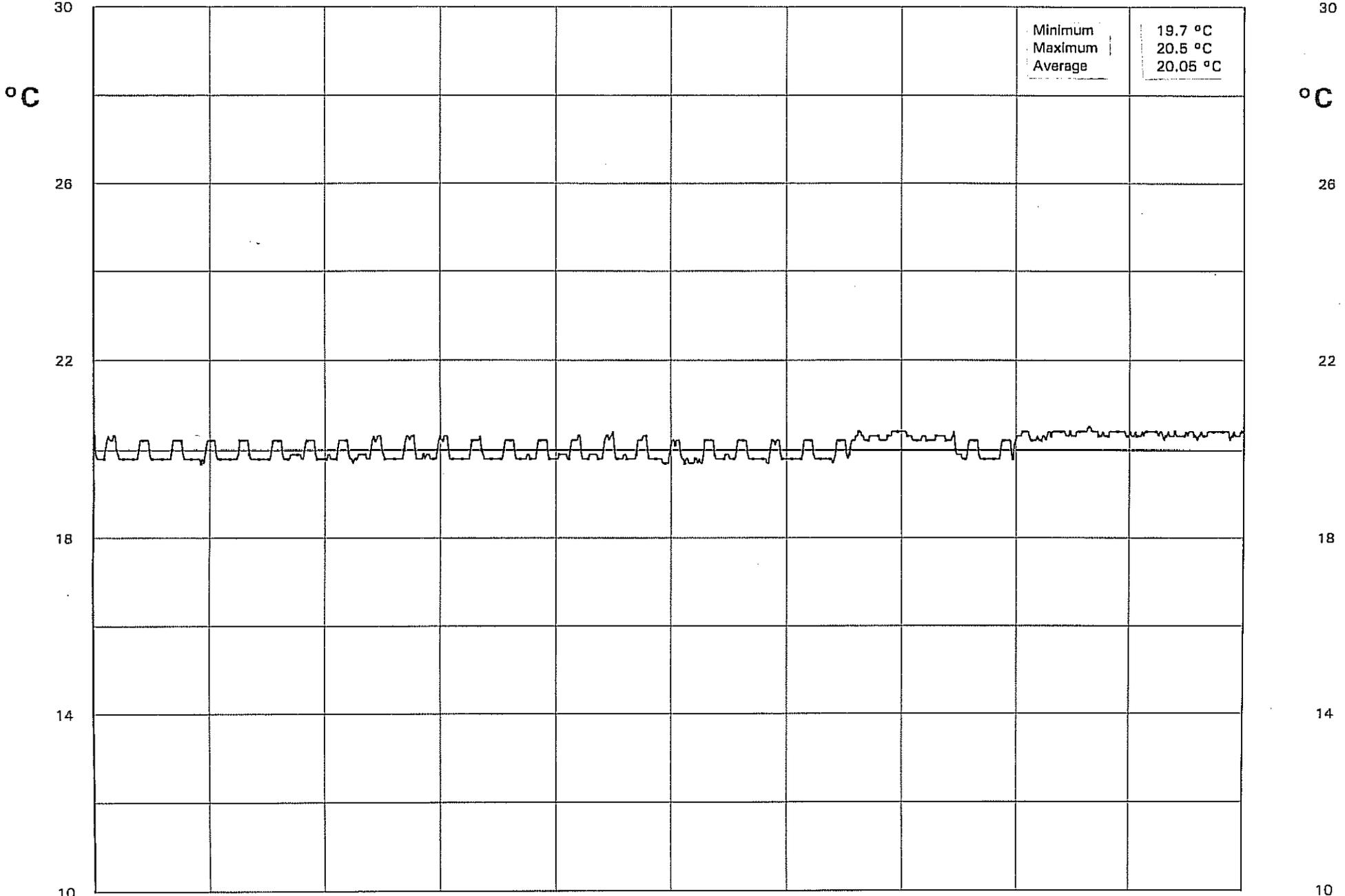
STUDY: 12365  
 CLIENT: CH2MHill  
 PROJECT: E. fetida 28 Day Survival and Growth  
 TASK: Percent Moisture Determinations  
 REVIEWED: BY: EN LEVEL: 100%

ESI Sample ID	Beaker ID	Beaker Weight (g)	Weight Beaker + Wet Soil	(A)	Dry Wt. #1 (g)	Dry Wt. #2 (g)	Mean Dry Weight w/Beaker	(B)	% Moisture
				Soil Wet Weight (g)				Soil Dry Weight (g)	
Blank	18	28.6012	57.4548	28.8536	57.4549		57.4549	28.8537	-0.0%
AS	19	29.1833	39.8289	10.6456	37.2548		37.2548	8.0715	24.2%
1	33	29.5313	41.9697	12.4384	40.0164		40.0164	10.4851	15.7%
2	10	28.9837	42.9281	13.9444	40.5565		40.5565	11.5728	17.0%
3	47	29.6901	42.4723	12.7822	39.7351		39.7351	10.0450	21.4%
4	29	29.4240	43.4661	14.0421	40.6523		40.6523	11.2283	20.0%
5	6	28.4510	40.1509	11.6999	37.2210		37.2210	8.7700	25.0%
6	45	29.4395	41.6503	12.2108	40.5008		40.5008	11.0613	9.4%
7	11	29.5871	42.0219	12.4348	39.8457		39.8457	10.2586	17.5%
8	90	28.9852	40.6631	11.6779	37.8505		37.8505	8.8653	24.1%
9	3	28.7334	42.4006	13.6672	40.2760		40.2760	11.5426	15.5%
10	51	29.6535	44.2244	14.5709	41.2725		41.2725	11.6190	20.3%
11	37	29.5337	42.8231	13.2894	40.8781		40.8781	11.3444	14.6%
12	21	30.0097	41.9762	11.9665	39.1336		39.1336	9.1239	23.8%
13	35	29.7287	44.0664	14.3377	41.0075		41.0075	11.2788	21.3%
14	44	29.5666	39.3072	9.7406	37.8539		37.8539	8.2873	14.9%
15	9	29.4572	40.4841	11.0269	38.3891		38.3891	8.9319	19.0%
15	1	29.3625	38.4260	9.0635	36.7174		36.7174	7.3549	18.9%
Blank	5	29.2505	53.4948	24.2443	53.4947		53.4947	24.2442	0.0%

# 12365 CH2MHill

Device - MicroPoint1  
Serial Number - M10333  
User ID - Temp

Temperature



3:00:47 PM  
Aug 04, 2004

1:48:47 PM  
Aug 11, 2004

12:36:47 PM  
Aug 18, 2004

11:24:47 AM  
Aug 25, 2004

10:12:47 AM  
Sep 01, 2004

9:00:47 AM  
Sep 08, 2004

**LABORATORY SAMPLE RECEIVING LOG**

ESI Project Number 12365

Date/Time Received 7/23/04 1140

Client Name and Address CH2M Hill

ABL Site 1 CTO 167

Proj # 158506.AR.ER

Method of Shipment/ Pick Up From CH2M Hill

Via Fed Ex

Description of Shipping / Packing Containers(s) 5 coolers intact cosbody seals  
(Number, Type, Size)

Sample ID	ESI #	# containers/vol	Other
A501-SS45-(0-1)	-1	1x1g	
-SS46-	-2	↓	
-SS47-	-3		
-SS48-	-4		
-SS49-	-5		
-SS50-	-6		
-SS51-	-7		
-SS52-	-8		
-SS53-	-9		
-SS54-	-10		
-SS55-	-11		2x1g
-SS56-	-12	↓	
-SS57-	-13		
-SS58-	-14		
↓ -SS59- ↓	-15		

Sample Storage Location and Required Storage Conditions Refrigerator "F" Locked, 4°C & Dark

Signature [Signature] Date 7/23/04

Notes All samples received on ice at 3-4°C

Date and Description of Final Sample Removal / Disposal \_\_\_\_\_

# Chain of Custody Record

STL-4124 (0901)

Client <b>CH2M HILL</b>	Project Manager <b>Chris English / STL</b>	Date <b>7/20/04</b>	Chain of Custody Number <b>124500</b>
Address <b>13921 Park Center RD., STE 600</b>	Telephone Number (Area Code)/Fax Number <b>314 421 0313 x 221</b>	Lab Number <b>---</b>	Page <b>1</b> of <b>1</b>

City <b>Herndon</b>	State <b>VA</b>	Zip Code <b>20171</b>	Site Contact <b>Dan Lavoie</b>	Lab Contact <b>Ken Simon</b>	Analysis (Attach list if more space is needed)
Project Name and Location (State) <b>Site 1 - ABL</b>			Carrier/Waybill Number <b>FedEx -</b>		Special Instructions/ Conditions of Receipt

Contract/Purchase Order/Quote No. <b>Proj # 158506.A2.R2</b>			Matrix				Containers & Preservatives										Special Instructions/ Conditions of Receipt	
Sample I.D. No. and Description (Containers for each sample may be combined on one form)			Date	Time	Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	1% I Size	25-50 E. Fertilizer Sur. Respc		28-01 E. Fertilizer Biocuum
<b>AS01-SS45-(0-1)</b>	<b>-1</b>	<b>7-20-04</b>	<b>4:30p</b>				X		X						X	X		
<b>AS01-SS46-(0-1)</b>	<b>-2</b>	<b>7-20-04</b>	<b>3:00p</b>				X		X						X	X		
<b>AS01-SS47-(0-1)</b>	<b>-3</b>	<b>7-20-04</b>	<b>3:30p</b>				X		X						X	X		
<b>AS01-SS48-(0-1)</b>	<b>-4</b>	<b>7-20-04</b>	<b>3:50p</b>				X		X						X	X		
<b>AS01-SS49-(0-1)</b>	<b>-5</b>	<b>7-20-04</b>	<b>2:15p</b>				X		X						X	X		
<b>AS01-SS50-(0-1)</b>	<b>-6</b>	<b>7-21-04</b>	<b>0930</b>				X		X						X	1		
<b>AS01-SS51-(0-1)</b>	<b>-7</b>	<b>7-21-04</b>	<b>1000</b>				X		X						X	1		
<b>AS01-SS52-(0-2)</b>	<b>-8</b>	<b>7/21</b>	<b>1030</b>				X		X						X	1		
<b>AS01-SS53-(0-2)</b>	<b>-9</b>	<b>7/21</b>	<b>1130</b>				X		X						X	1		
<b>AS01-SS54-(0-1)</b>	<b>-10</b>	<b>7/21</b>	<b>1200</b>				X		X						X	1		
<b>AS01-SS55-(0-1)</b>	<b>-11</b>	<b>7/21</b>	<b>1430</b>				X		X						X		<b>2</b>	<b>Double Volume</b>
<b>AS01-SS56-(0-1)</b>	<b>-12</b>	<b>7/21</b>	<b>1400</b>				X		X						X		<b>2</b>	<b>"</b>

Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown	Sample Disposal <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	(A fee may be assessed if samples are retained longer than 1 month)
--	--	---

Turn Around Time Required <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 7 Days <input type="checkbox"/> 14 Days <input type="checkbox"/> 21 Days <input checked="" type="checkbox"/> Other Per Protocol / Spec	QC Requirements (Specify)
--	---------------------------

1. Relinquished By <b>Andrew Brown</b>	Date <b>7/22/04</b>	Time <b>1200</b>	1. Received By <b>[Signature]</b>	Date <b>7/23/04</b>	Time <b>1140</b>
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

# Chain of Custody Record

STL-4124 (0901)

12365

Client <b>CH2M Hill</b>		Project Manager <b>Chris English</b>		Date <b>7/21/04</b>	Chain of Custody Number <b>124498</b>
Address <b>Same</b>		Telephone Number (Area Code)/Fax Number <b>703-471-1441</b>		Lab Number	Page _____ of _____
City	State	Zip Code	Site Contact <b>Gary Fisher</b>	Lab Contact	Analysis (Attach list if more space is needed)
Project Name and Location (State) <b>ABL site 1 CTO 167</b>			Carrier/Waybill Number		

Contract/Purchase Order/Quote No. <b>Proj. # 158506 AR BR</b>	Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix				Containers & Preservatives							Special Instructions/Conditions of Receipt			
				Air	Aqueous	Sed.	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	29 day E. Fold		Bioreactor		
	<b>AS01-SS57-(0-1)</b>	<b>-13</b>	<b>7/21/04 1330</b>				<b>X</b>											<b>Double Volume</b>
	<b>AS01-SS58-(0-1)</b>	<b>-14</b>	<b>7/21 1230</b>				<b>X</b>											"
	<b>AS01-SS59-(0-1)</b>	<b>-15</b>	<b>7/21 1300</b>				<b>X</b>											"

Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown			Sample Disposal <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			(A fee may be assessed if samples are retained longer than 1 month)		
Turn Around Time Required <input type="checkbox"/> 24 Hours <input type="checkbox"/> 48 Hours <input type="checkbox"/> 7 Days <input type="checkbox"/> 14 Days <input type="checkbox"/> 21 Days <input type="checkbox"/> Other _____			QC Requirements (Specify)					
1. Relinquished By <b>Madha P. own</b>		Date <b>7/22/04</b>	Time <b>1200</b>	1. Received By <b>[Signature]</b>		Date <b>7/23/04</b>	Time <b>1140</b>	
2. Relinquished By		Date	Time	2. Received By		Date	Time	
3. Relinquished By		Date	Time	3. Received By		Date	Time	

Comments

# CHAIN OF CUSTODY RECORD

COPY

**ENVIROSYSTEMS, INCORPORATED**

**ESI STUDY #12365**

One Lafayette Road, P.O. Box 778, Hampton, New Hampshire 03843

Customer Services: Phone # (603) 926-3345  
Fax # (603) 926-3521

PAGE 1 OF

CLIENT: <b>CH2M Hill</b>	CONTACT: <b>Dan Lavoie</b>	PROJECT NAME: <b>158506.AR.ER</b>	P.O. #
REPORT TO: <b>CH2M Hill</b>	ADDRESS: <b>13921 Park Center Road, Suite 600</b>		PHONE: <b>703-471-6405</b>
INVOICE TO: <b>CH2M Hill</b>	ADDRESS: <b>Herndon, VA 20171</b>		SAMPLED BY: <b>BB</b>

SAMPLE #	FIELD IDENTIFICATION (MUST AGREE WITH CONTAINER)	DATE SAMPLED	COMPOSITE (YES/NO)	TIME SAMPLED	SAMPLE MATRIX	CONTAINER #/VOL/TYPE	DID YOU FIELD PRESERVE	NOTES / ANALYSIS REQUESTED (SPECIAL INSTRUCTIONS, CAUTIONS, ETC.)
Lab	Lab Control	09/01/04	Yes	N/A	Tissue	1x4oz Amber	Frozen	As per client
-11	ASO1-TI55-(0-1)	09/01/04	Yes	N/A	Tissue	1x4oz Amber	Frozen	As per client
-12	ASO1-TI56-(0-1)	09/01/04	Yes	N/A	Tissue	1x4oz Amber	Frozen	As per client
-13	ASO1-TI57-(0-1)	09/01/04	Yes	N/A	Tissue	1x4oz Amber	Frozen	As per client
-14	ASO1-TI58-(0-1)	09/01/04	Yes	N/A	Tissue	1x4oz Amber	Frozen	As per client
-15	ASO1-TI59-(0-1)	09/01/04	Yes	N/A	Tissue	1x4oz Amber	Frozen	As per client

RELINQUISHED BY:	DATE: <b>9/8/04</b>	TIME: <b>1400</b>	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:

COMMENTS: \_\_\_\_\_

**Appendix F**  
**Human Health Risk Assessment**

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**Appendix F1**  
**RAGs Tables**

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TABLE 1  
 SELECTION OF EXPOSURE PATHWAYS  
 Site 1, Allegany Ballistics Laboratory

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Groundwater	Groundwater	Tap Water	Industrial Worker	Adult	Dermal Absorption	On-Site	None	Groundwater remediation system is in place.
						Ingestion	On-Site	None	Groundwater remediation system is in place.
	Surface Soil	Surface Soil	Site 1 Former Disposal Pits	Industrial Worker	Adult	Dermal Absorption	On-Site	Quant	Site workers may be exposed to surface soil during maintenance activities, site inspections, or daily duties.
						Ingestion	On-Site	Quant	Site workers may be exposed to surface soil during maintenance activities, site inspections, or daily duties.
				Trespasser/Visitor	Adolescents	Dermal Absorption	On-Site	Quant	Trespasser/Visitors may be exposed to surface soil while visiting the site.
						Ingestion	On-Site	Quant	Trespasser/Visitors may be exposed to surface soil while visiting the site.
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Industrial Worker	Adult	Inhalation	On-Site	Quant	Site workers may inhale dust particulates and volatile emissions from surface soil while conducting maintenance activities.	
								Trespasser/Visitor	Adolescents
	Surface Soil	Surface Soil	Site 1 Outside Active Burning Grounds	Industrial Worker	Adult	Dermal Absorption	On-Site	Quant	Site workers may be exposed to surface soil during maintenance activities, site inspections, or daily duties.
						Ingestion	On-Site	Quant	Site workers may be exposed to surface soil during maintenance activities, site inspections, or daily duties.
				Trespasser/Visitor	Adolescents	Dermal Absorption	On-Site	Quant	Trespasser/Visitors may be exposed to surface soil while visiting the site.
						Ingestion	On-Site	Quant	Trespasser/Visitors may be exposed to surface soil while visiting the site.
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Industrial Worker	Adult	Inhalation	On-Site	Quant	Site workers may inhale dust particulates and volatile emissions from surface soil while conducting maintenance activities.	
								Trespasser/Visitor	Adolescents
	Surface Soil	Surface Soil	Site 1 Active Burning Grounds	Industrial Worker	Adult	Dermal Absorption	On-Site	Quant	Site workers may be exposed to surface soil during maintenance activities, site inspections, or daily duties.
						Ingestion	On-Site	Quant	Site workers may be exposed to surface soil during maintenance activities, site inspections, or daily duties.
				Trespasser/Visitor	Adolescents	Dermal Absorption	On-Site	Quant	Trespasser/Visitors may be exposed to surface soil while visiting the site.
						Ingestion	On-Site	Quant	Trespasser/Visitors may be exposed to surface soil while visiting the site.
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Industrial Worker	Adult	Inhalation	On-Site	Quant	Site workers may inhale dust particulates and volatile emissions from surface soil while conducting maintenance activities.	
								Trespasser/Visitor	Adolescents

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway		
Future	Soil*	Soil*	Site 1 Former Disposal Pits	Industrial Worker	Adult	Dermal Absorption	On-Site	Quant	Site workers may be exposed to soil during maintenance activities, site inspections, or daily duties.		
						Ingestion	On-Site	Quant	Site workers may be exposed to soil during maintenance activities, site inspections, or daily duties.		
				Trespasser/Visitor	Adolescents	Dermal Absorption	On-Site	Quant	Trespasser/Visitors may be exposed to soil while visiting the site.		
						Ingestion	On-Site	Quant	Trespasser/Visitors may be exposed to soil while visiting the site.		
				Resident	Adult	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
					Child	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
					Child/Adult	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.		
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.		
				Construction Worker	Adult	Dermal Absorption	On-Site	Quant	Construction worker may be exposed to soil during excavation activities.		
						Ingestion	On-Site	Quant	Construction worker may be exposed to soil during excavation activities.		
				Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Industrial Worker	Adult	Inhalation	On-Site	Quant	Site workers may inhale dust particulates and volatile emissions from soil while conducting maintenance activities.
								Trespasser/Visitor	Adolescents	Inhalation	On-Site
		Resident	Adult			Inhalation	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
						Child	Inhalation	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.	
			Child/Adult			Inhalation	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.		
		Construction Worker	Adult			Inhalation	On-Site	Quant	Construction workers may inhale fugitive dust from soil during excavation activities.		

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway		
Future	Soil*	Soil*	Site 1 Outside Active Burning Grounds	Industrial Worker	Adult	Dermal Absorption	On-Site	Quant	Site workers may be exposed to soil during maintenance activities, site inspections, or daily duties.		
						Ingestion	On-Site	Quant	Site workers may be exposed to soil during maintenance activities, site inspections, or daily duties.		
				Trespasser/Visitor	Adolescents	Dermal Absorption	On-Site	Quant	Trespasser/Visitors may be exposed to soil while visiting the site.		
						Ingestion	On-Site	Quant	Trespasser/Visitors may be exposed to soil while visiting the site.		
				Resident	Adult	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
					Child	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.		
					Child/Adult	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.		
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.		
				Construction Worker	Adult	Dermal Absorption	On-Site	Quant	Construction worker may be exposed to soil during excavation activities.		
						Ingestion	On-Site	Quant	Construction worker may be exposed to soil during excavation activities.		
				Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Industrial Worker	Adult	Inhalation	On-Site	Quant	Site workers may inhale dust particulates and volatile emissions from soil while conducting maintenance activities.
	Resident	Adult	Inhalation			On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.			
									Child	Inhalation	On-Site
		Child/Adult	Inhalation			On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This is for cancer risk only.			
	Construction Worker	Adult	Inhalation			On-Site	Quant	Construction workers may inhale fugitive dust from soil during excavation activities.			
	Soil*	Soil*	Site 1 Active Burning Grounds			Industrial Worker	Adult	Dermal Absorption	On-Site	Quant	Site workers may be exposed to soil during maintenance activities, site inspections, or daily duties.
				Ingestion	On-Site			Quant	Site workers may be exposed to soil during maintenance activities, site inspections, or daily duties.		
				Trespasser/Visitor	Adolescents	Dermal Absorption	On-Site	Quant	Trespasser/Visitors may be exposed to soil while visiting the site.		
Ingestion						On-Site	Quant	Trespasser/Visitors may be exposed to soil while visiting the site.			

TABLE 1  
SELECTION OF EXPOSURE PATHWAYS  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway	
Future (cont'd)	Soil*	Soil*	Site 1 Active Burning Grounds	Resident	Adult	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.	
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.	
					Child	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.	
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.	
					Child/Adult	Dermal Absorption	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.	
						Ingestion	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This receptor is evaluated for cancer risk only.	
					Construction Worker	Dermal Absorption	On-Site	Quant	Construction worker may be exposed to soil during excavation activities.	
						Ingestion	On-Site	Quant	Construction worker may be exposed to soil during excavation activities.	
			Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Industrial Worker	Adult	Inhalation	On-Site	Quant	Site workers may inhale dust particulates and volatile emissions from soil while conducting maintenance activities.
					Resident	Adult	Inhalation	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
						Child	Inhalation	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
						Child/Adult	Inhalation	On-Site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation. This is for cancer risk only.
					Trespasser/Visitor	Adolescents	Inhalation	On-Site	Quant	Trespassers/Visitors may inhale dust particulates and volatile emissions from soil while visiting the site.
					Construction Worker	Adult	Inhalation	On-Site	Quant	Construction workers may inhale fugitive dust from soil during excavation activities.
	Soil* (Burning Grounds)	Groundwater	Shallow Aquifer - Tap Water	Resident	Adult	Ingestion	On-site	None	Groundwater remediation system is in place.	
					Child	Dermal Absorption	On-site	None	Groundwater remediation system is in place.	
						Ingestion	On-site	None	Groundwater remediation system is in place.	
					Child/Adult	Ingestion	On-site	None	Groundwater remediation system is in place.	
			Shallow Aquifer - Water in Excavation Pit	Construction Worker	Adult	Ingestion	On-site	None	Groundwater remediation system is in place.	
					Adult	Dermal Absorption	On-site	None	Groundwater remediation system is in place.	
Ingestion						On-site	None	Groundwater remediation system is in place.		
Dermal Absorption					On-site	None	Groundwater remediation system is in place.			

TABLE 1  
 SELECTION OF EXPOSURE PATHWAYS  
 Site 1, Allegany Ballistics Laboratory

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Soil* (Outside Active Burning Grounds)	Groundwater	Shallow Aquifer - Tap Water	Resident	Adult	Ingestion	On-site	None	Groundwater remediation system is in place.
					Child	Dermal Absorption	On-site	None	Groundwater remediation system is in place.
						Ingestion	On-site	None	Groundwater remediation system is in place.
			Child/Adult	Ingestion	On-site	None	Groundwater remediation system is in place.		
			Shallow Aquifer - Water in Excavation Pit	Construction Worker	Adult	Ingestion	On-site	None	Groundwater remediation system is in place.
					Dermal Absorption	On-site	None	Groundwater remediation system is in place.	
Current/Future	Surface Water	Surface Water	Site 1 Surface Water	Recreational Person	Adult	Dermal Absorption	On-Site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
						Ingestion	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
					Adolescents	Dermal Absorption	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
						Ingestion	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
	Sediment	Sediment	Site 1 Sediment	Recreational Person	Adult	Dermal Absorption	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
						Ingestion	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
					Adolescents	Dermal Absorption	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river
						Ingestion	On-site	Quant	To be evaluated for potential impacts from overland flow, as there is a ROD in place for the river

\* Surface and subsurface soil

Quant: will be quantitatively evaluated.

None: Not considered to be a complete pathway, therefore, not evaluated.

TABLE 4.1.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	--	
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
Dermal	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	--	
				SA	Skin Surface Area Available for Contact	3,300	cm2	EPA, 2004 (4)	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2-day	EPA, 2004 (4)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	

TABLE 4.1.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT
				SA	Skin Surface Area Available for Contact	5,300	cm2	EPA, 2004, (5)	
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm2-day	EPA, 2004, (6)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					

Notes:

- (1) Professional Judgement assuming 3 days per week for 4 warm weather months per year.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
- (4) Recommended value for commercial/industrial workers.
- (5) SA is the total of the head, hands, forearms, lower legs and feet for the 7 through 18 year old, EPA, 2004, Exhibit C-1.
- (6) SSAF is the 95th percentile for soil adherence for Soccer Players # 1 (teens).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.2.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name					
Inhalation	Industrial Worker	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	--	$CDI (mg/kg-day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$					
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--						
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996						
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996						
				IN	Inhalation Rate	0.83	m <sup>3</sup> /hour	EPA, 1991						
				ET	Exposure Time	8	hr/day	(1)						
				EF	Exposure Frequency	250	days/year	EPA, 1991						
				ED	Exposure Duration	25	years	EPA, 1991						
				BW	Body Weight	70	kg	EPA, 1991						
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989						
				Inhalation	Trespasser/Visitor	Adolescents	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS		Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	--	$CDI (mg/kg-day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$
								CA		Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
								PEF		Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg					EPA, 1996						
IN	Inhalation Rate	0.83	m <sup>3</sup> /hour					EPA, 1991						
ET	Exposure Time	2	hr/day					(1)						
EF	Exposure Frequency	52	days/year					(2)						
ED	Exposure Duration	9	years					(3)						
BW	Body Weight	51	kg					EPA, 1997, (4)						
AT-C	Averaging Time (Cancer)	25,550	days					EPA, 1989						
AT-N	Averaging Time (Non-Cancer)	3,285	days					EPA, 1989						

Notes:

- (1) Professional Judgement.
- (2) Professional Judgement assuming 3 days per week for 4 warm weather months per year.
- (3) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (4) Body weight is average of the mean values for boys and girls for the ages 9 through 18.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.3.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	
	Resident	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8760	days	EPA, 1989	
Child		Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT	
			IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991		
			EF	Exposure Frequency	350	days/year	EPA, 1991		
			ED	Exposure Duration	6	years	EPA, 1991		
			CF1	Conversion Factor 1	0.000001	kg/mg	--		
			BW	Body Weight	15	kg	EPA, 1991		
			AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989		
			AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989		

TABLE 4.3.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name					
Ingestion	Resident	Child/Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	EPA, 1991	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR-S-Adj x EF x CF1 x 1/AT  IR-S-Adj (mg-year/kd-day) = (ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)					
				IR-S-A	Ingestion Rate of Soil, Adult	100	mg/day	EPA, 1991						
				IR-S-C	Ingestion Rate of Soil, Child	200	mg/day	EPA, 1991						
				IR-S-Adj	Ingestion Rate of Soil, Age-adjusted	114	mg-year/kg-day	Calculated						
				EF	Exposure Frequency	350	days/year	EPA, 1991						
				ED-A	Exposure Duration, Adult	24	years	EPA, 1991						
				ED-C	Exposure Duration, Child	6	years	EPA, 1991						
				CF1	Conversion Factor 1	0.000001	kg/mg	--						
				BW-A	Body Weight, Adult	70	kg	EPA, 1991						
				BW-C	Body Weight, Child	15	kg							
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
				Ingestion	Constuction Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS		Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
								IR-S		Ingestion Rate of Soil	480	mg/day	EPA, 1991	
								EF		Exposure Frequency	250	days/year	(4)	
ED	Exposure Duration	1	years					(4)						
CF1	Conversion Factor 1	0.000001	kg/mg					--						
BW	Body Weight	70	kg					EPA, 1991						
AT-C	Averaging Time (Cancer)	25,550	days					EPA, 1989						
AT-N	Averaging Time (Non-Cancer)	365	days					EPA, 1989						
Dermal	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT					
				SA	Skin Surface Area Available for Contact	3,300	cm2	EPA, 2004 (5)						
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2-day	EPA, 2004 (5)						
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004						
				CF1	Conversion Factor 1	0.000001	kg/mg	--						
				EF	Exposure Frequency	250	days/year	EPA, 1991						
				ED	Exposure Duration	25	years	EPA, 1991						
				BW	Body Weight	70	kg	EPA, 1991						
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989						

TABLE 4.3.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT
				SA	Skin Surface Area Available for Contact	5,300	cm <sup>2</sup>	EPA, 2004, (6)	
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm <sup>2</sup> -day	EPA, 2004, (7)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989				
	Resident	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT
				SA	Skin Surface Area Available for Contact	5,700	cm <sup>2</sup>	EPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm <sup>2</sup> -day	EPA, 2004	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989					
Child	Child	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT	
			SA	Skin Surface Area Available for Contact	2,800	cm <sup>2</sup>	EPA, 2004		
			SSAF	Soil to Skin Adherence Factor	0.2	mg/cm <sup>2</sup> -day	EPA, 2004		
			DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004		
			CF1	Conversion Factor 1	0.000001	kg/mg	--		
			EF	Exposure Frequency	350	days/year	EPA, 1991		
			ED	Exposure Duration	6	years	EPA, 1991		
			BW	Body Weight	15	kg	EPA, 1991		
			AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989					

TABLE 4.3.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Soil*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal		Child/Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.RME	mg/kg	--	$CDI \text{ (mg/kg-day)} = CS \times DA\text{-}Adj \times DABS \times CF1 \times EF \times 1/AT$  $DA\text{-}Adj \text{ (mg-year/kd-day)} = [(ED\text{-}C \times SA\text{-}C \times SSAF\text{-}C / BW\text{-}C) + (ED\text{-}A \times SA\text{-}A \times SSAF\text{-}A / BW\text{-}A)]$
				SA-A	Skin Surface Area Available for Contact, Adult	5,700	cm <sup>2</sup>	EPA, 2004	
				SA-C	Skin Surface Area Available for Contact, Child	2,800	cm <sup>2</sup>	EPA, 2004	
				SSAF-A	Soil to Skin Adherence Factor	0.07	mg/cm <sup>2</sup> -day	EPA, 2004	
				SSAF-C	Soil to Skin Adherence Factor	0.2	mg/cm <sup>2</sup> -day	EPA, 2004	
				DA-Adj	Dermal Absorption, Age-adjusted	361	mg-year/kg-day	calculated	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED-A	Exposure Duration, Adult	24	years	EPA, 1991	
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				BW-A	Body Weight, Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	
					Construction Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	
SA	Skin Surface Area Available for Contact	3,300	cm <sup>2</sup>					EPA, 2004	
SSAF	Soil to Skin Adherence Factor	0.3	mg/cm <sup>2</sup> -day					EPA, 2004	
DABS	Dermal Absorption Factor Solids	chem specific	--					EPA, 2004	
CF1	Conversion Factor 1	0.000001	kg/mg					--	
EF	Exposure Frequency	250	days/year					(1)	
ED	Exposure Duration	1	years					EPA, 1991	
BW	Body Weight	70	kg					EPA, 1991	
AT-C	Averaging Time (Cancer)	25,550	days					EPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days					EPA, 1989	

Notes:

\*Surface and subsurface soil combined.

- (1) Professional Judgement assuming 3 days per week for 4 warm weather months per year.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
- (4) Professional Judgement assuming a construction project could take up to one year, with two weeks off for vacation/holiday.
- (5) Recommended value for commercial/industrial workers.
- (6) SA is the total of the head, hands, forearms, lower legs and feet for the 7 through 18 year old, EPA, 2004, Exhibit C-1.
- (7) SSAF is the 95th percentile for soil adherence for Soccer Players # 1 (teens).

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.4.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Inhalation	Industrial Worker	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996	
				IN	Inhalation Rate	0.83	m <sup>3</sup> /hour	EPA, 1991	
				ET	Exposure Time	8	hr/day	(1)	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989				
	Trespasser/Visitor	Adolescents	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996	
				IN	Inhalation Rate	0.83	m <sup>3</sup> /hour	EPA, 1991	
				ET	Exposure Time	2	hr/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	51	kg	EPA, 1997, (4)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989				
	Resident	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996	
				IN	Inhalation Rate	20	m <sup>3</sup> /day	EPA, 1991	
EF				Exposure Frequency	350	days/year	EPA, 1991		
ED				Exposure Duration	24	years	EPA, 1991		
BW				Body Weight	70	kg	EPA, 1991		
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N				Averaging Time (Non-Cancer)	8,760	days	EPA, 1989		

TABLE 4.4.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Resident	Child	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m3	--	
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996	
				IN	Inhalation Rate	14.4	m3/day	EPA, 1997	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
		Child/Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN\text{-}Adj \times EF \times 1/AT$  $CA (mg/m3) = CS (1/PEF + 1/VF)$  $IN\text{-}Adj (m^3\text{-}year/kd\text{-}day) = (ED\text{-}C \times IN\text{-}C / BW\text{-}C) + (ED\text{-}A \times IN\text{-}A / BW\text{-}A)$
				CA	Chemical Concentration in Air	calc	mg/m3	--	
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996	
	IN-A			Inhalation Rate, Adult	20	m3/day	EPA, 1991		
	IN-C			Inhalation Rate, Child	14.4	m3/day	EPA, 1997		
	IN-Adj			Inhalation Rate, Age-adjusted	12.6	m3-year/kg-day	calc		
	EF			Exposure Frequency	350	days/year	EPA, 1991		
	ED-A			Exposure Duration, Adult	24	years	EPA, 1991		
	ED-C			Exposure Duration, Child	6	years	EPA, 1991		
	BW-A			Body Weight, Adult	70	kg	EPA, 1991		
	BW-C			Body Weight, Child	15	kg	EPA, 1991		
	AT-C			Averaging Time (Cancer)	25,550	days	EPA, 1989		
	Construction Worker	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m3	--	
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996	
IN				Inhalation Rate	3.3	m3/hour	EPA, 1997, (5)		
ET				Exposure Time	8	hr/day	(1)		
EF				Exposure Frequency	250	days/year	(6)		
ED				Exposure Duration	1	years	EPA, 1991		
BW				Body Weight	70	kg	EPA, 1991		
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N				Averaging Time (Non-Cancer)	365	days	EPA, 1989		

TABLE 4.4.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
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Notes:

\*Surface and subsurface soil combined.

- (1) Professional Judgement.
- (2) Professional Judgement assuming 3 days per week for 4 warm weather months per year.
- (3) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (4) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
- (5) Inhalation rate is the short-term exposure to outdoor workers hourly average upper percentile from EPA, 1997, Table 5-23.
- (6) Professional Judgement assuming a construction project could take up to one year, with two weeks off for vacation/holiday.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

(2) RME inhalation rate is the short-term exposure to outdoor workers hourly average upper percentile and CT is the short term exposure to outdoor workers hourly average during heavy activities, as per recommendations by EPA, Table 5-23, EFH 1997.

TABLE 4.5.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Recreational Person	Adult	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.RME	ug/L	--	$CDI \text{ (mg/kg-day)} = \frac{CSW \times IR-SW \times ET \times EF \times ED \times CF1 \times 1}{BW \times 1/AT}$
				IR-SW	Ingestion Rate of Surface Water	0.01	l/hr	EPA, 1996	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989				
	Recreational Person	Adolescents	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.RME	ug/L	--	
				IR-SW	Ingestion Rate of Surface Water	0.01	l/hr	EPA, 1996	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
CF1				Conversion Factor 1	0.001	kg/mg	--		
BW	Body Weight	37	kg	EPA, 1997					
AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989					
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					
Dermal	Recreational Person	Adult	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.RME	ug/L	--	$CDI \text{ (mg/kg-day)} = \frac{CSW \times SA \times Kp \times CF1 \times ET \times EF \times ED \times CF2 \times 1}{BW \times 1/AT}$
				SA	Skin Surface Area Available for Contact	20,000	cm <sup>2</sup>	EPA, 1997, (3)	
				Kp	Skin Permeability Constant	chem specific	cm/hr	EPA, 1992	
				CF1	Conversion Factor 1	0.001	mg/μg	--	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF2	Conversion Factor 2	0.001	l/cm <sup>3</sup>	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	

TABLE 4.5.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational Person	Adolescents	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.RME	ug/L	- -	$CDI (mg/kg\text{-}day) =$ $CSW \times SA \times Kp \times CF1 \times ET \times EF \times ED \times$ $CF2 \times 1/BW \times 1/AT$
				SA	Skin Surface Area Available for Contact	15,000	cm <sup>2</sup>	EPA, 1997, (4)	
				Kp	Skin Permeability Constant	chem specific	cm/hr	EPA, 1992	
				CF1	Conversion Factor 1	0.001	mg/ug	- -	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF2	Conversion Factor 2	0.001	l/cm <sup>3</sup>	- -	
				BW	Body Weight	37	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

- (1) Professional Judgement assuming 2 days per week for 6 months per year.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) Skin surface area in contact with surface water is based on ranges. For total adult male surface area ranges from 17,000 to 23,000 cm<sup>2</sup>, with a mean of 20,000 cm<sup>2</sup>.
- (4) Surface area in contact with surface water is based on ranges. For the adolescent recreational person, the total body surface area ranges from 12,000 to 19,000 cm<sup>2</sup> of a 12- to 15-year-old male, with a mean of 15,000 cm<sup>2</sup>.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1996: Supplemental Guidance to RAGS: Region 4 Bulletins.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.6.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Recreational Person	Adult	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	$CDI \text{ (mg/kg-day)} =$ $CSed \times IR-S \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Recreational Person	Adolescents	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	37	kg	EPA, 1997	
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N				Averaging Time (Non-Cancer)	3,285	days	EPA, 1989		
Dermal	Recreational Person	Adult	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	
				SA	Skin Surface Area Available for Contact	5,170	cm <sup>2</sup>	EPA, 1997 (4)	
				SSAF	Soil to Skin Adherence Factor	0.25	mg/cm <sup>2</sup> -day	EPA, 1997 (5)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	

TABLE 4.6.RME  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Recreational Person	Adolescents	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CSed \times SA \times SSAFE \times DABS \times CF1 \times EF \times ED \times 1/BW \times 1/AT$
				SA	Skin Surface Area Available for Contact	1,550	cm <sup>2</sup>	EPA, 1997 (6)	
				SSAF	Soil to Skin Adherence Factor	0.25	mg/cm <sup>2</sup> -day	EPA, 1997 (5)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	37	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					

Notes:

\*Surface and subsurface soil combined.

- (1) Professional Judgement assuming 1/2 the default value for the residential soil scenario per comment from EPA Region III, June 16, 1998.
- (2) Professional Judgement assuming 2 days per week for 6 months per year.
- (3) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (4) SA is the sum of the mean surface areas (for a male) of the hands, forearms, feet, and lower legs.
- (5) Soil to skin adherence factor is based on maximum adherence factor for Reed Gatherers.
- (6) SA is 30 percent of the sum of the mean surface areas (for a male) of the hands, forearms, feet, and lower legs.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.1.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	50	mg/day	(1)	
				EF	Exposure Frequency	219	days/year	EPA, 1993	
				ED	Exposure Duration	6.6	years	EPA, 1997	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989	
	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	50	mg/day	(1)	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N				Averaging Time (Non-Cancer)	3,285	days	EPA, 1989		
Dermal	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.CTE	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT
				SA	Skin Surface Area Available for Contact	3,300	cm <sup>2</sup>	EPA, 2004 (4)	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm <sup>2</sup> -day	EPA, 2004, (5)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	219	days/year	EPA, 1993	
				ED	Exposure Duration	6.6	years	EPA, 1997	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989	

TABLE 4.1.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current  
Medium: Surface Soil  
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.1.CTE	mg/kg	--	$CDI (mg/kg\text{-}day) = CS \times SA \times SSAF \times DABS \times CF1 \times EF \times ED \times 1/BW \times 1/AT$
				SA	Skin Surface Area Available for Contact	5,300	cm2	EPA, 2004, (6)	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2-day	EPA, 2004, (7)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

- (1) Professional Judgement assuming 1/2 the RME value for the CTE.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
- (4) Recommended value for commercial/industrial workers.
- (5) Geometric mean SSAF for Landscaper/Rockery.
- (6) SA is the total of the head, hands, forearms, lower legs and feet for the 7 through 18 year old, EPA, 2004, Exhibit C-1.
- (7) Geometric mean SSAF for soil adherence for Soccer Players # 1 (teens).

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.2.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name					
Inhalation	Industrial Worker	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.2.CTE	mg/kg	--	$CDI (mg/kg-day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$					
				CA	Chemical Concentration in Air	calc	mg/m3	--						
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996						
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996						
				IN	Inhalation Rate	0.83	m3/hour	EPA, 1991						
				ET	Exposure Time	4	hr/day	(1)						
				EF	Exposure Frequency	219	days/year	EPA, 1993						
				ED	Exposure Duration	6.6	years	EPA, 1997						
				BW	Body Weight	70	kg	EPA, 1991						
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
				AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989						
				Inhalation	Trespasser/Visitor	Adolescents	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS		Chemical Concentration in Soil	See Table 3.2.CTE	mg/kg	--	$CDI (mg/kg-day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m^3) = CS (1/PEF + 1/VF)$
								CA		Chemical Concentration in Air	calc	mg/m3	--	
								PEF		Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
VF	Volatilization Factor for volatile constituents	calc	m3/kg					EPA, 1996						
IN	Inhalation Rate	0.83	m3/hour					EPA, 1991						
ET	Exposure Time	1	hr/day					(1)						
EF	Exposure Frequency	26	days/year					(1)						
ED	Exposure Duration	9	years					(3)						
BW	Body Weight	51	kg					EPA, 1997, (4)						
AT-C	Averaging Time (Cancer)	25,550	days					EPA, 1989						
AT-N	Averaging Time (Non-Cancer)	3,285	days					EPA, 1989						

Notes:

- (1) Professional Judgement assuming 1/2 the RME value for the CTE.
- (2) Professional Judgement assuming 3 days per week for 4 warm weather months per year.
- (3) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (4) Body weight is average of the mean values for boys and girls for the ages 9 through 18.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.  
EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.3.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Soil\*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	50	mg/day	(1)	
				EF	Exposure Frequency	219	days/year	EPA, 1993	
				ED	Exposure Duration	6.6	years	EPA, 1997	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989				
	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	50	mg/day	(1)	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	51	kg	EPA, 1997,(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989				
	Resident	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				IR-S	Ingestion Rate of Soil	50	mg/day	EPA, 1993	
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
BW				Body Weight	70	kg	EPA, 1991		
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N		Averaging Time (Non-Cancer)	3285	days	EPA, 1989				
Child		Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT	
			IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1993		
			EF	Exposure Frequency	234	days/year	EPA, 1993		
			ED	Exposure Duration	6	years	EPA, 1991		
			CF1	Conversion Factor 1	0.000001	kg/mg	--		
			BW	Body Weight	15	kg	EPA, 1991		
	AT-C		Averaging Time (Cancer)	25,550	days	EPA, 1989			
AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989					

TABLE 4.3.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Soil\*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name					
Ingestion	Resident	Child/Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	EPA, 1993	Chronic Daily Intake (CDI) (mg/kg-day) = CS x IR-S-Adj x EF x CF1 x 1/AT  IR-S-Adj (mg-year/kd-day) = (ED-C x IR-S-C / BW-C) + (ED-A x IR-S-A / BW-A)					
				IR-S-A	Ingestion Rate of Soil, Adult	50	mg/day	EPA, 1991						
				IR-S-C	Ingestion Rate of Soil, Child	100	mg/day	EPA, 1991						
				IR-S-Adj	Ingestion Rate of Soil, Age-adjusted	46.4	mg-year/kg-day	Calculated						
				EF	Exposure Frequency	234	days/year	EPA, 1991						
				ED-A	Exposure Duration, Adult	9	years	EPA, 1991						
				ED-C	Exposure Duration, Child	6	years	EPA, 1991						
				CF1	Conversion Factor 1	0.000001	kg/mg	--						
				BW-A	Body Weight, Adult	70	kg	EPA, 1991						
				BW-C	Body Weight, Child	15	kg							
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
				Ingestion	Construction Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS		Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
								IR-S		Ingestion Rate of Soil	240	mg/day	(1)	
								EF		Exposure Frequency	130	days/year	(4)	
ED	Exposure Duration	1	years					EPA, 1991						
CF1	Conversion Factor 1	0.000001	kg/mg					--						
BW	Body Weight	70	kg					EPA, 1991						
AT-C	Averaging Time (Cancer)	25,550	days					EPA, 1989						
AT-N	Averaging Time (Non-Cancer)	365	days					EPA, 1989						
Dermal	Industrial Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT					
				SA	Skin Surface Area Available for Contact	3,300	cm2	EPA, 2004 (5)						
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2-day	EPA, 2004, (6)						
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004						
				CF1	Conversion Factor 1	0.000001	kg/mg	--						
				EF	Exposure Frequency	219	days/year	EPA, 1993						
				ED	Exposure Duration	6.6	years	EPA, 1997						
				BW	Body Weight	70	kg	EPA, 1991						
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
				AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989						

TABLE 4.3.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Soil\*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name	
Dermal	Trespasser/Visitor	Adolescents	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT	
				SA	Skin Surface Area Available for Contact	5,300	cm2	EPA, 2004, (7)		
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2-day	EPA, 2004, (8)		
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004		
				CF1	Conversion Factor 1	0.000001	kg/mg	--		
				EF	Exposure Frequency	26	days/year	(1)		
				ED	Exposure Duration	9	years	(2)		
				BW	Body Weight	51	kg	EPA, 1997,(3)		
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989		
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989		
	Resident	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT	
				SA	Skin Surface Area Available for Contact	5,700	cm2	EPA, 2004		
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2-day	EPA, 2004		
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004		
				CF1	Conversion Factor 1	0.000001	kg/mg	--		
				EF	Exposure Frequency	234	days/year	EPA, 1993		
				ED	Exposure Duration	9	years	EPA, 1993		
		BW	Body Weight	70	kg	EPA, 1991				
		AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989				
		AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989				
		Child	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--		CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT
				SA	Skin Surface Area Available for Contact	2,800	cm2	EPA, 2004		
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2-day	EPA, 2004		
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004		
CF1	Conversion Factor 1			0.000001	kg/mg	--				
EF	Exposure Frequency			234	days/year	EPA, 1993				
ED	Exposure Duration			6	years	EPA, 1991				
BW	Body Weight	15	kg	EPA, 1991						
AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989						
AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989						

TABLE 4.3.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Soil\*

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal		Child/Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x DA-Adj x DABS x CF3 x EF x 1/AT  DA-Adj (mg-year/kd-day) = [(ED-C x SA-C x SSAF-C / BW-C) + (ED-A x SA-A x SSAF-A / BW-A)]
				SA-A	Skin Surface Area Available for Contact, A	5,700	cm <sup>2</sup>	EPA, 2004	
				SA-C	Skin Surface Area Available for Contact, C	2,800	cm <sup>2</sup>	EPA, 2004	
				SSAF-A	Soil to Skin Adherence Factor	0.07	mg/cm <sup>2</sup> -day	EPA, 2004	
				SSAF-C	Soil to Skin Adherence Factor	0.2	mg/cm <sup>2</sup> -day	EPA, 2004	
				DA-Adj	Dermal Absorption, Age-adjusted	213	mg-year/kg-day	calculated	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED-A	Exposure Duration, Adult	9	years	EPA, 1991	
				ED-C	Exposure Duration, Child	6	years	EPA, 1991	
				BW-A	Body Weight, Adult	70	kg	EPA, 1991	
				BW-C	Body Weight, Child	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25550	days	EPA, 1989	
	Construction Worker	Adult	Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.3.CTE	mg/kg	--	CDI (mg/kg-day) = CS x SA x SSAF x DABS x CF1 x EF x ED x 1/BW x 1/AT
				SA	Skin Surface Area Available for Contact	3,300	cm <sup>2</sup>	EPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.1	mg/cm <sup>2</sup> -day	EPA, 2004 (9)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	130	days/year	(4)	
ED	Exposure Duration	1	years	EPA, 1991					
BW	Body Weight	70	kg	EPA, 1991					
AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989					
AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989					

Notes:

\*Surface and subsurface soil combined.

- (1) Professional Judgement assuming 1/2 the RME value for the CTE.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
- (4) Professional Judgement assuming a construction project would take approximately half a year, 5 days a week.
- (5) Recommended value for commercial/industrial workers.
- (6) Geometric mean SSAF for Landscaper/Rockery.
- (7) SA is the total of the head, hands, forearms, lower legs and feet for the 7 through 18 year old, EPA, 2004, Exhibit C-1.
- (8) Geometric mean SSAF for soil adherence for Soccer Players # 1 (teens).
- (9) Adherence factor for construction worker is for construction workers, geometric mean.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.4.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Industrial Worker	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.CTE	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m3	--	
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996	
				IN	Inhalation Rate	0.83	m3/hour	EPA, 1991	
				ET	Exposure Time	4	hr/day	(1)	
				EF	Exposure Frequency	219	days/year	EPA, 1993	
				ED	Exposure Duration	6.6	years	EPA, 1997	
				BW	Body Weight	70	kg	EPA, 1991	
	AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989				
	AT-N	Averaging Time (Non-Cancer)	2,409	days	EPA, 1989				
	Trespasser/Visitor	Adolescents	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.CTE	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m3	--	
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996	
				IN	Inhalation Rate	0.83	m3/hour	EPA, 1991	
				ET	Exposure Time	1	hr/day	(1)	
				EF	Exposure Frequency	26	days/year	(2)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	51	kg	EPA, 1997, (4)	
	AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989				
	AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989				
	Resident	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CA \times IN \times EF \times ED \times 1/BW \times 1/AT$  $CA (mg/m3) = CS (1/PEF + 1/VF)$
				CA	Chemical Concentration in Air	calc	mg/m3	--	
				PEF	Particulate Emissions Factor	1.32E+09	m3/kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m3/kg	EPA, 1996	
				IN	Inhalation Rate	20	m3/day	EPA, 1991	
EF				Exposure Frequency	234	days/year	EPA, 1993		
ED				Exposure Duration	9	years	EPA, 1993		
BW				Body Weight	70	kg	EPA, 1991		
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					

TABLE 4.4.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future  
Medium: Soil\*  
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Resident	Child	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.CTE	mg/kg	--	$CDI \text{ (mg/kg-day)} = CA \times IN \times EF \times ED \times 1/BW \times 1/AT$  $CA \text{ (mg/m}^3\text{)} = CS \text{ (1/PEF + 1/VF)}$
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996	
				IN	Inhalation Rate	14.4	m <sup>3</sup> /day	EPA, 1997	
				EF	Exposure Frequency	234	days/year	EPA, 1993	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
		Child/Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.CTE	mg/kg	--	$CDI \text{ (mg/kg-day)} = CA \times IN\text{-Adj} \times EF \times 1/AT$  $CA \text{ (mg/m}^3\text{)} = CS \text{ (1/PEF + 1/VF)}$  $IN\text{-Adj} \text{ (m}^3\text{-year/kg-day)} = (ED\text{-C} \times IN\text{-C} / BW\text{-C}) + (ED\text{-A} \times IN\text{-A} / BW\text{-A})$
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996	
	IN-A			Inhalation Rate, Adult	20	m <sup>3</sup> /day	EPA, 1991		
	IN-C			Inhalation Rate, Child	14.4	m <sup>3</sup> /day	EPA, 1997		
	IN-Adj			Inhalation Rate, Age-adjusted	8.3	m <sup>3</sup> -year/kg-day	calc		
	EF			Exposure Frequency	234	days/year	EPA, 1993		
	ED-A			Exposure Duration, Adult	9	years	EPA, 1993		
	ED-C			Exposure Duration, Child	6	years	EPA, 1991		
	BW-A			Body Weight, Adult	70	kg	EPA, 1991		
	BW-C			Body Weight, Child	15	kg	EPA, 1991		
	AT-C			Averaging Time (Cancer)	25,550	days	EPA, 1989		
	Construction Worker	Adult	Airborne Particulates and Volatiles Emissions from Site 1 Former Disposal Pits, Site 1 Outside Active Burning Grounds, and Site 1 Active Burning Grounds	CS	Chemical Concentration in Soil	See Table 3.4.CTE	mg/kg	--	$CDI \text{ (mg/kg-day)} = CA \times IN \times ET \times EF \times ED \times 1/BW \times 1/AT$  $CA \text{ (mg/m}^3\text{)} = CS \text{ (1/PEF + 1/VF)}$
				CA	Chemical Concentration in Air	calc	mg/m <sup>3</sup>	--	
				PEF	Particulate Emissions Factor	1.32E+09	m <sup>3</sup> /kg	EPA, 1996	
				VF	Volatilization Factor for volatile constituents	calc	m <sup>3</sup> /kg	EPA, 1996	
IN				Inhalation Rate	2.5	m <sup>3</sup> /hour	EPA, 1997, (5)		
ET				Exposure Time	4	hr/day	(1)		
EF				Exposure Frequency	250	days/year	(6)		
ED				Exposure Duration	1	years	EPA, 1991		
BW				Body Weight	70	kg	EPA, 1991		
AT-C				Averaging Time (Cancer)	25,550	days	EPA, 1989		
AT-N	Averaging Time (Non-Cancer)	365	days	EPA, 1989					

TABLE 4.4.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Future
Medium: Soil*
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
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Notes:

\*Surface and subsurface soil combined.

- (1) Professional Judgement.
- (2) Professional Judgement assuming 1/2 of RME.
- (3) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (4) Body weight is average of the mean values for boys and girls for the ages 9 through 18.
- (5) Inhalation rate is the short term exposure to outdoor workers hourly average during heavy activities, as per recommendations by EPA, Table 5-23, EFH 1997.
- (6) Professional Judgement assuming a construction project could take up to one year, with two weeks off for vacation/holiday.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.  
EPA, 1996: Soil Screening Guidance: User's Guide. OSWER. EPA/540/R-96/018.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.5.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Recreational Person	Adult	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.CTE	ug/L	--	$CDI \text{ (mg/kg-day)} = \frac{CSW \times IR-SW \times ET \times EF \times ED \times CF1 \times 1}{BW \times 1/AT}$
				IR-SW	Ingestion Rate of Surface Water	0.01	l/hr	EPA, 1996	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF1	Conversion Factor 1	0.001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989				
	Recreational Person	Adolescents	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.CTE	ug/L	--	
				IR-SW	Ingestion Rate of Surface Water	0.01	l/hr	EPA, 1996	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
CF1				Conversion Factor 1	0.001	kg/mg	--		
BW	Body Weight	37	kg	EPA, 1997					
AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989					
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					
Dermal	Recreational Person	Adult	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.CTE	ug/L	--	$CDI \text{ (mg/kg-day)} = \frac{CSW \times SA \times Kp \times CF1 \times ET \times EF \times ED \times CF2 \times 1}{BW \times 1/AT}$
				SA	Skin Surface Area Available for Contact	17,000	cm <sup>2</sup>	EPA, 1997, (3)	
				Kp	Skin Permeability Constant	chem specific	cm/hr	EPA, 1992	
				CF1	Conversion Factor 1	0.001	mg/μg	--	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF2	Conversion Factor 2	0.001	l/cm <sup>3</sup>	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

TABLE 4.5.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Recreational Person	Adolescents	Site 1 Surface Water	CSW	Chemical Concentration in Surface Water	See Table 3.x.CTE	ug/L	--	$CDI (mg/kg\text{-}day) =$ $CSW \times SA \times Kp \times CF1 \times ET \times EF \times ED \times$ $CF2 \times 1/BW \times 1/AT$
				SA	Skin Surface Area Available for Contact	12,000	cm <sup>2</sup>	EPA, 1997, (4)	
				Kp	Skin Permeability Constant	chem specific	cm/hr	EPA, 1992	
				CF1	Conversion Factor 1	0.001	mg/ug	--	
				ET	Exposure Time	2.6	hr/day	EPA, 1989	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF2	Conversion Factor 2	0.001	l/cm <sup>3</sup>	--	
				BW	Body Weight	37	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					

Notes:

- (1) Professional Judgement assuming 1/2 of RME value.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) Skin surface area in contact with surface water is based on ranges. For total adult male surface area ranges from 17,000 to 23,000 cm<sup>2</sup>, with a mean of 20,000 cm<sup>2</sup>. Low end of range used for CTE value.
- (4) Surface area in contact with surface water is based on ranges. For the adolescent recreational person, the total body surface area ranges from 12,000 to 19,000 cm<sup>2</sup> of a 12- to 15-year-old male, with a mean of 15,000 cm<sup>2</sup>. Low end of range used for CTE value.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.  
EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.  
EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.  
EPA, 1996: Supplemental Guidance to RAGS: Region 4 Bulletins.  
EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.  
EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

TABLE 4.6.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Recreational Person	Adult	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	$CDI (mg/kg-day) = CSed \times IR-S \times EF \times ED \times CF1 \times 1/BW \times 1/AT$
				IR-Sed	Ingestion Rate of Sediment	25	mg/day	(1)	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Recreational Person	Adolescents	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	
				IR-Sed	Ingestion Rate of Sediment	25	mg/day	(1)	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				BW	Body Weight	37	kg	EPA, 1997	
AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989					
AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989					
Dermal	Recreational Person	Adult	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	
				SA	Skin Surface Area Available for Contact	1,960	cm <sup>2</sup>	EPA, 1997 (3)	
				SSAF	Soil to Skin Adherence Factor	0.25	mg/cm <sup>2</sup> -day	EPA, 1997 (4)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	EPA, 1993	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	

TABLE 4.6.CTE  
VALUES USED FOR DAILY INTAKE CALCULATIONS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Recreational Person	Adolescents	Site 1 Sediment	CSed	Chemical Concentration in Sediment	See Table 3.x.RME	mg/kg	--	$CDI (mg/kg\text{-}day) = CSed \times SA \times SSAF \times DABS \times CF1 \times EF \times ED \times 1/BW \times 1/AT$
				SA	Skin Surface Area Available for Contact	588	cm <sup>2</sup>	EPA, 1997 (5)	
				SSAF	Soil to Skin Adherence Factor	0.25	mg/cm <sup>2</sup> -day	EPA, 1997 (4)	
				DABS	Dermal Absorption Factor Solids	chem specific	--	EPA, 2004	
				CF1	Conversion Factor 1	0.000001	kg/mg	--	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	9	years	(3)	
				BW	Body Weight	37	kg	EPA, 1997	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

Notes:

\*Surface and subsurface soil combined.

- (1) Professional Judgement assuming 1/2 the RME value.
- (2) Professional Judgement assuming adolescents from 9 to 18 years of age.
- (3) SA is the sum of the mean surface areas (for a male) of the feet and hands.
- (4) Soil to skin adherence factor is based on maximum adherence factor for Reed Gatherers.
- (5) SA is 30 percent of the sum of the mean surface areas (for a male) of the feet and hands.

Sources:

- EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
- EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
- EPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.
- EPA, 2004: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.



TABLE 5.1  
NON-CANCER TOXICITY DATA -- ORAL/DERMAL  
Site 1 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
Lead	Chronic	NA	mg/kg-day	NA	NA	mg/kg-day	NA	NA	NA	12/03/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (nonfood)	Chronic	2.0E-02	mg/kg-day	4%	8.0E-04	mg/kg-day	CNS	1/1	IRIS	11/11/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (food)	Chronic	1.4E-01	mg/kg-day	4%	5.6E-03	mg/kg-day	CNS	1/1	IRIS	12/02/04
	Subchronic	1.4E-01	mg/kg-day	4%	5.6E-03	mg/kg-day	CNS	1/1	HEAST	07/01/97
Mercury (Inorganic)	Chronic	NA	NA	74% - 80%	NA	NA	NA	NA	IRIS	12/02/04
	Subchronic	NA	NA	74% - 80%	NA	NA	NA	NA	NA	NA
Mercuric chloride	Chronic	3.0E-04	mg/kg-day	7%	2.1E-05	mg/kg-day	Immune System	1000/1	IRIS	12/02/04
	Subchronic	3.0E-04	mg/kg-day	7%	2.1E-05	mg/kg-day	Kidney	1000	HEAST	07/01/97
Nickel	Chronic	2.0E-02	mg/kg-day	4%	8.0E-04	mg/kg-day	Decreased Body Weight	300/1	IRIS	12/02/04
	Subchronic	2.0E-02	mg/kg-day	4%	8.0E-04	mg/kg-day	Whole body	300	HEAST	07/01/97
Perchlorate	Chronic	7.0E-04	mg/kg-day	NA	7.0E-04	mg/kg-day	Thyroid	10	IRIS	02/18/05
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
RDX	Chronic	3.0E-03	mg/kg-day	NA	3.0E-03	mg/kg-day	Prostate	100/1	IRIS	12/02/04
	Subchronic	3.0E-03	mg/kg-day	NA	3.0E-03	mg/kg-day	Prostate	100/1	HEAST	07/01/97
Silver	Chronic	5.0E-03	mg/kg-day	NA	5.0E-03	mg/kg-day	Skin	3/1	IRIS	12/02/04
	Subchronic	5.0E-03	mg/kg-day	NA	5.0E-03	mg/kg-day	Skin	3	HEAST	07/01/97
2,3,7,8-Tetrachlorodibenzodioxin	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	1.0E-02	mg/kg-day	100%	1.0E-02	mg/kg-day	Liver, whole body	1000/1	IRIS	12/02/04
	Subchronic	1.0E-01	mg/kg-day	100%	1.0E-01	mg/kg-day	Liver, whole body	100	HEAST	07/01/97
Thallium	Chronic	7.0E-05	mg/kg-day	NA	7.0E-05	mg/kg-day	Liver, Blood, Hair	NA	RBC	10/08/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene - pre 2001	Chronic	6.0E-03	mg/kg-day	NA	6.0E-03	mg/kg-day	Liver	3000	NCEA	03/05/92
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene - draft 2001	Chronic	3.0E-04	mg/kg-day	NA	3.0E-04	mg/kg-day	Liver, Kidney, Fetus	3000	NCEA	08/01/01
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	Chronic	1.0E-03	mg/kg-day	2.6%	2.6E-05	mg/kg-day	Kidney	300	NCEA	05/01/00
	Subchronic	7.0E-03	mg/kg-day	2.6%	1.8E-04	mg/kg-day	Lifetime	100	HEAST	07/01/97
Zinc	Chronic	3.0E-01	mg/kg-day	NA	3.0E-01	mg/kg-day	Blood	3/1	IRIS	12/02/04
	Subchronic	3.0E-01	mg/kg-day	NA	3.0E-01	mg/kg-day	Blood	3	HEAST	07/01/97

NA = Not Applicable or Not Available.

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment (Final).

Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%.

Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

TABLE 5.1  
 NON-CANCER TOXICITY DATA -- ORAL/DERMAL  
 Site 1 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD: Target Organ	Dates of RfD: Target Organ (3) (MM/DD/YY)
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IRIS = Integrated Risk Information System

CNS = Central Nervous System

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

EPA = EPA Memorandum

(2) Provide equation for derivation in text.

(3) For IRIS values, provide the date IRIS was searched.

For HEAST values, provide the date of HEAST.

For NCEA values, provide the date of the article provided by NCEA.



TABLE 5.2

## NON-CANCER TOXICITY DATA -- INHALATION

Site 1 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ (2)	Dates (3) (MM/DD/YY)
RDX	Chronic	NA	NA	NA	NA	NA	NA	IRIS	12/02/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Silver	Chronic	NA	NA	NA	NA	NA	NA	IRIS	12/02/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzodioxin	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	4.90E-01	mg/m3	1.4E-01	mg/kg-day	Kidney, Liver	NA	NCEA	06/20/97
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene - pre 2001	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene - draft 2001	Chronic	3.50E-02	mg/m3	1.0E-02	mg/kg-day	CNS, Liver, Endocrine system	1000	NCEA	08/01/01
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	Chronic	NA	NA	NA	NA	NA	NA	IRIS	12/02/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	Chronic	NA	NA	NA	NA	NA	NA	IRIS	12/02/04
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not Applicable

(1) Provide equation used for derivation in text.

(2) HEAST, Alternative Methods used as source of barium values.

Chromium and cadmium values were withdrawn from HEAST, but available in Region III RBC Table.

(3) For IRIS values, provide the date IRIS was searched.

For HEAST values, provide the date of HEAST.

For NCEA values, provide the date of the article provided by NCEA.

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

CNS - Central Nervous System

TABLE 6.1  
 CANCER TOXICITY DATA -- ORAL/DERMAL  
 Site 1 Allegany Ballistica Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (1)	Units	EPA Carcinogen Group	Source	Date (2) (MM/DD/YY)
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	1.5E+00	95%	1.5E+00	(mg/kg-day) <sup>-1</sup>	A	IRIS	12/02/2004
Benzo(a)anthracene	7.3E-01	58% - 89%	7.3E-01	(mg/kg-day) <sup>-1</sup>	B2	NCEA	07/01/1993
Benzo(a)pyrene	7.3E+00	58% - 89%	7.3E+00	(mg/kg-day) <sup>-1</sup>	B2	IRIS	12/03/2004
Benzo(b)fluoranthene	7.3E-01	58% - 89%	7.3E-01	(mg/kg-day) <sup>-1</sup>	B2	NCEA	07/01/1993
Benzo(k)fluoranthene	7.3E-02	58% - 89%	7.3E-02	(mg/kg-day) <sup>-1</sup>	B2	NCEA	07/01/1993
Cadmium	NA	NA	NA	NA	B1	IRIS	12/03/2004
Chromium (hexavalent)	NA	NA	NA	NA	D	IRIS	12/03/2004
Copper	NA	NA	NA	NA	D	IRIS	12/06/2004
Dibenz(a,h)anthracene	7.3E+00	58% - 89%	7.3E+00	(mg/kg-day) <sup>-1</sup>	B2	NCEA	07/01/1993
Indeno(1,2,3-cd)pyrene	7.3E-01	58% - 89%	7.3E-01	(mg/kg-day) <sup>-1</sup>	B2	NCEA	07/01/1993
Iron	NA	NA	NA	NA	NA	NCEA	07/23/1996
HMX	NA	NA	NA	NA	D	IRIS	12/06/2004
Lead	NA	NA	NA	NA	NA	NA	NA
Manganese (nonfood)	NA	NA	NA	NA	D	IRIS	11/11/2004
Manganese (food)	NA	NA	NA	NA	D	IRIS	12/03/2004
Mercuric Chloride	NA	NA	NA	NA	C	IRIS	12/06/2004
Mercury	NA	NA	NA	NA	D	IRIS	12/06/2004
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA
RDX	1.1E-01	NA	1.1E-01	(mg/kg-day) <sup>-1</sup>	C	IRIS	12/06/2004
Silver	NA	NA	NA	NA	D	IRIS	12/06/2004
2,3,7,8-Tetrachlorodibenzodioxin	1.5E+05	50%	3.0E+05	(mg/kg-day) <sup>-1</sup>	B2	HEAST	07/01/97
Tetrachloroethene	5.4E-01	NA	5.4E-01	(mg/kg-day) <sup>-1</sup>	NA	CalEPA	04/26/2004
Thallium	NA	NA	NA	NA	NA	RBC	10/08/2004
Trichloroethene - pre 2001	1.1E-02	NA	1.1E-02	(mg/kg-day) <sup>-1</sup>	B2 - C	NCEA	03/05/1992
Trichloroethene - draft 2001	4.0E-01	NA	4.0E-01	(mg/kg-day) <sup>-1</sup>	B2 - C	NCEA	08/01/2001
Vanadium	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	D	IRIS	12/02/2004

NA-Not available

IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

EPA Carcinogen Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

TABLE 6.1  
 CANCER TOXICITY DATA -- ORAL/DERMAL  
 Site 1 Allegany Ballistica Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (1)	Units	EPA Carcinogen Group	Source	Date (2) (MM/DD/YY)
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E - Evidence of noncarcinogenicity

- (1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment (Final).  
 Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%.
- (2) For IRIS values, provide the date IRIS was searched.  
 For HEAST values, provide the date of HEAST.  
 For NCEA values, provide article date provided by NCEA.  
 For RBC values, provide the date of last change in the Tables.

TABLE 6.2  
 CANCER TOXICITY DATA -- INHALATION  
 Site 1 Allegany Ballistica Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guidance Description	Source	Date (2) (MM/DD/YY)
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	4.0E-03	(ug/m3) <sup>-1</sup>	3500	1.5E+01	(mg/kg-day) <sup>-1</sup>	A	IRIS	12/02/2004
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	8.9E-04	(ug/m3) <sup>-1</sup>	3500	3.1E+00	(mg/kg-day) <sup>-1</sup>	B2	NCEA	1997
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	1.8E-03	(ug/m3) <sup>-1</sup>	3500	6.3E+00	(mg/kg-day) <sup>-1</sup>	B1	IRIS	12/03/2004
Chromium (hexavalent)	1.2E-02	(ug/m3) <sup>-1</sup>	3500	4.1E+01	(mg/kg-day) <sup>-1</sup>	A	IRIS	12/03/2004
Copper	NA	NA	NA	NA	NA	D	IRIS	12/06/2004
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NCEA	07/23/1996
HMX	NA	NA	NA	NA	NA	D	IRIS	12/06/2004
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (nonfood)	NA	NA	NA	NA	NA	D	IRIS	11/11/2004
Manganese (food)	NA	NA	NA	NA	NA	D	IRIS	12/03/2004
Mercuric chloride	NA	NA	NA	NA	NA	C	IRIS	12/06/2004
Mercury	NA	NA	NA	NA	NA	D	IRIS	12/06/2004
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	NA	NA	NA	NA	NA	NA	NA	NA
RDX	NA	NA	NA	NA	NA	C	IRIS	12/06/2004
Silver	NA	NA	NA	NA	NA	D	IRIS	12/06/2004
2,3,7,8-Tetrachlorodibenzodioxin	4.3E+01	(ug/m3) <sup>-1</sup>	3500	1.5E+05	(mg/kg-day) <sup>-1</sup>	B2	HEAST	07/01/97
Tetrachloroethene	5.7E-06	(ug/m3) <sup>-1</sup>	3500	2.0E-02	(mg/kg-day) <sup>-1</sup>	NA	CalEPA	04/26/2004
Thallium	NA	NA	NA	NA	NA	NA	RBC	10/08/2004
Trichloroethene - pre 2001	1.7E-06	(ug/m3) <sup>-1</sup>	3500	6.0E-03	(mg/kg-day) <sup>-1</sup>	B2 -C	NCEA	03/05/1992
Trichloroethene - draft 2001	1.1E-04	(ug/m3) <sup>-1</sup>	3500	4.0E-01	(mg/kg-day) <sup>-1</sup>	NA	NCEA	08/01/2001
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	D	IRIS	12/02/2004

TABLE 6.2  
 CANCER TOXICITY DATA -- INHALATION  
 Site 1 Allegany Ballistica Laboratory, Rocket Center, West Virginia

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guidance Description	Source	Date (2) (MM/DD/YY)
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IRIS = Integrated Risk Information System

HEAST= Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

U = Under review.

NA = Not Available

(1) Adjustment Factor applied to Unit Risk to calculate Inhalation Slope Factor =  
 $70\text{kg} \times 1/20\text{m}^3/\text{day} \times 1000\text{ug}/\text{mg}$

(2) For IRIS values, provide the date IRIS was searched.

For HEAST values, provide the date of HEAST.

For NCEA values, provide the date of the article provided by NCEA.

For RBC values, provide the date of last change in the Tables.

EPA Group:

A - Human carcinogen

B1 - Probable human carcinogen - indicates that limited human data are available

B2 - Probable human carcinogen - indicates sufficient evidence in animals and  
 inadequate or no evidence in humans

C - Possible human carcinogen

D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE 7.1.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Surface Soil	Surface Soil	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	1.4E+00	mg/kg	4.8E-07	mg/kg/day	1.1E-02	1/(mg/kg-day)	5.3E-09	1.3E-06	mg/kg/day	6.0E-03	mg/kg/day	2.2E-04			
				2,3,7,8-TCDD (dioxin)	1.2E-05	mg/kg	4.1E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	6.1E-07	1.1E-11	mg/kg/day	NA	NA	NA			
				Arsenic	8.0E+00	mg/kg	2.8E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.2E-06	7.8E-06	mg/kg/day	3.0E-04	mg/kg/day	2.6E-02			
				Iron	2.5E+04	mg/kg	8.7E-03	mg/kg/day	NA	NA	NA	2.4E-02	mg/kg/day	3.0E-01	mg/kg/day	8.1E-02			
				Manganese	8.1E+02	mg/kg	2.8E-04	mg/kg/day	NA	NA	NA	7.9E-04	mg/kg/day	2.0E-02	mg/kg/day	4.0E-02			
				Vanadium	1.9E+01	mg/kg	6.6E-06	mg/kg/day	NA	NA	NA	1.8E-05	mg/kg/day	1.0E-03	mg/kg/day	1.8E-02			
			Exp. Route Total							4.8E-06							1.7E-01		
			Dermal Absorption	Trichloroethene	1.4E+00	mg/kg	NA	mg/kg/day	1.1E-02	NA	NA	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA		
				2,3,7,8-TCDD (dioxin)	1.2E-05	mg/kg	8.1E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	2.4E-07	2.3E-12	mg/kg/day	NA	NA	NA			
				Arsenic	8.0E+00	mg/kg	5.5E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	8.3E-07	1.5E-06	mg/kg/day	3.0E-04	mg/kg/day	5.2E-03			
		Iron		2.5E+04	mg/kg	5.7E-04	mg/kg/day	NA	NA	NA	1.6E-03	mg/kg/day	3.0E-01	mg/kg/day	5.4E-03				
		Manganese		8.1E+02	mg/kg	1.9E-05	mg/kg/day	NA	NA	NA	5.2E-05	mg/kg/day	8.0E-04	mg/kg/day	6.5E-02				
		Vanadium	1.9E+01	mg/kg	4.3E-07	mg/kg/day	NA	NA	NA	1.2E-06	mg/kg/day	2.6E-05	mg/kg/day	4.7E-02					
		Exp. Route Total							1.1E-06							1.2E-01			
		Exposure Point Total								5.9E-06							2.9E-01		
		Exposure Medium Total								5.9E-06							2.9E-01		
		Surface Soil Total								5.9E-06							2.9E-01		
		Total of Receptor Risks Across All Media											5.9E-06	Total of Receptor Hazards Across All Media					2.9E-01

TABLE 7.2.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE

Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
 Receptor Population: Trespasser/Visitor  
 Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Surface Soil	Surface Soil	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	1.4E+00	mg/kg	5.0E-08	mg/kg/day	1.1E-02	1/(mg/kg-day)	5.4E-10	3.9E-07	mg/kg/day	6.0E-03	mg/kg/day	6.4E-05		
				2,3,7,8-TCDD (dioxin)	1.2E-05	mg/kg	4.2E-13	mg/kg/day	1.5E+05	1/(mg/kg-day)	6.3E-08	3.3E-12	mg/kg/day	NA	NA	NA		
				Arsenic	8.0E+00	mg/kg	2.9E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.3E-07	2.2E-06	mg/kg/day	3.0E-04	mg/kg/day	7.4E-03		
				Iron	2.5E+04	mg/kg	8.9E-04	mg/kg/day	NA	NA	NA	7.0E-03	mg/kg/day	3.0E-01	mg/kg/day	2.3E-02		
				Manganese	8.1E+02	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	2.3E-04	mg/kg/day	2.0E-02	mg/kg/day	1.1E-02		
				Vanadium	1.9E+01	mg/kg	6.8E-07	mg/kg/day	NA	NA	NA	5.3E-06	mg/kg/day	1.0E-03	mg/kg/day	5.3E-03		
			Exp. Route Total							4.9E-07						4.7E-02		
			Dermal Absorption	Trichloroethene	1.4E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.00E-03	mg/kg/day	NA		
				2,3,7,8-TCDD (dioxin)	1.2E-05	mg/kg	2.0E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	6.0E-08	1.6E-12	mg/kg/day	NA	NA	NA		
				Arsenic	8.0E+00	mg/kg	1.4E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.1E-07	1.1E-06	mg/kg/day	3.0E-04	mg/kg/day	3.6E-03		
		Iron		2.5E+04	mg/kg	1.4E-04	mg/kg/day	NA	NA	NA	1.1E-03	mg/kg/day	3.0E-01	mg/kg/day	3.7E-03			
			Manganese	8.1E+02	mg/kg	4.6E-06	mg/kg/day	NA	NA	NA	3.6E-05	mg/kg/day	8.0E-04	mg/kg/day	4.5E-02			
			Vanadium	1.9E+01	mg/kg	1.1E-07	mg/kg/day	NA	NA	NA	8.4E-07	mg/kg/day	2.6E-05	mg/kg/day	3.2E-02			
		Exp. Route Total								2.7E-07					8.4E-02			
		Exposure Point Total								7.6E-07					1.3E-01			
		Exposure Medium Total								7.6E-07					1.3E-01			
		Medium Total								7.6E-07					1.3E-01			
		Total of Receptor Risks Across All Media										7.6E-07	Total of Receptor Hazards Across All Media					1.3E-01





TABLE 7.5.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
 Receptor Population: Industrial Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RTC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Site 1 Outside Active Burning Grounds	Ingestion	Trichloroethene	3.3E+01	mg/kg	1.2E-05	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.3E-07	3.3E-05	mg/kg/day	6.0E-03	mg/kg/day	5.5E-03
				Benzo(a)anthracene	2.8E+00	mg/kg	9.6E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.0E-07	2.7E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	3.7E+00	mg/kg	1.3E-06	mg/kg/day	7.3E+00	1/(mg/kg-day)	9.3E-06	3.6E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.4E+00	mg/kg	2.2E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.6E-06	6.2E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.2E-01	mg/kg	7.8E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	5.7E-07	2.2E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	1.8E+00	mg/kg	6.4E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.6E-07	1.8E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	5.6E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	8.4E-06	1.6E-10	mg/kg/day	NA	NA	NA
				HMX	4.1E+02	mg/kg	1.4E-04	mg/kg/day	NA	NA	NA	4.1E-04	mg/kg/day	5.0E-02	mg/kg/day	8.1E-03
				RDX	3.0E-01	mg/kg	1.0E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.1E-08	2.9E-07	mg/kg/day	3.0E-03	mg/kg/day	9.7E-05
				Antimony	7.8E+00	mg/kg	2.7E-06	mg/kg/day	NA	NA	NA	7.6E-06	mg/kg/day	4.0E-04	mg/kg/day	1.9E-02
				Arsenic	1.3E+01	mg/kg	4.6E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	6.9E-06	1.3E-05	mg/kg/day	3.0E-04	mg/kg/day	4.3E-02
				Cadmium	9.4E+01	mg/kg	3.3E-05	mg/kg/day	NA	NA	NA	9.2E-05	mg/kg/day	1.0E-03	mg/kg/day	9.2E-02
				Chromium	6.8E+01	mg/kg	2.4E-05	mg/kg/day	NA	NA	NA	6.7E-05	mg/kg/day	3.0E-03	mg/kg/day	2.2E-02
				Copper	6.2E+02	mg/kg	2.2E-04	mg/kg/day	NA	NA	NA	6.1E-04	mg/kg/day	4.0E-02	mg/kg/day	1.5E-02
				Iron	3.7E+04	mg/kg	1.3E-02	mg/kg/day	NA	NA	NA	3.6E-02	mg/kg/day	3.0E-01	mg/kg/day	1.2E-01
				Lead	6.3E+02	mg/kg	2.2E-04	mg/kg/day	NA	NA	NA	6.2E-04	mg/kg/day	NA	NA	NA
				Manganese	1.4E+03	mg/kg	5.0E-04	mg/kg/day	NA	NA	NA	1.4E-03	mg/kg/day	2.0E-02	mg/kg/day	7.0E-02
				Mercury	9.0E+00	mg/kg	3.2E-06	mg/kg/day	NA	NA	NA	8.8E-06	mg/kg/day	3.0E-04	mg/kg/day	2.9E-02
				Nickel	8.2E+01	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	8.0E-05	mg/kg/day	2.0E-02	mg/kg/day	4.0E-03
				Silver	3.7E+01	mg/kg	1.3E-05	mg/kg/day	NA	NA	NA	3.6E-05	mg/kg/day	5.0E-03	mg/kg/day	7.2E-03
				Thallium	1.3E+00	mg/kg	4.5E-07	mg/kg/day	NA	NA	NA	1.3E-06	mg/kg/day	7.0E-05	mg/kg/day	1.8E-02
Vanadium	6.8E+01	mg/kg	2.4E-05	mg/kg/day	NA	NA	NA	6.7E-05	mg/kg/day	1.0E-03	mg/kg/day	6.7E-02				
Zinc	1.1E+03	mg/kg	3.9E-04	mg/kg/day	NA	NA	NA	1.1E-03	mg/kg/day	3.0E-01	mg/kg/day	3.6E-03				
Exp. Route Total										2.8E-05					5.3E-01	

TABLE 7.5.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
 Receptor Population: Industrial Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Trichloroethene	3.3E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	2.8E+00	mg/kg	8.3E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	6.0E-07	2.3E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	3.7E+00	mg/kg	1.1E-06	mg/kg/day	7.3E+00	1/(mg/kg-day)	8.0E-06	3.1E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.4E+00	mg/kg	1.9E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.4E-06	5.3E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.2E-01	mg/kg	6.7E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	4.9E-07	1.9E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	1.8E+00	mg/kg	5.5E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.0E-07	1.5E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	1.1E-11	mg/kg/day	3.0E+05	1/(mg/kg-day)	3.3E-06	3.1E-11	mg/kg/day	NA	NA	NA
				HMX	4.1E+02	mg/kg	5.7E-06	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	5.0E-02	mg/kg/day	3.2E-04
				RDX	3.0E-01	mg/kg	1.0E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.1E-09	2.9E-08	mg/kg/day	3.0E-03	mg/kg/day	9.6E-06
				Antimony	7.8E+00	mg/kg	1.8E-07	mg/kg/day	NA	NA	NA	5.0E-07	mg/kg/day	6.0E-05	mg/kg/day	8.4E-03
				Arsenic	1.3E+01	mg/kg	9.1E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.4E-06	2.6E-06	mg/kg/day	3.0E-04	mg/kg/day	8.5E-03
				Cadmium	9.4E+01	mg/kg	2.2E-07	mg/kg/day	NA	NA	NA	6.1E-07	mg/kg/day	2.5E-05	mg/kg/day	2.4E-02
				Chromium	6.8E+01	mg/kg	1.6E-06	mg/kg/day	NA	NA	NA	4.4E-06	mg/kg/day	7.5E-05	mg/kg/day	5.9E-02
				Copper	6.2E+02	mg/kg	1.4E-05	mg/kg/day	NA	NA	NA	4.0E-05	mg/kg/day	4.0E-02	mg/kg/day	1.0E-03
				Iron	3.7E+04	mg/kg	8.5E-04	mg/kg/day	NA	NA	NA	2.4E-03	mg/kg/day	3.0E-01	mg/kg/day	8.0E-03
				Lead	6.3E+02	mg/kg	1.5E-05	mg/kg/day	NA	NA	NA	4.1E-05	mg/kg/day	NA	NA	NA
				Manganese	1.4E+03	mg/kg	3.3E-05	mg/kg/day	NA	NA	NA	9.3E-05	mg/kg/day	8.0E-04	mg/kg/day	1.2E-01
				Mercury	9.0E+00	mg/kg	2.1E-07	mg/kg/day	NA	NA	NA	5.8E-07	mg/kg/day	2.1E-05	mg/kg/day	2.8E-02
				Nickel	8.2E+01	mg/kg	1.9E-06	mg/kg/day	NA	NA	NA	5.3E-06	mg/kg/day	8.0E-04	mg/kg/day	6.6E-03
				Silver	3.7E+01	mg/kg	8.5E-07	mg/kg/day	NA	NA	NA	2.4E-06	mg/kg/day	5.0E-03	mg/kg/day	4.7E-04
			Thallium	1.3E+00	mg/kg	3.0E-08	mg/kg/day	NA	NA	NA	8.4E-08	mg/kg/day	7.0E-05	mg/kg/day	1.2E-03	
			Vanadium	6.8E+01	mg/kg	1.6E-06	mg/kg/day	NA	NA	NA	4.4E-06	mg/kg/day	2.6E-05	mg/kg/day	1.7E-01	
			Zinc	1.1E+03	mg/kg	2.5E-05	mg/kg/day	NA	NA	NA	7.1E-05	mg/kg/day	3.0E-01	mg/kg/day	2.4E-04	
			Exp. Route Total							1.6E-05					4.3E-01	
		Exposure Point Total								4.4E-05					9.6E-01	
	Exposure Medium Total									4.4E-05					9.6E-01	
Surface Soil Total										4.4E-05					9.6E-01	
Total of Receptor Risks Across All Media										4.4E-05	Total of Receptor Hazards Across All Media					9.6E-01

TABLE 7.6.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
 Receptor Population: Trespasser/Visitor  
 Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Surface Soil	Site 1 Outside Active Burning Grounds	Ingestion	Trichloroethene	3.3E+01	mg/kg	1.2E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.3E-08	9.3E-06	mg/kg/day	6.0E-03	mg/kg/day	1.6E-03	
				Benzo(a)anthracene	2.8E+00	mg/kg	9.9E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.2E-08	7.7E-07	mg/kg/day	NA	NA	NA	NA
				Benzo(a)pyrene	3.7E+00	mg/kg	1.3E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	9.6E-07	1.0E-06	mg/kg/day	NA	NA	NA	NA
				Benzo(b)fluoranthene	6.4E+00	mg/kg	2.3E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.7E-07	1.8E-06	mg/kg/day	NA	NA	NA	NA
				Dibenz(a,h)anthracene	2.2E-01	mg/kg	8.0E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	5.8E-08	6.2E-08	mg/kg/day	NA	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	1.8E+00	mg/kg	6.5E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.8E-08	5.1E-07	mg/kg/day	NA	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	5.7E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	8.6E-07	4.5E-11	mg/kg/day	NA	NA	NA	NA
				HMX	4.1E+02	mg/kg	1.5E-05	mg/kg/day	NA	NA	NA	1.2E-04	mg/kg/day	5.0E-02	mg/kg/day	2.3E-03	2.3E-03
				RDX	3.0E-01	mg/kg	1.1E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.2E-09	8.3E-08	mg/kg/day	3.0E-03	mg/kg/day	2.8E-05	2.8E-05
				Antimony	7.8E+00	mg/kg	2.8E-07	mg/kg/day	NA	NA	NA	2.2E-06	mg/kg/day	4.0E-04	mg/kg/day	5.5E-03	5.5E-03
				Arsenic	1.3E+01	mg/kg	4.7E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.1E-07	3.7E-06	mg/kg/day	3.0E-04	mg/kg/day	1.2E-02	1.2E-02
				Cadmium	9.4E+01	mg/kg	3.4E-06	mg/kg/day	NA	NA	NA	2.6E-05	mg/kg/day	1.0E-03	mg/kg/day	2.6E-02	2.6E-02
				Chromium	6.8E+01	mg/kg	2.4E-06	mg/kg/day	NA	NA	NA	1.9E-05	mg/kg/day	3.0E-03	mg/kg/day	6.3E-03	6.3E-03
				Copper	6.2E+02	mg/kg	2.2E-05	mg/kg/day	NA	NA	NA	1.7E-04	mg/kg/day	4.0E-02	mg/kg/day	4.4E-03	4.4E-03
				Iron	3.7E+04	mg/kg	1.3E-03	mg/kg/day	NA	NA	NA	1.0E-02	mg/kg/day	3.0E-01	mg/kg/day	3.4E-02	3.4E-02
				Lead	6.3E+02	mg/kg	2.3E-05	mg/kg/day	NA	NA	NA	1.8E-04	mg/kg/day	NA	NA	NA	NA
				Manganese	1.4E+03	mg/kg	5.2E-05	mg/kg/day	NA	NA	NA	4.0E-04	mg/kg/day	2.0E-02	mg/kg/day	2.0E-02	2.0E-02
				Mercury	9.0E+00	mg/kg	3.2E-07	mg/kg/day	NA	NA	NA	2.5E-06	mg/kg/day	3.0E-04	mg/kg/day	8.4E-03	8.4E-03
				Nickel	8.2E+01	mg/kg	3.0E-06	mg/kg/day	NA	NA	NA	2.3E-05	mg/kg/day	2.0E-02	mg/kg/day	1.1E-03	1.1E-03
				Silver	3.7E+01	mg/kg	1.3E-06	mg/kg/day	NA	NA	NA	1.0E-05	mg/kg/day	5.0E-03	mg/kg/day	2.0E-03	2.0E-03
				Thallium	1.3E+00	mg/kg	4.7E-08	mg/kg/day	NA	NA	NA	3.6E-07	mg/kg/day	7.0E-05	mg/kg/day	5.2E-03	5.2E-03
Vanadium	6.8E+01	mg/kg	2.4E-06	mg/kg/day	NA	NA	NA	1.9E-05	mg/kg/day	1.0E-03	mg/kg/day	1.9E-02	1.9E-02				
Zinc	1.1E+03	mg/kg	4.0E-05	mg/kg/day	NA	NA	NA	3.1E-04	mg/kg/day	3.0E-01	mg/kg/day	1.0E-03	1.0E-03				
Exp. Route Total											2.9E-06					1.5E-01	

TABLE 7.6.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
 Receptor Population: Trespasser/Visitor  
 Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Trichloroethene	3.3E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	2.8E+00	mg/kg	2.0E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.5E-07	1.6E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	3.7E+00	mg/kg	2.7E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.0E-06	2.1E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.4E+00	mg/kg	4.7E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	3.4E-07	3.7E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.2E-01	mg/kg	1.7E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.2E-07	1.3E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	1.8E+00	mg/kg	1.4E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	9.9E-08	1.1E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	2.7E-12	mg/kg/day	3.0E+05	1/(mg/kg-day)	8.2E-07	2.1E-11	mg/kg/day	NA	NA	NA
				HMX	4.1E+02	mg/kg	1.4E-06	mg/kg/day	NA	NA	NA	1.1E-05	mg/kg/day	5.0E-02	mg/kg/day	2.2E-04
				RDX	3.0E-01	mg/kg	2.5E-09	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.8E-10	2.0E-08	mg/kg/day	3.0E-03	mg/kg/day	6.6E-06
				Antimony	7.8E+00	mg/kg	4.5E-08	mg/kg/day	NA	NA	NA	3.5E-07	mg/kg/day	6.0E-05	mg/kg/day	5.8E-03
				Arsenic	1.3E+01	mg/kg	2.3E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.4E-07	1.8E-06	mg/kg/day	3.0E-04	mg/kg/day	5.9E-03
				Cadmium	9.4E+01	mg/kg	5.3E-08	mg/kg/day	NA	NA	NA	4.2E-07	mg/kg/day	2.5E-05	mg/kg/day	1.7E-02
				Chromium	6.8E+01	mg/kg	3.9E-07	mg/kg/day	NA	NA	NA	3.0E-06	mg/kg/day	7.5E-05	mg/kg/day	4.0E-02
				Copper	6.2E+02	mg/kg	3.6E-06	mg/kg/day	NA	NA	NA	2.8E-05	mg/kg/day	4.0E-02	mg/kg/day	6.9E-04
				Iron	3.7E+04	mg/kg	2.1E-04	mg/kg/day	NA	NA	NA	1.6E-03	mg/kg/day	3.0E-01	mg/kg/day	5.5E-03
				Lead	6.3E+02	mg/kg	3.6E-06	mg/kg/day	NA	NA	NA	2.8E-05	mg/kg/day	NA	NA	NA
				Manganese	1.4E+03	mg/kg	8.2E-06	mg/kg/day	NA	NA	NA	6.4E-05	mg/kg/day	8.0E-04	mg/kg/day	8.0E-02
				Mercury	9.0E+00	mg/kg	5.2E-08	mg/kg/day	NA	NA	NA	4.0E-07	mg/kg/day	2.1E-05	mg/kg/day	1.9E-02
				Nickel	8.2E+01	mg/kg	4.7E-07	mg/kg/day	NA	NA	NA	3.6E-06	mg/kg/day	8.0E-04	mg/kg/day	4.6E-03
				Silver	3.7E+01	mg/kg	2.1E-07	mg/kg/day	NA	NA	NA	1.6E-06	mg/kg/day	5.0E-03	mg/kg/day	3.3E-04
			Thallium	1.3E+00	mg/kg	7.4E-09	mg/kg/day	NA	NA	NA	5.8E-08	mg/kg/day	7.0E-05	mg/kg/day	8.2E-04	
			Vanadium	6.8E+01	mg/kg	3.9E-07	mg/kg/day	NA	NA	NA	3.0E-06	mg/kg/day	2.6E-05	mg/kg/day	1.2E-01	
			Zinc	1.1E+03	mg/kg	6.3E-06	mg/kg/day	NA	NA	NA	4.9E-05	mg/kg/day	3.0E-01	mg/kg/day	1.6E-04	
			Exp. Route Total							3.9E-06					3.0E-01	
		Exposure Point Total								6.7E-06					4.5E-01	
	Exposure Medium Total									6.7E-06					4.5E-01	
Surface Soil Total										6.7E-06					4.5E-01	
Total of Receptor Risks Across All Media										6.7E-06	Total of Receptor Hazards Across All Media					4.5E-01

TABLE 7.7.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Trichloroethene	1.0E-02	mg/m <sup>3</sup>	2.4E-04	mg/kg/day	6.0E-03	1/(mg/kg-day)	1.5E-06	6.8E-04	mg/kg/day	NA	NA	NA	
				Chromium	5.2E-08	mg/m <sup>3</sup>	1.2E-09	mg/kg/day	4.1E+01	1/(mg/kg-day)	4.9E-08	3.3E-09	mg/kg/day	2.9E-05	mg/kg/day	1.2E-04	
			Exp. Route Total														
			Exposure Point Total														
	Exposure Medium Total																
Surface Soil Total										1.5E-06						1.2E-04	
										Total of Receptor Risks Across All Media		1.5E-06	Total of Receptor Hazards Across All Media		1.2E-04		

TABLE 7.8.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Surface Soil	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Trichloroethene Chromium	1.0E-02	mg/m <sup>3</sup>	6.2E-06	mg/kg/day	6.0E-03	1/(mg/kg-day)	3.7E-08	4.9E-05	mg/kg/day	NA	NA	NA		
					5.2E-08	mg/m <sup>3</sup>	3.1E-11	mg/kg/day	4.1E+01	1/(mg/kg-day)	1.3E-09	2.4E-10	mg/kg/day	2.9E-05	mg/kg/day	8.4E-06		
					Exp. Route Total							3.9E-08						8.4E-06
					Exposure Point Total							3.9E-08						8.4E-06
					Exposure Medium Total							3.9E-08						8.4E-06
Surface Soil Total													3.9E-08			8.4E-06		
											Total of Receptor Risks Across All Media		3.9E-08	Total of Receptor Hazards Across All Media		8.4E-06		

TABLE 7.9.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RTC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Surface Soil	Site 1 Active Burning Grounds	Ingestion	2,3,7,8-TCDD (dioxin)	4.9E-05	mg/kg	1.7E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	2.6E-06	4.8E-11	mg/kg/day	NA	NA	NA	
				RDX	1.3E+01	mg/kg	4.6E-06	mg/kg/day	1.1E-01	1/(mg/kg-day)	5.0E-07	1.3E-05	mg/kg/day	3.0E-03	mg/kg/day	4.3E-03	
				Arsenic	7.1E+00	mg/kg	2.5E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.7E-06	6.9E-06	mg/kg/day	3.0E-04	mg/kg/day	2.3E-02	
				Iron	2.8E+04	mg/kg	9.9E-03	mg/kg/day	NA	NA	NA	2.8E-02	mg/kg/day	3.0E-01	mg/kg/day	9.2E-02	
				Lead	1.3E+02	mg/kg	4.6E-05	mg/kg/day	NA	NA	NA	1.3E-04	mg/kg/day	NA	NA	NA	
				Exp. Route Total							6.8E-06						1.2E-01
			Dermal Absorption	2,3,7,8-TCDD (dioxin)	4.9E-05	mg/kg	3.4E-12	mg/kg/day	3.0E+05	1/(mg/kg-day)	1.0E-06	9.5E-12	mg/kg/day	NA	NA	NA	
				RDX	1.3E+01	mg/kg	4.5E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	5.0E-08	1.3E-06	mg/kg/day	3.0E-03	mg/kg/day	4.2E-04	
				Arsenic	7.1E+00	mg/kg	4.9E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.3E-07	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	4.6E-03	
				Iron	2.8E+04	mg/kg	6.5E-04	mg/kg/day	NA	NA	NA	1.8E-03	mg/kg/day	3.0E-01	mg/kg/day	6.1E-03	
				Lead	1.3E+02	mg/kg	3.0E-06	mg/kg/day	NA	NA	NA	8.4E-06	mg/kg/day	NA	NA	NA	
			Exp. Route Total							1.8E-06						1.1E-02	
			Exposure Point Total							8.6E-06							1.3E-01
			Exposure Medium Total							8.6E-06							1.3E-01
			Surface Soil Total							8.6E-06							1.3E-01
Total of Receptor Risks Across All Media										8.6E-06	Total of Receptor Hazards Across All Media					1.3E-01	

TABLE 7.10.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RTC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Surface Soil	Site 1 Active Burning Grounds	Ingestion	2,3,7,8-TCDD (dioxin)	4.9E-05	mg/kg	1.8E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	2.6E-07	1.4E-11	mg/kg/day	NA	NA	NA	
				RDX	1.3E+01	mg/kg	4.7E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	5.2E-08	3.7E-06	mg/kg/day	3.0E-03	mg/kg/day	1.2E-03	
				Arsenic	7.1E+00	mg/kg	2.5E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.8E-07	2.0E-06	mg/kg/day	3.0E-04	mg/kg/day	6.6E-03	
				Iron	2.8E+04	mg/kg	1.0E-03	mg/kg/day	NA	NA	NA	7.9E-03	mg/kg/day	3.0E-01	mg/kg/day	2.6E-02	
				Lead	1.3E+02	mg/kg	4.7E-06	mg/kg/day	NA	NA	NA	3.6E-05	mg/kg/day	NA	NA	NA	
				Exp. Route Total							7.0E-07						3.4E-02
			Dermal Absorption	2,3,7,8-TCDD (dioxin)	4.9E-05	mg/kg	8.4E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	2.5E-07	6.5E-12	mg/kg/day	NA	NA	NA	
				RDX	1.3E+01	mg/kg	1.1E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.2E-08	8.7E-07	mg/kg/day	3.0E-03	mg/kg/day	2.9E-04	
				Arsenic	7.1E+00	mg/kg	1.2E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.8E-07	9.4E-07	mg/kg/day	3.0E-04	mg/kg/day	3.1E-03	
				Iron	2.8E+04	mg/kg	1.6E-04	mg/kg/day	NA	NA	NA	1.3E-03	mg/kg/day	3.0E-01	mg/kg/day	4.2E-03	
				Lead	1.3E+02	mg/kg	7.5E-07	mg/kg/day	NA	NA	NA	5.8E-06	mg/kg/day	NA	NA	NA	
			Exp. Route Total							4.5E-07						7.6E-03	
			Exposure Point Total								1.1E-06						4.2E-02
			Exposure Medium Total								1.1E-06						4.2E-02
			Surface Soil Total								1.1E-06						4.2E-02
Total of Receptor Risks Across All Media										1.1E-06	Total of Receptor Hazards Across All Media					4.2E-02	

TABLE 7.11.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RTC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	1.7E-04	mg/m <sup>3</sup>	3.9E-06	mg/kg/day	6.0E-03	1/(mg/kg-day)	2.3E-08	1.1E-05	mg/kg/day	NA	NA	NA	
			Exp. Route Total								2.3E-08					0.0E+00	
			Exposure Point Total									2.3E-08					0.0E+00
			Exposure Medium Total									2.3E-08					0.0E+00
Surface Soil Total											2.3E-08					0.0E+00	
Total of Receptor Risks Across All Media											2.3E-08	Total of Receptor Hazards Across All Media					0.0E+00

TABLE 7.12.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RTC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	1.7E-04	mg/m <sup>3</sup>	1.0E-07	mg/kg/day	6.0E-03	1/(mg/kg-day)	6.0E-10	7.8E-07	mg/kg/day	NA	NA	NA	
			Exp. Route Total								6.0E-10					0.0E+00	
			Exposure Point Total									6.0E-10					0.0E+00
			Exposure Medium Total									6.0E-10					0.0E+00
Surface Soil Total										6.0E-10					0.0E+00		
Total of Receptor Risks Across All Media										6.0E-10	Total of Receptor Hazards Across All Media					0.0E+00	



TABLE 7.14.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	2.4E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	2.7E-08	1.9E-05	mg/kg/day	6.0E-03	mg/kg/day	3.2E-03			
					4.7E-04	mg/kg	1.7E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	2.5E-06	1.3E-10	mg/kg/day	NA	NA	NA			
				2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	2.5E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.7E-07	1.9E-06	mg/kg/day	3.0E-04	mg/kg/day	6.4E-03			
					1.4E+02	mg/kg	4.9E-06	mg/kg/day	NA	NA	NA	3.8E-05	mg/kg/day	4.0E-02	mg/kg/day	9.6E-04			
				Copper	2.7E+04	mg/kg	9.9E-04	mg/kg/day	NA	NA	NA	7.7E-03	mg/kg/day	3.0E-01	mg/kg/day	2.6E-02			
					8.2E+02	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	2.3E-04	mg/kg/day	2.0E-02	mg/kg/day	1.1E-02			
				Manganese	9.0E-01	mg/kg	3.2E-08	mg/kg/day	NA	NA	NA	2.5E-07	mg/kg/day	7.0E-05	mg/kg/day	3.6E-03			
					1.8E+01	mg/kg	6.6E-07	mg/kg/day	NA	NA	NA	5.1E-06	mg/kg/day	1.0E-03	mg/kg/day	5.1E-03			
				Vanadium	Exp. Route Total							2.9E-06						5.6E-02	
					Dermal Absorption	Trichloroethene	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA	NA	NA	
			8.1E-12	mg/kg/day			3.0E+05	1/(mg/kg-day)	2.4E-06	6.3E-11	mg/kg/day	NA	NA	NA	NA				
			2,3,7,8-TCDD (dioxin)	1.2E-07		mg/kg/day	1.5E+00	1/(mg/kg-day)	1.8E-07	9.2E-07	mg/kg/day	3.0E-04	mg/kg/day	3.1E-03					
				7.8E-07		mg/kg/day	NA	NA	NA	6.1E-06	mg/kg/day	4.0E-02	mg/kg/day	1.5E-04					
			Copper	1.6E-04		mg/kg/day	NA	NA	NA	1.2E-03	mg/kg/day	3.0E-01	mg/kg/day	4.1E-03					
				8.2E+02		mg/kg	4.7E-06	mg/kg/day	NA	NA	NA	3.6E-05	mg/kg/day	8.0E-04	mg/kg/day	4.5E-02			
			Manganese	9.0E-01		mg/kg	5.2E-09	mg/kg/day	NA	NA	NA	4.0E-08	mg/kg/day	7.0E-05	mg/kg/day	5.7E-04			
				1.8E+01		mg/kg	1.1E-07	mg/kg/day	NA	NA	NA	8.2E-07	mg/kg/day	2.6E-05	mg/kg/day	3.1E-02			
			Vanadium	Exp. Route Total							2.6E-06						8.5E-02		
				Exposure Point Total							5.5E-06						1.4E-01		
			Exposure Medium Total							5.5E-06						1.4E-01			
			Soil Total							5.5E-06						1.4E-01			
										Total of Receptor Risks Across All Media		5.5E-06		Total of Receptor Hazards Across All Media					1.4E-01

\* Combined surface and subsurface soil.

TABLE 7.15.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	9.3E-05	mg/kg/day	6.0E-03	mg/kg/day	1.5E-02			
					4.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	6.5E-10	mg/kg/day	NA	NA	NA			
				2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	9.5E-06	mg/kg/day	3.0E-04	mg/kg/day	3.2E-02			
					1.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.9E-04	mg/kg/day	4.0E-02	mg/kg/day	4.7E-03			
				Copper	2.7E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	3.8E-02	mg/kg/day	3.0E-01	mg/kg/day	1.3E-01			
					8.2E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.1E-03	mg/kg/day	2.0E-02	mg/kg/day	5.6E-02			
				Iron	9.0E-01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-06	mg/kg/day	7.0E-05	mg/kg/day	1.8E-02			
					1.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.5E-05	mg/kg/day	1.0E-03	mg/kg/day	2.5E-02			
				Manganese	Exp. Route Total							0.0E+00						2.8E-01	
					Dermal Absorption		Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
			4.7E-04	mg/kg	NA	mg/kg/day		3.0E+05	1/(mg/kg-day)	NA	7.7E-11	mg/kg/day	NA	NA	NA				
			2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	3.0E-04	mg/kg/day	3.8E-03				
				1.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	7.5E-06	mg/kg/day	4.0E-02	mg/kg/day	1.9E-04				
			Copper	2.7E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.5E-03	mg/kg/day	3.0E-01	mg/kg/day	5.0E-03				
				8.2E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	4.5E-05	mg/kg/day	8.0E-04	mg/kg/day	5.6E-02				
			Iron	9.0E-01	mg/kg	NA	mg/kg/day	NA	NA	NA	4.9E-08	mg/kg/day	7.0E-05	mg/kg/day	7.1E-04				
				1.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.0E-06	mg/kg/day	2.6E-05	mg/kg/day	3.9E-02				
			Manganese	Exp. Route Total							0.0E+00						1.0E-01		
				Exposure Point Total							0.0E+00						3.8E-01		
			Exposure Medium Total							0.0E+00						3.8E-01			
			Soil Total							0.0E+00						3.8E-01			
										Total of Receptor Risks Across All Media		0.0E+00		Total of Receptor Hazards Across All Media					3.8E-01

\* Combined surface and subsurface soil.

TABLE 7.16.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations											
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient							
							Value	Units	Value	Units		Value	Units	Value	Units								
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	8.7E-04	mg/kg/day	6.0E-03	mg/kg/day	1.4E-01							
					4.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	6.0E-09	mg/kg/day	NA	NA	NA							
				2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	8.8E-05	mg/kg/day	3.0E-04	mg/kg/day	2.9E-01							
					1.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.8E-03	mg/kg/day	4.0E-02	mg/kg/day	4.4E-02							
				Copper	2.7E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	3.5E-01	mg/kg/day	3.0E-01	mg/kg/day	1.2E+00							
					8.2E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.0E-02	mg/kg/day	2.0E-02	mg/kg/day	5.2E-01							
				Iron	9.0E-01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-05	mg/kg/day	7.0E-05	mg/kg/day	1.7E-01							
					1.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.4E-04	mg/kg/day	1.0E-03	mg/kg/day	2.4E-01							
				Manganese	Exp. Route Total							0.0E+00						2.6E+00					
					Dermal Absorption		Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA				
			4.7E-04	mg/kg	NA	mg/kg/day		3.0E+05	1/(mg/kg-day)	NA	5.1E-10	mg/kg/day	NA	NA	NA								
			2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	7.4E-06	mg/kg/day	3.0E-04	mg/kg/day	2.5E-02								
				1.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	4.9E-05	mg/kg/day	4.0E-02	mg/kg/day	1.2E-03								
			Copper	2.7E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	9.8E-03	mg/kg/day	3.0E-01	mg/kg/day	3.3E-02								
				8.2E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.9E-04	mg/kg/day	8.0E-04	mg/kg/day	3.7E-01								
			Iron	9.0E-01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.2E-07	mg/kg/day	7.0E-05	mg/kg/day	4.6E-03								
				1.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	6.6E-06	mg/kg/day	2.6E-05	mg/kg/day	2.5E-01								
			Exp. Route Total							0.0E+00						6.8E-01							
			Exposure Point Total							0.0E+00						3.3E+00							
			Exposure Medium Total							0.0E+00						3.3E+00							
			Soil Total							0.0E+00						3.3E+00							
										Total of Receptor Risks Across All Media						0.0E+00						Total of Receptor Hazards Across All Media	3.3E+00

\* Combined surface and subsurface soil.

TABLE 7.17.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	1.1E-04	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.2E-06	NA	mg/kg/day	6.0E-03	mg/kg/day	NA			
					4.7E-04	mg/kg	7.4E-10	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.1E-04	NA	mg/kg/day	NA	NA				
				Arsenic	6.9E+00	mg/kg	1.1E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.6E-05	NA	mg/kg/day	3.0E-04	mg/kg/day	NA			
					Copper	1.4E+02	mg/kg	2.1E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA		
				Iron	2.7E+04	mg/kg	4.3E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA			
				Manganese	8.2E+02	mg/kg	1.3E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg/day	NA			
				Thallium	9.0E-01	mg/kg	1.4E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA			
				Vanadium	1.8E+01	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg/day	NA			
				Exp. Route Total										1.3E-04					0.0E+00
				Dermal Absorption	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA		
			4.7E-04			mg/kg	7.0E-11	mg/kg/day	3.0E+05	1/(mg/kg-day)	2.1E-05	NA	mg/kg/day	NA	NA				
			Arsenic		6.9E+00	mg/kg	1.0E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.5E-06	NA	mg/kg/day	3.0E-04	mg/kg/day	NA			
					Copper	1.4E+02	mg/kg	6.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA		
			Iron		2.7E+04	mg/kg	1.4E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA			
			Manganese		8.2E+02	mg/kg	4.0E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	8.0E-04	mg/kg/day	NA			
			Thallium		9.0E-01	mg/kg	4.5E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA			
			Vanadium		1.8E+01	mg/kg	9.1E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.6E-05	mg/kg/day	NA			
			Exp. Route Total										2.3E-05					0.0E+00	
			Exposure Point Total										1.5E-04					0.0E+00	
			Exposure Medium Total										1.5E-04					0.0E+00	
			Soil Total										1.5E-04					0.0E+00	
			Total of Receptor Risks Across All Media										1.5E-04	Total of Receptor Hazards Across All Media					0.0E+00

\* Combined surface and subsurface soil.

TABLE 7.18.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	4.5E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	5.0E-08	3.2E-04	mg/kg/day	6.0E-03	mg/kg/day	5.3E-02			
					4.7E-04	mg/kg	3.2E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	4.8E-06	2.2E-09	mg/kg/day	NA	NA	NA			
				2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	4.6E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.0E-07	3.2E-05	mg/kg/day	3.0E-04	mg/kg/day	1.1E-01			
					1.4E+02	mg/kg	9.2E-06	mg/kg/day	NA	NA	NA	6.4E-04	mg/kg/day	4.0E-02	mg/kg/day	1.6E-02			
				Copper	2.7E+04	mg/kg	1.8E-03	mg/kg/day	NA	NA	NA	1.3E-01	mg/kg/day	3.0E-01	mg/kg/day	4.3E-01			
					8.2E+02	mg/kg	5.5E-05	mg/kg/day	NA	NA	NA	3.8E-03	mg/kg/day	2.0E-02	mg/kg/day	1.9E-01			
				Iron	9.0E-01	mg/kg	6.1E-08	mg/kg/day	NA	NA	NA	4.2E-06	mg/kg/day	7.0E-05	mg/kg/day	6.1E-02			
					1.8E+01	mg/kg	1.2E-06	mg/kg/day	NA	NA	NA	8.6E-05	mg/kg/day	1.0E-03	mg/kg/day	8.6E-02			
				Manganese	Exp. Route Total							5.5E-06						9.5E-01	
					Dermal Absorption		Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
			4.7E-04	mg/kg	2.0E-12	mg/kg/day		3.0E+05	1/(mg/kg-day)	5.9E-07	1.4E-10	mg/kg/day	NA	NA	NA				
			2,3,7,8-TCDD (dioxin)	6.9E+00	mg/kg	2.9E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.3E-08	2.0E-06	mg/kg/day	3.0E-04	mg/kg/day	6.7E-03				
				1.4E+02	mg/kg	1.9E-07	mg/kg/day	NA	NA	NA	1.3E-05	mg/kg/day	4.0E-02	mg/kg/day	3.3E-04				
			Copper	2.7E+04	mg/kg	3.8E-05	mg/kg/day	NA	NA	NA	2.7E-03	mg/kg/day	3.0E-01	mg/kg/day	8.9E-03				
				8.2E+02	mg/kg	1.1E-06	mg/kg/day	NA	NA	NA	7.9E-05	mg/kg/day	8.0E-04	mg/kg/day	9.9E-02				
			Iron	9.0E-01	mg/kg	1.3E-09	mg/kg/day	NA	NA	NA	8.8E-08	mg/kg/day	7.0E-05	mg/kg/day	1.3E-03				
				1.8E+01	mg/kg	2.5E-08	mg/kg/day	NA	NA	NA	1.8E-06	mg/kg/day	2.6E-05	mg/kg/day	6.9E-02				
			Manganese	Exp. Route Total							6.3E-07						1.8E-01		
				Exposure Point Total							6.1E-06						1.1E+00		
			Exposure Medium Total							6.1E-06						1.1E+00			
			Soil Total							6.1E-06						1.1E+00			
										Total of Receptor Risks Across All Media						6.1E-06	Total of Receptor Hazards Across All Media		1.1E+00

\* Combined surface and subsurface soil.

TABLE 7.19.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	4.9E-04	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	3.0E-06	1.4E-03	mg/kg/day	NA	NA	NA	
			Exp. Route Total								3.0E-06					0.0E+00	
			Exposure Point Total									3.0E-06					0.0E+00
			Exposure Medium Total									3.0E-06					0.0E+00
<b>Soil Total</b>										<b>3.0E-06</b>					<b>0.0E+00</b>		
<b>Total of Receptor Risks Across All Media</b>										<b>3.0E-06</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>0.0E+00</b>	

\* Combined surface and subsurface soil.

TABLE 7.20.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	1.3E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	7.6E-08	9.8E-05	mg/kg/day	NA	NA	NA	
			Exp. Route Total								7.6E-08					0.0E+00	
			Exposure Point Total									7.6E-08					0.0E+00
			Exposure Medium Total									7.6E-08					0.0E+00
Soil Total										7.6E-08					0.0E+00		
Total of Receptor Risks Across All Media										7.6E-08	Total of Receptor Hazards Across All Media					0.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.21.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	NA	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	NA	5.8E-03	mg/kg/day	NA	NA	NA	
			Exp. Route Total								0.0E+00					0.0E+00	
			Exposure Point Total									0.0E+00					0.0E+00
			Exposure Medium Total									0.0E+00					0.0E+00
Soil Total										0.0E+00					0.0E+00		
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					0.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.22.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	NA	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	NA	2.0E-02	mg/kg/day	NA	NA	NA	
			Exp. Route Total								0.0E+00					0.0E+00	
			Exposure Point Total									0.0E+00					0.0E+00
			Exposure Medium Total									0.0E+00					0.0E+00
Soil Total										0.0E+00					0.0E+00		
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					0.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.23.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	3.7E-03	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	2.2E-05	NA	NA	NA	NA	NA	
			Exp. Route Total								2.2E-05					0.0E+00	
			Exposure Point Total									2.2E-05					0.0E+00
			Exposure Medium Total									2.2E-05					0.0E+00
Soil Total										2.2E-05					0.0E+00		
Total of Receptor Risks Across All Media										2.2E-05	Total of Receptor Hazards Across All Media				0.0E+00		

\* Combined surface and subsurface soil.

TABLE 7.24.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Solvent Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	7.8E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	4.7E-07	5.5E-03	mg/kg/day	NA	NA	NA	
			Exp. Route Total								4.7E-07					0.0E+00	
			Exposure Point Total									4.7E-07					0.0E+00
			Exposure Medium Total									4.7E-07					0.0E+00
Soil Total										4.7E-07					0.0E+00		
Total of Receptor Risks Across All Media										4.7E-07	Total of Receptor Hazards Across All Media					0.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.25.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Industrial Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	5.2E-07	mg/kg/day	5.4E-01	1/(mg/kg-day)	2.8E-07	1.5E-06	mg/kg/day	1.0E-02	mg/kg/day	1.5E-04
				Trichloroethene	6.4E+01	mg/kg	2.2E-05	mg/kg/day	1.1E-02	1/(mg/kg-day)	2.5E-07	6.3E-05	mg/kg/day	6.0E-03	mg/kg/day	1.0E-02
				Benzo(a)anthracene	7.0E+00	mg/kg	2.4E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.8E-06	6.8E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	2.4E-06	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.7E-05	6.6E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	3.0E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.2E-06	8.3E-06	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	2.3E-06	mg/kg/day	7.3E-02	1/(mg/kg-day)	1.7E-07	6.4E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	1.1E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.7E-07	2.9E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	8.4E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	6.1E-07	2.3E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	5.8E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	8.6E-06	1.6E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	8.3E-05	mg/kg/day	NA	NA	NA	2.3E-04	mg/kg/day	5.0E-02	mg/kg/day	4.6E-03
				RDX	1.9E+00	mg/kg	6.5E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	7.2E-08	1.8E-06	mg/kg/day	3.0E-03	mg/kg/day	6.1E-04
				Antimony	6.6E+00	mg/kg	2.3E-06	mg/kg/day	NA	NA	NA	6.5E-06	mg/kg/day	4.0E-04	mg/kg/day	1.6E-02
				Arsenic	1.3E+01	mg/kg	4.6E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	6.9E-06	1.3E-05	mg/kg/day	3.0E-04	mg/kg/day	4.3E-02
				Cadmium	7.6E+01	mg/kg	2.7E-05	mg/kg/day	NA	NA	NA	7.5E-05	mg/kg/day	1.0E-03	mg/kg/day	7.5E-02
				Chromium	6.7E+01	mg/kg	2.4E-05	mg/kg/day	NA	NA	NA	6.6E-05	mg/kg/day	3.0E-03	mg/kg/day	2.2E-02
				Copper	1.7E+03	mg/kg	5.8E-04	mg/kg/day	NA	NA	NA	1.6E-03	mg/kg/day	4.0E-02	mg/kg/day	4.1E-02
				Iron	3.8E+04	mg/kg	1.3E-02	mg/kg/day	NA	NA	NA	3.7E-02	mg/kg/day	3.0E-01	mg/kg/day	1.2E-01
				Lead	5.6E+02	mg/kg	2.0E-04	mg/kg/day	NA	NA	NA	5.5E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	4.5E-04	mg/kg/day	NA	NA	NA	1.3E-03	mg/kg/day	2.0E-02	mg/kg/day	6.3E-02
				Mercury	7.6E+00	mg/kg	2.6E-06	mg/kg/day	NA	NA	NA	7.4E-06	mg/kg/day	3.0E-04	mg/kg/day	2.5E-02
				Nickel	8.5E+01	mg/kg	3.0E-05	mg/kg/day	NA	NA	NA	8.3E-05	mg/kg/day	2.0E-02	mg/kg/day	4.1E-03
				Silver	3.5E+01	mg/kg	1.2E-05	mg/kg/day	NA	NA	NA	3.4E-05	mg/kg/day	5.0E-03	mg/kg/day	6.9E-03
				Thallium	1.2E+00	mg/kg	4.0E-07	mg/kg/day	NA	NA	NA	1.1E-06	mg/kg/day	7.0E-05	mg/kg/day	1.6E-02
				Vanadium	5.8E+01	mg/kg	2.0E-05	mg/kg/day	NA	NA	NA	5.7E-05	mg/kg/day	1.0E-03	mg/kg/day	5.7E-02
Zinc	1.2E+03	mg/kg	4.3E-04	mg/kg/day	NA	NA	NA	1.2E-03	mg/kg/day	3.0E-01	mg/kg/day	4.0E-03				
Exp. Route Total										3.9E-05					5.1E-01	



TABLE 7.26.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	5.4E-08	mg/kg/day	5.4E-01	1/(mg/kg-day)	2.9E-08	4.2E-07	mg/kg/day	1.0E-02	mg/kg/day	4.2E-05
				Trichloroethene	6.4E+01	mg/kg	2.3E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	2.5E-08	1.8E-05	mg/kg/day	6.0E-03	mg/kg/day	3.0E-03
				Benzo(a)anthracene	7.0E+00	mg/kg	2.5E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.8E-07	1.9E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	2.4E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.8E-06	1.9E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	3.0E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.2E-07	2.4E-06	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	2.3E-07	mg/kg/day	7.3E-02	1/(mg/kg-day)	1.7E-08	1.8E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	1.1E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.9E-08	8.4E-08	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	8.6E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	6.3E-08	6.7E-07	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	5.9E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	8.9E-07	4.6E-11	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	8.5E-06	mg/kg/day	NA	NA	NA	6.6E-05	mg/kg/day	5.0E-02	mg/kg/day	1.3E-03
				RDX	1.9E+00	mg/kg	6.7E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	7.4E-09	5.2E-07	mg/kg/day	3.0E-03	mg/kg/day	1.7E-04
				Antimony	6.6E+00	mg/kg	2.4E-07	mg/kg/day	NA	NA	NA	1.9E-06	mg/kg/day	4.0E-04	mg/kg/day	4.6E-03
				Arsenic	1.3E+01	mg/kg	4.7E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.1E-07	3.7E-06	mg/kg/day	3.0E-04	mg/kg/day	1.2E-02
				Cadmium	7.6E+01	mg/kg	2.7E-06	mg/kg/day	NA	NA	NA	2.1E-05	mg/kg/day	1.0E-03	mg/kg/day	2.1E-02
				Chromium	6.7E+01	mg/kg	2.4E-06	mg/kg/day	NA	NA	NA	1.9E-05	mg/kg/day	3.0E-03	mg/kg/day	6.3E-03
				Copper	1.7E+03	mg/kg	6.0E-05	mg/kg/day	NA	NA	NA	4.6E-04	mg/kg/day	4.0E-02	mg/kg/day	1.2E-02
				Iron	3.8E+04	mg/kg	1.4E-03	mg/kg/day	NA	NA	NA	1.1E-02	mg/kg/day	3.0E-01	mg/kg/day	3.5E-02
				Lead	5.6E+02	mg/kg	2.0E-05	mg/kg/day	NA	NA	NA	1.6E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	4.7E-05	mg/kg/day	NA	NA	NA	3.6E-04	mg/kg/day	2.0E-02	mg/kg/day	1.8E-02
				Mercury	7.6E+00	mg/kg	2.7E-07	mg/kg/day	NA	NA	NA	2.1E-06	mg/kg/day	3.0E-04	mg/kg/day	7.1E-03
				Nickel	8.5E+01	mg/kg	3.0E-06	mg/kg/day	NA	NA	NA	2.4E-05	mg/kg/day	2.0E-02	mg/kg/day	1.2E-03
				Silver	3.5E+01	mg/kg	1.3E-06	mg/kg/day	NA	NA	NA	9.8E-06	mg/kg/day	5.0E-03	mg/kg/day	2.0E-03
				Thallium	1.2E+00	mg/kg	4.2E-08	mg/kg/day	NA	NA	NA	3.2E-07	mg/kg/day	7.0E-05	mg/kg/day	4.6E-03
				Vanadium	5.8E+01	mg/kg	2.1E-06	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	1.0E-03	mg/kg/day	1.6E-02
				Zinc	1.2E+03	mg/kg	4.4E-05	mg/kg/day	NA	NA	NA	3.4E-04	mg/kg/day	3.0E-01	mg/kg/day	1.1E-03
			Exp. Route Total								4.0E-06					1.5E-01



TABLE 7.27.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	2.1E-06	mg/kg/day	1.0E-02	mg/kg/day	2.1E-04
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	8.8E-05	mg/kg/day	6.0E-03	mg/kg/day	1.5E-02
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	9.5E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	9.3E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.2E-05	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	8.9E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	4.1E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.3E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	2.3E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.2E-04	mg/kg/day	5.0E-02	mg/kg/day	6.5E-03
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	2.6E-06	mg/kg/day	3.0E-03	mg/kg/day	8.5E-04
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	9.1E-06	mg/kg/day	4.0E-04	mg/kg/day	2.3E-02
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	1.8E-05	mg/kg/day	3.0E-04	mg/kg/day	6.0E-02
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.0E-04	mg/kg/day	1.0E-03	mg/kg/day	1.0E-01
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	9.2E-05	mg/kg/day	3.0E-03	mg/kg/day	3.1E-02
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	2.3E-03	mg/kg/day	4.0E-02	mg/kg/day	5.7E-02
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	5.2E-02	mg/kg/day	3.0E-01	mg/kg/day	1.7E-01
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	7.7E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	1.8E-03	mg/kg/day	2.0E-02	mg/kg/day	8.9E-02
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.0E-05	mg/kg/day	3.0E-04	mg/kg/day	3.5E-02
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-04	mg/kg/day	2.0E-02	mg/kg/day	5.8E-03
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	4.8E-05	mg/kg/day	5.0E-03	mg/kg/day	9.6E-03
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-06	mg/kg/day	7.0E-05	mg/kg/day	2.3E-02
Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	8.0E-05	mg/kg/day	1.0E-03	mg/kg/day	8.0E-02				
Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	1.7E-03	mg/kg/day	3.0E-01	mg/kg/day	5.6E-03				
Exp. Route Total											0.0E+00				7.2E-01	

TABLE 7.27.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	4.9E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	4.8E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	6.0E-06	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	4.6E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	2.1E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.7E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	3.0E+05	1/(mg/kg-day)	NA	2.7E-11	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	7.7E-05	mg/kg/day	5.0E-02	mg/kg/day	1.5E-03
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	1.5E-06	mg/kg/day	3.0E-03	mg/kg/day	5.1E-04
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	3.6E-07	mg/kg/day	6.0E-05	mg/kg/day	6.1E-03
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	2.2E-06	mg/kg/day	3.0E-04	mg/kg/day	7.2E-03
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	4.2E-07	mg/kg/day	2.5E-05	mg/kg/day	1.7E-02
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.7E-06	mg/kg/day	7.5E-05	mg/kg/day	4.9E-02
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	9.1E-05	mg/kg/day	4.0E-02	mg/kg/day	2.3E-03
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	2.1E-03	mg/kg/day	3.0E-01	mg/kg/day	6.9E-03
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.1E-05	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	7.1E-05	mg/kg/day	8.0E-04	mg/kg/day	8.9E-02
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.1E-07	mg/kg/day	2.1E-05	mg/kg/day	2.0E-02
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	4.6E-06	mg/kg/day	8.0E-04	mg/kg/day	5.8E-03
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.9E-06	mg/kg/day	5.0E-03	mg/kg/day	3.8E-04
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	6.3E-08	mg/kg/day	7.0E-05	mg/kg/day	9.0E-04
			Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.2E-06	mg/kg/day	2.6E-05	mg/kg/day	1.2E-01	
			Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	6.7E-05	mg/kg/day	3.0E-01	mg/kg/day	2.2E-04	
			Exp. Route Total								0.0E+00				3.3E-01	
			Exposure Point Total								0.0E+00				1.0E+00	
			Exposure Medium Total								0.0E+00				1.0E+00	
Soil Total											0.0E+00				1.0E+00	
											0.0E+00				1.0E+00	
											0.0E+00				1.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.28.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	1.9E-05	mg/kg/day	1.0E-02	mg/kg/day	1.9E-03
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	8.2E-04	mg/kg/day	6.0E-03	mg/kg/day	1.4E-01
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	8.9E-05	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	8.7E-05	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.1E-04	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	8.3E-05	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	3.9E-06	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.1E-05	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	2.1E-09	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.0E-03	mg/kg/day	5.0E-02	mg/kg/day	6.0E-02
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	2.4E-05	mg/kg/day	3.0E-03	mg/kg/day	7.9E-03
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	8.5E-05	mg/kg/day	4.0E-04	mg/kg/day	2.1E-01
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	1.7E-04	mg/kg/day	3.0E-04	mg/kg/day	5.6E-01
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	9.8E-04	mg/kg/day	1.0E-03	mg/kg/day	9.8E-01
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	8.6E-04	mg/kg/day	3.0E-03	mg/kg/day	2.9E-01
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	2.1E-02	mg/kg/day	4.0E-02	mg/kg/day	5.3E-01
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	4.8E-01	mg/kg/day	3.0E-01	mg/kg/day	1.6E+00
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	7.1E-03	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	1.7E-02	mg/kg/day	2.0E-02	mg/kg/day	8.3E-01
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	9.7E-05	mg/kg/day	3.0E-04	mg/kg/day	3.2E-01
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.1E-03	mg/kg/day	2.0E-02	mg/kg/day	5.4E-02
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	4.5E-04	mg/kg/day	5.0E-03	mg/kg/day	9.0E-02
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.5E-05	mg/kg/day	7.0E-05	mg/kg/day	2.1E-01
Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	7.5E-04	mg/kg/day	1.0E-03	mg/kg/day	7.5E-01				
Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-02	mg/kg/day	3.0E-01	mg/kg/day	5.2E-02				
Exp. Route Total										0.0E+00					6.7E+00	

TABLE 7.28.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.2E-05	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	3.2E-05	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.9E-05	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	3.0E-05	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	1.4E-06	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.1E-05	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	3.0E+05	1/(mg/kg-day)	NA	1.8E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	5.1E-05	mg/kg/day	5.0E-02	mg/kg/day	1.0E-03
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	1.0E-06	mg/kg/day	3.0E-03	mg/kg/day	3.3E-04
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.4E-06	mg/kg/day	6.0E-05	mg/kg/day	4.0E-02
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	1.4E-05	mg/kg/day	3.0E-04	mg/kg/day	4.7E-02
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.7E-06	mg/kg/day	2.5E-05	mg/kg/day	1.1E-01
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.4E-05	mg/kg/day	7.5E-05	mg/kg/day	3.2E-01
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	5.9E-04	mg/kg/day	4.0E-02	mg/kg/day	1.5E-02
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.4E-02	mg/kg/day	3.0E-01	mg/kg/day	4.5E-02
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.0E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	4.6E-04	mg/kg/day	8.0E-04	mg/kg/day	5.8E-01
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.7E-06	mg/kg/day	2.1E-05	mg/kg/day	1.3E-01
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.0E-05	mg/kg/day	8.0E-04	mg/kg/day	3.8E-02
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.3E-05	mg/kg/day	5.0E-03	mg/kg/day	2.5E-03
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.1E-07	mg/kg/day	7.0E-05	mg/kg/day	5.9E-03
			Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.1E-05	mg/kg/day	2.6E-05	mg/kg/day	8.1E-01	
			Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	4.4E-04	mg/kg/day	3.0E-01	mg/kg/day	1.5E-03	
			Exp. Route Total							0.0E+00					2.1E+00	
			Exposure Point Total							0.0E+00					8.8E+00	
			Exposure Medium Total							0.0E+00					8.8E+00	
Soil Total										0.0E+00					8.8E+00	
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					8.8E+00

\* Combined surface and subsurface soil.

TABLE 7.29.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	2.3E-06	mg/kg/day	5.4E-01	1/(mg/kg-day)	1.3E-06	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	1.0E-04	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.1E-06	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	1.1E-05	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.9E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	1.1E-05	mg/kg/day	7.3E+00	1/(mg/kg-day)	7.7E-05	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	1.3E-05	mg/kg/day	7.3E-01	1/(mg/kg-day)	9.6E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	1.0E-05	mg/kg/day	7.3E-02	1/(mg/kg-day)	7.4E-07	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	4.7E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.4E-06	NA	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	3.7E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.7E-06	NA	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	2.6E-10	mg/kg/day	1.5E+05	1/(mg/kg-day)	3.9E-05	NA	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	3.7E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	5.0E-02	mg/kg/day	NA
				RDX	1.9E+00	mg/kg	2.9E-06	mg/kg/day	1.1E-01	1/(mg/kg-day)	3.2E-07	NA	mg/kg/day	3.0E-03	mg/kg/day	NA
				Antimony	6.6E+00	mg/kg	1.0E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-04	mg/kg/day	NA
				Arsenic	1.3E+01	mg/kg	2.1E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.1E-05	NA	mg/kg/day	3.0E-04	mg/kg/day	NA
				Cadmium	7.6E+01	mg/kg	1.2E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg/day	NA
				Chromium	6.7E+01	mg/kg	1.1E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-03	mg/kg/day	NA
				Copper	1.7E+03	mg/kg	2.6E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA
				Iron	3.8E+04	mg/kg	5.9E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA
				Lead	5.6E+02	mg/kg	8.7E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	2.0E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg/day	NA
				Mercury	7.6E+00	mg/kg	1.2E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	NA
				Nickel	8.5E+01	mg/kg	1.3E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg/day	NA
				Silver	3.5E+01	mg/kg	5.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	5.0E-03	mg/kg/day	NA
				Thallium	1.2E+00	mg/kg	1.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA
				Vanadium	5.8E+01	mg/kg	9.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg/day	NA
Zinc	1.2E+03	mg/kg	1.9E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA				
Exp. Route Total										1.7E-04					0.0E+00	



TABLE 7.30.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	1.0E-07	mg/kg/day	5.4E-01	1/(mg/kg-day)	5.4E-08	3.7E-06	mg/kg/day	1.0E-01	mg/kg/day	3.7E-05
				Trichloroethene	6.4E+01	mg/kg	4.3E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	4.7E-08	1.6E-04	mg/kg/day	6.0E-03	mg/kg/day	2.6E-02
				Benzo(a)anthracene	7.0E+00	mg/kg	4.7E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	3.4E-07	1.7E-05	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	4.5E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.3E-06	1.7E-05	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	5.7E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.1E-07	2.1E-05	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	4.4E-07	mg/kg/day	7.3E-02	1/(mg/kg-day)	3.2E-08	1.6E-05	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	2.0E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.5E-07	7.4E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	1.6E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.2E-07	5.9E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	1.1E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.7E-06	4.0E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	1.6E-05	mg/kg/day	NA	NA	NA	5.8E-04	mg/kg/day	5.0E-02	mg/kg/day	1.2E-02
				RDX	1.9E+00	mg/kg	1.2E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.4E-08	4.5E-06	mg/kg/day	3.0E-03	mg/kg/day	1.5E-03
				Antimony	6.6E+00	mg/kg	4.5E-07	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	2.0E-04	mg/kg/day	8.1E-02
				Arsenic	1.3E+01	mg/kg	8.9E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.3E-06	3.2E-05	mg/kg/day	3.0E-04	mg/kg/day	1.1E-01
				Cadmium	7.6E+01	mg/kg	5.1E-06	mg/kg/day	NA	NA	NA	1.9E-04	mg/kg/day	1.0E-03	mg/kg/day	1.9E-01
				Chromium	6.7E+01	mg/kg	4.5E-06	mg/kg/day	NA	NA	NA	1.6E-04	mg/kg/day	2.0E-02	mg/kg/day	8.2E-03
				Copper	1.7E+03	mg/kg	1.1E-04	mg/kg/day	NA	NA	NA	4.1E-03	mg/kg/day	4.0E-02	mg/kg/day	1.0E-01
				Iron	3.8E+04	mg/kg	2.5E-03	mg/kg/day	NA	NA	NA	9.2E-02	mg/kg/day	3.0E-01	mg/kg/day	3.1E-01
				Lead	5.6E+02	mg/kg	3.7E-05	mg/kg/day	NA	NA	NA	1.4E-03	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	8.7E-05	mg/kg/day	NA	NA	NA	3.2E-03	mg/kg/day	2.0E-02	mg/kg/day	1.6E-01
				Mercury	7.6E+00	mg/kg	5.1E-07	mg/kg/day	NA	NA	NA	1.9E-05	mg/kg/day	3.0E-04	mg/kg/day	6.2E-02
				Nickel	8.5E+01	mg/kg	5.7E-06	mg/kg/day	NA	NA	NA	2.1E-04	mg/kg/day	2.0E-02	mg/kg/day	1.0E-02
				Silver	3.5E+01	mg/kg	2.4E-06	mg/kg/day	NA	NA	NA	8.6E-05	mg/kg/day	5.0E-03	mg/kg/day	1.7E-02
				Thallium	1.2E+00	mg/kg	7.8E-08	mg/kg/day	NA	NA	NA	2.8E-06	mg/kg/day	7.0E-05	mg/kg/day	4.0E-02
Vanadium	5.8E+01	mg/kg	3.9E-06	mg/kg/day	NA	NA	NA	1.4E-04	mg/kg/day	7.0E-03	mg/kg/day	2.0E-02				
Zinc	1.2E+03	mg/kg	8.2E-05	mg/kg/day	NA	NA	NA	3.0E-03	mg/kg/day	3.0E-01	mg/kg/day	1.0E-02				
Exp. Route Total										7.5E-06					1.2E+00	



TABLE 7.31.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	mg/m <sup>3</sup>	7.5E-05	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	1.5E-06	2.1E-04	mg/kg/day	1.4E-01	mg/kg/day	1.5E-03
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	4.7E-04	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	2.8E-06	1.3E-03	mg/kg/day	NA	mg/kg/day	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	1.2E-09	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	4.9E-08	3.3E-09	mg/kg/day	2.9E-05	mg/kg/day	1.2E-04
				Exp. Route Total							4.3E-06					1.6E-03
				Exposure Point Total							4.3E-06					
	Exposure Medium Total							4.3E-06						1.6E-03		
Soil Total								4.3E-06						1.6E-03		
Total of Receptor Risks Across All Media										4.3E-06	Total of Receptor Hazards Across All Media					1.6E-03

\* Combined surface and subsurface soil.

TABLE 7.32.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	mg/m <sup>3</sup>	1.9E-06	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	3.9E-08	1.5E-05	mg/kg/day	1.4E-01	mg/kg/day	1.1E-04
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	1.2E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	7.2E-08	9.3E-05	mg/kg/day	NA	NA	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	3.0E-11	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	1.2E-09	2.4E-10	mg/kg/day	2.9E-05	mg/kg/day	8.3E-06
				Exp. Route Total												
		Exposure Point Total														1.2E-04
		Exposure Medium Total														1.2E-04
		Soil Total														1.2E-04
Total of Receptor Risks Across All Media										1.1E-07	Total of Receptor Hazards Across All Media					1.2E-04

\* Combined surface and subsurface soil.

TABLE 7.33.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	mg/m <sup>3</sup>	NA	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	NA	8.9E-04	mg/kg/day	1.4E-01	mg/kg/day	6.4E-03
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	NA	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	NA	5.5E-03	mg/kg/day	NA	NA	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	NA	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	NA	1.4E-08	mg/kg/day	2.9E-05	mg/kg/day	4.9E-04
				Exp. Route Total												
		Exposure Point Total														6.8E-03
		Exposure Medium Total														6.8E-03
		Soil Total														6.8E-03
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					6.8E-03

\* Combined surface and subsurface soil.

TABLE 7.34.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	mg/m <sup>3</sup>	NA	mg/kg/day	2.00E-02	(mg/kg/d) <sup>-1</sup>	NA	3.0E-03	mg/kg/day	1.4E-01	mg/kg/day	2.1E-02
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	NA	mg/kg/day	6.00E-03	(mg/kg/d) <sup>-1</sup>	NA	1.8E-02	mg/kg/day	NA	NA	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	NA	mg/kg/day	4.10E+01	(mg/kg/d) <sup>-1</sup>	NA	4.7E-08	mg/kg/day	2.9E-05	mg/kg/day	1.6E-03
				Exp. Route Total							0.0E+00					2.3E-02
		Exposure Point Total													0.0E+00	2.3E-02
		Exposure Medium Total													0.0E+00	2.3E-02
		Soil Total													0.0E+00	2.3E-02
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					2.3E-02

\* Combined surface and subsurface soil.

TABLE 7.35.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	mg/m <sup>3</sup>	5.6E-04	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	1.1E-05	NA	mg/kg/day	1.4E-01	mg/kg/day	NA
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	3.5E-03	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	2.1E-05	NA	mg/kg/day	NA	mg/kg/day	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	8.8E-09	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	3.6E-07	NA	mg/kg/day	2.9E-05	mg/kg/day	NA
				Exp. Route Total							3.2E-05					
		Exposure Point Total								3.2E-05						0.0E+00
		Exposure Medium Total								3.2E-05						0.0E+00
		Soil Total								3.2E-05						0.0E+00
Total of Receptor Risks Across All Media										3.2E-05	Total of Receptor Hazards Across All Media					0.0E+00

\* Combined surface and subsurface soil.

TABLE 7.36.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	mg/m <sup>3</sup>	1.2E-05	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	2.4E-07	8.4E-04	mg/kg/day	1.4E-01	mg/kg/day	6.0E-03			
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	7.4E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	4.4E-07	5.2E-03	mg/kg/day	NA	mg/kg/day	NA			
				Chromium	5.1E-08	mg/m <sup>3</sup>	1.9E-10	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	7.7E-09	1.3E-08	mg/kg/day	2.9E-05	mg/kg/day	4.6E-04			
				Exp. Route Total														6.9E-07	
		Exposure Point Total																6.9E-07	6.5E-03
		Exposure Medium Total																6.9E-07	6.5E-03
		Soil Total																6.9E-07	6.5E-03
Total of Receptor Risks Across All Media										6.9E-07	Total of Receptor Hazards Across All Media					6.5E-03			

\* Combined surface and subsurface soil.

TABLE 7.37.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	1.6E-07	mg/kg/day	5.4E-01	1/(mg/kg-day)	8.8E-08	4.6E-07	mg/kg/day	1.0E-02	mg/kg/day	4.6E-05
				Trichloroethene	1.0E+00	mg/kg	3.5E-07	mg/kg/day	1.1E-02	1/(mg/kg-day)	3.9E-09	9.9E-07	mg/kg/day	6.0E-03	mg/kg/day	1.6E-04
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	5.8E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	8.7E-06	1.6E-10	mg/kg/day	NA	NA	NA
				RDX	6.7E+00	mg/kg	2.3E-06	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.6E-07	6.5E-06	mg/kg/day	3.0E-03	mg/kg/day	2.2E-03
				Arsenic	7.0E+00	mg/kg	2.4E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.6E-06	6.8E-06	mg/kg/day	3.0E-04	mg/kg/day	2.3E-02
				Iron	2.9E+04	mg/kg	1.0E-02	mg/kg/day	NA	NA	NA	2.8E-02	mg/kg/day	3.0E-01	mg/kg/day	9.3E-02
				Lead	1.6E+02	mg/kg	5.5E-05	mg/kg/day	NA	NA	NA	1.5E-04	mg/kg/day	NA	NA	NA
Exp. Route Total											1.3E-05					1.2E-01
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	#REF!	NA
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	1.2E-11	mg/kg/day	3.0E+05	1/(mg/kg-day)	3.5E-06	3.2E-11	mg/kg/day	NA	NA	NA
				RDX	6.7E+00	mg/kg	2.3E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.5E-08	6.5E-07	mg/kg/day	3.0E-03	mg/kg/day	2.2E-04
				Arsenic	7.0E+00	mg/kg	4.8E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.2E-07	1.3E-06	mg/kg/day	3.0E-04	mg/kg/day	4.5E-03
				Iron	2.9E+04	mg/kg	6.6E-04	mg/kg/day	NA	NA	NA	1.8E-03	mg/kg/day	3.0E-01	mg/kg/day	6.2E-03
				Lead	1.6E+02	mg/kg	3.7E-06	mg/kg/day	NA	NA	NA	1.0E-05	mg/kg/day	NA	NA	NA
Exp. Route Total											4.2E-06					1.1E-02
		Exposure Point Total									1.7E-05					1.3E-01
		Exposure Medium Total									1.7E-05					1.3E-01
Soil Total											1.7E-05					1.3E-01
Total of Receptor Risks Across All Media										1.7E-05	Total of Receptor Hazards Across All Media					1.3E-01

\* Combined surface and subsurface soil.

TABLE 7.38.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	1.7E-08	mg/kg/day	5.4E-01	1/(mg/kg-day)	9.1E-09	1.3E-07	mg/kg/day	1.0E-02	mg/kg/day	1.3E-05	
				Trichloroethene	1.0E+00	mg/kg	3.6E-08	mg/kg/day	1.1E-02	1/(mg/kg-day)	4.0E-10	2.8E-07	mg/kg/day	6.0E-03	mg/kg/day	4.7E-05	
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	6.0E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	9.0E-07	4.7E-11	mg/kg/day	NA	NA	NA	
				RDX	6.7E+00	mg/kg	2.4E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.6E-08	1.9E-06	mg/kg/day	3.0E-03	mg/kg/day	6.2E-04	
				Arsenic	7.0E+00	mg/kg	2.5E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.7E-07	1.9E-06	mg/kg/day	3.0E-04	mg/kg/day	6.5E-03	
				Iron	2.9E+04	mg/kg	1.0E-03	mg/kg/day	NA	NA	NA	8.0E-03	mg/kg/day	3.0E-01	mg/kg/day	2.7E-02	
				Lead	1.6E+02	mg/kg	5.7E-06	mg/kg/day	NA	NA	NA	4.4E-05	mg/kg/day	NA	NA	NA	
Exp. Route Total										1.3E-06					3.4E-02		
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	#REF!	NA	
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	2.9E-12	mg/kg/day	3.0E+05	1/(mg/kg-day)	8.6E-07	2.2E-11	mg/kg/day	NA	NA	NA	NA
				RDX	6.7E+00	mg/kg	5.7E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	6.3E-09	4.4E-07	mg/kg/day	3.0E-03	mg/kg/day	1.5E-04	
				Arsenic	7.0E+00	mg/kg	1.2E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.8E-07	9.3E-07	mg/kg/day	3.0E-04	mg/kg/day	3.1E-03	
				Iron	2.9E+04	mg/kg	1.6E-04	mg/kg/day	NA	NA	NA	1.3E-03	mg/kg/day	3.0E-01	mg/kg/day	4.2E-03	
				Lead	1.6E+02	mg/kg	9.0E-07	mg/kg/day	NA	NA	NA	7.0E-06	mg/kg/day	NA	NA	NA	NA
Exp. Route Total										1.0E-06					7.5E-03		
Exposure Point Total										2.4E-06					4.1E-02		
Exposure Medium Total										2.4E-06					4.1E-02		
Soil Total										2.4E-06					4.1E-02		
Total of Receptor Risks Across All Media										2.4E-06	Total of Receptor Hazards Across All Media					4.1E-02	

\* Combined surface and subsurface soil.

TABLE 7.39.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	6.4E-07	mg/kg/day	1.0E-02	mg/kg-day	6.4E-05
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	1.4E-06	mg/kg/day	6.0E-02	mg/kg-day	2.3E-05
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	2.3E-10	mg/kg/day	NA	NA	NA
				Perchlorate	9.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.3E-05	mg/kg/day	7.0E-04	mg/kg-day	1.9E-02
				RDX	6.7E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	9.1E-06	mg/kg/day	3.0E-03	mg/kg-day	3.0E-03
				Antimony	3.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.1E-06	mg/kg/day	4.0E-04	mg/kg-day	1.0E-02
				Arsenic	7.0E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	9.5E-06	mg/kg/day	3.0E-04	mg/kg-day	3.2E-02
				Cadmium	4.5E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	6.2E-06	mg/kg/day	1.0E-03	mg/kg-day	6.2E-03
				Chromium	1.4E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.0E-05	mg/kg/day	3.0E-03	mg/kg-day	6.5E-03
				Copper	2.5E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.4E-04	mg/kg/day	4.0E-02	mg/kg-day	8.5E-03
				Iron	2.9E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	3.9E-02	mg/kg/day	3.0E-01	mg/kg-day	1.3E-01
				Lead	1.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.2E-04	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-03	mg/kg/day	2.0E-02	mg/kg-day	6.2E-02
				Mercury	2.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.7E-06	mg/kg/day	3.0E-04	mg/kg-day	9.1E-03
				Thallium	1.3E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.7E-06	mg/kg/day	7.0E-05	mg/kg-day	2.5E-02
Vanadium	2.2E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.0E-05	mg/kg/day	1.0E-03	mg/kg-day	3.0E-02				
Exp. Route Total										NA					3.4E-01	
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg-day	NA
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-02	mg/kg-day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	2.7E-11	mg/kg/day	NA	NA	NA
				Perchlorate	9.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	5.3E-08	mg/kg/day	7.0E-04	mg/kg-day	7.5E-05
				RDX	6.7E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	5.5E-07	mg/kg/day	3.0E-03	mg/kg-day	1.8E-04
				Antimony	3.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-08	mg/kg/day	4.0E-04	mg/kg-day	4.1E-05
				Arsenic	7.0E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	3.0E-04	mg/kg-day	3.8E-03
				Cadmium	4.5E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.5E-08	mg/kg/day	2.5E-05	mg/kg-day	9.9E-04
				Chromium	1.4E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	7.8E-08	mg/kg/day	7.5E-05	mg/kg-day	1.0E-03
				Copper	2.5E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.4E-06	mg/kg/day	4.0E-02	mg/kg-day	3.4E-05
				Iron	2.9E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-04	mg/kg/day	3.0E-01	mg/kg-day	5.2E-04
				Lead	1.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	8.7E-07	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	5.0E-06	mg/kg/day	8.0E-04	mg/kg-day	6.2E-03
				Mercury	2.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.1E-08	mg/kg/day	2.1E-05	mg/kg-day	5.2E-04
				Thallium	1.3E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	6.9E-09	mg/kg/day	7.0E-05	mg/kg-day	9.8E-05
Vanadium	2.2E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-07	mg/kg/day	2.6E-05	mg/kg-day	4.6E-03				
Exp. Route Total										NA					1.8E-02	
Exposure Point Total										NA						3.6E-01
Exposure Medium Total										NA						3.6E-01
Soil Total										NA						3.6E-01
Total of Receptor Risks Across All Media										NA	Total of Receptor Hazards Across All Media					3.6E-01

\* Combined surface and subsurface soil.

TABLE 7.40.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE

Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	6.0E-06	mg/kg/day	1.0E-02	mg/kg-day	6.0E-04
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	1.3E-05	mg/kg/day	6.0E-02	mg/kg-day	2.2E-04
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	2.1E-09	mg/kg/day	NA	NA	NA
				Perchlorate	9.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-04	mg/kg/day	7.0E-04	mg/kg-day	1.8E-01
				RDX	6.7E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	8.5E-05	mg/kg/day	3.0E-03	mg/kg-day	2.8E-02
				Antimony	3.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	3.8E-05	mg/kg/day	4.0E-04	mg/kg-day	9.5E-02
				Arsenic	7.0E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	8.9E-05	mg/kg/day	3.0E-04	mg/kg-day	3.0E-01
				Cadmium	4.5E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	5.8E-05	mg/kg/day	1.0E-03	mg/kg-day	5.8E-02
				Chromium	1.4E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.8E-04	mg/kg/day	3.0E-03	mg/kg-day	6.1E-02
				Copper	2.5E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.2E-03	mg/kg/day	4.0E-02	mg/kg-day	7.9E-02
				Iron	2.9E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	3.7E-01	mg/kg/day	3.0E-01	mg/kg-day	1.2E+00
				Lead	1.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.0E-03	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-02	mg/kg/day	2.0E-02	mg/kg-day	5.8E-01
				Mercury	2.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.6E-05	mg/kg/day	3.0E-04	mg/kg-day	8.5E-02
				Thallium	1.3E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	7.0E-05	mg/kg-day	2.3E-01
				Vanadium	2.2E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.8E-04	mg/kg/day	1.0E-03	mg/kg-day	2.8E-01
				Exp. Route Total										0.0E+00		
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg-day	NA
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-02	mg/kg-day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	1.8E-10	mg/kg/day	NA	NA	NA
				Perchlorate	9.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	3.4E-07	mg/kg/day	7.0E-04	mg/kg-day	4.9E-04
				RDX	6.7E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	3.6E-06	mg/kg/day	3.0E-03	mg/kg-day	1.2E-03
				Antimony	3.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.1E-07	mg/kg/day	4.0E-04	mg/kg-day	2.7E-04
				Arsenic	7.0E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	7.5E-06	mg/kg/day	3.0E-04	mg/kg-day	2.5E-02
				Cadmium	4.5E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-07	mg/kg/day	2.5E-05	mg/kg-day	6.5E-03
				Chromium	1.4E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	5.1E-07	mg/kg/day	7.5E-05	mg/kg-day	6.8E-03
				Copper	2.5E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	8.9E-06	mg/kg/day	4.0E-02	mg/kg-day	2.2E-04
				Iron	2.9E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.0E-03	mg/kg/day	3.0E-01	mg/kg-day	3.4E-03
				Lead	1.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	5.7E-06	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.2E-05	mg/kg/day	8.0E-04	mg/kg-day	4.1E-02
				Mercury	2.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	7.1E-08	mg/kg/day	2.1E-05	mg/kg-day	3.4E-03
				Thallium	1.3E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.5E-08	mg/kg/day	7.0E-05	mg/kg-day	6.4E-04
				Vanadium	2.2E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	7.9E-07	mg/kg/day	2.6E-05	mg/kg-day	3.0E-02
				Exp. Route Total										0.0E+00		
Exposure Point Total										0.0E+00						3.3E+00
Exposure Medium Total										0.0E+00						3.3E+00
Soil Total										0.0E+00						3.3E+00
										0.0E+00						3.3E+00
										0.0E+00						3.3E+00

\* Combined surface and subsurface soil.

TABLE 7.41.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE

Site 1 Burning Grounds

Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	7.3E-07	mg/kg/day	5.4E-01	1/(mg/kg-day)	3.9E-07	NA	mg/kg/day	1.0E-02	mg/kg-day	NA
				Trichloroethene	1.0E+00	mg/kg	1.6E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.7E-08	NA	mg/kg/day	6.0E-02	mg/kg-day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	2.6E-10	mg/kg/day	1.5E+05	1/(mg/kg-day)	3.9E-05	NA	mg/kg/day	NA	mg/kg-day	NA
				Perchlorate	9.6E+00	mg/kg	1.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-04	mg/kg-day	NA
				RDX	6.7E+00	mg/kg	1.0E-05	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.1E-06	NA	mg/kg/day	3.0E-03	mg/kg-day	NA
				Antimony	3.0E+00	mg/kg	4.7E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-04	mg/kg-day	NA
				Arsenic	7.0E+00	mg/kg	1.1E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.6E-05	NA	mg/kg/day	3.0E-04	mg/kg-day	NA
				Cadmium	4.5E+00	mg/kg	7.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg-day	NA
				Chromium	1.4E+01	mg/kg	2.2E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-03	mg/kg-day	NA
				Copper	2.5E+02	mg/kg	3.9E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg-day	NA
				Iron	2.9E+04	mg/kg	4.5E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg-day	NA
				Lead	1.6E+02	mg/kg	2.5E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	1.4E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg-day	NA
				Mercury	2.0E+00	mg/kg	3.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-04	mg/kg-day	NA
				Thallium	1.3E+00	mg/kg	2.0E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg-day	NA
				Vanadium	2.2E+01	mg/kg	3.4E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg-day	NA
				Exp. Route Total										5.7E-05		
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg-day	NA
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-02	mg/kg-day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	2.5E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	3.7E-06	NA	mg/kg/day	NA	mg/kg-day	NA
				Perchlorate	9.6E+00	mg/kg	4.8E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-04	mg/kg-day	NA
				RDX	6.7E+00	mg/kg	5.0E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	5.4E-08	NA	mg/kg/day	3.0E-03	mg/kg-day	NA
				Antimony	3.0E+00	mg/kg	1.5E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-04	mg/kg-day	NA
				Arsenic	7.0E+00	mg/kg	1.0E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.5E-06	NA	mg/kg/day	3.0E-04	mg/kg-day	NA
				Cadmium	4.5E+00	mg/kg	2.2E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.5E-05	mg/kg-day	NA
				Chromium	1.4E+01	mg/kg	7.1E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.5E-05	mg/kg-day	NA
				Copper	2.5E+02	mg/kg	1.2E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg-day	NA
				Iron	2.9E+04	mg/kg	1.4E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg-day	NA
				Lead	1.6E+02	mg/kg	7.8E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	4.5E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	8.0E-04	mg/kg-day	NA
				Mercury	2.0E+00	mg/kg	9.9E-09	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.1E-05	mg/kg-day	NA
				Thallium	1.3E+00	mg/kg	6.2E-09	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg-day	NA
				Vanadium	2.2E+01	mg/kg	1.1E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.6E-05	mg/kg-day	NA
				Exp. Route Total										5.3E-06		
Exposure Point Total										6.2E-05					NA	
Exposure Medium Total										6.2E-05					NA	
Soil Total										6.2E-05					NA	
Total of Receptor Risks Across All Media										6.2E-05	Total of Receptor Hazards Across All Media				NA	

\* Combined surface and subsurface soil.

TABLE 7.42.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	3.1E-08	mg/kg/day	5.4E-01	1/(mg/kg-day)	1.7E-08	2.2E-06	mg/kg/day	1.0E-01	mg/kg/day	2.2E-05
				Trichloroethene	1.0E+00	mg/kg	6.8E-08	mg/kg/day	1.1E-02	1/(mg/kg-day)	7.5E-10	4.8E-06	mg/kg/day	6.0E-03	mg/kg/day	7.9E-04
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	1.1E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.7E-06	7.8E-10	mg/kg/day	NA	NA	NA
				RDX	6.7E+00	mg/kg	4.5E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	4.9E-08	3.1E-05	mg/kg/day	3.0E-03	mg/kg/day	1.0E-02
				Arsenic	7.0E+00	mg/kg	4.7E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.0E-07	3.3E-05	mg/kg/day	3.0E-04	mg/kg/day	1.1E-01
				Iron	2.9E+04	mg/kg	1.9E-03	mg/kg/day	NA	NA	NA	1.3E-01	mg/kg/day	3.0E-01	mg/kg/day	4.5E-01
				Lead	1.6E+02	mg/kg	1.1E-05	mg/kg/day	NA	NA	NA	7.4E-04	mg/kg/day	NA	NA	NA
Exp. Route Total											2.4E-06					5.7E-01
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	NA
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	6.9E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	2.1E-07	4.9E-11	mg/kg/day	NA	NA	NA
				RDX	6.7E+00	mg/kg	1.4E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.5E-09	9.7E-07	mg/kg/day	3.0E-03	mg/kg/day	3.2E-04
				Arsenic	7.0E+00	mg/kg	2.9E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.3E-08	2.0E-06	mg/kg/day	3.0E-04	mg/kg/day	6.7E-03
				Iron	2.9E+04	mg/kg	4.0E-05	mg/kg/day	NA	NA	NA	2.8E-03	mg/kg/day	3.0E-01	mg/kg/day	9.2E-03
				Lead	1.6E+02	mg/kg	2.2E-07	mg/kg/day	NA	NA	NA	1.5E-05	mg/kg/day	NA	NA	NA
Exp. Route Total											2.5E-07					1.6E-02
Exposure Point Total										2.7E-06					5.8E-01	
Exposure Medium Total										2.7E-06					5.8E-01	
Soil Total										2.7E-06					5.8E-01	
Total of Receptor Risks Across All Media										2.7E-06	Total of Receptor Hazards Across All Media					5.8E-01

\* Combined surface and subsurface soil.

TABLE 7.43.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	3.2E-04	mg/m <sup>3</sup>	7.4E-06	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	4.4E-08	2.1E-05	mg/kg/day	NA	mg/kg/day	NA	
			Exp. Route Total								4.4E-08					0.0E+00	
			Exposure Point Total									4.4E-08					0.0E+00
			Exposure Medium Total									4.4E-08					0.0E+00
Soil Total										4.4E-08					0.0E+00		
Total of Receptor Risks Across All Media										4.4E-08	Total of Receptor Hazards Across All Media					0.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.441.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Trespasser/Visitor
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	3.2E-04	mg/m <sup>3</sup>	1.9E-07	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	1.1E-09	1.5E-06	mg/kg/day	NA	mg/kg/day	NA	
			Exp. Route Total								1.1E-09					0.0E+00	
			Exposure Point Total									1.1E-09					0.0E+00
			Exposure Medium Total									1.1E-09					0.0E+00
Soil Total										1.1E-09					0.0E+00		
Total of Receptor Risks Across All Media										1.1E-09	Total of Receptor Hazards Across All Media					0.0E+00	

\* Combined surface and subsurface soil.

TABLE 7.45.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	3.2E-04	mg/m <sup>3</sup>	NA	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	NA	8.7E-05	mg/kg/day	NA	NA	NA			
																	Exp. Route Total	NA	0.0E+00
																	Exposure Point Total	NA	0.0E+00
																	Exposure Medium Total	NA	0.0E+00
Soil Total																	NA	0.0E+00	
Total of Receptor Risks Across All Media											NA	Total of Receptor Hazards Across All Media				0.0E+00			

\* Combined surface and subsurface soil.

TABLE 7.46.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-04	mg/m <sup>3</sup>	NA	mg/kg/day	6.00E-03	(mg/kg/d) <sup>-1</sup>	NA	2.9E-04	mg/kg/day	NA	NA	NA	
							Exp. Route Total					NA					
							Exposure Point Total					NA					
							Exposure Medium Total					NA					
Soil Total											NA						
Total of Receptor Risks Across All Media											NA	Total of Receptor Hazards Across All Media					0.0E+00

\* Combined surface and subsurface soil.

TABLE 7.47.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-04	mg/m <sup>3</sup>	5.5E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	3.3E-07	NA	mg/kg/day	NA	NA	NA
			Exp. Route Total								3.3E-07				NA	
			Exposure Point Total								3.3E-07					NA
			Exposure Medium Total								3.3E-07					NA
Soil Total										3.3E-07					NA	
Total of Receptor Risks Across All Media										3.3E-07	Total of Receptor Hazards Across All Media				NA	

\* Combined surface and subsurface soil.

TABLE 7.48.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	3.2E-04	mg/m <sup>3</sup>	1.2E-06	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	7.0E-09	8.2E-05	mg/kg/day	NA	mg/kg/day	NA	
			Exp. Route Total								7.0E-09					0.0E+00	
			Exposure Point Total									7.0E-09					0.0E+00
			Exposure Medium Total									7.0E-09					0.0E+00
<b>Soil Total</b>										<b>7.0E-09</b>						<b>0.0E+00</b>	
<b>Total of Receptor Risks Across All Media</b>										<b>7.0E-09</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>0.0E+00</b>	

\* Combined surface and subsurface soil.

TABLE 7.49.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current/Future
Receptor Population: Recreational Person
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Site 1 Surface Water	Ingestion	Trichloroethene	5.0E+00	ug/L	9.1E-08	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.0E-09	2.7E-07	mg/kg/day	6.0E-03	mg/kg/day	4.4E-05
				Arsenic	3.0E+00	ug/L	5.5E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	8.2E-08	1.6E-07	mg/kg/day	3.0E-04	mg/kg/day	5.3E-04
				Thallium	3.1E+00	ug/L	5.6E-08	mg/kg/day	NA	NA	NA	1.6E-07	mg/kg/day	7.0E-05	mg/kg/day	2.3E-03
				Exp. Route Total												
			Dermal Absorption	Trichloroethene	5.0E+00	ug/L	2.2E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	2.4E-08	6.4E-06	mg/kg/day	6.0E-03	mg/kg/day	1.1E-03
				Arsenic	3.0E+00	ug/L	1.1E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.6E-07	3.2E-07	mg/kg/day	3.0E-04	mg/kg/day	1.1E-03
				Thallium	3.1E+00	ug/L	1.1E-07	mg/kg/day	NA	NA	NA	3.3E-07	mg/kg/day	7.0E-05	mg/kg/day	4.7E-03
				Exp. Route Total												
		Exposure Point Total														9.7E-03
		Exposure Medium Total														9.7E-03
		Surface Water Total														9.7E-03
Total of Receptor Risks Across All Media										2.7E-07	Total of Receptor Hazards Across All Media					9.7E-03

TABLE 7.50.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current/Future
Receptor Population: Recreational Person
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Water	Surface Water	Site 1 Surface Water	Ingestion	Trichloroethene	5.0E+00	ug/L	6.5E-08	mg/kg/day	1.1E-02	1/(mg/kg-day)	7.1E-10	1.9E-07	mg/kg/day	6.0E-03	mg/kg/day	3.2E-05
				Arsenic	3.0E+00	ug/L	3.9E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	5.8E-08	1.1E-07	mg/kg/day	3.0E-04	mg/kg/day	3.8E-04
				Thallium	3.1E+00	ug/L	4.0E-08	mg/kg/day	NA	NA	NA	1.2E-07	mg/kg/day	6.0E-03	mg/kg/day	1.9E-05
			Exp. Route Total								5.9E-08					4.3E-04
			Dermal Absorption	Trichloroethene	5.0E+00	ug/L	1.6E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.7E-08	4.5E-06	mg/kg/day	6.0E-03	mg/kg/day	7.6E-04
				Arsenic	3.0E+00	ug/L	7.7E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.2E-07	2.3E-07	mg/kg/day	3.0E-04	mg/kg/day	7.5E-04
				Thallium	3.1E+00	ug/L	8.0E-08	mg/kg/day	NA	NA	NA	2.3E-07	mg/kg/day	6.0E-03	mg/kg/day	3.9E-05
			Exp. Route Total								1.3E-07					1.5E-03
			Exposure Point Total												1.9E-07	
			Exposure Medium Total												2.0E-03	
			Surface Water Total												2.0E-03	
										Total of Receptor Risks Across All Media	1.9E-07	Total of Receptor Hazards Across All Media				2.0E-03

TABLE 7.51.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current/Future
Receptor Population: Recreational Person
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Site 1 Active Burning Grounds	Ingestion	Benzo(a)anthracene	2.2E+00	mg/kg	7.8E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	5.7E-08	2.2E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	1.8E+00	mg/kg	6.4E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	4.7E-07	1.8E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.6E+00	mg/kg	8.9E-08	mg/kg/day	7.3E-02	1/(mg/kg-day)	6.5E-09	2.5E-07	mg/kg/day	NA	NA	NA
				Arsenic	1.2E+01	mg/kg	4.1E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	6.2E-07	1.2E-06	mg/kg/day	3.0E-04	mg/kg/day	3.9E-03
				Iron	3.6E+04	mg/kg	1.2E-03	mg/kg/day	NA	NA	NA	3.5E-03	mg/kg/day	3.0E-01	mg/kg/day	1.2E-02
				Manganese	1.4E+03	mg/kg	5.0E-05	mg/kg/day	NA	NA	NA	1.4E-04	mg/kg/day	2.0E-02	mg/kg/day	7.0E-03
			Exp. Route Total								1.2E-06					2.2E-02
			Dermal Absorption	Benzo(a)anthracene	2.2E+00	mg/kg	2.6E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.9E-07	7.4E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	1.8E+00	mg/kg	2.2E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.6E-07	6.0E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.6E+00	mg/kg	3.0E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.2E-07	8.4E-07	mg/kg/day	NA	NA	NA
Arsenic	1.2E+01	mg/kg		3.2E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.8E-07	9.0E-07	mg/kg/day	3.0E-04	mg/kg/day	3.0E-03			
Iron	3.6E+04	mg/kg		3.2E-04	mg/kg/day	NA	NA	NA	9.0E-04	mg/kg/day	3.0E-01	mg/kg/day	3.0E-03			
Manganese	1.4E+03	mg/kg		1.3E-05	mg/kg/day	NA	NA	NA	3.6E-05	mg/kg/day	8.0E-04	NA	4.6E-02			
Exp. Route Total								1.0E-06					5.2E-02			
Exposure Point Total								2.2E-06					7.4E-02			
Exposure Medium Total								2.2E-06					7.4E-02			
Sediment Total								2.2E-06					7.4E-02			
Total of Receptor Risks Across All Media										2.2E-06	Total of Receptor Hazards Across All Media				7.4E-02	

TABLE 7.52.RME  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current/Future
Receptor Population: Recreational Person
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	Site 1 Active Burning Grounds	Ingestion	Benzo(a)anthracene	2.2E+00	mg/kg	5.5E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.0E-08	4.3E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	1.8E+00	mg/kg	4.5E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.3E-07	3.5E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.6E+00	mg/kg	6.3E-08	mg/kg/day	7.3E-02	1/(mg/kg-day)	4.6E-09	4.9E-07	mg/kg/day	NA	NA	NA
				Arsenic	1.2E+01	mg/kg	2.9E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.4E-07	2.3E-06	mg/kg/day	3.0E-04	mg/kg/day	7.6E-03
				Iron	3.6E+04	mg/kg	8.8E-04	mg/kg/day	NA	NA	NA	6.8E-03	mg/kg/day	3.0E-01	mg/kg/day	2.3E-02
				Manganese	1.4E+03	mg/kg	3.6E-05	mg/kg/day	NA	NA	NA	2.8E-04	mg/kg/day	2.0E-02	mg/kg/day	1.4E-02
				<b>Exp. Route Total</b>												
			Dermal Absorption	Benzo(a)anthracene	2.2E+00	mg/kg	5.6E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.1E-08	4.3E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	1.8E+00	mg/kg	4.6E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	3.3E-08	3.6E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	2.6E+00	mg/kg	6.4E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.7E-08	5.0E-07	mg/kg/day	NA	NA	NA
				Arsenic	1.2E+01	mg/kg	6.8E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.0E-07	5.3E-07	mg/kg/day	3.0E-04	mg/kg/day	1.8E-03
				Iron	3.6E+04	mg/kg	6.8E-05	mg/kg/day	NA	NA	NA	5.3E-04	mg/kg/day	3.0E-01	mg/kg/day	1.8E-03
				Manganese	1.4E+03	mg/kg	2.8E-06	mg/kg/day	NA	NA	NA	2.2E-05	mg/kg/day	8.0E-04	NA	2.7E-02
				<b>Exp. Route Total</b>												
		<b>Exposure Point Total</b>														
	<b>Exposure Medium Total</b>															
<b>Sediment Total</b>																
<b>Total of Receptor Risks Across All Media</b>																
<b>Total of Receptor Hazards Across All Media</b>																

TABLE 7.1.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Site 1 Outside Active Burning Grounds	Ingestion	Trichloroethene	3.3E+01	mg/kg	1.4E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.5E-08	1.4E-05	mg/kg/day	6.0E-03	mg/kg/day	2.4E-03
				Benzo(a)anthracene	2.8E+00	mg/kg	1.1E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	8.1E-08	1.2E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	3.7E+00	mg/kg	1.5E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.1E-06	1.6E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.4E+00	mg/kg	2.6E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.9E-07	2.7E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.2E-01	mg/kg	9.0E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	6.6E-08	9.5E-08	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	1.8E+00	mg/kg	7.3E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	5.4E-08	7.8E-07	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	6.5E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	9.7E-07	6.9E-11	mg/kg/day	NA	NA	NA
				HMX	4.1E+02	mg/kg	1.7E-05	mg/kg/day	NA	NA	NA	1.8E-04	mg/kg/day	5.0E-02	mg/kg/day	3.6E-03
				RDX	3.0E-01	mg/kg	1.2E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.3E-09	1.3E-07	mg/kg/day	3.0E-03	mg/kg/day	4.2E-05
				Antimony	7.8E+00	mg/kg	3.2E-07	mg/kg/day	NA	NA	NA	3.3E-06	mg/kg/day	4.0E-04	mg/kg/day	8.4E-03
				Arsenic	1.3E+01	mg/kg	5.3E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	8.0E-07	5.6E-06	mg/kg/day	3.0E-04	mg/kg/day	1.9E-02
				Cadmium	9.4E+01	mg/kg	3.8E-06	mg/kg/day	NA	NA	NA	4.0E-05	mg/kg/day	1.0E-03	mg/kg/day	4.0E-02
				Chromium	6.8E+01	mg/kg	2.7E-06	mg/kg/day	NA	NA	NA	2.9E-05	mg/kg/day	3.0E-03	mg/kg/day	9.7E-03
				Copper	6.2E+02	mg/kg	2.5E-05	mg/kg/day	NA	NA	NA	2.7E-04	mg/kg/day	4.0E-02	mg/kg/day	6.7E-03
				Iron	3.7E+04	mg/kg	1.5E-03	mg/kg/day	NA	NA	NA	1.6E-02	mg/kg/day	3.0E-01	mg/kg/day	5.3E-02
				Lead	6.3E+02	mg/kg	2.6E-05	mg/kg/day	NA	NA	NA	2.7E-04	mg/kg/day	NA	NA	NA
				Manganese	1.4E+03	mg/kg	5.8E-05	mg/kg/day	NA	NA	NA	6.2E-04	mg/kg/day	2.0E-02	mg/kg/day	3.1E-02
				Mercury	9.0E+00	mg/kg	3.6E-07	mg/kg/day	NA	NA	NA	3.9E-06	mg/kg/day	3.0E-04	mg/kg/day	1.3E-02
				Nickel	8.2E+01	mg/kg	3.3E-06	mg/kg/day	NA	NA	NA	3.5E-05	mg/kg/day	2.0E-02	mg/kg/day	1.8E-03
				Silver	3.7E+01	mg/kg	1.5E-06	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	5.0E-03	mg/kg/day	3.1E-03
				Thallium	1.3E+00	mg/kg	5.3E-08	mg/kg/day	NA	NA	NA	5.6E-07	mg/kg/day	7.0E-05	mg/kg/day	8.0E-03
				Vanadium	6.8E+01	mg/kg	2.8E-06	mg/kg/day	NA	NA	NA	2.9E-05	mg/kg/day	1.0E-03	mg/kg/day	2.9E-02
				Zinc	1.1E+03	mg/kg	4.5E-05	mg/kg/day	NA	NA	NA	4.7E-04	mg/kg/day	3.0E-01	mg/kg/day	1.6E-03
			Exp. Route Total								3.2E-06					2.3E-01

TABLE 7.1.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Trichloroethene	3.3E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	2.8E+00	mg/kg	3.8E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.8E-08	4.1E-07	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	3.7E+00	mg/kg	5.1E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.7E-07	5.4E-07	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	6.4E+00	mg/kg	8.8E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	6.4E-08	9.4E-07	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	2.2E-01	mg/kg	3.1E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.3E-08	3.3E-08	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	1.8E+00	mg/kg	2.5E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.8E-08	2.7E-07	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	5.1E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	1.5E-07	5.4E-12	mg/kg/day	NA	NA	NA
				HMX	4.1E+02	mg/kg	2.7E-07	mg/kg/day	NA	NA	NA	2.8E-06	mg/kg/day	5.0E-02	mg/kg/day	5.6E-05
				RDX	3.0E-01	mg/kg	4.8E-10	mg/kg/day	1.1E-01	1/(mg/kg-day)	5.2E-11	5.0E-09	mg/kg/day	3.0E-03	mg/kg/day	1.7E-06
				Antimony	7.8E+00	mg/kg	8.3E-09	mg/kg/day	NA	NA	NA	8.8E-08	mg/kg/day	6.0E-05	mg/kg/day	1.5E-03
				Arsenic	1.3E+01	mg/kg	4.2E-08	mg/kg/day	1.5E+00	1/(mg/kg-day)	6.3E-08	4.5E-07	mg/kg/day	3.0E-04	mg/kg/day	1.5E-03
				Cadmium	9.4E+01	mg/kg	1.0E-08	mg/kg/day	NA	NA	NA	1.1E-07	mg/kg/day	2.5E-05	mg/kg/day	4.2E-03
				Chromium	6.8E+01	mg/kg	7.3E-08	mg/kg/day	NA	NA	NA	7.7E-07	mg/kg/day	7.5E-05	mg/kg/day	1.0E-02
				Copper	6.2E+02	mg/kg	6.6E-07	mg/kg/day	NA	NA	NA	7.1E-06	mg/kg/day	4.0E-02	mg/kg/day	1.8E-04
				Iron	3.7E+04	mg/kg	4.0E-05	mg/kg/day	NA	NA	NA	4.2E-04	mg/kg/day	3.0E-01	mg/kg/day	1.4E-03
				Lead	6.3E+02	mg/kg	6.8E-07	mg/kg/day	NA	NA	NA	7.2E-06	mg/kg/day	NA	NA	NA
				Manganese	1.4E+03	mg/kg	1.5E-06	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	8.0E-04	mg/kg/day	2.0E-02
				Mercury	9.0E+00	mg/kg	9.6E-09	mg/kg/day	NA	NA	NA	1.0E-07	mg/kg/day	2.1E-05	mg/kg/day	4.9E-03
				Nickel	8.2E+01	mg/kg	8.8E-08	mg/kg/day	NA	NA	NA	9.3E-07	mg/kg/day	8.0E-04	mg/kg/day	1.2E-03
				Silver	3.7E+01	mg/kg	3.9E-08	mg/kg/day	NA	NA	NA	4.1E-07	mg/kg/day	5.0E-03	mg/kg/day	8.3E-05
			Thallium	1.3E+00	mg/kg	1.4E-09	mg/kg/day	NA	NA	NA	1.5E-08	mg/kg/day	7.0E-05	mg/kg/day	2.1E-04	
			Vanadium	6.8E+01	mg/kg	7.3E-08	mg/kg/day	NA	NA	NA	7.7E-07	mg/kg/day	2.6E-05	mg/kg/day	3.0E-02	
			Zinc	1.1E+03	mg/kg	1.2E-06	mg/kg/day	NA	NA	NA	1.2E-05	mg/kg/day	3.0E-01	mg/kg/day	4.2E-05	
			Exp. Route Total							7.2E-07					7.5E-02	
		Exposure Point Total								4.0E-06					3.1E-01	
	Exposure Medium Total									4.0E-06					3.1E-01	
Surface Soil Total										4.0E-06					3.1E-01	
Total of Receptor Risks Across All Media										4.0E-06	Total of Receptor Hazards Across All Media					3.1E-01

TABLE 7.2.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Trichloroethene Chromium	1.0E-02	ug/m <sup>3</sup>	2.8E-05	mg/kg/day	6.0E-03	1/(mg/kg-day)	1.7E-07	3.0E-04	mg/kg/day	NA	NA	NA
					5.2E-08	ug/m <sup>3</sup>	1.4E-10	mg/kg/day	4.1E+01	1/(mg/kg-day)	5.7E-09	1.5E-09	mg/kg/day	2.9E-05	mg/kg/day	5.1E-05
					Exp. Route Total							1.7E-07				
					Exposure Point Total							1.7E-07				
Exposure Medium Total							1.7E-07									
Surface Soil Total							1.7E-07									
Total of Receptor Risks Across All Media										1.7E-07	Total of Receptor Hazards Across All Media				5.1E-05	

TABLE 7.3.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	2.9E-04	mg/kg/day	6.0E-03	mg/kg/day	4.8E-02			
				2,3,7,8-TCDD (dioxin)	4.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	2.0E-09	mg/kg/day	NA	NA	NA			
				Arsenic	6.9E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	3.0E-05	mg/kg/day	3.0E-04	mg/kg/day	9.8E-02			
				Copper	1.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	5.9E-04	mg/kg/day	4.0E-02	mg/kg/day	1.5E-02			
				Iron	2.7E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-01	mg/kg/day	3.0E-01	mg/kg/day	3.9E-01			
				Manganese	8.2E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.5E-03	mg/kg/day	2.0E-02	mg/kg/day	1.7E-01			
				Thallium	9.0E-01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.9E-06	mg/kg/day	7.0E-05	mg/kg/day	5.5E-02			
				Vanadium	1.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	7.9E-05	mg/kg/day	1.0E-03	mg/kg/day	7.9E-02			
				<b>Exp. Route Total</b>									<b>0.0E+00</b>					<b>8.6E-01</b>	
				Dermal Absorption	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA		
			2,3,7,8-TCDD (dioxin)		4.7E-04	mg/kg	NA	mg/kg/day	3.0E+05	1/(mg/kg-day)	NA	3.4E-10	mg/kg/day	NA	NA	NA			
			Arsenic		6.9E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	5.0E-06	mg/kg/day	3.0E-04	mg/kg/day	1.7E-02			
			Copper		1.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.3E-05	mg/kg/day	4.0E-02	mg/kg/day	8.2E-04			
			Iron		2.7E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	6.6E-03	mg/kg/day	3.0E-01	mg/kg/day	2.2E-02			
			Manganese		8.2E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.0E-04	mg/kg/day	8.0E-04	mg/kg/day	2.4E-01			
			Thallium		9.0E-01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.2E-07	mg/kg/day	7.0E-05	mg/kg/day	3.1E-03			
			Vanadium		1.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	4.4E-06	mg/kg/day	2.6E-05	mg/kg/day	1.7E-01			
			<b>Exp. Route Total</b>									<b>0.0E+00</b>					<b>4.6E-01</b>		
			<b>Exposure Point Total</b>										<b>0.0E+00</b>					<b>1.3E+00</b>	
			<b>Exposure Medium Total</b>										<b>0.0E+00</b>					<b>1.3E+00</b>	
			<b>Soil Total</b>										<b>0.0E+00</b>					<b>1.3E+00</b>	
			<b>Total of Receptor Risks Across All Media</b>										<b>0.0E+00</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>1.3E+00</b>

\*Combines surface and subsurface soil.

TABLE 7.4.CTW  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations															
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient											
							Value	Units	Value	Units		Value	Units	Value	Units												
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	mg/m <sup>3</sup>	1.6E-03	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	9.7E-06	NA	NA	NA	NA	NA											
																	Exp. Route Total									0.0E+00	
																	Exposure Point Total										0.0E+00
																	Exposure Medium Total										0.0E+00
Soil Total																				0.0E+00							
											Total of Receptor Risks Across All Media		9.7E-06	Total of Receptor Hazards Across All Media					0.0E+00								

\* Combined surface and subsurface soil.

TABLE 7.5.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	2.9E-05	mg/kg/day	1.1E-02	1/(mg/kg-day)	3.2E-07	NA	mg/kg/day	6.0E-03	mg/kg/day	NA		
				2,3,7,8-TCDD (dioxin)	4.7E-04	mg/kg	2.0E-10	mg/kg/day	1.5E+05	1/(mg/kg-day)	3.0E-05	NA	mg/kg/day	NA	NA	NA		
				Arsenic	6.9E+00	mg/kg	2.9E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	4.4E-06	NA	mg/kg/day	3.0E-04	mg/kg/day	NA		
				Copper	1.4E+02	mg/kg	5.8E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA		
				Iron	2.7E+04	mg/kg	1.2E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA		
				Manganese	8.2E+02	mg/kg	3.5E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg/day	NA		
				Thallium	9.0E-01	mg/kg	3.8E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA		
				Vanadium	1.8E+01	mg/kg	7.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg/day	NA		
				<b>Exp. Route Total</b>								<b>3.5E-05</b>						<b>0.0E+00</b>
				Dermal Absorption	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA	
		2,3,7,8-TCDD (dioxin)	4.7E-04		mg/kg	2.8E-10	mg/kg/day	3.0E+05	1/(mg/kg-day)	8.3E-05	NA	mg/kg/day	NA	NA	NA			
		Arsenic	6.9E+00		mg/kg	4.0E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	6.1E-06	NA	mg/kg/day	3.0E-04	mg/kg/day	NA			
		Copper	1.4E+02		mg/kg	2.7E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA			
		Iron	2.7E+04		mg/kg	5.4E-03	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA			
		Manganese	8.2E+02		mg/kg	1.6E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	8.0E-04	mg/kg/day	NA			
		Thallium	9.0E-01		mg/kg	1.8E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA			
		Vanadium	1.8E+01		mg/kg	3.6E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.6E-05	mg/kg/day	NA			
		<b>Exp. Route Total</b>								<b>8.9E-05</b>					<b>0.0E+00</b>			
			<b>Exposure Point Total</b>								<b>1.2E-04</b>					<b>0.0E+00</b>		
			<b>Exposure Medium Total</b>								<b>1.2E-04</b>					<b>0.0E+00</b>		
			<b>Soil Total</b>								<b>1.2E-04</b>					<b>0.0E+00</b>		
		<b>Total of Receptor Risks Across All Media</b>										<b>1.2E-04</b>	<b>Total of Receptor Hazards Across All Media</b>					<b>0.0E+00</b>

\*Combines surface and subsurface soil.

TABLE 7.6.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations															
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient											
							Value	Units	Value	Units		Value	Units	Value	Units												
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	ug/m <sup>3</sup>	1.6E-03	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	9.7E-06	NA	mg/kg/day	NA	mg/kg/day	NA											
																	Exp. Route Total									0.0E+00	
																	Exposure Point Total										0.0E+00
																	Exposure Medium Total										0.0E+00
Soil Total																				0.0E+00							
Total of Receptor Risks Across All Media											9.7E-06	Total of Receptor Hazards Across All Media					0.0E+00										

\*Combines surface and subsurface soil.

TABLE 7.7.CTeE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Soil*	Soil*	Site 1 Former Disposal Pits	Ingestion	Trichloroethene	6.8E+01	mg/kg	1.2E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.3E-08	8.3E-05	mg/kg/day	6.0E-03	mg/kg/day	1.4E-02		
				2,3,7,8-TCDD (dioxin)	4.7E-04	mg/kg	8.2E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.2E-06	5.8E-10	mg/kg/day	NA	NA	NA		
				Arsenic	6.9E+00	mg/kg	1.2E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.8E-07	8.4E-06	mg/kg/day	3.0E-04	mg/kg/day	2.8E-02		
				Copper	1.4E+02	mg/kg	2.4E-06	mg/kg/day	NA	NA	NA	1.7E-04	mg/kg/day	4.0E-02	mg/kg/day	4.2E-03		
				Iron	2.7E+04	mg/kg	4.8E-04	mg/kg/day	NA	NA	NA	3.4E-02	mg/kg/day	3.0E-01	mg/kg/day	1.1E-01		
				Manganese	8.2E+02	mg/kg	1.4E-05	mg/kg/day	NA	NA	NA	1.0E-03	mg/kg/day	2.0E-02	mg/kg/day	5.0E-02		
				Thallium	9.0E-01	mg/kg	1.6E-08	mg/kg/day	NA	NA	NA	1.1E-06	mg/kg/day	7.0E-05	mg/kg/day	1.6E-02		
				Vanadium	1.8E+01	mg/kg	3.2E-07	mg/kg/day	NA	NA	NA	2.2E-05	mg/kg/day	7.0E-03	mg/kg/day	3.2E-03		
				<b>Exp. Route Total</b>														
			Dermal Absorption	Trichloroethene	6.8E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA		
				2,3,7,8-TCDD (dioxin)	4.7E-04	mg/kg	3.4E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	1.0E-07	2.4E-11	mg/kg/day	NA	NA	NA		
				Arsenic	6.9E+00	mg/kg	5.0E-09	mg/kg/day	1.5E+00	1/(mg/kg-day)	7.5E-09	3.5E-07	mg/kg/day	3.0E-04	mg/kg/day	1.2E-03		
				Copper	1.4E+02	mg/kg	3.3E-08	mg/kg/day	NA	NA	NA	2.3E-06	mg/kg/day	4.0E-02	mg/kg/day	5.8E-05		
				Iron	2.7E+04	mg/kg	6.6E-06	mg/kg/day	NA	NA	NA	4.6E-04	mg/kg/day	3.0E-01	mg/kg/day	1.5E-03		
				Manganese	8.2E+02	mg/kg	2.0E-07	mg/kg/day	NA	NA	NA	1.4E-05	mg/kg/day	8.0E-04	mg/kg/day	1.7E-02		
				Thallium	9.0E-01	mg/kg	2.2E-10	mg/kg/day	NA	NA	NA	1.5E-08	mg/kg/day	7.0E-05	mg/kg/day	2.2E-04		
				Vanadium	1.8E+01	mg/kg	4.4E-09	mg/kg/day	NA	NA	NA	3.1E-07	mg/kg/day	1.8E-04	mg/kg/day	1.7E-03		
			<b>Exp. Route Total</b>															
			<b>Exposure Point Total</b>															
			<b>Exposure Medium Total</b>															
			<b>Soil Total</b>															
			<b>Total of Receptor Risks Across All Media</b>											<b>Total of Receptor Hazards Across All Media</b>				

\* Combined surface and subsurface soil.

TABLE 7.8.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations														
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient										
							Value	Units	Value	Units		Value	Units	Value	Units											
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Inhalation	Trichloroethene	2.1E-02	ug/m <sup>3</sup>	3.0E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	1.8E-07	2.1E-03	mg/kg/day	NA	mg/kg/day	NA										
																	Exp. Route Total									0.0E+00
																	Exposure Point Total									0.0E+00
																	Exposure Medium Total									0.0E+00
Soil Total																	0.0E+00									
Total of Receptor Risks Across All Media											1.8E-07	Total of Receptor Hazards Across All Media					0.0E+00									

\*Combines surface and subsurface soil.

TABLE 7.9.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	6.9E-07	mg/kg/day	1.0E-02	mg/kg/day	6.9E-05
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	2.9E-05	mg/kg/day	6.0E-03	mg/kg/day	4.9E-03
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.2E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	3.1E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.9E-06	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	3.0E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	1.4E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	7.5E-11	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.1E-04	mg/kg/day	5.0E-02	mg/kg/day	2.2E-03
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	8.5E-07	mg/kg/day	3.0E-03	mg/kg/day	2.8E-04
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	3.0E-06	mg/kg/day	4.0E-04	mg/kg/day	7.6E-03
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	6.1E-06	mg/kg/day	3.0E-04	mg/kg/day	2.0E-02
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.5E-05	mg/kg/day	1.0E-03	mg/kg/day	3.5E-02
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.1E-05	mg/kg/day	3.0E-03	mg/kg/day	1.0E-02
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	7.6E-04	mg/kg/day	4.0E-02	mg/kg/day	1.9E-02
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.7E-02	mg/kg/day	3.0E-01	mg/kg/day	5.8E-02
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.6E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	5.9E-04	mg/kg/day	2.0E-02	mg/kg/day	3.0E-02
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	3.5E-06	mg/kg/day	3.0E-04	mg/kg/day	1.2E-02
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.9E-05	mg/kg/day	2.0E-02	mg/kg/day	1.9E-03
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	5.0E-03	mg/kg/day	3.2E-03
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	5.3E-07	mg/kg/day	7.0E-05	mg/kg/day	7.6E-03
				Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.7E-05	mg/kg/day	1.0E-03	mg/kg/day	2.7E-02
				Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	5.6E-04	mg/kg/day	3.0E-01	mg/kg/day	1.9E-03
			Exp. Route Total								0.0E+00					2.4E-01

TABLE 7.9.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.3E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	3.2E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	4.0E-06	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	3.1E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	1.4E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.1E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	3.0E+05	1/(mg/kg-day)	NA	1.8E-11	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	5.2E-06	mg/kg/day	5.0E-02	mg/kg/day	1.0E-04
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	1.0E-07	mg/kg/day	3.0E-03	mg/kg/day	3.4E-05
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.4E-07	mg/kg/day	6.0E-05	mg/kg/day	4.0E-03
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	1.4E-06	mg/kg/day	3.0E-04	mg/kg/day	4.8E-03
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.8E-07	mg/kg/day	2.5E-05	mg/kg/day	1.1E-02
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.5E-06	mg/kg/day	7.5E-05	mg/kg/day	3.3E-02
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	6.1E-05	mg/kg/day	4.0E-02	mg/kg/day	1.5E-03
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.4E-03	mg/kg/day	3.0E-01	mg/kg/day	4.6E-03
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.0E-05	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	4.7E-05	mg/kg/day	8.0E-04	mg/kg/day	5.9E-02
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.8E-07	mg/kg/day	2.1E-05	mg/kg/day	1.3E-02
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.1E-06	mg/kg/day	8.0E-04	mg/kg/day	3.9E-03
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.3E-06	mg/kg/day	5.0E-03	mg/kg/day	2.6E-04
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.2E-08	mg/kg/day	7.0E-05	mg/kg/day	6.0E-04
				Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.1E-06	mg/kg/day	2.6E-05	mg/kg/day	8.2E-02
				Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	4.5E-05	mg/kg/day	3.0E-01	mg/kg/day	1.5E-04
			Exp. Route Total								0.0E+00					2.2E-01
		Exposure Point Total									0.0E+00					4.6E-01
	Exposure Medium Total										0.0E+00					4.6E-01
Soil Total											0.0E+00					4.6E-01
Total of Receptor Risks Across All Media											0.0E+00	Total of Receptor Hazards Across All Media				4.6E-01

\*Combines surface and subsurface soil.

TABLE 7.10.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	6.4E-06	mg/kg/day	1.0E-02	mg/kg/day	6.4E-04
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	2.7E-04	mg/kg/day	6.0E-03	mg/kg/day	4.6E-02
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.0E-05	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	2.9E-05	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	3.6E-05	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	2.8E-05	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	1.3E-06	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	1.0E-05	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	7.0E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.0E-03	mg/kg/day	5.0E-02	mg/kg/day	2.0E-02
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	8.0E-06	mg/kg/day	3.0E-03	mg/kg/day	2.7E-03
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.8E-05	mg/kg/day	4.0E-04	mg/kg/day	7.1E-02
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	5.7E-05	mg/kg/day	3.0E-04	mg/kg/day	1.9E-01
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.3E-04	mg/kg/day	1.0E-03	mg/kg/day	3.3E-01
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.9E-04	mg/kg/day	3.0E-03	mg/kg/day	9.6E-02
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	7.1E-03	mg/kg/day	4.0E-02	mg/kg/day	1.8E-01
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-01	mg/kg/day	3.0E-01	mg/kg/day	5.4E-01
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	2.4E-03	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	5.5E-03	mg/kg/day	2.0E-02	mg/kg/day	2.8E-01
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	3.2E-05	mg/kg/day	3.0E-04	mg/kg/day	1.1E-01
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	3.6E-04	mg/kg/day	2.0E-02	mg/kg/day	1.8E-02
				Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.5E-04	mg/kg/day	5.0E-03	mg/kg/day	3.0E-02
				Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.9E-06	mg/kg/day	7.0E-05	mg/kg/day	7.1E-02
				Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.5E-04	mg/kg/day	1.0E-03	mg/kg/day	2.5E-01
				Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	5.2E-03	mg/kg/day	3.0E-01	mg/kg/day	1.7E-02
			Exp. Route Total								0.0E+00					2.2E+00

TABLE 7.10.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	2.2E-05	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	2.1E-05	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	2.6E-05	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	NA	mg/kg/day	7.3E-02	1/(mg/kg-day)	NA	2.0E-05	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	NA	mg/kg/day	7.3E+00	1/(mg/kg-day)	NA	9.4E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	NA	mg/kg/day	7.3E-01	1/(mg/kg-day)	NA	7.5E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	NA	mg/kg/day	3.0E+05	1/(mg/kg-day)	NA	1.2E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.4E-05	mg/kg/day	5.0E-02	mg/kg/day	6.8E-04
				RDX	1.9E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	6.7E-07	mg/kg/day	3.0E-03	mg/kg/day	2.2E-04
				Antimony	6.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-06	mg/kg/day	6.0E-05	mg/kg/day	2.7E-02
				Arsenic	1.3E+01	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	9.5E-06	mg/kg/day	3.0E-04	mg/kg/day	3.2E-02
				Cadmium	7.6E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.8E-06	mg/kg/day	2.5E-05	mg/kg/day	7.3E-02
				Chromium	6.7E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.6E-05	mg/kg/day	7.5E-05	mg/kg/day	2.1E-01
				Copper	1.7E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	4.0E-04	mg/kg/day	4.0E-02	mg/kg/day	9.9E-03
				Iron	3.8E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	9.1E-03	mg/kg/day	3.0E-01	mg/kg/day	3.0E-02
				Lead	5.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.3E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	3.1E-04	mg/kg/day	8.0E-04	mg/kg/day	3.9E-01
				Mercury	7.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.8E-06	mg/kg/day	2.1E-05	mg/kg/day	8.6E-02
				Nickel	8.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	2.0E-05	mg/kg/day	8.0E-04	mg/kg/day	2.5E-02
			Silver	3.5E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	8.4E-06	mg/kg/day	5.0E-03	mg/kg/day	1.7E-03	
			Thallium	1.2E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	2.8E-07	mg/kg/day	7.0E-05	mg/kg/day	4.0E-03	
			Vanadium	5.8E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	1.4E-05	mg/kg/day	2.6E-05	mg/kg/day	5.4E-01	
			Zinc	1.2E+03	mg/kg	NA	mg/kg/day	NA	NA	NA	2.9E-04	mg/kg/day	3.0E-01	mg/kg/day	9.8E-04	
			Exp. Route Total								0.0E+00				1.4E+00	
		Exposure Point Total									0.0E+00				3.7E+00	
	Exposure Medium Total										0.0E+00				3.7E+00	
Soil Total											0.0E+00				3.7E+00	
Total of Receptor Risks Across All Media											0.0E+00	Total of Receptor Hazards Across All Media				3.7E+00

\*Combines surface and subsurface soil.

TABLE 7.11.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	6.4E-07	mg/kg/day	5.4E-01	1/(mg/kg-day)	3.4E-07	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	2.7E-05	mg/kg/day	1.1E-02	1/(mg/kg-day)	3.0E-07	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	3.0E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.2E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	2.9E-06	mg/kg/day	7.3E+00	1/(mg/kg-day)	2.1E-05	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	3.6E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	2.6E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	2.8E-06	mg/kg/day	7.3E-02	1/(mg/kg-day)	2.0E-07	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	1.3E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	9.3E-07	NA	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	1.0E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	7.4E-07	NA	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	7.0E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.0E-05	NA	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	1.0E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	5.0E-02	mg/kg/day	NA
				RDX	1.9E+00	mg/kg	7.9E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	8.7E-08	NA	mg/kg/day	3.0E-03	mg/kg/day	NA
				Antimony	6.6E+00	mg/kg	2.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-04	mg/kg/day	NA
				Arsenic	1.3E+01	mg/kg	5.6E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	8.4E-06	NA	mg/kg/day	3.0E-04	mg/kg/day	NA
				Cadmium	7.6E+01	mg/kg	3.2E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg/day	NA
				Chromium	6.7E+01	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-03	mg/kg/day	NA
				Copper	1.7E+03	mg/kg	7.0E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA
				Iron	3.8E+04	mg/kg	1.6E-02	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA
				Lead	5.6E+02	mg/kg	2.4E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	5.5E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg/day	NA
				Mercury	7.6E+00	mg/kg	3.2E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-04	mg/kg/day	NA
				Nickel	8.5E+01	mg/kg	3.6E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.0E-02	mg/kg/day	NA
				Silver	3.5E+01	mg/kg	1.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	5.0E-03	mg/kg/day	NA
				Thallium	1.2E+00	mg/kg	4.9E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA
				Vanadium	5.8E+01	mg/kg	2.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	1.0E-03	mg/kg/day	NA
				Zinc	1.2E+03	mg/kg	5.2E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA
			Exp. Route Total								4.7E-05					0.0E+00

TABLE 7.11.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Resident  
 Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	1.8E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.3E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	1.7E-06	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.3E-05	NA	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	2.1E-06	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.6E-06	NA	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	1.7E-06	mg/kg/day	7.3E-02	1/(mg/kg-day)	1.2E-07	NA	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	7.6E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	5.6E-07	NA	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	6.1E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	4.4E-07	NA	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	9.6E-12	mg/kg/day	3.0E+05	1/(mg/kg-day)	2.9E-06	NA	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	2.8E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	5.0E-02	mg/kg/day	NA
				RDX	1.9E+00	mg/kg	5.4E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	6.0E-09	NA	mg/kg/day	3.0E-03	mg/kg/day	NA
				Antimony	6.6E+00	mg/kg	1.3E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	6.0E-05	mg/kg/day	NA
				Arsenic	1.3E+01	mg/kg	7.7E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.2E-06	NA	mg/kg/day	3.0E-04	mg/kg/day	NA
				Cadmium	7.6E+01	mg/kg	1.5E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.5E-05	mg/kg/day	NA
				Chromium	6.7E+01	mg/kg	1.3E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.5E-05	mg/kg/day	NA
				Copper	1.7E+03	mg/kg	3.2E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	4.0E-02	mg/kg/day	NA
				Iron	3.8E+04	mg/kg	7.4E-04	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA
				Lead	5.6E+02	mg/kg	1.1E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	2.5E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	8.0E-04	mg/kg/day	NA
				Mercury	7.6E+00	mg/kg	1.5E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.1E-05	mg/kg/day	NA
				Nickel	8.5E+01	mg/kg	1.7E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	8.0E-04	mg/kg/day	NA
			Silver	3.5E+01	mg/kg	6.9E-07	mg/kg/day	NA	NA	NA	NA	mg/kg/day	5.0E-03	mg/kg/day	NA	
			Thallium	1.2E+00	mg/kg	2.3E-08	mg/kg/day	NA	NA	NA	NA	mg/kg/day	7.0E-05	mg/kg/day	NA	
			Vanadium	5.8E+01	mg/kg	1.1E-06	mg/kg/day	NA	NA	NA	NA	mg/kg/day	2.6E-05	mg/kg/day	NA	
			Zinc	1.2E+03	mg/kg	2.4E-05	mg/kg/day	NA	NA	NA	NA	mg/kg/day	3.0E-01	mg/kg/day	NA	
			Exp. Route Total							2.1E-05					0.0E+00	
		Exposure Point Total								6.8E-05					0.0E+00	
	Exposure Medium Total									6.8E-05					0.0E+00	
Soil Total										6.8E-05					0.0E+00	
Total of Receptor Risks Across All Media										6.8E-05	Total of Receptor Hazards Across All Media				0.0E+00	

\*Combines surface and subsurface soil.

TABLE 7.12.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Tetrachloroethene	1.5E+00	mg/kg	2.6E-08	mg/kg/day	5.4E-01	1/(mg/kg-day)	1.4E-08	1.8E-06	mg/kg/day	1.0E-01	mg/kg/day	1.8E-05
				Trichloroethene	6.4E+01	mg/kg	1.1E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.2E-08	7.8E-05	mg/kg/day	6.0E-03	mg/kg/day	1.3E-02
				Benzo(a)anthracene	7.0E+00	mg/kg	1.2E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	8.9E-08	8.5E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	1.2E-07	mg/kg/day	7.3E+00	1/(mg/kg-day)	8.6E-07	8.3E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	1.5E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.1E-07	1.0E-05	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	1.1E-07	mg/kg/day	7.3E-02	1/(mg/kg-day)	8.3E-09	7.9E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	5.3E-09	mg/kg/day	7.3E+00	1/(mg/kg-day)	3.8E-08	3.7E-07	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	4.2E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	3.1E-08	2.9E-06	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	2.9E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	4.3E-07	2.0E-10	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	4.1E-06	mg/kg/day	NA	NA	NA	2.9E-04	mg/kg/day	5.0E-02	mg/kg/day	5.8E-03
				RDX	1.9E+00	mg/kg	3.2E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	3.6E-09	2.3E-06	mg/kg/day	3.0E-03	mg/kg/day	7.6E-04
				Antimony	6.6E+00	mg/kg	1.2E-07	mg/kg/day	NA	NA	NA	8.1E-06	mg/kg/day	2.0E-04	mg/kg/day	4.1E-02
				Arsenic	1.3E+01	mg/kg	2.3E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.5E-07	1.6E-05	mg/kg/day	3.0E-04	mg/kg/day	5.4E-02
				Cadmium	7.6E+01	mg/kg	1.3E-06	mg/kg/day	NA	NA	NA	9.3E-05	mg/kg/day	1.0E-03	mg/kg/day	9.3E-02
				Chromium	6.7E+01	mg/kg	1.2E-06	mg/kg/day	NA	NA	NA	8.2E-05	mg/kg/day	2.0E-02	mg/kg/day	4.1E-03
				Copper	1.7E+03	mg/kg	2.9E-05	mg/kg/day	NA	NA	NA	2.0E-03	mg/kg/day	4.0E-02	mg/kg/day	5.1E-02
				Iron	3.8E+04	mg/kg	6.6E-04	mg/kg/day	NA	NA	NA	4.6E-02	mg/kg/day	3.0E-01	mg/kg/day	1.5E-01
				Lead	5.6E+02	mg/kg	9.7E-06	mg/kg/day	NA	NA	NA	6.8E-04	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	2.3E-05	mg/kg/day	NA	NA	NA	1.6E-03	mg/kg/day	2.0E-02	mg/kg/day	7.9E-02
				Mercury	7.6E+00	mg/kg	1.3E-07	mg/kg/day	NA	NA	NA	9.3E-06	mg/kg/day	3.0E-04	mg/kg/day	3.1E-02
				Nickel	8.5E+01	mg/kg	1.5E-06	mg/kg/day	NA	NA	NA	1.0E-04	mg/kg/day	2.0E-02	mg/kg/day	5.2E-03
				Silver	3.5E+01	mg/kg	6.1E-07	mg/kg/day	NA	NA	NA	4.3E-05	mg/kg/day	5.0E-03	mg/kg/day	8.6E-03
				Thallium	1.2E+00	mg/kg	2.0E-08	mg/kg/day	NA	NA	NA	1.4E-06	mg/kg/day	7.0E-05	mg/kg/day	2.0E-02
				Vanadium	5.8E+01	mg/kg	1.0E-06	mg/kg/day	NA	NA	NA	7.1E-05	mg/kg/day	7.0E-03	mg/kg/day	1.0E-02
				Zinc	1.2E+03	mg/kg	2.1E-05	mg/kg/day	NA	NA	NA	1.5E-03	mg/kg/day	3.0E-01	mg/kg/day	5.0E-03
			Exp. Route Total								1.9E-06					5.8E-01

TABLE 7.12.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Outside Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
 Receptor Population: Construction Worker  
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal Absorption	Tetrachloroethene	1.5E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	NA
				Trichloroethene	6.4E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				Benzo(a)anthracene	7.0E+00	mg/kg	2.2E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.6E-08	1.5E-06	mg/kg/day	NA	NA	NA
				Benzo(a)pyrene	6.8E+00	mg/kg	2.1E-08	mg/kg/day	7.3E+00	1/(mg/kg-day)	1.5E-07	1.5E-06	mg/kg/day	NA	NA	NA
				Benzo(b)fluoranthene	8.4E+00	mg/kg	2.6E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	1.9E-08	1.8E-06	mg/kg/day	NA	NA	NA
				Benzo(k)fluoranthene	6.5E+00	mg/kg	2.0E-08	mg/kg/day	7.3E-02	1/(mg/kg-day)	1.5E-09	1.4E-06	mg/kg/day	NA	NA	NA
				Dibenz(a,h)anthracene	3.0E-01	mg/kg	9.4E-10	mg/kg/day	7.3E+00	1/(mg/kg-day)	6.9E-09	6.6E-08	mg/kg/day	NA	NA	NA
				Indeno(1,2,3-cd)pyrene	2.4E+00	mg/kg	7.5E-09	mg/kg/day	7.3E-01	1/(mg/kg-day)	5.5E-09	5.2E-07	mg/kg/day	NA	NA	NA
				2,3,7,8-TCDD (dioxin)	1.6E-04	mg/kg	1.2E-13	mg/kg/day	3.0E+05	1/(mg/kg-day)	3.6E-08	8.3E-12	mg/kg/day	NA	NA	NA
				HMX	2.4E+02	mg/kg	3.4E-08	mg/kg/day	NA	NA	NA	2.4E-06	mg/kg/day	5.0E-02	mg/kg/day	4.8E-05
				RDX	1.9E+00	mg/kg	6.7E-10	mg/kg/day	1.1E-01	1/(mg/kg-day)	7.4E-11	4.7E-08	mg/kg/day	3.0E-03	mg/kg/day	1.6E-05
				Antimony	6.6E+00	mg/kg	1.6E-09	mg/kg/day	NA	NA	NA	1.1E-07	mg/kg/day	3.0E-05	mg/kg/day	3.7E-03
				Arsenic	1.3E+01	mg/kg	9.5E-09	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.4E-08	6.7E-07	mg/kg/day	3.0E-04	mg/kg/day	2.2E-03
				Cadmium	7.6E+01	mg/kg	1.8E-09	mg/kg/day	NA	NA	NA	1.3E-07	mg/kg/day	2.5E-05	mg/kg/day	5.1E-03
				Chromium	6.7E+01	mg/kg	1.6E-08	mg/kg/day	NA	NA	NA	1.1E-06	mg/kg/day	5.0E-04	mg/kg/day	2.3E-03
				Copper	1.7E+03	mg/kg	4.0E-07	mg/kg/day	NA	NA	NA	2.8E-05	mg/kg/day	4.0E-02	mg/kg/day	7.0E-04
				Iron	3.8E+04	mg/kg	9.1E-06	mg/kg/day	NA	NA	NA	6.4E-04	mg/kg/day	3.0E-01	mg/kg/day	2.1E-03
				Lead	5.6E+02	mg/kg	1.3E-07	mg/kg/day	NA	NA	NA	9.4E-06	mg/kg/day	NA	NA	NA
				Manganese	1.3E+03	mg/kg	3.1E-07	mg/kg/day	NA	NA	NA	2.2E-05	mg/kg/day	8.0E-04	mg/kg/day	2.7E-02
				Mercury	7.6E+00	mg/kg	1.8E-09	mg/kg/day	NA	NA	NA	1.3E-07	mg/kg/day	2.1E-05	mg/kg/day	6.1E-03
				Nickel	8.5E+01	mg/kg	2.0E-08	mg/kg/day	NA	NA	NA	1.4E-06	mg/kg/day	8.0E-04	mg/kg/day	1.8E-03
			Silver	3.5E+01	mg/kg	8.4E-09	mg/kg/day	NA	NA	NA	5.9E-07	mg/kg/day	5.0E-03	mg/kg/day	1.2E-04	
			Thallium	1.2E+00	mg/kg	2.8E-10	mg/kg/day	NA	NA	NA	1.9E-08	mg/kg/day	7.0E-05	mg/kg/day	2.8E-04	
			Vanadium	5.8E+01	mg/kg	1.4E-08	mg/kg/day	NA	NA	NA	9.8E-07	mg/kg/day	1.8E-04	mg/kg/day	5.4E-03	
			Zinc	1.2E+03	mg/kg	2.9E-07	mg/kg/day	NA	NA	NA	2.1E-05	mg/kg/day	3.0E-01	mg/kg/day	6.9E-05	
			Exp. Route Total							2.5E-07					5.7E-02	
		Exposure Point Total								2.2E-06					6.3E-01	
	Exposure Medium Total									2.2E-06					6.3E-01	
Soil Total										2.2E-06					6.3E-01	
Total of Receptor Risks Across All Media										2.2E-06	Total of Receptor Hazards Across All Media					6.3E-01

\*Combines surface and subsurface soil.

TABLE 7.13.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	ug/m <sup>3</sup>	2.5E-04	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	4.9E-06	2.9E-03	mg/kg/day	1.4E-01	mg/kg/day	NA
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	1.5E-03	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	9.1E-06	1.8E-02	mg/kg/day	NA	mg/kg/day	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	3.9E-09	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	1.6E-07	4.5E-08	mg/kg/day	2.9E-05	mg/kg/day	NA
				Exp. Route Total							4.9E-06					0.0E+00
				Exposure Point Total							4.9E-06					
	Exposure Medium Total							4.9E-06						0.0E+00		
Soil Total										4.9E-06				0.0E+00		
Total of Receptor Risks Across All Media										4.9E-06	Total of Receptor Hazards Across All Media					0.0E+00

\*Combines surface and subsurface soil.

TABLE 7.14.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Former Disposal Pits  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Inhalation	Tetrachloroethene	3.2E-03	ug/m <sup>3</sup>	4.5E-06	mg/kg/day	2.0E-02	(mg/kg/d) <sup>-1</sup>	9.1E-08	3.2E-04	mg/kg/day	1.4E-01	mg/kg/day	2.3E-03
				Trichloroethene	2.0E-02	mg/m <sup>3</sup>	2.8E-05	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	1.7E-07	2.0E-03	mg/kg/day	NA	mg/kg/day	NA
				Chromium	5.1E-08	mg/m <sup>3</sup>	7.1E-11	mg/kg/day	4.1E+01	(mg/kg/d) <sup>-1</sup>	2.9E-09	5.0E-09	mg/kg/day	2.9E-05	mg/kg/day	1.7E-04
				Exp. Route Total							2.6E-07					2.4E-03
				Exposure Point Total							2.6E-07					2.4E-03
	Exposure Medium Total							2.6E-07					2.4E-03			
Soil Total										2.6E-07				2.4E-03		
Total of Receptor Risks Across All Media										2.6E-07	Total of Receptor Hazards Across All Media					2.4E-03

\*Combines surface and subsurface soil.

TABLE 7.15.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	8.2E-09	mg/kg/day	5.4E-01	1/(mg/kg-day)	4.4E-09	5.7E-07	mg/kg/day	1.0E-01	mg/kg/day	5.7E-06
				Trichloroethene	1.0E+00	mg/kg	1.8E-08	mg/kg/day	1.1E-02	1/(mg/kg-day)	1.9E-10	1.2E-06	mg/kg/day	6.0E-03	mg/kg/day	2.1E-04
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	2.9E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	4.4E-07	2.0E-10	mg/kg/day	NA	NA	NA
				RDX	3.0E+00	mg/kg	5.2E-08	mg/kg/day	1.1E-01	1/(mg/kg-day)	5.8E-09	3.7E-06	mg/kg/day	3.0E-03	mg/kg/day	1.2E-03
				Arsenic	9.6E+00	mg/kg	1.7E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.5E-07	1.2E-05	mg/kg/day	3.0E-04	mg/kg/day	3.9E-02
				Iron	6.7E+00	mg/kg	1.2E-07	mg/kg/day	NA	NA	NA	8.2E-06	mg/kg/day	3.0E-01	mg/kg/day	2.7E-05
				Lead	3.0E+00	mg/kg	5.2E-08	mg/kg/day	NA	NA	NA	3.6E-06	mg/kg/day	NA	NA	NA
				<b>Exp. Route Total</b>												
			Dermal Absorption	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-01	mg/kg/day	NA
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	1.2E-13	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.8E-08	8.4E-12	mg/kg/day	NA	NA	NA
				RDX	3.0E+00	mg/kg	1.1E-09	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.2E-10	7.6E-08	mg/kg/day	3.0E-03	mg/kg/day	2.5E-05
				Arsenic	9.6E+00	mg/kg	6.9E-09	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.0E-08	4.9E-07	mg/kg/day	3.0E-04	mg/kg/day	1.6E-03
				Iron	6.7E+00	mg/kg	1.6E-09	mg/kg/day	NA	NA	NA	1.1E-07	mg/kg/day	3.0E-01	mg/kg/day	3.7E-07
				Lead	3.0E+00	mg/kg	7.2E-10	mg/kg/day	NA	NA	NA	5.0E-08	mg/kg/day	NA	NA	NA
				<b>Exp. Route Total</b>												
		<b>Exposure Point Total</b>														
	<b>Exposure Medium Total</b>															
<b>Soil Total</b>																
<b>Total of Receptor Risks Across All Media</b>																
												<b>Total of Receptor Hazards Across All Media</b>				

\*Combines surface and subsurface soil.

TABLE 7.16.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	4.7E-01	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	2.0E-06	mg/kg/day	1.0E-02	mg/kg-day	2.0E-04
				Trichloroethene	1.0E+00	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	4.3E-06	mg/kg/day	6.0E-02	mg/kg-day	7.2E-05
				2,3,7,8-TCDD (dioxin)	1.7E-04	mg/kg	NA	mg/kg/day	1.5E+05	1/(mg/kg-day)	NA	7.1E-10	mg/kg/day	NA	NA	NA
				Perchlorate	9.6E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	4.1E-05	mg/kg/day	7.0E-04	mg/kg-day	5.9E-02
				RDX	6.7E+00	mg/kg	NA	mg/kg/day	1.1E-01	1/(mg/kg-day)	NA	2.9E-05	mg/kg/day	3.0E-03	mg/kg-day	9.5E-03
				Antimony	3.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.3E-05	mg/kg/day	4.0E-04	mg/kg-day	3.2E-02
				Arsenic	7.0E+00	mg/kg	NA	mg/kg/day	1.5E+00	1/(mg/kg-day)	NA	3.0E-05	mg/kg/day	3.0E-04	mg/kg-day	9.9E-02
				Cadmium	4.5E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	1.9E-05	mg/kg/day	1.0E-03	mg/kg-day	1.9E-02
				Chromium	1.4E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	6.1E-05	mg/kg/day	3.0E-03	mg/kg-day	2.0E-02
				Copper	2.5E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	1.1E-03	mg/kg/day	4.0E-02	mg/kg-day	2.7E-02
				Iron	2.9E+04	mg/kg	NA	mg/kg/day	NA	NA	NA	1.2E-01	mg/kg/day	3.0E-01	mg/kg-day	4.1E-01
				Lead	1.6E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	6.8E-04	mg/kg/day	NA	NA	NA
				Manganese	9.1E+02	mg/kg	NA	mg/kg/day	NA	NA	NA	3.9E-03	mg/kg/day	2.0E-02	mg/kg-day	1.9E-01
				Mercury	2.0E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	8.5E-06	mg/kg/day	3.0E-04	mg/kg-day	2.8E-02
				Thallium	1.3E+00	mg/kg	NA	mg/kg/day	NA	NA	NA	5.4E-06	mg/kg/day	7.0E-05	mg/kg-day	7.7E-02
				Vanadium	2.2E+01	mg/kg	NA	mg/kg/day	NA	NA	NA	9.4E-05	mg/kg/day	1.0E-03	mg/kg-day	9.4E-02
			Exp. Route Total								0.0E+00					1.1E+00



TABLE 7.17.CTE  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 CENTRAL TENDENCY EXPOSURE  
 Site 1 Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations														
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient										
							Value	Units	Value	Units		Value	Units	Value	Units											
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Inhalation	Trichloroethene	3.2E-04	ug/m <sup>3</sup>	4.4E-07	mg/kg/day	6.0E-03	(mg/kg/d) <sup>-1</sup>	2.7E-09	3.1E-05	mg/kg/day	NA	mg/kg/day	NA										
																	Exp. Route Total									0.0E+00
																	Exposure Point Total									0.0E+00
																	Exposure Medium Total									0.0E+00
Soil Total																	0.0E+00									
Total of Receptor Risks Across All Media																		2.7E-09			0.0E+00					
Total of Receptor Hazards Across All Media																					0.0E+00					

\*Combines surface and subsurface soil.

TABLE 9.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
Receptor Population: Industrial Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Surface Soil	Surface Soil	Site 1 Former Disposal Pits	Trichloroethene	5.3E-09	NA	NA	5.3E-09	Liver	2.2E-04	NA	NA	2.2E-04		
			2,3,7,8-TCDD (dioxin)	6.1E-07	NA	2.4E-07	8.5E-07	NA	NA	NA	0.0E+00			
			Arsenic	4.2E-06	NA	8.3E-07	5.0E-06	Skin,vascular Gastrointestinal, Blood, Liver	2.6E-02	NA	5.2E-03	3.1E-02		
			Iron	NA	NA	NA	0.0E+00		8.1E-02	NA	5.4E-03	8.7E-02		
			Manganese	NA	NA	NA	0.0E+00	CNS	4.0E-02	NA	6.5E-02	1.1E-01		
			Vanadium	NA	NA	NA	0.0E+00	Kidney	1.8E-02	NA	4.7E-02	6.5E-02		
	Chemical Total	4.8E-06	0.0E+00	1.1E-06	5.9E-06		1.7E-01	0.0E+00	1.2E-01	2.9E-01				
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	6.0E-08	NA	6.0E-08	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00		
			Chemical Total	0.0E+00	6.0E-08	0.0E+00	6.0E-08		0.0E+00	0.0E+00	0.0E+00	0.0E+00		
	Exposure Point Total				5.9E-06				2.9E-01					
Surface Soil	Surface Soil	Site 1 Outside Burning Grounds	Trichloroethene	1.3E-07	NA	NA	1.3E-07	Liver	5.5E-03	NA	NA	5.5E-03		
			Benzo(a)anthracene	7.0E-07	NA	6.0E-07	1.3E-06	NA	NA	NA	0.0E+00			
			Benzo(a)pyrene	9.3E-06	NA	8.0E-06	1.7E-05	NA	NA	NA	0.0E+00			
			Benzo(b)fluoranthene	1.6E-06	NA	1.4E-06	3.0E-06	NA	NA	NA	0.0E+00			
			Dibenz(a,h)anthracene	5.7E-07	NA	4.9E-07	1.1E-06	NA	NA	NA	0.0E+00			
			Indeno(1,2,3-cd)pyrene	4.6E-07	NA	4.0E-07	8.6E-07	NA	NA	NA	0.0E+00			
			2,3,7,8-TCDD (dioxin)	8.4E-06	NA	3.3E-06	1.2E-05	NA	NA	NA	0.0E+00			
			HMX	NA	NA	NA	0.0E+00	Liver	8.1E-03	NA	3.2E-04	8.4E-03		
			RDX	1.1E-08	NA	1.1E-09	1.3E-08	Prostate	9.7E-05	NA	9.6E-06	1.1E-04		
			Antimony	NA	NA	NA	0.0E+00	Blood	1.9E-02	NA	8.4E-03	2.8E-02		
			Arsenic	6.9E-06	NA	1.4E-06	8.3E-06	Skin,vascular	4.3E-02	NA	8.5E-03	5.1E-02		
			Cadmium	NA	NA	NA	0.0E+00	Kidney	9.2E-02	NA	2.4E-02	1.2E-01		
			Chromium	NA	NA	NA	0.0E+00	Not identified	2.2E-02	NA	5.9E-02	8.1E-02		
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal Gastrointestinal, Blood, Liver	1.5E-02	NA	1.0E-03	1.6E-02		
			Iron	NA	NA	NA	0.0E+00		1.2E-01	NA	8.0E-03	1.3E-01		
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	0.0E+00			
			Manganese	NA	NA	NA	0.0E+00	CNS	7.0E-02	NA	1.2E-01	1.9E-01		
			Mercury	NA	NA	NA	0.0E+00	Immune System Decreased Body Weight	2.9E-02	NA	2.8E-02	5.7E-02		
			Nickel	NA	NA	NA	0.0E+00		4.0E-03	NA	6.6E-03	1.1E-02		
			Silver	NA	NA	NA	0.0E+00	Skin	7.2E-03	NA	4.7E-04	7.6E-03		
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.8E-02	NA	1.2E-03	1.9E-02		
			Vanadium	NA	NA	NA	0.0E+00	Kidney	6.7E-02	NA	1.7E-01	2.4E-01		
			Zinc	NA	NA	NA	0.0E+00	Blood	3.6E-03	NA	2.4E-04	3.8E-03		
			Chemical Total	2.8E-05	0.0E+00	1.6E-05	4.4E-05		5.3E-01	0.0E+00	4.3E-01	9.6E-01		
			Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Trichloroethene	NA	1.5E-06	NA	1.5E-06	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
					Chromium	NA	4.9E-08	NA	4.9E-08	Respiratory System	NA	1.2E-04	NA	1.2E-04
					Chemical Total	0.0E+00	1.5E-06	0.0E+00	1.5E-06		0.0E+00	1.2E-04	0.0E+00	1.2E-04
					Exposure Point Total	4.5E-05				9.6E-01				

TABLE 9.1.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
Receptor Population: Industrial Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Surface Soil	Surface Soil	Site 1 Active Burning Grounds	2,3,7,8-TCDD (dioxin)	2.6E-06	NA	1.0E-06	3.6E-06	NA	NA	NA	NA	0.0E+00		
			RDX	5.0E-07	NA	5.0E-08	5.5E-07	Prostate	4.3E-03	NA	4.2E-04	4.7E-03		
			Arsenic	3.7E-06	NA	7.3E-07	4.4E-06	Skin,vascular Gastrointestinal, Blood, Liver	2.3E-02	NA	4.6E-03	2.8E-02		
			Iron	NA	NA	NA	0.0E+00	NA	9.2E-02	NA	6.1E-03	9.8E-02		
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00		
	Chemical Total				6.8E-06	0.0E+00	1.8E-06	8.6E-06		1.2E-01	0.0E+00	1.1E-02	1.3E-01	
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	2.3E-08	NA	2.3E-08	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00		
			Chemical Total				0.0E+00	2.3E-08	0.0E+00	2.3E-08		0.0E+00	0.0E+00	0.0E+00
			Exposure Point Total				8.6E-06				1.3E-01			
			Receptor Total				6.0E-05				Receptor HI Total 1.4E+00			

HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	2.9E-01
Total Skin HI Across All Media =	1.2E-01
Total Vascular HI Across All Media =	1.1E-01
Total GI HI Across All Media =	3.3E-01
Total Liver HI Across All Media =	3.5E-01
Total Blood HI Across All Media =	3.6E-01
Total Kidney HI Across All Media =	4.2E-01
Total Prostate HI Across All Media =	4.8E-03
Total Immune System HI Across All Media =	5.7E-02
Total Body Weight HI Across All Media =	1.1E-02
Total Hair HI Across All Media =	1.9E-02
Total Respiratory System HI Across All Media =	1.2E-04

TABLE 9.2.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
Receptor Population: Trespasser/Visitor  
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Surface Soil	Surface Soil	Site 1 Former Disposal Pits	Trichloroethene	5.4E-10	NA	NA	5.4E-10	Liver NA Skin,vascular Gastrointestinal, Blood, Liver CNS Kidney	6.4E-05	NA	NA	6.4E-05	
			2,3,7,8-TCDD (dioxin)	6.3E-08	NA	6.0E-08	1.2E-07		NA	NA	NA	0.0E+00	
			Arsenic	4.3E-07	NA	2.1E-07	6.4E-07		7.4E-03	NA	3.6E-03	1.1E-02	
			Iron	NA	NA	NA	0.0E+00		2.3E-02	NA	3.7E-03	2.7E-02	
			Manganese	NA	NA	NA	0.0E+00		1.1E-02	NA	4.5E-02	5.6E-02	
	Vanadium	NA	NA	NA	0.0E+00	5.3E-03	NA	3.2E-02	3.7E-02				
	Chemical Total	4.9E-07	0.0E+00	2.7E-07	7.6E-07		4.7E-02	0.0E+00	8.4E-02	1.3E-01			
Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	1.5E-09	NA	1.5E-09	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00		
		Chemical Total	0.0E+00	1.5E-09	0.0E+00	1.5E-09		0.0E+00	0.0E+00	0.0E+00	0.0E+00		
		Exposure Point Total				7.6E-07					1.3E-01		
Surface Soil	Surface Soil	Site 1 Outside Burning Grounds	Trichloroethene	1.3E-08	NA	NA	1.3E-08	Liver NA NA NA NA NA NA NA NA NA NA Liver Prostate Blood Skin,vascular Kidney Not identified Gastrointestinal Gastrointestinal, Blood, Liver NA CNS Immune System Decreased Body Weight Skin Liver, Blood, Hair Kidney Blood	1.6E-03	NA	NA	1.6E-03	
			Benzo(a)anthracene	7.2E-08	NA	1.5E-07	2.2E-07		NA	NA	NA	0.0E+00	
			Benzo(a)pyrene	9.6E-07	NA	2.0E-06	2.9E-06		NA	NA	NA	0.0E+00	
			Benzo(b)fluoranthene	1.7E-07	NA	3.4E-07	5.1E-07		NA	NA	NA	0.0E+00	
			Dibenz(a,h)anthracene	5.8E-08	NA	1.2E-07	1.8E-07		NA	NA	NA	0.0E+00	
			Indeno(1,2,3-cd)pyrene	4.8E-08	NA	9.9E-08	1.5E-07		NA	NA	NA	0.0E+00	
			2,3,7,8-TCDD (dioxin)	8.6E-07	NA	8.2E-07	1.7E-06		NA	NA	NA	0.0E+00	
			HMX	NA	NA	NA	0.0E+00		Liver	2.3E-03	NA	2.2E-04	2.5E-03
			RDX	1.2E-09	NA	2.8E-10	1.5E-09		Prostate	2.8E-05	NA	6.6E-06	3.4E-05
			Antimony	NA	NA	NA	0.0E+00		Blood	5.5E-03	NA	5.8E-03	1.1E-02
			Arsenic	7.1E-07	NA	3.4E-07	1.0E-06		Skin,vascular	1.2E-02	NA	5.9E-03	1.8E-02
			Cadmium	NA	NA	NA	0.0E+00		Kidney	2.6E-02	NA	1.7E-02	4.3E-02
			Chromium	NA	NA	NA	0.0E+00		Not identified	6.3E-03	NA	4.0E-02	4.7E-02
			Copper	NA	NA	NA	0.0E+00		Gastrointestinal	4.4E-03	NA	6.9E-04	5.0E-03
			Iron	NA	NA	NA	0.0E+00		Gastrointestinal, Blood, Liver	3.4E-02	NA	5.5E-03	4.0E-02
			Lead	NA	NA	NA	0.0E+00		NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00		CNS	2.0E-02	NA	8.0E-02	1.0E-01
			Mercury	NA	NA	NA	0.0E+00		Immune System	8.4E-03	NA	1.9E-02	2.7E-02
			Nickel	NA	NA	NA	0.0E+00		Decreased Body Weight	1.1E-03	NA	4.6E-03	5.7E-03
			Silver	NA	NA	NA	0.0E+00		Skin	2.0E-03	NA	3.3E-04	2.4E-03
			Thallium	NA	NA	NA	0.0E+00		Liver, Blood, Hair	5.2E-03	NA	8.2E-04	6.0E-03
			Vanadium	NA	NA	NA	0.0E+00		Kidney	1.9E-02	NA	1.2E-01	1.4E-01
			Zinc	NA	NA	NA	0.0E+00		Blood	1.0E-03	NA	1.6E-04	1.2E-03
		Chemical Total	2.9E-06	0.0E+00	3.9E-06	6.7E-06		1.5E-01	0.0E+00	3.0E-01	4.5E-01		

TABLE 9.2.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
Receptor Population: Trespasser/Visitor  
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Trichloroethene	NA	3.7E-08	NA	3.7E-08	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chromium	NA	1.3E-09	NA	1.3E-09	Respiratory System	NA	8.4E-06	NA	8.4E-06
			Chemical Total	0.0E+00	3.9E-08	0.0E+00	3.9E-08		0.0E+00	8.4E-06	0.0E+00	8.4E-06
Exposure Point Total				6.8E-06				4.5E-01				
Surface Soil	Surface Soil	Site 1 Active Burning Grounds	2,3,7,8-TCDD (dioxin)	2.6E-07	NA	2.5E-07	5.2E-07	NA	NA	NA	NA	0.0E+00
			RDX	5.2E-08	NA	1.2E-08	6.4E-08	Prostate	1.2E-03	NA	2.9E-04	1.5E-03
			Arsenic	3.8E-07	NA	1.8E-07	5.6E-07	Skin,vascular	6.6E-03	NA	3.1E-03	9.7E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	2.6E-02	NA	4.2E-03	3.0E-02
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
	Chemical Total	7.0E-07	0.0E+00	4.5E-07	1.1E-06		3.4E-02	0.0E+00	7.6E-03	4.2E-02		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	6.0E-10	NA	6.0E-10	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
Chemical Total			0.0E+00	6.0E-10	0.0E+00	6.0E-10		0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Exposure Point Total				1.1E-06				4.2E-02				
Receptor Total				8.7E-06				Receptor HI Total 6.2E-01				

HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	1.6E-01
Total Skin HI Across All Media =	4.1E-02
Total Vascular HI Across All Media =	3.9E-02
Total GI HI Across All Media =	1.0E-01
Total Liver HI Across All Media =	1.1E-01
Total Blood HI Across All Media =	1.1E-01
Total Kidney HI Across All Media =	2.2E-01
Total Prostate HI Across All Media =	1.5E-03
Total Immune System HI Across All Media =	2.7E-02
Total Body Weight HI Across All Media =	5.7E-03
Total Hair HI Across All Media =	6.0E-03
Total Respiratory System HI Across All Media =	8.4E-06

TABLE 9.3.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Industrial Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	2.6E-07	NA	NA	2.6E-07	Liver	1.1E-02	NA	NA	1.1E-02
			2,3,7,8-TCDD (dioxin)	2.5E-05	NA	9.8E-06	3.5E-05	NA	NA	NA	0.0E+00	
			Arsenic	3.6E-06	NA	7.2E-07	4.3E-06	Skin,vascular	2.3E-02	NA	4.5E-03	2.7E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	3.4E-03	NA	2.2E-04	3.6E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	8.9E-02	NA	5.9E-03	9.5E-02
			Manganese	NA	NA	NA	0.0E+00	CNS	4.0E-02	NA	6.6E-02	1.1E-01
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.3E-02	NA	8.3E-04	1.3E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	1.8E-02	NA	4.6E-02	6.4E-02
	Chemical Total	2.9E-05	0.0E+00	1.1E-05	3.9E-05		2.0E-01	0.0E+00	1.2E-01	3.2E-01		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	3.0E-06	NA	3.0E-06	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
Chemical Total			0.0E+00	3.0E-06	0.0E+00	3.0E-06		0.0E+00	0.0E+00	0.0E+00		
Exposure Point Total				4.2E-05				3.2E-01				
Soil*	Soil*	Site 1 Outside Burning Grounds	Tetrachloroethene	2.8E-07	NA	NA	2.8E-07	Liver,whole body	1.5E-04	NA	NA	1.5E-04
			Trichloroethene	2.5E-07	NA	NA	2.5E-07	Liver	1.0E-02	NA	NA	1.0E-02
			Benzo(a)anthracene	1.8E-06	NA	1.5E-06	3.3E-06	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	1.7E-05	NA	1.5E-05	3.2E-05	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	2.2E-06	NA	1.8E-06	4.0E-06	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	1.7E-07	NA	1.4E-07	3.1E-07	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	7.7E-07	NA	6.6E-07	1.4E-06	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	6.1E-07	NA	5.2E-07	1.1E-06	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	8.6E-06	NA	3.4E-06	1.2E-05	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	4.6E-03	NA	1.8E-04	4.8E-03
			RDX	7.2E-08	NA	7.1E-09	7.9E-08	Prostate	6.1E-04	NA	6.0E-05	6.7E-04
			Antimony	NA	NA	NA	0.0E+00	Blood	1.6E-02	NA	7.2E-03	2.3E-02
			Arsenic	6.9E-06	NA	1.4E-06	8.3E-06	Skin,vascular	4.3E-02	NA	8.5E-03	5.2E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	7.5E-02	NA	2.0E-02	9.4E-02
			Chromium	NA	NA	NA	0.0E+00	Not identified	2.2E-02	NA	5.8E-02	8.0E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.1E-02	NA	2.7E-03	4.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.2E-01	NA	8.2E-03	1.3E-01
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	6.3E-02	NA	1.0E-01	1.7E-01
			Mercury	NA	NA	NA	0.0E+00	Immune System	2.5E-02	NA	2.3E-02	4.8E-02
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weight	4.1E-03	NA	6.8E-03	1.1E-02			

TABLE 9.3.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Industrial Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil* (cont'd)	Soil*	Site 1 Outside Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin	6.9E-03	NA	4.5E-04	7.3E-03	
			Thallium	NA	NA	NA	0.0E+00		Liver, Blood, Hair	1.6E-02	NA	1.1E-03	1.7E-02
			Vanadium	NA	NA	NA	0.0E+00		Kidney	5.7E-02	NA	1.5E-01	2.0E-01
			Zinc	NA	NA	NA	0.0E+00		Blood	4.0E-03	NA	2.6E-04	4.3E-03
			Chemical Total	3.9E-05	0.0E+00	2.4E-05	6.3E-05			5.1E-01	0.0E+00	3.9E-01	9.0E-01
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	1.5E-06	NA	1.5E-06	Kidney, Liver CNS, Liver, Endocrine system Respiratory System	NA	1.5E-03	NA	1.5E-03	
			Trichloroethene	NA	2.8E-06	NA	2.8E-06		NA	NA	NA	0.0E+00	
			Chromium	NA	4.9E-08	NA	4.9E-08		NA	1.2E-04	NA	1.2E-04	
			Chemical Total	0.0E+00	4.3E-06	0.0E+00	4.3E-06			0.0E+00	1.6E-03	0.0E+00	1.6E-03
			Exposure Point Total				6.8E-05						9.0E-01
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	8.8E-08	NA	NA	8.8E-08	Liver,whole body Liver NA Prostate Skin,vascular Gastrointestinal, Blood, Liver NA	4.6E-05	NA	NA	4.6E-05	
			Trichloroethene	3.9E-09	NA	NA	3.9E-09		1.6E-04	NA	NA	1.6E-04	
			2,3,7,8-TCDD (dioxin)	8.7E-06	NA	3.5E-06	1.2E-05		NA	NA	NA	0.0E+00	
			RDX	2.6E-07	NA	2.5E-08	2.8E-07		2.2E-03	NA	2.2E-04	2.4E-03	
			Arsenic	3.6E-06	NA	7.2E-07	4.4E-06		2.3E-02	NA	4.5E-03	2.7E-02	
			Iron	NA	NA	NA	0.0E+00		9.3E-02	NA	6.2E-03	9.9E-02	
			Lead	NA	NA	NA	0.0E+00		NA	NA	NA	0.0E+00	
	Chemical Total	1.3E-05	0.0E+00	4.2E-06	1.7E-05		1.2E-01	0.0E+00	1.1E-02	1.3E-01			
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	4.4E-08	NA	4.4E-08	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00	
			Chemical Total	0.0E+00	4.4E-08	0.0E+00	4.4E-08			0.0E+00	0.0E+00	0.0E+00	
Exposure Point Total						1.7E-05					1.3E-01		
Receptor Total				1.3E-04				Receptor HI Total				1.3E+00	

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	2.7E-01
Total Skin HI Across All Media =	1.1E-01
Total Vascular HI Across All Media =	1.1E-01
Total GI HI Across All Media =	3.7E-01
Total Liver HI Across All Media =	3.9E-01
Total Blood HI Across All Media =	3.8E-01
Total Kidney HI Across All Media =	3.6E-01
Total Prostate HI Across All Media =	3.1E-03
Total Immune System HI Across All Media =	4.8E-02
Total Body Weight HI Across All Media =	1.1E-02
Total Respiratory System HI Across All Media =	1.2E-04
Total Whole Body HI Across All Media =	1.9E-04

TABLE 9.4.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Trespasser/Visitor  
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	2.7E-08	NA	NA	2.7E-08	Liver	3.2E-03	NA	NA	3.2E-03
			2,3,7,8-TCDD (dioxin)	2.5E-06	NA	2.4E-06	5.0E-06	NA	NA	NA	0.0E+00	
			Arsenic	3.7E-07	NA	1.8E-07	5.5E-07	Skin,vascular	6.4E-03	NA	3.1E-03	9.5E-03
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	9.6E-04	NA	1.5E-04	1.1E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	2.6E-02	NA	4.1E-03	3.0E-02
			Manganese	NA	NA	NA	0.0E+00	CNS	1.1E-02	NA	4.5E-02	5.7E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	3.6E-03	NA	5.7E-04	4.2E-03
			Vanadium	NA	NA	NA	0.0E+00	Kidney	5.1E-03	NA	3.1E-02	3.7E-02
			Chemical Total	2.9E-06	0.0E+00	2.6E-06	5.5E-06		5.6E-02	0.0E+00	8.5E-02	1.4E-01
			Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	7.6E-08	NA	7.6E-08	CNS, Liver, Endocrine system	NA	NA
		Chemical Total	0.0E+00	7.6E-08	0.0E+00	7.6E-08		0.0E+00	0.0E+00	0.0E+00	0.0E+00	
		Exposure Point Total				5.6E-06					1.4E-01	
Soil*	Soil*	Site 1 Outside Burning Grounds	Tetrachloroethene	2.9E-08	NA	NA	2.9E-08	Liver,whole body	4.2E-05	NA	NA	4.2E-05
			Trichloroethene	2.5E-08	NA	NA	2.5E-08	Liver	3.0E-03	NA	NA	3.0E-03
			Benzo(a)anthracene	1.8E-07	NA	3.8E-07	5.6E-07	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	1.8E-06	NA	3.7E-06	5.4E-06	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	2.2E-07	NA	4.6E-07	6.8E-07	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	1.7E-08	NA	3.5E-08	5.2E-08	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	7.9E-08	NA	1.6E-07	2.4E-07	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	6.3E-08	NA	1.3E-07	1.9E-07	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	8.9E-07	NA	8.5E-07	1.7E-06	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	1.3E-03	NA	1.3E-04	1.4E-03
			RDX	7.4E-09	NA	1.8E-09	9.1E-09	Prostate	1.7E-04	NA	4.1E-05	2.1E-04
			Antimony	NA	NA	NA	0.0E+00	Blood	4.6E-03	NA	4.9E-03	9.6E-03
			Arsenic	7.1E-07	NA	3.4E-07	1.1E-06	Skin,vascular	1.2E-02	NA	5.9E-03	1.8E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	2.1E-02	NA	1.4E-02	3.5E-02
			Chromium	NA	NA	NA	0.0E+00	Not identified	6.3E-03	NA	4.0E-02	4.6E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.2E-02	NA	1.8E-03	1.3E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	3.5E-02	NA	5.6E-03	4.1E-02
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	1.8E-02	NA	7.2E-02	9.0E-02
			Mercury	NA	NA	NA	0.0E+00	Immune System	7.1E-03	NA	1.6E-02	2.3E-02
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weight	1.2E-03	NA	4.7E-03	5.9E-03			

TABLE 9.4.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Trespasser/Visitor  
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil* (cont'd)	Soil*	Site 1 Outside Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin Liver, Blood, Hair Kidney Blood	2.0E-03	NA	3.1E-04	2.3E-03	
			Thallium	NA	NA	NA	0.0E+00		4.6E-03	NA	7.3E-04	5.3E-03	
			Vanadium	NA	NA	NA	0.0E+00		1.6E-02	NA	1.0E-01	1.2E-01	
			Zinc	NA	NA	NA	0.0E+00		1.1E-03	NA	1.8E-04	1.3E-03	
			Chemical Total	4.0E-06	0.0E+00	6.0E-06	1.0E-05		1.5E-01	0.0E+00	2.7E-01	4.1E-01	
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Burning Pits	Tetrachloroethene	NA	3.9E-08	NA	3.9E-08	Kidney, Liver CNS, Liver, Endocrine system Respiratory System	NA	1.1E-04	NA	1.1E-04	
			Trichloroethene	NA	7.2E-08	NA	7.2E-08		NA	NA	NA	0.0E+00	
			Chromium	NA	1.2E-09	NA	1.2E-09		NA	8.3E-06	NA	8.3E-06	
			Chemical Total	0.0E+00	1.1E-07	0.0E+00	1.1E-07		0.0E+00	1.2E-04	0.0E+00	1.2E-04	
			Exposure Point Total				1.0E-05						4.1E-01
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	9.1E-09	NA	NA	9.1E-09	Liver,whole body Liver NA Prostate Skin,vascular Gastrointestinal, Blood, Liver NA	1.3E-05	NA	NA	1.3E-05	
			Trichloroethene	4.0E-10	NA	NA	4.0E-10		4.7E-05	NA	NA	4.7E-05	
			2,3,7,8-TCDD (dioxin)	9.0E-07	NA	8.6E-07	1.8E-06		NA	NA	NA	0.0E+00	
			RDX	2.6E-08	NA	6.3E-09	3.3E-08		6.2E-04	NA	1.5E-04	7.7E-04	
			Arsenic	3.7E-07	NA	1.8E-07	5.5E-07		6.5E-03	NA	3.1E-03	9.6E-03	
			Iron	NA	NA	NA	0.0E+00		2.7E-02	NA	4.2E-03	3.1E-02	
			Lead	NA	NA	NA	0.0E+00		NA	NA	NA	0.0E+00	
			Chemical Total	1.3E-06	0.0E+00	1.0E-06	2.4E-06		3.4E-02	0.0E+00	7.5E-03	4.1E-02	
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	1.1E-09	NA	1.1E-09	NA	NA	NA	NA	0.0E+00	
			Chemical Total	0.0E+00	1.1E-09	0.0E+00	1.1E-09		0.0E+00	0.0E+00	0.0E+00	0.0E+00	
			Exposure Point Total				2.4E-06					4.1E-02	
			Receptor Total				1.8E-05					Receptor HI Total	5.9E-01

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	1.5E-01
Total Skin HI Across All Media =	3.7E-02
Total Vascular HI Across All Media =	3.7E-02
Total GI HI Across All Media =	1.2E-01
Total Liver HI Across All Media =	1.2E-01
Total Blood HI Across All Media =	1.2E-01
Total Kidney HI Across All Media =	1.9E-01
Total Prostate HI Across All Media =	9.8E-04
Total Immune System HI Across All Media =	2.3E-02
Total Body Weight HI Across All Media =	5.9E-03
Total Respiratory System HI Across All Media =	8.3E-06
Total Whole Body HI Across All Media =	5.5E-05

TABLE 9.5.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	NA	NA	NA	0.0E+00	Liver	1.5E-02	NA	NA	1.5E-02
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	3.2E-02	NA	3.8E-03	3.5E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.7E-03	NA	1.9E-04	4.9E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.3E-01	NA	5.0E-03	1.3E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	5.6E-02	NA	5.6E-02	1.1E-01
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.8E-02	NA	7.1E-04	1.8E-02
	Vanadium	NA	NA	NA	0.0E+00	Kidney	2.5E-02	NA	3.9E-02	6.4E-02		
	Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		2.8E-01	0.0E+00	1.0E-01	3.8E-01		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	NA	NA	0.0E+00	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
Chemical Total			0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	0.0E+00	0.0E+00	
Exposure Point Total							0.0E+00					
Soil*	Soil*	Site 1 Outside Burning Grounds	Tetrachloroethene	NA	NA	NA	0.0E+00	Liver,whole body	2.1E-04	NA	NA	2.1E-04
			Trichloroethene	NA	NA	NA	0.0E+00	Liver	1.5E-02	NA	NA	1.5E-02
			Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	6.5E-03	NA	1.5E-03	8.0E-03
			RDX	NA	NA	NA	0.0E+00	Prostate	8.5E-04	NA	5.1E-04	1.4E-03
			Antimony	NA	NA	NA	0.0E+00	Blood	2.3E-02	NA	6.1E-03	2.9E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	6.0E-02	NA	7.2E-03	6.8E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	1.0E-01	NA	1.2E-02	1.2E-01
			Chromium	NA	NA	NA	0.0E+00	Not identified	3.1E-02	NA	4.9E-02	8.0E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	5.7E-02	NA	2.3E-03	5.9E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.7E-01	NA	6.9E-03	1.8E-01
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	8.9E-02	NA	8.9E-02	1.8E-01
			Mercury	NA	NA	NA	0.0E+00	Immune System	3.5E-02	NA	2.0E-02	5.4E-02
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weight	5.8E-03	NA	5.8E-03	1.2E-02			

TABLE 9.5.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil* (cont'd)	Soil*	Site 1 Outside Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin	9.6E-03	NA	3.8E-04	1.0E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	2.3E-02	NA	9.0E-04	2.4E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	8.0E-02	NA	1.2E-01	2.0E-01
			Zinc	NA	NA	NA	0.0E+00	Blood	5.6E-03	NA	2.2E-04	5.8E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		7.2E-01	0.0E+00	3.3E-01	1.0E+00
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	NA	NA	0.0E+00	Kidney, Liver	NA	6.4E-03	NA	6.4E-03
			Trichloroethene	NA	NA	NA	0.0E+00	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	Respiratory System	NA	4.9E-04	NA	4.9E-04
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	6.8E-03	0.0E+00	6.8E-03
			Exposure Point Total				0.0E+00					1.1E+00
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	NA	NA	NA	NA	Liver,whole body	6.4E-05	NA	NA	6.4E-05
			Trichloroethene	NA	NA	NA	NA	Liver,whole body	2.3E-05	NA	NA	2.3E-05
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00
			Perchlorate	NA	NA	NA	NA	Thyroid	1.9E-02	NA	7.5E-05	1.9E-02
			RDX	NA	NA	NA	NA	Prostate	3.0E-03	NA	1.8E-04	3.2E-03
			Antimony	NA	NA	NA	NA	Blood	1.0E-02	NA	4.1E-05	1.0E-02
			Arsenic	NA	NA	NA	NA	Skin,vascular	3.2E-02	NA	3.8E-03	3.6E-02
			Cadmium	NA	NA	NA	NA	Kidney	6.2E-03	NA	9.9E-04	7.2E-03
			Chromium	NA	NA	NA	NA	Not identified	6.5E-03	NA	1.0E-03	7.6E-03
			Copper	NA	NA	NA	NA	Gastrointestinal	8.5E-03	NA	3.4E-05	8.5E-03
			Iron	NA	NA	NA	NA	Gastrointestinal, Blood, Liver	1.3E-01	NA	5.2E-04	1.3E-01
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	NA	CNS	6.2E-02	NA	6.2E-03	6.8E-02
			Mercury	NA	NA	NA	NA	Immune System	9.1E-03	NA	5.2E-04	9.6E-03
			Thallium	NA	NA	NA	NA	Liver, Blood, Hair	2.5E-02	NA	9.8E-05	2.5E-02
			Vanadium	NA	NA	NA	NA	Kidney	3.0E-02	NA	4.6E-03	3.5E-02
			Chemical Total	NA	NA	NA	NA		3.4E-01	0.0E+00	1.8E-02	3.6E-01
Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00	
		Chemical Total	NA	NA	NA	NA		NA	0.0E+00	NA	0.0E+00	
		Exposure Point Total				NA					3.6E-01	
Receptor Total				NA				Receptor HI Total				1.8E+00

TABLE 9.5.RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient			
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal

\*Soil = combined surface and subsurface soil  
 HI - Hazard Index  
 NA - Not Applicable  
 CNS - Central Nervous System  
 GI - Gastrointestinal System

Total CNS HI Across All Media =	3.6E-01
Total Skin HI Across All Media =	1.5E-01
Total Vascular HI Across All Media =	1.4E-01
Total GI HI Across All Media =	5.1E-01
Total Liver HI Across All Media =	5.5E-01
Total Blood HI Across All Media =	5.5E-01
Total Kidney HI Across All Media =	4.4E-01
Total Prostate HI Across All Media =	4.6E-03
Total Immune System HI Across All Media =	6.4E-02
Total Body Weight HI Across All Media =	1.2E-02
Total Respiratory System HI Across All Media =	4.9E-04
Total Whole Body HI Across All Media =	2.9E-04
Total Thyroid HI Across All Media =	1.9E-02

TABLE 9.6.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	NA	NA	NA	0.0E+00	Liver	1.4E-01	NA	NA	1.4E-01
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	2.9E-01	NA	2.5E-02	3.2E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.4E-02	NA	1.2E-03	4.5E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.2E+00	NA	3.3E-02	1.2E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	5.2E-01	NA	3.7E-01	8.9E-01
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.7E-01	NA	4.6E-03	1.7E-01
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.4E-01	NA	2.5E-01	4.9E-01
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		2.6E+00	0.0E+00	6.8E-01	3.3E+00
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	NA	NA	0.0E+00		0.0E+00	0.0E+00	0.0E+00	4.9E-01	
		Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	0.0E+00	0.0E+00	4.9E-01	
		Exposure Point Total				0.0E+00					3.3E+00	
Soil*	Soil*	Site 1 Outside Burning Grounds	Tetrachloroethene	NA	NA	NA	0.0E+00	Liver,whole body	1.9E-03	NA	NA	1.9E-03
			Trichloroethene	NA	NA	NA	0.0E+00	Liver	1.4E-01	NA	NA	1.4E-01
			Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	6.0E-02	NA	1.0E-03	6.1E-02
			RDX	NA	NA	NA	0.0E+00	Prostate	7.9E-03	NA	3.3E-04	8.3E-03
			Antimony	NA	NA	NA	0.0E+00	Blood	2.1E-01	NA	4.0E-02	2.5E-01
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	5.6E-01	NA	4.7E-02	6.1E-01
			Cadmium	NA	NA	NA	0.0E+00	Kidney	9.8E-01	NA	1.1E-01	1.1E+00
			Chromium	NA	NA	NA	0.0E+00	Not identified	2.9E-01	NA	3.2E-01	6.1E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	5.3E-01	NA	1.5E-02	5.4E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.6E+00	NA	4.5E-02	1.7E+00
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	8.3E-01	NA	5.8E-01	1.4E+00
			Mercury	NA	NA	NA	0.0E+00	Immune System	3.2E-01	NA	1.3E-01	4.5E-01
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weight	5.4E-02	NA	3.8E-02	9.2E-02			

TABLE 9.6.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil* (cont'd)	Soil*	Site 1 Outside Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin Liver, Blood, Hair Kidney Blood	9.0E-02	NA	2.5E-03	9.2E-02
			Thallium	NA	NA	NA	0.0E+00		2.1E-01	NA	5.9E-03	2.2E-01
			Vanadium	NA	NA	NA	0.0E+00		7.5E-01	NA	8.1E-01	1.6E+00
			Zinc	NA	NA	NA	0.0E+00		5.2E-02	NA	1.5E-03	5.4E-02
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		6.7E+00	0.0E+00	2.1E+00	8.8E+00
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	NA	NA	0.0E+00	Kidney, Liver CNS, Liver, Endocrine system Respiratory System	NA	2.1E-02	NA	2.1E-02
			Trichloroethene	NA	NA	NA	0.0E+00		NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00		NA	1.6E-03	NA	1.6E-03
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		0.0E+00	2.3E-02	0.0E+00	2.3E-02
			Exposure Point Total				0.0E+00					8.9E+00
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	NA	NA	NA	NA	Liver,whole body Liver,whole body NA Thyroid Prostate Blood Skin,vascular Kidney Not identified Gastrointestinal Gastrointestinal, Blood, Liver NA CNS Immune System Liver, Blood, Hair Kidney	6.0E-04	NA	NA	6.0E-04
			Trichloroethene	NA	NA	NA	NA		2.2E-04	NA	NA	2.2E-04
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA		NA	NA	NA	0.0E+00
			Perchlorate	NA	NA	NA	NA		1.8E-01	NA	4.9E-04	1.8E-01
			RDX	NA	NA	NA	NA		2.8E-02	NA	1.2E-03	3.0E-02
			Antimony	NA	NA	NA	NA		9.5E-02	NA	2.7E-04	9.6E-02
			Arsenic	NA	NA	NA	NA		3.0E-01	NA	2.5E-02	3.2E-01
			Cadmium	NA	NA	NA	NA		5.8E-02	NA	6.5E-03	6.4E-02
			Chromium	NA	NA	NA	NA		6.1E-02	NA	6.8E-03	6.8E-02
			Copper	NA	NA	NA	NA		7.9E-02	NA	2.2E-04	8.0E-02
			Iron	NA	NA	NA	NA		1.2E+00	NA	3.4E-03	1.2E+00
			Lead	NA	NA	NA	NA		NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	NA		5.8E-01	NA	4.1E-02	6.2E-01
			Mercury	NA	NA	NA	NA		8.5E-02	NA	3.4E-03	8.8E-02
			Thallium	NA	NA	NA	NA		2.3E-01	NA	6.4E-04	2.3E-01
			Vanadium	NA	NA	NA	NA		2.8E-01	NA	3.0E-02	3.1E-01
			Chemical Total	NA	NA	NA	NA		3.2E+00	0.0E+00	1.2E-01	3.3E+00
Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00	
		Chemical Total	NA	NA	NA	NA	NA	0.0E+00	NA	0.0E+00		
		Exposure Point Total				NA				3.3E+00		
Receptor Total				NA				Receptor HI Total				1.5E+01

TABLE 9.6.RME  
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

\*Soil = combined surface and subsurface soil  
 HI - Hazard Index  
 NA - Not Applicable  
 CNS - Central Nervous System  
 GI - Gastrointestinal System

Total CNS HI Across All Media =	2.9E+00
Total Skin HI Across All Media =	1.3E+00
Total Vascular HI Across All Media =	1.3E+00
Total GI HI Across All Media =	4.8E+00
Total Liver HI Across All Media =	4.8E+00
Total Blood HI Across All Media =	5.1E+00
Total Kidney HI Across All Media =	3.5E+00
Total Prostate HI Across All Media =	3.8E-02
Total Immune System HI Across All Media =	5.4E-01
Total Body Weight HI Across All Media =	9.2E-02
Total Respiratory System HI Across All Media =	1.6E-03
Total Whole Body HI Across All Media =	2.7E-03
Total Thyroid HI Across All Media =	1.8E-01

TABLE 9.7.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	1.2E-06	NA	NA	1.2E-06	Liver	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	1.1E-04	NA	2.1E-05	1.3E-04	NA	NA	NA	NA	0.0E+00
			Arsenic	1.6E-05	NA	1.5E-06	1.8E-05	Skin,vascular	NA	NA	NA	0.0E+00
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	NA	0.0E+00
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chemical Total	1.3E-04	0.0E+00	2.3E-05	1.5E-04		0.0E+00	0.0E+00	0.0E+00	0.0E+00
Soil*	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	2.2E-05	NA	2.2E-05	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	2.2E-05	0.0E+00	2.2E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
			Exposure Point Total				1.7E-04					0.0E+00
Soil*	Soil*	Site 1 Outside Burning Grounds	Tetrachloroethene	1.3E-06	NA	NA	1.3E-06	Liver,whole body	NA	NA	NA	0.0E+00
			Trichloroethene	1.1E-06	NA	NA	1.1E-06	Liver	NA	NA	NA	0.0E+00
			Benzo(a)anthracene	7.9E-06	NA	3.3E-06	1.1E-05	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	7.7E-05	NA	3.2E-05	1.1E-04	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	9.6E-06	NA	4.0E-06	1.4E-05	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	7.4E-07	NA	3.1E-07	1.0E-06	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	3.4E-06	NA	1.4E-06	4.8E-06	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	2.7E-06	NA	1.1E-06	3.9E-06	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	3.9E-05	NA	7.3E-06	4.6E-05	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	NA	NA	NA	0.0E+00
			RDX	3.2E-07	NA	1.5E-08	3.4E-07	Prostate	NA	NA	NA	0.0E+00
			Antimony	NA	NA	NA	0.0E+00	Blood	NA	NA	NA	0.0E+00
			Arsenic	3.1E-05	NA	2.9E-06	3.4E-05	Skin,vascular	NA	NA	NA	0.0E+00
			Cadmium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	Not identified	NA	NA	NA	0.0E+00
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	NA	NA	NA	0.0E+00
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00			
Mercury	NA	NA	NA	0.0E+00	Immune System	NA	NA	NA	0.0E+00			
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weigh	NA	NA	NA	0.0E+00			

TABLE 9.7.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil* (cont'd)	Soil*	Site 1 Outside Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin	NA	NA	NA	0.0E+00		
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	NA	0.0E+00		
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00		
			Zinc	NA	NA	NA	0.0E+00	Blood	NA	NA	NA	0.0E+00		
	Chemical Total			1.7E-04	0.0E+00	5.2E-05	2.3E-04		0.0E+00	0.0E+00	0.0E+00	0.0E+00		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	1.1E-05	NA	1.1E-05	Kidney, Liver	NA	NA	NA	0.0E+00		
			Trichloroethene	NA	2.1E-05	NA	2.1E-05	S, Liver, Endocrine sys	NA	NA	NA	0.0E+00		
			Chromium	NA	3.6E-07	NA	3.6E-07	Respiratory System	NA	NA	NA	0.0E+00		
			Chemical Total			0.0E+00	3.2E-05	0.0E+00	3.2E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
			Exposure Point Total						2.6E-04				0.0E+00	
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	3.9E-07	NA	NA	3.9E-07	Liver,whole body	NA	NA	NA	NA		
			Trichloroethene	1.7E-08	NA	NA	1.7E-08	Liver,whole body	NA	NA	NA	NA		
			2,3,7,8-TCDD (dioxin)	3.9E-05	NA	3.7E-06	4.3E-05	NA	NA	NA	NA	NA		
			Perchlorate	NA	NA	NA	0.0E+00	Thyroid	NA	NA	NA	NA		
			RDX	1.1E-06	NA	5.4E-08	1.2E-06	Prostate	NA	NA	NA	NA		
			Antimony	NA	NA	NA	0.0E+00	Blood	NA	NA	NA	NA		
			Arsenic	1.6E-05	NA	1.5E-06	1.8E-05	Skin,vascular	NA	NA	NA	NA		
			Cadmium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	NA		
			Chromium	NA	NA	NA	0.0E+00	Not identified	NA	NA	NA	NA		
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	NA		
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	NA	NA	NA	NA		
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	NA		
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	NA		
			Mercury	NA	NA	NA	0.0E+00	Immune System	NA	NA	NA	NA		
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	NA	NA		
Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	NA					
Chemical Total			5.7E-05	NA	5.3E-06	6.2E-05		NA	NA	NA	NA			
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	3.3E-07	NA	3.3E-07	NA	NA	NA	NA	NA		
			Chemical Total			NA	3.3E-07	NA	3.3E-07		NA	NA	NA	NA
			Exposure Point Total						6.3E-05				NA	
Receptor Total						6.3E-05	Receptor HI Total			NA				
Receptor Total						4.3E-04	Receptor HI Total			0.0E+00				

\*Soil = combined surface and subsurface soil  
HI - Hazard Index

TABLE 9.8.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	5.0E-08	NA	NA	5.0E-08	Liver	5.3E-02	NA	NA	5.3E-02
			2,3,7,8-TCDD (dioxin)	4.8E-06	NA	5.9E-07	5.3E-06	NA	NA	NA	0.0E+00	
			Arsenic	7.0E-07	NA	4.3E-08	7.4E-07	Skin,vascular	1.1E-01	NA	6.7E-03	1.1E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.6E-02	NA	3.3E-04	1.6E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	4.3E-01	NA	8.9E-03	4.4E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	1.9E-01	NA	9.9E-02	2.9E-01
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	6.1E-02	NA	1.3E-03	6.2E-02
			Vanadium	NA	NA	NA	0.0E+00	Blood	8.6E-02	NA	6.9E-02	1.5E-01
	Chemical Total	5.5E-06	0.0E+00	6.3E-07	6.1E-06		9.5E-01	0.0E+00	1.8E-01	1.1E+00		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	4.7E-07	NA	4.7E-07	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	4.7E-07	0.0E+00	4.7E-07		0.0E+00	0.0E+00	0.0E+00	
			Exposure Point Total				6.6E-06				1.1E+00	
Soil*	Soil*	Site 1 Outside Burning Grounds	Tetrachloroethene	5.4E-08	NA	NA	5.4E-08	Liver,whole body	3.7E-05	NA	NA	3.7E-05
			Trichloroethene	4.7E-08	NA	NA	4.7E-08	Liver	2.6E-02	NA	NA	2.6E-02
			Benzo(a)anthracene	3.4E-07	NA	9.1E-08	4.3E-07	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	3.3E-06	NA	8.9E-07	4.2E-06	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	4.1E-07	NA	1.1E-07	5.2E-07	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	3.2E-08	NA	8.5E-09	4.0E-08	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	1.5E-07	NA	4.0E-08	1.9E-07	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	1.2E-07	NA	3.1E-08	1.5E-07	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	1.7E-06	NA	2.1E-07	1.9E-06	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	1.2E-02	NA	4.8E-05	1.2E-02
			RDX	1.4E-08	NA	4.3E-10	1.4E-08	Prostate	1.5E-03	NA	1.6E-05	1.5E-03
			Antimony	NA	NA	NA	0.0E+00	Blood	8.1E-02	NA	3.7E-03	8.5E-02
			Arsenic	1.3E-06	NA	8.2E-08	1.4E-06	Skin,vascular	1.1E-01	NA	2.2E-03	1.1E-01
			Cadmium	NA	NA	NA	0.0E+00	Kidney	1.9E-01	NA	5.1E-03	1.9E-01
			Chromium	NA	NA	NA	0.0E+00	Not identified	8.2E-03	NA	2.3E-03	1.0E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.0E-01	NA	7.0E-04	1.0E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	3.1E-01	NA	2.1E-03	3.1E-01
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	1.6E-01	NA	2.7E-02	1.9E-01
			Mercury	NA	NA	NA	0.0E+00	Kidney	6.2E-02	NA	6.1E-03	6.8E-02
			Nickel	NA	NA	NA	0.0E+00	Whole body	1.0E-02	NA	1.8E-03	1.2E-02

TABLE 9.8.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total			
Soil* (cont'd)	Soil*	Site 1 Outside Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin Liver, Blood, Hair Kidney Blood	1.7E-02	NA	1.2E-04	1.7E-02			
			Thallium	NA	NA	NA	0.0E+00		4.0E-02	NA	2.8E-04	4.1E-02			
			Vanadium	NA	NA	NA	0.0E+00		2.0E-02	NA	5.4E-03	2.6E-02			
			Zinc	NA	NA	NA	0.0E+00		1.0E-02	NA	6.9E-05	1.0E-02			
	Chemical Total			7.5E-06	0.0E+00	1.5E-06	8.9E-06		1.2E+00	0.0E+00	5.7E-02	1.2E+00			
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	2.4E-07	NA	2.4E-07	Kidney, Liver CNS, Liver, Endocrine system Respiratory System	NA	6.0E-03	NA	6.0E-03			
			Trichloroethene	NA	4.4E-07	NA	4.4E-07		NA	NA	NA	0.0E+00			
			Chromium	NA	7.7E-09	NA	7.7E-09		NA	4.6E-04	NA	4.6E-04			
			Chemical Total			0.0E+00	6.9E-07		0.0E+00	6.9E-07		0.0E+00	6.5E-03	0.0E+00	6.5E-03
			Exposure Point Total							9.6E-06					1.2E+00
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	1.7E-08	NA	NA	1.7E-08	Liver,whole body Liver NA Prostate Skin,vascular Gastrointestinal, Blood, Liver NA	2.2E-05	NA	NA	2.2E-05			
			Trichloroethene	7.5E-10	NA	NA	7.5E-10		7.9E-04	NA	NA	7.9E-04			
			2,3,7,8-TCDD (dioxin)	1.7E-06	NA	2.1E-07	1.9E-06		NA	NA	NA	0.0E+00			
			RDX	4.9E-08	NA	1.5E-09	5.1E-08		1.0E-02	NA	3.2E-04	1.1E-02			
			Arsenic	7.0E-07	NA	4.3E-08	7.4E-07		1.1E-01	NA	6.7E-03	1.2E-01			
			Iron	NA	NA	NA	0.0E+00		4.5E-01	NA	9.2E-03	4.6E-01			
			Lead	NA	NA	NA	0.0E+00		NA	NA	NA	0.0E+00			
	Chemical Total			2.4E-06	0.0E+00	2.5E-07	2.7E-06		5.7E-01	0.0E+00	1.6E-02	5.8E-01			
	Air	Airborne Particulates and Volatile Emissions from Site 1 Active Burning Grounds	Trichloroethene	NA	7.0E-09	NA	7.0E-09	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00			
			Chemical Total			0.0E+00	7.0E-09		0.0E+00	7.0E-09		0.0E+00	0.0E+00	0.0E+00	
Exposure Point Total						2.7E-06					5.8E-01				
Receptor Total						1.9E-05					Receptor HI Total	2.9E+00			

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	4.8E-01
Total Skin HI Across All Media =	3.4E-01
Total Vascular HI Across All Media =	3.4E-01
Total GI HI Across All Media =	1.3E+00
Total Liver HI Across All Media =	1.4E+00
Total Blood HI Across All Media =	1.4E+00
Total Kidney HI Across All Media =	2.9E-01
Total Prostate HI Across All Media =	1.2E-02
Total Respiratory System HI Across All Media =	4.6E-04
Total Whole Body HI Across All Media =	1.2E-02
Total Lifetime HI Across All Media =	1.8E-01

TABLE 9.9.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current/Future
Receptor Population: Recreational Person
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Surface Water	Surface Water	Site 1 Surface Water	Trichloroethene	1.0E-09	NA	2.4E-08	2.5E-08	Liver	4.4E-05	NA	1.1E-03	1.1E-03	
			Arsenic	8.2E-08	NA	1.6E-07	2.5E-07	Skin,vascular	5.3E-04	NA	1.1E-03	1.6E-03	
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	2.3E-03	NA	4.7E-03	7.0E-03	
			Chemical Total	8.3E-08	0.0E+00	1.9E-07	2.7E-07		2.9E-03	0.0E+00	6.8E-03	9.7E-03	
		Exposure Point Total					2.7E-07						9.7E-03
Medium Total													9.7E-03
Sediment	Sediment	Site 1 Sediment	Benzo(a)anthracene	5.7E-08	NA	1.9E-07	2.5E-07	NA	NA	NA	NA	0.0E+00	
			Benzo(a)pyrene	4.7E-07	NA	1.6E-07	6.2E-07	NA	NA	NA	NA	0.0E+00	
			Benzo(b)fluoranthene	6.5E-09	NA	2.2E-07	2.3E-07	NA	NA	NA	NA	0.0E+00	
			Arsenic	6.2E-07	NA	4.8E-07	1.1E-06	Skin,vascular Gastrointestinal, Blood, Liver	3.9E-03	NA	3.0E-03	6.8E-03	
			Iron	NA	NA	NA	0.0E+00		1.2E-02	NA	3.0E-03	1.5E-02	
			Manganese	NA	NA	NA	0.0E+00	Liver	7.0E-03	NA	4.6E-02	5.3E-02	
		Chemical Total	1.2E-06	0.0E+00	1.0E-06	2.2E-06		2.2E-02	0.0E+00	5.2E-02	7.4E-02		
Exposure Point Total					2.2E-06						7.4E-02		
Medium Total													7.4E-02
Receptor Total								Receptor HI Total					8.4E-02

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable

Total Skin HI Across All Media =	8.4E-03
Total Vascular HI Across All Media =	8.4E-03
Total Liver HI Across All Media =	7.5E-02
Total Blood HI Across All Media =	2.2E-02
Total Hair HI Across All Media =	7.0E-03
Total Gastrointestinal HI Across All Media =	1.5E-02

TABLE 9.10.RME  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current/Future
Receptor Population: Recreational Person
Receptor Age: Adolescents

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Surface Water	Surface Water	Site 1 Surface Water	Trichloroethene	7.1E-10	NA	1.7E-08	1.8E-08	Liver	3.2E-05	NA	7.6E-04	7.9E-04	
			Arsenic	5.8E-08	NA	1.2E-07	1.7E-07	Skin/vascular	3.8E-04	NA	7.5E-04	1.1E-03	
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.9E-05	NA	3.9E-05	5.8E-05	
			Chemical Total	5.9E-08	0.0E+00	1.3E-07	1.9E-07		4.3E-04	0.0E+00	1.5E-03	2.0E-03	
		Exposure Point Total					1.9E-07						2.0E-03
Medium Total							1.9E-07						2.0E-03
Sediment	Sediment	Site 1 Sediment	Benzo(a)anthracene	4.0E-08	NA	4.1E-08	8.1E-08	NA	NA	NA	NA	0.0E+00	
			Benzo(a)pyrene	3.3E-07	NA	3.3E-08	3.7E-07	NA	NA	NA	NA	0.0E+00	
			Benzo(b)fluoranthene	4.6E-09	NA	4.7E-08	5.1E-08	NA	NA	NA	NA	0.0E+00	
			Arsenic	4.4E-07	NA	1.0E-07	5.4E-07	Skin,vascular Gastrointestinal, Blood, Liver	7.6E-03	NA	1.8E-03	9.4E-03	
			Iron	NA	NA	NA	0.0E+00		2.3E-02	NA	1.8E-03	2.5E-02	
		Manganese	NA	NA	NA	0.0E+00	Liver	1.4E-02	NA	2.7E-02	4.1E-02		
		Chemical Total	8.2E-07	0.0E+00	2.2E-07	1.0E-06		4.4E-02	0.0E+00	3.0E-02	7.5E-02		
Exposure Point Total							1.0E-06						7.5E-02
Medium Total							1.0E-06						7.5E-02
Receptor Total							1.2E-06	Receptor HI Total					7.7E-02

\*Soil = combined surface and subsurface soil

HI - Hazard Index

NA - Not Applicable

Total Skin HI Across All Media =	1.0E-02
Total Vascular HI Across All Media =	1.0E-02
Total Liver HI Across All Media =	6.6E-02
Total Blood HI Across All Media =	2.5E-02
Total Hair HI Across All Media =	5.8E-05
Total Gastrointestinal HI Across All Media =	2.5E-02

TABLE 9.1.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
Receptor Population: Industrial Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 1 Outside Burning Grounds	Trichloroethene	1.5E-08	NA	NA	1.5E-08	Liver	2.4E-03	NA	NA	2.4E-03
			Benzo(a)anthracene	8.1E-08	NA	2.8E-08	1.1E-07	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	1.1E-06	NA	3.7E-07	1.4E-06	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	1.9E-07	NA	6.4E-08	2.5E-07	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	6.6E-08	NA	2.3E-08	8.8E-08	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	5.4E-08	NA	1.8E-08	7.2E-08	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	9.7E-07	NA	1.5E-07	1.1E-06	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	3.6E-03	NA	5.6E-05	3.6E-03
			RDX	1.3E-09	NA	5.2E-11	1.4E-09	Prostate	4.2E-05	NA	1.7E-06	4.4E-05
			Antimony	NA	NA	NA	0.0E+00	Blood	8.4E-03	NA	1.5E-03	9.8E-03
			Arsenic	8.0E-07	NA	6.3E-08	8.6E-07	Skin,vascular	1.9E-02	NA	1.5E-03	2.0E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	4.0E-02	NA	4.2E-03	4.4E-02
			Chromium	NA	NA	NA	0.0E+00	Not identified	9.7E-03	NA	1.0E-02	2.0E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	6.7E-03	NA	1.8E-04	6.9E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	5.3E-02	NA	1.4E-03	5.4E-02
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	3.1E-02	NA	2.0E-02	5.1E-02
			Mercury	NA	NA	NA	0.0E+00	Immune System	1.3E-02	NA	4.9E-03	1.8E-02
			Nickel	NA	NA	NA	0.0E+00	Decreased Body Weigh	1.8E-03	NA	1.2E-03	2.9E-03
			Silver	NA	NA	NA	0.0E+00	NA	3.1E-03	NA	8.3E-05	3.2E-03
	Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	8.0E-03	NA	2.1E-04	8.2E-03		
	Vanadium	NA	NA	NA	0.0E+00	Kidney	2.9E-02	NA	3.0E-02	5.9E-02		
	Zinc	NA	NA	NA	0.0E+00	Blood	1.6E-03	NA	4.2E-05	1.6E-03		
	Chemical Total			3.2E-06	0.0E+00	7.2E-07	4.0E-06		2.3E-01	0.0E+00	7.5E-02	3.1E-01
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Trichloroethene	NA	1.7E-07	NA	1.7E-07	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chromium	NA	5.7E-09	NA	5.7E-09	Respiratory System	NA	5.1E-05	NA	5.1E-05
			Chemical Total	0.0E+00	1.7E-07	0.0E+00	1.7E-07		0.0E+00	5.1E-05	0.0E+00	1.7E-03
Exposure Point Total						4.1E-06				3.1E-01		
Receptor Total						4.1E-06		Receptor HI Total			3.1E-01	

\*Soil = combined surface and subsurface soil

Total CNS HI Across All Media = 5.1E-02

TABLE 9.1.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Current  
Receptor Population: Industrial Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
HI - Hazard Index NA - Not Applicable CNS - Central Nervous System GI - Gastrointestinal System								Total Skin HI Across All Media = 2.4E-02 Total Vascular HI Across All Media = 2.0E-02 Total GI HI Across All Media = 6.1E-02 Total Liver HI Across All Media = 6.8E-02 Total Blood HI Across All Media = 7.2E-02 Total Kidney HI Across All Media = 1.0E-01 Total Prostate HI Across All Media = 4.4E-05 Total Immune System HI Across All Media = 1.8E-02 Total Body Weight HI Across All Media = 2.9E-03 Total Hair HI Across All Media = 8.2E-03 Total Respiratory System HI Across All Media = 5.1E-05				

TABLE 9.2.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	NA	NA	0.0E+00	Liver,whole body	6.9E-05	NA	NA	6.9E-05
			Trichloroethene	NA	NA	NA	0.0E+00	Liver	4.9E-03	NA	NA	4.9E-03
			Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	2.2E-03	NA	1.0E-04	2.3E-03
			RDX	NA	NA	NA	0.0E+00	Prostate	2.8E-04	NA	3.4E-05	3.2E-04
			Antimony	NA	NA	NA	0.0E+00	Blood	7.6E-03	NA	4.0E-03	1.2E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	2.0E-02	NA	4.8E-03	2.5E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	3.5E-02	NA	1.1E-02	4.6E-02
			Chromium	NA	NA	NA	0.0E+00	Not identified	1.0E-02	NA	3.3E-02	4.3E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.9E-02	NA	1.5E-03	2.1E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	5.8E-02	NA	4.6E-03	6.2E-02
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	3.0E-02	NA	5.9E-02	8.9E-02
			Mercury	NA	NA	NA	0.0E+00	Immune System	1.2E-02	NA	1.3E-02	2.5E-02
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weigh	1.9E-03	NA	3.9E-03	5.8E-03			
Soil* (cont'd)	Soil*	Site 1 Outside Active Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin	3.2E-03	NA	2.6E-04	3.5E-03
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	7.6E-03	NA	6.0E-04	8.2E-03
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.7E-02	NA	8.2E-02	1.1E-01
			Zinc	NA	NA	NA	0.0E+00	Blood	1.9E-03	NA	1.5E-04	2.0E-03
			Chemical Total	0.0E+00	NA	0.0E+00	0.0E+00		2.4E-01	0.0E+00	2.2E-01	4.6E-01
Receptor Total								Receptor HI Total				4.6E-01

TABLE 9.2.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
*Soil = combined surface and subsurface soil										Total CNS HI Across All Media =	8.9E-02	
HI - Hazard Index										Total Skin HI Across All Media =	2.5E-02	
NA - Not Applicable										Total Vascular HI Across All Media =	2.5E-02	
CNS - Central Nervous System										Total GI HI Across All Media =	8.3E-02	
GI - Gastrointestinal System										Total Liver HI Across All Media =	7.8E-02	
										Total Blood HI Across All Media =	8.2E-02	
										Total Kidney HI Across All Media =	1.6E-01	
										Total Prostate HI Across All Media =	3.2E-04	
										Total Immune System HI Across All Media =	2.5E-02	
										Total Body Weight HI Across All Media =	5.8E-03	
										Total Whole Body HI Across All Media =	6.9E-05	
										Total Lifetime HI Across All Media =	2.0E-03	

TABLE 9.3.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	NA	NA	NA	0.0E+00	Liver	4.8E-02	NA	NA	4.8E-02
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	0.0E+00	
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	9.8E-02	NA	1.7E-02	1.2E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.5E-02	NA	8.2E-04	1.5E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	3.9E-01	NA	2.2E-02	4.1E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	1.7E-01	NA	2.4E-01	4.2E-01
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	5.5E-02	NA	3.1E-03	5.8E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	7.9E-02	NA	1.7E-01	2.5E-01
	Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		8.6E-01	0.0E+00	4.6E-01	1.3E+00		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	9.7E-06	NA	9.7E-06	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	9.7E-06	0.0E+00	9.7E-06		0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Exposure Point Total											
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	NA	NA	0.0E+00	Liver,whole body	6.4E-04	NA	NA	6.4E-04
			Trichloroethene	NA	NA	NA	0.0E+00	Liver	4.6E-02	NA	NA	4.6E-02
			Benzo(a)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	2.0E-02	NA	6.8E-04	2.1E-02
			RDX	NA	NA	NA	0.0E+00	Prostate	2.7E-03	NA	2.2E-04	2.9E-03
			Antimony	NA	NA	NA	0.0E+00	Blood	7.1E-02	NA	2.7E-02	9.8E-02
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	1.9E-01	NA	3.2E-02	2.2E-01
			Cadmium	NA	NA	NA	0.0E+00	Kidney	3.3E-01	NA	7.3E-02	4.0E-01
			Chromium	NA	NA	NA	0.0E+00	Not identified	9.6E-02	NA	2.1E-01	3.1E-01
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	1.8E-01	NA	9.9E-03	1.9E-01
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	5.4E-01	NA	3.0E-02	5.7E-01
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
Manganese	NA	NA	NA	0.0E+00	CNS	2.8E-01	NA	3.9E-01	6.7E-01			
Mercury	NA	NA	NA	0.0E+00	Immune System	1.1E-01	NA	8.6E-02	1.9E-01			
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weight	1.8E-02	NA	2.5E-02	4.3E-02			

TABLE 9.3.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil* (cont'd)	Soil*	Site 1 Outside Active Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin	3.0E-02	NA	1.7E-03	3.2E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	7.1E-02	NA	4.0E-03	7.5E-02
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.5E-01	NA	5.4E-01	7.9E-01
			Zinc	NA	NA	NA	0.0E+00	Blood	1.7E-02	NA	9.8E-04	1.8E-02
			Chemical Total	0.0E+00	NA	0.0E+00	0.0E+00		2.2E+00	0.0E+00	1.4E+00	3.7E+00
		Exposure Point Total									0.0E+00	3.7E+00
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	NA	NA	NA	NA	Liver,whole body	2.0E-04	NA	NA	2.0E-04
			Trichloroethene	NA	NA	NA	NA	Liver,whole body	7.2E-05	NA	NA	7.2E-05
			2,3,7,8-TCDD (dioxin)	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00
			Perchlorate	NA	NA	NA	NA	Thyroid	5.9E-02	NA	3.3E-04	5.9E-02
			RDX	NA	NA	NA	NA	Prostate	9.5E-03	NA	8.0E-04	1.0E-02
			Antimony	NA	NA	NA	NA	Blood	3.2E-02	NA	1.8E-04	3.2E-02
			Arsenic	NA	NA	NA	NA	Skin,vascular	9.9E-02	NA	1.7E-02	1.2E-01
			Cadmium	NA	NA	NA	NA	Kidney	1.9E-02	NA	4.3E-03	2.4E-02
			Chromium	NA	NA	NA	NA	Not identified	2.0E-02	NA	4.6E-03	2.5E-02
			Copper	NA	NA	NA	NA	Gastrointestinal	2.7E-02	NA	1.5E-04	2.7E-02
			Iron	NA	NA	NA	NA	Gastrointestinal, Blood, Liver	4.1E-01	NA	2.3E-03	4.1E-01
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	NA	CNS	1.9E-01	NA	2.7E-02	2.2E-01
			Mercury	NA	NA	NA	NA	Immune System	2.8E-02	NA	2.3E-03	3.1E-02
			Thallium	NA	NA	NA	NA	Liver, Blood, Hair	7.7E-02	NA	4.3E-04	7.7E-02
Vanadium	NA	NA	NA	NA	Kidney	9.4E-02	NA	2.0E-02	1.1E-01			
		Chemical Total	NA	NA	NA		1.1E+00	0.0E+00	7.9E-02	1.1E+00		
		Exposure Point Total					NA				NA	1.1E+00
Receptor Total							NA	Receptor HI Total			1.1E+00	



TABLE 9.4.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	3.2E-07	NA	NA	3.2E-07	Liver	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	3.0E-05	NA	8.3E-05	1.1E-04	NA	NA	NA	NA	0.0E+00
			Arsenic	4.4E-06	NA	6.1E-06	1.0E-05	Skin,vascular	NA	NA	NA	0.0E+00
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	NA	0.0E+00
	Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00		
	Chemical Total	3.5E-05	0.0E+00	8.9E-05	1.2E-04		0.0E+00	0.0E+00	0.0E+00	0.0E+00		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	9.7E-06	NA	9.7E-06	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
Chemical Total			0.0E+00	9.7E-06	0.0E+00	9.7E-06		0.0E+00	0.0E+00	0.0E+00	0.0E+00	
Exposure Point Total						1.3E-04					0.0E+00	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Tetrachloroethene	3.4E-07	NA	NA	3.4E-07	Liver,whole body	NA	NA	NA	0.0E+00
			Trichloroethene	3.0E-07	NA	NA	3.0E-07	Liver	NA	NA	NA	0.0E+00
			Benzo(a)anthracene	2.2E-06	NA	1.3E-06	3.4E-06	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	2.1E-05	NA	1.3E-05	3.4E-05	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	2.6E-06	NA	1.6E-06	4.2E-06	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	2.0E-07	NA	1.2E-07	3.2E-07	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	9.3E-07	NA	5.6E-07	1.5E-06	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	7.4E-07	NA	4.4E-07	1.2E-06	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	1.0E-05	NA	2.9E-06	1.3E-05	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	NA	NA	NA	0.0E+00
			RDX	8.7E-08	NA	6.0E-09	9.3E-08	Prostate	NA	NA	NA	0.0E+00
			Antimony	NA	NA	NA	0.0E+00	Blood	NA	NA	NA	0.0E+00
			Arsenic	8.4E-06	NA	1.2E-06	9.6E-06	Skin,vascular	NA	NA	NA	0.0E+00
			Cadmium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00
			Chromium	NA	NA	NA	0.0E+00	Not identified	NA	NA	NA	0.0E+00
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	NA	NA	NA	0.0E+00
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	NA	NA	NA	0.0E+00
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	NA	NA	NA	0.0E+00
			Mercury	NA	NA	NA	0.0E+00	Immune System	NA	NA	NA	0.0E+00
Nickel	NA	NA	NA	0.0E+00	Decreased Body Weigh	NA	NA	NA	0.0E+00			

TABLE 9.4.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total			
Soil* (cont'd)	Soil*	Site 1 Outside Active Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin	NA	NA	NA	0.0E+00			
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	NA	NA	NA	0.0E+00			
			Vanadium	NA	NA	NA	0.0E+00	Kidney	NA	NA	NA	0.0E+00			
			Zinc	NA	NA	NA	0.0E+00	Blood	NA	NA	NA	0.0E+00			
	Chemical Total			4.7E-05	NA	2.1E-05	6.8E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00			
			Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	4.9E-06	NA	4.9E-06	Kidney, Liver CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00		
				Trichloroethene	NA	9.1E-06	NA	9.1E-06		NA	NA	NA	0.0E+00		
				Chromium	NA	1.6E-07	NA	1.6E-07	Respiratory System	NA	NA	NA	0.0E+00		
				Chemical Total			0.0E+00	1.4E-05	0.0E+00	1.4E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
				Exposure Point Total						8.2E-05				0.0E+00	
Receptor Total							2.2E-04	Receptor HI Total			0.0E+00				

\*Soil = combined surface and subsurface soil  
HI - Hazard Index

TABLE 9.5.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	1.3E-08	NA	NA	1.3E-08	Liver	1.4E-02	NA	NA	1.4E-02
			2,3,7,8-TCDD (dioxin)	1.2E-06	NA	1.0E-07	1.3E-06	NA	NA	NA	0.0E+00	
			Arsenic	1.8E-07	NA	7.5E-09	1.9E-07	Skin,vascular	2.8E-02	NA	1.2E-03	2.9E-02
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	4.2E-03	NA	5.8E-05	4.2E-03
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.1E-01	NA	1.5E-03	1.1E-01
			Manganese	NA	NA	NA	0.0E+00	CNS	5.0E-02	NA	1.7E-02	6.7E-02
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.6E-02	NA	2.2E-04	1.6E-02
			Vanadium	NA	NA	NA	0.0E+00	Lifetime	3.2E-03	NA	1.7E-03	4.9E-03
	Chemical Total	1.4E-06	0.0E+00	1.1E-07	1.5E-06		2.3E-01	0.0E+00	2.2E-02	2.5E-01		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	1.8E-07	NA	1.8E-07	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
Chemical Total			0.0E+00	1.8E-07	0.0E+00	1.8E-07		0.0E+00	0.0E+00	0.0E+00	0.0E+00	
		Exposure Point Total									1.7E-06	2.5E-01
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Tetrachloroethene	1.4E-08	NA	NA	1.4E-08	Liver,whole body	1.8E-05	NA	NA	1.8E-05
			Trichloroethene	1.2E-08	NA	NA	1.2E-08	Liver	1.3E-02	NA	NA	1.3E-02
			Benzo(a)anthracene	8.9E-08	NA	1.6E-08	1.0E-07	NA	NA	NA	NA	0.0E+00
			Benzo(a)pyrene	8.6E-07	NA	1.5E-07	1.0E-06	NA	NA	NA	NA	0.0E+00
			Benzo(b)fluoranthene	1.1E-07	NA	1.9E-08	1.3E-07	NA	NA	NA	NA	0.0E+00
			Benzo(k)fluoranthene	8.3E-09	NA	1.5E-09	9.8E-09	NA	NA	NA	NA	0.0E+00
			Dibenz(a,h)anthracene	3.8E-08	NA	6.9E-09	4.5E-08	NA	NA	NA	NA	0.0E+00
			Indeno(1,2,3-cd)pyrene	3.1E-08	NA	5.5E-09	3.6E-08	NA	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	4.3E-07	NA	3.6E-08	4.7E-07	NA	NA	NA	NA	0.0E+00
			HMX	NA	NA	NA	0.0E+00	Liver	5.8E-03	NA	4.8E-05	5.8E-03
			RDX	3.6E-09	NA	7.4E-11	3.6E-09	Prostate	7.6E-04	NA	1.6E-05	7.7E-04
			Antimony	NA	NA	NA	0.0E+00	Blood	4.1E-02	NA	3.7E-03	4.4E-02
			Arsenic	3.5E-07	NA	1.4E-08	3.6E-07	Skin,vascular	5.4E-02	NA	2.2E-03	5.6E-02
			Cadmium	NA	NA	NA	0.0E+00	Kidney	9.3E-02	NA	5.1E-03	9.8E-02
			Chromium	NA	NA	NA	0.0E+00	Not identified	4.1E-03	NA	2.3E-03	6.4E-03
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	5.1E-02	NA	7.0E-04	5.1E-02
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.5E-01	NA	2.1E-03	1.6E-01
			Lead	NA	NA	NA	0.0E+00	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	0.0E+00	CNS	7.9E-02	NA	2.7E-02	1.1E-01
			Mercury	NA	NA	NA	0.0E+00	Kidney	3.1E-02	NA	6.1E-03	3.7E-02
Nickel	NA	NA	NA	0.0E+00	Whole body	5.2E-03	NA	1.8E-03	7.0E-03			

TABLE 9.5.CTE  
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Construction Worker  
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil* (cont'd)	Soil*	Site 1 Outside Active Burning Grounds	Silver	NA	NA	NA	0.0E+00	Skin Liver, Blood, Hair Lifetime Blood	8.6E-03	NA	1.2E-04	8.7E-03
			Thallium	NA	NA	NA	0.0E+00		2.0E-02	NA	2.8E-04	2.0E-02
			Vanadium	NA	NA	NA	0.0E+00		1.0E-02	NA	5.4E-03	1.6E-02
			Zinc	NA	NA	NA	0.0E+00		5.0E-03	NA	6.9E-05	5.1E-03
	Chemical Total			1.9E-06	0.0E+00	2.5E-07	2.2E-06	5.8E-01	0.0E+00	5.7E-02	6.3E-01	
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Tetrachloroethene	NA	9.1E-08	NA	9.1E-08	Kidney, Liver CNS, Liver, Endocrine system Respiratory System	NA	2.3E-03	NA	2.3E-03
			Trichloroethene	NA	1.7E-07	NA	1.7E-07		NA	NA	NA	0.0E+00
			Chromium	NA	2.9E-09	NA	2.9E-09		NA	1.7E-04	NA	1.7E-04
			Chemical Total			0.0E+00	2.6E-07		0.0E+00	2.6E-07	0.0E+00	2.4E-03
	Exposure Point Total								0.0E+00	2.4E-03	0.0E+00	6.3E-01
Soil*	Soil*	Site 1 Active Burning Grounds	Tetrachloroethene	4.4E-09	NA	NA	4.4E-09	Liver,whole body Liver NA Prostate Skin,vascular Gastrointestinal, Blood, Liver NA	5.7E-06	NA	NA	5.7E-06
			Trichloroethene	1.9E-10	NA	NA	1.9E-10		2.1E-04	NA	NA	2.1E-04
			2,3,7,8-TCDD (dioxin)	4.4E-07	NA	1.8E-08	4.5E-07		NA	NA	NA	0.0E+00
			RDX	5.8E-09	NA	1.2E-10	5.9E-09		1.2E-03	NA	2.5E-05	1.2E-03
			Arsenic	2.5E-07	NA	1.0E-08	2.6E-07		3.9E-02	NA	1.6E-03	4.1E-02
			Iron	NA	NA	NA	0.0E+00		2.7E-05	NA	3.7E-07	2.8E-05
			Lead	NA	NA	NA	0.0E+00		NA	NA	NA	0.0E+00
	Chemical Total			7.0E-07	0.0E+00	2.9E-08	7.3E-07	4.1E-02	0.0E+00	1.6E-03	4.2E-02	
	Air	Airborne Particulates and Volatile Emissions from Site 1 Burning Grounds	Trichloroethene	NA	2.7E-09	NA	2.7E-09	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chemical Total			0.0E+00	2.7E-09		0.0E+00	2.7E-09	0.0E+00	0.0E+00
Exposure Point Total									0.0E+00	0.0E+00	0.0E+00	
Receptor Total							4.9E-06	Receptor HI Total			9.2E-01	

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	1.7E-01
Total Skin HI Across All Media =	1.3E-01
Total Vascular HI Across All Media =	1.3E-01
Total GI HI Across All Media =	3.3E-01
Total Liver HI Across All Media =	3.4E-01
Total Blood HI Across All Media =	3.6E-01
Total Kidney HI Across All Media =	1.5E-01
Total Prostate HI Across All Media =	2.0E-03
Total Respiratory System HI Across All Media =	1.7E-04
Total Whole Body HI Across All Media =	7.0E-03
Total Lifetime HI Across All Media =	2.1E-02

TABLE 10.1.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Cadmium	NA	NA	NA	0.0E+00	Kidney Gastrointestinal, Blood, Liver	1.0E-01	NA	1.7E-02	1.2E-01	
			Iron	NA	NA	NA	0.0E+00		1.7E-01	NA	6.9E-03	1.8E-01	
			Manganese	NA	NA	NA	0.0E+00		CNS	8.9E-02	NA	8.9E-02	1.8E-01
			Vanadium	NA	NA	NA	0.0E+00		Kidney	8.0E-02	NA	1.2E-01	2.0E-01
		Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.5E-01	0.0E+00	2.4E-01	6.8E-01			
		Exposure Point Total				0.0E+00					6.8E-01		
Receptor Total							0.0E+00				Receptor HI Total	6.8E-01	

\*Soil = combined surface and subsurface soil  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	1.8E-01
Total GI HI Across All Media =	1.8E-01
Total Liver HI Across All Media =	1.8E-01
Total Blood HI Across All Media =	1.8E-01
Total Kidney HI Across All Media =	3.2E-01

TABLE 10.2.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	NA	NA	NA	0.0E+00	Liver	1.4E-01	NA	NA	1.4E-01	
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	2.9E-01	NA	2.5E-02	3.2E-01	
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.2E+00	NA	3.3E-02	1.2E+00	
			Manganese	NA	NA	NA	0.0E+00	CNS	5.2E-01	NA	3.7E-01	8.9E-01	
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.7E-01	NA	4.6E-03	1.7E-01	
			Vanadium	NA	NA	NA	0.0E+00	Kidney	2.4E-01	NA	2.5E-01	4.9E-01	
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		2.5E+00	0.0E+00	6.8E-01	3.2E+00	
		Exposure Point Total				0.0E+00				3.2E+00			
		Site 1 Outside Active Burning Grounds	Trichloroethene	NA	NA	NA	0.0E+00	Liver	1.4E-01	NA	NA	1.4E-01	
			Antimony	NA	NA	NA	0.0E+00	Blood	2.1E-01	NA	4.0E-02	2.5E-01	
			Arsenic	NA	NA	NA	0.0E+00	Skin,vascular	5.6E-01	NA	4.7E-02	6.1E-01	
			Cadmium	NA	NA	NA	0.0E+00	Kidney	9.8E-01	NA	1.1E-01	1.1E+00	
			Chromium	NA	NA	NA	0.0E+00	Not identified	2.9E-01	NA	3.2E-01	6.1E-01	
			Copper	NA	NA	NA	0.0E+00	Gastrointestinal	5.3E-01	NA	1.5E-02	5.4E-01	
			Iron	NA	NA	NA	0.0E+00	Gastrointestinal, Blood, Liver	1.6E+00	NA	4.5E-02	1.7E+00	
			Manganese	NA	NA	NA	0.0E+00	CNS	8.3E-01	NA	5.8E-01	1.4E+00	
			Mercury	NA	NA	NA	0.0E+00	Immune System	3.2E-01	NA	1.3E-01	4.5E-01	
			Thallium	NA	NA	NA	0.0E+00	Liver, Blood, Hair	2.1E-01	NA	5.9E-03	2.2E-01	
		Vanadium	NA	NA	NA	0.0E+00	Kidney	7.5E-01	NA	8.1E-01	1.6E+00		
		Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		6.4E+00	0.0E+00	2.1E+00	8.5E+00		
		Exposure Point Total				0.0E+00				8.5E+00			
		Site 1 Active Burning Grounds	Perchlorate	NA	NA	NA	NA	Thyroid	1.8E-01	NA	4.9E-04	1.8E-01	
			Arsenic	NA	NA	NA	NA	Skin,vascular	3.0E-01	NA	2.5E-02	3.2E-01	
			Iron	NA	NA	NA	NA	Gastrointestinal, Blood, Liver	1.2E+00	NA	3.4E-03	1.2E+00	
Manganese	NA		NA	NA	NA	CNS	5.8E-01	NA	4.1E-02	6.2E-01			
Thallium	NA		NA	NA	NA	Liver, Blood, Hair	2.3E-01	NA	6.4E-04	2.3E-01			
Vanadium	NA		NA	NA	NA	Kidney	2.8E-01	NA	3.0E-02	3.1E-01			
Chemical Total	NA	NA	NA	NA		2.8E+00	0.0E+00	1.0E-01	2.9E+00				
Exposure Point Total				NA				2.9E+00					
Receptor Total							0.0E+00				Receptor HI Total		1.5E+01

TABLE 10.2.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
*Soil = combined surface and subsurface soil										Total CNS HI Across All Media =	2.9E+00	
HI - Hazard Index										Total Skin HI Across All Media =	1.3E+00	
NA - Not Applicable										Total Vascular HI Across All Media =	1.3E+00	
CNS - Central Nervous System										Total GI HI Across All Media =	4.6E+00	
GI - Gastrointestinal System										Total Liver HI Across All Media =	5.0E+00	
										Total Blood HI Across All Media =	5.0E+00	
										Total Kidney HI Across All Media =	3.4E+00	
										Total Immune System HI Across All Media =	4.5E-01	
										Total Thyroid HI Across All Media =	1.8E-01	
										Total Hair HI Across All Media =	6.2E-01	

TABLE 10.3.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil*	Soil*	Site 1 Former Disposal Pits	Trichloroethene	1.2E-06	NA	NA	1.2E-06	Liver	NA	NA	NA	0.0E+00
			2,3,7,8-TCDD (dioxin)	1.1E-04	NA	2.1E-05	1.3E-04	NA	NA	NA	0.0E+00	
			Arsenic	1.6E-05	NA	1.5E-06	1.8E-05	Skin,vascular	NA	NA	NA	0.0E+00
			Chemical Total	1.3E-04	0.0E+00	2.3E-05	1.5E-04		0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	2.2E-05	NA	2.2E-05	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	2.2E-05	0.0E+00	2.2E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
			Exposure Point Total				1.7E-04					0.0E+00
			Site 1 Outside Active Burning Grounds									
		Tetrachloroethene	1.3E-06	NA	NA	1.3E-06	Liver,whole body	NA	NA	NA	0.0E+00	
		Trichloroethene	1.1E-06	NA	NA	1.1E-06	Liver	NA	NA	NA	0.0E+00	
		Benzo(a)anthracene	7.9E-06	NA	3.3E-06	1.1E-05	NA	NA	NA	NA	0.0E+00	
		Benzo(a)pyrene	7.7E-05	NA	3.2E-05	1.1E-04	NA	NA	NA	NA	0.0E+00	
		Benzo(b)fluoranthene	9.6E-06	NA	4.0E-06	1.4E-05	NA	NA	NA	NA	0.0E+00	
		Benzo(k)fluoranthene	7.4E-07	NA	3.1E-07	1.0E-06	NA	NA	NA	NA	0.0E+00	
	Dibenz(a,h)anthracene	3.4E-06	NA	1.4E-06	4.8E-06	NA	NA	NA	NA	0.0E+00		
	Indeno(1,2,3-cd)pyrene	2.7E-06	NA	1.1E-06	3.9E-06	NA	NA	NA	NA	0.0E+00		
	2,3,7,8-TCDD (dioxin)	3.9E-05	NA	7.3E-06	4.6E-05	NA	NA	NA	NA	0.0E+00		
	Arsenic	3.1E-05	NA	2.9E-06	3.4E-05	Skin,vascular	NA	NA	NA	0.0E+00		
	Chemical Total	1.7E-04	0.0E+00	5.2E-05	2.3E-04		0.0E+00	0.0E+00	0.0E+00	0.0E+00		
	Air	Airborne Particulates and Volatile Emissions from Site 1 Outside Active Burning Grounds	Trichloroethene	NA	2.1E-05	NA	2.1E-05	CNS, Liver, Endocrine system	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	2.1E-05	0.0E+00	2.1E-05		0.0E+00	0.0E+00	0.0E+00	0.0E+00
			Exposure Point Total				2.5E-04					0.0E+00
			Receptor Total				4.2E-04				Receptor HI Total	0.0E+00

\*Soil = combined surface and subsurface soil  
HI - Hazard Index

TABLE 10.4.RME  
RISK ASSESSMENT SUMMARY  
REASONABLE MAXIMUM EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Soil*	Soil*	Site 1 Former Disposal Pits	Arsenic	7.0E-07	NA	4.3E-08	7.4E-07	Skin,vascular Gastrointestinal, Blood, Liver	1.1E-01	NA	6.7E-03	1.1E-01		
			Iron	NA	NA	NA	0.0E+00		4.3E-01	NA	8.9E-03	4.4E-01		
			Manganese	NA	NA	NA	0.0E+00		CNS	1.9E-01	NA	9.9E-02	2.9E-01	
			Vanadium	NA	NA	NA	0.0E+00		Blood	8.6E-02	NA	6.9E-02	1.5E-01	
			Chemical Total	7.0E-07	0.0E+00	4.3E-08	7.4E-07			8.2E-01	0.0E+00	1.8E-01	1.0E+00	
		Exposure Point Total				7.4E-07				1.0E+00				
		Site 1 Outside Active Burning Grounds	Arsenic	1.3E-06	NA	8.2E-08	1.4E-06	Skin,vascular Kidney Gastrointestinal Gastrointestinal, Blood, Liver CNS	1.1E-01	NA	2.2E-03	1.1E-01		
			Cadmium	NA	NA	NA	0.0E+00		1.9E-01	NA	5.1E-03	1.9E-01		
			Copper	NA	NA	NA	0.0E+00		1.0E-01	NA	7.0E-04	1.0E-01		
			Iron	NA	NA	NA	0.0E+00		3.1E-01	NA	2.1E-03	3.1E-01		
			Manganese	NA	NA	NA	0.0E+00		1.6E-01	NA	2.7E-02	1.9E-01		
		Chemical Total	1.3E-06	0.0E+00	8.2E-08	1.4E-06		8.6E-01	0.0E+00	3.7E-02	9.0E-01			
		Exposure Point Total				1.4E-06				9.0E-01				
		Site 1 Active Burning Grounds	Arsenic	7.0E-07	NA	4.3E-08	7.4E-07	Gastrointestinal, Blood, Liver NA	1.1E-01	NA	6.7E-03	1.2E-01		
			Iron	NA	NA	NA	0.0E+00		4.5E-01	NA	9.2E-03	4.6E-01		
			Chemical Total	7.0E-07	0.0E+00	4.3E-08	7.4E-07			5.6E-01	0.0E+00	1.6E-02	5.7E-01	
		Exposure Point Total				7.4E-07				5.7E-01				
		Receptor Total				2.9E-06				Receptor HI Total 2.5E+00				

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	4.8E-01
Total Skin HI Across All Media =	3.4E-01
Total Vascular HI Across All Media =	3.4E-01
Total GI HI Across All Media =	1.3E+00
Total Liver HI Across All Media =	1.2E+00
Total Blood HI Across All Media =	1.2E+00
Total Kidney HI Across All Media =	1.9E-01
Total Lifetime HI Across All Media =	1.5E-01

TABLE 10.1.CTE  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future  
Receptor Population: Resident  
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil*	Soil*	Site 1 Former Disposal Pits	Arsenic	NA	NA	NA	0.0E+00	Skin,vascular Gastrointestinal, Blood, Liver CNS Kidney	9.8E-02	NA	1.7E-02	1.2E-01	
			Iron	NA	NA	NA	0.0E+00		3.9E-01	NA	2.2E-02	4.1E-01	
			Manganese	NA	NA	NA	0.0E+00		1.7E-01	NA	2.4E-01	4.2E-01	
			Vanadium	NA	NA	NA	0.0E+00		7.9E-02	NA	1.7E-01	2.5E-01	
			Chemical Total	0.0E+00	0.0E+00	0.0E+00	0.0E+00		7.4E-01	0.0E+00	4.5E-01	1.2E+00	
Exposure Point Total				0.0E+00				1.2E+00					
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Arsenic	NA	NA	NA	0.0E+00	Skin,vascular Not identified Gastrointestinal, Blood, Liver CNS Kidney	1.9E-01	NA	3.2E-02	2.2E-01	
			Chromium	NA	NA	NA	0.0E+00		9.6E-02	NA	2.1E-01	3.1E-01	
			Iron	NA	NA	NA	0.0E+00		5.4E-01	NA	3.0E-02	5.7E-01	
			Manganese	NA	NA	NA	0.0E+00		2.8E-01	NA	3.9E-01	6.7E-01	
			Vanadium	NA	NA	NA	0.0E+00		2.5E-01	NA	5.4E-01	7.9E-01	
		Chemical Total	0.0E+00	NA	0.0E+00	0.0E+00	1.4E+00	0.0E+00	1.2E+00	2.6E+00			
		Exposure Point Total				0.0E+00				2.6E+00			
		Site 1 Active Burning Grounds	Arsenic	NA	NA	NA	NA	NA	Skin,vascular	9.9E-02	NA	1.7E-02	1.2E-01
			Cadmium	NA	NA	NA	NA	NA	Kidney	1.9E-02	NA	4.3E-03	2.4E-02
			Chromium	NA	NA	NA	NA	NA	Not identified	2.0E-02	NA	4.6E-03	2.5E-02
			Copper	NA	NA	NA	NA	NA	Gastrointestinal	2.7E-02	NA	1.5E-04	2.7E-02
			Iron	NA	NA	NA	NA	NA	Gastrointestinal, Blood, Liver	4.1E-01	NA	2.3E-03	4.1E-01
			Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0E+00
			Manganese	NA	NA	NA	NA	NA	CNS	1.9E-01	NA	2.7E-02	2.2E-01
			Mercury	NA	NA	NA	NA	NA	Immune System	2.8E-02	NA	2.3E-03	3.1E-02
Thallium	NA		NA	NA	NA	NA	Liver, Blood, Hair	7.7E-02	NA	4.3E-04	7.7E-02		
Vanadium	NA		NA	NA	NA	NA	Kidney	9.4E-02	NA	2.0E-02	1.1E-01		
Chemical Total	NA	NA	NA	NA	NA		9.7E-01	0.0E+00	7.8E-02	1.0E+00			
Exposure Point Total				NA				#REF!					
Receptor Total							0.0E+00		Receptor HI Total			3.7E+00	

\*Soil = combined surface and subsurface soil  
HI - Hazard Index  
NA - Not Applicable  
CNS - Central Nervous System  
GI - Gastrointestinal System

Total CNS HI Across All Media =	1.1E+00
Total Skin HI Across All Media =	3.4E-01
Total Vascular HI Across All Media =	3.4E-01
Total GI HI Across All Media =	9.8E-01
Total Liver HI Across All Media =	9.8E-01
Total Blood HI Across All Media =	9.8E-01
Total Kidney HI Across All Media =	1.0E+00

TABLE 10.2.CTE  
RISK ASSESSMENT SUMMARY  
CENTRAL TENDENCY EXPOSURE  
Site 1, Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Soil*	Soil*	Site 1 Former Disposal Pits	2,3,7,8-TCDD (dioxin)	3.0E-05	NA	8.3E-05	1.1E-04	NA Skin,vascular	NA	NA	NA	NA	0.0E+00
			Arsenic	4.4E-06	NA	6.1E-06	1.0E-05						0.0E+00
			Chemical Total	3.4E-05	0.0E+00	8.9E-05	1.2E-04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
	Air	Airborne Particulates and Volatile Emissions from Site 1 Former Disposal Pits	Trichloroethene	NA	9.7E-06	NA	9.7E-06	CNS, Liver, Endocrine system	NA	NA	NA	NA	0.0E+00
			Chemical Total	0.0E+00	9.7E-06	0.0E+00	9.7E-06						0.0E+00
			Exposure Point Total					1.3E-04					0.0E+00
Receptor Total				1.3E-04				Receptor HI Total				0.0E+00	

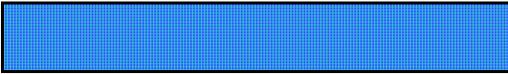
\*Soil = combined surface and subsurface soil

HI - Hazard Index

**Appendix F2**  
**Lead Output**

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**Table Lead-1**  
**Surface Soil, OABG, Industrial Worker**  
**Calculations of Blood Lead Concentrations (PbBs)**  
 U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee



Version date 05/19/03

Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	635	635	635	635
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR <sub>S+D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S+D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>2.4</b>	<b>2.6</b>	<b>2.4</b>	<b>2.6</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>7.4</b>	<b>9.3</b>	<b>7.4</b>	<b>9.3</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>2.0%</b>	<b>4.1%</b>	<b>2.0%</b>	<b>4.1%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
 When IR<sub>S</sub> = IR<sub>S+D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

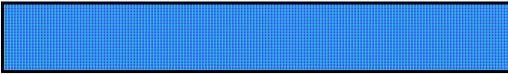
**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S+D} * AF_{S,D} * EF_{S,D} / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * ((IR_{S+D} * AF_{S,D} * EF_{S,D} * W_S) + (K_{SD} * (IR_{S+D}) * (1 - W_S) * AF_{T,D} * EF_{T,D})) / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**Table Lead-2**  
**Surface Soil, ABG, Industrial Worker**  
**Calculations of Blood Lead Concentrations (PbBs)**  
 U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee



Version date 05/19/03

Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	131	131	131	131
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR <sub>S+D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S+D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>1.7</b>	<b>1.9</b>	<b>1.7</b>	<b>1.9</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>5.2</b>	<b>6.7</b>	<b>5.2</b>	<b>6.7</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>0.6%</b>	<b>1.7%</b>	<b>0.6%</b>	<b>1.7%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
 When IR<sub>S</sub> = IR<sub>S+D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

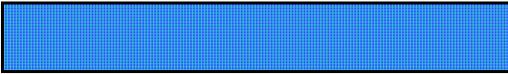
**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S+D} * AF_{S,D} * EF_{S,D} / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * ((IR_{S+D} * AF_{S,D} * EF_{S,D} * W_S) + (K_{SD} * (IR_{S+D}) * (1 - W_S) * AF_{T,D} * EF_{T,D})) / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**Table Lead-3**  
**Combined Surface and Subsurface Soil, OABG, Industrial Worker**  
**Calculations of Blood Lead Concentrations (PbBs)**  
 U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee



Version date 05/19/03

Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	559	559	559	559
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR <sub>S+D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S+D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>2.3</b>	<b>2.5</b>	<b>2.3</b>	<b>2.5</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>7.0</b>	<b>8.9</b>	<b>7.0</b>	<b>8.9</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>1.7%</b>	<b>3.7%</b>	<b>1.7%</b>	<b>3.7%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
 When IR<sub>S</sub> = IR<sub>S+D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

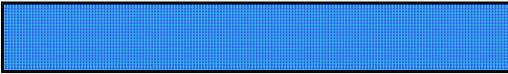
**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S+D} * AF_{S,D} * EF_{S,D} / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * ((IR_{S+D} * AF_{S,D} * EF_{S,D} * W_S) + (K_{SD} * (IR_{S+D}) * (1 - W_S) * AF_{T,D} * EF_{T,D})) / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**Table Lead-4**  
**Combined Surface and Subsurface Soil, ABG, Industrial Worker**  
**Calculations of Blood Lead Concentrations (PbBs)**  
 U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee



Version date 05/19/03

Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	158	158	158	158
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	--	--
IR <sub>S,D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.050	0.050
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S,D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>1.7</b>	<b>1.9</b>	<b>1.7</b>	<b>1.9</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>5.3</b>	<b>6.8</b>	<b>5.3</b>	<b>6.8</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>0.6%</b>	<b>1.8%</b>	<b>0.6%</b>	<b>1.8%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
 When IR<sub>S</sub> = IR<sub>S,D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S,D} * AF_{S,D} * EF_{S,D} / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * ((IR_{S,D}) * AF_{S,D} * EF_{S,D} * W_S + K_{SD} * (IR_{S,D}) * (1 - W_S) * AF_{D,D} * EF_{D,D}) / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

Table Lead-5  
LEAD MODEL FOR WINDOWS Version 1.0

```
=====
Model Version: 1.0 Build 263
User Name: rwarren
Date: 01/19/2006
Site Name: ABL Site 1
Operable Unit: OABG
Run Mode: Site Risk Assessment
-----
```

# Soil/Dust Data  
Average Soil Lead Concentration

```
=====
The time step used in this model run: 3 - Hourly (24 times a day).
```

\*\*\*\*\* Air \*\*\*\*\*

Indoor Air Pb Concentration: 30.000 percent of outdoor.  
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m <sup>3</sup> /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m <sup>3</sup> )
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

\*\*\*\*\* Diet \*\*\*\*\*

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

\*\*\*\*\* Drinking Water \*\*\*\*\*

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 ug Pb/L

Table Lead-5

\*\*\*\*\* Soil & Dust \*\*\*\*\*

Multiple Source Analysis Used  
 Average multiple source concentration: 401.300 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700  
 Outdoor airborne lead to indoor household dust lead concentration: 100.000  
 Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	559.000	401.300
1-2	559.000	401.300
2-3	559.000	401.300
3-4	559.000	401.300
4-5	559.000	401.300
5-6	559.000	401.300
6-7	559.000	401.300

\*\*\*\*\* Alternate Intake \*\*\*\*\*

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

\*\*\*\*\* Maternal Contribution: Infant Model \*\*\*\*\*

Maternal Blood Concentration: 2.500 ug Pb/dL

\*\*\*\*\*  
 CALCULATED BLOOD LEAD AND LEAD UPTAKES:  
 \*\*\*\*\*

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.376	0.000	0.344
1-2	0.034	2.430	0.000	0.841
2-3	0.062	2.786	0.000	0.893
3-4	0.067	2.734	0.000	0.929
4-5	0.067	2.740	0.000	1.003
5-6	0.093	2.934	0.000	1.074
6-7	0.093	3.264	0.000	1.100

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	10.350	13.092	7.0
1-2	16.083	19.388	7.9
2-3	16.421	20.162	7.4
3-4	16.763	20.493	7.1
4-5	12.920	16.730	5.9

Table Lead-5

5-6	11.801	15.902	5.0
6-7	11.229	15.686	4.5

Table Lead-6  
LEAD MODEL FOR WINDOWS Version 1.0

```

=====
Model Version: 1.0 Build 263
User Name: rwarren
Date: 01/20/2006
Site Name: ABL Site 1
Operable Unit: ABG
Run Mode: Site Risk Assessment
-----
  
```

# Soil/Dust Data  
Average Soil Lead Concentration

The time step used in this model run: 3 - Hourly (24 times a day).

\*\*\*\*\* Air \*\*\*\*\*

Indoor Air Pb Concentration: 30.000 percent of outdoor.  
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m <sup>3</sup> /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m <sup>3</sup> )
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

\*\*\*\*\* Diet \*\*\*\*\*

Age	Diet Intake(ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

\*\*\*\*\* Drinking Water \*\*\*\*\*

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 4.000 ug Pb/L

Table Lead-6

\*\*\*\*\* Soil & Dust \*\*\*\*\*

Multiple Source Analysis Used  
 Average multiple source concentration: 120.600 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700  
 Outdoor airborne lead to indoor household dust lead concentration: 100.000  
 Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	158.000	120.600
1-2	158.000	120.600
2-3	158.000	120.600
3-4	158.000	120.600
4-5	158.000	120.600
5-6	158.000	120.600
6-7	158.000	120.600

\*\*\*\*\* Alternate Intake \*\*\*\*\*

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

\*\*\*\*\* Maternal Contribution: Infant Model \*\*\*\*\*

Maternal Blood Concentration: 2.500 ug Pb/dL

\*\*\*\*\*  
 CALCULATED BLOOD LEAD AND LEAD UPTAKES:  
 \*\*\*\*\*

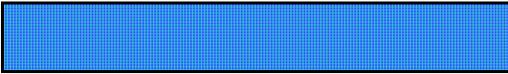
Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.576	0.000	0.373
1-2	0.034	2.676	0.000	0.926
2-3	0.062	3.030	0.000	0.971
3-4	0.067	2.943	0.000	1.000
4-5	0.067	2.878	0.000	1.054
5-6	0.093	3.053	0.000	1.117
6-7	0.093	3.379	0.000	1.139

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	3.265	6.234	3.4
1-2	5.154	8.790	3.7
2-3	5.197	9.260	3.4
3-4	5.250	9.259	3.3
4-5	3.949	7.947	2.8

Table Lead-6

5-6	3.574	7.837	2.5
6-7	3.383	7.995	2.3

**Table Lead-7**  
**Combined Surface and Subsurface Soil, OABG, Construction Worker**  
**Calculations of Blood Lead Concentrations (PbBs)**  
 U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee



Version date 05/19/03

Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	559	559	559	559
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR <sub>S,D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S,D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>3.1</b>	<b>3.3</b>	<b>3.1</b>	<b>3.3</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>9.5</b>	<b>11.7</b>	<b>9.5</b>	<b>11.7</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>4.3%</b>	<b>7.3%</b>	<b>4.3%</b>	<b>7.3%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
 When IR<sub>S</sub> = IR<sub>S,D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

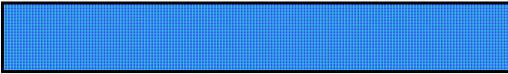
**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S,D} * AF_{S,D} * EF_{S,D} / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * ((IR_{S,D}) * AF_{S,D} * EF_{S,D} * W_S + K_{SD} * (IR_{S,D}) * (1 - W_S) * AF_{D,D} * EF_{D,D}) / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**Table Lead-8**  
**Combined Surface and Subsurface Soil, ABG, Construction Worker**  
**Calculations of Blood Lead Concentrations (PbBs)**  
 U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee



Version date 05/19/03

Exposure Variable	PbB Equation <sup>1</sup>		Description of Exposure Variable	Units	Values for Non-Residential Exposure Scenario			
	1*	2**			Using Equation 1		Using Equation 2	
					GSDi = Hom	GSDi = Het	GSDi = Hom	GSDi = Het
PbS	X	X	Soil lead concentration	ug/g or ppm	158	158	158	158
R <sub>fetal/maternal</sub>	X	X	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9
BKSF	X	X	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4
GSD <sub>i</sub>	X	X	Geometric standard deviation PbB	--	2.1	2.3	2.1	2.3
PbB <sub>0</sub>	X	X	Baseline PbB	ug/dL	1.5	1.7	1.5	1.7
IR <sub>S</sub>	X		Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	--	--
IR <sub>S+D</sub>		X	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	0.100	0.100
W <sub>S</sub>		X	Weighting factor; fraction of IR <sub>S+D</sub> ingested as outdoor soil	--	--	--	1.0	1.0
K <sub>SD</sub>		X	Mass fraction of soil in dust	--	--	--	0.7	0.7
AF <sub>S,D</sub>	X	X	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12
EF <sub>S,D</sub>	X	X	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219
AT <sub>S,D</sub>	X	X	Averaging time (same for soil and dust)	days/yr	365	365	365	365
<b>PbB<sub>adult</sub></b>	<b>PbB of adult worker, geometric mean</b>			<b>ug/dL</b>	<b>2.0</b>	<b>2.2</b>	<b>2.0</b>	<b>2.2</b>
<b>PbB<sub>fetal, 0.95</sub></b>	<b>95th percentile PbB among fetuses of adult workers</b>			<b>ug/dL</b>	<b>6.0</b>	<b>7.6</b>	<b>6.0</b>	<b>7.6</b>
<b>PbB<sub>t</sub></b>	<b>Target PbB level of concern (e.g., 10 ug/dL)</b>			<b>ug/dL</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>	<b>10.0</b>
<b>P(PbB<sub>fetal</sub> &gt; PbB<sub>t</sub>)</b>	<b>Probability that fetal PbB &gt; PbB<sub>t</sub>, assuming lognormal distribution</b>			<b>%</b>	<b>1.0%</b>	<b>2.4%</b>	<b>1.0%</b>	<b>2.4%</b>

<sup>1</sup> Equation 1 does not apportion exposure between soil and dust ingestion (excludes W<sub>S</sub>, K<sub>SD</sub>).  
 When IR<sub>S</sub> = IR<sub>S+D</sub> and W<sub>S</sub> = 1.0, the equations yield the same PbB<sub>fetal,0.95</sub>.

**\*Equation 1, based on Eq. 1, 2 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$(PbS * BKSF * IR_{S+D} * AF_{S,D} * EF_{S,D} / AT_{S,D}) + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**\*\*Equation 2, alternate approach based on Eq. 1, 2, and A-19 in USEPA (1996).**

<b>PbB<sub>adult</sub></b> =	$PbS * BKSF * ((IR_{S+D} * AF_{S,D} * EF_{S,D} * W_S) + (K_{SD} * (IR_{S+D}) * (1 - W_S) * AF_{D,D} * EF_{D,D})) / 365 + PbB_0$
<b>PbB<sub>fetal, 0.95</sub></b> =	$PbB_{adult} * (GSD_i^{1.645} * R)$

**Appendix F3**  
**Targeted Area Risk Assessment**

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Hot Spot Evaluation - TABLE 1  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (Non-Cancer) and Lifetime Resident (Cancer)

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RID/RIC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Antimony	1.7E+01	mg/kg	2.7E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	2.2E-04	mg/kg/day	4.0E-04	mg/kg/day	5.5E-01
				Mercury	7.2E+00	mg/kg	1.1E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	9.2E-05	mg/kg/day	3.0E-04	mg/kg/day	3.1E-01
			Exp. Route Total							0.0E+00					5.5E-01	
			Dermal Absorption	Antimony	1.7E+01	mg/kg	8.5E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	6.2E-06	mg/kg/day	6.0E-05	mg/kg/day	1.0E-01
				Mercury	7.2E+00	mg/kg	3.6E-07	mg/kg/day	NA	1/(mg/kg-day)	NA	2.6E-06	mg/kg/day	2.1E-05	mg/kg/day	1.2E-01
			Exp. Route Total							0.0E+00					2.3E-01	
Exposure Point Total									0.0E+00					7.8E-01		
Exposure Medium Total									0.0E+00					7.8E-01		
Soil Total									0.0E+00					7.8E-01		
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					7.8E-01

\* Combined surface and subsurface soil.

\*\* Hot spot is sample AS01-SB70-2.5-3

Hot Spot Evaluation - TABLE 2  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (Non-Cancer) and Lifetime Resident (Cancer)

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Copper	1.8E+03	mg/kg	2.8E-03	mg/kg/day	NA	1/(mg/kg-day)	NA	2.3E-02	mg/kg/day	4.0E-02	mg/kg/day	5.8E-01
			Exp. Route Total								0.0E+00					5.8E-01
			Dermal Absorption	Copper	1.8E+03	mg/kg	9.0E-05	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	6.5E-04	mg/kg/day	4.0E-02	mg/kg/day	1.6E-02
			Exp. Route Total								0.0E+00					1.6E-02
		Exposure Point Total									0.0E+00				6.0E-01	
		Exposure Medium Total									0.0E+00				6.0E-01	
Soil Total															6.0E-01	
										Total of Receptor Risks Across All Media		0.0E+00	Total of Receptor Hazards Across All Media		6.0E-01	

\* Combined surface and subsurface soil.

\*\* AS01-SS67-0-0.5

Hot Spot Evaluation - TABLE 3  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	5.8E+00	mg/kg	2.0E-06	mg/kg/day	5.4E-01	1/(mg/kg-day)	1.1E-06	5.7E-06	mg/kg/day	1.0E-02	mg/kg/day	5.7E-04
				Trichloroethene	1.2E+01	mg/kg	4.2E-06	mg/kg/day	1.1E-02	1/(mg/kg-day)	4.6E-08	1.2E-05	mg/kg/day	6.0E-03	mg/kg/day	2.0E-03
			Exp. Route Total									1.1E-06				
			Dermal Absorption	Tetrachloroethene	5.8E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	1.2E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
			Exp. Route Total									0.0E+00				
		Exposure Point Total									1.1E-06				2.5E-03	
		Exposure Medium Total									1.1E-06				2.5E-03	
Soil Total										1.1E-06	2.5E-03					
Total of Receptor Risks Across All Media										1.1E-06	Total of Receptor Hazards Across All Media				2.5E-03	

\* Combined surface and subsurface soil.

\*\* Hot spot is sample AS01-SB69-1-1.5

Hot Spot Evaluation - TABLE 4  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (Non-Cancer) and Lifetime Resident (Cancer)

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	Tetrachloroethene	5.8E+00	mg/kg	9.1E-06	mg/kg/day	5.4E-01	1/(mg/kg-day)	4.9E-06	7.4E-05	mg/kg/day	1.0E-02	mg/kg/day	7.4E-03
				Trichloroethene	1.2E+01	mg/kg	1.9E-05	mg/kg/day	1.1E-02	1/(mg/kg-day)	2.1E-07	1.5E-04	mg/kg/day	6.0E-03	mg/kg/day	2.6E-02
			Exp. Route Total							5.1E-06					3.3E-02	
			Dermal Absorption	Tetrachloroethene	5.8E+00	mg/kg	NA	mg/kg/day	5.4E-01	1/(mg/kg-day)	NA	NA	mg/kg/day	1.0E-02	mg/kg/day	NA
				Trichloroethene	1.2E+01	mg/kg	NA	mg/kg/day	1.1E-02	1/(mg/kg-day)	NA	NA	mg/kg/day	6.0E-03	mg/kg/day	NA
			Exp. Route Total							0.0E+00					0.0E+00	
		Exposure Point Total								5.1E-06					3.3E-02	
	Exposure Medium Total									5.1E-06					3.3E-02	
Soil Total										5.1E-06					3.3E-02	
										Total of Receptor Risks Across All Media		5.1E-06	Total of Receptor Hazards Across All Media		3.3E-02	

\* Combined surface and subsurface soil.

\*\* Hot spot is sample AS01-SB69-1-1.5

Hot Spot Evaluation - TABLE 5  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Active Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	2,3,7,8-TCDD (dioxin)	5.3E-05	mg/kg	1.9E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	2.8E-06	5.2E-11	mg/kg/day	NA	NA	NA	
			Exp. Route Total									2.8E-06					
			Dermal Absorption	2,3,7,8-TCDD (dioxin)	5.3E-05	mg/kg	3.7E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	5.5E-07	1.0E-11	mg/kg/day	NA	NA	NA	
			Exp. Route Total									5.5E-07					
		Exposure Point Total											3.3E-06			0.0E+00	
		Exposure Medium Total											3.3E-06			0.0E+00	
Soil Total												3.3E-06			0.0E+00		
Total of Receptor Risks Across All Media											3.3E-06	Total of Receptor Hazards Across All Media					0.0E+00

\* Combined surface and subsurface soil.

\*\* Dioxin hot spot is sample AS01-SB67-1.5-2.

Hot Spot Evaluation - TABLE 6  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Active Burning Grounds  
 Allegheny Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child (Non-Cancer) and Lifetime Resident (Cancer)

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations														
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient										
							Value	Units	Value	Units		Value	Units	Value	Units											
Soil*	Soil*	Site 1 Active Burning Grounds	Ingestion	2,3,7,8-TCDD (dioxin)**	5.3E-05	mg/kg	8.3E-11	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.2E-05	6.8E-10	mg/kg/day	NA	NA	NA										
			Exp. Route Total																							0.0E+00
			Dermal Absorption														2,3,7,8-TCDD (dioxin)**	5.3E-05	mg/kg	7.9E-12	mg/kg/day	1.5E+05	1/(mg/kg-day)	1.2E-06	5.7E-11	mg/kg/day
Exp. Route Total										0.0E+00																
Exposure Point Total													0.0E+00													
Exposure Medium Total																	0.0E+00									
Soil Total																	0.0E+00									
Total of Receptor Risks Across All Media											1.4E-05	Total of Receptor Hazards Across All Media				0.0E+00										

\* Combined surface and subsurface soil.

\*\* Dioxin hot spot is sample AS01-SB67-1-1.5.

Hot Spot Evaluation - TABLE 7  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Chromium	3.2E+02	mg/kg	1.1E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	3.1E-04	mg/kg/day	3.0E-03	mg/kg/day	1.0E-01
				Copper	1.4E+04	mg/kg	4.8E-03	mg/kg/day	NA	1/(mg/kg-day)	NA	1.3E-02	mg/kg/day	4.0E-02	mg/kg/day	3.3E-01
				Mercury	5.6E+01	mg/kg	2.0E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	5.5E-05	mg/kg/day	3.0E-04	mg/kg/day	1.8E-01
				Nickel	3.5E+02	mg/kg	1.2E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	3.4E-04	mg/kg/day	2.0E-02	mg/kg/day	1.7E-02
				Vanadium	3E+02	mg/kg	1.2E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	3.2E-04	mg/kg/day	1.0E-03	mg/kg/day	3.2E-01
			Exp. Route Total								0.0E+00					
			Dermal Absorption	Chromium	3.2E+02	mg/kg	7.4E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.1E-05	mg/kg/day	7.5E-05	mg/kg/day	2.7E-01
				Copper	1.4E+04	mg/kg	3.1E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	8.8E-04	mg/kg/day	4.0E-02	mg/kg/day	2.2E-02
				Mercury	5.6E+01	mg/kg	1.3E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	3.6E-06	mg/kg/day	2.1E-05	mg/kg/day	1.7E-01
				Nickel	3.5E+02	mg/kg	8.0E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.2E-05	mg/kg/day	8.0E-04	mg/kg/day	2.8E-02
				Vanadium	3.3E+02	mg/kg	7.7E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.1E-05	mg/kg/day	2.6E-05	mg/kg/day	8.2E-01
			Exp. Route Total								0.0E+00					
		Exposure Point Total								0.0E+00					1.3E+00	
		Exposure Medium Total								0.0E+00					1.3E+00	
Soil Total										0.0E+00					1.3E+00	
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					1.3E+00

\* Combined surface and subsurface soil.

\*\* Hot spot is samples AS01-SS22-0-1 (chromium, vanadium), AS01-SS72-0-0.5 (chromium, mercury), and AS01-SB74-4-4.5 (chromium, copper, nickel)

1.5E+00  
7.4E-01

Hot Spot Evaluation - TABLE 8  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	Chromium	3.2E+02	mg/kg	5.0E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	4.1E-03	mg/kg/day	3.0E-03	mg/kg/day	1.4E+00
				Copper	1.4E+04	mg/kg	2.1E-02	mg/kg/day	NA	1/(mg/kg-day)	NA	1.7E-01	mg/kg/day	4.0E-02	mg/kg/day	4.3E+00
				Mercury	5.6E+01	mg/kg	8.8E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	7.2E-04	mg/kg/day	3.0E-04	mg/kg/day	2.4E+00
				Nickel	3.5E+02	mg/kg	5.4E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	4.4E-03	mg/kg/day	2.0E-02	mg/kg/day	2.2E-01
				Vanadium	3.3E+02	mg/kg	5.2E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	4.2E-03	mg/kg/day	1.0E-03	mg/kg/day	4.2E+00
			Exp. Route Total							0.0E+00					2.2E-01	
			Dermal Absorption	Chromium	3.2E+02	mg/kg	1.6E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-04	mg/kg/day	7.5E-05	mg/kg/day	1.5E+00
				Copper	1.4E+04	mg/kg	6.7E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	4.9E-03	mg/kg/day	4.0E-02	mg/kg/day	1.2E-01
				Mercury	5.6E+01	mg/kg	2.8E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.0E-05	mg/kg/day	2.1E-05	mg/kg/day	9.6E-01
				Nickel	3.5E+02	mg/kg	1.7E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-04	mg/kg/day	8.0E-04	mg/kg/day	1.6E-01
				Vanadium	3.3E+02	mg/kg	1.6E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	1.2E-04	mg/kg/day	2.6E-05	mg/kg/day	4.6E+00
			Exp. Route Total							0.0E+00					7.3E+00	
			Exposure Point Total							0.0E+00					7.6E+00	
			Exposure Medium Total							0.0E+00					7.6E+00	
Soil Total										0.0E+00					7.6E+00	
Total of Receptor Risks Across All Media										0.0E+00	Total of Receptor Hazards Across All Media					7.6E+00

\* Combined surface and subsurface soil.

\*\* Hot spot is samples AS01-SS22-0-1 (chromium, vanadium), AS01-SS72-0-0.5 (chromium, mercury), and AS01-SB74-4-4.5 (chromium, copper, nickel)

Hot Spot Evaluation - TABLE 9  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units					
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	HMX	5.3E+02	mg/kg	1.9E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	5.2E-04	mg/kg/day	5.0E-02	mg/kg/day	1.0E-02				
				RDX	7.3E+00	mg/kg	2.6E-06	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.8E-07	7.1E-06	mg/kg/day	3.0E-03	mg/kg/day	2.4E-03				
			Exp. Route Total			2.8E-07					1.3E-02									
			Dermal Absorption	HMX	5.3E+02	mg/kg	7.3E-06	mg/kg/day	NA	1/(mg/kg-day)	NA	2.1E-05	mg/kg/day	5.0E-02	mg/kg/day	4.1E-04				
				RDX	7.3E+00	mg/kg	2.5E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	2.8E-08	7.1E-07	mg/kg/day	3.0E-03	mg/kg/day	2.4E-04				
			Exp. Route Total			2.8E-08					6.5E-04									
			Exposure Point Total			3.1E-07					1.3E-02									
			Exposure Medium Total			3.1E-07					1.3E-02									
Soil Total							3.1E-07					1.3E-02								
Total of Receptor Risks Across All Media										3.1E-07					Total of Receptor Hazards Across All Media					1.3E-02

\* Combined surface and subsurface soil.

\*\* Hot spot is sample AS01-SS72-0-0.5

Hot Spot Evaluation - TABLE 10  
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS  
 REASONABLE MAXIMUM EXPOSURE  
 Site 1 Outside Active Burning Grounds  
 Allegany Ballistics Laboratory, Rocket Center, West Virginia

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC**		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil*	Soil*	Site 1 Outside Active Burning Grounds	Ingestion	HMX RDX	5.3E+02	mg/kg	8.3E-04	mg/kg/day	NA	1/(mg/kg-day)	NA	6.8E-03	mg/kg/day	5.0E-02	mg/kg/day	1.4E-01
					7.3E+00	mg/kg	1.1E-05	mg/kg/day	1.1E-01	1/(mg/kg-day)	1.3E-06	9.3E-05	mg/kg/day	3.0E-03	mg/kg/day	3.1E-02
			Exp. Route Total										1.3E-06			1.7E-01
			Dermal Absorption	HMX RDX	5.3E+02	mg/kg	1.6E-05	mg/kg/day	NA	1/(mg/kg-day)	NA	1.1E-04	mg/kg/day	5.0E-02	mg/kg/day	2.3E-03
					7.3E+00	mg/kg	5.4E-07	mg/kg/day	1.1E-01	1/(mg/kg-day)	6.0E-08	3.9E-06	mg/kg/day	3.0E-03	mg/kg/day	1.3E-03
			Exp. Route Total										6.0E-08			3.6E-03
			Exposure Point Total										1.3E-06			1.7E-01
			Exposure Medium Total										1.3E-06			1.7E-01
Soil Total												1.3E-06			1.7E-01	
										Total of Receptor Risks Across All Media				Total of Receptor Hazards Across All Media		1.7E-01

\* Combined surface and subsurface soil.

\*\* Hot spot is samples AS01-SS22-0-1, AS01-SS72-0-0.5, and AS011-SB74-4-4.5

Table B-1: Individual Mathematical Outliers

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SS	Burn Grounds	1,3,5-Trinitrobenzene	HCS-BP-7	BP-07	30000	ug/kg		9		No	No	No
SS	Burn Grounds	2,4-Dinitrotoluene	HCS-BP-1	BP-01	720	ug/kg	JQ	3		No	No	No
SS	Burn Grounds	2-Nitroaniline	HCS-BP-7	BP-07	13000	ug/kg	J	5		No	No	No
SS	Burn Grounds	Aluminum	AS01-SS67-0-0.5	AS01-SB67	19000	mg/kg		100		No	No	No
SS	Burn Grounds	Cadmium	AS01-SS15-R01X	AS01-SB15	10.9	mg/kg		74		No	No	No
SS	Burn Grounds	Chromium	AS01-SS07-R01X	AS01-SB07	23.8	mg/kg		100		No	No	No
SS	Burn Grounds	Copper	AS01-SS67-0-0.5	AS01-SB67	1820	mg/kg	L	100		No	No	No
SS	Burn Grounds	Copper	AS01-SS69P-0-0.5	AS01-SB69	68.1	mg/kg	L	100		No	No	No
SS	Burn Grounds	Dimethyl phthalate	AS01-SS02-R01X	AS01-SB02	2300	ug/kg		10		No	No	No
SS	Burn Grounds	Dimethyl phthalate	AS01-SS09-R01X	AS01-SB09	1100	ug/kg		10		No	No	No
SS	Burn Grounds	Dimethyl phthalate	AS01-SS14-R01X	AS01-SB14	1600	ug/kg		10		No	No	No
SS	Burn Grounds	Dimethyl phthalate	AS01-SS67-0-0.5	AS01-SB67	520	ug/kg		10	X	No	No	No
SS	Burn Grounds	Lead	AS01-SS02-R01X	AS01-SB02	1730	mg/kg		100		Yes	No	Yes
SS	Burn Grounds	Mercury	AS01-SS18-R01X	AS01-SB18	0.38	mg/kg		97		No	No	No
SS	Burn Grounds	Mercury	AS01-SS70-0-0.5	AS01-SB70	7.2	mg/kg		97		No	No	No
SS	Burn Grounds	Nitroglycerin	AS01-SS64-0-0.5	AS01-SB64	98000	ug/kg		3		No	No	No
SS	Burn Grounds	n-Nitrosodiphenylamine	HCS-BP-7	BP-07	3000	ug/kg	J	5		No	No	No
SS	Burn Grounds	Perchlorate	AS01-SS04-R01X	AS01-SB04	96	ug/kg		26		No	No	No
SS	Burn Grounds	Perchlorate	AS01-SS05-R01X	AS01-SB05	880	ug/kg		26		No	No	No
SS	Burn Grounds	Perchlorate	AS01-SS06-R01X	AS01-SB06	95	ug/kg		26		No	No	No
SS	Burn Grounds	Perchlorate	AS01-SS17-R01X	AS01-SB17	220	ug/kg		26		No	No	No
SS	Burn Grounds	Perchlorate	AS01-SS64-0-0.5	AS01-SB64	31300	ug/kg		26		No	No	No
SS	Burn Grounds	Silver	AS01-SS69P-0-0.5	AS01-SB69	3	mg/kg		35		No	No	No
SS	Burn Grounds	Tetrachloroethene	AS01-SS69-0-0.5	AS01-SB69	410	ug/kg	J	6		No	No	No
SS	Burn Grounds	Tetrachloroethene	AS01-SS69P-0-0.5	AS01-SB69	420	ug/kg	J	6		No	No	No
SS	Burn Grounds	Tetryl	HCS-BP-7	BP-07	540	ug/kg	JC	3	X	No	No	No
SS	Burn Grounds	Trichloroethene	AS01-SS02-R01X	AS01-SB02	28	ug/kg		28		No	No	No
SS	Burn Grounds	Trichloroethene	AS01-SS65-0-0.5	AS01-SB65	66	ug/kg		28		No	No	No
SS	Burn Grounds	Trichloroethene	AS01-SS69-0-0.5	AS01-SB69	870	ug/kg	J	28		No	No	No
SS	Burn Grounds	Trichloroethene	AS01-SS69P-0-0.5	AS01-SB69	1400	ug/kg	J	28		No	No	No
SS	Burn Grounds	Trichloroethene	AS01-SS70-0-0.5	AS01-SB70	38	ug/kg	J	28		No	No	No
SS	Burn Grounds	Zinc	AS01-SS02-R01X	AS01-SB02	271	mg/kg	K	100		No	No	No
SS	Burn Grounds	Zinc	AS01-SS14-R01X	AS01-SB14	223	mg/kg	K	100		No	No	No
SSSB	Burn Grounds	1,2-Dichloroethene (total)	HCS-BG-53	BG-010/010S/053	16	ug/kg	D	2	X	No	No	No
SSSB	Burn Grounds	1,3,5-Trinitrobenzene	HCS-BP-7	BP-07	30000	ug/kg		5		No	No	No
SSSB	Burn Grounds	2,3,7,8-Tetrachlorodibenzofuran	AS01-SB67-1.5-2	AS01-SB67	0.032	ug/kg		19		Yes	No	Yes
SSSB	Burn Grounds	2,4-Dinitrotoluene	HCS-BP-1	BP-01	720	ug/kg	JQ	2		No	No	No
SSSB	Burn Grounds	2-Nitroaniline	HCS-BP-7	BP-07	13000	ug/kg	J	4		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Burn Grounds	Aluminum	AS01-SB68-1.5-2	AS01-SB68	50500	mg/kg		100		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Burn Grounds	Aluminum	AS01-SB70-2.5-3	AS01-SB70	19100	mg/kg		100		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Burn Grounds	Aluminum	AS01-SS67-0-0.5	AS01-SB67	19000	mg/kg		100		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Burn Grounds	Antimony	AS01-SB70-2.5-3	AS01-SB70	17.2	mg/kg	L	60		Yes	No	Yes
SSSB	Burn Grounds	Copper	AS01-SB68-1.5-2	AS01-SB68	36.4	mg/kg	L	100		No	No	No
SSSB	Burn Grounds	Copper	AS01-SB70-2.5-3	AS01-SB70	136	mg/kg	L	100		No	No	No
SSSB	Burn Grounds	Copper	AS01-SS67-0-0.5	AS01-SB67	1820	mg/kg	L	100		Yes	No	Yes
SSSB	Burn Grounds	Copper	AS01-SS69P-0-0.5	AS01-SB69	68.1	mg/kg	L	100		No	No	No
SSSB	Burn Grounds	Diethylphthalate	AS01-SB70-2.5-3	AS01-SB70	340	ug/kg	J	11	X	No	No	No

Table B-1: Individual Mathematical Outliers

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SSSB	Burn Grounds	Dimethyl phthalate	AS01-SS02-R01X	AS01-SB02	2300	ug/kg		7		No	No	No
SSSB	Burn Grounds	Dimethyl phthalate	AS01-SS09-R01X	AS01-SB09	1100	ug/kg		7		No	No	No
SSSB	Burn Grounds	Dimethyl phthalate	AS01-SS14-R01X	AS01-SB14	1600	ug/kg		7		No	No	No
SSSB	Burn Grounds	Dimethyl phthalate	AS01-SS67-0-0.5	AS01-SB67	520	ug/kg		7	X	No	No	No
SSSB	Burn Grounds	Lead	AS01-SB68-1.5-2	AS01-SB68	914	mg/kg	J	100		Yes	No	Yes
SSSB	Burn Grounds	Lead	AS01-SB70-2.5-3	AS01-SB70	1760	mg/kg	J	100		Yes	No	Yes
SSSB	Burn Grounds	Lead	AS01-SS02-R01X	AS01-SB02	1730	mg/kg		100		Yes	No	Yes
SSSB	Burn Grounds	Magnesium	AS01-SB67-1.5-2	AS01-SB67	2040	mg/kg		100		No	No	No
SSSB	Burn Grounds	Magnesium	AS01-SB70-2.5-3	AS01-SB70	2790	mg/kg		100		No	No	No
SSSB	Burn Grounds	Magnesium	AS01-SS67-0-0.5	AS01-SB67	15900	mg/kg		100		No	No	No
SSSB	Burn Grounds	Magnesium	AS01-SS69-0-0.5	AS01-SB69	18400	mg/kg		100		No	No	No
SSSB	Burn Grounds	Magnesium	AS01-SS70-0-0.5	AS01-SB70	3480	mg/kg		100		No	No	No
SSSB	Burn Grounds	Mercury	AS01-SB68-1.5-2	AS01-SB68	2	mg/kg		75		No	No	No
SSSB	Burn Grounds	Mercury	AS01-SS70-0-0.5	AS01-SB70	7.2	mg/kg		75		Yes	No	Yes
SSSB	Burn Grounds	Nitroglycerin	AS01-SS64-0-0.5	AS01-SB64	98000	ug/kg		6		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Burn Grounds	n-Nitrosodiphenylamine	HCS-BP-7	BP-07	3000	ug/kg	J	4		No	No	No
SSSB	Burn Grounds	Perchlorate	AS01-SB17-R01X	AS01-SB17	2500	ug/kg		40		No	No	No
SSSB	Burn Grounds	Perchlorate	AS01-SB64-7.5-8	AS01-SB64	18800	ug/kg		40		Yes	Yes	No
SSSB	Burn Grounds	Perchlorate	AS01-SB64P-7.5-8	AS01-SB64	16800	ug/kg		40		Yes	Yes	No
SSSB	Burn Grounds	Perchlorate	AS01-SS05-R01X	AS01-SB05	880	ug/kg		40		No	No	No
SSSB	Burn Grounds	Perchlorate	AS01-SS64-0-0.5	AS01-SB64	31300	ug/kg		40		Yes	Yes	No
SSSB	Burn Grounds	Selenium	AS01-SB67-1.5-2	AS01-SB67	9	mg/kg	L	31		No	No	No
SSSB	Burn Grounds	Silver	AS01-SB68-1.5-2	AS01-SB68	2.8	mg/kg		29		No	No	No
SSSB	Burn Grounds	Silver	AS01-SB70-2.5-3	AS01-SB70	4.1	mg/kg		29		No	No	No
SSSB	Burn Grounds	Silver	AS01-SS69P-0-0.5	AS01-SB69	3	mg/kg		29		No	No	No
SSSB	Burn Grounds	Tetrachloroethene	AS01-SB69-1-1.5	AS01-SB69	5800	ug/kg	L	12		Yes	No	Yes
SSSB	Burn Grounds	Tetrachloroethene	AS01-SS69-0-0.5	AS01-SB69	410	ug/kg	J	12		No	No	No
SSSB	Burn Grounds	Tetrachloroethene	AS01-SS69P-0-0.5	AS01-SB69	420	ug/kg	J	12		No	No	No
SSSB	Burn Grounds	Tetryl	HCS-BP-7	BP-07	540	ug/kg	JC	2	X	No	No	No
SSSB	Burn Grounds	Total pentachlorodibenzo-p-dioxin	AS01-SB67-1.5-2	AS01-SB67	0.14	ug/kg		11		Yes	No	Yes
SSSB	Burn Grounds	Trichloroethene	AS01-SB69-1-1.5	AS01-SB69	12000	ug/kg	L	56		Yes	No	Yes
SSSB	Burn Grounds	Zinc	AS01-SB68-1.5-2	AS01-SB68	222	mg/kg	K	100		No	No	No
SSSB	Burn Grounds	Zinc	AS01-SB70-2.5-3	AS01-SB70	202	mg/kg	K	100		No	No	No
SSSB	Burn Grounds	Zinc	AS01-SS02-R01X	AS01-SB02	271	mg/kg	K	100		No	No	No
SSSB	Burn Grounds	Zinc	AS01-SS14-R01X	AS01-SB14	223	mg/kg	K	100		No	No	No
SS	Outside Burn Grounds	Acenaphthene	AS01-SS57-0-1	AS01-SB57	4100	ug/kg	J	12		No	No	No
SS	Outside Burn Grounds	Acenaphthylene	AS01-SS49-0-1	AS01-SB49	630	ug/kg	J	10	X	No	No	No
SS	Outside Burn Grounds	Aluminum	AS01-SS72-0-0.5	AS01-SB72	53700	mg/kg		100		Yes	No <sup>a</sup>	No <sup>a</sup>
SS	Outside Burn Grounds	Aluminum	HCS-B1-11-S	B1-011	51700	mg/kg	JD	100		Yes	No <sup>a</sup>	No <sup>a</sup>
SS	Outside Burn Grounds	Aluminum	HCS-B1-4-S	B1-004	96900	mg/kg	JD	100		Yes	No <sup>a</sup>	No <sup>a</sup>
SS	Outside Burn Grounds	Aluminum	HCS-B2-10	B2-010	34700	mg/kg	JD	100		Yes	No <sup>a</sup>	No <sup>a</sup>
SS	Outside Burn Grounds	Anthracene	AS01-SS57-0-1	AS01-SB57	8300	ug/kg		48		No	No	No
SS	Outside Burn Grounds	Benzaldehyde	AS01-SS24-(0-1)	AS01-SB24	600	ug/kg		14	X	No	No	No
SS	Outside Burn Grounds	Benzaldehyde	AS01-SS25-(0-1)	AS01-SB25	500	ug/kg		14	X	No	No	No
SS	Outside Burn Grounds	Benzaldehyde	AS01-SS41-(0-1)	AS01-SB41	300	ug/kg	J	14	X	No	No	No
SS	Outside Burn Grounds	Benzo(a)anthracene	AS01-SS49-0-1	AS01-SB49	7500	ug/kg	J	87		Yes	Yes	No
SS	Outside Burn Grounds	Benzo(a)anthracene	AS01-SS57-0-1	AS01-SB57	8100	ug/kg		87		Yes	Yes	No

Table B-1: Individual Mathematical Outliers

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SS	Outside Burn Grounds	Benzo(a)pyrene	AS01-SS49-0-1	AS01-SB49	9000	ug/kg		73		Yes	Yes	No
SS	Outside Burn Grounds	Benzo(a)pyrene	AS01-SS57-0-1	AS01-SB57	12000	ug/kg	J	73		Yes	Yes	No
SS	Outside Burn Grounds	Benzo(b)fluoranthene	AS01-SS49-0-1	AS01-SB49	21000	ug/kg	J	88		Yes	Yes	No
SS	Outside Burn Grounds	Benzo(b)fluoranthene	AS01-SS57-0-1	AS01-SB57	16000	ug/kg	J	88		Yes	Yes	No
SS	Outside Burn Grounds	Benzo(g,h,i)perylene	AS01-SS49-0-1	AS01-SB49	3700	ug/kg	J	67		No	No	No
SS	Outside Burn Grounds	Benzo(g,h,i)perylene	AS01-SS57-0-1	AS01-SB57	4200	ug/kg	J	67		No	No	No
SS	Outside Burn Grounds	Benzo(k)fluoranthene	AS01-SS49-0-1	AS01-SB49	8600	ug/kg	J	73		No	No	No
SS	Outside Burn Grounds	Benzo(k)fluoranthene	AS01-SS57-0-1	AS01-SB57	7300	ug/kg		73		No	No	No
SS	Outside Burn Grounds	Chromium	AS01-SS22-(0-1)	AS01-SB22	224	mg/kg	J	100		Yes	No	Yes
SS	Outside Burn Grounds	Chromium	AS01-SS72P-0-0.5	AS01-SB72	319	mg/kg		100		Yes	No	Yes
SS	Outside Burn Grounds	Chrysene	AS01-SS49-0-1	AS01-SB49	10000	ug/kg		88		No	No	No
SS	Outside Burn Grounds	Chrysene	AS01-SS57-0-1	AS01-SB57	8500	ug/kg		88		No	No	No
SS	Outside Burn Grounds	Dibenz(a,h)anthracene	AS01-SS26-(0-1)	AS01-SB26	430	ug/kg	L	11	X	Yes	No	No <sup>d</sup>
SS	Outside Burn Grounds	Diethylphthalate	AS01-SS72-0-0.5	AS01-SB72	1300	ug/kg		24		No	No	No
SS	Outside Burn Grounds	Dimethyl phthalate	AS01-SS41-(0-1)	AS01-SB41	1100	ug/kg		3		No	No	No
SS	Outside Burn Grounds	Fluoranthene	AS01-SS49-0-1	AS01-SB49	4000	ug/kg	J	92		No	No	No
SS	Outside Burn Grounds	Fluoranthene	AS01-SS57-0-1	AS01-SB57	12000	ug/kg		92		No	No	No
SS	Outside Burn Grounds	Fluoranthene	HCS-B2-4-4	B2-004	2900	ug/kg		92		No	No	No
SS	Outside Burn Grounds	Fluorene	AS01-SS57-0-1	AS01-SB57	5500	ug/kg		17		No	No	No
SS	Outside Burn Grounds	Fluorene	HCS-B2-4-4	B2-004	410	ug/kg		17	X	No	No	No
SS	Outside Burn Grounds	HMX	AS01-SS71-0-0.5	AS01-SB71	500	ug/kg		24	X	No	No	No
SS	Outside Burn Grounds	HMX	AS01-SS72-0-0.5	AS01-SB72	520000	ug/kg		24		Yes	No	Yes
SS	Outside Burn Grounds	HMX	AS01-SS72P-0-0.5	AS01-SB72	530000	ug/kg		24		Yes	No	Yes
SS	Outside Burn Grounds	Indeno(1,2,3-cd)pyrene	AS01-SS49-0-1	AS01-SB49	5000	ug/kg	J	79		Yes	Yes	No
SS	Outside Burn Grounds	Indeno(1,2,3-cd)pyrene	AS01-SS57-0-1	AS01-SB57	5400	ug/kg		79		Yes	Yes	No
SS	Outside Burn Grounds	Iron	HCS-B1-4-S	B1-004	122000	mg/kg		100		Yes	No	No <sup>c</sup>
SS	Outside Burn Grounds	Mercury	AS01-SS72-0-0.5	AS01-SB72	56.3	mg/kg		93		Yes	No	Yes
SS	Outside Burn Grounds	Methyl acetate	AS01-SS48-0-1	AS01-SB48	850	ug/kg	L	23		No	No	No
SS	Outside Burn Grounds	Methyl acetate	AS01-SS49-0-1	AS01-SB49	450	ug/kg	L	23		No	No	No
SS	Outside Burn Grounds	Methyl acetate	AS01-SS72P-0-0.5	AS01-SB72	1600	ug/kg	L	23		No	No	No
SS	Outside Burn Grounds	n-Nitrosodiphenylamine	AS01-SS41-(0-1)	AS01-SB41	440	ug/kg		3	X	No	No	No
SS	Outside Burn Grounds	Perchlorate	AS01-SS72-0-0.5	AS01-SB72	311	ug/kg		12		No	No	No
SS	Outside Burn Grounds	Perchlorate	AS01-SS72P-0-0.5	AS01-SB72	120	ug/kg		12		No	No	No
SS	Outside Burn Grounds	Phenanthrene	AS01-SS57-0-1	AS01-SB57	31000	ug/kg		88		No	No	No
SS	Outside Burn Grounds	Pyrene	AS01-SS49-0-1	AS01-SB49	7500	ug/kg	J	88		No	No	No
SS	Outside Burn Grounds	Pyrene	AS01-SS57-0-1	AS01-SB57	21000	ug/kg		88		No	No	No
SS	Outside Burn Grounds	RDX	AS01-SS72-0-0.5	AS01-SB72	7300	ug/kg	J	12		Yes	No	Yes
SS	Outside Burn Grounds	Selenium	HCS-B1-4-S	B1-004	3.9	mg/kg	JS	26		No	No	No
SS	Outside Burn Grounds	Sodium	HCS-B1-4-S	B1-004	9740	mg/kg		36		No	No	No
SS	Outside Burn Grounds	Sodium	HCS-B2-10	B2-010	1290	mg/kg		36		No	No	No
SS	Outside Burn Grounds	Vanadium	AS01-SS22-(0-1)	AS01-SB22	332	mg/kg		100		Yes	No	Yes
SS	Outside Burn Grounds	Vanadium	AS01-SS53-0-1	AS01-SB53	173	mg/kg		100		Yes	No	No <sup>c</sup>
SSSB	Outside Burn Grounds	2-Methylnaphthalene	AS01-SB25-(1-2)	AS01-SB25	1900	ug/kg		43		No	No	No
SSSB	Outside Burn Grounds	Acenaphthene	AS01-SB25-(1-2)	AS01-SB25	12000	ug/kg		14		No	No	No
SSSB	Outside Burn Grounds	Acenaphthene	AS01-SS57-0-1	AS01-SB57	4100	ug/kg	J	14		No	No	No
SSSB	Outside Burn Grounds	Acenaphthylene	AS01-SS49-0-1	AS01-SB49	630	ug/kg	J	14		No	No	No
SSSB	Outside Burn Grounds	Aluminum	AS01-SB72-4.5-5	AS01-SB72	66300	mg/kg		100		Yes	No <sup>a</sup>	No <sup>a</sup>

Table B-1: Individual Mathematical Outliers

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SSSB	Outside Burn Grounds	Aluminum	AS01-SS72-0-0.5	AS01-SB72	53700	mg/kg		100		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Outside Burn Grounds	Aluminum	HCS-B1-11-S	B1-011	51700	mg/kg	JD	100		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Outside Burn Grounds	Aluminum	HCS-B1-4-S	B1-004	96900	mg/kg	JD	100		Yes	No <sup>a</sup>	No <sup>a</sup>
SSSB	Outside Burn Grounds	Anthracene	AS01-SB25-(1-2)	AS01-SB25	21000	ug/kg		46		No	No	No
SSSB	Outside Burn Grounds	Anthracene	AS01-SS24-(0-1)	AS01-SB24	440	ug/kg		46	X	No	No	No
SSSB	Outside Burn Grounds	Anthracene	AS01-SS49-0-1	AS01-SB49	920	ug/kg	J	46		No	No	No
SSSB	Outside Burn Grounds	Anthracene	AS01-SS57-0-1	AS01-SB57	8300	ug/kg		46		No	No	No
SSSB	Outside Burn Grounds	Anthracene	HCS-B2-4-4	B2-004	730	ug/kg		46		No	No	No
SSSB	Outside Burn Grounds	Barium	HCS-B1-11-2	B1-011	1510	mg/kg		100		No	No	No
SSSB	Outside Burn Grounds	Benzaldehyde	AS01-SB30-(1-2)	AS01-SB30	390	ug/kg		13	X	No	No	No
SSSB	Outside Burn Grounds	Benzaldehyde	AS01-SS24-(0-1)	AS01-SB24	600	ug/kg		13	X	No	No	No
SSSB	Outside Burn Grounds	Benzaldehyde	AS01-SS25-(0-1)	AS01-SB25	500	ug/kg		13	X	No	No	No
SSSB	Outside Burn Grounds	Benzo(a)anthracene	AS01-SB25-(1-2)	AS01-SB25	58000	ug/kg		81		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(a)anthracene	AS01-SS49-0-1	AS01-SB49	7500	ug/kg	J	81		No	No	No
SSSB	Outside Burn Grounds	Benzo(a)anthracene	AS01-SS57-0-1	AS01-SB57	8100	ug/kg		81		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(a)anthracene	HCS-B2-4-4	B2-004	1700	ug/kg		81		No	No	No
SSSB	Outside Burn Grounds	Benzo(a)pyrene	AS01-SB25-(1-2)	AS01-SB25	55000	ug/kg		71		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(a)pyrene	AS01-SS49-0-1	AS01-SB49	9000	ug/kg		71		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(a)pyrene	AS01-SS57-0-1	AS01-SB57	12000	ug/kg	J	71		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(b)fluoranthene	AS01-SB25-(1-2)	AS01-SB25	65000	ug/kg		82		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(b)fluoranthene	AS01-SS49-0-1	AS01-SB49	21000	ug/kg	J	82		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(b)fluoranthene	AS01-SS57-0-1	AS01-SB57	16000	ug/kg	J	82		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(g,h,i)perylene	AS01-SB25-(1-2)	AS01-SB25	17000	ug/kg		65		No	No	No
SSSB	Outside Burn Grounds	Benzo(g,h,i)perylene	AS01-SS49-0-1	AS01-SB49	3700	ug/kg	J	65		No	No	No
SSSB	Outside Burn Grounds	Benzo(g,h,i)perylene	AS01-SS57-0-1	AS01-SB57	4200	ug/kg	J	65		No	No	No
SSSB	Outside Burn Grounds	Benzo(k)fluoranthene	AS01-SB25-(1-2)	AS01-SB25	54000	ug/kg		71		Yes	Yes	No
SSSB	Outside Burn Grounds	Benzo(k)fluoranthene	AS01-SS49-0-1	AS01-SB49	8600	ug/kg	J	71		No	No	No
SSSB	Outside Burn Grounds	Benzo(k)fluoranthene	AS01-SS57-0-1	AS01-SB57	7300	ug/kg		71		No	No	No
SSSB	Outside Burn Grounds	bis(2-Ethylhexyl)phthalate	AS01-SB38P-(1-2)	AS01-SB38	7000	ug/kg		29		No	No	No
SSSB	Outside Burn Grounds	Carbazole	AS01-SB25-(1-2)	AS01-SB25	9500	ug/kg		24		No	No	No
SSSB	Outside Burn Grounds	Chromium	AS01-SB74-4-4.5	AS01-SB74	282	mg/kg		100		Yes	No	Yes
SSSB	Outside Burn Grounds	Chromium	AS01-SS22-(0-1)	AS01-SB22	224	mg/kg	J	100		Yes	No	Yes
SSSB	Outside Burn Grounds	Chromium	AS01-SS72P-0-0.5	AS01-SB72	319	mg/kg		100		Yes	No	Yes
SSSB	Outside Burn Grounds	Chrysene	AS01-SB25-(1-2)	AS01-SB25	63000	ug/kg		82		No	No	No
SSSB	Outside Burn Grounds	Chrysene	AS01-SS49-0-1	AS01-SB49	10000	ug/kg		82		No	No	No
SSSB	Outside Burn Grounds	Chrysene	AS01-SS57-0-1	AS01-SB57	8500	ug/kg		82		No	No	No
SSSB	Outside Burn Grounds	Copper	AS01-SB74-4-4.5	AS01-SB74	13600	mg/kg	L	100		Yes	No	Yes
SSSB	Outside Burn Grounds	Dibenz(a,h)anthracene	AS01-SB25-(1-2)	AS01-SB25	2100	ug/kg		9		Yes	Yes	No
SSSB	Outside Burn Grounds	Dibenzofuran	AS01-SB25-(1-2)	AS01-SB25	6800	ug/kg		17		No	No	No
SSSB	Outside Burn Grounds	Diethylphthalate	AS01-SB72-4.5-5	AS01-SB72	3400	ug/kg		19		No	No	No
SSSB	Outside Burn Grounds	Diethylphthalate	AS01-SS72-0-0.5	AS01-SB72	1300	ug/kg		19		No	No	No
SSSB	Outside Burn Grounds	Dimethyl phthalate	AS01-SS41-(0-1)	AS01-SB41	1100	ug/kg		2		No	No	No
SSSB	Outside Burn Grounds	Fluoranthene	AS01-SB25-(1-2)	AS01-SB25	97000	ug/kg		88		No	No	No
SSSB	Outside Burn Grounds	Fluoranthene	AS01-SS49-0-1	AS01-SB49	4000	ug/kg	J	88		No	No	No
SSSB	Outside Burn Grounds	Fluoranthene	AS01-SS57-0-1	AS01-SB57	12000	ug/kg		88		No	No	No
SSSB	Outside Burn Grounds	Fluoranthene	HCS-B2-4-4	B2-004	2900	ug/kg		88		No	No	No
SSSB	Outside Burn Grounds	Fluorene	AS01-SB25-(1-2)	AS01-SB25	11000	ug/kg		21		No	No	No
SSSB	Outside Burn Grounds	Fluorene	AS01-SS57-0-1	AS01-SB57	5500	ug/kg		21		No	No	No

Table B-1: Individual Mathematical Outliers

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SSSB	Outside Burn Grounds	Fluorene	HCS-B2-4-4	B2-004	410	ug/kg		21	X	No	No	No
SSSB	Outside Burn Grounds	HMX	AS01-SB71-1.5-2	AS01-SB71	1500	ug/kg		27		No	No	No
SSSB	Outside Burn Grounds	HMX	AS01-SB72-4.5-5	AS01-SB72	75000	ug/kg		27		No	No	No
SSSB	Outside Burn Grounds	HMX	AS01-SS72-0-0.5	AS01-SB72	520000	ug/kg		27		Yes	No	Yes
SSSB	Outside Burn Grounds	HMX	AS01-SS72P-0-0.5	AS01-SB72	530000	ug/kg		27		Yes	No	Yes
SSSB	Outside Burn Grounds	Indeno(1,2,3-cd)pyrene	AS01-SB25-(1-2)	AS01-SB25	18000	ug/kg		72		Yes	Yes	No
SSSB	Outside Burn Grounds	Indeno(1,2,3-cd)pyrene	AS01-SS49-0-1	AS01-SB49	5000	ug/kg	J	72		Yes	Yes	No
SSSB	Outside Burn Grounds	Indeno(1,2,3-cd)pyrene	AS01-SS57-0-1	AS01-SB57	5400	ug/kg		72		Yes	Yes	No
SSSB	Outside Burn Grounds	Iron	AS01-SB30-(1-2)	AS01-SB30	122000	mg/kg		100		Yes	No	No <sup>c</sup>
SSSB	Outside Burn Grounds	Iron	HCS-B1-4-S	B1-004	122000	mg/kg		100		Yes	No	No <sup>c</sup>
SSSB	Outside Burn Grounds	Magnesium	AS01-SB74-4-4.5	AS01-SB74	30400	mg/kg		94		No	No	No
SSSB	Outside Burn Grounds	Mercury	AS01-SS72-0-0.5	AS01-SB72	56.3	mg/kg		92		Yes	No	Yes
SSSB	Outside Burn Grounds	Methyl acetate	AS01-SB72-4.5-5	AS01-SB72	2800	ug/kg	L	18		No	No	No
SSSB	Outside Burn Grounds	Methyl acetate	AS01-SS48-0-1	AS01-SB48	850	ug/kg	L	18		No	No	No
SSSB	Outside Burn Grounds	Methyl acetate	AS01-SS72P-0-0.5	AS01-SB72	1600	ug/kg	L	18		No	No	No
SSSB	Outside Burn Grounds	Naphthalene	AS01-SB25-(1-2)	AS01-SB25	650	ug/kg		29		No	No	No
SSSB	Outside Burn Grounds	Nickel	AS01-SB74-4-4.5	AS01-SB74	347	mg/kg		100		Yes	No	Yes
SSSB	Outside Burn Grounds	n-Nitrosodiphenylamine	AS01-SS41-(0-1)	AS01-SB41	440	ug/kg		2	X	No	No	No
SSSB	Outside Burn Grounds	Perchlorate	AS01-SB72-4.5-5	AS01-SB72	199	ug/kg		10		No	No	No
SSSB	Outside Burn Grounds	Perchlorate	AS01-SS72-0-0.5	AS01-SB72	311	ug/kg		10		No	No	No
SSSB	Outside Burn Grounds	Perchlorate	AS01-SS72P-0-0.5	AS01-SB72	120	ug/kg		10		No	No	No
SSSB	Outside Burn Grounds	Phenanthrene	AS01-SB25-(1-2)	AS01-SB25	96000	ug/kg		85		No	No	No
SSSB	Outside Burn Grounds	Phenanthrene	AS01-SS57-0-1	AS01-SB57	31000	ug/kg		85		No	No	No
SSSB	Outside Burn Grounds	Pyrene	AS01-SB25-(1-2)	AS01-SB25	160000	ug/kg		83		No	No	No
SSSB	Outside Burn Grounds	Pyrene	AS01-SS49-0-1	AS01-SB49	7500	ug/kg	J	83		No	No	No
SSSB	Outside Burn Grounds	Pyrene	AS01-SS57-0-1	AS01-SB57	21000	ug/kg		83		No	No	No
SSSB	Outside Burn Grounds	RDX	AS01-SB72-4.5-5	AS01-SB72	1800	ug/kg	J	13		No	No	No
SSSB	Outside Burn Grounds	RDX	AS01-SS72-0-0.5	AS01-SB72	7300	ug/kg	J	13		Yes	No	Yes
SSSB	Outside Burn Grounds	Selenium	HCS-B1-4-S	B1-004	3.9	mg/kg	JS	28		No	No	No
SSSB	Outside Burn Grounds	Sodium	HCS-B1-4-S	B1-004	9740	mg/kg		40		No	No	No
SSSB	Outside Burn Grounds	Vanadium	AS01-SS22-(0-1)	AS01-SB22	332	mg/kg		100		Yes	No	Yes
SSSB	Outside Burn Grounds	Vanadium	AS01-SS53-0-1	AS01-SB53	173	mg/kg		100		Yes	No	No <sup>c</sup>
SSSB	Solvent Pits	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	1.8	ug/kg		89		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,4,7,8,9-Heptachlorodibenzofuran	AS01-SB43-(1-2)	AS01-SB43	0.0009	ug/kg	J	21		No	No	No
SSSB	Solvent Pits	1,2,3,4,7,8,9-Heptachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	0.4	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,4,7,8,9-Heptachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.0056	ug/kg	J	21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,4,7,8,9-Heptachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.0061	ug/kg	J	21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	0.075	ug/kg		5		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,6,7,8-Hexachlorodibenzofuran	AS01-SB43-(1-2)	AS01-SB43	0.0005	ug/kg		21		No	No	No
SSSB	Solvent Pits	1,2,3,6,7,8-Hexachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	0.76	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,6,7,8-Hexachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.0079	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,6,7,8-Hexachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.0081	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	0.17	ug/kg		11		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	AS01-SS60-0-0.5	AS01-SB60	0.0054	ug/kg	J	11		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,7,8,9-Hexachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	0.056	ug/kg		5		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	0.16	ug/kg		11		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	AS01-SS60-0-0.5	AS01-SB60	0.0058	ug/kg	J	11		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,7,8-Pentachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	0.71	ug/kg		21		Yes	Yes	No

Table B-1: Individual Mathematical Outliers

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SSSB	Solvent Pits	1,2,3,7,8-Pentachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.0082	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,7,8-Pentachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.0075	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	0.094	ug/kg		5		Yes	Yes	No
SSSB	Solvent Pits	2,3,4,6,7,8-Hexachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	0.29	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	2,3,4,6,7,8-Hexachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.0043	ug/kg	J	16		Yes	Yes	No
SSSB	Solvent Pits	2,3,4,6,7,8-Hexachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.0056	ug/kg	J	16		Yes	Yes	No
SSSB	Solvent Pits	2,3,4,7,8-Pentachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	0.6	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	2,3,4,7,8-Pentachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.0071	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	2,3,4,7,8-Pentachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.0079	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	2,3,7,8-TCDD (dioxin)	AS01-SB62-1-3	AS01-SB62	0.016	ug/kg		11		Yes	Yes	No
SSSB	Solvent Pits	2,3,7,8-TCDD (dioxin)	AS01-SS60-0-0.5	AS01-SB60	0.0007	ug/kg	J	11		Yes	Yes	No
SSSB	Solvent Pits	2-Methylnaphthalene	HCS-BG-4(92)	BG-004/004S/005/039	350	ug/kg	JC	15	X	No	No	No
SSSB	Solvent Pits	Beryllium	AS01-SB42-(1-2)	AS01-SB42	1.1	mg/kg	J	18	X	No	No	No
SSSB	Solvent Pits	Beryllium	AS01-SB44-(1-2)	AS01-SB44	0.92	mg/kg	J	18	X	No	No	No
SSSB	Solvent Pits	Beryllium	AS01-SS60-0-0.5	AS01-SB60	0.97	mg/kg	J	18	X	No	No	No
SSSB	Solvent Pits	Calcium	AS01-SS62-0-0.5	AS01-SB62	266000	mg/kg		91		No	No	No
SSSB	Solvent Pits	Calcium	HCS-BG-6(94)	BG-006/007	91700	mg/kg		91		No	No	No
SSSB	Solvent Pits	Copper	AS01-SS60-0-0.5	AS01-SB60	24.1	mg/kg		100		No	No	No
SSSB	Solvent Pits	Copper	HCS-BG-6(94)	BG-006/007	492	mg/kg		100		Yes	No	No <sup>c</sup>
SSSB	Solvent Pits	Cyanide	AS01-SS61-0-0.5	AS01-SB61	0.91	mg/kg		18		No	No	No
SSSB	Solvent Pits	HMX	AS01-SB62-1-3	AS01-SB62	1500	ug/kg		32		No	No	No
SSSB	Solvent Pits	HMX	AS01-SB62-3-5	AS01-SB62	1200	ug/kg		32		No	No	No
SSSB	Solvent Pits	HMX	AS01-SB62-5-7	AS01-SB62	750	ug/kg		32	X	No	No	No
SSSB	Solvent Pits	HMX	AS01-SB62-7-8	AS01-SB62	350	ug/kg	J	32	X	No	No	No
SSSB	Solvent Pits	HMX	AS01-SS62-0-0.5	AS01-SB62	3300	ug/kg		32		No	No	No
SSSB	Solvent Pits	Lead	AS01-SS60-0-0.5	AS01-SB60	42.5	mg/kg		100		No	No	No
SSSB	Solvent Pits	Lead	AS01-SS61-0-0.5	AS01-SB61	25	mg/kg		100		No	No	No
SSSB	Solvent Pits	Magnesium	AS01-SS62-0-0.5	AS01-SB62	3960	mg/kg	J	100		No	No	No
SSSB	Solvent Pits	Magnesium	HCS-BG-6(94)	BG-006/007	24200	mg/kg		100		No	No	No
SSSB	Solvent Pits	Octachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	8.9	ug/kg	J	100		Yes	Yes	No
SSSB	Solvent Pits	Perchlorate	AS01-SB62-1-3	AS01-SB62	288	ug/kg		26		No	No	No
SSSB	Solvent Pits	Perchlorate	AS01-SB62-3-5	AS01-SB62	269	ug/kg		26		No	No	No
SSSB	Solvent Pits	Perchlorate	AS01-SB62-5-7	AS01-SB62	757	ug/kg		26		No	No	No
SSSB	Solvent Pits	Perchlorate	AS01-SB62-7-8	AS01-SB62	459	ug/kg		26		No	No	No
SSSB	Solvent Pits	Perchlorate	AS01-SS62-0-0.5	AS01-SB62	74	ug/kg		26	X	No	No	No
SSSB	Solvent Pits	RDX	AS01-SB62-1-3	AS01-SB62	2100	ug/kg		47		No	No	No
SSSB	Solvent Pits	RDX	AS01-SB62-3-5	AS01-SB62	4500	ug/kg		47		No	No	No
SSSB	Solvent Pits	RDX	AS01-SB62-5-7	AS01-SB62	5500	ug/kg		47		No	No	No
SSSB	Solvent Pits	RDX	AS01-SB62-7-8	AS01-SB62	3600	ug/kg		47		No	No	No
SSSB	Solvent Pits	RDX	AS01-SS62-0-0.5	AS01-SB62	1000	ug/kg		47		No	No	No
SSSB	Solvent Pits	Silver	HCS-BG-8	BG-008/008S/009/038	1.2	mg/kg	J	5		No	No	No
SSSB	Solvent Pits	Sodium	AS01-SB42-(1-2)	AS01-SB42	66.1	mg/kg	J	14	X	No	No	No
SSSB	Solvent Pits	Sodium	AS01-SS62-0-0.5	AS01-SB62	139	mg/kg	J	14		No	No	No
SSSB	Solvent Pits	Total heptachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	3.4	ug/kg		89		Yes	Yes	No
SSSB	Solvent Pits	Total hexachlorodibenzofuran	AS01-SB43-(1-2)	AS01-SB43	0.003	ug/kg		21		No	No	No
SSSB	Solvent Pits	Total hexachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	4.6	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	Total hexachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.05	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	Total hexachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.057	ug/kg		21		Yes	Yes	No

**Table B-1: Individual Mathematical Outliers**

Depth	Grouping	Parameter	Sample ID	Station ID	Concentration	Units	Qualifier	Percent Detections	Detection Limit Noise	Concentration above RBC?	COC in full HHRA?	Perform Targeted HHRA?
SSSB	Solvent Pits	Total hexachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	1.4	ug/kg		32		Yes	Yes	No
SSSB	Solvent Pits	Total hexachlorodibenzo-p-dioxin	AS01-SS60-0-0.5	AS01-SB60	0.052	ug/kg		32		Yes	Yes	No
SSSB	Solvent Pits	Total hexachlorodibenzo-p-dioxin	AS01-SS61-0-0.5	AS01-SB61	0.0083	ug/kg		32		No	No	No
SSSB	Solvent Pits	Total hexachlorodibenzo-p-dioxin	AS01-SS62-0-0.5	AS01-SB62	0.018	ug/kg		32		Yes	Yes	No
SSSB	Solvent Pits	Total pentachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	4.5	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	Total pentachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.046	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	Total pentachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.069	ug/kg		21		Yes	Yes	No
SSSB	Solvent Pits	Total pentachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	0.68	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	Total pentachlorodibenzo-p-dioxin	AS01-SS60-0-0.5	AS01-SB60	0.0086	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	Total pentachlorodibenzo-p-dioxin	AS01-SS62-0-0.5	AS01-SB62	0.0035	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	Total tetrachlorodibenzofuran	AS01-SB61-1-3	AS01-SB61	0.0047	ug/kg		37		No	No	No
SSSB	Solvent Pits	Total tetrachlorodibenzofuran	AS01-SB62-1-3	AS01-SB62	3.9	ug/kg		37		Yes	Yes	No
SSSB	Solvent Pits	Total tetrachlorodibenzofuran	AS01-SS60-0-0.5	AS01-SB60	0.071	ug/kg		37		Yes	Yes	No
SSSB	Solvent Pits	Total tetrachlorodibenzofuran	AS01-SS61-0-0.5	AS01-SB61	0.011	ug/kg		37		No	No	No
SSSB	Solvent Pits	Total tetrachlorodibenzofuran	AS01-SS62-0-0.5	AS01-SB62	0.094	ug/kg		37		Yes	Yes	No
SSSB	Solvent Pits	Total tetrachlorodibenzo-p-dioxin	AS01-SB62-1-3	AS01-SB62	0.45	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	Total tetrachlorodibenzo-p-dioxin	AS01-SS60-0-0.5	AS01-SB60	0.015	ug/kg		16		Yes	Yes	No
SSSB	Solvent Pits	Total tetrachlorodibenzo-p-dioxin	AS01-SS62-0-0.5	AS01-SB62	0.011	ug/kg		16		Yes	Yes	No

Notes

- a. Not quantitatively evaluated in risk assessment due to retired toxicity values
- b. Dibenzo(a,h)anthracene not a COC in broader HHRA, however, this sample not a hot spot for other PAHs.
- c. Not a COC in broader HHRA, however, this location was not a hot spot for any other metals.

RBC - USEPA Region III Risk Based Concentration

HHRA - Human health risk assessment

**Appendix F4**  
**Background Comparison**

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Background Table 1

**Solvent Disposal Pits Comparison of Combined Depths to Combined Background**

Matrix	Parameter	Assumed Distribution for Comparison	Probability that the Observed Differences Would Occur Purely by Chance	Is there a significant difference between these two groups? *	Bkgd Detection Frequency	Site Solvent Disposal Pits Detection Frequency
SO	Aluminum	Nonparametric	0.000	Yes	60/60	21/21
SO	Antimony	Nonparametric	0.000	no *	8/57	0/21
SO	Arsenic	Nonparametric	0.001	Yes	60/60	21/21
SO	Barium	Nonparametric	0.095	no	60/60	21/21
SO	Beryllium	Nonparametric	0.844	no	37/60	4/21
SO	Cadmium	Nonparametric	0.990	no	54/60	1/21
SO	Calcium	Nonparametric	0.009	Yes	59/59	19/21
SO	Chromium	Nonparametric	0.000	Yes	60/60	21/21
SO	Cobalt	Nonparametric	0.002	Yes	60/60	20/21
SO	Copper	Nonparametric	0.002	Yes	60/60	21/21
SO	Cyanide	Nonparametric	0.000	Yes	10/60	4/21
SO	Iron	Nonparametric	0.000	Yes	60/60	21/21
SO	Lead	Nonparametric	0.047	Yes	60/60	21/21
SO	Magnesium	Nonparametric	0.000	Yes	60/60	21/21
SO	Manganese	Normal	0.054	no	60/60	21/21
SO	Mercury	Nonparametric	0.000	Yes	17/60	11/21
SO	Nickel	Nonparametric	0.018	Yes	60/60	21/21
SO	Potassium	Nonparametric	0.011	Yes	60/60	18/21
SO	Selenium	Nonparametric	1.000	no	47/60	3/21
SO	Silver	Nonparametric	0.000	Yes	0/60	1/21
SO	Sodium	Nonparametric	0.000	Yes	0/58	3/21
SO	Thallium	Nonparametric	0.000	Yes	14/60	4/21
SO	Vanadium	Normal	0.000	Yes	60/60	21/21
SO	Zinc	Nonparametric	0.013	Yes	40/60	21/21

\* no site detections

Background Table 2

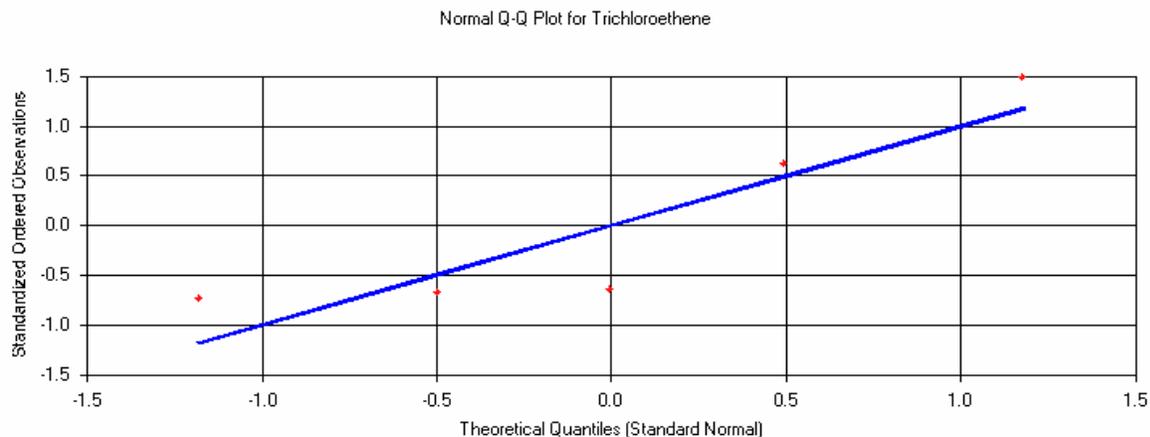
**Outside Burning Grounds Comparison of Combined Depths to Combined Background**

Matrix	Parameter	Assumed Distribution for Comparison	Probability that the Observed Differences Would Occur Purely by Chance	Is there a significant difference between these two groups? *	Bkgd Detection Frequency	Site Outside Burning Grounds Detection Frequency
SO	Aluminum	Nonparametric	0.000	Yes	60/60	64/64
SO	Antimony	Nonparametric	0.000	Yes	8/57	22/64
SO	Arsenic	Nonparametric	0.000	Yes	60/60	64/64
SO	Barium	Nonparametric	0.000	Yes	60/60	64/64
SO	Beryllium	Nonparametric	0.000	Yes	37/60	48/64
SO	Cadmium	Nonparametric	0.000	Yes	54/60	30/64
SO	Calcium	Nonparametric	0.000	Yes	59/59	64/64
SO	Chromium	Nonparametric	0.000	Yes	60/60	64/64
SO	Cobalt	Nonparametric	0.000	Yes	60/60	64/64
SO	Copper	Nonparametric	0.000	Yes	60/60	64/64
SO	Cyanide	Nonparametric	0.000	Yes	10/60	12/57
SO	Iron	Nonparametric	0.000	Yes	60/60	64/64
SO	Lead	Nonparametric	0.000	Yes	60/60	64/64
SO	Magnesium	Nonparametric	0.000	Yes	60/60	63/64
SO	Manganese	Nonparametric	0.000	Yes	60/60	64/64
SO	Mercury	Nonparametric	0.000	Yes	17/60	60/64
SO	Nickel	Nonparametric	0.000	Yes	60/60	64/64
SO	Potassium	Normal	0.000	Yes	60/60	62/64
SO	Selenium	Nonparametric	1.000	no	47/60	15/62
SO	Silver	Nonparametric	0.000	Yes	0/60	37/62
SO	Sodium	Nonparametric	0.000	Yes	0/58	28/64
SO	Thallium	Nonparametric	0.000	Yes	14/60	2/64
SO	Vanadium	Nonparametric	0.000	Yes	60/60	64/64
SO	Zinc	Nonparametric	0.000	Yes	40/60	64/64

**Appendix F5**  
**ProUCL Output Files**

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FDP Area Surface Soil  
Trichloroethene



N = 5, Mean = 611.8000, Sd = 804.7488  
 Slope = 0.9975, Intercept = 0.0000, Correlation, R = 0.90304202  
 Shapiro-Wilk Statistic = 0.803, Critical Value(0.05) = 0.762, Data are Normal

Data File

Variable: Trichloroethene

Raw Statistics

Number of Observations	5
Number of Missing Data	0
Number of Valid Observations	5
Number of Distinct Observations	5
Minimum	9
Maximum	1800
Mean	611.8
Standard Deviation	804.7488
Variance	647620.7
Coefficient of Variation	1.315379
Skewness	1.010892
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.802665	
Shapiro-Wilk 5% Critical Value	0.762	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1379.04	

Gamma Statistics

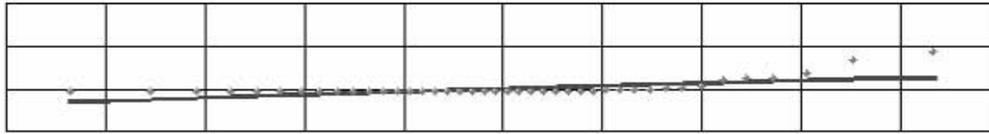
k hat	0.470734	
k star (bias corrected)	0.321627	
Theta hat	1299.673	
Theta star	1902.204	
nu hat	4.70734	
nu star	3.216269	
5% Approximate Chi Square Value	0.43907	
Adjusted Level of Significance	0.0086	
Adjusted Chi Square Value	0.165695	
Anderson-Darling Test Statistic	0.368064	
Anderson-Darling 5% Critical Value	0.715087	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% significance level.

FDP Area Surface Soil  
Trichloroethene

Kolmogrov-Smirnov Test Statistic	0.281038	
Kolmogrov-Smirnov 5% Critical Value	0.372833	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% significance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% significance level
95% Approximate Gamma UCL	4481.55	
95% Adjusted Gamma UCL	11875.48	
Lognormal Statistics		
Minimum of log data	2.197225	
Maximum of log data	7.495542	
Mean of log data	5.054297	
Standard Deviation of log data	2.191747	
Variance of log data	4.803756	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.933622	
Shapiro-Wilk 5% Critical Value	0.762	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	1730.515	
MLE Standard Deviation	19033.13	
MLE Coefficient of Variation	10.99853	
MLE Skewness	1363.462	
MLE Median	156.6943	
MLE 80% Quantile	998.5687	
MLE 90% Quantile	2619.377	
MLE 95% Quantile	5765.925	
MLE 99% Quantile	25650.05	
MVU Estimate of Median	92.55504	
MVU Estimate of Mean	725.9259	
MVU Estimate of Standard Deviation	1395.936	
MVU Estimate of SE of Mean	565.2405	
95% H-UCL	1.32E+08	
95% Chebyshev (MVUE) UCL	3189.752	
97.5% Chebyshev (MVUE) UCL	4255.852	
99% Chebyshev (MVUE) UCL	6349.998	
Non-parametric Statistics		
95% CLT UCL	1203.774	
95% Adjusted-CLT UCL	1377.624	
95% Modified-t UCL	1406.157	
95% Jackknife UCL	1379.04	
95% Chebyshev (Mean, Sd) UCL	2180.544	
97.5% Chebyshev (Mean, Sd) UCL	2859.341	
99% Chebyshev (Mean, Sd) UCL	4192.706	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1123.949	
95% Bootstrap-t UCL	12422	
95% Hall's Bootstrap UCL	15914.94	
95% Percentile Bootstrap UCL	1171.4	
95% BCA Bootstrap UCL	1178.6	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1379.04	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

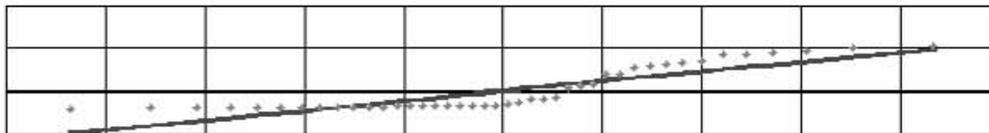
OABG Area Surface Soil  
Trichloroethene

Normal Q-Q Plot for Trichloroethene



N = 42, Mean = 6800.2238, Sd = 17347.3804  
Slope = 0.6827, Intercept = 0.0000, Correlation, R = 0.66823832  
Shapiro-Wilk Statistic = 0.464, Critical Value(0.05) = 0.942, Data not Normal

Lognormal Q-Q Plot for Trichloroethene



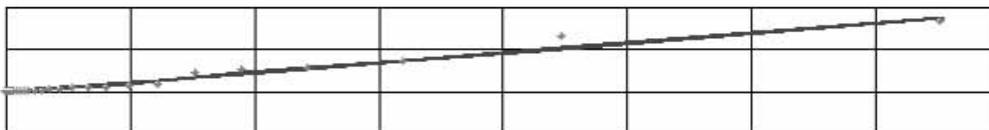
N = 42, Mean = 4.4310, Sd = 3.4103  
Slope = 0.9004, Intercept = 0.0000, Correlation, R = 0.88131931  
Shapiro-Wilk Statistic = 0.713, Critical Value(0.05) = 0.942, Data not Lognormal

Gamma Q-Q Plot for Trichloroethene



N = 42, Mean = 6800.224, k hat = 0.1715  
Slope = 1.183, Intercept = -930.822, Correlation, R = 0.984  
A-D Test Statistic = 5.233, Critical Value(0.05) = 0.921, Data not Gamma Distributed

Gamma Q-Q Plot for Trichloroethene



N = 42, Mean = 6800.224, k hat = 0.171  
Slope = 1.183, Intercept = -930.822, Correlation, R = 0.984  
K-S Test Statistic = 0.312, Critical Value(0.05) = 0.152, Data not Gamma Distributed

OABG Area Surface Soil  
Trichloroethene

Data File

Variable: Trichloroethene

Raw Statistics

Number of Observations	42
Number of Missing Data	0
Number of Valid Observations	42
Number of Distinct Observations	28
Minimum	4.4
Maximum	82000
Mean	6800.224
Standard Deviation	17347.38
Variance	3.01E+08
Coefficient of Variation	2.551001
Skewness	3.220948

Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.463767	
Shapiro-Wilk 5% Critical Value	0.942	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	11304.88	

Gamma Statistics

k hat	0.171492	
k star (bias corrected)	0.175116	
Theta hat	39653.32	
Theta star	38832.79	
nu hat	14.40532	
nu star	14.7097	
5% Approximate Chi Square Value	7.058891	
Adjusted Level of Significance	0.044286	
Adjusted Chi Square Value	6.86976	
Anderson-Darling Test Statistic	5.23261	
Anderson-Darling 5% Critical Value	0.921317	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.311919	
Kolmogrov-Smirnov 5% Critical Value	0.152118	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	14170.68	
95% Adjusted Gamma UCL	14560.81	

Lognormal Statistics

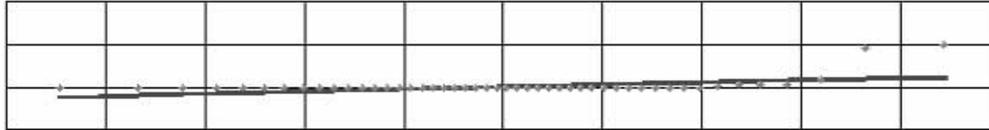
Minimum of log data	1.481605	
Maximum of log data	11.31447	
Mean of log data	4.430968	
Standard Deviation of log data	3.410328	
Variance of log data	11.63034	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.712514	
Shapiro-Wilk 5% Critical Value	0.942	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	28173.52	
MLE Standard Deviation	9447902	
MLE Coefficient of Variation	335.3469	
MLE Skewness	37713283	
MLE Median	84.0127	
MLE 80% Quantile	1499.213	
MLE 90% Quantile	6722.665	

OABG Area Surface Soil  
Trichloroethene

MLE 95% Quantile	22947.36	
MLE 99% Quantile	234073.8	
MVU Estimate of Median	73.11708	
MVU Estimate of Mean	13824.64	
MVU Estimate of Standard Deviation	393781.4	
MVU Estimate of SE of Mean	10836.39	
95% H-UCL	610742.2	
95% Chebyshev (MVUE) UCL	61059.36	
97.5% Chebyshev (MVUE) UCL	81497.85	
99% Chebyshev (MVUE) UCL	121645.3	
Non-parametric Statistics		
95% CLT UCL	11203.1	
95% Adjusted-CLT UCL	12624.61	
95% Modified-t UCL	11526.61	
95% Jackknife UCL	11304.88	
95% Chebyshev (Mean, Sd) UCL	18467.95	
97.5% Chebyshev (Mean, Sd) UCL	23516.58	
99% Chebyshev (Mean, Sd) UCL	33433.64	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	11234.59	
95% Bootstrap-t UCL	15027.87	
95% Hall's Bootstrap UCL	15081.54	
95% Percentile Bootstrap UCL	11787.6	
95% BCA Bootstrap UCL	12596.25	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	33433.64	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

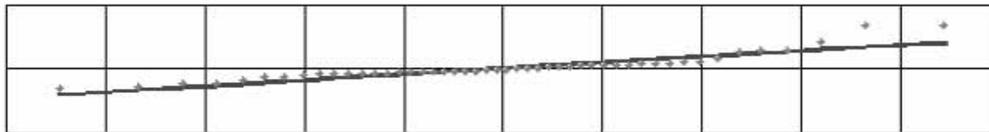
OABG Area Surface Soil  
Benzo(a)anthracene

Normal Q-Q Plot for Benzo(a)anthracene



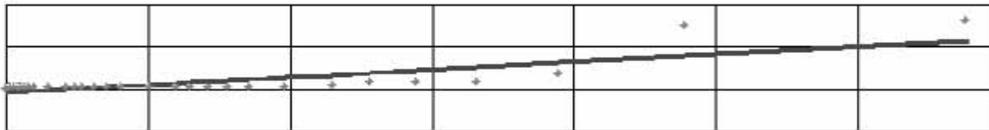
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Slope = 0.5422, Intercept = 0.0000, Correlation, R = 0.53180629  
Shapiro-Wilk Statistic = 0.309, Critical Value(0.05) = 0.947, Data not Normal

Lognormal Q-Q Plot for Benzo(a)anthracene



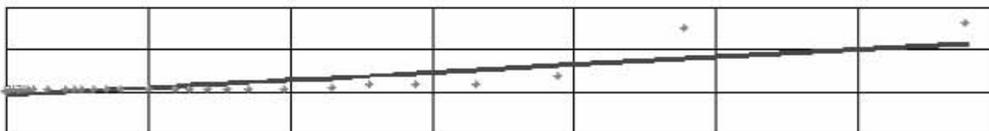
N = 48, Mean = 5.0237, Sd = 1.1800  
Slope = 0.9348, Intercept = 0.0000, Correlation, R = 0.91690397  
Shapiro-Wilk Statistic = 0.851, Critical Value(0.05) = 0.947, Data not Lognormal

Gamma Q-Q Plot for Benzo(a)anthracene



N = 48, Mean = 515.167, k hat = 0.5175  
Slope = 1.834, Intercept = -416.380, Correlation, R = 0.817  
A-D Test Statistic = 7.206, Critical Value(0.05) = 0.812, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(a)anthracene



N = 48, Mean = 515.167, k hat = 0.518  
Slope = 1.834, Intercept = -416.380, Correlation, R = 0.817  
K-S Test Statistic = 0.347, Critical Value(0.05) = 0.135, Data not Gamma Distributed

OABG Area Surface Soil  
Benzo(a)anthracene

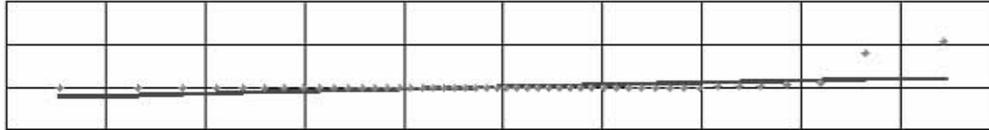
Data File		
Variable:	Benzo(a)anthracene	
Raw Statistics		
Number of Observations	48	
Number of Missing Data	0	
Number of Valid Observations	48	
Number of Distinct Observations	36	
Minimum	21	
Maximum	8100	
Mean	515.1667	
Standard Deviation	1560.174	
Variance	2434143	
Coefficient of Variation	3.028484	
Skewness	4.537279	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.308713	
Shapiro-Wilk 5% Critical Value	0.947	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	893.0218	
Gamma Statistics		
k hat	0.517531	
k star (bias corrected)	0.499074	
Theta hat	995.4317	
Theta star	1032.245	
nu hat	49.68297	
nu star	47.91111	
5% Approximate Chi Square Value	33.02152	
Adjusted Level of Significance	0.045	
Adjusted Chi Square Value	32.63795	
Anderson-Darling Test Statistic	7.206071	
Anderson-Darling 5% Critical Value	0.812384	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.346515	
Kolmogrov-Smirnov 5% Critical Value	0.135015	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	747.4584	
95% Adjusted Gamma UCL	756.2426	
Lognormal Statistics		
Minimum of log data	3.044522	
Maximum of log data	8.999619	
Mean of log data	5.023677	
Standard Deviation of log data	1.179979	
Variance of log data	1.39235	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.850679	
Shapiro-Wilk 5% Critical Value	0.947	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	304.8597	
MLE Standard Deviation	530.1664	
MLE Coefficient of Variation	1.739051	
MLE Skewness	10.47656	
MLE Median	151.969	

OABG Area Surface Soil  
Benzo(a)anthracene

MLE 80% Quantile	411.891	
MLE 90% Quantile	692.2516	
MLE 95% Quantile	1058.642	
MLE 99% Quantile	2364.466	
MVU Estimate of Median	149.7802	
MVU Estimate of Mean	297.7301	
MVU Estimate of Standard Deviation	473.3368	
MVU Estimate of SE of Mean	62.25291	
95% H-UCL	470.5243	
95% Chebyshev (MVUE) UCL	569.0842	
97.5% Chebyshev (MVUE) UCL	686.4993	
99% Chebyshev (MVUE) UCL	917.1387	
Non-parametric Statistics		
95% CLT UCL	885.5741	
95% Adjusted-CLT UCL	1043.157	
95% Modified-t UCL	917.6015	
95% Jackknife UCL	893.0218	
95% Chebyshev (Mean, Sd) UCL	1496.755	
97.5% Chebyshev (Mean, Sd) UCL	1921.489	
99% Chebyshev (Mean, Sd) UCL	2755.796	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	884.4395	
95% Bootstrap-t UCL	2727.856	
95% Hall's Bootstrap UCL	2661.466	
95% Percentile Bootstrap UCL	870.5208	
95% BCA Bootstrap UCL	1132.875	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	2755.796	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

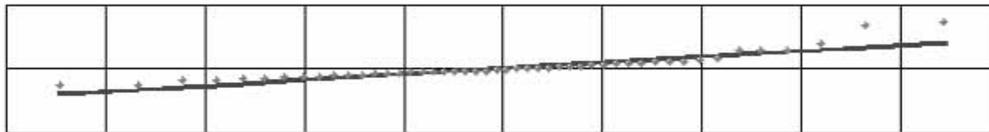
OABG Area Surface Soil  
Benzo(a)pyrene

Normal Q-Q Plot for Benzo(a)pyrene



N = 48, Mean = 608.5104, Sd = 2120.8860  
Slope = 0.5135, Intercept = 0.0000, Correlation, R = 0.50371593  
Shapiro-Wilk Statistic = 0.284, Critical Value(0.05) = 0.947, Data not Normal

Lognormal Q-Q Plot for Benzo(a)pyrene



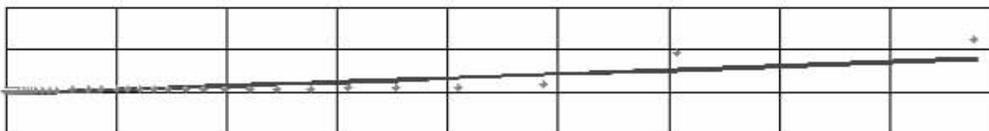
N = 48, Mean = 4.9093, Sd = 1.2515  
Slope = 0.9235, Intercept = 0.0000, Correlation, R = 0.90584910  
Shapiro-Wilk Statistic = 0.830, Critical Value(0.05) = 0.947, Data not Lognormal

Gamma Q-Q Plot for Benzo(a)pyrene



N = 48, Mean = 608.510, k hat = 0.4327  
Slope = 1.947, Intercept = -557.550, Correlation, R = 0.817  
A-D Test Statistic = 7.994, Critical Value(0.05) = 0.830, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(a)pyrene



N = 48, Mean = 608.510, k hat = 0.433  
Slope = 1.947, Intercept = -557.550, Correlation, R = 0.817  
K-S Test Statistic = 0.347, Critical Value(0.05) = 0.136, Data not Gamma Distributed

OABG Area Surface Soil  
Benzo(a)pyrene

Data File

Variable: Benzo(a)pyrene

Raw Statistics

Number of Observations	48
Number of Missing Data	0
Number of Valid Observations	48
Number of Distinct Observations	41
Minimum	24
Maximum	12000
Mean	608.5104
Standard Deviation	2120.886
Variance	4498157
Coefficient of Variation	3.485373
Skewness	4.803793
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.284079	
Shapiro-Wilk 5% Critical Value	0.947	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1122.163	

Gamma Statistics

k hat	0.432694	
k star (bias corrected)	0.41954	
Theta hat	1406.329	
Theta star	1450.423	
nu hat	41.53866	
nu star	40.27582	
5% Approximate Chi Square Value	26.73185	
Adjusted Level of Significance	0.045	
Adjusted Chi Square Value	26.38927	
Anderson-Darling Test Statistic	7.994234	
Anderson-Darling 5% Critical Value	0.830176	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.346862	
Kolmogrov-Smirnov 5% Critical Value	0.136431	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	916.8185	
95% Adjusted Gamma UCL	928.7205	

Lognormal Statistics

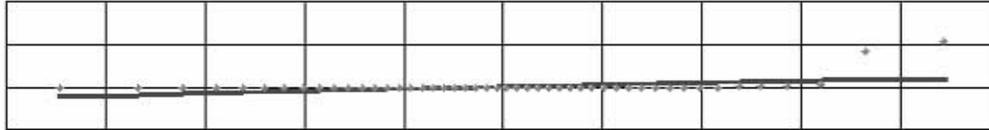
Minimum of log data	3.178054	
Maximum of log data	9.392662	
Mean of log data	4.909258	
Standard Deviation of log data	1.251509	
Variance of log data	1.566275	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.82986	
Shapiro-Wilk 5% Critical Value	0.947	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	296.6032	
MLE Standard Deviation	577.3316	
MLE Coefficient of Variation	1.946478	
MLE Skewness	13.2142	
MLE Median	135.5388	

OABG Area Surface Soil  
Benzo(a)pyrene

MLE 80% Quantile	390.2483	
MLE 90% Quantile	676.8482	
MLE 95% Quantile	1062.086	
MLE 99% Quantile	2490.573	
MVU Estimate of Median	133.3447	
MVU Estimate of Mean	288.4541	
MVU Estimate of Standard Deviation	505.1071	
MVU Estimate of SE of Mean	65.08876	
95% H-UCL	477.2309	
95% Chebyshev (MVUE) UCL	572.1695	
97.5% Chebyshev (MVUE) UCL	694.9333	
99% Chebyshev (MVUE) UCL	936.0791	
Non-parametric Statistics		
95% CLT UCL	1112.039	
95% Adjusted-CLT UCL	1338.838	
95% Modified-t UCL	1157.539	
95% Jackknife UCL	1122.163	
95% Chebyshev (Mean, Sd) UCL	1942.872	
97.5% Chebyshev (Mean, Sd) UCL	2520.251	
99% Chebyshev (Mean, Sd) UCL	3654.401	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1093.759	
95% Bootstrap-t UCL	5232.801	
95% Hall's Bootstrap UCL	3739.964	
95% Percentile Bootstrap UCL	1180.115	
95% BCA Bootstrap UCL	1330.927	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	3654.401	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

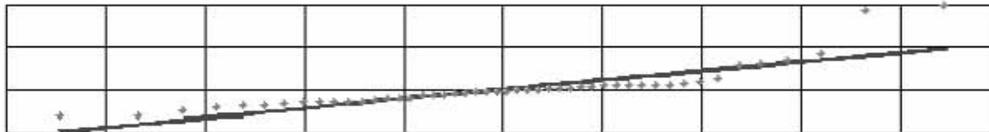
OABG Area Surface Soil  
Benzo(b)fluoranthene

Normal Q-Q Plot for Benzo(b)fluoranthene



N = 48, Mean = 1000.2917, Sd = 3732.5121  
Slope = 0.4894, Intercept = 0.0000, Correlation, R = 0.48001963  
Shapiro-Wilk Statistic = 0.260, Critical Value(0.05) = 0.947, Data not Normal

Lognormal Q-Q Plot for Benzo(b)fluoranthene



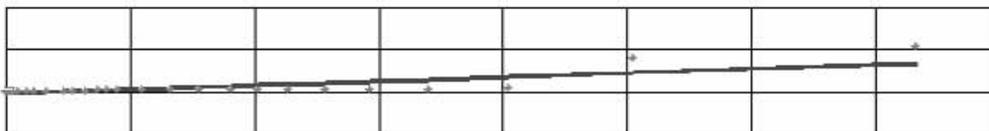
N = 48, Mean = 5.3585, Sd = 1.1755  
Slope = 0.8773, Intercept = 0.0000, Correlation, R = 0.86057738  
Shapiro-Wilk Statistic = 0.757, Critical Value(0.05) = 0.947, Data not Lognormal

Gamma Q-Q Plot for Benzo(b)fluoranthene



N = 48, Mean = 1000.292, k hat = 0.4212  
Slope = 2.008, Intercept = -974.805, Correlation, R = 0.796  
A-D Test Statistic = 9.884, Critical Value(0.05) = 0.833, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(b)fluoranthene



N = 48, Mean = 1000.292, k hat = 0.421  
Slope = 2.008, Intercept = -974.805, Correlation, R = 0.796  
K-S Test Statistic = 0.405, Critical Value(0.05) = 0.137, Data not Gamma Distributed

OABG Area Surface Soil  
Benzo(b)fluoranthene

Data File

Variable: Benzo(b)fluoranthene

Raw Statistics

Number of Observations	48
Number of Missing Data	0
Number of Valid Observations	48
Number of Distinct Observations	33
Minimum	45
Maximum	21000
Mean	1000.292
Standard Deviation	3732.512
Variance	13931647
Coefficient of Variation	3.731424
Skewness	4.845769
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.260154	
Shapiro-Wilk 5% Critical Value	0.947	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1904.261	

Gamma Statistics

k hat	0.421159	
k star (bias corrected)	0.408725	
Theta hat	2375.094	
Theta star	2447.345	
nu hat	40.43124	
nu star	39.23762	
5% Approximate Chi Square Value	25.88626	
Adjusted Level of Significance	0.045	
Adjusted Chi Square Value	25.54954	
Anderson-Darling Test Statistic	9.883937	
Anderson-Darling 5% Critical Value	0.83296	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.405073	
Kolmogrov-Smirnov 5% Critical Value	0.136648	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1516.212	
95% Adjusted Gamma UCL	1536.194	

Lognormal Statistics

Minimum of log data	3.806662	
Maximum of log data	9.952278	
Mean of log data	5.358483	
Standard Deviation of log data	1.175496	
Variance of log data	1.38179	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.757159	
Shapiro-Wilk 5% Critical Value	0.947	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	423.8493	
MLE Standard Deviation	731.9256	
MLE Coefficient of Variation	1.726853	
MLE Skewness	10.33008	
MLE Median	212.4025	

OABG Area Surface Soil  
Benzo(b)fluoranthene

MLE 80% Quantile	573.5108	
MLE 90% Quantile	961.9812	
MLE 95% Quantile	1468.759	
MLE 99% Quantile	3270.46	
MVU Estimate of Median	209.3663	
MVU Estimate of Mean	414.0388	
MVU Estimate of Standard Deviation	654.245	
MVU Estimate of SE of Mean	86.14876	
95% H-UCL	652.5193	
95% Chebyshev (MVUE) UCL	789.5526	
97.5% Chebyshev (MVUE) UCL	952.0377	
99% Chebyshev (MVUE) UCL	1271.208	
Non-parametric Statistics		
95% CLT UCL	1886.443	
95% Adjusted-CLT UCL	2289.07	
95% Modified-t UCL	1967.062	
95% Jackknife UCL	1904.261	
95% Chebyshev (Mean, Sd) UCL	3348.612	
97.5% Chebyshev (Mean, Sd) UCL	4364.733	
99% Chebyshev (Mean, Sd) UCL	6360.704	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1877.556	
95% Bootstrap-t UCL	13542.98	
95% Hall's Bootstrap UCL	9465.893	
95% Percentile Bootstrap UCL	1989.042	
95% BCA Bootstrap UCL	2344.271	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6360.704	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

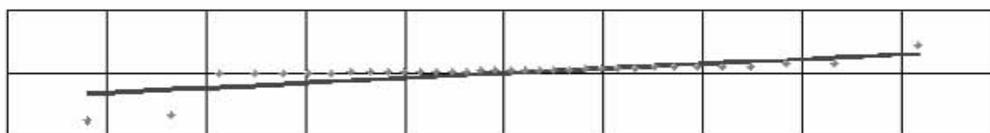
OABG Area Surface Soil  
Dibenz(a,h)anthracene

Normal Q-Q Plot for Dibenz(a,h)anthracene



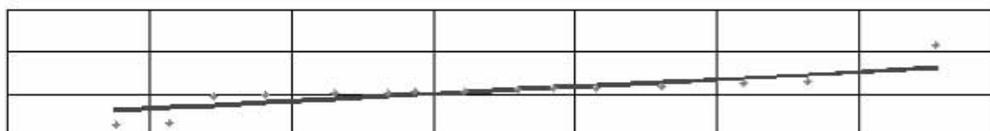
N = 34, Mean = 206.2647, Sd = 56.5124  
Slope = 0.8191, Intercept = 0.0000, Correlation, R = 0.79883675  
Shapiro-Wilk Statistic = 0.687, Critical Value(0.05) = 0.933, Data not Normal

Lognormal Q-Q Plot for Dibenz(a,h)anthracene



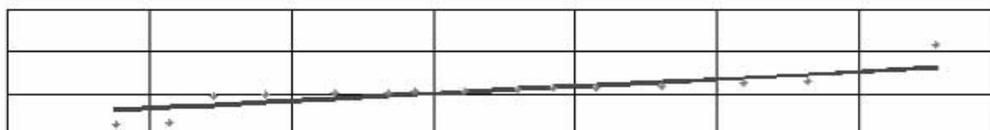
N = 34, Mean = 5.2804, Sd = 0.3593  
Slope = 0.7575, Intercept = 0.0000, Correlation, R = 0.73877279  
Shapiro-Wilk Statistic = 0.584, Critical Value(0.05) = 0.933, Data not Lognormal

Gamma Q-Q Plot for Dibenz(a,h)anthracene



N = 34, Mean = 206.265, k hat = 10.4226  
Slope = 0.693, Intercept = 63.439, Correlation, R = 0.809  
A-D Test Statistic = 4.979, Critical Value(0.05) = 0.748, Data not Gamma Distributed

Gamma Q-Q Plot for Dibenz(a,h)anthracene



N = 34, Mean = 206.265, k hat = 10.423  
Slope = 0.693, Intercept = 63.439, Correlation, R = 0.809  
K-S Test Statistic = 0.346, Critical Value(0.05) = 0.151, Data not Gamma Distributed

OABG Area Surface Soil  
 Dibenz(a,h)anthracene

Data File

Variable: Dibenz(a,h)anthracene

Raw Statistics

Number of Observations	34
Number of Missing Data	0
Number of Valid Observations	34
Number of Distinct Observations	15
Minimum	51
Maximum	430
Mean	206.2647
Standard Deviation	56.51243
Variance	3193.655
Coefficient of Variation	0.27398
Skewness	0.765607
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.687326	
Shapiro-Wilk 5% Critical Value	0.933	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	222.6667	

Gamma Statistics

k hat	10.42262	
k star (bias corrected)	9.522584	
Theta hat	19.7901	
Theta star	21.66058	
nu hat	708.7381	
nu star	647.5357	
5% Approximate Chi Square Value	589.4887	
Adjusted Level of Significance	0.0422	
Adjusted Chi Square Value	586.7594	
Anderson-Darling Test Statistic	4.978582	
Anderson-Darling 5% Critical Value	0.747652	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.346099	
Kolmogrov-Smirnov 5% Critical Value	0.150886	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	226.5756	
95% Adjusted Gamma UCL	227.6295	

Lognormal Statistics

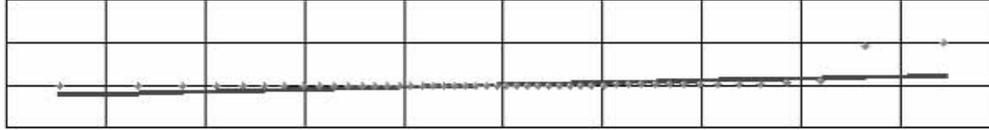
Minimum of log data	3.931826	
Maximum of log data	6.063785	
Mean of log data	5.280421	
Standard Deviation of log data	0.359335	
Variance of log data	0.129122	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.583956	
Shapiro-Wilk 5% Critical Value	0.933	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	209.5541	
MLE Standard Deviation	77.79752	
MLE Coefficient of Variation	0.371253	
MLE Skewness	1.164927	
MLE Median	196.4526	

OABG Area Surface Soil  
 Dibenz(a,h)anthracene

MLE 80% Quantile	266.1498	
MLE 90% Quantile	311.7391	
MLE 95% Quantile	354.7905	
MLE 99% Quantile	453.1551	
MVU Estimate of Median	196.0799	
MVU Estimate of Mean	209.1332	
MVU Estimate of Standard Deviation	77.05532	
MVU Estimate of SE of Mean	13.20139	
95% H-UCL	234.869	
95% Chebyshev (MVUE) UCL	266.6768	
97.5% Chebyshev (MVUE) UCL	291.5759	
99% Chebyshev (MVUE) UCL	340.4854	
Non-parametric Statistics		
95% CLT UCL	222.2063	
95% Adjusted-CLT UCL	223.566	
95% Modified-t UCL	222.8788	
95% Jackknife UCL	222.6667	
95% Chebyshev (Mean, Sd) UCL	248.5103	
97.5% Chebyshev (Mean, Sd) UCL	266.79	
99% Chebyshev (Mean, Sd) UCL	302.6969	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	221.7513	
95% Bootstrap-t UCL	223.1753	
95% Hall's Bootstrap UCL	230.0329	
95% Percentile Bootstrap UCL	222.4706	
95% BCA Bootstrap UCL	222.6471	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	222.6667	95% Student's-t UCL
2nd Recommended UCL	222.8788	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

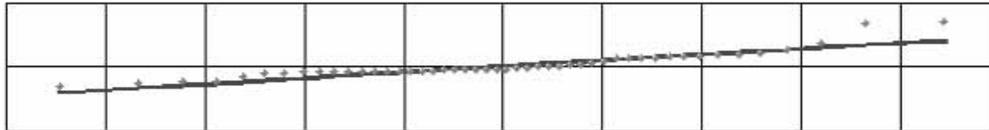
OABG Area Surface Soil  
Indeno(1,2,3-cd)pyrene

Normal Q-Q Plot for Indeno(1,2,3-cd)pyrene



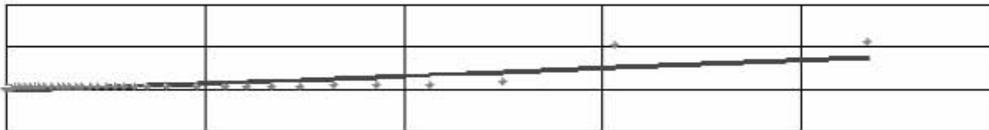
N = 48, Mean = 332.7917, Sd = 1034.5162  
Slope = 0.5273, Intercept = 0.0000, Correlation, R = 0.51727772  
Shapiro-Wilk Statistic = 0.294, Critical Value(0.05) = 0.947, Data not Normal

Lognormal Q-Q Plot for Indeno(1,2,3-cd)pyrene



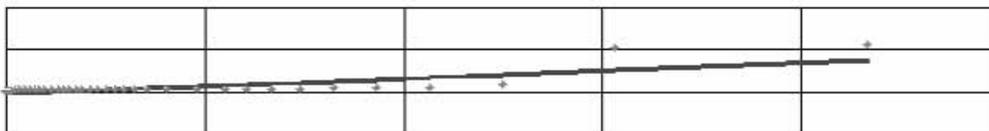
N = 48, Mean = 4.6064, Sd = 1.1590  
Slope = 0.9344, Intercept = 0.0000, Correlation, R = 0.91658852  
Shapiro-Wilk Statistic = 0.852, Critical Value(0.05) = 0.947, Data not Lognormal

Gamma Q-Q Plot for Indeno(1,2,3-cd)pyrene



N = 48, Mean = 332.792, k hat = 0.5249  
Slope = 1.849, Intercept = -274.252, Correlation, R = 0.798  
A-D Test Statistic = 7.001, Critical Value(0.05) = 0.812, Data not Gamma Distributed

Gamma Q-Q Plot for Indeno(1,2,3-cd)pyrene



N = 48, Mean = 332.792, k hat = 0.525  
Slope = 1.849, Intercept = -274.252, Correlation, R = 0.798  
K-S Test Statistic = 0.272, Critical Value(0.05) = 0.135, Data not Gamma Distributed

OABG Area Surface Soil  
 Indeno(1,2,3-cd)pyrene

Data File

Variable: Indeno(1,2,3-cd)pyrene

Raw Statistics

Number of Observations	48
Number of Missing Data	0
Number of Valid Observations	48
Number of Distinct Observations	40
Minimum	14
Maximum	5400
Mean	332.7917
Standard Deviation	1034.516
Variance	1070224
Coefficient of Variation	3.1086
Skewness	4.635517
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.293737	
Shapiro-Wilk 5% Critical Value	0.947	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	583.3389	

Gamma Statistics

k hat	0.524878	
k star (bias corrected)	0.505962	
Theta hat	634.0366	
Theta star	657.7408	
nu hat	50.38826	
nu star	48.57232	
5% Approximate Chi Square Value	33.57147	
Adjusted Level of Significance	0.045	
Adjusted Chi Square Value	33.18451	
Anderson-Darling Test Statistic	7.000638	
Anderson-Darling 5% Critical Value	0.811737	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.271903	
Kolmogrov-Smirnov 5% Critical Value	0.134953	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	481.4941	
95% Adjusted Gamma UCL	487.1087	

Lognormal Statistics

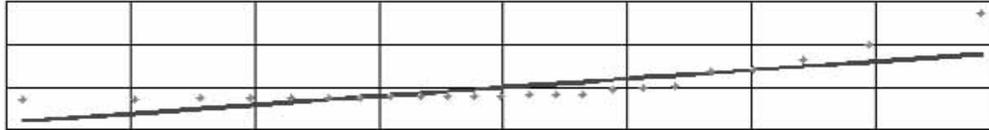
Minimum of log data	2.639057	
Maximum of log data	8.594154	
Mean of log data	4.606394	
Standard Deviation of log data	1.159015	
Variance of log data	1.343317	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.851559	
Shapiro-Wilk 5% Critical Value	0.947	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	195.9877	
MLE Standard Deviation	329.8032	
MLE Coefficient of Variation	1.682775	
MLE Skewness	9.813491	
MLE Median	100.1224	

OABG Area Surface Soil  
 Indeno(1,2,3-cd)pyrene

MLE 80% Quantile	266.6033	
MLE 90% Quantile	443.9573	
MLE 95% Quantile	673.8274	
MLE 99% Quantile	1483.654	
MVU Estimate of Median	98.73078	
MVU Estimate of Mean	191.6215	
MVU Estimate of Standard Deviation	296.0655	
MVU Estimate of SE of Mean	39.15332	
95% H-UCL	298.9504	
95% Chebyshev (MVUE) UCL	362.2869	
97.5% Chebyshev (MVUE) UCL	436.1339	
99% Chebyshev (MVUE) UCL	581.1921	
Non-parametric Statistics		
95% CLT UCL	578.4005	
95% Adjusted-CLT UCL	685.1521	
95% Modified-t UCL	599.99	
95% Jackknife UCL	583.3389	
95% Chebyshev (Mean, Sd) UCL	983.6605	
97.5% Chebyshev (Mean, Sd) UCL	1265.292	
99% Chebyshev (Mean, Sd) UCL	1818.502	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	571.1736	
95% Bootstrap-t UCL	2347.477	
95% Hall's Bootstrap UCL	1836.201	
95% Percentile Bootstrap UCL	635.3542	
95% BCA Bootstrap UCL	738.6042	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1818.502	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

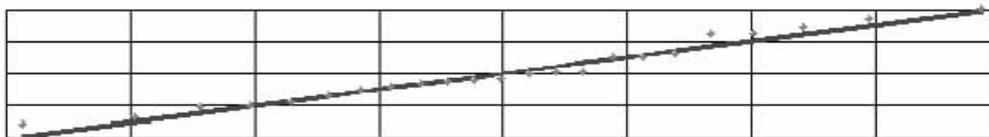
OABG Area Surface Soil  
2,3,7,8-TCDD

Normal Q-Q Plot for 2,3,7,8-TCDD equivalents



N = 23, Mean = 0.0001, Sd = 0.0001  
Slope = 0.8282, Intercept = 0.0000, Correlation, R = 0.80077496  
Shapiro-Wilk Statistic = 0.652, Critical Value(0.05) = 0.914, Data not Normal

Lognormal Q-Q Plot for 2,3,7,8-TCDD equivalents



N = 23, Mean = -10.5146, Sd = 1.3661  
Slope = 1.0189, Intercept = 0.0000, Correlation, R = 0.98519712  
Shapiro-Wilk Statistic = 0.962, Critical Value(0.05) = 0.914, Data are Lognormal

Gamma Q-Q Plot for 2,3,7,8-TCDD equivalents



N = 23, Mean = 0.000, k hat = 0.6698  
Slope = 1.258, Intercept = -0.000, Correlation, R = 0.983  
A-D Test Statistic = 1.058, Critical Value(0.05) = 0.790, Data not Gamma Distributed

Gamma Q-Q Plot for 2,3,7,8-TCDD equivalents



N = 23, Mean = 0.000, k hat = 0.670  
Slope = 1.258, Intercept = -0.000, Correlation, R = 0.983  
K-S Test Statistic = 0.227, Critical Value(0.05) = 0.190, Data not Gamma Distributed

OABG Area Surface Soil  
2,3,7,8-TCDD

Data File		
Variable:	2,3,7,8-TCDD equivalents	
Raw Statistics		
Number of Observations	23	
Number of Missing Data	0	
Number of Valid Observations	23	
Number of Distinct Observations	23	
Minimum	2.99E-06	
Maximum	0.000413	
Mean	6.73E-05	
Standard Deviation	0.000103	
Variance	1.05E-08	
Coefficient of Variation	1.525685	
Skewness	2.317228	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.652316	
Shapiro-Wilk 5% Critical Value	0.914	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.000104	
Gamma Statistics		
k hat	0.669833	
k star (bias corrected)	0.611449	
Theta hat	0.0001	
Theta star	0.00011	
nu hat	30.81233	
nu star	28.12666	
5% Approximate Chi Square Value	17.02477	
Adjusted Level of Significance	0.0389	
Adjusted Chi Square Value	16.39884	
Anderson-Darling Test Statistic	1.058449	
Anderson-Darling 5% Critical Value	0.789554	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.227402	
Kolmogrov-Smirnov 5% Critical Value	0.189672	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.000111	
95% Adjusted Gamma UCL	0.000115	
Lognormal Statistics		
Minimum of log data	-12.72024	
Maximum of log data	-7.792063	
Mean of log data	-10.51457	
Standard Deviation of log data	1.366105	
Variance of log data	1.866242	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.96181	
Shapiro-Wilk 5% Critical Value	0.914	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	6.90E-05	
MLE Standard Deviation	0.000161	
MLE Coefficient of Variation	2.337512	
MLE Skewness	19.78461	
MLE Median	2.71E-05	

OABG Area Surface Soil  
2,3,7,8-TCDD

MLE 80% Quantile	8.61E-05	
MLE 90% Quantile	0.000157	
MLE 95% Quantile	0.000257	
MLE 99% Quantile	0.000651	
MVU Estimate of Median	2.61E-05	
MVU Estimate of Mean	6.43E-05	
MVU Estimate of Standard Deviation	0.000118	
MVU Estimate of SE of Mean	2.19E-05	
95% H-UCL	0.000168	
95% Chebyshev (MVUE) UCL	0.00016	
97.5% Chebyshev (MVUE) UCL	0.000201	
99% Chebyshev (MVUE) UCL	0.000283	
Non-parametric Statistics		
95% CLT UCL	0.000102	
95% Adjusted-CLT UCL	0.000114	
95% Modified-t UCL	0.000106	
95% Jackknife UCL	0.000104	
95% Chebyshev (Mean, Sd) UCL	0.000161	
97.5% Chebyshev (Mean, Sd) UCL	0.000201	
99% Chebyshev (Mean, Sd) UCL	0.00028	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.000101	
95% Bootstrap-t UCL	0.000134	
95% Hall's Bootstrap UCL	0.000125	
95% Percentile Bootstrap UCL	0.000105	
95% BCA Bootstrap UCL	0.000114	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	0.00016	95% Chebyshev (MVUE) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

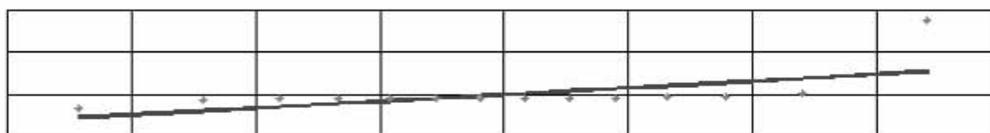
OABG Area Surface Soil  
HMX

Normal Q-Q Plot for HMX



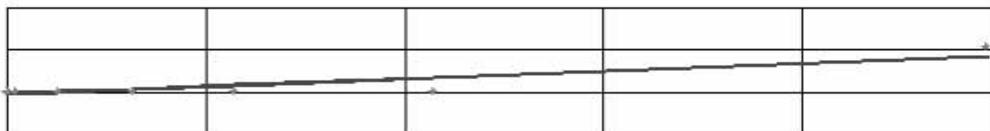
N = 14, Mean = 38141.4286, Sd = 141566.6561  
Slope = 0.5418, Intercept = 0.0000, Correlation, R = 0.51623378  
Shapiro-Wilk Statistic = 0.297, Critical Value(0.05) = 0.874, Data not Normal

Lognormal Q-Q Plot for HMX



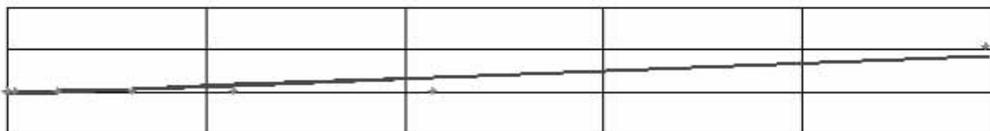
N = 14, Mean = 6.2210, Sd = 2.0252  
Slope = 0.6435, Intercept = 0.0000, Correlation, R = 0.61313999  
Shapiro-Wilk Statistic = 0.413, Critical Value(0.05) = 0.874, Data not Lognormal

Gamma Q-Q Plot for HMX



N = 14, Mean = 38141.429, k hat = 0.1738  
Slope = 1.850, Intercept = -24710.233, Correlation, R = 0.895  
A-D Test Statistic = 4.764, Critical Value(0.05) = 0.882, Data not Gamma Distributed

Gamma Q-Q Plot for HMX



N = 14, Mean = 38141.429, k hat = 0.174  
Slope = 1.850, Intercept = -24710.233, Correlation, R = 0.895  
K-S Test Statistic = 0.553, Critical Value(0.05) = 0.254, Data not Gamma Distributed

OABG Area Surface Soil  
HMX

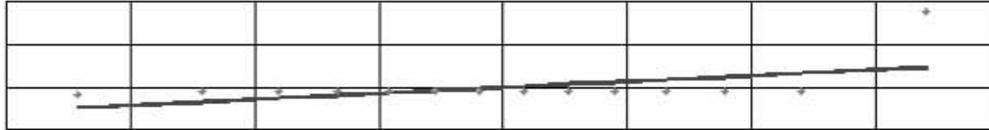
Data File		
Variable:	HMX	
Raw Statistics		
Number of Observations	14	
Number of Missing Data	0	
Number of Valid Observations	14	
Number of Distinct Observations	11	
Minimum	120	
Maximum	530000	
Mean	38141.43	
Standard Deviation	141566.7	
Variance	2.00E+10	
Coefficient of Variation	3.711624	
Skewness	3.741655	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.297365	
Shapiro-Wilk 5% Critical Value	0.874	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	105145.2	
Gamma Statistics		
k hat	0.173751	
k star (bias corrected)	0.184138	
Theta hat	219517.2	
Theta star	207135	
nu hat	4.865041	
nu star	5.155866	
5% Approximate Chi Square Value	1.224459	
Adjusted Level of Significance	0.03122	
Adjusted Chi Square Value	0.991925	
Anderson-Darling Test Statistic	4.76379	
Anderson-Darling 5% Critical Value	0.882344	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.553334	
Kolmogrov-Smirnov 5% Critical Value	0.253968	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	160603.2	
95% Adjusted Gamma UCL	198253	
Lognormal Statistics		
Minimum of log data	4.787492	
Maximum of log data	13.18063	
Mean of log data	6.221013	
Standard Deviation of log data	2.025225	
Variance of log data	4.101535	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.413468	
Shapiro-Wilk 5% Critical Value	0.874	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	3911.906	
MLE Standard Deviation	30157.97	
MLE Coefficient of Variation	7.709277	
MLE Skewness	481.313	
MLE Median	503.2126	

OABG Area Surface Soil  
 HMX

MLE 80% Quantile	2785.904	
MLE 90% Quantile	6791.495	
MLE 95% Quantile	14079.95	
MLE 99% Quantile	55920.44	
MVU Estimate of Median	434.0089	
MVU Estimate of Mean	2796.686	
MVU Estimate of Standard Deviation	8290.492	
MVU Estimate of SE of Mean	1708.104	
95% H-UCL	56308.7	
95% Chebyshev (MVUE) UCL	10242.14	
97.5% Chebyshev (MVUE) UCL	13463.79	
99% Chebyshev (MVUE) UCL	19792.11	
Non-parametric Statistics		
95% CLT UCL	100374.9	
95% Adjusted-CLT UCL	140802.5	
95% Modified-t UCL	111451.1	
95% Jackknife UCL	105145.2	
95% Chebyshev (Mean, Sd) UCL	203061.6	
97.5% Chebyshev (Mean, Sd) UCL	274422.7	
99% Chebyshev (Mean, Sd) UCL	414597.7	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	99289.83	
95% Bootstrap-t UCL	1.02E+08	
95% Hall's Bootstrap UCL	87318178	
95% Percentile Bootstrap UCL	113811.8	
95% BCA Bootstrap UCL	151645.7	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	414597.7	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

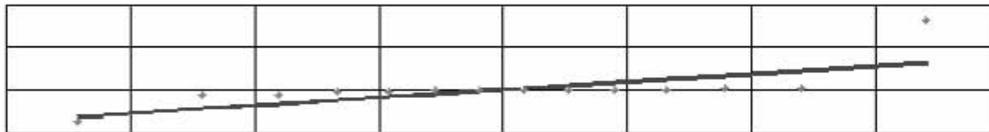
OABG Area Surface Soil  
RDX

Normal Q-Q Plot for RDX



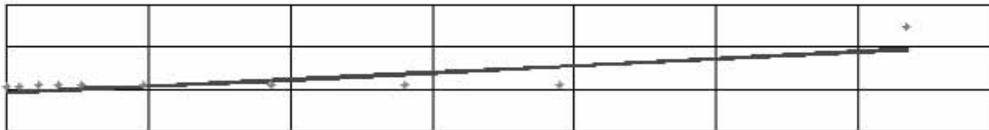
N = 14, Mean = 785.1429, Sd = 1876.1701  
Slope = 0.5656, Intercept = 0.0000, Correlation, R = 0.53886529  
Shapiro-Wilk Statistic = 0.323, Critical Value(0.05) = 0.874, Data not Normal

Lognormal Q-Q Plot for RDX



N = 14, Mean = 5.8382, Sd = 0.9492  
Slope = 0.7448, Intercept = 0.0000, Correlation, R = 0.70964191  
Shapiro-Wilk Statistic = 0.552, Critical Value(0.05) = 0.874, Data not Lognormal

Gamma Q-Q Plot for RDX



N = 14, Mean = 785.143, k hat = 0.7265  
Slope = 1.637, Intercept = -446.849, Correlation, R = 0.786  
A-D Test Statistic = 3.857, Critical Value(0.05) = 0.773, Data not Gamma Distributed

Gamma Q-Q Plot for RDX



N = 14, Mean = 785.143, k hat = 0.726  
Slope = 1.637, Intercept = -446.849, Correlation, R = 0.786  
K-S Test Statistic = 0.517, Critical Value(0.05) = 0.238, Data not Gamma Distributed

OABG Area Surface Soil  
RDX

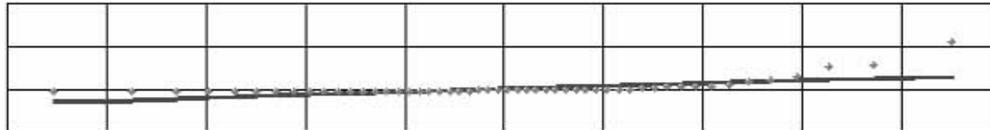
Data File		
Variable:	RDX	
Raw Statistics		
Number of Observations	14	
Number of Missing Data	0	
Number of Valid Observations	14	
Number of Distinct Observations	10	
Minimum	82	
Maximum	7300	
Mean	785.1429	
Standard Deviation	1876.17	
Variance	3520014	
Coefficient of Variation	2.389591	
Skewness	3.734118	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.322937	
Shapiro-Wilk 5% Critical Value	0.874	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1673.138	
Gamma Statistics		
k hat	0.726464	
k star (bias corrected)	0.618412	
Theta hat	1080.773	
Theta star	1269.611	
nu hat	20.34099	
nu star	17.31554	
5% Approximate Chi Square Value	8.896758	
Adjusted Level of Significance	0.03122	
Adjusted Chi Square Value	8.106644	
Anderson-Darling Test Statistic	3.857234	
Anderson-Darling 5% Critical Value	0.772752	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.51671	
Kolmogrov-Smirnov 5% Critical Value	0.23797	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1528.104	
95% Adjusted Gamma UCL	1677.041	
Lognormal Statistics		
Minimum of log data	4.406719	
Maximum of log data	8.89563	
Mean of log data	5.838233	
Standard Deviation of log data	0.949167	
Variance of log data	0.900919	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.552156	
Shapiro-Wilk 5% Critical Value	0.874	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	538.4486	
MLE Standard Deviation	651.025	
MLE Coefficient of Variation	1.209076	
MLE Skewness	5.39473	
MLE Median	343.1723	

OABG Area Surface Soil  
RDX

MLE 80% Quantile	765.3085	
MLE 90% Quantile	1162.017	
MLE 95% Quantile	1635.351	
MLE 99% Quantile	3121.272	
MVU Estimate of Median	332.2832	
MVU Estimate of Mean	515.7171	
MVU Estimate of Standard Deviation	542.4831	
MVU Estimate of SE of Mean	141.2824	
95% H-UCL	1101.073	
95% Chebyshev (MVUE) UCL	1131.553	
97.5% Chebyshev (MVUE) UCL	1398.026	
99% Chebyshev (MVUE) UCL	1921.46	
Non-parametric Statistics		
95% CLT UCL	1609.918	
95% Adjusted-CLT UCL	2144.621	
95% Modified-t UCL	1756.54	
95% Jackknife UCL	1673.138	
95% Chebyshev (Mean, Sd) UCL	2970.815	
97.5% Chebyshev (Mean, Sd) UCL	3916.557	
99% Chebyshev (Mean, Sd) UCL	5774.284	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1585.154	
95% Bootstrap-t UCL	37504.98	
95% Hall's Bootstrap UCL	20588.79	
95% Percentile Bootstrap UCL	1787.643	
95% BCA Bootstrap UCL	2288.714	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	2970.815	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

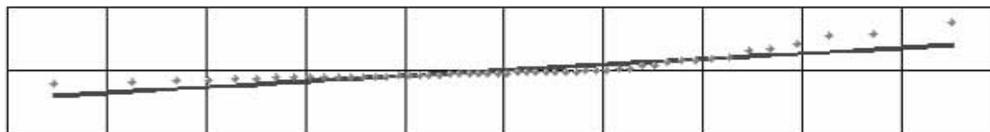
OABG Area Surface Soil  
Aluminum

Normal Q-Q Plot for Aluminum



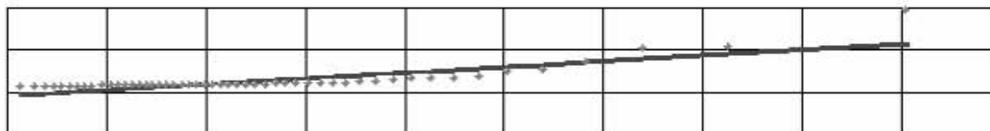
N = 52, Mean = 12879.8077, Sd = 15535.9249  
Slope = 0.6884, Intercept = 0.0000, Correlation, R = 0.67607469  
Lilliefors Statistic = 0.326, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Aluminum



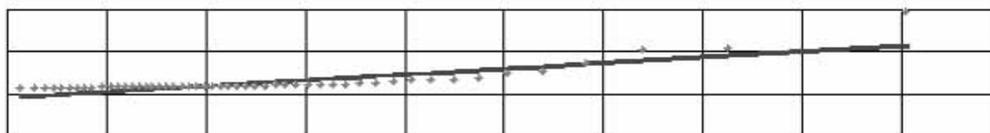
N = 52, Mean = 9.1741, Sd = 0.6283  
Slope = 0.8880, Intercept = 0.0000, Correlation, R = 0.87206299  
Lilliefors Statistic = 0.251, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Aluminum



N = 52, Mean = 12879.808, k hat = 1.8775  
Slope = 1.388, Intercept = -4920.972, Correlation, R = 0.848  
A-D Test Statistic = 6.405, Critical Value(0.05) = 0.764, Data not Gamma Distributed

Gamma Q-Q Plot for Aluminum



N = 52, Mean = 12879.808, k hat = 1.878  
Slope = 1.388, Intercept = -4920.972, Correlation, R = 0.848  
K-S Test Statistic = 0.287, Critical Value(0.05) = 0.125, Data not Gamma Distributed

OABG Area Surface Soil  
Aluminum

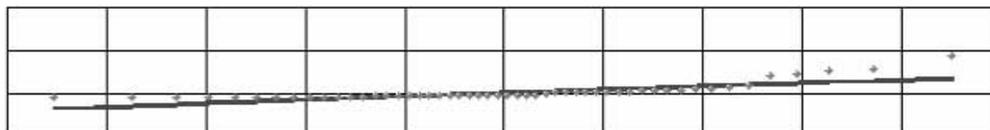
Data File		
Variable:	Aluminum	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	51	
Minimum	4730	
Maximum	96900	
Mean	12879.81	
Standard Deviation	15535.92	
Variance	2.41E+08	
Coefficient of Variation	1.206223	
Skewness	3.94714	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.325799	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	16489.12	
Gamma Statistics		
k hat	1.877503	
k star (bias corrected)	1.782006	
Theta hat	6860.074	
Theta star	7227.703	
nu hat	195.2603	
nu star	185.3286	
5% Approximate Chi Square Value	154.8321	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	154.0396	
Anderson-Darling Test Statistic	6.404925	
Anderson-Darling 5% Critical Value	0.76404	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.287412	
Kolmogrov-Smirnov 5% Critical Value	0.124888	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	15416.68	
95% Adjusted Gamma UCL	15496	
Lognormal Statistics		
Minimum of log data	8.46168	
Maximum of log data	11.48143	
Mean of log data	9.174063	
Standard Deviation of log data	0.628263	
Variance of log data	0.394714	
Lilliefors Test Statistic	0.250954	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	11747.79	
MLE Standard Deviation	8172.609	
MLE Coefficient of Variation	0.695672	
MLE Skewness	2.423694	
MLE Median	9643.728	

OABG Area Surface Soil  
Aluminum

MLE 80% Quantile	16398.5	
MLE 90% Quantile	21620.14	
MLE 95% Quantile	27107.22	
MLE 99% Quantile	41581.15	
MVU Estimate of Median	9607.194	
MVU Estimate of Mean	11695.09	
MVU Estimate of Standard Deviation	7997.466	
MVU Estimate of SE of Mean	1098.334	
95% H-UCL	13965.51	
95% Chebyshev (MVUE) UCL	16482.62	
97.5% Chebyshev (MVUE) UCL	18554.18	
99% Chebyshev (MVUE) UCL	22623.37	
Non-parametric Statistics		
95% CLT UCL	16423.55	
95% Adjusted-CLT UCL	17683.63	
95% Modified-t UCL	16685.66	
95% Jackknife UCL	16489.12	
95% Chebyshev (Mean, Sd) UCL	22270.82	
97.5% Chebyshev (Mean, Sd) UCL	26334.31	
99% Chebyshev (Mean, Sd) UCL	34316.27	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	16372.87	
95% Bootstrap-t UCL	19695.18	
95% Hall's Bootstrap UCL	18633.21	
95% Percentile Bootstrap UCL	16465.58	
95% BCA Bootstrap UCL	18260.77	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	22270.82	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

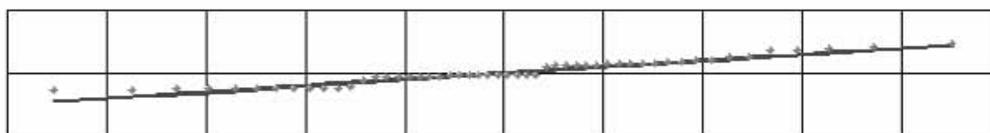
OABG Area Surface Soil  
Antimony

Normal Q-Q Plot for Antimony



N = 52, Mean = 3.4692, Sd = 5.0154  
Slope = 0.8018, Intercept = 0.0000, Correlation, R = 0.78741161  
Lilliefors Statistic = 0.264, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Antimony



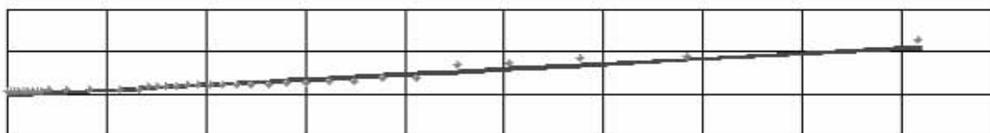
N = 52, Mean = 0.5109, Sd = 1.2062  
Slope = 0.9871, Intercept = 0.0000, Correlation, R = 0.96935189  
Lilliefors Statistic = 0.171, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Antimony



N = 52, Mean = 3.469, k hat = 0.8085  
Slope = 1.269, Intercept = -0.897, Correlation, R = 0.967  
A-D Test Statistic = 2.111, Critical Value(0.05) = 0.790, Data not Gamma Distributed

Gamma Q-Q Plot for Antimony



N = 52, Mean = 3.469, k hat = 0.809  
Slope = 1.269, Intercept = -0.897, Correlation, R = 0.967  
K-S Test Statistic = 0.229, Critical Value(0.05) = 0.128, Data not Gamma Distributed

OABG Area Surface Soil  
Antimony

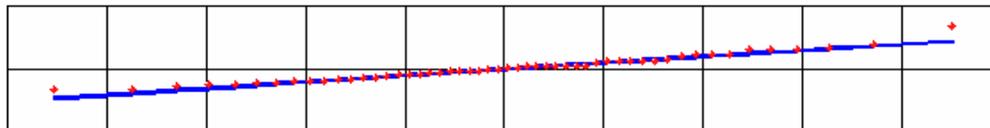
Data File	Antimony	
Variable:	Antimony	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	37	
Minimum	0.3	
Maximum	25.1	
Mean	3.469231	
Standard Deviation	5.015351	
Variance	25.15375	
Coefficient of Variation	1.445667	
Skewness	2.674614	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.263724	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	4.634398	
Gamma Statistics		
k hat	0.808529	
k star (bias corrected)	0.774704	
Theta hat	4.290792	
Theta star	4.478138	
nu hat	84.08704	
nu star	80.5692	
5% Approximate Chi Square Value	60.88284	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	60.39505	
Anderson-Darling Test Statistic	2.111426	
Anderson-Darling 5% Critical Value	0.789979	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.228759	
Kolmogrov-Smirnov 5% Critical Value	0.127824	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	4.591	
95% Adjusted Gamma UCL	4.62808	
Lognormal Statistics		
Minimum of log data	-1.203973	
Maximum of log data	3.222868	
Mean of log data	0.510916	
Standard Deviation of log data	1.206173	
Variance of log data	1.454854	
Lilliefors Test Statistic	0.171209	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	3.449892	
MLE Standard Deviation	6.251692	
MLE Coefficient of Variation	1.812141	
MLE Skewness	11.38724	
MLE Median	1.666817	

OABG Area Surface Soil  
Antimony

MLE 80% Quantile	4.618788	
MLE 90% Quantile	7.85263	
MLE 95% Quantile	12.12259	
MLE 99% Quantile	27.56301	
MVU Estimate of Median	1.643656	
MVU Estimate of Mean	3.370522	
MVU Estimate of Standard Deviation	5.587661	
MVU Estimate of SE of Mean	0.699561	
95% H-UCL	5.285132	
95% Chebyshev (MVUE) UCL	6.419839	
97.5% Chebyshev (MVUE) UCL	7.739282	
99% Chebyshev (MVUE) UCL	10.33107	
Non-parametric Statistics		
95% CLT UCL	4.613233	
95% Adjusted-CLT UCL	4.888871	
95% Modified-t UCL	4.677392	
95% Jackknife UCL	4.634398	
95% Chebyshev (Mean, Sd) UCL	6.500863	
97.5% Chebyshev (Mean, Sd) UCL	7.812652	
99% Chebyshev (Mean, Sd) UCL	10.38941	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4.591423	
95% Bootstrap-t UCL	5.146652	
95% Hall's Bootstrap UCL	4.989805	
95% Percentile Bootstrap UCL	4.690192	
95% BCA Bootstrap UCL	4.954615	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	7.812652	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface Soil  
Arsenic

Normal Q-Q Plot for Arsenic



N = 52, Mean = 12.2731, Sd = 3.8688  
Slope = 0.9990, Intercept = 0.0000, Correlation, R = 0.98107872  
Lilliefors Statistic = 0.088, Critical Value(0.05) = 0.123, Data are Normal

Data File

Variable: Arsenic

Raw Statistics

Number of Observations	52
Number of Missing Data	0
Number of Valid Observations	52
Number of Distinct Observations	46
Minimum	5.8
Maximum	24.9
Mean	12.27308
Standard Deviation	3.868785
Variance	14.9675
Coefficient of Variation	0.315225
Skewness	0.696603
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.088451
Lilliefors 5% Critical Value	0.122866
Shapiro-Wilk Test Statistic	N/A
Shapiro-Wilk 5% Critical Value	N/A
5% Normality Test Result	NORMAL
95% Student's-t UCL	13.17187

Data are normal at 5% significance level

Gamma Statistics

k hat	10.42762
k star (bias corrected)	9.838845
Theta hat	1.176978
Theta star	1.24741
nu hat	1084.472
nu star	1023.24
5% Approximate Chi Square Value	949.9688
Adjusted Level of Significance	0.045385
Adjusted Chi Square Value	947.9678
Anderson-Darling Test Statistic	0.192958
Anderson-Darling 5% Critical Value	0.749825
Anderson-Darling 5% Gamma Test Result	AD GAMMA
Kolmogrov-Smirnov Test Statistic	0.058364
Kolmogrov-Smirnov 5% Critical Value	0.123094
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA
5% Gamma Test Result	GAMMA
95% Approximate Gamma UCL	13.2197
95% Adjusted Gamma UCL	13.2476
Lognormal Statistics	
Minimum of log data	1.757858

Data follow gamma distribution at 5% significance level.

Data follow gamma distribution at 5% significance level

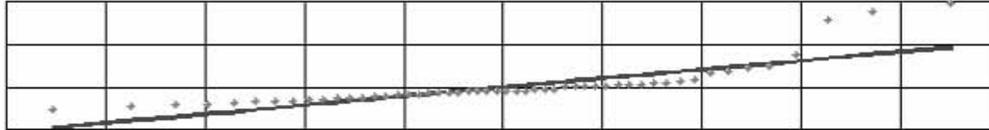
Data follow gamma distribution at 5% significance level

OABG Area Surface Soil  
Arsenic

Maximum of log data	3.214868	
Mean of log data	2.458693	
Standard Deviation of log data	0.318365	
Variance of log data	0.101356	
Lilliefors Test Statistic	0.078122	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	12.29719	
MLE Standard Deviation	4.016324	
MLE Coefficient of Variation	0.326605	
MLE Skewness	1.014654	
MLE Median	11.68952	
MLE 80% Quantile	15.29783	
MLE 90% Quantile	17.59811	
MLE 95% Quantile	19.73519	
MLE 99% Quantile	24.51315	
MVU Estimate of Median	11.67813	
MVU Estimate of Mean	12.28464	
MVU Estimate of Standard Deviation	3.996482	
MVU Estimate of SE of Mean	0.553826	
95% H-UCL	13.3062	
95% Chebyshev (MVUE) UCL	14.69871	
97.5% Chebyshev (MVUE) UCL	15.74328	
99% Chebyshev (MVUE) UCL	17.79514	
Non-parametric Statistics		
95% CLT UCL	13.15555	
95% Adjusted-CLT UCL	13.21093	
95% Modified-t UCL	13.18051	
95% Jackknife UCL	13.17187	
95% Chebyshev (Mean, Sd) UCL	14.61164	
97.5% Chebyshev (Mean, Sd) UCL	15.62354	
99% Chebyshev (Mean, Sd) UCL	17.61122	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	13.14064	
95% Bootstrap-t UCL	13.21996	
95% Hall's Bootstrap UCL	13.29054	
95% Percentile Bootstrap UCL	13.13269	
95% BCA Bootstrap UCL	13.17308	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	13.17187	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface Soil  
Barium

Normal Q-Q Plot for Barium



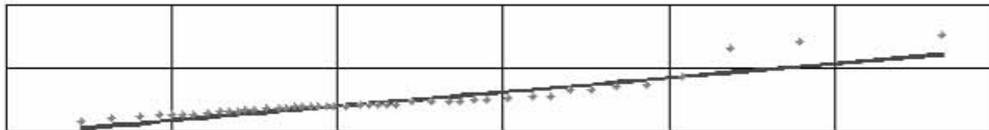
N = 52, Mean = 224.6750, Sd = 137.0260  
Slope = 0.8477, Intercept = 0.0000, Correlation, R = 0.83246857  
Lilliefors Statistic = 0.240, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Barium



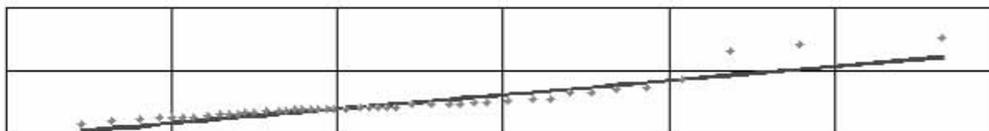
N = 52, Mean = 5.2929, Sd = 0.4648  
Slope = 0.9831, Intercept = 0.0000, Correlation, R = 0.96542438  
Lilliefors Statistic = 0.129, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Barium



N = 52, Mean = 224.675, k hat = 4.2648  
Slope = 1.128, Intercept = -28.379, Correlation, R = 0.913  
A-D Test Statistic = 2.001, Critical Value(0.05) = 0.754, Data not Gamma Distributed

Gamma Q-Q Plot for Barium



N = 52, Mean = 224.675, k hat = 4.265  
Slope = 1.128, Intercept = -28.379, Correlation, R = 0.913  
K-S Test Statistic = 0.169, Critical Value(0.05) = 0.124, Data not Gamma Distributed

OABG Area Surface Soil  
Barium

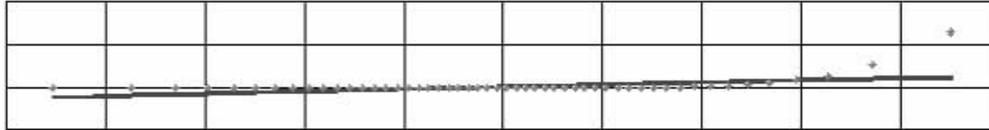
Data File	Barium	
Variable:	Barium	
<b>Raw Statistics</b>		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	45	
Minimum	72.3	
Maximum	758	
Mean	224.675	
Standard Deviation	137.026	
Variance	18776.11	
Coefficient of Variation	0.609885	
Skewness	2.575101	
Too Few Distinct Observations?	NO	
<b>Normal Statistics</b>		
Lilliefors Test Statistic	0.24011	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	256.5089	
<b>Gamma Statistics</b>		
k hat	4.264823	
k star (bias corrected)	4.031596	
Theta hat	52.68097	
Theta star	55.72855	
nu hat	443.5416	
nu star	419.286	
5% Approximate Chi Square Value	372.8084	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	371.5645	
Anderson-Darling Test Statistic	2.001478	
Anderson-Darling 5% Critical Value	0.753547	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.168549	
Kolmogrov-Smirnov 5% Critical Value	0.123566	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	252.685	
95% Adjusted Gamma UCL	253.5308	
<b>Lognormal Statistics</b>		
Minimum of log data	4.280824	
Maximum of log data	6.630683	
Mean of log data	5.29286	
Standard Deviation of log data	0.464795	
Variance of log data	0.216035	
Lilliefors Test Statistic	0.129138	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	221.6007	
MLE Standard Deviation	108.8205	
MLE Coefficient of Variation	0.491066	
MLE Skewness	1.591615	
MLE Median	198.9114	

OABG Area Surface Soil  
Barium

MLE 80% Quantile	294.598	
MLE 90% Quantile	361.4492	
MLE 95% Quantile	427.2836	
MLE 99% Quantile	586.3832	
MVU Estimate of Median	198.4987	
MVU Estimate of Mean	221.0943	
MVU Estimate of Standard Deviation	107.6233	
MVU Estimate of SE of Mean	14.87904	
95% H-UCL	249.9756	
95% Chebyshev (MVUE) UCL	285.9505	
97.5% Chebyshev (MVUE) UCL	314.0139	
99% Chebyshev (MVUE) UCL	369.1389	
Non-parametric Statistics		
95% CLT UCL	255.9306	
95% Adjusted-CLT UCL	263.1812	
95% Modified-t UCL	257.6398	
95% Jackknife UCL	256.5089	
95% Chebyshev (Mean, Sd) UCL	307.5032	
97.5% Chebyshev (Mean, Sd) UCL	343.343	
99% Chebyshev (Mean, Sd) UCL	413.7433	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	255.8705	
95% Bootstrap-t UCL	268.0771	
95% Hall's Bootstrap UCL	267.6795	
95% Percentile Bootstrap UCL	257.5769	
95% BCA Bootstrap UCL	264.8154	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	256.5089	95% Student's-t UCL
2nd Recommended UCL	257.6398	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

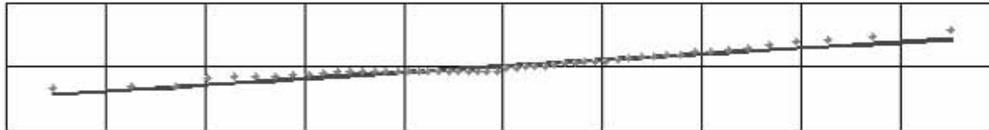
OABG Area Surface Soil  
Cadmium

Normal Q-Q Plot for Cadmium



N = 52, Mean = 15.6815, Sd = 56.5319  
Slope = 0.5368, Intercept = 0.0000, Correlation, R = 0.52712675  
Lilliefors Statistic = 0.404, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Cadmium



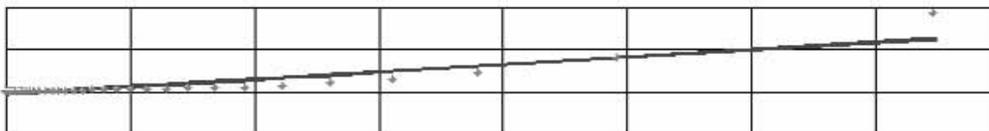
N = 52, Mean = 0.1316, Sd = 2.1108  
Slope = 0.9838, Intercept = 0.0000, Correlation, R = 0.96608372  
Lilliefors Statistic = 0.182, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Cadmium



N = 52, Mean = 15.682, k hat = 0.2680  
Slope = 1.797, Intercept = -11.881, Correlation, R = 0.899  
A-D Test Statistic = 5.800, Critical Value(0.05) = 0.877, Data not Gamma Distributed

Gamma Q-Q Plot for Cadmium



N = 52, Mean = 15.682, k hat = 0.268  
Slope = 1.797, Intercept = -11.881, Correlation, R = 0.899  
K-S Test Statistic = 0.261, Critical Value(0.05) = 0.135, Data not Gamma Distributed

OABG Area Surface Soil  
Cadmium

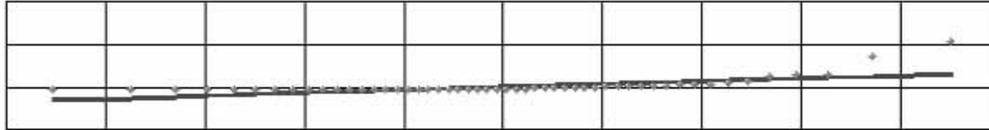
Data File		
Variable:	Cadmium	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	47	
Minimum	0.022	
Maximum	373	
Mean	15.68154	
Standard Deviation	56.53192	
Variance	3195.858	
Coefficient of Variation	3.604998	
Skewness	5.478989	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.403532	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	28.81504	
Gamma Statistics		
k hat	0.267983	
k star (bias corrected)	0.265343	
Theta hat	58.51696	
Theta star	59.09918	
nu hat	27.87021	
nu star	27.59565	
5% Approximate Chi Square Value	16.61169	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	16.3679	
Anderson-Darling Test Statistic	5.800136	
Anderson-Darling 5% Critical Value	0.877087	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.260881	
Kolmogrov-Smirnov 5% Critical Value	0.134647	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	26.05046	
95% Adjusted Gamma UCL	26.43846	
Lognormal Statistics		
Minimum of log data	-3.816713	
Maximum of log data	5.921578	
Mean of log data	0.131599	
Standard Deviation of log data	2.110815	
Variance of log data	4.455541	
Lilliefors Test Statistic	0.182009	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	10.58428	
MLE Standard Deviation	97.64117	
MLE Coefficient of Variation	9.225113	
MLE Skewness	812.7574	
MLE Median	1.140651	

OABG Area Surface Soil  
Cadmium

MLE 80% Quantile	6.788556	
MLE 90% Quantile	17.18431	
MLE 95% Quantile	36.74089	
MLE 99% Quantile	154.6795	
MVU Estimate of Median	1.092778	
MVU Estimate of Mean	9.344723	
MVU Estimate of Standard Deviation	52.79308	
MVU Estimate of SE of Mean	4.084854	
95% H-UCL	31.36664	
95% Chebyshev (MVUE) UCL	27.15019	
97.5% Chebyshev (MVUE) UCL	34.85463	
99% Chebyshev (MVUE) UCL	49.98851	
Non-parametric Statistics		
95% CLT UCL	28.57648	
95% Adjusted-CLT UCL	34.94108	
95% Modified-t UCL	29.80779	
95% Jackknife UCL	28.81504	
95% Chebyshev (Mean, Sd) UCL	49.85342	
97.5% Chebyshev (Mean, Sd) UCL	64.63962	
99% Chebyshev (Mean, Sd) UCL	93.68425	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	28.34895	
95% Bootstrap-t UCL	61.48978	
95% Hall's Bootstrap UCL	71.4464	
95% Percentile Bootstrap UCL	28.96514	
95% BCA Bootstrap UCL	36.16031	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	93.68425	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

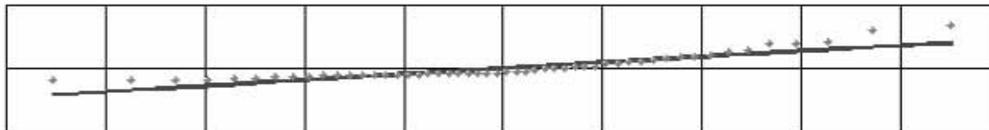
OABG Area Surface Soil  
Chromium

Normal Q-Q Plot for Chromium



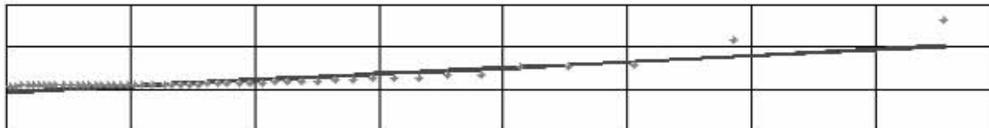
N = 52, Mean = 35.5500, Sd = 53.7486  
Slope = 0.6897, Intercept = 0.0000, Correlation, R = 0.67732066  
Lilliefors Statistic = 0.314, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Chromium



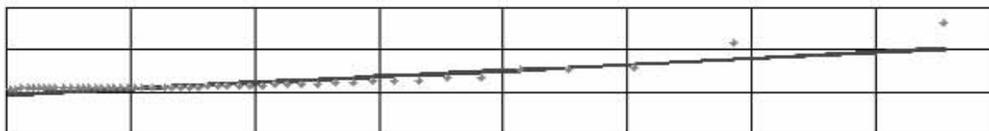
N = 52, Mean = 3.1210, Sd = 0.7920  
Slope = 0.9243, Intercept = 0.0000, Correlation, R = 0.90772108  
Lilliefors Statistic = 0.197, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Chromium



N = 52, Mean = 35.550, k hat = 1.2517  
Slope = 1.480, Intercept = -16.773, Correlation, R = 0.877  
A-D Test Statistic = 5.225, Critical Value(0.05) = 0.774, Data not Gamma Distributed

Gamma Q-Q Plot for Chromium



N = 52, Mean = 35.550, k hat = 1.252  
Slope = 1.480, Intercept = -16.773, Correlation, R = 0.877  
K-S Test Statistic = 0.240, Critical Value(0.05) = 0.126, Data not Gamma Distributed

OABG Area Surface Soil  
Chromium

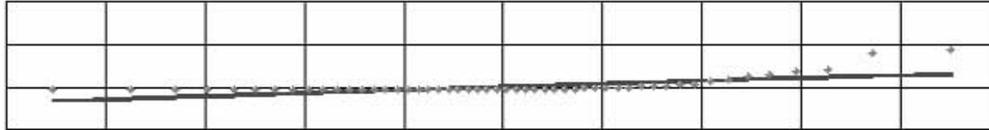
Data File	Chromium	
Variable:	Chromium	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	50	
Minimum	9.5	
Maximum	319	
Mean	35.55	
Standard Deviation	53.74857	
Variance	2888.908	
Coefficient of Variation	1.511915	
Skewness	3.96033	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.313957	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	48.03688	
Gamma Statistics		
k hat	1.251652	
k star (bias corrected)	1.192262	
Theta hat	28.40245	
Theta star	29.81727	
nu hat	130.1719	
nu star	123.9953	
5% Approximate Chi Square Value	99.27355	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	98.64392	
Anderson-Darling Test Statistic	5.224871	
Anderson-Darling 5% Critical Value	0.77364	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.239863	
Kolmogrov-Smirnov 5% Critical Value	0.126046	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	44.40288	
95% Adjusted Gamma UCL	44.6863	
Lognormal Statistics		
Minimum of log data	2.251292	
Maximum of log data	5.765191	
Mean of log data	3.120999	
Standard Deviation of log data	0.792029	
Variance of log data	0.62731	
Lilliefors Test Statistic	0.196752	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	31.02067	
MLE Standard Deviation	28.9768	
MLE Coefficient of Variation	0.934113	
MLE Skewness	3.617414	
MLE Median	22.66901	

OABG Area Surface Soil  
Chromium

MLE 80% Quantile	44.26805	
MLE 90% Quantile	62.72475	
MLE 95% Quantile	83.41987	
MLE 99% Quantile	143.0592	
MVU Estimate of Median	22.53267	
MVU Estimate of Mean	30.77992	
MVU Estimate of Standard Deviation	27.91135	
MVU Estimate of SE of Mean	3.782458	
95% H-UCL	39.16658	
95% Chebyshev (MVUE) UCL	47.26727	
97.5% Chebyshev (MVUE) UCL	54.40136	
99% Chebyshev (MVUE) UCL	68.4149	
Non-parametric Statistics		
95% CLT UCL	47.81006	
95% Adjusted-CLT UCL	52.18402	
95% Modified-t UCL	48.71913	
95% Jackknife UCL	48.03688	
95% Chebyshev (Mean, Sd) UCL	68.03942	
97.5% Chebyshev (Mean, Sd) UCL	82.09762	
99% Chebyshev (Mean, Sd) UCL	109.7122	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	47.13669	
95% Bootstrap-t UCL	60.10364	
95% Hall's Bootstrap UCL	100.8021	
95% Percentile Bootstrap UCL	48.70577	
95% BCA Bootstrap UCL	53.26731	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	68.03942	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface Soil  
Copper

Normal Q-Q Plot for Copper



N = 52, Mean = 237.8000, Sd = 445.0811  
Slope = 0.7295, Intercept = 0.0000, Correlation, R = 0.71640292  
Lilliefors Statistic = 0.310, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Copper



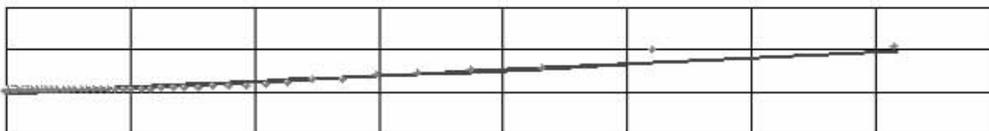
N = 52, Mean = 4.5013, Sd = 1.2386  
Slope = 0.9340, Intercept = 0.0000, Correlation, R = 0.91725773  
Lilliefors Statistic = 0.245, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Copper



N = 52, Mean = 237.800, k hat = 0.6321  
Slope = 1.442, Intercept = -101.487, Correlation, R = 0.950  
A-D Test Statistic = 5.616, Critical Value(0.05) = 0.803, Data not Gamma Distributed

Gamma Q-Q Plot for Copper



N = 52, Mean = 237.800, k hat = 0.632  
Slope = 1.442, Intercept = -101.487, Correlation, R = 0.950  
K-S Test Statistic = 0.287, Critical Value(0.05) = 0.129, Data not Gamma Distributed

OABG Area Surface Soil  
Copper

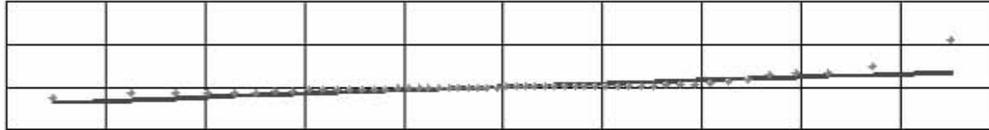
Data File		
Variable:	Copper	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	48	
Minimum	17.3	
Maximum	2150	
Mean	237.8	
Standard Deviation	445.0811	
Variance	198097.1	
Coefficient of Variation	1.871661	
Skewness	3.090982	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.310153	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	341.2013	
Gamma Statistics		
k hat	0.632079	
k star (bias corrected)	0.608433	
Theta hat	376.2189	
Theta star	390.8399	
nu hat	65.73619	
nu star	63.27705	
5% Approximate Chi Square Value	45.97452	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	45.55378	
Anderson-Darling Test Statistic	5.61584	
Anderson-Darling 5% Critical Value	0.803243	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.287409	
Kolmogrov-Smirnov 5% Critical Value	0.129115	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	327.2962	
95% Adjusted Gamma UCL	330.3191	
Lognormal Statistics		
Minimum of log data	2.850707	
Maximum of log data	7.673223	
Mean of log data	4.501319	
Standard Deviation of log data	1.238617	
Variance of log data	1.534173	
Lilliefors Test Statistic	0.245163	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	194.1062	
MLE Standard Deviation	370.2033	
MLE Coefficient of Variation	1.90722	
MLE Skewness	12.65915	
MLE Median	90.13593	

OABG Area Surface Soil  
Copper

MLE 80% Quantile	256.7109	
MLE 90% Quantile	442.7221	
MLE 95% Quantile	691.4871	
MLE 99% Quantile	1607.351	
MVU Estimate of Median	88.81567	
MVU Estimate of Mean	189.3024	
MVU Estimate of Standard Deviation	328.014	
MVU Estimate of SE of Mean	40.67462	
95% H-UCL	302.7395	
95% Chebyshev (MVUE) UCL	366.5989	
97.5% Chebyshev (MVUE) UCL	443.3153	
99% Chebyshev (MVUE) UCL	594.0098	
Non-parametric Statistics		
95% CLT UCL	339.3231	
95% Adjusted-CLT UCL	367.5922	
95% Modified-t UCL	345.6107	
95% Jackknife UCL	341.2013	
95% Chebyshev (Mean, Sd) UCL	506.8384	
97.5% Chebyshev (Mean, Sd) UCL	623.2515	
99% Chebyshev (Mean, Sd) UCL	851.9225	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	338.1715	
95% Bootstrap-t UCL	399.7397	
95% Hall's Bootstrap UCL	393.9722	
95% Percentile Bootstrap UCL	345.7885	
95% BCA Bootstrap UCL	377.6038	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	623.2515	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface Soil  
Iron

Normal Q-Q Plot for Iron



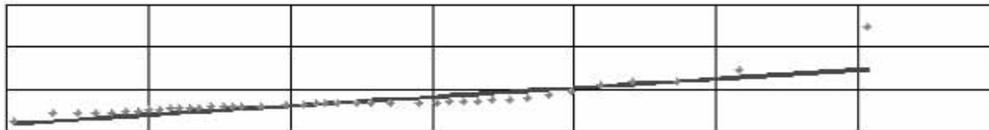
N = 52, Mean = 33271.1538, Sd = 16188.7923  
Slope = 0.7949, Intercept = 0.0000, Correlation, R = 0.78064159  
Lilliefors Statistic = 0.299, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Iron



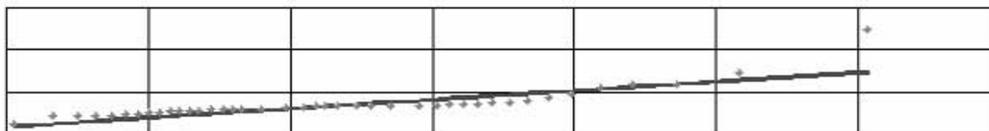
N = 52, Mean = 10.3396, Sd = 0.3583  
Slope = 0.9405, Intercept = 0.0000, Correlation, R = 0.92364845  
Lilliefors Statistic = 0.205, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Iron



N = 52, Mean = 33271.154, k hat = 7.0245  
Slope = 1.073, Intercept = -2393.487, Correlation, R = 0.851  
A-D Test Statistic = 3.119, Critical Value(0.05) = 0.752, Data not Gamma Distributed

Gamma Q-Q Plot for Iron



N = 52, Mean = 33271.154, k hat = 7.024  
Slope = 1.073, Intercept = -2393.487, Correlation, R = 0.851  
K-S Test Statistic = 0.237, Critical Value(0.05) = 0.123, Data not Gamma Distributed

OABG Area Surface Soil  
Iron

Data File

Variable: Iron

Raw Statistics

Number of Observations	52
Number of Missing Data	0
Number of Valid Observations	52
Number of Distinct Observations	41
Minimum	10500
Maximum	122000
Mean	33271.15
Standard Deviation	16188.79
Variance	2.62E+08
Coefficient of Variation	0.486571
Skewness	3.66627
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.298733	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	37032.14	

Gamma Statistics

k hat	7.024481	
k star (bias corrected)	6.632043	
Theta hat	4736.457	
Theta star	5016.727	
nu hat	730.5461	
nu star	689.7325	
5% Approximate Chi Square Value	629.7862	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	628.1618	
Anderson-Darling Test Statistic	3.119221	
Anderson-Darling 5% Critical Value	0.752101	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.237289	
Kolmogrov-Smirnov 5% Critical Value	0.123317	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	36438.07	
95% Adjusted Gamma UCL	36532.3	

Lognormal Statistics

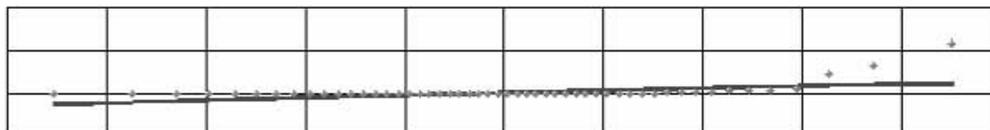
Minimum of log data	9.259131	
Maximum of log data	11.71178	
Mean of log data	10.33958	
Standard Deviation of log data	0.358333	
Variance of log data	0.128403	
Lilliefors Test Statistic	0.205348	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	32984.15	
MLE Standard Deviation	12209.08	
MLE Coefficient of Variation	0.37015	
MLE Skewness	1.161164	
MLE Median	30933.07	

OABG Area Surface Soil  
Iron

MLE 80% Quantile	41872	
MLE 90% Quantile	49022.73	
MLE 95% Quantile	55772.68	
MLE 99% Quantile	71186.93	
MVU Estimate of Median	30894.9	
MVU Estimate of Mean	32940.99	
MVU Estimate of Standard Deviation	12131.86	
MVU Estimate of SE of Mean	1680.519	
95% H-UCL	36082.37	
95% Chebyshev (MVUE) UCL	40266.21	
97.5% Chebyshev (MVUE) UCL	43435.83	
99% Chebyshev (MVUE) UCL	49661.95	
Non-parametric Statistics		
95% CLT UCL	36963.82	
95% Adjusted-CLT UCL	38183.42	
95% Modified-t UCL	37222.37	
95% Jackknife UCL	37032.14	
95% Chebyshev (Mean, Sd) UCL	43056.8	
97.5% Chebyshev (Mean, Sd) UCL	47291.06	
99% Chebyshev (Mean, Sd) UCL	55608.44	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	36952.99	
95% Bootstrap-t UCL	39317.55	
95% Hall's Bootstrap UCL	53180.98	
95% Percentile Bootstrap UCL	37198.08	
95% BCA Bootstrap UCL	38732.69	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	37032.14	95% Student's-t UCL
2nd Recommended UCL	37222.37	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

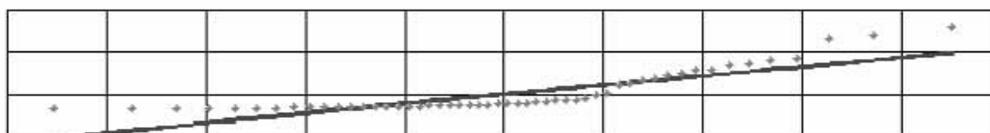
OABG Area Surface Soil  
Lead

Normal Q-Q Plot for Lead



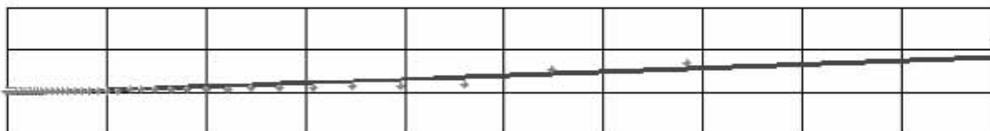
N = 52, Mean = 634.6788, Sd = 1985.2518  
Slope = 0.5696, Intercept = 0.0000, Correlation, R = 0.55939123  
Lilliefors Statistic = 0.382, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Lead



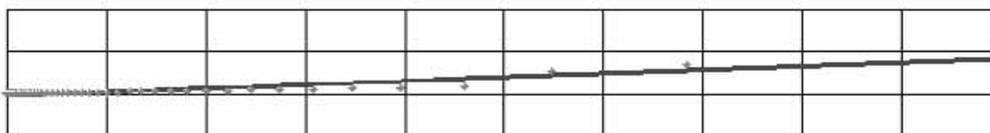
N = 52, Mean = 4.7413, Sd = 1.4768  
Slope = 0.8756, Intercept = 0.0000, Correlation, R = 0.85985136  
Lilliefors Statistic = 0.287, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Lead



N = 52, Mean = 634.679, k hat = 0.3865  
Slope = 1.806, Intercept = -493.836, Correlation, R = 0.890  
A-D Test Statistic = 8.536, Critical Value(0.05) = 0.842, Data not Gamma Distributed

Gamma Q-Q Plot for Lead



N = 52, Mean = 634.679, k hat = 0.387  
Slope = 1.806, Intercept = -493.836, Correlation, R = 0.890  
K-S Test Statistic = 0.336, Critical Value(0.05) = 0.132, Data not Gamma Distributed

OABG Area Surface Soil  
Lead

Data File

Variable: Lead

Raw Statistics

Number of Observations	52
Number of Missing Data	0
Number of Valid Observations	52
Number of Distinct Observations	51
Minimum	37.1
Maximum	12100
Mean	634.6788
Standard Deviation	1985.252
Variance	3941225
Coefficient of Variation	3.127963
Skewness	4.700615
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.381704	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1095.893	

Gamma Statistics

k hat	0.38653	
k star (bias corrected)	0.377051	
Theta hat	1641.992	
Theta star	1683.272	
nu hat	40.19911	
nu star	39.21326	
5% Approximate Chi Square Value	25.86645	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	25.55669	
Anderson-Darling Test Statistic	8.536026	
Anderson-Darling 5% Critical Value	0.841822	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.336475	
Kolmogrov-Smirnov 5% Critical Value	0.132204	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	962.1662	
95% Adjusted Gamma UCL	973.8284	

Lognormal Statistics

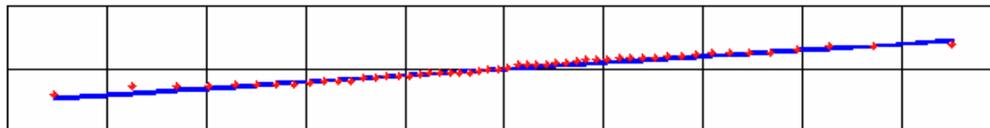
Minimum of log data	3.613617	
Maximum of log data	9.400961	
Mean of log data	4.741256	
Standard Deviation of log data	1.476805	
Variance of log data	2.180953	
Lilliefors Test Statistic	0.287387	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	340.9491	
MLE Standard Deviation	955.5547	
MLE Coefficient of Variation	2.802632	
MLE Skewness	30.42185	
MLE Median	114.5781	

OABG Area Surface Soil  
Lead

MLE 80% Quantile	399.0779	
MLE 90% Quantile	764.2928	
MLE 95% Quantile	1300.626	
MLE 99% Quantile	3555.693	
MVU Estimate of Median	112.1994	
MVU Estimate of Mean	327.087	
MVU Estimate of Standard Deviation	780.8999	
MVU Estimate of SE of Mean	88.71962	
95% H-UCL	614.2403	
95% Chebyshev (MVUE) UCL	713.8069	
97.5% Chebyshev (MVUE) UCL	881.1409	
99% Chebyshev (MVUE) UCL	1209.836	
Non-parametric Statistics		
95% CLT UCL	1087.515	
95% Adjusted-CLT UCL	1279.27	
95% Modified-t UCL	1125.803	
95% Jackknife UCL	1095.893	
95% Chebyshev (Mean, Sd) UCL	1834.705	
97.5% Chebyshev (Mean, Sd) UCL	2353.957	
99% Chebyshev (Mean, Sd) UCL	3373.928	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1104.746	
95% Bootstrap-t UCL	1738.608	
95% Hall's Bootstrap UCL	1324.946	
95% Percentile Bootstrap UCL	1142.54	
95% BCA Bootstrap UCL	1318.971	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	2353.957	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface Soil  
Manganese

Normal Q-Q Plot for Manganese



N = 52, Mean = 1297.1923, Sd = 539.6621  
Slope = 1.0062, Intercept = 0.0000, Correlation, R = 0.98817224  
Lilliefors Statistic = 0.085, Critical Value(0.05) = 0.123, Data are Normal

Data File

Variable: Manganese

Raw Statistics

Number of Observations	52
Number of Missing Data	0
Number of Valid Observations	52
Number of Distinct Observations	47
Minimum	147
Maximum	2320
Mean	1297.192
Standard Deviation	539.6621
Variance	291235.2
Coefficient of Variation	0.416023
Skewness	0.006101
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.084901
Lilliefors 5% Critical Value	0.122866
Shapiro-Wilk Test Statistic	N/A
Shapiro-Wilk 5% Critical Value	N/A
5% Normality Test Result	NORMAL
95% Student's-t UCL	1422.567

Data are normal at 5% significance level

Gamma Statistics

k hat	4.697584
k star (bias corrected)	4.43939
Theta hat	276.1403
Theta star	292.2006
nu hat	488.5487
nu star	461.6966
5% Approximate Chi Square Value	412.8663
Adjusted Level of Significance	0.045385
Adjusted Chi Square Value	411.556
Anderson-Darling Test Statistic	0.731878
Anderson-Darling 5% Critical Value	0.75358
Anderson-Darling 5% Gamma Test Result	AD GAMMA
Kolmogrov-Smirnov Test Statistic	0.122248
Kolmogrov-Smirnov 5% Critical Value	0.123504
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA
5% Gamma Test Result	GAMMA
95% Approximate Gamma UCL	1450.613
95% Adjusted Gamma UCL	1455.232
Lognormal Statistics	
Minimum of log data	4.990433

Data follow gamma distribution at 5% significance level.

Data follow gamma distribution at 5% significance level

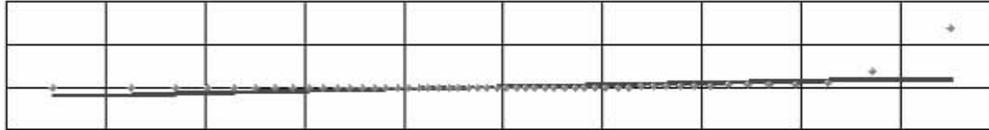
Data follow gamma distribution at 5% significance level

OABG Area Surface Soil  
Manganese

Maximum of log data	7.749322	
Mean of log data	7.05776	
Standard Deviation of log data	0.523011	
Variance of log data	0.273541	
Lilliefors Test Statistic	0.130396	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1332.125	
MLE Standard Deviation	747.1917	
MLE Coefficient of Variation	0.560902	
MLE Skewness	1.859172	
MLE Median	1161.84	
MLE 80% Quantile	1807.509	
MLE 90% Quantile	2275.215	
MLE 95% Quantile	2746.586	
MLE 99% Quantile	3921.717	
MVU Estimate of Median	1158.788	
MVU Estimate of Mean	1328.178	
MVU Estimate of Standard Deviation	736.5611	
MVU Estimate of SE of Mean	101.6509	
95% H-UCL	1529.875	
95% Chebyshev (MVUE) UCL	1771.264	
97.5% Chebyshev (MVUE) UCL	1962.987	
99% Chebyshev (MVUE) UCL	2339.591	
Non-parametric Statistics		
95% CLT UCL	1420.289	
95% Adjusted-CLT UCL	1420.357	
95% Modified-t UCL	1422.577	
95% Jackknife UCL	1422.567	
95% Chebyshev (Mean, Sd) UCL	1623.402	
97.5% Chebyshev (Mean, Sd) UCL	1764.553	
99% Chebyshev (Mean, Sd) UCL	2041.818	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1420.816	
95% Bootstrap-t UCL	1421.495	
95% Hall's Bootstrap UCL	1416.568	
95% Percentile Bootstrap UCL	1421.096	
95% BCA Bootstrap UCL	1416.058	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1422.567	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

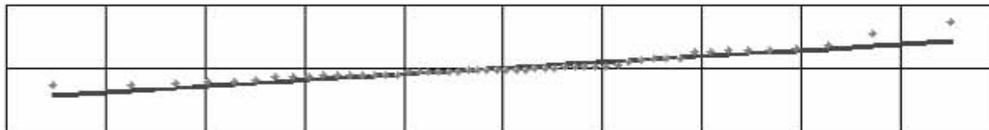
OABG Area Surface Soil  
Mercury

Normal Q-Q Plot for Mercury



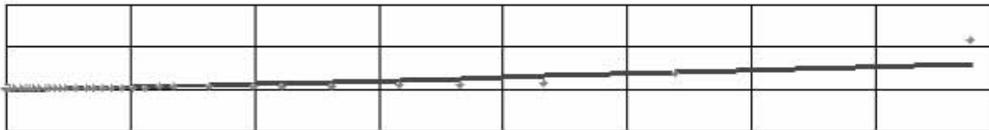
N = 52, Mean = 2.0554, Sd = 8.0445  
Slope = 0.4731, Intercept = 0.0000, Correlation, R = 0.46463915  
Lilliefors Statistic = 0.402, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Mercury



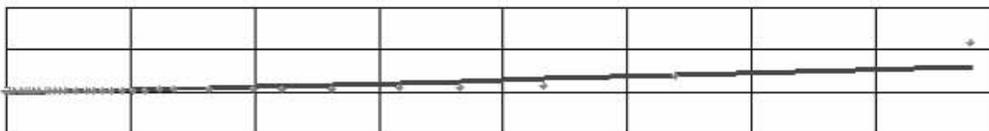
N = 52, Mean = -0.8662, Sd = 1.3632  
Slope = 0.9547, Intercept = 0.0000, Correlation, R = 0.93753040  
Lilliefors Statistic = 0.192, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Mercury



N = 52, Mean = 2.055, k hat = 0.4126  
Slope = 2.052, Intercept = -2.096, Correlation, R = 0.784  
A-D Test Statistic = 6.970, Critical Value(0.05) = 0.836, Data not Gamma Distributed

Gamma Q-Q Plot for Mercury



N = 52, Mean = 2.055, k hat = 0.413  
Slope = 2.052, Intercept = -2.096, Correlation, R = 0.784  
K-S Test Statistic = 0.313, Critical Value(0.05) = 0.132, Data not Gamma Distributed

OABG Area Surface Soil  
Mercury

Data File		
Variable:	Mercury	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	38	
Minimum	0.06	
Maximum	56.3	
Mean	2.055423	
Standard Deviation	8.044456	
Variance	64.71328	
Coefficient of Variation	3.913772	
Skewness	6.369477	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.402048	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	3.924313	
Gamma Statistics		
k hat	0.412645	
k star (bias corrected)	0.401659	
Theta hat	4.981092	
Theta star	5.117332	
nu hat	42.91509	
nu star	41.77255	
5% Approximate Chi Square Value	27.95526	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	27.63233	
Anderson-Darling Test Statistic	6.969927	
Anderson-Darling 5% Critical Value	0.83556	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.313022	
Kolmogrov-Smirnov 5% Critical Value	0.131741	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	3.071345	
95% Adjusted Gamma UCL	3.10724	
Lognormal Statistics		
Minimum of log data	-2.813411	
Maximum of log data	4.030695	
Mean of log data	-0.866238	
Standard Deviation of log data	1.363209	
Variance of log data	1.858337	
Lilliefors Test Statistic	0.192121	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.064953	
MLE Standard Deviation	2.477719	
MLE Coefficient of Variation	2.3266	
MLE Skewness	19.57384	
MLE Median	0.42053	

OABG Area Surface Soil  
Mercury

MLE 80% Quantile	1.330657	
MLE 90% Quantile	2.424159	
MLE 95% Quantile	3.959983	
MLE 99% Quantile	10.02002	
MVU Estimate of Median	0.41308	
MVU Estimate of Mean	1.030502	
MVU Estimate of Standard Deviation	2.11278	
MVU Estimate of SE of Mean	0.251226	
95% H-UCL	1.785843	
95% Chebyshev (MVUE) UCL	2.125571	
97.5% Chebyshev (MVUE) UCL	2.599408	
99% Chebyshev (MVUE) UCL	3.53017	
Non-parametric Statistics		
95% CLT UCL	3.890365	
95% Adjusted-CLT UCL	4.943242	
95% Modified-t UCL	4.08854	
95% Jackknife UCL	3.924313	
95% Chebyshev (Mean, Sd) UCL	6.91806	
97.5% Chebyshev (Mean, Sd) UCL	9.022127	
99% Chebyshev (Mean, Sd) UCL	13.15516	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	3.882028	
95% Bootstrap-t UCL	14.97864	
95% Hall's Bootstrap UCL	10.81134	
95% Percentile Bootstrap UCL	4.178135	
95% BCA Bootstrap UCL	5.971577	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	9.022127	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

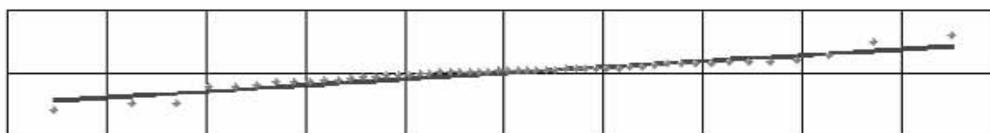
OABG Area Surface Soil  
Nickel

Normal Q-Q Plot for Nickel



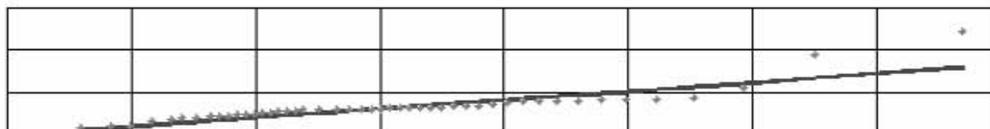
N = 52, Mean = 60.3250, Sd = 36.1446  
Slope = 0.8288, Intercept = 0.0000, Correlation, R = 0.81395741  
Lilliefors Statistic = 0.221, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Nickel



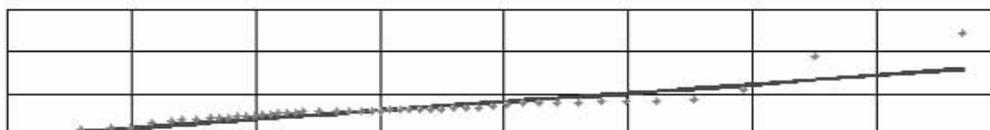
N = 52, Mean = 3.9731, Sd = 0.5078  
Slope = 0.9599, Intercept = 0.0000, Correlation, R = 0.94263998  
Lilliefors Statistic = 0.137, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Nickel



N = 52, Mean = 60.325, k hat = 4.1063  
Slope = 1.053, Intercept = -3.051, Correlation, R = 0.883  
A-D Test Statistic = 1.878, Critical Value(0.05) = 0.754, Data not Gamma Distributed

Gamma Q-Q Plot for Nickel



N = 52, Mean = 60.325, k hat = 4.106  
Slope = 1.053, Intercept = -3.051, Correlation, R = 0.883  
K-S Test Statistic = 0.150, Critical Value(0.05) = 0.124, Data not Gamma Distributed

OABG Area Surface Soil  
Nickel

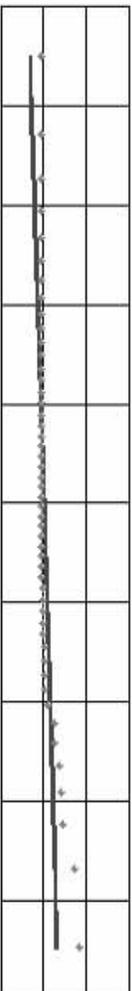
Data File	Nickel	
Variable:	Nickel	
Raw Statistics		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	47	
Minimum	11.4	
Maximum	240	
Mean	60.325	
Standard Deviation	36.1446	
Variance	1306.432	
Coefficient of Variation	0.599165	
Skewness	3.202598	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.220957	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	68.72212	
Gamma Statistics		
k hat	4.106314	
k star (bias corrected)	3.882232	
Theta hat	14.69079	
Theta star	15.53874	
nu hat	427.0567	
nu star	403.7521	
5% Approximate Chi Square Value	358.1659	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	356.9472	
Anderson-Darling Test Statistic	1.877954	
Anderson-Darling 5% Critical Value	0.753534	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.150387	
Kolmogrov-Smirnov 5% Critical Value	0.123589	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	68.00298	
95% Adjusted Gamma UCL	68.23514	
Lognormal Statistics		
Minimum of log data	2.433613	
Maximum of log data	5.480639	
Mean of log data	3.973069	
Standard Deviation of log data	0.507758	
Variance of log data	0.257818	
Lilliefors Test Statistic	0.136945	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	60.45979	
MLE Standard Deviation	32.78815	
MLE Coefficient of Variation	0.542313	
MLE Skewness	1.786436	
MLE Median	53.14741	

OABG Area Surface Soil  
Nickel

MLE 80% Quantile	81.62413	
MLE 90% Quantile	102.0577	
MLE 95% Quantile	122.527	
MLE 99% Quantile	173.1425	
MVU Estimate of Median	53.01581	
MVU Estimate of Mean	60.29202	
MVU Estimate of Standard Deviation	32.35098	
MVU Estimate of SE of Mean	4.466993	
95% H-UCL	69.1047	
95% Chebyshev (MVUE) UCL	79.76319	
97.5% Chebyshev (MVUE) UCL	88.18838	
99% Chebyshev (MVUE) UCL	104.738	
Non-parametric Statistics		
95% CLT UCL	68.56959	
95% Adjusted-CLT UCL	70.9482	
95% Modified-t UCL	69.09313	
95% Jackknife UCL	68.72212	
95% Chebyshev (Mean, Sd) UCL	82.17335	
97.5% Chebyshev (Mean, Sd) UCL	91.62714	
99% Chebyshev (Mean, Sd) UCL	110.1973	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	68.37129	
95% Bootstrap-t UCL	73.711	
95% Hall's Bootstrap UCL	116.3735	
95% Percentile Bootstrap UCL	68.94423	
95% BCA Bootstrap UCL	71.49231	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	82.17335	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

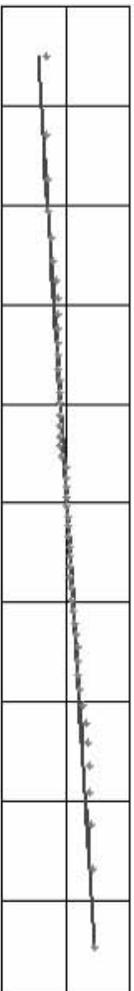
OABG Area Surface Soil  
Silver

Normal Q-Q Plot for Silver



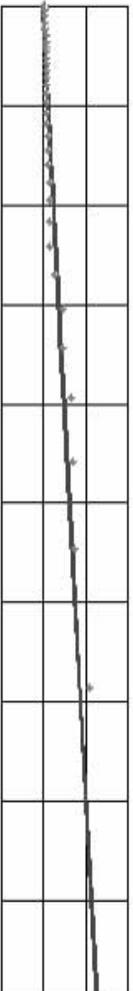
N = 50, Mean = 12.9483, Sd = 26.8273  
Slope = 0.7371, Intercept = 0.0000, Correlation, R = 0.72341095  
Lilliefors Statistic = 0.345, Critical Value(0.05) = 0.125, Data not Normal

Lognormal Q-Q Plot for Silver



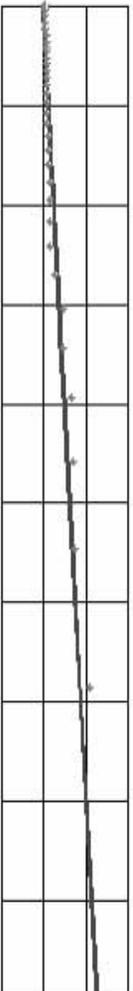
N = 50, Mean = 0.8661, Sd = 1.8784  
Slope = 0.9982, Intercept = 0.0000, Correlation, R = 0.97974391  
Lilliefors Statistic = 0.130, Critical Value(0.05) = 0.125, Data not Lognormal

Gamma Q-Q Plot for Silver



N = 50, Mean = 12.948, k hat = 0.3899  
Slope = 1.313, Intercept = -3.774, Correlation, R = 0.971  
A-D Test Statistic= 3.126, Critical Value(0.05) = 0.841, Data not Gamma Distributed

Gamma Q-Q Plot for Silver



N = 50, Mean = 12.948, k hat = 0.390  
Slope = 1.313, Intercept = -3.774, Correlation, R = 0.971  
K-S Test Statistic = 0.215, Critical Value(0.05) = 0.134, Data not Gamma Distributed

OABG Area Surface Soil  
Silver

Data File

Variable: Silver

Raw Statistics

Number of Observations	50
Number of Missing Data	0
Number of Valid Observations	50
Number of Distinct Observations	41
Minimum	0.11
Maximum	121
Mean	12.9483
Standard Deviation	26.82731
Variance	719.7044
Coefficient of Variation	2.071879
Skewness	2.749792
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.536032	
Shapiro-Wilk 5% Critical Value	0.947	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	19.30906	

Gamma Statistics

k hat	0.389866	
k star (bias corrected)	0.379807	
Theta hat	33.21218	
Theta star	34.09176	
nu hat	38.9866	
nu star	37.98074	
5% Approximate Chi Square Value	24.86604	
Adjusted Level of Significance	0.0452	
Adjusted Chi Square Value	24.55019	
Anderson-Darling Test Statistic	3.12571	
Anderson-Darling 5% Critical Value	0.840774	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.214571	
Kolmogrov-Smirnov 5% Critical Value	0.134415	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	19.77742	
95% Adjusted Gamma UCL	20.03186	

Lognormal Statistics

Minimum of log data	-2.207275	
Maximum of log data	4.795791	
Mean of log data	0.866106	
Standard Deviation of log data	1.878439	
Variance of log data	3.528534	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.94064	
Shapiro-Wilk 5% Critical Value	0.947	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	13.87895	
MLE Standard Deviation	79.81781	
MLE Coefficient of Variation	5.750998	
MLE Skewness	207.4614	
MLE Median	2.377635	

OABG Area Surface Soil  
Silver

MLE 80% Quantile	11.62767	
MLE 90% Quantile	26.57313	
MLE 95% Quantile	52.25517	
MLE 99% Quantile	187.7959	
MVU Estimate of Median	2.295146	
MVU Estimate of Mean	12.69285	
MVU Estimate of Standard Deviation	51.54732	
MVU Estimate of SE of Mean	4.826344	
95% H-UCL	34.39792	
95% Chebyshev (MVUE) UCL	33.73039	
97.5% Chebyshev (MVUE) UCL	42.83336	
99% Chebyshev (MVUE) UCL	60.71436	
Non-parametric Statistics		
95% CLT UCL	19.1888	
95% Adjusted-CLT UCL	20.76528	
95% Modified-t UCL	19.55495	
95% Jackknife UCL	19.30906	
95% Chebyshev (Mean, Sd) UCL	29.48576	
97.5% Chebyshev (Mean, Sd) UCL	36.64154	
99% Chebyshev (Mean, Sd) UCL	50.69767	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	18.90166	
95% Bootstrap-t UCL	21.90663	
95% Hall's Bootstrap UCL	20.88207	
95% Percentile Bootstrap UCL	19.7165	
95% BCA Bootstrap UCL	21.0692	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	36.64154	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

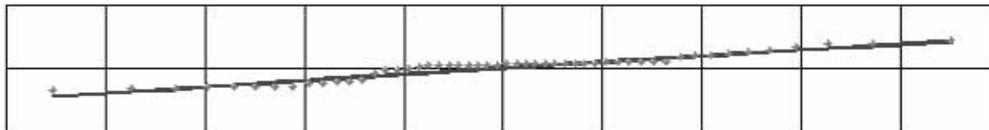
OABG Area Surface Soil  
Thallium

Normal Q-Q Plot for Thallium



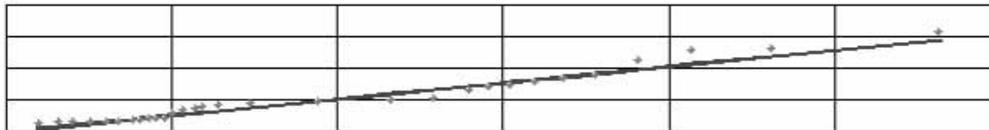
N = 52, Mean = 0.9240, Sd = 0.6209  
Slope = 0.9201, Intercept = 0.0000, Correlation, R = 0.90355867  
Lilliefors Statistic = 0.259, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Thallium



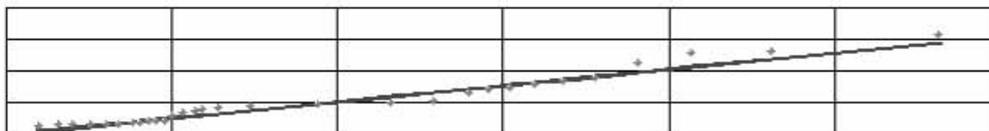
N = 52, Mean = -0.2831, Sd = 0.6598  
Slope = 0.9801, Intercept = 0.0000, Correlation, R = 0.96253699  
Lilliefors Statistic = 0.190, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Thallium



N = 52, Mean = 0.924, k hat = 2.6043  
Slope = 1.039, Intercept = -0.032, Correlation, R = 0.970  
A-D Test Statistic = 1.684, Critical Value(0.05) = 0.759, Data not Gamma Distributed

Gamma Q-Q Plot for Thallium



N = 52, Mean = 0.924, k hat = 2.604  
Slope = 1.039, Intercept = -0.032, Correlation, R = 0.970  
K-S Test Statistic = 0.176, Critical Value(0.05) = 0.124, Data not Gamma Distributed

OABG Area Surface Soil

Thallium

Data File

Variable:

Thallium

Raw Statistics

Number of Observations 52

Number of Missing Data 0

Number of Valid Observations 52

Number of Distinct Observations 30

Minimum 0.23

Maximum 3.1

Mean 0.924038

Standard Deviation 0.620931

Variance 0.385556

Coefficient of Variation 0.671976

Skewness 1.651946

Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic 0.259009

Lilliefors 5% Critical Value 0.122866

Shapiro-Wilk Test Statistic N/A

Shapiro-Wilk 5% Critical Value N/A

5% Normality Test Result NOT NORMAL Data not normal at 5% significance level

95% Student's-t UCL 1.068293

Gamma Statistics

k hat 2.604254

k star (bias corrected) 2.466829

Theta hat 0.354819

Theta star 0.374586

nu hat 270.8424

nu star 256.5502

5% Approximate Chi Square Value 220.4553

Adjusted Level of Significance 0.045385

Adjusted Chi Square Value 219.5047

Anderson-Darling Test Statistic 1.684181

Anderson-Darling 5% Critical Value 0.759419

Anderson-Darling 5% Gamma Test Result NOT AD GAMMA Data not gamma distributed at 5% significance level

Kolmogrov-Smirnov Test Statistic 0.176136

Kolmogrov-Smirnov 5% Critical Value 0.124334

Kolmogrov-Smirnov 5% Gamma Test Result NOT KS GAMMA Data not gamma distributed at 5% significance level

5% Gamma Test Result NOT GAMMA Data not gamma distributed at 5% significance level

95% Approximate Gamma UCL 1.07533

95% Adjusted Gamma UCL 1.079987

Lognormal Statistics

Minimum of log data -1.469676

Maximum of log data 1.131402

Mean of log data -0.283112

Standard Deviation of log data 0.659823

Variance of log data 0.435367

Lilliefors Test Statistic 0.190055

Lilliefors 5% Critical Value 0.122866

Shapiro-Wilk Test Statistic N/A

Shapiro-Wilk 5% Critical Value N/A

5% Lognormality Test Result NOT LOGNORMAL Data not lognormal at 5% significance level

MLE Mean 0.936666

MLE Standard Deviation 0.691821

MLE Coefficient of Variation 0.7386

MLE Skewness 2.618728

MLE Median 0.753435

MLE 80% Quantile 1.315792

OABG Area Surface Soil

Thallium

MLE 90% Quantile	1.759027
MLE 95% Quantile	2.230659
MLE 99% Quantile	3.49606
MVU Estimate of Median	0.750287
MVU Estimate of Mean	0.931959
MVU Estimate of Standard Deviation	0.675239
MVU Estimate of SE of Mean	0.092552
95% H-UCL	1.125766
95% Chebyshev (MVUE) UCL	1.335382
97.5% Chebyshev (MVUE) UCL	1.509943
99% Chebyshev (MVUE) UCL	1.852835

Non-parametric Statistics

95% CLT UCL	1.065673
95% Adjusted-CLT UCL	1.08675
95% Modified-t UCL	1.071581
95% Jackknife UCL	1.068293
95% Chebyshev (Mean, Sd) UCL	1.299373
97.5% Chebyshev (Mean, Sd) UCL	1.461781
99% Chebyshev (Mean, Sd) UCL	1.780799

Bootstrap Statistics

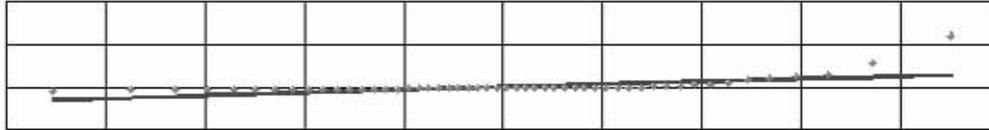
Number of Bootstrap Runs	2000
95% Standard Bootstrap UCL	1.066007
95% Bootstrap-t UCL	1.109902
95% Hall's Bootstrap UCL	1.095423
95% Percentile Bootstrap UCL	1.067212
95% BCA Bootstrap UCL	1.089038

Recommendations

Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.299373	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

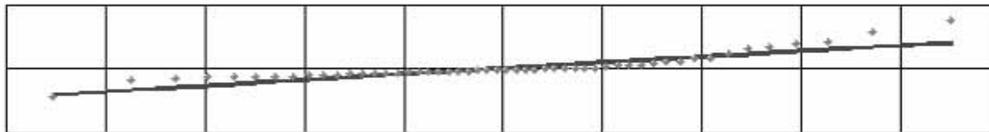
OABG Area Surface Soil  
Vanadium

Normal Q-Q Plot for Vanadium



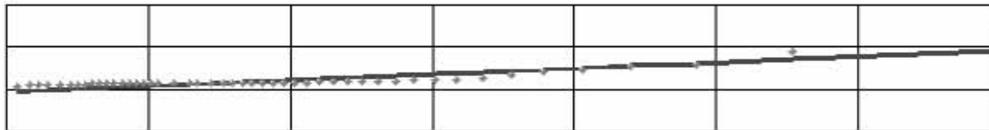
N = 52, Mean = 37.7115, Sd = 50.4396  
Slope = 0.6655, Intercept = 0.0000, Correlation, R = 0.65351327  
Lilliefors Statistic = 0.332, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Vanadium



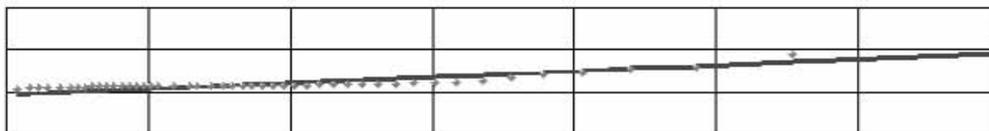
N = 52, Mean = 3.3025, Sd = 0.6758  
Slope = 0.9152, Intercept = 0.0000, Correlation, R = 0.89880492  
Lilliefors Statistic = 0.226, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Vanadium



N = 52, Mean = 37.712, k hat = 1.6741  
Slope = 1.428, Intercept = -15.900, Correlation, R = 0.832  
A-D Test Statistic = 5.786, Critical Value(0.05) = 0.766, Data not Gamma Distributed

Gamma Q-Q Plot for Vanadium



N = 52, Mean = 37.712, k hat = 1.674  
Slope = 1.428, Intercept = -15.900, Correlation, R = 0.832  
K-S Test Statistic = 0.277, Critical Value(0.05) = 0.125, Data not Gamma Distributed

OABG Area Surface Soil

Vanadium

Data File

Variable: Vanadium

Raw Statistics

Number of Observations 52

Number of Missing Data 0

Number of Valid Observations 52

Number of Distinct Observations 48

Minimum 5.6

Maximum 332

Mean 37.71154

Standard Deviation 50.43959

Variance 2544.152

Coefficient of Variation 1.337511

Skewness 4.524873

Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic 0.331967

Lilliefors 5% Critical Value 0.122866

Shapiro-Wilk Test Statistic N/A

Shapiro-Wilk 5% Critical Value N/A

5% Normality Test Result NOT NORMAL Data not normal at 5% significance level

95% Student's-t UCL 49.42967

Gamma Statistics

k hat 1.674098

k star (bias corrected) 1.590336

Theta hat 22.52649

Theta star 23.71294

nu hat 174.1062

nu star 165.3949

5% Approximate Chi Square Value 136.6526

Adjusted Level of Significance 0.045385

Adjusted Chi Square Value 135.9096

Anderson-Darling Test Statistic 5.786121

Anderson-Darling 5% Critical Value 0.765939

Anderson-Darling 5% Gamma Test Result NOT AD GAMMA Data not gamma distributed at 5% significance level

Kolmogrov-Smirnov Test Statistic 0.276879

Kolmogrov-Smirnov 5% Critical Value 0.12514

Kolmogrov-Smirnov 5% Gamma Test Result NOT KS GAMMA Data not gamma distributed at 5% significance level

5% Gamma Test Result NOT GAMMA Data not gamma distributed at 5% significance level

95% Approximate Gamma UCL 45.64345

95% Adjusted Gamma UCL 45.89299

Lognormal Statistics

Minimum of log data 1.722767

Maximum of log data 5.805135

Mean of log data 3.302488

Standard Deviation of log data 0.675791

Variance of log data 0.456694

Lilliefors Test Statistic 0.226496

Lilliefors 5% Critical Value 0.122866

Shapiro-Wilk Test Statistic N/A

Shapiro-Wilk 5% Critical Value N/A

5% Lognormality Test Result NOT LOGNORMAL Data not lognormal at 5% significance level

MLE Mean 34.15247

MLE Standard Deviation 25.98384

MLE Coefficient of Variation 0.760819

MLE Skewness 2.722854

MLE Median 27.18018

MLE 80% Quantile 48.11199

OABG Area Surface Soil

Vanadium

MLE 90% Quantile	64.77241
MLE 95% Quantile	82.61279
MLE 99% Quantile	130.8928
MVU Estimate of Median	27.06107
MVU Estimate of Mean	33.971
MVU Estimate of Standard Deviation	25.3258
MVU Estimate of SE of Mean	3.46747
95% H-UCL	41.28051
95% Chebyshev (MVUE) UCL	49.08535
97.5% Chebyshev (MVUE) UCL	55.62534
99% Chebyshev (MVUE) UCL	68.47189
Non-parametric Statistics	
95% CLT UCL	49.21682
95% Adjusted-CLT UCL	53.90662
95% Modified-t UCL	50.16119
95% Jackknife UCL	49.42967
95% Chebyshev (Mean, Sd) UCL	68.20078
97.5% Chebyshev (Mean, Sd) UCL	81.3935
99% Chebyshev (Mean, Sd) UCL	107.308

Bootstrap Statistics

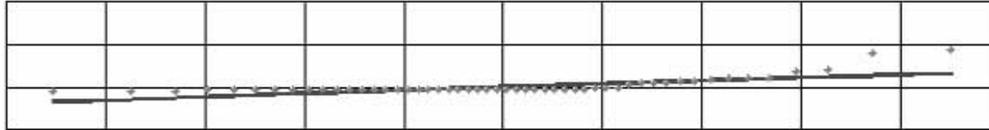
Number of Bootstrap Runs	2000
95% Standard Bootstrap UCL	48.84232
95% Bootstrap-t UCL	63.63236
95% Hall's Bootstrap UCL	95.27049
95% Percentile Bootstrap UCL	50.8
95% BCA Bootstrap UCL	55.68846

Recommendations

Human Inspection Recommended?	NO
Appropriate Distribution	NON-PARAMETRIC
1st Recommended UCL	68.20078      95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL	
3rd Recommended UCL	
Recommended UCL > Max Data Value	
Recommendation Warning!	NONE
Alternative UCL	NONE

OABG Area Surface Soil  
Zinc

Normal Q-Q Plot for Zinc



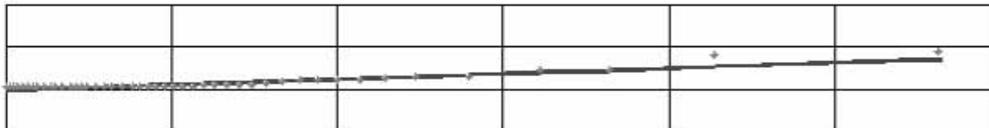
N = 52, Mean = 586.9442, Sd = 854.7971  
Slope = 0.7647, Intercept = 0.0000, Correlation, R = 0.75101087  
Lilliefors Statistic = 0.319, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Zinc



N = 52, Mean = 5.7832, Sd = 0.9816  
Slope = 0.9419, Intercept = 0.0000, Correlation, R = 0.92498749  
Lilliefors Statistic = 0.246, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Zinc



N = 52, Mean = 586.944, k hat = 0.9780  
Slope = 1.363, Intercept = -207.453, Correlation, R = 0.942  
A-D Test Statistic = 5.091, Critical Value(0.05) = 0.781, Data not Gamma Distributed

Gamma Q-Q Plot for Zinc



N = 52, Mean = 586.944, k hat = 0.978  
Slope = 1.363, Intercept = -207.453, Correlation, R = 0.942  
K-S Test Statistic = 0.288, Critical Value(0.05) = 0.127, Data not Gamma Distributed

OABG Area Surface Soil  
Zinc

Data File

Variable: Zinc

Raw Statistics

Number of Observations	52
Number of Missing Data	0
Number of Valid Observations	52
Number of Distinct Observations	46
Minimum	61.9
Maximum	4230
Mean	586.9442
Standard Deviation	854.7971
Variance	730678.2
Coefficient of Variation	1.456352
Skewness	2.941799
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.318891	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	785.5309	

Gamma Statistics

k hat	0.978023	
k star (bias corrected)	0.934419	
Theta hat	600.1331	
Theta star	628.1379	
nu hat	101.7144	
nu star	97.17962	
5% Approximate Chi Square Value	75.43603	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	74.89032	
Anderson-Darling Test Statistic	5.090657	
Anderson-Darling 5% Critical Value	0.780965	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.287718	
Kolmogrov-Smirnov 5% Critical Value	0.12687	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	756.1243	
95% Adjusted Gamma UCL	761.6341	

Lognormal Statistics

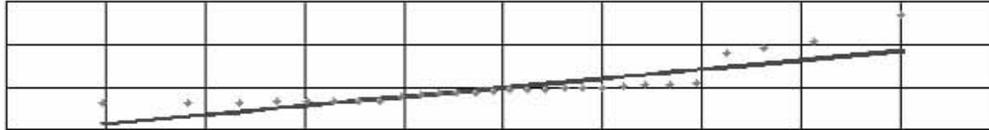
Minimum of log data	4.12552	
Maximum of log data	8.349957	
Mean of log data	5.783193	
Standard Deviation of log data	0.981578	
Variance of log data	0.963496	
Lilliefors Test Statistic	0.246056	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	525.8107	
MLE Standard Deviation	669.4217	
MLE Coefficient of Variation	1.273123	
MLE Skewness	5.8829	
MLE Median	324.7948	

OABG Area Surface Soil  
Zinc

MLE 80% Quantile	744.4361	
MLE 90% Quantile	1146.56	
MLE 95% Quantile	1632.535	
MLE 99% Quantile	3185.435	
MVU Estimate of Median	321.7991	
MVU Estimate of Mean	518.8207	
MVU Estimate of Standard Deviation	627.707	
MVU Estimate of SE of Mean	82.80053	
95% H-UCL	719.7355	
95% Chebyshev (MVUE) UCL	879.7399	
97.5% Chebyshev (MVUE) UCL	1035.91	
99% Chebyshev (MVUE) UCL	1342.676	
Non-parametric Statistics		
95% CLT UCL	781.9236	
95% Adjusted-CLT UCL	833.5953	
95% Modified-t UCL	793.5906	
95% Jackknife UCL	785.5309	
95% Chebyshev (Mean, Sd) UCL	1103.644	
97.5% Chebyshev (Mean, Sd) UCL	1327.22	
99% Chebyshev (Mean, Sd) UCL	1766.393	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	775.3749	
95% Bootstrap-t UCL	902.4867	
95% Hall's Bootstrap UCL	977.9323	
95% Percentile Bootstrap UCL	798.6154	
95% BCA Bootstrap UCL	837.4577	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1103.644	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

ABG Area Surface Soil  
2,3,7,8-TCDD

Normal Q-Q Plot for TCDD



N = 28, Mean = 0.0000, Sd = 0.0000  
Slope = 0.8643, Intercept = 0.0000, Correlation, R = 0.83950909  
Shapiro-Wilk Statistic = 0.713, Critical Value(0.05) = 0.924, Data not Normal

Lognormal Q-Q Plot for TCDD



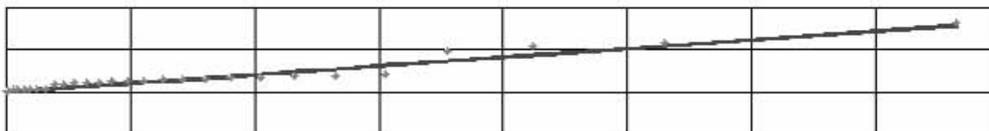
N = 28, Mean = -11.1561, Sd = 1.5254  
Slope = 0.9898, Intercept = 0.0000, Correlation, R = 0.96149385  
Shapiro-Wilk Statistic = 0.920, Critical Value(0.05) = 0.924, Data not Lognormal

Gamma Q-Q Plot for TCDD



N = 28, Mean = 0.000, k hat = 0.7453  
Slope = 1.046, Intercept = -0.000, Correlation, R = 0.970  
A-D Test Statistic = 0.701, Critical Value(0.05) = 0.785, Data are Gamma Distributed

Gamma Q-Q Plot for TCDD



N = 28, Mean = 0.000, k hat = 0.745  
Slope = 1.046, Intercept = -0.000, Correlation, R = 0.970  
K-S Test Statistic = 0.154, Critical Value(0.05) = 0.172, Data are Gamma Distributed

ABG Area Surface Soil  
2,3,7,8-TCDD

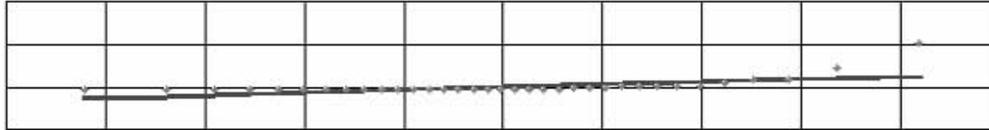
Data File		
Variable:	TCDD	
Raw Statistics		
Number of Observations	28	
Number of Missing Data	0	
Number of Valid Observations	28	
Number of Distinct Observations	28	
Minimum	4.08E-07	
Maximum	0.000162	
Mean	3.19E-05	
Standard Deviation	3.92E-05	
Variance	1.54E-09	
Coefficient of Variation	1.228481	
Skewness	2.091802	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.713043	
Shapiro-Wilk 5% Critical Value	0.924	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	4.45E-05	
Gamma Statistics		
k hat	0.745314	
k star (bias corrected)	0.689268	
Theta hat	4.28E-05	
Theta star	4.63E-05	
nu hat	41.73757	
nu star	38.59902	
5% Approximate Chi Square Value	25.36742	
Adjusted Level of Significance	0.0404	
Adjusted Chi Square Value	24.70353	
Anderson-Darling Test Statistic	0.701031	
Anderson-Darling 5% Critical Value	0.78514	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% significance level.
Kolmogrov-Smirnov Test Statistic	0.153785	
Kolmogrov-Smirnov 5% Critical Value	0.171928	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% significance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% significance level
95% Approximate Gamma UCL	4.86E-05	
95% Adjusted Gamma UCL	4.99E-05	
Lognormal Statistics		
Minimum of log data	-14.712	
Maximum of log data	-8.727914	
Mean of log data	-11.15613	
Standard Deviation of log data	1.525448	
Variance of log data	2.326993	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.920076	
Shapiro-Wilk 5% Critical Value	0.924	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	4.57E-05	
MLE Standard Deviation	0.000139	
MLE Coefficient of Variation	3.040901	
MLE Skewness	37.24217	
MLE Median	1.43E-05	

ABG Area Surface Soil  
2,3,7,8-TCDD

MLE 80% Quantile	5.19E-05	
MLE 90% Quantile	0.000101	
MLE 95% Quantile	0.000176	
MLE 99% Quantile	0.000496	
MVU Estimate of Median	1.37E-05	
MVU Estimate of Mean	4.22E-05	
MVU Estimate of Standard Deviation	9.65E-05	
MVU Estimate of SE of Mean	1.53E-05	
95% H-UCL	0.000116	
95% Chebyshev (MVUE) UCL	0.000109	
97.5% Chebyshev (MVUE) UCL	0.000138	
99% Chebyshev (MVUE) UCL	0.000194	
Non-parametric Statistics		
95% CLT UCL	4.41E-05	
95% Adjusted-CLT UCL	4.72E-05	
95% Modified-t UCL	4.50E-05	
95% Jackknife UCL	4.45E-05	
95% Chebyshev (Mean, Sd) UCL	6.42E-05	
97.5% Chebyshev (Mean, Sd) UCL	7.82E-05	
99% Chebyshev (Mean, Sd) UCL	0.000106	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4.43E-05	
95% Bootstrap-t UCL	5.05E-05	
95% Hall's Bootstrap UCL	4.89E-05	
95% Percentile Bootstrap UCL	4.46E-05	
95% BCA Bootstrap UCL	4.75E-05	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	4.86E-05	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

ABG Area Surface Soil  
RDX

Normal Q-Q Plot for RDX



N = 35, Mean = 2490.1714, Sd = 6295.6823  
Slope = 0.6430, Intercept = 0.0000, Correlation, R = 0.62736979  
Shapiro-Wilk Statistic = 0.425, Critical Value(0.05) = 0.934, Data not Normal

Lognormal Q-Q Plot for RDX



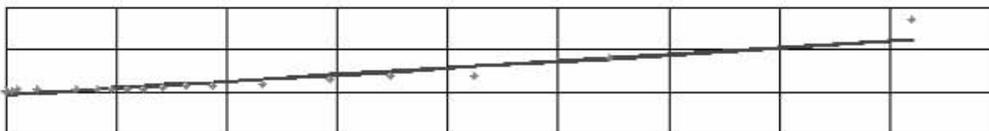
N = 35, Mean = 6.3281, Sd = 1.5361  
Slope = 0.9149, Intercept = 0.0000, Correlation, R = 0.89266797  
Shapiro-Wilk Statistic = 0.800, Critical Value(0.05) = 0.934, Data not Lognormal

Gamma Q-Q Plot for RDX



N = 35, Mean = 2490.171, k hat = 0.4351  
Slope = 1.619, Intercept = -1442.964, Correlation, R = 0.925  
A-D Test Statistic = 4.600, Critical Value(0.05) = 0.827, Data not Gamma Distributed

Gamma Q-Q Plot for RDX



N = 35, Mean = 2490.171, k hat = 0.435  
Slope = 1.619, Intercept = -1442.964, Correlation, R = 0.925  
K-S Test Statistic = 0.343, Critical Value(0.05) = 0.158, Data not Gamma Distributed

ABG Area Surface Soil  
RDX

Data File

Variable: RDX

Raw Statistics

Number of Observations	35
Number of Missing Data	0
Number of Valid Observations	35
Number of Distinct Observations	20
Minimum	49
Maximum	34000
Mean	2490.171
Standard Deviation	6295.682
Variance	39635615
Coefficient of Variation	2.528212
Skewness	4.209095
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.425064	
Shapiro-Wilk 5% Critical Value	0.934	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	4289.593	

Gamma Statistics

k hat	0.435135	
k star (bias corrected)	0.416885	
Theta hat	5722.761	
Theta star	5973.281	
nu hat	30.45943	
nu star	29.18195	
5% Approximate Chi Square Value	17.84898	
Adjusted Level of Significance	0.0425	
Adjusted Chi Square Value	17.42771	
Anderson-Darling Test Statistic	4.600369	
Anderson-Darling 5% Critical Value	0.826578	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.3433	
Kolmogrov-Smirnov 5% Critical Value	0.158496	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	4071.272	
95% Adjusted Gamma UCL	4169.685	

Lognormal Statistics

Minimum of log data	3.89182	
Maximum of log data	10.43412	
Mean of log data	6.328111	
Standard Deviation of log data	1.536113	
Variance of log data	2.359644	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.800273	
Shapiro-Wilk 5% Critical Value	0.934	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1822.442	
MLE Standard Deviation	5642.861	
MLE Coefficient of Variation	3.096318	
MLE Skewness	38.97392	
MLE Median	560.0974	

ABG Area Surface Soil  
RDX

MLE 80% Quantile	2051.09	
MLE 90% Quantile	4031.994	
MLE 95% Quantile	7009.469	
MLE 99% Quantile	19952.51	
MVU Estimate of Median	541.5145	
MVU Estimate of Mean	1703.409	
MVU Estimate of Standard Deviation	4123.182	
MVU Estimate of SE of Mean	571.5132	
95% H-UCL	4110.432	
95% Chebyshev (MVUE) UCL	4194.577	
97.5% Chebyshev (MVUE) UCL	5272.507	
99% Chebyshev (MVUE) UCL	7389.893	
Non-parametric Statistics		
95% CLT UCL	4240.566	
95% Adjusted-CLT UCL	5049.558	
95% Modified-t UCL	4415.779	
95% Jackknife UCL	4289.593	
95% Chebyshev (Mean, Sd) UCL	7128.757	
97.5% Chebyshev (Mean, Sd) UCL	9135.877	
99% Chebyshev (Mean, Sd) UCL	13078.47	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4184.471	
95% Bootstrap-t UCL	8094.715	
95% Hall's Bootstrap UCL	10860.53	
95% Percentile Bootstrap UCL	4386.886	
95% BCA Bootstrap UCL	5440.743	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	13078.47	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

ABG Area Surface Soil  
Arsenic

Normal Q-Q Plot for Arsenic



N = 28, Mean = 6.7321, Sd = 1.0548  
Slope = 0.9482, Intercept = 0.0000, Correlation, R = 0.92107273  
Shapiro-Wilk Statistic = 0.881, Critical Value(0.05) = 0.924, Data not Normal

Lognormal Q-Q Plot for Arsenic



N = 28, Mean = 1.8931, Sd = 0.1779  
Slope = 0.9014, Intercept = 0.0000, Correlation, R = 0.87557861  
Shapiro-Wilk Statistic = 0.801, Critical Value(0.05) = 0.924, Data not Lognormal

Gamma Q-Q Plot for Arsenic



N = 28, Mean = 6.732, k hat = 36.3070  
Slope = 0.831, Intercept = 1.141, Correlation, R = 0.920  
A-D Test Statistic = 1.673, Critical Value(0.05) = 0.744, Data not Gamma Distributed

Gamma Q-Q Plot for Arsenic



N = 28, Mean = 6.732, k hat = 36.307  
Slope = 0.831, Intercept = 1.141, Correlation, R = 0.920  
K-S Test Statistic = 0.260, Critical Value(0.05) = 0.165, Data not Gamma Distributed

ABG Area Surface Soil  
Arsenic

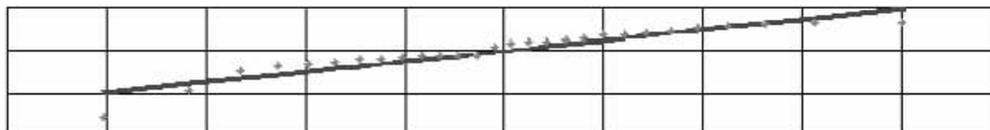
Data File		
Variable:	Arsenic	
Raw Statistics		
Number of Observations	28	
Number of Missing Data	0	
Number of Valid Observations	28	
Number of Distinct Observations	17	
Minimum	3.4	
Maximum	9.5	
Mean	6.732143	
Standard Deviation	1.054814	
Variance	1.112632	
Coefficient of Variation	0.156683	
Skewness	-0.705428	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.881469	
Shapiro-Wilk 5% Critical Value	0.924	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	7.071678	
Gamma Statistics		
k hat	36.30704	
k star (bias corrected)	32.44081	
Theta hat	0.185423	
Theta star	0.207521	
nu hat	2033.194	
nu star	1816.685	
5% Approximate Chi Square Value	1718.667	
Adjusted Level of Significance	0.0404	
Adjusted Chi Square Value	1712.793	
Anderson-Darling Test Statistic	1.672787	
Anderson-Darling 5% Critical Value	0.743794	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.259702	
Kolmogrov-Smirnov 5% Critical Value	0.165027	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	7.116088	
95% Adjusted Gamma UCL	7.140492	
Lognormal Statistics		
Minimum of log data	1.223775	
Maximum of log data	2.251292	
Mean of log data	1.893059	
Standard Deviation of log data	0.177941	
Variance of log data	0.031663	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.801442	
Shapiro-Wilk 5% Critical Value	0.924	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	6.7456	
MLE Standard Deviation	1.209887	
MLE Coefficient of Variation	0.179359	
MLE Skewness	0.543848	
MLE Median	6.639647	

ABG Area Surface Soil  
Arsenic

MLE 80% Quantile	7.716952	
MLE 90% Quantile	8.345427	
MLE 95% Quantile	8.89752	
MLE 99% Quantile	10.04375	
MVU Estimate of Median	6.635894	
MVU Estimate of Mean	6.741733	
MVU Estimate of Standard Deviation	1.206596	
MVU Estimate of SE of Mean	0.228012	
95% H-UCL	7.159807	
95% Chebyshev (MVUE) UCL	7.735612	
97.5% Chebyshev (MVUE) UCL	8.165665	
99% Chebyshev (MVUE) UCL	9.01042	
Non-parametric Statistics		
95% CLT UCL	7.06003	
95% Adjusted-CLT UCL	7.031634	
95% Modified-t UCL	7.067249	
95% Jackknife UCL	7.071678	
95% Chebyshev (Mean, Sd) UCL	7.60105	
97.5% Chebyshev (Mean, Sd) UCL	7.977028	
99% Chebyshev (Mean, Sd) UCL	8.715562	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	7.04593	
95% Bootstrap-t UCL	7.041109	
95% Hall's Bootstrap UCL	7.056751	
95% Percentile Bootstrap UCL	7.060714	
95% BCA Bootstrap UCL	7.053571	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	7.071678	95% Student's-t UCL
2nd Recommended UCL	7.067249	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

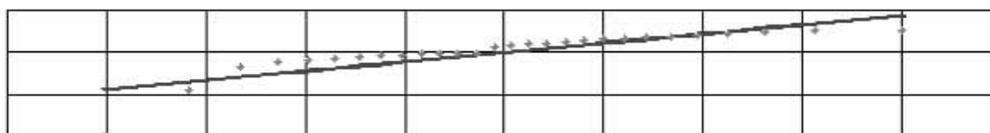
ABG Area Surface Soil  
Iron

Normal Q-Q Plot for Iron



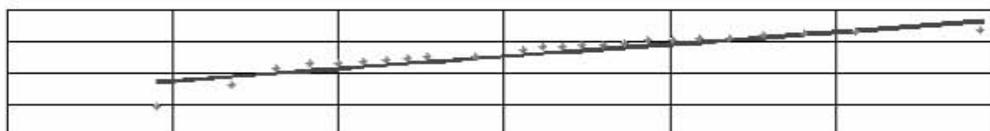
N = 28, Mean = 26460.0000, Sd = 5397.0692  
Slope = 0.9671, Intercept = 0.0000, Correlation, R = 0.93939298  
Shapiro-Wilk Statistic = 0.890, Critical Value(0.05) = 0.924, Data not Normal

Lognormal Q-Q Plot for Iron



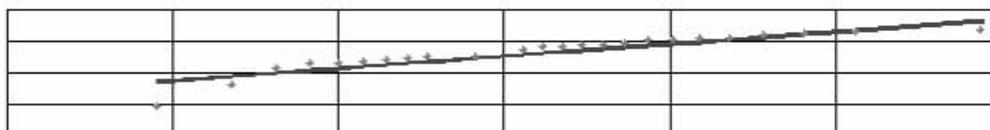
N = 28, Mean = 10.1556, Sd = 0.2645  
Slope = 0.8771, Intercept = 0.0000, Correlation, R = 0.85199449  
Shapiro-Wilk Statistic = 0.747, Critical Value(0.05) = 0.924, Data not Lognormal

Gamma Q-Q Plot for Iron



N = 28, Mean = 26460.000, k hat = 18.1494  
Slope = 0.770, Intercept = 6118.317, Correlation, R = 0.916  
A-D Test Statistic = 1.346, Critical Value(0.05) = 0.745, Data not Gamma Distributed

Gamma Q-Q Plot for Iron



N = 28, Mean = 26460.000, k hat = 18.149  
Slope = 0.770, Intercept = 6118.317, Correlation, R = 0.916  
K-S Test Statistic = 0.169, Critical Value(0.05) = 0.165, Data not Gamma Distributed

ABG Area Surface Soil  
Iron

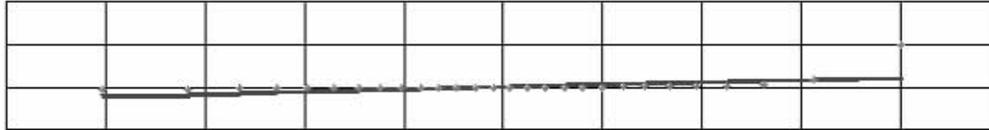
Data File		
Variable:	Iron	
Raw Statistics		
Number of Observations	28	
Number of Missing Data	0	
Number of Valid Observations	28	
Number of Distinct Observations	24	
Minimum	8980	
Maximum	33200	
Mean	26460	
Standard Deviation	5397.069	
Variance	29128356	
Coefficient of Variation	0.203971	
Skewness	-1.364075	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.890395	
Shapiro-Wilk 5% Critical Value	0.924	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	28197.27	
Gamma Statistics		
k hat	18.14938	
k star (bias corrected)	16.22861	
Theta hat	1457.901	
Theta star	1630.453	
nu hat	1016.365	
nu star	908.8024	
5% Approximate Chi Square Value	839.8176	
Adjusted Level of Significance	0.0404	
Adjusted Chi Square Value	835.7298	
Anderson-Darling Test Statistic	1.34634	
Anderson-Darling 5% Critical Value	0.744693	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.169404	
Kolmogrov-Smirnov 5% Critical Value	0.16519	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	28633.49	
95% Adjusted Gamma UCL	28773.55	
Lognormal Statistics		
Minimum of log data	9.102755	
Maximum of log data	10.41031	
Mean of log data	10.15559	
Standard Deviation of log data	0.264546	
Variance of log data	0.069984	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.747245	
Shapiro-Wilk 5% Critical Value	0.924	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	26650.94	
MLE Standard Deviation	7175.56	
MLE Coefficient of Variation	0.269242	
MLE Skewness	0.827245	

ABG Area Surface Soil  
Iron

MLE Median	25734.49	
MLE 80% Quantile	32180.9	
MLE 90% Quantile	36153.48	
MLE 95% Quantile	39765.89	
MLE 99% Quantile	47615.82	
MVU Estimate of Median	25702.35	
MVU Estimate of Mean	26616.61	
MVU Estimate of Standard Deviation	7131.88	
MVU Estimate of SE of Mean	1347.409	
95% H-UCL	29185.63	
95% Chebyshev (MVUE) UCL	32489.83	
97.5% Chebyshev (MVUE) UCL	35031.18	
99% Chebyshev (MVUE) UCL	40023.16	
Non-parametric Statistics		
95% CLT UCL	28137.67	
95% Adjusted-CLT UCL	27856.73	
95% Modified-t UCL	28153.45	
95% Jackknife UCL	28197.27	
95% Chebyshev (Mean, Sd) UCL	30905.86	
97.5% Chebyshev (Mean, Sd) UCL	32829.59	
99% Chebyshev (Mean, Sd) UCL	36608.38	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	28080.33	
95% Bootstrap-t UCL	27982.03	
95% Hall's Bootstrap UCL	27927.55	
95% Percentile Bootstrap UCL	28000	
95% BCA Bootstrap UCL	27895	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	28197.27	95% Student's-t UCL
2nd Recommended UCL	28153.45	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

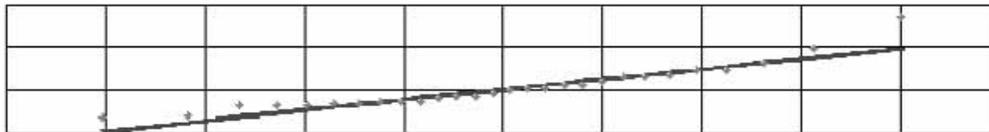
ABG Area Surface Soil  
Lead

Normal Q-Q Plot for Lead



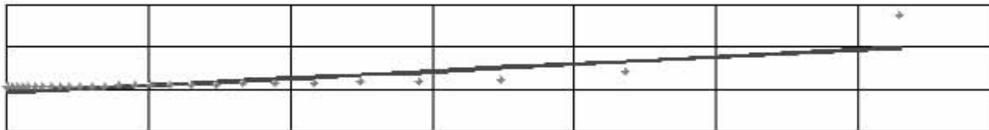
N = 28, Mean = 130.5643, Sd = 322.2167  
Slope = 0.5722, Intercept = 0.0000, Correlation, R = 0.55581255  
Shapiro-Wilk Statistic = 0.342, Critical Value(0.05) = 0.924, Data not Normal

Lognormal Q-Q Plot for Lead



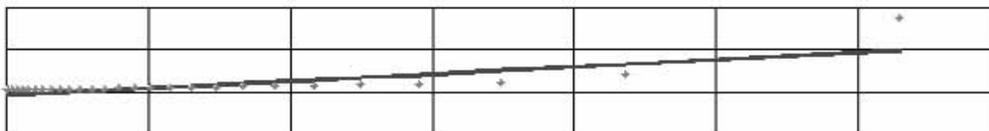
N = 28, Mean = 4.0566, Sd = 1.0152  
Slope = 0.9609, Intercept = 0.0000, Correlation, R = 0.93333344  
Shapiro-Wilk Statistic = 0.884, Critical Value(0.05) = 0.924, Data not Lognormal

Gamma Q-Q Plot for Lead



N = 28, Mean = 130.564, k hat = 0.7362  
Slope = 1.726, Intercept = -90.892, Correlation, R = 0.801  
A-D Test Statistic = 2.917, Critical Value(0.05) = 0.786, Data not Gamma Distributed

Gamma Q-Q Plot for Lead



N = 28, Mean = 130.564, k hat = 0.736  
Slope = 1.726, Intercept = -90.892, Correlation, R = 0.801  
K-S Test Statistic = 0.232, Critical Value(0.05) = 0.172, Data not Gamma Distributed

ABG Area Surface Soil  
Lead

Data File

Variable: Lead

Raw Statistics

Number of Observations	28
Number of Missing Data	0
Number of Valid Observations	28
Number of Distinct Observations	28
Minimum	14.1
Maximum	1730
Mean	130.5643
Standard Deviation	322.2167
Variance	103823.6
Coefficient of Variation	2.467878
Skewness	4.878402
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.341813	
Shapiro-Wilk 5% Critical Value	0.924	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	234.283	

Gamma Statistics

k hat	0.736152	
k star (bias corrected)	0.681088	
Theta hat	177.3606	
Theta star	191.6996	
nu hat	41.2245	
nu star	38.14092	
5% Approximate Chi Square Value	24.99585	
Adjusted Level of Significance	0.0404	
Adjusted Chi Square Value	24.33722	
Anderson-Darling Test Statistic	2.917008	
Anderson-Darling 5% Critical Value	0.786079	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.232207	
Kolmogrov-Smirnov 5% Critical Value	0.17204	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	199.2268	
95% Adjusted Gamma UCL	204.6184	

Lognormal Statistics

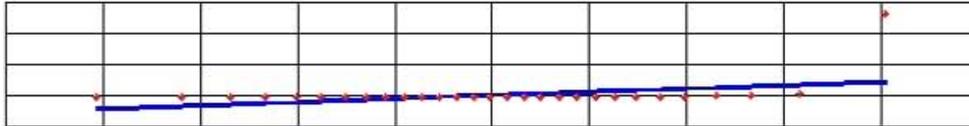
Minimum of log data	2.646175	
Maximum of log data	7.455877	
Mean of log data	4.056606	
Standard Deviation of log data	1.015157	
Variance of log data	1.030543	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.884111	
Shapiro-Wilk 5% Critical Value	0.924	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	96.72553	
MLE Standard Deviation	129.8642	
MLE Coefficient of Variation	1.342605	
MLE Skewness	6.447976	
MLE Median	57.77788	

ABG Area Surface Soil  
Lead

MLE 80% Quantile	136.2394	
MLE 90% Quantile	212.9553	
MLE 95% Quantile	306.9051	
MLE 99% Quantile	612.6907	
MVU Estimate of Median	56.72368	
MVU Estimate of Mean	94.18926	
MVU Estimate of Standard Deviation	115.0007	
MVU Estimate of SE of Mean	20.73975	
95% H-UCL	157.1421	
95% Chebyshev (MVUE) UCL	184.5917	
97.5% Chebyshev (MVUE) UCL	223.709	
99% Chebyshev (MVUE) UCL	300.5472	
Non-parametric Statistics		
95% CLT UCL	230.7247	
95% Adjusted-CLT UCL	290.7105	
95% Modified-t UCL	243.6396	
95% Jackknife UCL	234.283	
95% Chebyshev (Mean, Sd) UCL	395.9917	
97.5% Chebyshev (Mean, Sd) UCL	510.8424	
99% Chebyshev (Mean, Sd) UCL	736.4443	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	230.7031	
95% Bootstrap-t UCL	723.2522	
95% Hall's Bootstrap UCL	615.4922	
95% Percentile Bootstrap UCL	239.2321	
95% BCA Bootstrap UCL	331.1571	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	736.4443	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

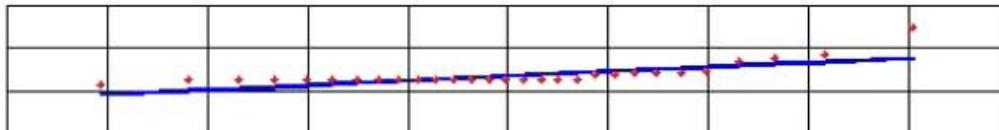
ABG Area Surface Soil  
Trichloroethene

Normal Q-Q Plot for TCE



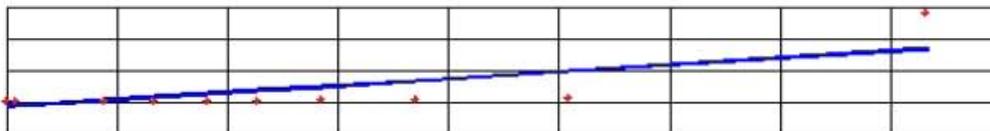
N = 29, Mean = 56.1586, Sd = 258.8143  
Slope = 0.4420, Intercept = 0.0000, Correlation, R = 0.42970809  
Shapiro-Wilk Statistic = 0.216, Critical Value(0.05) = 0.926, Data not Normal

Lognormal Q-Q Plot for TCE



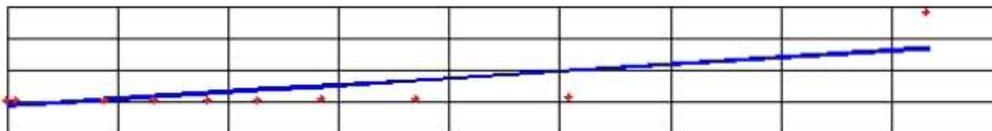
N = 29, Mean = 1.7282, Sd = 1.3593  
Slope = 1.0671, Intercept = 1.7282, Correlation, R = 0.76311044  
Shapiro-Wilk Statistic = 0.608, Critical Value(0.05) = 0.926, Data not Lognormal

Gamma Q-Q Plot for TCE



N = 29, Mean = 56.159, k hat = 0.2998  
Slope = 2.179, Intercept = -55.720, Correlation, R = 0.774  
A-D Test Statistic = 7.596, Critical Value(0.05) = 0.856, Data not Gamma Distributed

Gamma Q-Q Plot for TCE



N = 29, Mean = 56.159, k hat = 0.300  
Slope = 2.179, Intercept = -55.720, Correlation, R = 0.774  
K-S Test Statistic = 0.419, Critical Value(0.05) = 0.177, Data not Gamma Distributed

ABG Area Surface Soil  
Trichloroethene

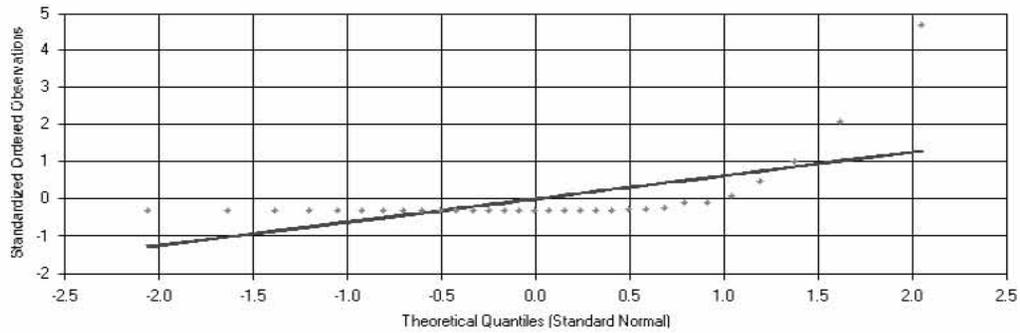
Data File		
Variable:	TCE	
Raw Statistics		
Number of Observations	29	
Number of Missing Data	0	
Number of Valid Observations	29	
Number of Distinct Observations	10	
Minimum	1.6	
Maximum	1400	
Mean	56.15862	
Standard Deviation	258.8143	
Variance	66984.83	
Coefficient of Variation	4.608629	
Skewness	5.361771	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.215727	
Shapiro-Wilk 5% Critical Value	0.926	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	137.916	
Gamma Statistics		
k hat	0.299844	
k star (bias corrected)	0.291814	
Theta hat	187.2926	
Theta star	192.4464	
nu hat	17.39097	
nu star	16.92523	
5% Approximate Chi Square Value	8.617517	
Adjusted Level of Significance	0.0407	
Adjusted Chi Square Value	8.263635	
Anderson-Darling Test Statistic	7.595805	
Anderson-Darling 5% Critical Value	0.856254	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.418548	
Kolmogrov-Smirnov 5% Critical Value	0.176695	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	110.2983	
95% Adjusted Gamma UCL	115.0217	
Lognormal Statistics		
Minimum of log data	0.470004	
Maximum of log data	7.244228	
Mean of log data	1.72824	
Standard Deviation of log data	1.35934	
Variance of log data	1.847804	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.607665	
Shapiro-Wilk 5% Critical Value	0.926	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	14.18439	
MLE Standard Deviation	32.79592	
MLE Coefficient of Variation	2.312114	
MLE Skewness	19.2966	
MLE Median	5.630734	
MLE 80% Quantile	17.75881	

ABG Area Surface Soil  
Trichloroethene

MLE 90% Quantile	32.29755	
MLE 95% Quantile	52.6862	
MLE 99% Quantile	132.9621	
MVU Estimate of Median	5.453989	
MVU Estimate of Mean	13.40401	
MVU Estimate of Standard Deviation	25.36228	
MVU Estimate of SE of Mean	4.154597	
95% H-UCL	30.06156	
95% Chebyshev (MVUE) UCL	31.51348	
97.5% Chebyshev (MVUE) UCL	39.34946	
99% Chebyshev (MVUE) UCL	54.74173	
Non-parametric Statistics		
95% CLT UCL	135.2113	
95% Adjusted-CLT UCL	186.3416	
95% Modified-t UCL	145.8913	
95% Jackknife UCL	137.916	
95% Chebyshev (Mean, Sd) UCL	265.6499	
97.5% Chebyshev (Mean, Sd) UCL	356.297	
99% Chebyshev (Mean, Sd) UCL	534.3556	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	134.8007	
95% Bootstrap-t UCL	2040.009	
95% Hall's Bootstrap UCL	1464.657	
95% Percentile Bootstrap UCL	151.4138	
95% BCA Bootstrap UCL	151.0345	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	534.3556	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

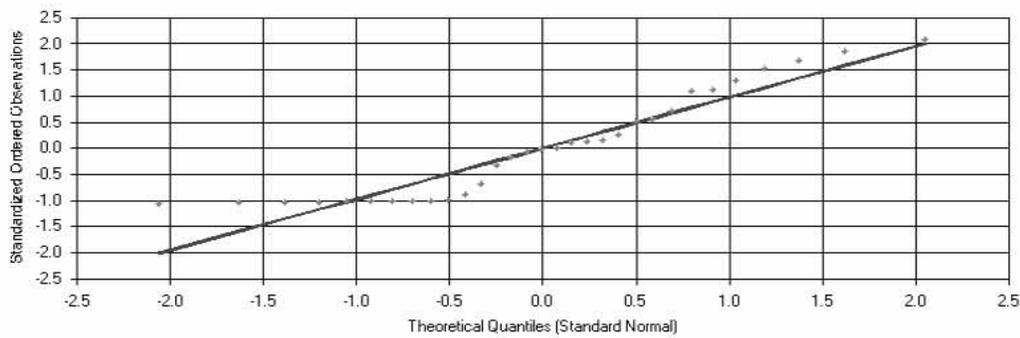
FDP Area Surface and Subsurface Soil  
Trichloroethene

Normal Q-Q Plot for Trichloroethene



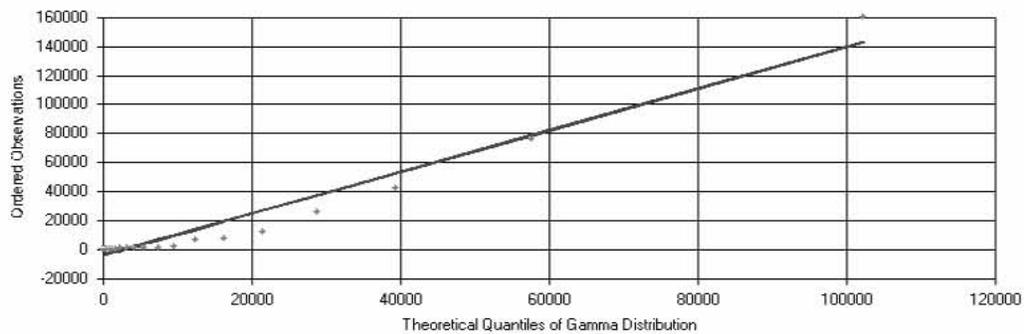
N = 31, Mean = 10766.2903, Sd = 31836.7505  
 Slope = 0.6258, Intercept = 0.0000, Correlation, R = 0.60916223  
 Shapiro-Wilk Statistic = 0.399, Critical Value(0.05) = 0.929, Data not Normal

Lognormal Q-Q Plot for Trichloroethene



N = 31, Mean = 5.1955, Sd = 3.3004  
 Slope = 0.9768, Intercept = 0.0000, Correlation, R = 0.95087960  
 Shapiro-Wilk Statistic = 0.884, Critical Value(0.05) = 0.929, Data not Lognormal

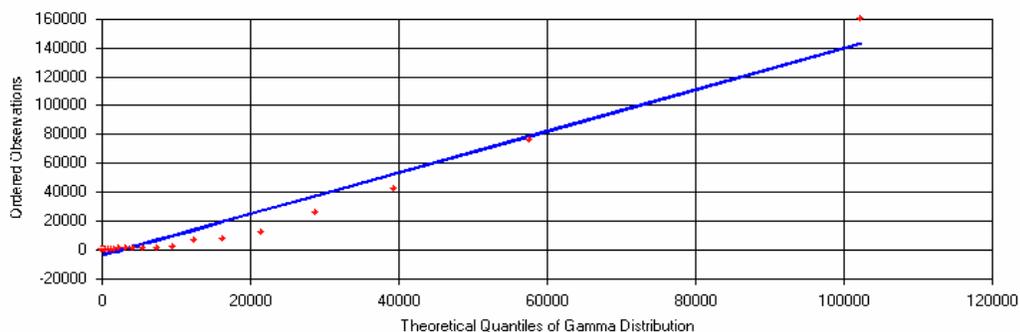
Gamma Q-Q Plot for Trichloroethene



N = 31, Mean = 10766.290, k hat = 0.1825  
 Slope = 1.438, Intercept = -3959.241, Correlation, R = 0.977  
 A-D Test Statistic = 2.612, Critical Value(0.05) = 0.907, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
Trichloroethene

Gamma Q-Q Plot for Trichloroethene



N = 31, Mean = 10766.290, k hat = 0.183  
Slope = 1.438, Intercept = -3959.241, Correlation, R = 0.977  
K-S Test Statistic = 0.246, Critical Value(0.05) = 0.175, Data not Gamma Distributed

Data File

Variable: Trichloroethene

Raw Statistics

Number of Observations	31
Number of Missing Data	0
Number of Valid Observations	31
Number of Distinct Observations	25
Minimum	5
Maximum	160000
Mean	10766.29
Standard Deviation	31836.75
Variance	1.01E+09
Coefficient of Variation	2.957077
Skewness	3.982021
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.399476	
Shapiro-Wilk 5% Critical Value	0.929	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	20471.31	

Gamma Statistics

k hat	0.182549	
k star (bias corrected)	0.186388	
Theta hat	58977.6	
Theta star	57762.74	
nu hat	11.31803	
nu star	11.55607	
5% Approximate Chi Square Value	4.935124	
Adjusted Level of Significance	0.0413	
Adjusted Chi Square Value	4.695643	
Anderson-Darling Test Statistic	2.612153	
Anderson-Darling 5% Critical Value	0.906988	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.246472	
Kolmogrov-Smirnov 5% Critical Value	0.175332	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level

FDP Area Surface and Subsurface Soil  
Trichloroethene

5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	25210.3	
95% Adjusted Gamma UCL	26496.04	
Lognormal Statistics		
Minimum of log data	1.609438	
Maximum of log data	11.98293	
Mean of log data	5.195541	
Standard Deviation of log data	3.300382	
Variance of log data	10.89252	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.884285	
Shapiro-Wilk 5% Critical Value	0.929	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	41848.02	
MLE Standard Deviation	9704010	
MLE Coefficient of Variation	231.8869	
MLE Skewness	12469614	
MLE Median	180.4657	
MLE 80% Quantile	2934.708	
MLE 90% Quantile	12538.15	
MLE 95% Quantile	41137.21	
MLE 99% Quantile	389347.7	
MVU Estimate of Median	151.2413	
MVU Estimate of Mean	18649.48	
MVU Estimate of Standard Deviation	326471.3	
MVU Estimate of SE of Mean	14916.43	
95% H-UCL	1442348	
95% Chebyshev (MVUE) UCL	83668.69	
97.5% Chebyshev (MVUE) UCL	111802.6	
99% Chebyshev (MVUE) UCL	167066.1	
Non-parametric Statistics		
95% CLT UCL	20171.64	
95% Adjusted-CLT UCL	24541.34	
95% Modified-t UCL	21152.89	
95% Jackknife UCL	20471.31	
95% Chebyshev (Mean, Sd) UCL	35690.69	
97.5% Chebyshev (Mean, Sd) UCL	46475.5	
99% Chebyshev (Mean, Sd) UCL	67660.16	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	20063.05	
95% Bootstrap-t UCL	41156.92	
95% Hall's Bootstrap UCL	52808.34	
95% Percentile Bootstrap UCL	20642.37	
95% BCA Bootstrap UCL	27337.84	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	67660.16	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

FDP Area Surface and Subsurface Soil  
2,3,7,8-TCDD

Normal Q-Q Plot for 2,3,7,8-TCDD (dioxin)



N = 18, Mean = 0.0000, Sd = 0.0002  
Slope = 0.5002, Intercept = 0.0000, Correlation, R = 0.48042079  
Shapiro-Wilk Statistic = 0.260, Critical Value(0.05) = 0.897, Data not Normal

Lognormal Q-Q Plot for 2,3,7,8-TCDD (dioxin)



N = 18, Mean = -13.8404, Sd = 2.1802  
Slope = 0.9169, Intercept = 0.0000, Correlation, R = 0.88066534  
Shapiro-Wilk Statistic = 0.815, Critical Value(0.05) = 0.897, Data not Lognormal

Gamma Q-Q Plot for 2,3,7,8-TCDD (dioxin)



N = 18, Mean = 0.000, k hat = 0.1937  
Slope = 1.934, Intercept = -0.000, Correlation, R = 0.862  
A-D Test Statistic = 4.135, Critical Value(0.05) = 0.887, Data not Gamma Distributed

Gamma Q-Q Plot for 2,3,7,8-TCDD (dioxin)



N = 18, Mean = 0.000, k hat = 0.194  
Slope = 1.934, Intercept = -0.000, Correlation, R = 0.862  
K-S Test Statistic = 0.441, Critical Value(0.05) = 0.226, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
2,3,7,8-TCDD

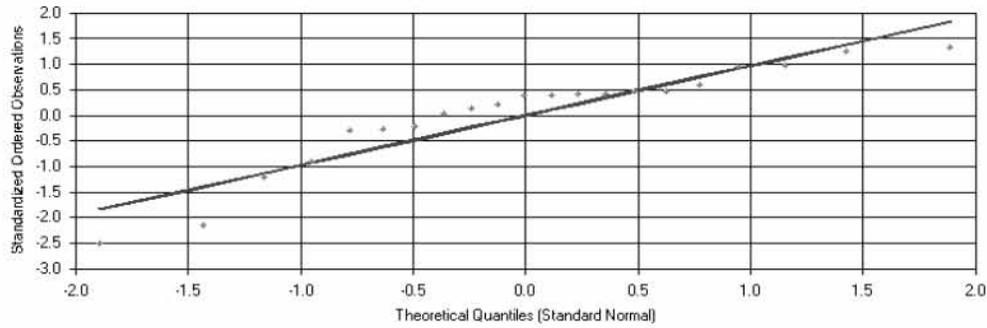
Data File		
Variable:	2,3,7,8-TCDD (dioxin)	
Raw Statistics		
Number of Observations	18	
Number of Missing Data	0	
Number of Valid Observations	18	
Number of Distinct Observations	18	
Minimum	9.06E-09	
Maximum	0.000775	
Mean	4.44E-05	
Standard Deviation	0.000182	
Variance	3.33E-08	
Coefficient of Variation	4.106912	
Skewness	4.241424	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.259693	
Shapiro-Wilk 5% Critical Value	0.897	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.000119	
Gamma Statistics		
k hat	0.193702	
k star (bias corrected)	0.198456	
Theta hat	0.000229	
Theta star	0.000224	
nu hat	6.973285	
nu star	7.144404	
5% Approximate Chi Square Value	2.249537	
Adjusted Level of Significance	0.03574	
Adjusted Chi Square Value	1.995109	
Anderson-Darling Test Statistic	4.135199	
Anderson-Darling 5% Critical Value	0.88664	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.441225	
Kolmogrov-Smirnov 5% Critical Value	0.225581	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.000141	
95% Adjusted Gamma UCL	0.000159	
Lognormal Statistics		
Minimum of log data	-18.5194	
Maximum of log data	-7.162648	
Mean of log data	-13.84044	
Standard Deviation of log data	2.180174	
Variance of log data	4.753161	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	8.15E-01	
Shapiro-Wilk 5% Critical Value	0.897	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.05E-05	
MLE Standard Deviation	0.000113	
MLE Coefficient of Variation	10.72148	
MLE Skewness	1264.601	
MLE Median	9.75E-07	

FDP Area Surface and Subsurface Soil  
2,3,7,8-TCDD

MLE 80% Quantile	6.16E-06	
MLE 90% Quantile	1.61E-05	
MLE 95% Quantile	3.52E-05	
MLE 99% Quantile	0.000155	
MVU Estimate of Median	8.54E-07	
MVU Estimate of Mean	7.46E-06	
MVU Estimate of Standard Deviation	2.85E-05	
MVU Estimate of SE of Mean	4.61E-06	
95% H-UCL	0.000125	
95% Chebyshev (MVUE) UCL	2.76E-05	
97.5% Chebyshev (MVUE) UCL	3.63E-05	
99% Chebyshev (MVUE) UCL	5.33E-05	
Non-parametric Statistics		
95% CLT UCL	0.000115	
95% Adjusted-CLT UCL	0.000161	
95% Modified-t UCL	0.000126	
95% Jackknife UCL	0.000119	
95% Chebyshev (Mean, Sd) UCL	0.000232	
97.5% Chebyshev (Mean, Sd) UCL	0.000313	
99% Chebyshev (Mean, Sd) UCL	0.000472	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.000114	
95% Bootstrap-t UCL	0.014696	
95% Hall's Bootstrap UCL	0.004368	
95% Percentile Bootstrap UCL	0.00013	
95% BCA Bootstrap UCL	0.000174	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.000472	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

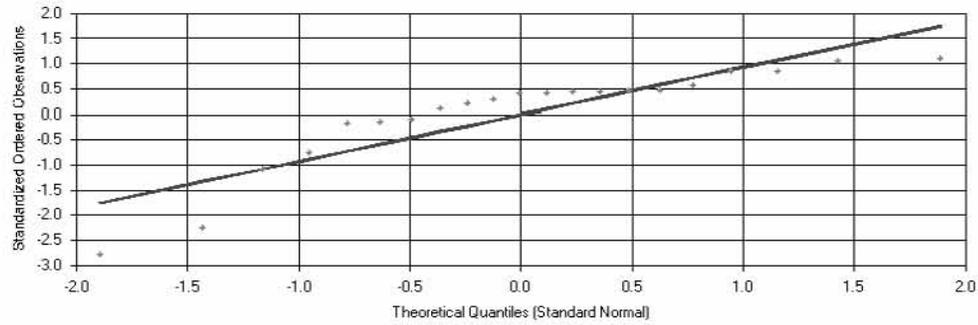
FDP Area Surface and Subsurface Soil  
Aluminum

Normal Q-Q Plot for Aluminum



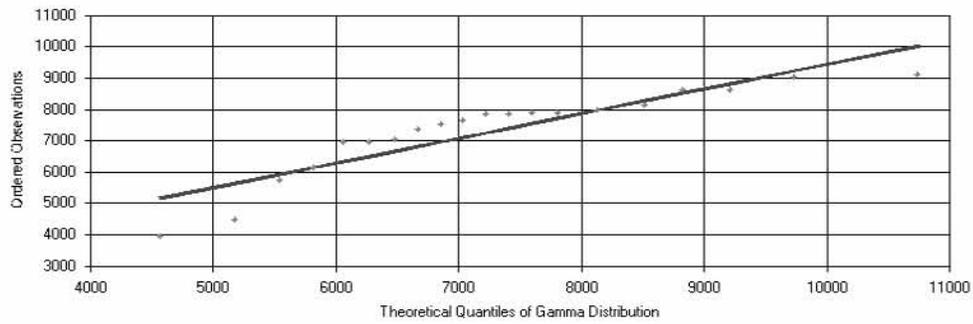
N = 21, Mean = 7339.5238, Sd = 1343.8842  
 Slope = 0.9721, Intercept = 0.0000, Correlation, R = 0.93771299  
 Shapiro-Wilk Statistic = 0.880, Critical Value(0.05) = 0.908, Data not Normal

Lognormal Q-Q Plot for Aluminum



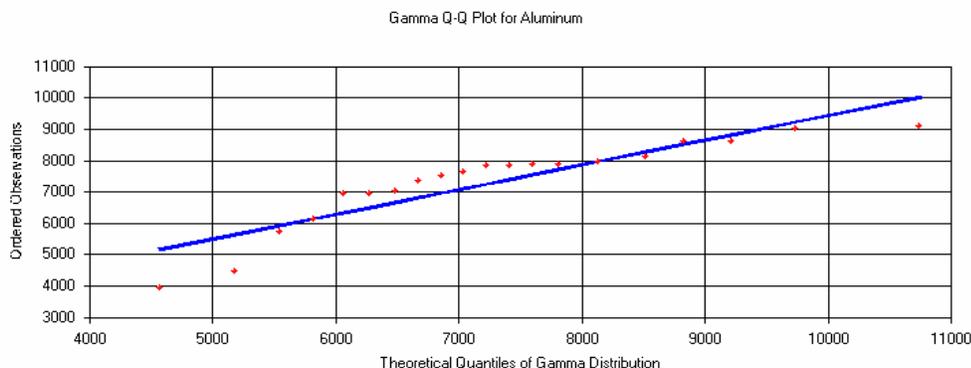
N = 21, Mean = 8.8814, Sd = 0.2145  
 Slope = 0.9281, Intercept = 0.0000, Correlation, R = 0.89526931  
 Shapiro-Wilk Statistic = 0.807, Critical Value(0.05) = 0.908, Data not Lognormal

Gamma Q-Q Plot for Aluminum



N = 21, Mean = 7339.524, k hat = 25.6497  
 Slope = 0.790, Intercept = 1550.060, Correlation, R = 0.911  
 A-D Test Statistic = 1.312, Critical Value(0.05) = 0.742, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
Aluminum



N = 21, Mean = 7339.524, k hat = 25.650  
Slope = 0.790, Intercept = 1550.060, Correlation, R = 0.911  
K-S Test Statistic = 0.216, Critical Value(0.05) = 0.189, Data not Gamma Distributed

Data File

Variable: Aluminum

Raw Statistics

Number of Observations 21  
Number of Missing Data 0  
Number of Valid Observations 21  
Number of Distinct Observations 20  
Minimum 3940  
Maximum 9090  
Mean 7339.524  
Standard Deviation 1343.884  
Variance 1806025  
Coefficient of Variation 0.183102  
Skewness -1.253472

Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic N/R Shapiro Wilk method yields a more accurate result  
Lilliefors 5% Critical Value N/R Shapiro Wilk method yields a more accurate result  
Shapiro-Wilk Test Statistic 0.880265  
Shapiro-Wilk 5% Critical Value 0.908  
5% Normality Test Result NOT NORMAL Data not normal at 5% significance level  
95% Student's-t UCL 7845.314

Gamma Statistics

k hat 25.6497  
k star (bias corrected) 22.0172  
Theta hat 286.1447  
Theta star 333.3541  
nu hat 1077.287  
nu star 924.7224  
5% Approximate Chi Square Value 855.1257  
Adjusted Level of Significance 0.0383  
Adjusted Chi Square Value 849.9955  
Anderson-Darling Test Statistic 1.311574  
Anderson-Darling 5% Critical Value 0.742273  
Anderson-Darling 5% Gamma Test Result NOT AD GAMMA Data not gamma distributed at 5% significance level

FDP Area Surface and Subsurface Soil  
Aluminum

Kolmogrov-Smirnov Test Statistic	0.216173	
Kolmogrov-Smirnov 5% Critical Value	0.189157	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	7936.87	
95% Adjusted Gamma UCL	7984.774	
Lognormal Statistics		
Minimum of log data	8.278936	
Maximum of log data	9.11493	
Mean of log data	8.881409	
Standard Deviation of log data	0.214491	
Variance of log data	0.046006	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.806577	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	7364.397	
MLE Standard Deviation	1597.94	
MLE Coefficient of Variation	0.216982	
MLE Skewness	0.661161	
MLE Median	7196.925	
MLE 80% Quantile	8627.017	
MLE 90% Quantile	9480.859	
MLE 95% Quantile	10241.95	
MLE 99% Quantile	11852.75	
MVU Estimate of Median	7189.046	
MVU Estimate of Mean	7356.174	
MVU Estimate of Standard Deviation	1589.635	
MVU Estimate of SE of Mean	346.8476	
95% H-UCL	8020.409	
95% Chebyshev (MVUE) UCL	8868.048	
97.5% Chebyshev (MVUE) UCL	9522.236	
99% Chebyshev (MVUE) UCL	10807.26	
Non-parametric Statistics		
95% CLT UCL	7821.893	
95% Adjusted-CLT UCL	7736.182	
95% Modified-t UCL	7831.945	
95% Jackknife UCL	7845.314	
95% Chebyshev (Mean, Sd) UCL	8617.813	
97.5% Chebyshev (Mean, Sd) UCL	9170.929	
99% Chebyshev (Mean, Sd) UCL	10257.42	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	7823.22	
95% Bootstrap-t UCL	7749.896	
95% Hall's Bootstrap UCL	7739.406	
95% Percentile Bootstrap UCL	7771.905	
95% BCA Bootstrap UCL	7730	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	7845.314	95% Student's-t UCL
2nd Recommended UCL	7831.945	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	

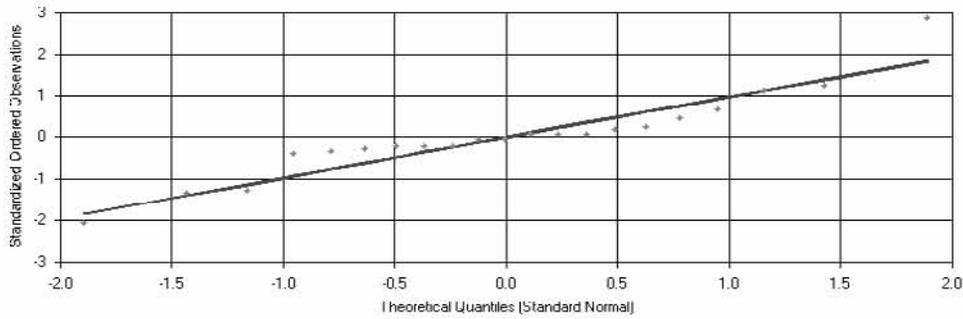
FDP Area Surface and Subsurface Soil  
Aluminum

Alternative UCL

NONE

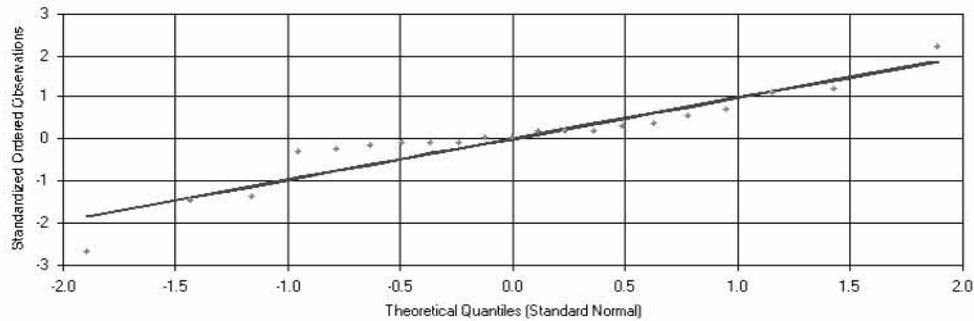
FDP Area Surface and Subsurface Soil  
Arsenic

Normal Q-Q Plot for Arsenic



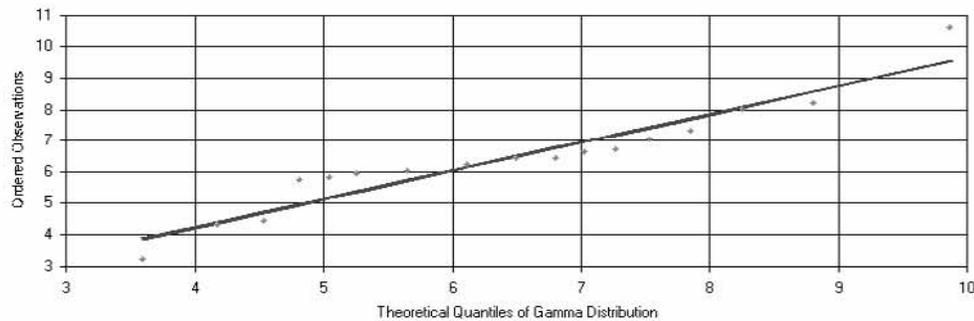
N = 21, Mean = 6.3476, Sd = 1.4999  
 Slope = 0.9760, Intercept = 0.0000, Correlation, R = 0.94149054  
 Shapiro-Wilk Statistic = 0.907, Critical Value(0.05) = 0.908, Data not Normal

Lognormal Q-Q Plot for Arsenic



N = 21, Mean = 1.8208, Sd = 0.2440  
 Slope = 0.9752, Intercept = 0.0000, Correlation, R = 0.94076011  
 Shapiro-Wilk Statistic = 0.906, Critical Value(0.05) = 0.908, Data not Lognormal

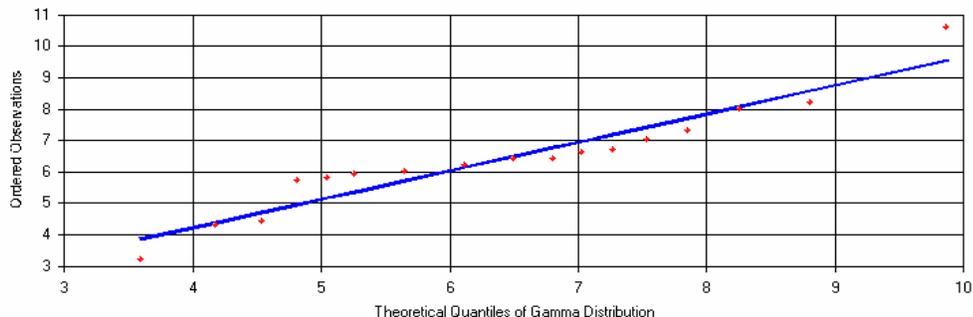
Gamma Q-Q Plot for Arsenic



N = 21, Mean = 6.348, k hat = 18.5100  
 Slope = 0.907, Intercept = 0.600, Correlation, R = 0.953  
 A-D Test Statistic = 0.864, Critical Value(0.05) = 0.743, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
Arsenic

Gamma Q-Q Plot for Arsenic



N = 21, Mean = 6.348, k hat = 18.510  
Slope = 0.907, Intercept = 0.600, Correlation, R = 0.953  
K-S Test Statistic = 0.210, Critical Value(0.05) = 0.189, Data not Gamma Distributed

Data File

Variable: Arsenic

Raw Statistics

Number of Observations 21  
Number of Missing Data 0  
Number of Valid Observations 21  
Number of Distinct Observations 17  
Minimum 3.2  
Maximum 10.6  
Mean 6.347619  
Standard Deviation 1.499873  
Variance 2.249619  
Coefficient of Variation 0.236289  
Skewness 0.673944  
Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic N/R Shapiro Wilk method yields a more accurate result  
Lilliefors 5% Critical Value N/R Shapiro Wilk method yields a more accurate result  
Shapiro-Wilk Test Statistic 0.907383  
Shapiro-Wilk 5% Critical Value 0.908  
5% Normality Test Result NOT NORMAL Data not normal at 5% significance level  
95% Student's-t UCL 6.912118

Gamma Statistics

k hat 18.51002  
k star (bias corrected) 15.89748  
Theta hat 0.342929  
Theta star 0.399285  
nu hat 777.421  
nu star 667.6942  
5% Approximate Chi Square Value 608.7324  
Adjusted Level of Significance 0.0383  
Adjusted Chi Square Value 604.416  
Anderson-Darling Test Statistic 0.864409  
Anderson-Darling 5% Critical Value 0.742536  
Anderson-Darling 5% Gamma Test Result NOT AD GAMMA Data not gamma distributed at 5% significance level  
Kolmogrov-Smirnov Test Statistic 0.210386

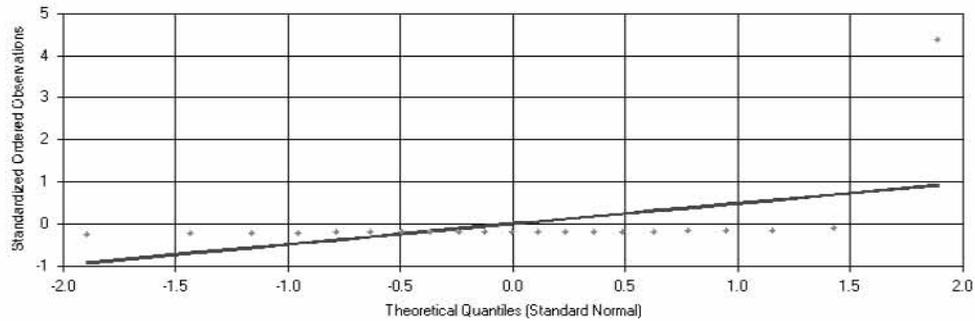
FDP Area Surface and Subsurface Soil  
Arsenic

Kolmogrov-Smirnov 5% Critical Value	0.189238	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	6.962449	
95% Adjusted Gamma UCL	7.012171	
Lognormal Statistics		
Minimum of log data	1.163151	
Maximum of log data	2.360854	
Mean of log data	1.820824	
Standard Deviation of log data	0.244028	
Variance of log data	0.05955	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.90558	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	6.36363	
MLE Standard Deviation	1.57631	
MLE Coefficient of Variation	0.247706	
MLE Skewness	0.758317	
MLE Median	6.176948	
MLE 80% Quantile	7.591488	
MLE 90% Quantile	8.451973	
MLE 95% Quantile	9.228069	
MLE 99% Quantile	10.8964	
MVU Estimate of Median	6.168195	
MVU Estimate of Mean	6.354383	
MVU Estimate of Standard Deviation	1.565665	
MVU Estimate of SE of Mean	0.341592	
95% H-UCL	7.019121	
95% Chebyshev (MVUE) UCL	7.843346	
97.5% Chebyshev (MVUE) UCL	8.487622	
99% Chebyshev (MVUE) UCL	9.753177	
Non-parametric Statistics		
95% CLT UCL	6.885978	
95% Adjusted-CLT UCL	6.937411	
95% Modified-t UCL	6.92014	
95% Jackknife UCL	6.912118	
95% Chebyshev (Mean, Sd) UCL	7.774283	
97.5% Chebyshev (Mean, Sd) UCL	8.391601	
99% Chebyshev (Mean, Sd) UCL	9.604204	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	6.877813	
95% Bootstrap-t UCL	6.940923	
95% Hall's Bootstrap UCL	7.150751	
95% Percentile Bootstrap UCL	6.866667	
95% BCA Bootstrap UCL	6.928571	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6.912118	95% Student's-t UCL
2nd Recommended UCL	6.92014	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

FDP Area Surface and Subsurface Soil  
Arsenic

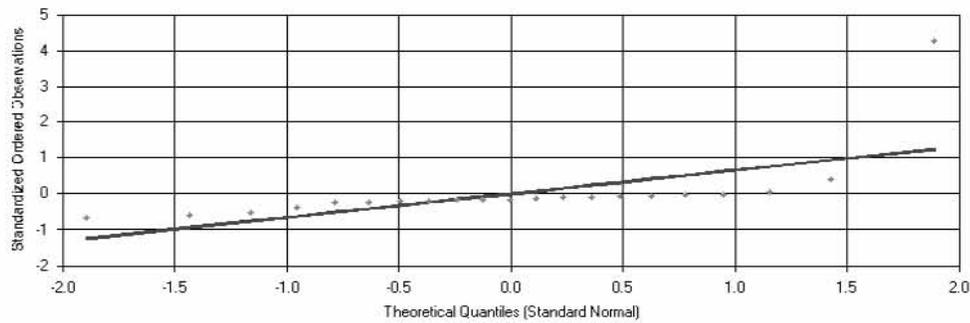
FDP Area Surface and Subsurface Soil  
Copper

Normal Q-Q Plot for Copper



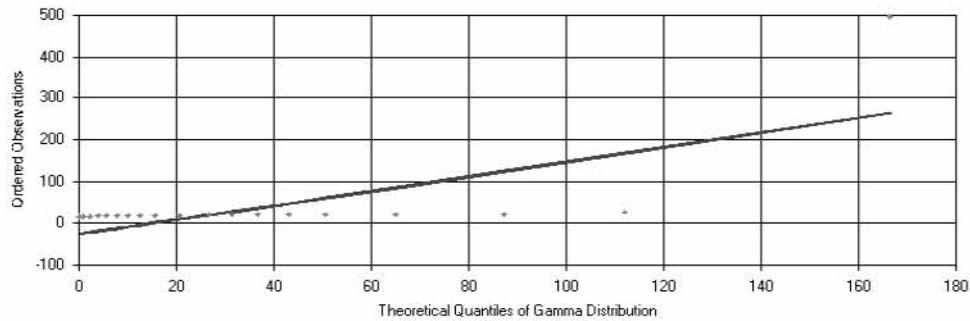
N = 21, Mean = 38.4095, Sd = 103.9693  
Slope = 0.4884, Intercept = 0.0000, Correlation, R = 0.47116615  
Shapiro-Wilk Statistic = 0.248, Critical Value(0.05) = 0.908, Data not Normal

Lognormal Q-Q Plot for Copper



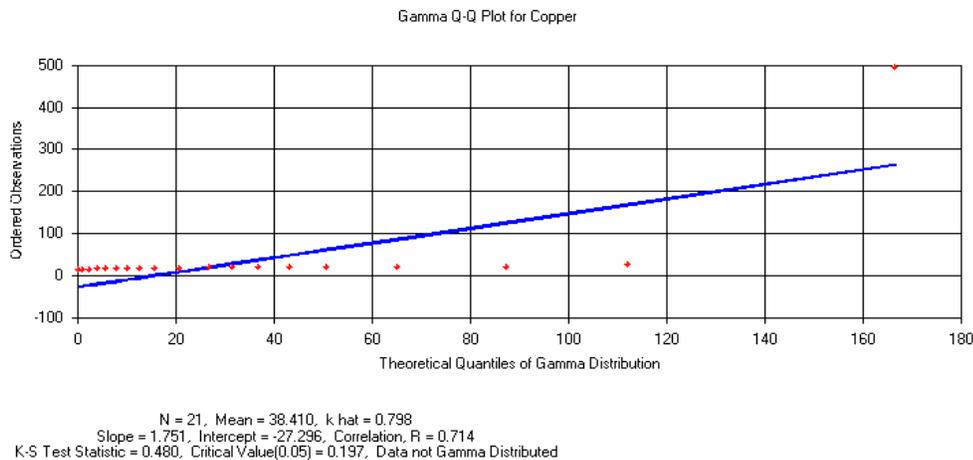
N = 21, Mean = 2.9042, Sd = 0.7760  
Slope = 0.6558, Intercept = 0.0000, Correlation, R = 0.63264813  
Shapiro-Wilk Statistic = 0.430, Critical Value(0.05) = 0.908, Data not Lognormal

Gamma Q-Q Plot for Copper



N = 21, Mean = 38.410, k hat = 0.7979  
Slope = 1.751, Intercept = -27.296, Correlation, R = 0.714  
A-D Test Statistic = 6.230, Critical Value(0.05) = 0.780, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
Copper



Data File

Variable: Copper

Raw Statistics

Number of Observations	21
Number of Missing Data	0
Number of Valid Observations	21
Number of Distinct Observations	19
Minimum	10.5
Maximum	492
Mean	38.40952
Standard Deviation	103.9693
Variance	10809.61
Coefficient of Variation	2.706862
Skewness	4.576945
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.247725	
Shapiro-Wilk 5% Critical Value	0.908	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	77.53985	

Gamma Statistics

k hat	0.797886	
k star (bias corrected)	0.715648	
Theta hat	48.13913	
Theta star	53.67097	
nu hat	33.5112	
nu star	30.05722	
5% Approximate Chi Square Value	18.53579	
Adjusted Level of Significance	0.0383	
Adjusted Chi Square Value	17.84097	
Anderson-Darling Test Statistic	6.229735	
Anderson-Darling 5% Critical Value	0.780292	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.479668	

FDP Area Surface and Subsurface Soil  
Copper

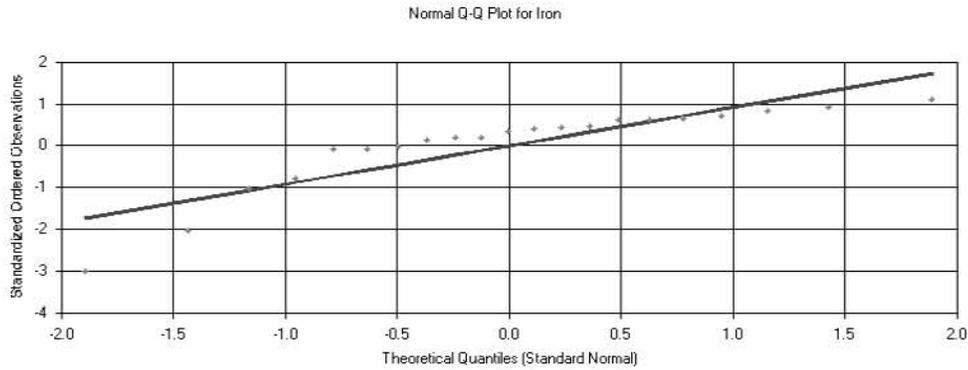
Kolmogrov-Smirnov 5% Critical Value	0.196531	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	62.28403	
95% Adjusted Gamma UCL	64.70967	
Lognormal Statistics		
Minimum of log data	2.351375	
Maximum of log data	6.198479	
Mean of log data	2.904215	
Standard Deviation of log data	0.775983	
Variance of log data	0.602149	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.430412	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	24.66264	
MLE Standard Deviation	22.41506	
MLE Coefficient of Variation	0.908867	
MLE Skewness	3.477361	
MLE Median	18.25091	
MLE 80% Quantile	35.1604	
MLE 90% Quantile	49.46933	
MLE 95% Quantile	65.41207	
MLE 99% Quantile	110.9579	
MVU Estimate of Median	17.99095	
MVU Estimate of Mean	24.22366	
MVU Estimate of Standard Deviation	20.67146	
MVU Estimate of SE of Mean	4.439314	
95% H-UCL	36.62007	
95% Chebyshev (MVUE) UCL	43.57418	
97.5% Chebyshev (MVUE) UCL	51.94717	
99% Chebyshev (MVUE) UCL	68.39428	
Non-parametric Statistics		
95% CLT UCL	75.72789	
95% Adjusted-CLT UCL	99.94051	
95% Modified-t UCL	81.31653	
95% Jackknife UCL	77.53985	
95% Chebyshev (Mean, Sd) UCL	137.304	
97.5% Chebyshev (Mean, Sd) UCL	180.0958	
99% Chebyshev (Mean, Sd) UCL	264.1518	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	74.76656	
95% Bootstrap-t UCL	1197.51	
95% Hall's Bootstrap UCL	675.5026	
95% Percentile Bootstrap UCL	83.53333	
95% BCA Bootstrap UCL	106.6952	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	137.304	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	

FDP Area Surface and Subsurface Soil  
Copper

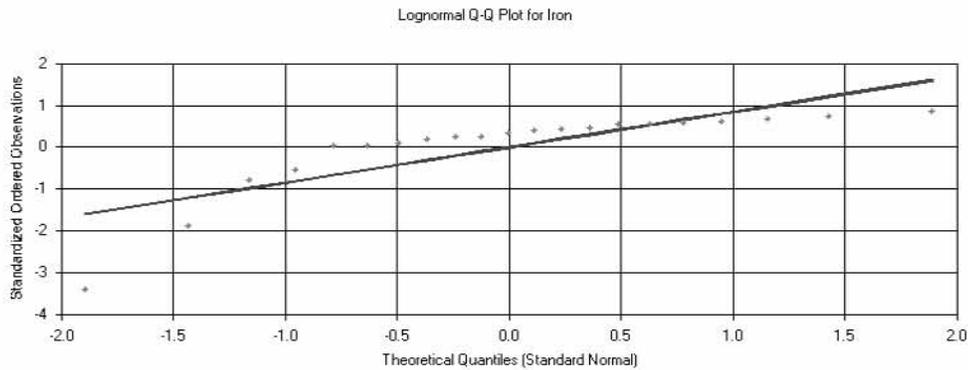
Alternative UCL

NONE

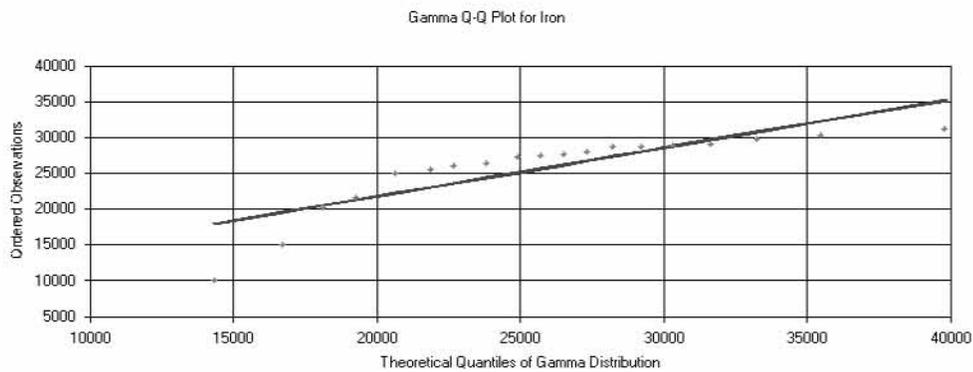
FDP Area Surface and Subsurface Soil  
Iron



N = 21, Mean = 25497.6190, Sd = 5146.9038  
 Slope = 0.9186, Intercept = 0.0000, Correlation, R = 0.88607993  
 Shapiro-Wilk Statistic = 0.794, Critical Value(0.05) = 0.908, Data not Normal



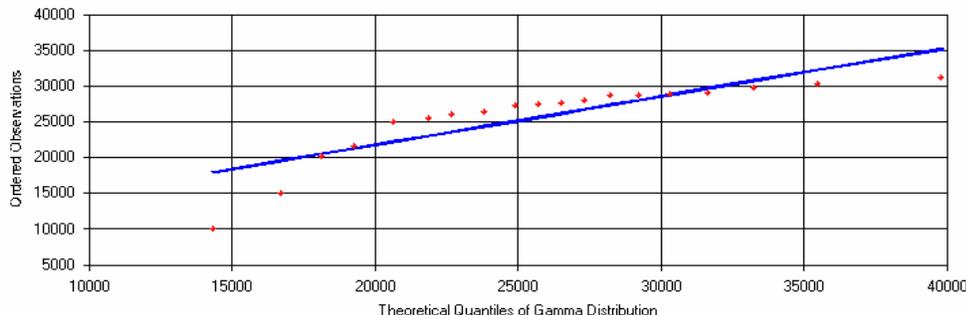
N = 21, Mean = 10.1185, Sd = 0.2664  
 Slope = 0.8469, Intercept = 0.0000, Correlation, R = 0.81695749  
 Shapiro-Wilk Statistic = 0.683, Critical Value(0.05) = 0.908, Data not Lognormal



N = 21, Mean = 25497.619, k hat = 18.1287  
 Slope = 0.678, Intercept = 8237.310, Correlation, R = 0.843  
 A-D Test Statistic = 2.118, Critical Value(0.05) = 0.743, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
Iron

Gamma Q-Q Plot for Iron



N = 21, Mean = 25497.619, k hat = 18.129  
Slope = 0.678, Intercept = 8237.310, Correlation, R = 0.843  
K-S Test Statistic = 0.301, Critical Value(0.05) = 0.189, Data not Gamma Distributed

Data File

Variable: Iron

Raw Statistics

Number of Observations 21  
Number of Missing Data 0  
Number of Valid Observations 21  
Number of Distinct Observations 19  
Minimum 9950  
Maximum 31100  
Mean 25497.62  
Standard Deviation 5146.904  
Variance 26490619  
Coefficient of Variation 0.201858  
Skewness -1.894933  
Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic N/R Shapiro Wilk method yields a more accurate result  
Lilliefors 5% Critical Value N/R Shapiro Wilk method yields a more accurate result  
Shapiro-Wilk Test Statistic 0.794426  
Shapiro-Wilk 5% Critical Value 0.908  
5% Normality Test Result NOT NORMAL Data not normal at 5% significance level  
95% Student's-t UCL 27434.73

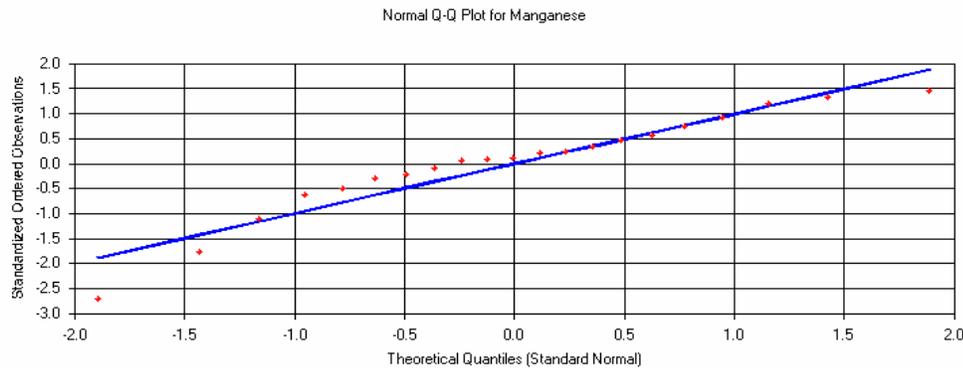
Gamma Statistics

k hat 18.12869  
k star (bias corrected) 15.57062  
Theta hat 1406.479  
Theta star 1637.546  
nu hat 761.405  
nu star 653.9662  
5% Approximate Chi Square Value 595.6259  
Adjusted Level of Significance 0.0383  
Adjusted Chi Square Value 591.357  
Anderson-Darling Test Statistic 2.118108  
Anderson-Darling 5% Critical Value 0.742541  
Anderson-Darling 5% Gamma Test Result NOT AD GAMMA Data not gamma distributed at 5% significance level  
Kolmogrov-Smirnov Test Statistic 0.300731  
Kolmogrov-Smirnov 5% Critical Value 0.189246

FDP Area Surface and Subsurface Soil  
Iron

Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	27995.06	
95% Adjusted Gamma UCL	28197.15	
Lognormal Statistics		
Minimum of log data	9.205328	
Maximum of log data	10.34496	
Mean of log data	10.11851	
Standard Deviation of log data	0.266367	
Variance of log data	0.070951	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.683192	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	25693.21	
MLE Standard Deviation	6967.038	
MLE Coefficient of Variation	0.271163	
MLE Skewness	0.833426	
MLE Median	24797.7	
MLE 80% Quantile	31057.22	
MLE 90% Quantile	34919.06	
MLE 95% Quantile	38433.33	
MLE 99% Quantile	46077.33	
MVU Estimate of Median	24755.84	
MVU Estimate of Mean	25648.52	
MVU Estimate of Standard Deviation	6910.797	
MVU Estimate of SE of Mean	1507.658	
95% H-UCL	28619.11	
95% Chebyshev (MVUE) UCL	32220.24	
97.5% Chebyshev (MVUE) UCL	35063.84	
99% Chebyshev (MVUE) UCL	40649.52	
Non-parametric Statistics		
95% CLT UCL	27345.03	
95% Adjusted-CLT UCL	26848.78	
95% Modified-t UCL	27357.33	
95% Jackknife UCL	27434.73	
95% Chebyshev (Mean, Sd) UCL	30393.3	
97.5% Chebyshev (Mean, Sd) UCL	32511.67	
99% Chebyshev (Mean, Sd) UCL	36672.79	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	27302.83	
95% Bootstrap-t UCL	27099.4	
95% Hall's Bootstrap UCL	26952.92	
95% Percentile Bootstrap UCL	27123.81	
95% BCA Bootstrap UCL	26969.05	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	27434.73	95% Student's-t UCL
2nd Recommended UCL	27357.33	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

FDP Area Surface and Subsurface Soil  
Manganese



N = 21, Mean = 747.0476, Sd = 190.0925  
 Slope = 0.9954, Intercept = 0.0000, Correlation, R = 0.96023631  
 Shapiro-Wilk Statistic = 0.928, Critical Value(0.05) = 0.908, Data are Normal

Data File

Variable: Manganese

Raw Statistics

Number of Observations	21
Number of Missing Data	0
Number of Valid Observations	21
Number of Distinct Observations	21
Minimum	228
Maximum	1020
Mean	747.0476
Standard Deviation	190.0925
Variance	36135.15
Coefficient of Variation	0.254458
Skewness	-1.08422
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.927537	
Shapiro-Wilk 5% Critical Value	0.908	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	818.5916	

Gamma Statistics

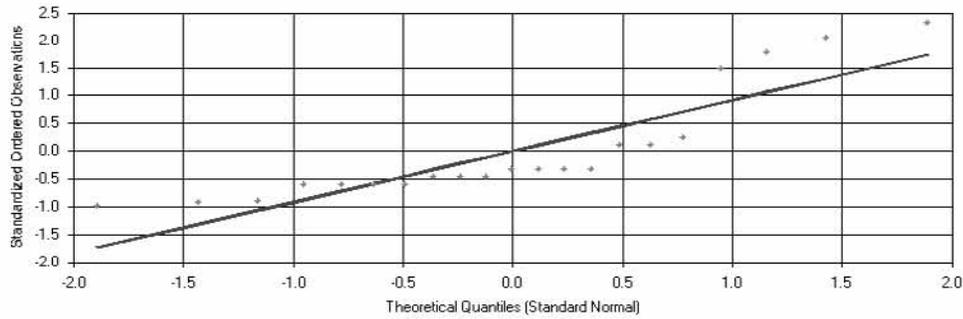
k hat	11.55567	
k star (bias corrected)	9.936606	
Theta hat	64.64771	
Theta star	75.18137	
nu hat	485.3381	
nu star	417.3374	
5% Approximate Chi Square Value	370.9707	
Adjusted Level of Significance	0.0383	
Adjusted Chi Square Value	367.6179	
Anderson-Darling Test Statistic	1.039141	
Anderson-Darling 5% Critical Value	0.742613	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.18781	
Kolmogrov-Smirnov 5% Critical Value	0.18937	

FDP Area Surface and Subsurface Soil  
Manganese

Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% significance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	840.4192	
95% Adjusted Gamma UCL	848.0843	
Lognormal Statistics		
Minimum of log data	5.429346	
Maximum of log data	6.927558	
Mean of log data	6.572237	
Standard Deviation of log data	0.337161	
Variance of log data	0.113677	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.780447	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	756.782	
MLE Standard Deviation	262.5832	
MLE Coefficient of Variation	0.346973	
MLE Skewness	1.082693	
MLE Median	714.9671	
MLE 80% Quantile	950.6418	
MLE 90% Quantile	1102.668	
MLE 95% Quantile	1244.969	
MLE 99% Quantile	1566.301	
MVU Estimate of Median	713.0343	
MVU Estimate of Mean	754.6365	
MVU Estimate of Standard Deviation	259.1466	
MVU Estimate of SE of Mean	56.51236	
95% H-UCL	870.6123	
95% Chebyshev (MVUE) UCL	1000.968	
97.5% Chebyshev (MVUE) UCL	1107.556	
99% Chebyshev (MVUE) UCL	1316.927	
Non-parametric Statistics		
95% CLT UCL	815.2787	
95% Adjusted-CLT UCL	804.7919	
95% Modified-t UCL	816.9559	
95% Jackknife UCL	818.5916	
95% Chebyshev (Mean, Sd) UCL	927.8616	
97.5% Chebyshev (Mean, Sd) UCL	1006.1	
99% Chebyshev (Mean, Sd) UCL	1159.784	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	815.064	
95% Bootstrap-t UCL	810.6753	
95% Hall's Bootstrap UCL	808.0436	
95% Percentile Bootstrap UCL	809.381	
95% BCA Bootstrap UCL	806.9524	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	818.5916	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

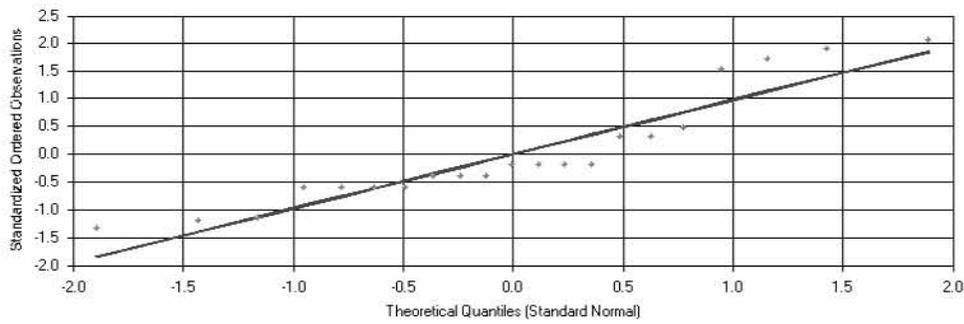
FDP Area Surface and Subsurface Soil  
Thallium

Normal Q-Q Plot for Thallium



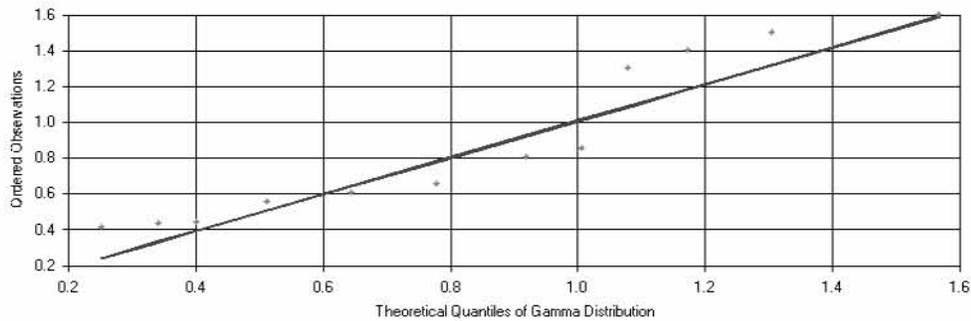
N = 21, Mean = 0.7683, Sd = 0.3603  
 Slope = 0.9165, Intercept = 0.0000, Correlation, R = 0.88410114  
 Shapiro-Wilk Statistic = 0.777, Critical Value(0.05) = 0.908, Data not Normal

Lognormal Q-Q Plot for Thallium



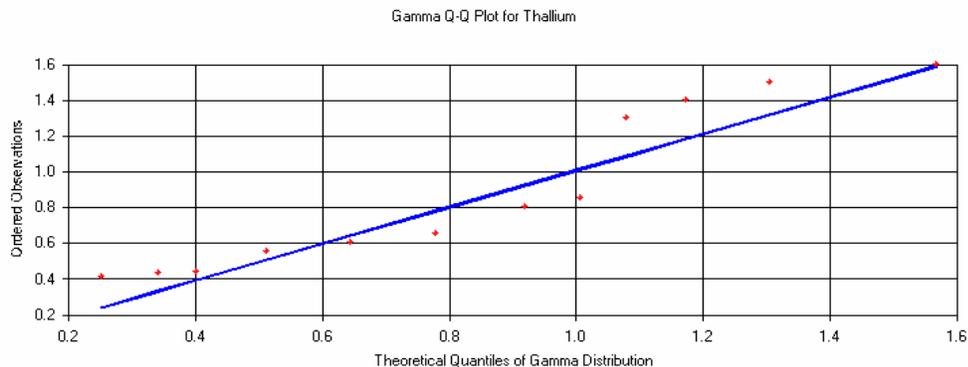
N = 21, Mean = -0.3489, Sd = 0.4034  
 Slope = 0.9747, Intercept = 0.0000, Correlation, R = 0.94027953  
 Shapiro-Wilk Statistic = 0.877, Critical Value(0.05) = 0.908, Data not Lognormal

Gamma Q-Q Plot for Thallium



N = 21, Mean = 0.768, k hat = 6.0202  
 Slope = 1.025, Intercept = -0.016, Correlation, R = 0.940  
 A-D Test Statistic = 1.423, Critical Value(0.05) = 0.745, Data not Gamma Distributed

FDP Area Surface and Subsurface Soil  
Thallium



N = 21, Mean = 0.768, k hat = 6.020  
 Slope = 1.025, Intercept = -0.016, Correlation, R = 0.940  
 K-S Test Statistic = 0.270, Critical Value(0.05) = 0.190, Data not Gamma Distributed

Data File

Variable: Thallium

Raw Statistics

Number of Observations 21  
 Number of Missing Data 0  
 Number of Valid Observations 21  
 Number of Distinct Observations 12  
 Minimum 0.41  
 Maximum 1.6  
 Mean 0.768333  
 Standard Deviation 0.360303  
 Variance 0.129818  
 Coefficient of Variation 0.468941  
 Skewness 1.404613  
 Too Few Distinct Observations? NO

Normal Statistics

Lilliefors Test Statistic N/R Shapiro Wilk method yields a more accurate result  
 Lilliefors 5% Critical Value N/R Shapiro Wilk method yields a more accurate result  
 Shapiro-Wilk Test Statistic 0.777141  
 Shapiro-Wilk 5% Critical Value 0.908  
 5% Normality Test Result NOT NORMAL Data not normal at 5% significance level  
 95% Student's-t UCL 0.903939

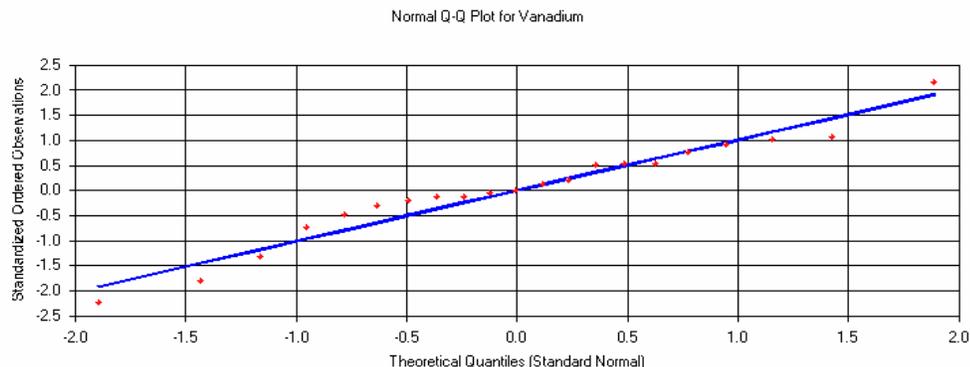
Gamma Statistics

k hat 6.020202  
 k star (bias corrected) 5.191919  
 Theta hat 0.127626  
 Theta star 0.147986  
 nu hat 252.8485  
 nu star 218.0606  
 5% Approximate Chi Square Value 184.8776  
 Adjusted Level of Significance 0.0383  
 Adjusted Chi Square Value 182.5328  
 Anderson-Darling Test Statistic 1.423308  
 Anderson-Darling 5% Critical Value 0.744763  
 Anderson-Darling 5% Gamma Test Result NOT AD GAMMA Data not gamma distributed at 5% significance level  
 Kolmogrov-Smirnov Test Statistic 0.269657  
 Kolmogrov-Smirnov 5% Critical Value 0.18987

FDP Area Surface and Subsurface Soil  
Thallium

Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.906239	
95% Adjusted Gamma UCL	0.91788	
Lognormal Statistics		
Minimum of log data	-0.891598	
Maximum of log data	0.470004	
Mean of log data	-0.348878	
Standard Deviation of log data	0.403357	
Variance of log data	0.162697	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.876504	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.765267	
MLE Standard Deviation	0.321667	
MLE Coefficient of Variation	0.420333	
MLE Skewness	1.335264	
MLE Median	0.705479	
MLE 80% Quantile	0.991991	
MLE 90% Quantile	1.184636	
MLE 95% Quantile	1.369771	
MLE 99% Quantile	1.80278	
MVU Estimate of Median	0.702751	
MVU Estimate of Mean	0.762103	
MVU Estimate of Standard Deviation	0.315562	
MVU Estimate of SE of Mean	0.068768	
95% H-UCL	0.908941	
95% Chebyshev (MVUE) UCL	1.061855	
97.5% Chebyshev (MVUE) UCL	1.191558	
99% Chebyshev (MVUE) UCL	1.446335	
Non-parametric Statistics		
95% CLT UCL	0.897659	
95% Adjusted-CLT UCL	0.92341	
95% Modified-t UCL	0.907955	
95% Jackknife UCL	0.903939	
95% Chebyshev (Mean, Sd) UCL	1.11105	
97.5% Chebyshev (Mean, Sd) UCL	1.259344	
99% Chebyshev (Mean, Sd) UCL	1.550638	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.891944	
95% Bootstrap-t UCL	0.949036	
95% Hall's Bootstrap UCL	0.904747	
95% Percentile Bootstrap UCL	0.901667	
95% BCA Bootstrap UCL	0.916429	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.903939	95% Student's-t UCL
2nd Recommended UCL	0.907955	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

FDP Area Surface and Subsurface Soil  
Vanadium



N = 21, Mean = 17.2714, Sd = 2.9641  
Slope = 1.0131, Intercept = 0.0000, Correlation, R = 0.97725425  
Shapiro-Wilk Statistic = 0.963, Critical Value(0.05) = 0.908, Data are Normal

Data File

Variable:	Vanadium
Raw Statistics	
Number of Observations	21
Number of Missing Data	0
Number of Valid Observations	21
Number of Distinct Observations	19
Minimum	10.6
Maximum	23.6
Mean	17.27143
Standard Deviation	2.964143
Variance	8.786143
Coefficient of Variation	0.171621
Skewness	-0.386647
Too Few Distinct Observations?	NO
Normal Statistics	
Lilliefors Test Statistic	N/R
Lilliefors 5% Critical Value	N/R
Shapiro-Wilk Test Statistic	0.963444
Shapiro-Wilk 5% Critical Value	0.908
5% Normality Test Result	NORMAL
95% Student's-t UCL	18.38703
Gamma Statistics	
k hat	32.70752
k star (bias corrected)	28.06677
Theta hat	0.528057
Theta star	0.615369
nu hat	1373.716
nu star	1178.804
5% Approximate Chi Square Value	1100.074
Adjusted Level of Significance	0.0383
Adjusted Chi Square Value	1094.245
Anderson-Darling Test Statistic	0.541652
Anderson-Darling 5% Critical Value	0.741965
Anderson-Darling 5% Gamma Test Result	AD GAMMA
Kolmogrov-Smirnov Test Statistic	0.155754
Kolmogrov-Smirnov 5% Critical Value	0.189091
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA

Shapiro Wilk method yields a more accurate result  
Shapiro Wilk method yields a more accurate result

Data are normal at 5% significance level

Data follow gamma distribution at 5% significance level.

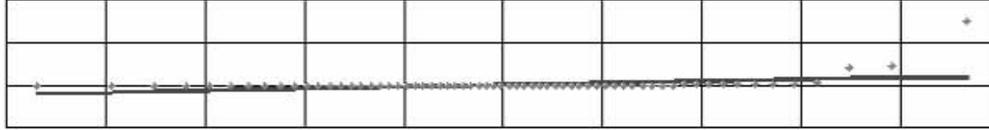
Data follow gamma distribution at 5% significance level

FDP Area Surface and Subsurface Soil  
Vanadium

5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% significance level
95% Approximate Gamma UCL	18.5075	
95% Adjusted Gamma UCL	18.60609	
Lognormal Statistics		
Minimum of log data	2.360854	
Maximum of log data	3.161247	
Mean of log data	2.833689	
Standard Deviation of log data	0.184564	
Variance of log data	0.034064	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.924083	
Shapiro-Wilk 5% Critical Value	0.908	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	17.30024	
MLE Standard Deviation	3.220387	
MLE Coefficient of Variation	0.186147	
MLE Skewness	0.564891	
MLE Median	17.00808	
MLE 80% Quantile	19.87863	
MLE 90% Quantile	21.56029	
MLE 95% Quantile	23.04149	
MLE 99% Quantile	26.1274	
MVU Estimate of Median	16.99429	
MVU Estimate of Mean	17.28601	
MVU Estimate of Standard Deviation	3.208036	
MVU Estimate of SE of Mean	0.700007	
95% H-UCL	18.60559	
95% Chebyshev (MVUE) UCL	20.33727	
97.5% Chebyshev (MVUE) UCL	21.65756	
99% Chebyshev (MVUE) UCL	24.251	
Non-parametric Statistics		
95% CLT UCL	18.33537	
95% Adjusted-CLT UCL	18.27705	
95% Modified-t UCL	18.37793	
95% Jackknife UCL	18.38703	
95% Chebyshev (Mean, Sd) UCL	20.09089	
97.5% Chebyshev (Mean, Sd) UCL	21.31087	
99% Chebyshev (Mean, Sd) UCL	23.7073	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	18.32931	
95% Bootstrap-t UCL	18.3258	
95% Hall's Bootstrap UCL	18.37189	
95% Percentile Bootstrap UCL	18.28571	
95% BCA Bootstrap UCL	18.19048	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
<b>1st Recommended UCL</b>	<b>18.38703</b>	<b>95% Student's-t UCL</b>
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

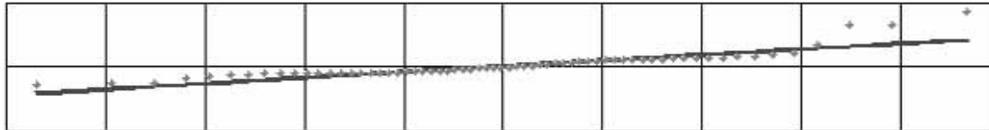
OABG Area Surface and Subsurface Soil  
Indeno(1,2,3-cd)pyrene

Normal Q-Q Plot for Indeno(1,2,3-cd)pyrene



N = 65, Mean = 560.6769, Sd = 2370.4113  
Slope = 0.4465, Intercept = 0.0000, Correlation, R = 0.43979340  
Lilliefors Statistic = 0.467, Critical Value(0.05) = 0.110, Data not Normal

Lognormal Q-Q Plot for Indeno(1,2,3-cd)pyrene



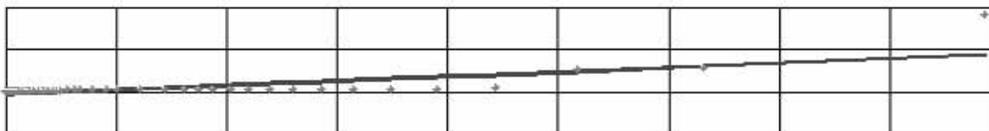
N = 65, Mean = 4.7874, Sd = 1.1828  
Slope = 0.9053, Intercept = 0.0000, Correlation, R = 0.89164449  
Lilliefors Statistic = 0.162, Critical Value(0.05) = 0.110, Data not Lognormal

Gamma Q-Q Plot for Indeno(1,2,3-cd)pyrene



N = 65, Mean = 560.677, k hat = 0.4230  
Slope = 2.166, Intercept = -639.318, Correlation, R = 0.762  
A-D Test Statistic = 11.971, Critical Value(0.05) = 0.835, Data not Gamma Distributed

Gamma Q-Q Plot for Indeno(1,2,3-cd)pyrene



N = 65, Mean = 560.677, k hat = 0.423  
Slope = 2.166, Intercept = -639.318, Correlation, R = 0.762  
K-S Test Statistic = 0.365, Critical Value(0.05) = 0.118, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
 Indeno(1,2,3-cd)pyrene

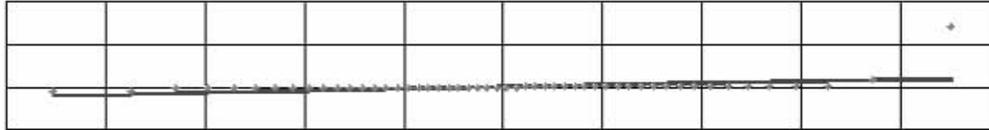
Data File		
Variable:	Indeno(1,2,3-cd)pyrene	
Raw Statistics		
Number of Observations	65	
Number of Missing Data	0	
Number of Valid Observations	65	
Number of Distinct Observations	50	
Minimum	19	
Maximum	18000	
Mean	560.6769	
Standard Deviation	2370.411	
Variance	5618850	
Coefficient of Variation	4.227767	
Skewness	6.655767	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.467162	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1051.389	
Gamma Statistics		
k hat	0.423008	
k star (bias corrected)	0.413741	
Theta hat	1325.451	
Theta star	1355.139	
nu hat	54.99109	
nu star	53.78637	
5% Approximate Chi Square Value	37.93368	
Adjusted Level of Significance	0.046308	
Adjusted Chi Square Value	37.63185	
Anderson-Darling Test Statistic	11.97082	
Anderson-Darling 5% Critical Value	0.834884	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.364929	
Kolmogrov-Smirnov 5% Critical Value	0.118158	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	794.9868	
95% Adjusted Gamma UCL	801.363	
Lognormal Statistics		
Minimum of log data	2.944439	
Maximum of log data	9.798127	
Mean of log data	4.787438	
Standard Deviation of log data	1.182813	
Variance of log data	1.399047	
Lilliefors Test Statistic	0.161852	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	241.5222	
MLE Standard Deviation	421.8928	
MLE Coefficient of Variation	1.746808	
MLE Skewness	10.57052	
MLE Median	119.9935	

OABG Area Surface and Subsurface Soil  
 Indeno(1,2,3-cd)pyrene

MLE 80% Quantile	326.0057	
MLE 90% Quantile	548.5908	
MLE 95% Quantile	839.8015	
MLE 99% Quantile	1879.313	
MVU Estimate of Median	118.7089	
MVU Estimate of Mean	237.27	
MVU Estimate of Standard Deviation	386.7338	
MVU Estimate of SE of Mean	43.38159	
95% H-UCL	347.0979	
95% Chebyshev (MVUE) UCL	426.366	
97.5% Chebyshev (MVUE) UCL	508.188	
99% Chebyshev (MVUE) UCL	668.9114	
Non-parametric Statistics		
95% CLT UCL	1044.286	
95% Adjusted-CLT UCL	1303.637	
95% Modified-t UCL	1091.843	
95% Jackknife UCL	1051.389	
95% Chebyshev (Mean, Sd) UCL	1842.251	
97.5% Chebyshev (Mean, Sd) UCL	2396.79	
99% Chebyshev (Mean, Sd) UCL	3486.073	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1038.035	
95% Bootstrap-t UCL	1992.747	
95% Hall's Bootstrap UCL	2224.387	
95% Percentile Bootstrap UCL	1094.385	
95% BCA Bootstrap UCL	1464.569	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	2396.79	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

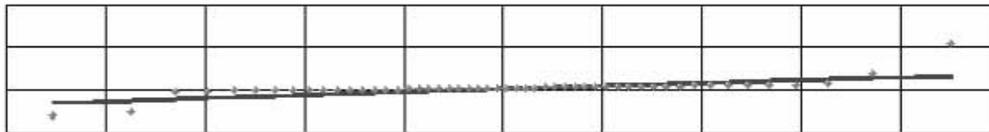
OABG Area Surface and Subsurface Soil  
Dibenz(a,h)anthracene

Normal Q-Q Plot for Dibenz(a,h)anthracene



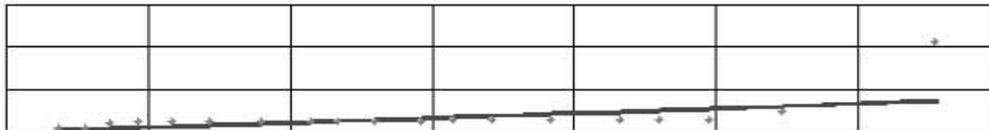
N = 52, Mean = 239.1923, Sd = 267.2528  
Slope = 0.4586, Intercept = 0.0000, Correlation, R = 0.45037180  
Lilliefors Statistic = 0.445, Critical Value(0.05) = 0.123, Data not Normal

Lognormal Q-Q Plot for Dibenz(a,h)anthracene



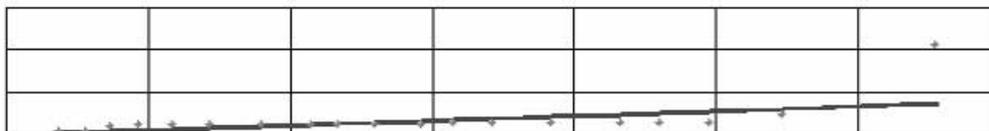
N = 52, Mean = 5.3232, Sd = 0.4409  
Slope = 0.7187, Intercept = 0.0000, Correlation, R = 0.70582474  
Lilliefors Statistic = 0.321, Critical Value(0.05) = 0.123, Data not Lognormal

Gamma Q-Q Plot for Dibenz(a,h)anthracene



N = 52, Mean = 239.192, k hat = 3.4037  
Slope = 1.148, Intercept = -34.616, Correlation, R = 0.564  
A-D Test Statistic = 10.549, Critical Value(0.05) = 0.756, Data not Gamma Distributed

Gamma Q-Q Plot for Dibenz(a,h)anthracene



N = 52, Mean = 239.192, k hat = 3.404  
Slope = 1.148, Intercept = -34.616, Correlation, R = 0.564  
K-S Test Statistic = 0.364, Critical Value(0.05) = 0.124, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
 Dibenz(a,h)anthracene

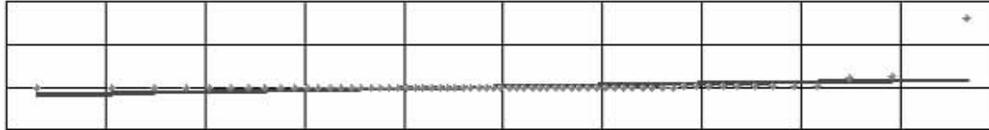
Data File	Dibenz(a,h)anthracene	
Variable:		
<b>Raw Statistics</b>		
Number of Observations	52	
Number of Missing Data	0	
Number of Valid Observations	52	
Number of Distinct Observations	19	
Minimum	51	
Maximum	2100	
Mean	239.1923	
Standard Deviation	267.2528	
Variance	71424.04	
Coefficient of Variation	1.117313	
Skewness	6.873362	
Too Few Distinct Observations?	NO	
<b>Normal Statistics</b>		
Lilliefors Test Statistic	0.44541	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	301.2805	
<b>Gamma Statistics</b>		
k hat	3.403702	
k star (bias corrected)	3.220155	
Theta hat	70.27416	
Theta star	74.27974	
nu hat	353.985	
nu star	334.8962	
5% Approximate Chi Square Value	293.4853	
Adjusted Level of Significance	0.045385	
Adjusted Chi Square Value	292.3846	
Anderson-Darling Test Statistic	10.54888	
Anderson-Darling 5% Critical Value	0.755682	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.363657	
Kolmogrov-Smirnov 5% Critical Value	0.123882	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	272.9424	
95% Adjusted Gamma UCL	273.9699	
<b>Lognormal Statistics</b>		
Minimum of log data	3.931826	
Maximum of log data	7.649693	
Mean of log data	5.323236	
Standard Deviation of log data	0.440883	
Variance of log data	0.194377	
Lilliefors Test Statistic	0.321189	
Lilliefors 5% Critical Value	0.122866	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	225.975	
MLE Standard Deviation	104.6717	
MLE Coefficient of Variation	0.4632	
MLE Skewness	1.488983	
MLE Median	205.0463	

OABG Area Surface and Subsurface Soil  
 Dibenz(a,h)anthracene

MLE 80% Quantile	297.6093	
MLE 90% Quantile	361.3221	
MLE 95% Quantile	423.472	
MLE 99% Quantile	571.7653	
MVU Estimate of Median	204.6634	
MVU Estimate of Mean	225.5146	
MVU Estimate of Standard Deviation	103.644	
MVU Estimate of SE of Mean	14.33703	
95% H-UCL	253.0996	
95% Chebyshev (MVUE) UCL	288.0082	
97.5% Chebyshev (MVUE) UCL	315.0493	
99% Chebyshev (MVUE) UCL	368.1662	
Non-parametric Statistics		
95% CLT UCL	300.1527	
95% Adjusted-CLT UCL	337.8985	
95% Modified-t UCL	307.1681	
95% Jackknife UCL	301.2805	
95% Chebyshev (Mean, Sd) UCL	400.7387	
97.5% Chebyshev (Mean, Sd) UCL	470.64	
99% Chebyshev (Mean, Sd) UCL	607.9475	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	298.3605	
95% Bootstrap-t UCL	579.2517	
95% Hall's Bootstrap UCL	668.6779	
95% Percentile Bootstrap UCL	312.5577	
95% BCA Bootstrap UCL	354.4423	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	301.2805	95% Student's-t UCL
2nd Recommended UCL	307.1681	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Benzo(k)fluoranthene

Normal Q-Q Plot for Benzo(k)fluoranthene



N = 65, Mean = 1252.9077, Sd = 6783.9925  
Slope = 0.3871, Intercept = 0.0000, Correlation, R = 0.38123247  
Lilliefors Statistic = 0.472, Critical Value(0.05) = 0.110, Data not Normal

Lognormal Q-Q Plot for Benzo(k)fluoranthene



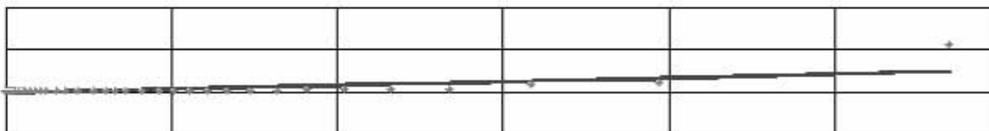
N = 65, Mean = 5.0738, Sd = 1.3455  
Slope = 0.9273, Intercept = 0.0000, Correlation, R = 0.91328780  
Lilliefors Statistic = 0.187, Critical Value(0.05) = 0.110, Data not Lognormal

Gamma Q-Q Plot for Benzo(k)fluoranthene



N = 65, Mean = 1252.908, k hat = 0.3297  
Slope = 2.345, Intercept = -1642.257, Correlation, R = 0.721  
A-D Test Statistic = 12.570, Critical Value(0.05) = 0.857, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(k)fluoranthene



N = 65, Mean = 1252.908, k hat = 0.330  
Slope = 2.345, Intercept = -1642.257, Correlation, R = 0.721  
K-S Test Statistic = 0.369, Critical Value(0.05) = 0.120, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Benzo(k)fluoranthene

Data File

Variable: Benzo(k)fluoranthene

Raw Statistics

Number of Observations	65
Number of Missing Data	0
Number of Valid Observations	65
Number of Distinct Observations	47
Minimum	11
Maximum	54000
Mean	1252.908
Standard Deviation	6783.992
Variance	46022554
Coefficient of Variation	5.414599
Skewness	7.605329
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.471526	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2657.3	

Gamma Statistics

k hat	0.329709	
k star (bias corrected)	0.324748	
Theta hat	3800.043	
Theta star	3858.094	
nu hat	42.86214	
nu star	42.21722	
5% Approximate Chi Square Value	28.31969	
Adjusted Level of Significance	0.046308	
Adjusted Chi Square Value	28.06138	
Anderson-Darling Test Statistic	12.56976	
Anderson-Darling 5% Critical Value	0.857332	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.36907	
Kolmogrov-Smirnov 5% Critical Value	0.119597	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1867.756	
95% Adjusted Gamma UCL	1884.949	

Lognormal Statistics

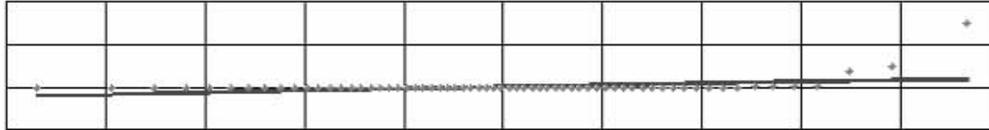
Minimum of log data	2.397895	
Maximum of log data	10.89674	
Mean of log data	5.073776	
Standard Deviation of log data	1.345468	
Variance of log data	1.810283	
Lilliefors Test Statistic	0.187153	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	395.0125	
MLE Standard Deviation	893.1283	
MLE Coefficient of Variation	2.261012	
MLE Skewness	18.34173	
MLE Median	159.7765	

OABG Area Surface and Subsurface Soil  
 Benzo(k)fluoranthene

MLE 80% Quantile	498.0478	
MLE 90% Quantile	900.2764	
MLE 95% Quantile	1461.283	
MLE 99% Quantile	3653.108	
MVU Estimate of Median	157.5665	
MVU Estimate of Mean	385.0447	
MVU Estimate of Standard Deviation	787.3077	
MVU Estimate of SE of Mean	83.60524	
95% H-UCL	614.9371	
95% Chebyshev (MVUE) UCL	749.4715	
97.5% Chebyshev (MVUE) UCL	907.1592	
99% Chebyshev (MVUE) UCL	1216.906	
Non-parametric Statistics		
95% CLT UCL	2636.971	
95% Adjusted-CLT UCL	3485.117	
95% Modified-t UCL	2789.593	
95% Jackknife UCL	2657.3	
95% Chebyshev (Mean, Sd) UCL	4920.706	
97.5% Chebyshev (Mean, Sd) UCL	6507.766	
99% Chebyshev (Mean, Sd) UCL	9625.237	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2622.905	
95% Bootstrap-t UCL	27048.26	
95% Hall's Bootstrap UCL	8875.638	
95% Percentile Bootstrap UCL	2891.446	
95% BCA Bootstrap UCL	3853.338	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6507.766	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Benzo(b)fluoranthene

Normal Q-Q Plot for Benzo(b)fluoranthene



N = 65, Mean = 1796.5385, Sd = 8586.9072  
Slope = 0.4295, Intercept = 0.0000, Correlation, R = 0.42304754  
Lilliefors Statistic = 0.477, Critical Value(0.05) = 0.110, Data not Normal

Lognormal Q-Q Plot for Benzo(b)fluoranthene



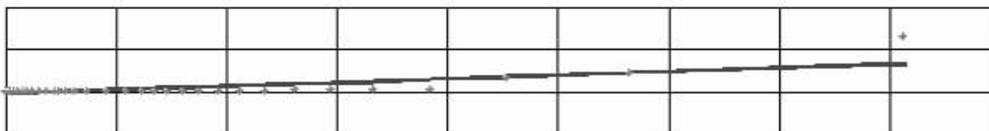
N = 65, Mean = 5.4510, Sd = 1.2510  
Slope = 0.8457, Intercept = 0.0000, Correlation, R = 0.83291959  
Lilliefors Statistic = 0.246, Critical Value(0.05) = 0.110, Data not Lognormal

Gamma Q-Q Plot for Benzo(b)fluoranthene



N = 65, Mean = 1796.538, k hat = 0.3320  
Slope = 2.243, Intercept = -2173.422, Correlation, R = 0.779  
A-D Test Statistic = 15.699, Critical Value(0.05) = 0.857, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(b)fluoranthene



N = 65, Mean = 1796.538, k hat = 0.332  
Slope = 2.243, Intercept = -2173.422, Correlation, R = 0.779  
K-S Test Statistic = 0.421, Critical Value(0.05) = 0.120, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Benzo(b)fluoranthene

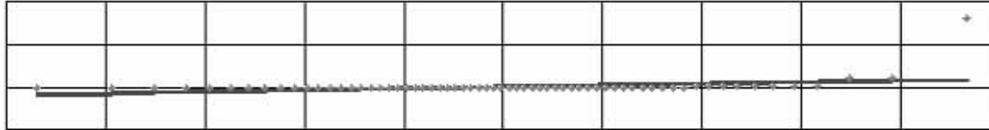
Data File		
Variable:	Benzo(b)fluoranthene	
Raw Statistics		
Number of Observations	65	
Number of Missing Data	0	
Number of Valid Observations	65	
Number of Distinct Observations	44	
Minimum	45	
Maximum	65000	
Mean	1796.538	
Standard Deviation	8586.907	
Variance	73734974	
Coefficient of Variation	4.779696	
Skewness	6.675402	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.476803	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	3574.162	
Gamma Statistics		
k hat	0.332038	
k star (bias corrected)	0.326969	
Theta hat	5410.648	
Theta star	5494.519	
nu hat	43.16489	
nu star	42.506	
5% Approximate Chi Square Value	28.55658	
Adjusted Level of Significance	0.046308	
Adjusted Chi Square Value	28.29712	
Anderson-Darling Test Statistic	15.69944	
Anderson-Darling 5% Critical Value	0.856772	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.421335	
Kolmogrov-Smirnov 5% Critical Value	0.119561	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	2674.118	
95% Adjusted Gamma UCL	2698.637	
Lognormal Statistics		
Minimum of log data	3.806662	
Maximum of log data	11.08214	
Mean of log data	5.450963	
Standard Deviation of log data	1.250972	
Variance of log data	1.564932	
Lilliefors Test Statistic	0.245925	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	509.4993	
MLE Standard Deviation	990.8876	
MLE Coefficient of Variation	1.944826	
MLE Skewness	13.19049	
MLE Median	232.9823	

OABG Area Surface and Subsurface Soil  
Benzo(b)fluoranthene

MLE 80% Quantile	670.5071	
MLE 90% Quantile	1162.656	
MLE 95% Quantile	1824.046	
MLE 99% Quantile	4275.791	
MVU Estimate of Median	230.194	
MVU Estimate of Mean	499.026	
MVU Estimate of Standard Deviation	894.7667	
MVU Estimate of SE of Mean	98.26952	
95% H-UCL	756.3669	
95% Chebyshev (MVUE) UCL	927.3729	
97.5% Chebyshev (MVUE) UCL	1112.719	
99% Chebyshev (MVUE) UCL	1476.795	
Non-parametric Statistics		
95% CLT UCL	3548.431	
95% Adjusted-CLT UCL	4490.713	
95% Modified-t UCL	3721.139	
95% Jackknife UCL	3574.162	
95% Chebyshev (Mean, Sd) UCL	6439.092	
97.5% Chebyshev (Mean, Sd) UCL	8447.928	
99% Chebyshev (Mean, Sd) UCL	12393.9	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	3534.204	
95% Bootstrap-t UCL	38049.79	
95% Hall's Bootstrap UCL	24470.96	
95% Percentile Bootstrap UCL	3778.323	
95% BCA Bootstrap UCL	5279.262	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	8447.928	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Benzo(a)anthracene

Normal Q-Q Plot for Benzo(a)anthracene



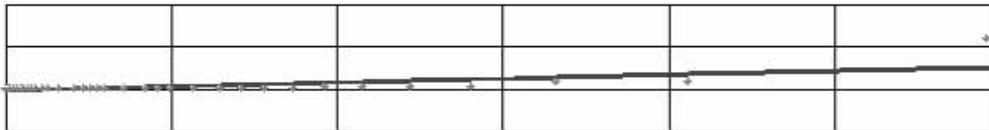
N = 65, Mean = 1325.4462, Sd = 7264.7976  
Slope = 0.3819, Intercept = 0.0000, Correlation, R = 0.37616594  
Lilliefors Statistic = 0.469, Critical Value(0.05) = 0.110, Data not Normal

Lognormal Q-Q Plot for Benzo(a)anthracene



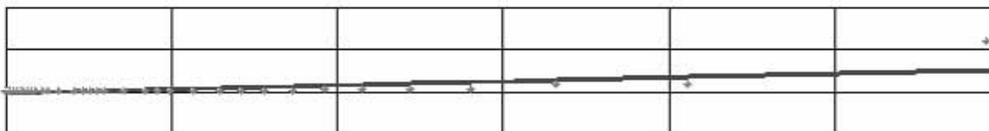
N = 65, Mean = 5.1989, Sd = 1.2432  
Slope = 0.8862, Intercept = 0.0000, Correlation, R = 0.87278572  
Lilliefors Statistic = 0.228, Critical Value(0.05) = 0.110, Data not Lognormal

Gamma Q-Q Plot for Benzo(a)anthracene



N = 65, Mean = 1325.446, k hat = 0.3395  
Slope = 2.374, Intercept = -1775.855, Correlation, R = 0.712  
A-D Test Statistic = 14.217, Critical Value(0.05) = 0.855, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(a)anthracene



N = 65, Mean = 1325.446, k hat = 0.339  
Slope = 2.374, Intercept = -1775.855, Correlation, R = 0.712  
K-S Test Statistic = 0.400, Critical Value(0.05) = 0.119, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Benzo(a)anthracene

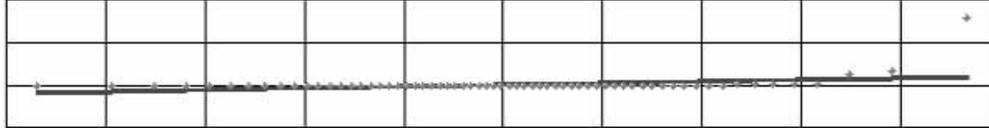
Data File		
Variable:	Benzo(a)anthracene	
Raw Statistics		
Number of Observations	65	
Number of Missing Data	0	
Number of Valid Observations	65	
Number of Distinct Observations	47	
Minimum	24	
Maximum	58000	
Mean	1325.446	
Standard Deviation	7264.798	
Variance	52777285	
Coefficient of Variation	5.481021	
Skewness	7.672902	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.469481	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2829.372	
Gamma Statistics		
k hat	0.339484	
k star (bias corrected)	0.334072	
Theta hat	3904.3	
Theta star	3967.551	
nu hat	44.13288	
nu star	43.42931	
5% Approximate Chi Square Value	29.31519	
Adjusted Level of Significance	0.046308	
Adjusted Chi Square Value	29.05207	
Anderson-Darling Test Statistic	14.21748	
Anderson-Darling 5% Critical Value	0.85498	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.400472	
Kolmogrov-Smirnov 5% Critical Value	0.119446	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1963.597	
95% Adjusted Gamma UCL	1981.381	
Lognormal Statistics		
Minimum of log data	3.178054	
Maximum of log data	10.9682	
Mean of log data	5.198868	
Standard Deviation of log data	1.243217	
Variance of log data	1.545589	
Lilliefors Test Statistic	0.228401	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	392.157	
MLE Standard Deviation	753.3838	
MLE Coefficient of Variation	1.921128	
MLE Skewness	12.85376	
MLE Median	181.0671	

OABG Area Surface and Subsurface Soil  
Benzo(a)anthracene

MLE 80% Quantile	517.695	
MLE 90% Quantile	894.6224	
MLE 95% Quantile	1399.625	
MLE 99% Quantile	3263.615	
MVU Estimate of Median	178.9267	
MVU Estimate of Mean	384.2342	
MVU Estimate of Standard Deviation	681.5302	
MVU Estimate of SE of Mean	75.04049	
95% H-UCL	579.9768	
95% Chebyshev (MVUE) UCL	711.3281	
97.5% Chebyshev (MVUE) UCL	852.8619	
99% Chebyshev (MVUE) UCL	1130.878	
Non-parametric Statistics		
95% CLT UCL	2807.603	
95% Adjusted-CLT UCL	3723.929	
95% Modified-t UCL	2972.301	
95% Jackknife UCL	2829.372	
95% Chebyshev (Mean, Sd) UCL	5253.194	
97.5% Chebyshev (Mean, Sd) UCL	6952.734	
99% Chebyshev (Mean, Sd) UCL	10291.15	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2818.85	
95% Bootstrap-t UCL	9449.053	
95% Hall's Bootstrap UCL	11731.29	
95% Percentile Bootstrap UCL	3106	
95% BCA Bootstrap UCL	4362.538	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6952.734	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Benzo(a)pyrene

Normal Q-Q Plot for Benzo(a)pyrene



N = 65, Mean = 1347.2385, Sd = 7001.0833  
Slope = 0.4031, Intercept = 0.0000, Correlation, R = 0.39698054  
Lilliefors Statistic = 0.472, Critical Value(0.05) = 0.110, Data not Normal

Lognormal Q-Q Plot for Benzo(a)pyrene



N = 65, Mean = 5.1075, Sd = 1.3047  
Slope = 0.8909, Intercept = 0.0000, Correlation, R = 0.87740070  
Lilliefors Statistic = 0.206, Critical Value(0.05) = 0.110, Data not Lognormal

Gamma Q-Q Plot for Benzo(a)pyrene



N = 65, Mean = 1347.238, k hat = 0.3245  
Slope = 2.314, Intercept = -1723.631, Correlation, R = 0.747  
A-D Test Statistic = 13.960, Critical Value(0.05) = 0.859, Data not Gamma Distributed

Gamma Q-Q Plot for Benzo(a)pyrene



N = 65, Mean = 1347.238, k hat = 0.324  
Slope = 2.314, Intercept = -1723.631, Correlation, R = 0.747  
K-S Test Statistic = 0.405, Critical Value(0.05) = 0.120, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Benzo(a)pyrene

Data File

Variable: Benzo(a)pyrene

Raw Statistics

Number of Observations	65
Number of Missing Data	0
Number of Valid Observations	65
Number of Distinct Observations	52
Minimum	24
Maximum	55000
Mean	1347.238
Standard Deviation	7001.083
Variance	49015168
Coefficient of Variation	5.196618
Skewness	7.328539
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.472453	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2796.572	

Gamma Statistics

k hat	0.324453	
k star (bias corrected)	0.319734	
Theta hat	4152.342	
Theta star	4213.618	
nu hat	42.17885	
nu star	41.56547	
5% Approximate Chi Square Value	27.7857	
Adjusted Level of Significance	0.046308	
Adjusted Chi Square Value	27.53001	
Anderson-Darling Test Statistic	13.96028	
Anderson-Darling 5% Critical Value	0.858597	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.405436	
Kolmogrov-Smirnov 5% Critical Value	0.119678	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	2015.375	
95% Adjusted Gamma UCL	2034.093	

Lognormal Statistics

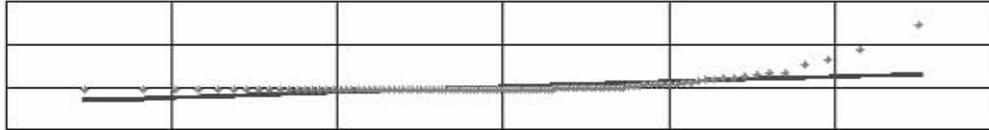
Minimum of log data	3.178054	
Maximum of log data	10.91509	
Mean of log data	5.107506	
Standard Deviation of log data	1.304714	
Variance of log data	1.702279	
Lilliefors Test Statistic	0.206286	
Lilliefors 5% Critical Value	0.109895	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	387.0857	
MLE Standard Deviation	819.8944	
MLE Coefficient of Variation	2.118121	
MLE Skewness	15.85718	
MLE Median	165.2578	

OABG Area Surface and Subsurface Soil  
Benzo(a)pyrene

MLE 80% Quantile	497.6962	
MLE 90% Quantile	883.6528	
MLE 95% Quantile	1413.411	
MLE 99% Quantile	3436.716	
MVU Estimate of Median	163.1075	
MVU Estimate of Mean	378.1327	
MVU Estimate of Standard Deviation	730.6491	
MVU Estimate of SE of Mean	78.77294	
95% H-UCL	590.1544	
95% Chebyshev (MVUE) UCL	721.4959	
97.5% Chebyshev (MVUE) UCL	870.0695	
99% Chebyshev (MVUE) UCL	1161.914	
Non-parametric Statistics		
95% CLT UCL	2775.592	
95% Adjusted-CLT UCL	3619.024	
95% Modified-t UCL	2928.13	
95% Jackknife UCL	2796.572	
95% Chebyshev (Mean, Sd) UCL	5132.408	
97.5% Chebyshev (Mean, Sd) UCL	6770.254	
99% Chebyshev (Mean, Sd) UCL	9987.486	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2756.173	
95% Bootstrap-t UCL	7935.476	
95% Hall's Bootstrap UCL	14673.58	
95% Percentile Bootstrap UCL	3043.908	
95% BCA Bootstrap UCL	4392.331	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6770.254	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

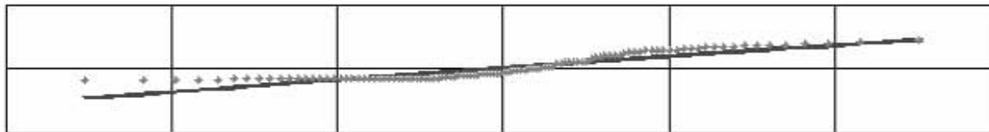
OABG Area Surface and Subsurface Soil  
Trichloroethene

Normal Q-Q Plot for Trichloroethene



N = 107, Mean = 17112.5505, Sd = 48795.5920  
Slope = 0.6301, Intercept = 0.0000, Correlation, R = 0.62369005  
Lilliefors Statistic = 0.363, Critical Value(0.05) = 0.086, Data not Normal

Lognormal Q-Q Plot for Trichloroethene



N = 107, Mean = 5.1551, Sd = 3.6467  
Slope = 0.9283, Intercept = 0.0000, Correlation, R = 0.91880526  
Lilliefors Statistic = 0.193, Critical Value(0.05) = 0.086, Data not Lognormal

Gamma Q-Q Plot for Trichloroethene



N = 107, Mean = 17112.550, k hat = 0.1650  
Slope = 1.226, Intercept = -3517.914, Correlation, R = 0.992  
A-D Test Statistic = 9.943, Critical Value(0.05) = 0.952, Data not Gamma Distributed

Gamma Q-Q Plot for Trichloroethene



N = 107, Mean = 17112.550, k hat = 0.165  
Slope = 1.226, Intercept = -3517.914, Correlation, R = 0.992  
K-S Test Statistic = 0.249, Critical Value(0.05) = 0.098, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Trichloroethene

Data File

Variable: Trichloroethene

Raw Statistics

Number of Observations	107
Number of Missing Data	0
Number of Valid Observations	107
Number of Distinct Observations	69
Minimum	4
Maximum	360000
Mean	17112.55
Standard Deviation	48795.59
Variance	2.38E+09
Coefficient of Variation	2.851451
Skewness	4.692132
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.362938	
Lilliefors 5% Critical Value	0.085653	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	24940.14	

Gamma Statistics

k hat	0.16502	
k star (bias corrected)	0.166624	
Theta hat	103699.6	
Theta star	102701.5	
nu hat	35.31435	
nu star	35.65757	
5% Approximate Chi Square Value	22.99097	
Adjusted Level of Significance	0.047757	
Adjusted Chi Square Value	22.85217	
Anderson-Darling Test Statistic	9.942517	
Anderson-Darling 5% Critical Value	0.951909	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.248858	
Kolmogrov-Smirnov 5% Critical Value	0.098492	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	26540.51	
95% Adjusted Gamma UCL	26701.71	

Lognormal Statistics

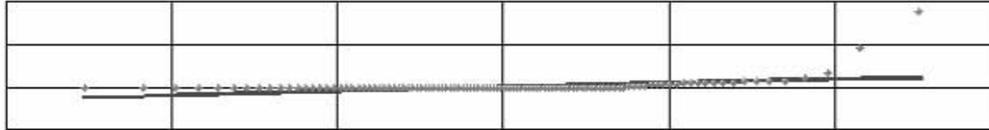
Minimum of log data	1.386294	
Maximum of log data	12.79386	
Mean of log data	5.155095	
Standard Deviation of log data	3.646681	
Variance of log data	13.29828	
Lilliefors Test Statistic	0.192696	
Lilliefors 5% Critical Value	0.085653	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	133818.1	
MLE Standard Deviation	1.03E+08	
MLE Coefficient of Variation	772.1206	
MLE Skewness	4.6E+08	
MLE Median	173.3122	

OABG Area Surface and Subsurface Soil  
Trichloroethene

MLE 80% Quantile	3776.453	
MLE 90% Quantile	18790	
MLE 95% Quantile	69834.63	
MLE 99% Quantile	836745.4	
MVU Estimate of Median	162.8643	
MVU Estimate of Mean	88715.56	
MVU Estimate of Standard Deviation	11419150	
MVU Estimate of SE of Mean	61348.32	
95% H-UCL	907126.3	
95% Chebyshev (MVUE) UCL	356126.7	
97.5% Chebyshev (MVUE) UCL	471835.7	
99% Chebyshev (MVUE) UCL	699123.6	
Non-parametric Statistics		
95% CLT UCL	24871.73	
95% Adjusted-CLT UCL	27158.11	
95% Modified-t UCL	25296.77	
95% Jackknife UCL	24940.14	
95% Chebyshev (Mean, Sd) UCL	37674.56	
97.5% Chebyshev (Mean, Sd) UCL	46571.75	
99% Chebyshev (Mean, Sd) UCL	64048.57	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	24832.6	
95% Bootstrap-t UCL	29224.69	
95% Hall's Bootstrap UCL	31574.31	
95% Percentile Bootstrap UCL	25848.87	
95% BCA Bootstrap UCL	27144.16	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	64048.57	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

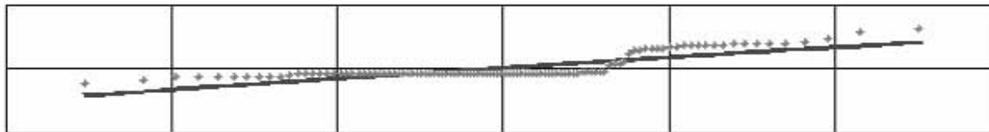
OABG Area Surface and Subsurface Soil  
Tetrachloroethene

Normal Q-Q Plot for Tetrachloroethene



N = 107, Mean = 313.1290, Sd = 1236.2378  
Slope = 0.4917, Intercept = 0.0000, Correlation, R = 0.48666819  
Lilliefors Statistic = 0.400, Critical Value(0.05) = 0.086, Data not Normal

Lognormal Q-Q Plot for Tetrachloroethene



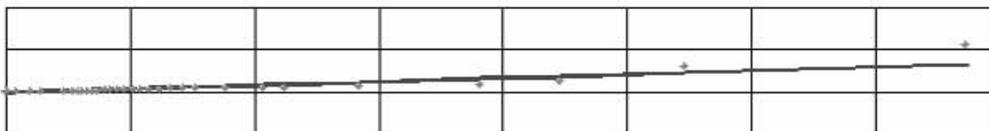
N = 107, Mean = 2.8615, Sd = 2.1332  
Slope = 0.8409, Intercept = 0.0000, Correlation, R = 0.83233344  
Lilliefors Statistic = 0.386, Critical Value(0.05) = 0.086, Data not Lognormal

Gamma Q-Q Plot for Tetrachloroethene



N = 107, Mean = 313.129, k hat = 0.2467  
Slope = 1.772, Intercept = -231.102, Correlation, R = 0.863  
A-D Test Statistic = 19.460, Critical Value(0.05) = 0.892, Data not Gamma Distributed

Gamma Q-Q Plot for Tetrachloroethene



N = 107, Mean = 313.129, k hat = 0.247  
Slope = 1.772, Intercept = -231.102, Correlation, R = 0.863  
K-S Test Statistic = 0.418, Critical Value(0.05) = 0.096, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Tetrachloroethene

Data File

Variable: Tetrachloroethene

Raw Statistics

Number of Observations	107
Number of Missing Data	0
Number of Valid Observations	107
Number of Distinct Observations	36
Minimum	1
Maximum	11000
Mean	313.129
Standard Deviation	1236.238
Variance	1528284
Coefficient of Variation	3.948015
Skewness	7.182446
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.400334	
Lilliefors 5% Critical Value	0.085653	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	511.4413	

Gamma Statistics

k hat	0.246718	
k star (bias corrected)	0.246032	
Theta hat	1269.175	
Theta star	1272.718	
nu hat	52.79775	
nu star	52.65077	
5% Approximate Chi Square Value	36.97993	
Adjusted Level of Significance	0.047757	
Adjusted Chi Square Value	36.80103	
Anderson-Darling Test Statistic	19.45973	
Anderson-Darling 5% Critical Value	0.891553	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significanc
Kolmogrov-Smirnov Test Statistic	0.418486	
Kolmogrov-Smirnov 5% Critical Value	0.096166	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significanc
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significanc
95% Approximate Gamma UCL	445.8224	
95% Adjusted Gamma UCL	447.9897	

Lognormal Statistics

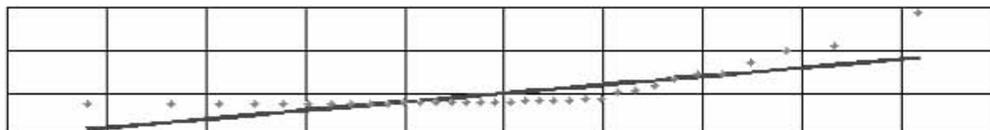
Minimum of log data	0	
Maximum of log data	9.305651	
Mean of log data	2.86153	
Standard Deviation of log data	2.133192	
Variance of log data	4.550508	
Lilliefors Test Statistic	0.385746	
Lilliefors 5% Critical Value	0.085653	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	170.1675	
MLE Standard Deviation	1647.029	
MLE Coefficient of Variation	9.678868	
MLE Skewness	935.7578	
MLE Median	17.48825	

OABG Area Surface and Subsurface Soil  
Tetrachloroethene

MLE 80% Quantile	106.0676	
MLE 90% Quantile	271.1524	
MLE 95% Quantile	584.4261	
MLE 99% Quantile	2498.221	
MVU Estimate of Median	17.12024	
MVU Estimate of Mean	159.3128	
MVU Estimate of Standard Deviation	1151.151	
MVU Estimate of SE of Mean	53.66236	
95% H-UCL	347.2995	
95% Chebyshev (MVUE) UCL	393.2216	
97.5% Chebyshev (MVUE) UCL	494.4342	
99% Chebyshev (MVUE) UCL	693.2466	
Non-parametric Statistics		
95% CLT UCL	509.7081	
95% Adjusted-CLT UCL	598.3769	
95% Modified-t UCL	525.2718	
95% Jackknife UCL	511.4413	
95% Chebyshev (Mean, Sd) UCL	834.068	
97.5% Chebyshev (Mean, Sd) UCL	1059.479	
99% Chebyshev (Mean, Sd) UCL	1502.255	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	507.9361	
95% Bootstrap-t UCL	997.4564	
95% Hall's Bootstrap UCL	1352.868	
95% Percentile Bootstrap UCL	529.0224	
95% BCA Bootstrap UCL	638.0009	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1502.255	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
2,3,7,8-TCDD

Normal Q-Q Plot for TCDD



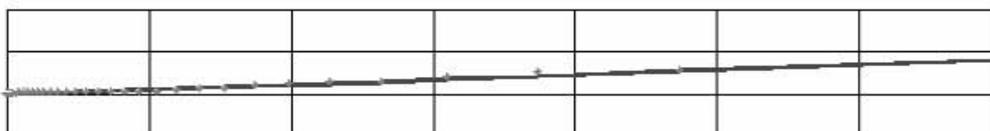
N = 34, Mean = 0.0001, Sd = 0.0001  
Slope = 0.8164, Intercept = 0.0000, Correlation, R = 0.79612909  
Shapiro-Wilk Statistic = 0.645, Critical Value(0.05) = 0.933, Data not Normal

Lognormal Q-Q Plot for TCDD



N = 34, Mean = -10.9625, Sd = 1.6563  
Slope = 1.0138, Intercept = 0.0000, Correlation, R = 0.98862926  
Shapiro-Wilk Statistic = 0.965, Critical Value(0.05) = 0.933, Data are Lognormal

Gamma Q-Q Plot for TCDD



N = 34, Mean = 0.000, k hat = 0.5205  
Slope = 1.209, Intercept = -0.000, Correlation, R = 0.988  
A-D Test Statistic = 1.384, Critical Value(0.05) = 0.810, Data not Gamma Distributed

Gamma Q-Q Plot for TCDD



N = 34, Mean = 0.000, k hat = 0.521  
Slope = 1.209, Intercept = -0.000, Correlation, R = 0.988  
K-S Test Statistic = 0.215, Critical Value(0.05) = 0.159, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
2,3,7,8-TCDD

Data File		
Variable:	TCDD	
Raw Statistics		
Number of Observations	34	
Number of Missing Data	0	
Number of Valid Observations	34	
Number of Distinct Observations	34	
Minimum	7.75E-07	
Maximum	0.000413	
Mean	5.83E-05	
Standard Deviation	9.54E-05	
Variance	9.10E-09	
Coefficient of Variation	1.63617	
Skewness	2.304653	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.645266	
Shapiro-Wilk 5% Critical Value	0.933	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	8.60E-05	
Gamma Statistics		
k hat	0.520522	
k star (bias corrected)	0.494201	
Theta hat	0.000112	
Theta star	0.000118	
nu hat	35.39546	
nu star	33.60567	
5% Approximate Chi Square Value	21.34729	
Adjusted Level of Significance	0.0422	
Adjusted Chi Square Value	20.86323	
Anderson-Darling Test Statistic	1.384384	
Anderson-Darling 5% Critical Value	0.809659	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.215008	
Kolmogrov-Smirnov 5% Critical Value	0.15933	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	9.18E-05	
95% Adjusted Gamma UCL	9.39E-05	
Lognormal Statistics		
Minimum of log data	-14.07085	
Maximum of log data	-7.79208	
Mean of log data	-10.96252	
Standard Deviation of log data	1.656292	
Variance of log data	2.743303	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.964525	
Shapiro-Wilk 5% Critical Value	0.933	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	6.84E-05	
MLE Standard Deviation	0.000261	
MLE Coefficient of Variation	3.812903	
MLE Skewness	66.87157	
MLE Median	1.73E-05	

OABG Area Surface and Subsurface Soil  
2,3,7,8-TCDD

MLE 80% Quantile	7.03E-05	
MLE 90% Quantile	0.000146	
MLE 95% Quantile	0.000264	
MLE 99% Quantile	0.000817	
MVU Estimate of Median	1.67E-05	
MVU Estimate of Mean	6.27E-05	
MVU Estimate of Standard Deviation	0.000175	
MVU Estimate of SE of Mean	2.34E-05	
95% H-UCL	0.000175	
95% Chebyshev (MVUE) UCL	0.000165	
97.5% Chebyshev (MVUE) UCL	0.000209	
99% Chebyshev (MVUE) UCL	0.000295	
Non-parametric Statistics		
95% CLT UCL	8.52E-05	
95% Adjusted-CLT UCL	9.21E-05	
95% Modified-t UCL	8.71E-05	
95% Jackknife UCL	8.60E-05	
95% Chebyshev (Mean, Sd) UCL	0.00013	
97.5% Chebyshev (Mean, Sd) UCL	0.00016	
99% Chebyshev (Mean, Sd) UCL	0.000221	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	8.43E-05	
95% Bootstrap-t UCL	9.68E-05	
95% Hall's Bootstrap UCL	9.53E-05	
95% Percentile Bootstrap UCL	8.69E-05	
95% BCA Bootstrap UCL	9.28E-05	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	0.000165	95% Chebyshev (MVUE) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

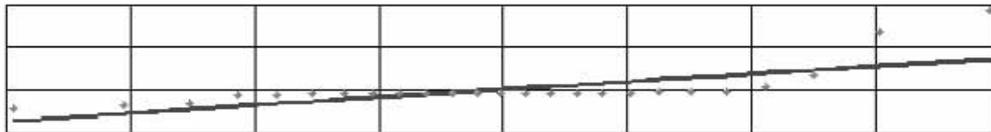
OABG Area Surface and Subsurface Soil  
 HMX

Normal Q-Q Plot for HMX



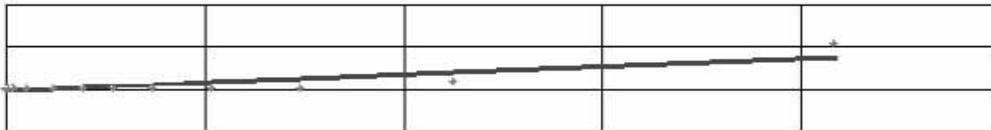
N = 25, Mean = 24507.8400, Sd = 106362.8424  
 Slope = 0.4828, Intercept = 0.0000, Correlation, R = 0.46773724  
 Lilliefors Statistic = 0.506, Critical Value(0.05) = 0.177, Data not Normal

Lognormal Q-Q Plot for HMX



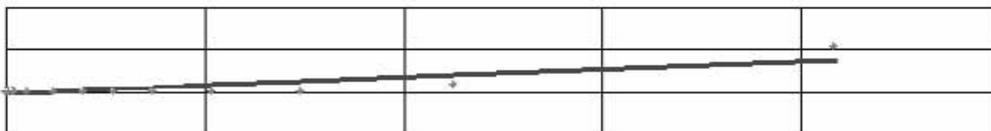
N = 25, Mean = 6.1713, Sd = 1.9126  
 Slope = 0.7391, Intercept = 0.0000, Correlation, R = 0.71606347  
 Lilliefors Statistic = 0.414, Critical Value(0.05) = 0.177, Data not Lognormal

Gamma Q-Q Plot for HMX



N = 25, Mean = 24507.840, k hat = 0.1887  
 Slope = 1.946, Intercept = -20341.153, Correlation, R = 0.868  
 A-D Test Statistic = 7.517, Critical Value(0.05) = 0.900, Data not Gamma Distributed

Gamma Q-Q Plot for HMX



N = 25, Mean = 24507.840, k hat = 0.189  
 Slope = 1.946, Intercept = -20341.153, Correlation, R = 0.868  
 K-S Test Statistic = 0.500, Critical Value(0.05) = 0.194, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
HMX

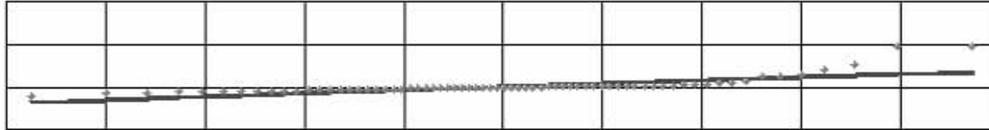
Data File		
Variable:	HMX	
Raw Statistics		
Number of Observations	25	
Number of Missing Data	0	
Number of Valid Observations	25	
Number of Distinct Observations	20	
Minimum	76	
Maximum	530000	
Mean	24507.84	
Standard Deviation	106362.8	
Variance	1.13E+10	
Coefficient of Variation	4.339952	
Skewness	4.854159	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.247516	
Shapiro-Wilk 5% Critical Value	0.918	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	60902.69	
Gamma Statistics		
k hat	0.188694	
k star (bias corrected)	0.192717	
Theta hat	129881.4	
Theta star	127169.8	
nu hat	9.434702	
nu star	9.635871	
5% Approximate Chi Square Value	3.714667	
Adjusted Level of Significance	0.0395	
Adjusted Chi Square Value	3.46697	
Anderson-Darling Test Statistic	7.516828	
Anderson-Darling 5% Critical Value	0.900434	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.500037	
Kolmogrov-Smirnov 5% Critical Value	0.193701	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	63573.5	
95% Adjusted Gamma UCL	68115.5	
Lognormal Statistics		
Minimum of log data	4.330733	
Maximum of log data	13.18063	
Mean of log data	6.171328	
Standard Deviation of log data	1.912606	
Variance of log data	3.658062	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.53592	
Shapiro-Wilk 5% Critical Value	0.918	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	2982.028	
MLE Standard Deviation	18330.64	
MLE Coefficient of Variation	6.147039	
MLE Skewness	250.7136	
MLE Median	478.8217	

OABG Area Surface and Subsurface Soil  
 HMX

MLE 80% Quantile	2410.237	
MLE 90% Quantile	5591.635	
MLE 95% Quantile	11131.84	
MLE 99% Quantile	40947.65	
MVU Estimate of Median	444.949	
MVU Estimate of Mean	2502.174	
MVU Estimate of Standard Deviation	8525.986	
MVU Estimate of SE of Mean	1233.017	
95% H-UCL	13493.97	
95% Chebyshev (MVUE) UCL	7876.769	
97.5% Chebyshev (MVUE) UCL	10202.36	
99% Chebyshev (MVUE) UCL	14770.54	
Non-parametric Statistics		
95% CLT UCL	59498.1	
95% Adjusted-CLT UCL	81565.15	
95% Modified-t UCL	64344.71	
95% Jackknife UCL	60902.69	
95% Chebyshev (Mean, Sd) UCL	117232.8	
97.5% Chebyshev (Mean, Sd) UCL	157355	
99% Chebyshev (Mean, Sd) UCL	236167.2	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	58251.72	
95% Bootstrap-t UCL	10307482	
95% Hall's Bootstrap UCL	8869590	
95% Percentile Bootstrap UCL	66830.68	
95% BCA Bootstrap UCL	94021.08	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	236167.2	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Iron

Normal Q-Q Plot for Iron



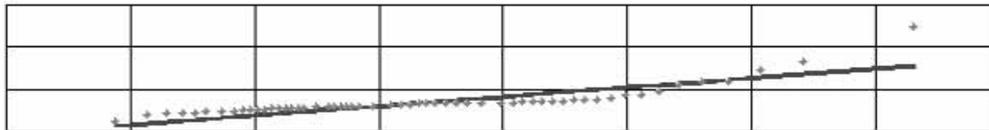
N = 70, Mean = 34115.7143, Sd = 18800.0126  
Slope = 0.7808, Intercept = 0.0000, Correlation, R = 0.76967960  
Lilliefors Statistic = 0.306, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Iron



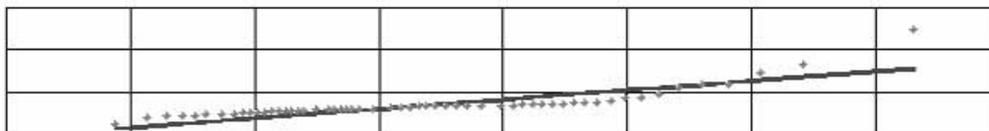
N = 70, Mean = 10.3488, Sd = 0.3852  
Slope = 0.9320, Intercept = 0.0000, Correlation, R = 0.91865758  
Lilliefors Statistic = 0.206, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Iron



N = 70, Mean = 34115.714, k hat = 5.7964  
Slope = 1.116, Intercept = -3882.342, Correlation, R = 0.847  
A-D Test Statistic = 4.983, Critical Value(0.05) = 0.754, Data not Gamma Distributed

Gamma Q-Q Plot for Iron



N = 70, Mean = 34115.714, k hat = 5.796  
Slope = 1.116, Intercept = -3882.342, Correlation, R = 0.847  
K-S Test Statistic = 0.244, Critical Value(0.05) = 0.107, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Iron

Data File

Variable: Iron

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	56
Minimum	10500
Maximum	122000
Mean	34115.71
Standard Deviation	18800.01
Variance	3.53E+08
Coefficient of Variation	0.551066
Skewness	3.367833
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.305575	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	37862.05	

Gamma Statistics

k hat	5.796354	
k star (bias corrected)	5.557462	
Theta hat	5885.72	
Theta star	6138.722	
nu hat	811.4895	
nu star	778.0447	
5% Approximate Chi Square Value	714.3031	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	713.0295	
Anderson-Darling Test Statistic	4.983398	
Anderson-Darling 5% Critical Value	0.753631	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.24371	
Kolmogrov-Smirnov 5% Critical Value	0.106629	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	37160.07	
95% Adjusted Gamma UCL	37226.44	

Lognormal Statistics

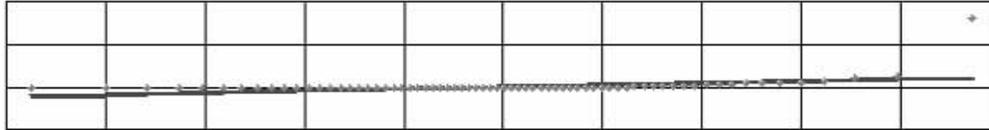
Minimum of log data	9.259131	
Maximum of log data	11.71178	
Mean of log data	10.34878	
Standard Deviation of log data	0.385199	
Variance of log data	0.148379	
Lilliefors Test Statistic	0.20625	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	33623.1	
MLE Standard Deviation	13447.22	
MLE Coefficient of Variation	0.39994	
MLE Skewness	1.263791	
MLE Median	31218.91	

OABG Area Surface and Subsurface Soil  
Iron

MLE 80% Quantile	43229.25	
MLE 90% Quantile	51213.6	
MLE 95% Quantile	58831.47	
MLE 99% Quantile	76477.59	
MVU Estimate of Median	31185.84	
MVU Estimate of Mean	33584.96	
MVU Estimate of Standard Deviation	13372.89	
MVU Estimate of SE of Mean	1595.9	
95% H-UCL	36527.91	
95% Chebyshev (MVUE) UCL	40541.32	
97.5% Chebyshev (MVUE) UCL	43551.35	
99% Chebyshev (MVUE) UCL	49463.96	
Non-parametric Statistics		
95% CLT UCL	37811.75	
95% Adjusted-CLT UCL	38778.23	
95% Modified-t UCL	38012.8	
95% Jackknife UCL	37862.05	
95% Chebyshev (Mean, Sd) UCL	43910.3	
97.5% Chebyshev (Mean, Sd) UCL	48148.42	
99% Chebyshev (Mean, Sd) UCL	56473.39	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	37748.93	
95% Bootstrap-t UCL	39768.81	
95% Hall's Bootstrap UCL	41549.53	
95% Percentile Bootstrap UCL	38078.57	
95% BCA Bootstrap UCL	38968.57	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	37862.05	95% Student's-t UCL
2nd Recommended UCL	38012.8	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

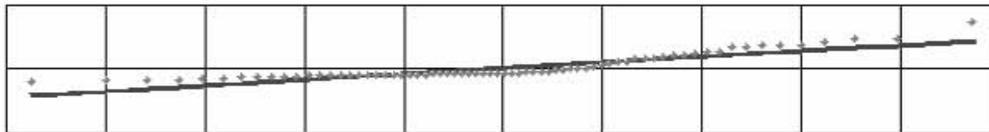
OABG Area Surface and Subsurface Soil  
Copper

Normal Q-Q Plot for Copper



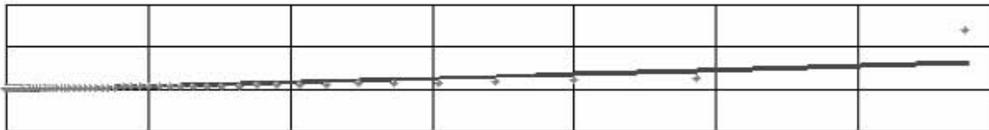
N = 70, Mean = 424.0957, Sd = 1653.5968  
Slope = 0.4614, Intercept = 0.0000, Correlation, R = 0.45483076  
Lilliefors Statistic = 0.403, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Copper



N = 70, Mean = 4.5385, Sd = 1.3772  
Slope = 0.9203, Intercept = 0.0000, Correlation, R = 0.90720794  
Lilliefors Statistic = 0.227, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Copper



N = 70, Mean = 424.096, k hat = 0.4303  
Slope = 1.996, Intercept = -413.547, Correlation, R = 0.757  
A-D Test Statistic = 9.149, Critical Value(0.05) = 0.834, Data not Gamma Distributed

Gamma Q-Q Plot for Copper



N = 70, Mean = 424.096, k hat = 0.430  
Slope = 1.996, Intercept = -413.547, Correlation, R = 0.757  
K-S Test Statistic = 0.294, Critical Value(0.05) = 0.114, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Copper

Data File

Variable: Copper

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	65
Minimum	17.4
Maximum	13600
Mean	424.0957
Standard Deviation	1653.597
Variance	2734382
Coefficient of Variation	3.899112
Skewness	7.572887
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.402862	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	753.613	

Gamma Statistics

k hat	0.430301	
k star (bias corrected)	0.421383	
Theta hat	985.5797	
Theta star	1006.437	
nu hat	60.24211	
nu star	58.99364	
5% Approximate Chi Square Value	42.33084	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	42.03441	
Anderson-Darling Test Statistic	9.148648	
Anderson-Darling 5% Critical Value	0.833802	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.293923	
Kolmogrov-Smirnov 5% Critical Value	0.113653	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	591.0336	
95% Adjusted Gamma UCL	595.2016	

Lognormal Statistics

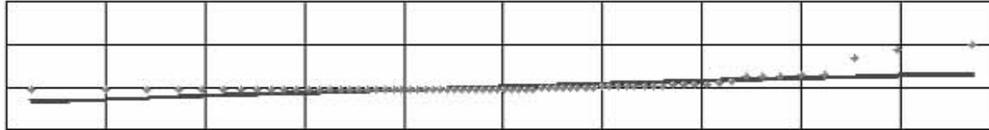
Minimum of log data	2.85647	
Maximum of log data	9.517825	
Mean of log data	4.538513	
Standard Deviation of log data	1.377154	
Variance of log data	1.896554	
Lilliefors Test Statistic	0.227391	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	241.4808	
MLE Standard Deviation	574.648	
MLE Coefficient of Variation	2.379684	
MLE Skewness	20.61495	
MLE Median	93.55159	

OABG Area Surface and Subsurface Soil  
Copper

MLE 80% Quantile	299.5282	
MLE 90% Quantile	549.0318	
MLE 95% Quantile	901.3845	
MLE 99% Quantile	2302.553	
MVU Estimate of Median	92.29257	
MVU Estimate of Mean	235.4124	
MVU Estimate of Standard Deviation	506.3594	
MVU Estimate of SE of Mean	51.03785	
95% H-UCL	374.74	
95% Chebyshev (MVUE) UCL	457.8812	
97.5% Chebyshev (MVUE) UCL	554.1436	
99% Chebyshev (MVUE) UCL	743.2326	
Non-parametric Statistics		
95% CLT UCL	749.1889	
95% Adjusted-CLT UCL	940.3385	
95% Modified-t UCL	783.4285	
95% Jackknife UCL	753.613	
95% Chebyshev (Mean, Sd) UCL	1285.6	
97.5% Chebyshev (Mean, Sd) UCL	1658.374	
99% Chebyshev (Mean, Sd) UCL	2390.615	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	747.3814	
95% Bootstrap-t UCL	1677.548	
95% Hall's Bootstrap UCL	1842.335	
95% Percentile Bootstrap UCL	793.1286	
95% BCA Bootstrap UCL	1144.331	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1658.374	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

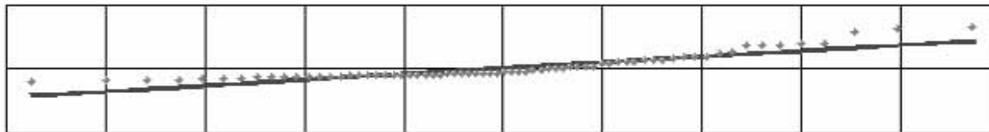
OABG Area Surface and Subsurface Soil  
Chromium

Normal Q-Q Plot for Chromium



N = 70, Mean = 37.6614, Sd = 56.9109  
Slope = 0.7066, Intercept = 0.0000, Correlation, R = 0.69655636  
Lilliefors Statistic = 0.306, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Chromium



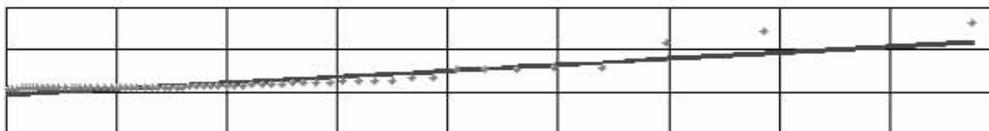
N = 70, Mean = 3.1408, Sd = 0.8331  
Slope = 0.9244, Intercept = 0.0000, Correlation, R = 0.91123698  
Lilliefors Statistic = 0.199, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Chromium



N = 70, Mean = 37.661, k hat = 1.1634  
Slope = 1.462, Intercept = -17.144, Correlation, R = 0.896  
A-D Test Statistic = 6.959, Critical Value(0.05) = 0.777, Data not Gamma Distributed

Gamma Q-Q Plot for Chromium



N = 70, Mean = 37.661, k hat = 1.163  
Slope = 1.462, Intercept = -17.144, Correlation, R = 0.896  
K-S Test Statistic = 0.239, Critical Value(0.05) = 0.109, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Chromium

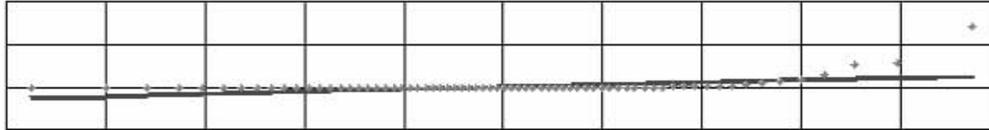
Data File	Chromium	
Variable:	Chromium	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	63	
Minimum	8.8	
Maximum	319	
Mean	37.66143	
Standard Deviation	56.91093	
Variance	3238.854	
Coefficient of Variation	1.51112	
Skewness	3.585152	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.306031	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	49.00225	
Gamma Statistics		
k hat	1.163397	
k star (bias corrected)	1.123061	
Theta hat	32.37196	
Theta star	33.53464	
nu hat	162.8755	
nu star	157.2285	
5% Approximate Chi Square Value	129.2353	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	128.7042	
Anderson-Darling Test Statistic	6.958842	
Anderson-Darling 5% Critical Value	0.776689	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.239034	
Kolmogrov-Smirnov 5% Critical Value	0.109157	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	45.81913	
95% Adjusted Gamma UCL	46.00821	
Lognormal Statistics		
Minimum of log data	2.174752	
Maximum of log data	5.765191	
Mean of log data	3.140845	
Standard Deviation of log data	0.833102	
Variance of log data	0.694059	
Lilliefors Test Statistic	0.198549	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	32.71633	
MLE Standard Deviation	32.74617	
MLE Coefficient of Variation	1.000912	
MLE Skewness	4.005474	
MLE Median	23.1234	

OABG Area Surface and Subsurface Soil  
Chromium

MLE 80% Quantile	46.75009	
MLE 90% Quantile	67.44963	
MLE 95% Quantile	91.0399	
MLE 99% Quantile	160.5556	
MVU Estimate of Median	23.00904	
MVU Estimate of Mean	32.50159	
MVU Estimate of Standard Deviation	31.71205	
MVU Estimate of SE of Mean	3.680948	
95% H-UCL	40.38642	
95% Chebyshev (MVUE) UCL	48.54647	
97.5% Chebyshev (MVUE) UCL	55.4891	
99% Chebyshev (MVUE) UCL	69.12656	
Non-parametric Statistics		
95% CLT UCL	48.84998	
95% Adjusted-CLT UCL	51.96446	
95% Modified-t UCL	49.48804	
95% Jackknife UCL	49.00225	
95% Chebyshev (Mean, Sd) UCL	67.31135	
97.5% Chebyshev (Mean, Sd) UCL	80.14089	
99% Chebyshev (Mean, Sd) UCL	105.342	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	48.98101	
95% Bootstrap-t UCL	56.29295	
95% Hall's Bootstrap UCL	53.91715	
95% Percentile Bootstrap UCL	49.49571	
95% BCA Bootstrap UCL	52.26714	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	67.31135	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

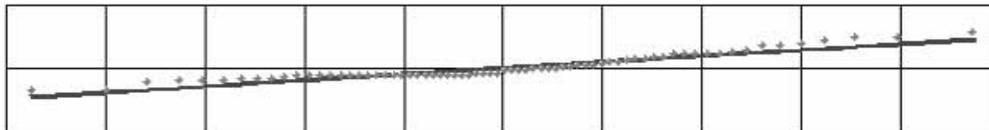
OABG Area Surface and Subsurface Soil  
Cadmium

Normal Q-Q Plot for Cadmium



N = 70, Mean = 15.0251, Sd = 51.5099  
Slope = 0.5523, Intercept = 0.0000, Correlation, R = 0.54441645  
Lilliefors Statistic = 0.401, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Cadmium



N = 70, Mean = 0.2463, Sd = 2.0211  
Slope = 0.9641, Intercept = 0.0000, Correlation, R = 0.95037203  
Lilliefors Statistic = 0.201, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Cadmium



N = 70, Mean = 15.025, k hat = 0.2826  
Slope = 1.745, Intercept = -10.792, Correlation, R = 0.910  
A-D Test Statistic = 8.051, Critical Value(0.05) = 0.873, Data not Gamma Distributed

Gamma Q-Q Plot for Cadmium



N = 70, Mean = 15.025, k hat = 0.283  
Slope = 1.745, Intercept = -10.792, Correlation, R = 0.910  
K-S Test Statistic = 0.258, Critical Value(0.05) = 0.116, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Cadmium

Data File

Variable: Cadmium

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	59
Minimum	0.0335
Maximum	373
Mean	15.02511
Standard Deviation	51.50993
Variance	2653.273
Coefficient of Variation	3.428256
Skewness	5.562069
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.401395	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	25.28966	

Gamma Statistics

k hat	0.282649	
k star (bias corrected)	0.280059	
Theta hat	53.15823	
Theta star	53.64978	
nu hat	39.57085	
nu star	39.20829	
5% Approximate Chi Square Value	25.86241	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	25.63439	
Anderson-Darling Test Statistic	8.050584	
Anderson-Darling 5% Critical Value	0.873324	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.258207	
Kolmogrov-Smirnov 5% Critical Value	0.116054	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	22.77858	
95% Adjusted Gamma UCL	22.9812	

Lognormal Statistics

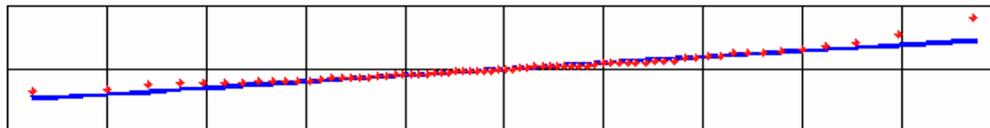
Minimum of log data	-3.39621	
Maximum of log data	5.921578	
Mean of log data	0.246261	
Standard Deviation of log data	2.021078	
Variance of log data	4.084758	
Lilliefors Test Statistic	0.20127	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	9.861513	
MLE Standard Deviation	75.37935	
MLE Coefficient of Variation	7.643791	
MLE Skewness	469.5393	
MLE Median	1.279233	

OABG Area Surface and Subsurface Soil  
Cadmium

MLE 80% Quantile	7.057366	
MLE 90% Quantile	17.17314	
MLE 95% Quantile	35.5498	
MLE 99% Quantile	140.7928	
MVU Estimate of Median	1.242433	
MVU Estimate of Mean	9.081109	
MVU Estimate of Standard Deviation	49.33487	
MVU Estimate of SE of Mean	3.353998	
95% H-UCL	22.74785	
95% Chebyshev (MVUE) UCL	23.70085	
97.5% Chebyshev (MVUE) UCL	30.02682	
99% Chebyshev (MVUE) UCL	42.45297	
Non-parametric Statistics		
95% CLT UCL	25.15184	
95% Adjusted-CLT UCL	29.52515	
95% Modified-t UCL	25.9718	
95% Jackknife UCL	25.28966	
95% Chebyshev (Mean, Sd) UCL	41.86117	
97.5% Chebyshev (Mean, Sd) UCL	53.47316	
99% Chebyshev (Mean, Sd) UCL	76.28265	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	25.13095	
95% Bootstrap-t UCL	40.63533	
95% Hall's Bootstrap UCL	56.01345	
95% Percentile Bootstrap UCL	26.40143	
95% BCA Bootstrap UCL	31.97192	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	76.28265	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Arsenic

Normal Q-Q Plot for Arsenic



N = 70, Mean = 12.2914, Sd = 4.6833  
Slope = 0.9754, Intercept = 0.0000, Correlation, R = 0.96148496  
Lilliefors Statistic = 0.103, Critical Value(0.05) = 0.106, Data are Normal

Data File

Variable: Arsenic

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	60
Minimum	3.9
Maximum	31
Mean	12.29143
Standard Deviation	4.683327
Variance	21.93355
Coefficient of Variation	0.381024
Skewness	1.224521
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.102892
Lilliefors 5% Critical Value	0.105897
Shapiro-Wilk Test Statistic	N/A
Shapiro-Wilk 5% Critical Value	N/A
5% Normality Test Result	NORMAL
95% Student's-t UCL	13.22469

Data are normal at 5% significance level

Gamma Statistics

k hat	7.487007
k star (bias corrected)	7.17566
Theta hat	1.641701
Theta star	1.712934
nu hat	1048.181
nu star	1004.592
5% Approximate Chi Square Value	932.0027
Adjusted Level of Significance	0.046571
Adjusted Chi Square Value	930.5452
Anderson-Darling Test Statistic	0.244497
Anderson-Darling 5% Critical Value	0.752444
Anderson-Darling 5% Gamma Test Result	AD GAMMA
Kolmogrov-Smirnov Test Statistic	0.061355
Kolmogrov-Smirnov 5% Critical Value	0.106521
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA
5% Gamma Test Result	GAMMA
95% Approximate Gamma UCL	13.24875
95% Adjusted Gamma UCL	13.26951
Lognormal Statistics	
Minimum of log data	1.360977

Data follow gamma distribution at 5% significance level.

Data follow gamma distribution at 5% significance level

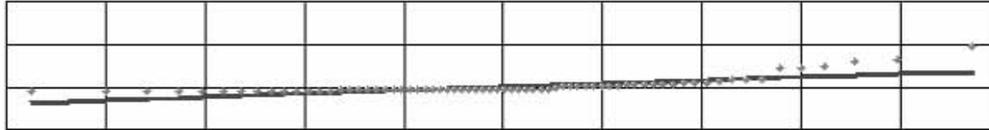
Data follow gamma distribution at 5% significance level

OABG Area Surface and Subsurface Soil  
Arsenic

Maximum of log data	3.433987	
Mean of log data	2.440636	
Standard Deviation of log data	0.376051	
Variance of log data	0.141414	
Lilliefors Test Statistic	0.05677	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	12.32147	
MLE Standard Deviation	4.802243	
MLE Coefficient of Variation	0.389746	
MLE Skewness	1.228441	
MLE Median	11.48034	
MLE 80% Quantile	15.77457	
MLE 90% Quantile	18.61302	
MLE 95% Quantile	21.31135	
MLE 99% Quantile	27.5315	
MVU Estimate of Median	11.46875	
MVU Estimate of Mean	12.30819	
MVU Estimate of Standard Deviation	4.777016	
MVU Estimate of SE of Mean	0.570161	
95% H-UCL	13.35676	
95% Chebyshev (MVUE) UCL	14.79346	
97.5% Chebyshev (MVUE) UCL	15.86884	
99% Chebyshev (MVUE) UCL	17.98122	
Non-parametric Statistics		
95% CLT UCL	13.21216	
95% Adjusted-CLT UCL	13.2997	
95% Modified-t UCL	13.23834	
95% Jackknife UCL	13.22469	
95% Chebyshev (Mean, Sd) UCL	14.73139	
97.5% Chebyshev (Mean, Sd) UCL	15.78716	
99% Chebyshev (Mean, Sd) UCL	17.86102	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	13.21574	
95% Bootstrap-t UCL	13.37416	
95% Hall's Bootstrap UCL	13.42788	
95% Percentile Bootstrap UCL	13.24286	
95% BCA Bootstrap UCL	13.34571	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	13.22469	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Antimony

Normal Q-Q Plot for Antimony



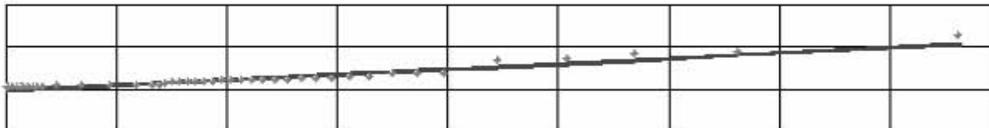
N = 70, Mean = 3.2219, Sd = 4.5885  
Slope = 0.7916, Intercept = 0.0000, Correlation, R = 0.78030330  
Lilliefors Statistic = 0.264, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Antimony



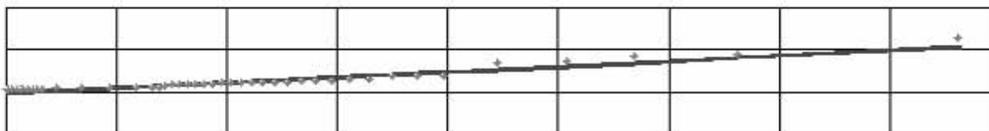
N = 70, Mean = 0.5090, Sd = 1.1192  
Slope = 0.9825, Intercept = 0.0000, Correlation, R = 0.96844625  
Lilliefors Statistic = 0.187, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Antimony



N = 70, Mean = 3.222, k hat = 0.8862  
Slope = 1.299, Intercept = -0.937, Correlation, R = 0.962  
A-D Test Statistic = 3.192, Critical Value(0.05) = 0.786, Data not Gamma Distributed

Gamma Q-Q Plot for Antimony



N = 70, Mean = 3.222, k hat = 0.886  
Slope = 1.299, Intercept = -0.937, Correlation, R = 0.962  
K-S Test Statistic = 0.239, Critical Value(0.05) = 0.110, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Antimony

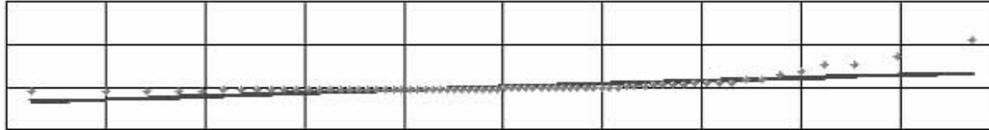
Data File		
Variable:	Antimony	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	43	
Minimum	0.32	
Maximum	25.1	
Mean	3.221929	
Standard Deviation	4.588487	
Variance	21.05421	
Coefficient of Variation	1.424143	
Skewness	2.828873	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.263551	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	4.13629	
Gamma Statistics		
k hat	0.886185	
k star (bias corrected)	0.857729	
Theta hat	3.63573	
Theta star	3.756347	
nu hat	124.0659	
nu star	120.0821	
5% Approximate Chi Square Value	95.77325	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	95.31854	
Anderson-Darling Test Statistic	3.191804	
Anderson-Darling 5% Critical Value	0.785993	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.23883	
Kolmogrov-Smirnov 5% Critical Value	0.110029	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	4.039708	
95% Adjusted Gamma UCL	4.058979	
Lognormal Statistics		
Minimum of log data	-1.139434	
Maximum of log data	3.222868	
Mean of log data	0.509013	
Standard Deviation of log data	1.119193	
Variance of log data	1.252594	
Lilliefors Test Statistic	0.186517	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	3.112137	
MLE Standard Deviation	4.920139	
MLE Coefficient of Variation	1.580952	
MLE Skewness	8.694299	
MLE Median	1.663648	

OABG Area Surface and Subsurface Soil  
Antimony

MLE 80% Quantile	4.283332	
MLE 90% Quantile	7.008869	
MLE 95% Quantile	10.48647	
MLE 99% Quantile	22.4717	
MVU Estimate of Median	1.648828	
MVU Estimate of Mean	3.068265	
MVU Estimate of Standard Deviation	4.588918	
MVU Estimate of SE of Mean	0.504184	
95% H-UCL	4.284092	
95% Chebyshev (MVUE) UCL	5.26595	
97.5% Chebyshev (MVUE) UCL	6.216891	
99% Chebyshev (MVUE) UCL	8.084829	
Non-parametric Statistics		
95% CLT UCL	4.124014	
95% Adjusted-CLT UCL	4.322151	
95% Modified-t UCL	4.167196	
95% Jackknife UCL	4.13629	
95% Chebyshev (Mean, Sd) UCL	5.612475	
97.5% Chebyshev (Mean, Sd) UCL	6.646867	
99% Chebyshev (Mean, Sd) UCL	8.678729	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	4.12453	
95% Bootstrap-t UCL	4.452831	
95% Hall's Bootstrap UCL	4.435744	
95% Percentile Bootstrap UCL	4.184571	
95% BCA Bootstrap UCL	4.271214	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6.646867	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

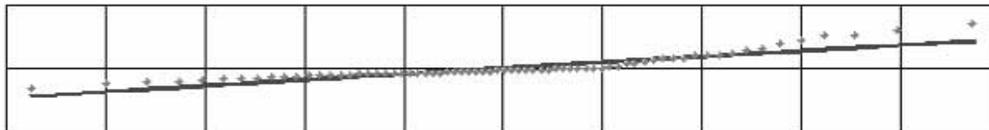
OABG Area Surface and Subsurface Soil  
Aluminum

Normal Q-Q Plot for Aluminum



N = 70, Mean = 13120.1429, Sd = 15509.5354  
Slope = 0.7294, Intercept = 0.0000, Correlation, R = 0.71894455  
Lilliefors Statistic = 0.311, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Aluminum



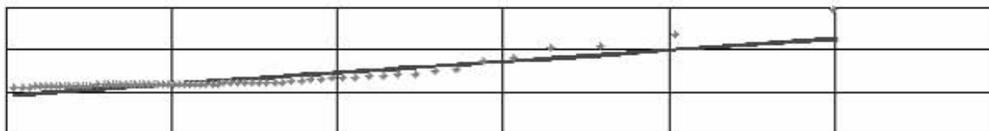
N = 70, Mean = 9.1673, Sd = 0.6770  
Slope = 0.9292, Intercept = 0.0000, Correlation, R = 0.91593355  
Lilliefors Statistic = 0.236, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Aluminum



N = 70, Mean = 13120.143, k hat = 1.7373  
Slope = 1.375, Intercept = -4863.155, Correlation, R = 0.887  
A-D Test Statistic = 6.780, Critical Value(0.05) = 0.766, Data not Gamma Distributed

Gamma Q-Q Plot for Aluminum



N = 70, Mean = 13120.143, k hat = 1.737  
Slope = 1.375, Intercept = -4863.155, Correlation, R = 0.887  
K-S Test Statistic = 0.278, Critical Value(0.05) = 0.108, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Aluminum

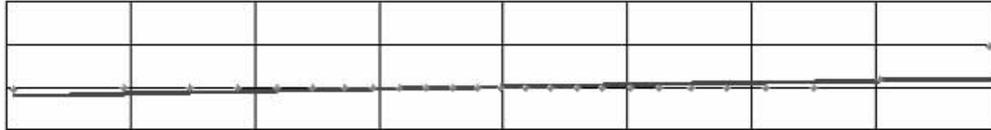
Data File		
Variable:	Aluminum	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	69	
Minimum	3130	
Maximum	96900	
Mean	13120.14	
Standard Deviation	15509.54	
Variance	2.41E+08	
Coefficient of Variation	1.182116	
Skewness	3.527607	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.310558	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	16210.78	
Gamma Statistics		
k hat	1.737288	
k star (bias corrected)	1.672357	
Theta hat	7552.082	
Theta star	7845.302	
nu hat	243.2203	
nu star	234.1299	
5% Approximate Chi Square Value	199.7022	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	199.0376	
Anderson-Darling Test Statistic	6.780068	
Anderson-Darling 5% Critical Value	0.766275	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.27761	
Kolmogrov-Smirnov 5% Critical Value	0.108122	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	15381.99	
95% Adjusted Gamma UCL	15433.36	
Lognormal Statistics		
Minimum of log data	8.048788	
Maximum of log data	11.48143	
Mean of log data	9.167292	
Standard Deviation of log data	0.677018	
Variance of log data	0.458354	
Lilliefors Test Statistic	0.23621	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	12045.77	
MLE Standard Deviation	9185.393	
MLE Coefficient of Variation	0.762541	
MLE Skewness	2.731016	
MLE Median	9578.653	

OABG Area Surface and Subsurface Soil  
Aluminum

MLE 80% Quantile	16972.89	
MLE 90% Quantile	22862.67	
MLE 95% Quantile	29172.66	
MLE 99% Quantile	46260.18	
MVU Estimate of Median	9547.342	
MVU Estimate of Mean	11997.84	
MVU Estimate of Standard Deviation	9008.793	
MVU Estimate of SE of Mean	1062.275	
95% H-UCL	14147.3	
95% Chebyshev (MVUE) UCL	16628.19	
97.5% Chebyshev (MVUE) UCL	18631.75	
99% Chebyshev (MVUE) UCL	22567.35	
Non-parametric Statistics		
95% CLT UCL	16169.28	
95% Adjusted-CLT UCL	17004.42	
95% Modified-t UCL	16341.04	
95% Jackknife UCL	16210.78	
95% Chebyshev (Mean, Sd) UCL	21200.43	
97.5% Chebyshev (Mean, Sd) UCL	24696.77	
99% Chebyshev (Mean, Sd) UCL	31564.66	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	16179.78	
95% Bootstrap-t UCL	17649.46	
95% Hall's Bootstrap UCL	17540.82	
95% Percentile Bootstrap UCL	16370.43	
95% BCA Bootstrap UCL	17132.14	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	21200.43	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

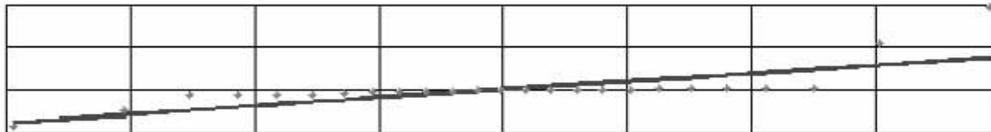
OABG Area Surface and Subsurface Soil  
RDX

Normal Q-Q Plot for RDX



N = 25, Mean = 618.8800, Sd = 1425.8888  
Slope = 0.5312, Intercept = 0.0000, Correlation, R = 0.51463517  
Lilliefors Statistic = 0.499, Critical Value(0.05) = 0.177, Data not Normal

Lognormal Q-Q Plot for RDX



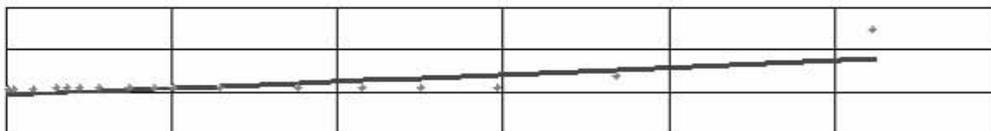
N = 25, Mean = 5.7972, Sd = 0.8070  
Slope = 0.7679, Intercept = 0.0000, Correlation, R = 0.74403678  
Lilliefors Statistic = 0.412, Critical Value(0.05) = 0.177, Data not Lognormal

Gamma Q-Q Plot for RDX



N = 25, Mean = 618.880, k hat = 0.9239  
Slope = 1.663, Intercept = -392.096, Correlation, R = 0.747  
A-D Test Statistic = 6.057, Critical Value(0.05) = 0.776, Data not Gamma Distributed

Gamma Q-Q Plot for RDX



N = 25, Mean = 618.880, k hat = 0.924  
Slope = 1.663, Intercept = -392.096, Correlation, R = 0.747  
K-S Test Statistic = 0.488, Critical Value(0.05) = 0.180, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
RDX

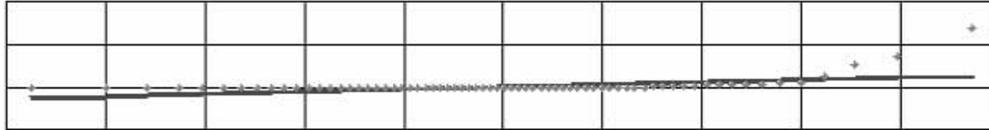
Data File		
Variable:	RDX	
Raw Statistics		
Number of Observations	25	
Number of Missing Data	0	
Number of Valid Observations	25	
Number of Distinct Observations	17	
Minimum	82	
Maximum	7300	
Mean	618.88	
Standard Deviation	1425.889	
Variance	2033159	
Coefficient of Variation	2.303983	
Skewness	4.669017	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.295124	
Shapiro-Wilk 5% Critical Value	0.918	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1106.785	
Gamma Statistics		
k hat	0.923912	
k star (bias corrected)	0.839709	
Theta hat	669.8473	
Theta star	737.017	
nu hat	46.1956	
nu star	41.98546	
5% Approximate Chi Square Value	28.1297	
Adjusted Level of Significance	0.0395	
Adjusted Chi Square Value	27.35598	
Anderson-Darling Test Statistic	6.057107	
Anderson-Darling 5% Critical Value	0.776232	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.488063	
Kolmogrov-Smirnov 5% Critical Value	0.180097	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	923.7198	
95% Adjusted Gamma UCL	949.8456	
Lognormal Statistics		
Minimum of log data	4.406719	
Maximum of log data	8.89563	
Mean of log data	5.797201	
Standard Deviation of log data	0.806966	
Variance of log data	0.651195	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.589949	
Shapiro-Wilk 5% Critical Value	0.918	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	456.1393	
MLE Standard Deviation	436.9974	
MLE Coefficient of Variation	0.958035	
MLE Skewness	3.753418	
MLE Median	329.3763	

OABG Area Surface and Subsurface Soil  
RDX

MLE 80% Quantile	651.3763	
MLE 90% Quantile	929.0409	
MLE 95% Quantile	1242.227	
MLE 99% Quantile	2152.112	
MVU Estimate of Median	325.1122	
MVU Estimate of Mean	448.5967	
MVU Estimate of Standard Deviation	404.9101	
MVU Estimate of SE of Mean	79.38848	
95% H-UCL	663.2835	
95% Chebyshev (MVUE) UCL	794.6431	
97.5% Chebyshev (MVUE) UCL	944.3776	
99% Chebyshev (MVUE) UCL	1238.502	
Non-parametric Statistics		
95% CLT UCL	1087.956	
95% Adjusted-CLT UCL	1372.501	
95% Modified-t UCL	1151.169	
95% Jackknife UCL	1106.785	
95% Chebyshev (Mean, Sd) UCL	1861.941	
97.5% Chebyshev (Mean, Sd) UCL	2399.815	
99% Chebyshev (Mean, Sd) UCL	3456.363	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1082.404	
95% Bootstrap-t UCL	10504.08	
95% Hall's Bootstrap UCL	8168.604	
95% Percentile Bootstrap UCL	1176.48	
95% BCA Bootstrap UCL	1510.8	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1861.941	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Lead

Normal Q-Q Plot for Lead



N = 70, Mean = 558.6486, Sd = 1740.5864  
Slope = 0.5646, Intercept = 0.0000, Correlation, R = 0.55656478  
Lilliefors Statistic = 0.379, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Lead



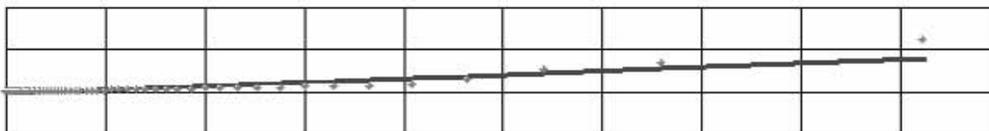
N = 70, Mean = 4.7016, Sd = 1.4755  
Slope = 0.9059, Intercept = 0.0000, Correlation, R = 0.89299715  
Lilliefors Statistic = 0.261, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Lead



N = 70, Mean = 558.649, k hat = 0.4045  
Slope = 1.810, Intercept = -441.103, Correlation, R = 0.884  
A-D Test Statistic = 9.914, Critical Value(0.05) = 0.840, Data not Gamma Distributed

Gamma Q-Q Plot for Lead



N = 70, Mean = 558.649, k hat = 0.404  
Slope = 1.810, Intercept = -441.103, Correlation, R = 0.884  
K-S Test Statistic = 0.316, Critical Value(0.05) = 0.114, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Lead

Data File

Variable: Lead

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	68
Minimum	20.5
Maximum	12100
Mean	558.6486
Standard Deviation	1740.586
Variance	3029641
Coefficient of Variation	3.115709
Skewness	5.249768
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.378594	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	905.5006	

Gamma Statistics

k hat	0.404481	
k star (bias corrected)	0.39667	
Theta hat	1381.15	
Theta star	1408.347	
nu hat	56.62731	
nu star	55.53376	
5% Approximate Chi Square Value	39.40499	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	39.11959	
Anderson-Darling Test Statistic	9.914417	
Anderson-Darling 5% Critical Value	0.840123	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.316201	
Kolmogrov-Smirnov 5% Critical Value	0.114051	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	787.3078	
95% Adjusted Gamma UCL	793.0516	

Lognormal Statistics

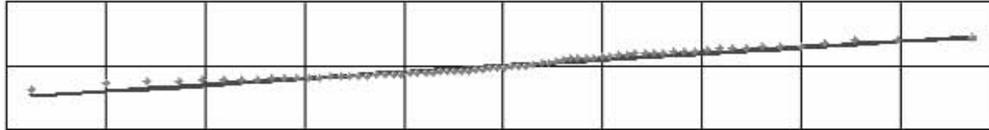
Minimum of log data	3.020425	
Maximum of log data	9.400961	
Mean of log data	4.701566	
Standard Deviation of log data	1.475471	
Variance of log data	2.177016	
Lilliefors Test Statistic	0.261227	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	327.0373	
MLE Standard Deviation	914.5327	
MLE Coefficient of Variation	2.796417	
MLE Skewness	30.25708	
MLE Median	110.1195	

OABG Area Surface and Subsurface Soil  
Lead

MLE 80% Quantile	383.1167	
MLE 90% Quantile	733.2943	
MLE 95% Quantile	1247.276	
MLE 99% Quantile	3406.746	
MVU Estimate of Median	108.42	
MVU Estimate of Mean	317.0035	
MVU Estimate of Standard Deviation	782.616	
MVU Estimate of SE of Mean	75.54251	
95% H-UCL	534.3235	
95% Chebyshev (MVUE) UCL	646.2857	
97.5% Chebyshev (MVUE) UCL	788.7664	
99% Chebyshev (MVUE) UCL	1068.642	
Non-parametric Statistics		
95% CLT UCL	900.8437	
95% Adjusted-CLT UCL	1040.326	
95% Modified-t UCL	927.2569	
95% Jackknife UCL	905.5006	
95% Chebyshev (Mean, Sd) UCL	1465.473	
97.5% Chebyshev (Mean, Sd) UCL	1857.857	
99% Chebyshev (Mean, Sd) UCL	2628.619	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	897.5214	
95% Bootstrap-t UCL	1336.07	
95% Hall's Bootstrap UCL	1812.189	
95% Percentile Bootstrap UCL	953.1214	
95% BCA Bootstrap UCL	1106.556	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1857.857	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Manganese

Normal Q-Q Plot for Manganese



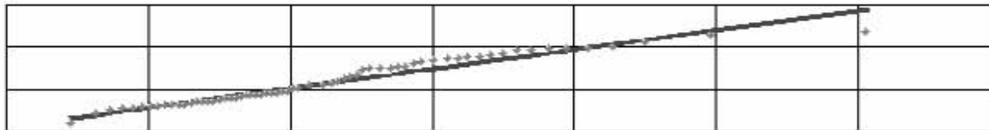
N = 70, Mean = 1174.6571, Sd = 540.1982  
Slope = 0.9915, Intercept = 0.0000, Correlation, R = 0.97731974  
Lilliefors Statistic = 0.120, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Manganese



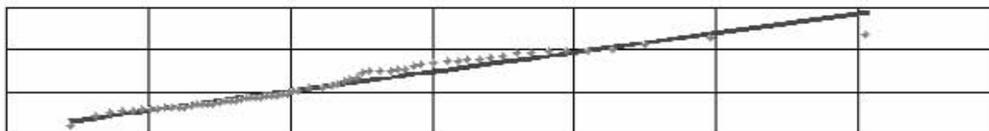
N = 70, Mean = 6.9493, Sd = 0.5219  
Slope = 0.9834, Intercept = 0.0000, Correlation, R = 0.96936444  
Lilliefors Statistic = 0.109, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Manganese



N = 70, Mean = 1174.657, k hat = 4.3478  
Slope = 0.925, Intercept = 90.236, Correlation, R = 0.976  
A-D Test Statistic = 0.763, Critical Value(0.05) = 0.755, Data not Gamma Distributed

Gamma Q-Q Plot for Manganese



N = 70, Mean = 1174.657, k hat = 4.348  
Slope = 0.925, Intercept = 90.236, Correlation, R = 0.976  
K-S Test Statistic = 0.101, Critical Value(0.05) = 0.107, Data are Gamma Distributed

OABG Area Surface and Subsurface Soil  
Manganese

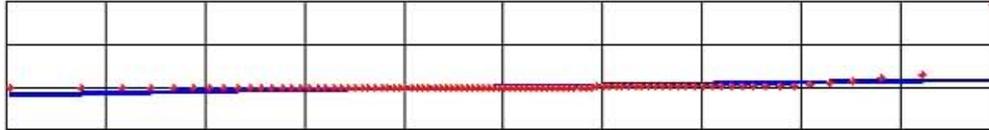
Data File		
Variable:	Manganese	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	64	
Minimum	147	
Maximum	2320	
Mean	1174.657	
Standard Deviation	540.1982	
Variance	291814.1	
Coefficient of Variation	0.459877	
Skewness	0.36172	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.120209	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1282.304	
Gamma Statistics		
k hat	4.347762	
k star (bias corrected)	4.170953	
Theta hat	270.1751	
Theta star	281.628	
nu hat	608.6867	
nu star	583.9334	
5% Approximate Chi Square Value	528.8704	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	527.7771	
Anderson-Darling Test Statistic	0.763462	
Anderson-Darling 5% Critical Value	0.755142	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.101449	
Kolmogrov-Smirnov 5% Critical Value	0.106797	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% significance level
5% Gamma Test Result	APPROX GAMMA	Data follow approximate gamma distribution at 5% significance level
95% Approximate Gamma UCL	1296.956	
95% Adjusted Gamma UCL	1299.642	
Lognormal Statistics		
Minimum of log data	4.990433	
Maximum of log data	7.749322	
Mean of log data	6.949344	
Standard Deviation of log data	0.521871	
Variance of log data	0.272349	
Lilliefors Test Statistic	0.108866	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1194.543	
MLE Standard Deviation	668.3516	
MLE Coefficient of Variation	0.559504	
MLE Skewness	1.853663	
MLE Median	1042.466	

OABG Area Surface and Subsurface Soil  
Manganese

MLE 80% Quantile	1620.232	
MLE 90% Quantile	2038.456	
MLE 95% Quantile	2459.765	
MLE 99% Quantile	3509.451	
MVU Estimate of Median	1040.44	
MVU Estimate of Mean	1191.92	
MVU Estimate of Standard Deviation	661.2289	
MVU Estimate of SE of Mean	78.63593	
95% H-UCL	1343.087	
95% Chebyshev (MVUE) UCL	1534.686	
97.5% Chebyshev (MVUE) UCL	1683.001	
99% Chebyshev (MVUE) UCL	1974.338	
Non-parametric Statistics		
95% CLT UCL	1280.859	
95% Adjusted-CLT UCL	1283.842	
95% Modified-t UCL	1282.769	
95% Jackknife UCL	1282.304	
95% Chebyshev (Mean, Sd) UCL	1456.094	
97.5% Chebyshev (Mean, Sd) UCL	1577.872	
99% Chebyshev (Mean, Sd) UCL	1817.081	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1280.03	
95% Bootstrap-t UCL	1285.404	
95% Hall's Bootstrap UCL	1286.42	
95% Percentile Bootstrap UCL	1282.814	
95% BCA Bootstrap UCL	1282.6	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	1296.956	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

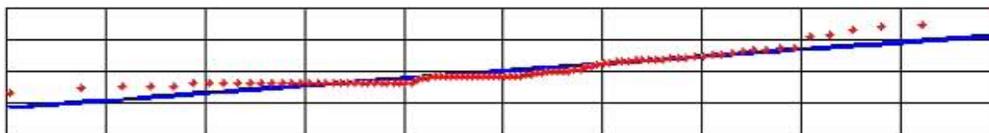
ABG Area Surface and Subsurface Soil  
Trichloroethene

Normal Q-Q Plot for Trichloroethene



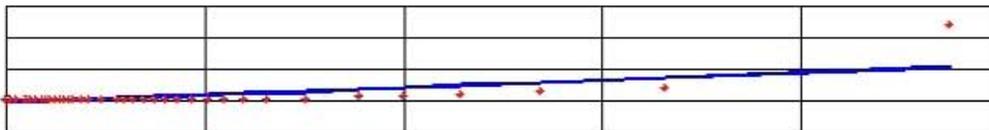
N = 94, Mean = 201.7351, Sd = 1257.0750  
Slope = 0.3592, Intercept = 0.0000, Correlation, R = 0.35509042  
Lilliefors Statistic = 0.456, Critical Value(0.05) = 0.091, Data not Normal

Lognormal Q-Q Plot for Trichloroethene



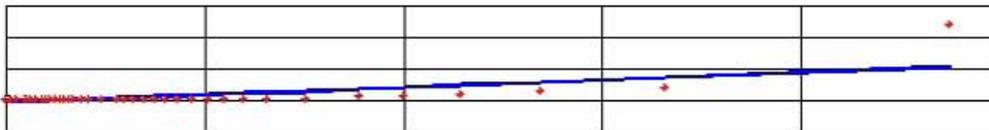
N = 94, Mean = 2.4907, Sd = 1.7394  
Slope = 0.9292, Intercept = 0.0000, Correlation, R = 0.91868050  
Lilliefors Statistic = 0.187, Critical Value(0.05) = 0.091, Data not Lognormal

Gamma Q-Q Plot for Trichloroethene



N = 94, Mean = 201.735, k hat = 0.2519  
Slope = 2.374, Intercept = -270.219, Correlation, R = 0.722  
A-D Test Statistic = 16.237, Critical Value(0.05) = 0.889, Data not Gamma Distributed

Gamma Q-Q Plot for Trichloroethene



N = 94, Mean = 201.735, k hat = 0.252  
Slope = 2.374, Intercept = -270.219, Correlation, R = 0.722  
K-S Test Statistic = 0.297, Critical Value(0.05) = 0.101, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Trichloroethene

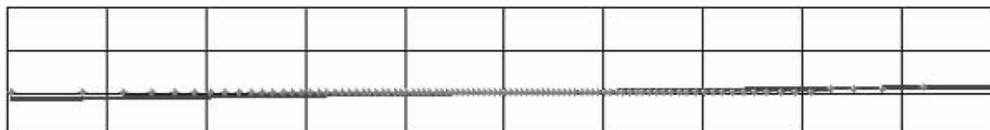
Data File	Trichloroethene	
Variable:	Trichloroethene	
Raw Statistics		
Number of Observations	94	
Number of Missing Data	0	
Number of Valid Observations	94	
Number of Distinct Observations	42	
Minimum	1	
Maximum	12000	
Mean	201.7351	
Standard Deviation	1257.075	
Variance	1580238	
Coefficient of Variation	6.231315	
Skewness	9.114623	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.455755	
Lilliefors 5% Critical Value	0.091384	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	417.1483	
Gamma Statistics		
k hat	0.251901	
k star (bias corrected)	0.250953	
Theta hat	800.8521	
Theta star	803.8748	
nu hat	47.35731	
nu star	47.17924	
5% Approximate Chi Square Value	32.41369	
Adjusted Level of Significance	0.047447	
Adjusted Chi Square Value	32.22338	
Anderson-Darling Test Statistic	16.23707	
Anderson-Darling 5% Critical Value	0.888921	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.296529	
Kolmogrov-Smirnov 5% Critical Value	0.101179	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	293.6323	
95% Adjusted Gamma UCL	295.3665	
Lognormal Statistics		
Minimum of log data	0	
Maximum of log data	9.392662	
Mean of log data	2.490676	
Standard Deviation of log data	1.739441	
Variance of log data	3.025654	
Lilliefors Test Statistic	0.186759	
Lilliefors 5% Critical Value	0.091384	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	54.78971	
MLE Standard Deviation	242.6106	
MLE Coefficient of Variation	4.428032	
MLE Skewness	100.1066	

ABG Area Surface and Subsurface Soil  
Trichloroethene

MLE Median	12.06943	
MLE 80% Quantile	52.48371	
MLE 90% Quantile	112.8271	
MLE 95% Quantile	211.0416	
MLE 99% Quantile	689.9468	
MVU Estimate of Median	11.87671	
MVU Estimate of Mean	52.70687	
MVU Estimate of Standard Deviation	198.1601	
MVU Estimate of SE of Mean	13.9294	
95% H-UCL	94.18783	
95% Chebyshev (MVUE) UCL	113.4237	
97.5% Chebyshev (MVUE) UCL	139.696	
99% Chebyshev (MVUE) UCL	191.3027	
Non-parametric Statistics		
95% CLT UCL	415.0025	
95% Adjusted-CLT UCL	545.245	
95% Modified-t UCL	437.4635	
95% Jackknife UCL	417.1483	
95% Chebyshev (Mean, Sd) UCL	766.8986	
97.5% Chebyshev (Mean, Sd) UCL	1011.445	
99% Chebyshev (Mean, Sd) UCL	1491.81	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	414.8774	
95% Bootstrap-t UCL	1428.239	
95% Hall's Bootstrap UCL	1105.769	
95% Percentile Bootstrap UCL	452.3521	
95% BCA Bootstrap UCL	443.0968	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1011.445	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

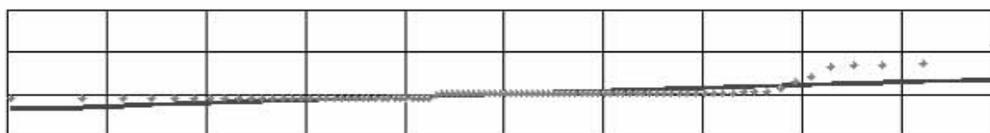
ABG Area Surface and Subsurface Soil  
Tetrachloroethene

Normal Q-Q Plot for Tetrachloroethene



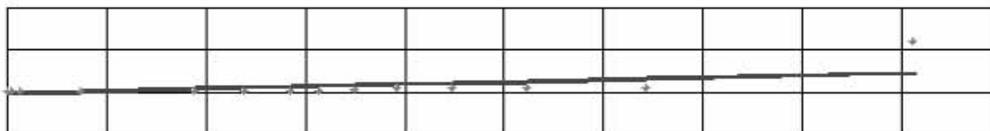
N = 94, Mean = 81.1809, Sd = 599.9635  
Slope = 0.3125, Intercept = 0.0000, Correlation, R = 0.30896420  
Lilliefors Statistic = 0.471, Critical Value(0.05) = 0.091, Data not Normal

Lognormal Q-Q Plot for Tetrachloroethene



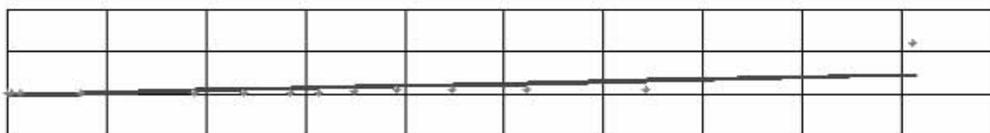
N = 94, Mean = 1.8199, Sd = 1.2105  
Slope = 0.7185, Intercept = 0.0000, Correlation, R = 0.71039816  
Lilliefors Statistic = 0.373, Critical Value(0.05) = 0.091, Data not Lognormal

Gamma Q-Q Plot for Tetrachloroethene



N = 94, Mean = 81.181, k hat = 0.2719  
Slope = 2.672, Intercept = -125.819, Correlation, R = 0.659  
A-D Test Statistic = 28.189, Critical Value(0.05) = 0.880, Data not Gamma Distributed

Gamma Q-Q Plot for Tetrachloroethene



N = 94, Mean = 81.181, k hat = 0.272  
Slope = 2.672, Intercept = -125.819, Correlation, R = 0.659  
K-S Test Statistic = 0.517, Critical Value(0.05) = 0.101, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Tetrachloroethene

Data File

Variable: Tetrachloroethene

Raw Statistics

Number of Observations	94
Number of Missing Data	0
Number of Valid Observations	94
Number of Distinct Observations	14
Minimum	3
Maximum	5800
Mean	81.18085
Standard Deviation	599.9635
Variance	359956.2
Coefficient of Variation	7.390456
Skewness	9.516511
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.471432	
Lilliefors 5% Critical Value	0.091384	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	183.991	

Gamma Statistics

k hat	0.271921	
k star (bias corrected)	0.270335	
Theta hat	298.5455	
Theta star	300.2972	
nu hat	51.12118	
nu star	50.82298	
5% Approximate Chi Square Value	35.44904	
Adjusted Level of Significance	0.047447	
Adjusted Chi Square Value	35.24945	
Anderson-Darling Test Statistic	28.18855	
Anderson-Darling 5% Critical Value	0.880132	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.517387	
Kolmogrov-Smirnov 5% Critical Value	0.100769	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	116.3883	
95% Adjusted Gamma UCL	117.0473	

Lognormal Statistics

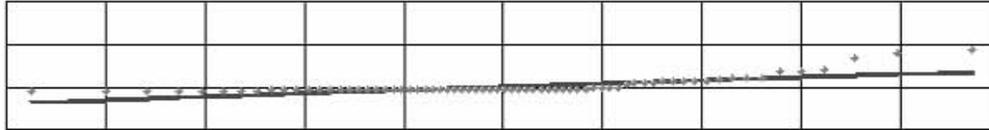
Minimum of log data	1.098612	
Maximum of log data	8.665613	
Mean of log data	1.819865	
Standard Deviation of log data	1.210478	
Variance of log data	1.465258	
Lilliefors Test Statistic	0.373427	
Lilliefors 5% Critical Value	0.091384	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	12.83908	
MLE Standard Deviation	23.42441	
MLE Coefficient of Variation	1.824461	
MLE Skewness	11.54639	
MLE Median	6.171026	

ABG Area Surface and Subsurface Soil  
Tetrachloroethene

MLE 80% Quantile	17.16237	
MLE 90% Quantile	29.23392	
MLE 95% Quantile	45.20022	
MLE 99% Quantile	103.073	
MVU Estimate of Median	6.123112	
MVU Estimate of Mean	12.67051	
MVU Estimate of Standard Deviation	21.92319	
MVU Estimate of SE of Mean	2.013607	
95% H-UCL	17.39341	
95% Chebyshev (MVUE) UCL	21.44762	
97.5% Chebyshev (MVUE) UCL	25.24548	
99% Chebyshev (MVUE) UCL	32.70564	
Non-parametric Statistics		
95% CLT UCL	182.9669	
95% Adjusted-CLT UCL	247.8684	
95% Modified-t UCL	194.1143	
95% Jackknife UCL	183.991	
95% Chebyshev (Mean, Sd) UCL	350.9161	
97.5% Chebyshev (Mean, Sd) UCL	467.6308	
99% Chebyshev (Mean, Sd) UCL	696.8941	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	185.2589	
95% Bootstrap-t UCL	996.5526	
95% Hall's Bootstrap UCL	760.9905	
95% Percentile Bootstrap UCL	201.9043	
95% BCA Bootstrap UCL	271.0798	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	467.6308	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

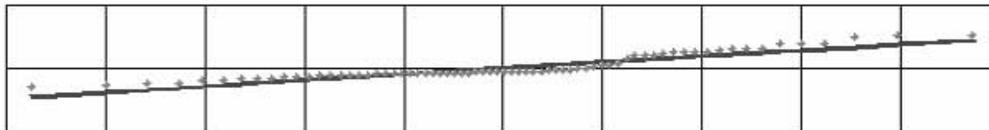
OABG Area Surface and Subsurface Soil  
Zinc

Normal Q-Q Plot for Zinc



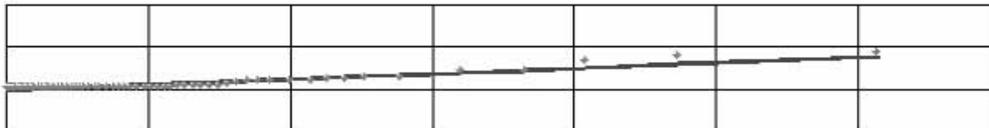
N = 70, Mean = 588.3486, Sd = 851.5539  
Slope = 0.7782, Intercept = 0.0000, Correlation, R = 0.76706504  
Lilliefors Statistic = 0.313, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Zinc



N = 70, Mean = 5.7527, Sd = 1.0160  
Slope = 0.9503, Intercept = 0.0000, Correlation, R = 0.93668706  
Lilliefors Statistic = 0.242, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Zinc



N = 70, Mean = 588.349, k hat = 0.9320  
Slope = 1.341, Intercept = -196.360, Correlation, R = 0.954  
A-D Test Statistic = 6.169, Critical Value(0.05) = 0.784, Data not Gamma Distributed

Gamma Q-Q Plot for Zinc



N = 70, Mean = 588.349, k hat = 0.932  
Slope = 1.341, Intercept = -196.360, Correlation, R = 0.954  
K-S Test Statistic = 0.287, Critical Value(0.05) = 0.110, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Zinc

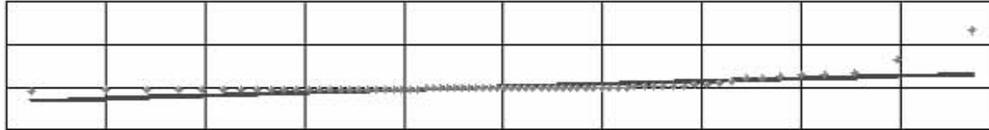
Data File		
Variable:	Zinc	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	61	
Minimum	63.2	
Maximum	4230	
Mean	588.3486	
Standard Deviation	851.5539	
Variance	725144	
Coefficient of Variation	1.447363	
Skewness	2.739683	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.313387	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	758.0403	
Gamma Statistics		
k hat	0.93196	
k star (bias corrected)	0.901543	
Theta hat	631.3022	
Theta star	652.6018	
nu hat	130.4744	
nu star	126.216	
5% Approximate Chi Square Value	101.2629	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	100.7948	
Anderson-Darling Test Statistic	6.169145	
Anderson-Darling 5% Critical Value	0.783776	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.28678	
Kolmogrov-Smirnov 5% Critical Value	0.10982	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	733.3289	
95% Adjusted Gamma UCL	736.7343	
Lognormal Statistics		
Minimum of log data	4.146304	
Maximum of log data	8.349957	
Mean of log data	5.752719	
Standard Deviation of log data	1.016	
Variance of log data	1.032256	
Lilliefors Test Statistic	0.242096	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	527.8682	
MLE Standard Deviation	709.6623	
MLE Coefficient of Variation	1.344393	
MLE Skewness	6.463024	
MLE Median	315.046	

OABG Area Surface and Subsurface Soil  
Zinc

MLE 80% Quantile	743.4032	
MLE 90% Quantile	1162.442	
MLE 95% Quantile	1675.788	
MLE 99% Quantile	3347.385	
MVU Estimate of Median	312.7314	
MVU Estimate of Mean	522.1182	
MVU Estimate of Standard Deviation	672.6442	
MVU Estimate of SE of Mean	75.71916	
95% H-UCL	696.7066	
95% Chebyshev (MVUE) UCL	852.1703	
97.5% Chebyshev (MVUE) UCL	994.9841	
99% Chebyshev (MVUE) UCL	1275.514	
Non-parametric Statistics		
95% CLT UCL	755.762	
95% Adjusted-CLT UCL	791.3739	
95% Modified-t UCL	763.5951	
95% Jackknife UCL	758.0403	
95% Chebyshev (Mean, Sd) UCL	1031.998	
97.5% Chebyshev (Mean, Sd) UCL	1223.965	
99% Chebyshev (Mean, Sd) UCL	1601.048	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	755.4937	
95% Bootstrap-t UCL	814.6435	
95% Hall's Bootstrap UCL	807.6278	
95% Percentile Bootstrap UCL	767.4586	
95% BCA Bootstrap UCL	797.3471	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1223.965	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

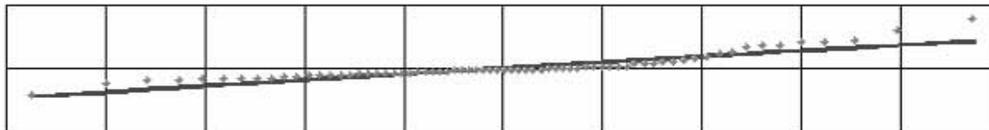
OABG Area Surface and Subsurface Soil  
Vanadium

Normal Q-Q Plot for Vanadium



N = 70, Mean = 34.8857, Sd = 45.3237  
Slope = 0.6754, Intercept = 0.0000, Correlation, R = 0.66576154  
Lilliefors Statistic = 0.326, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Vanadium



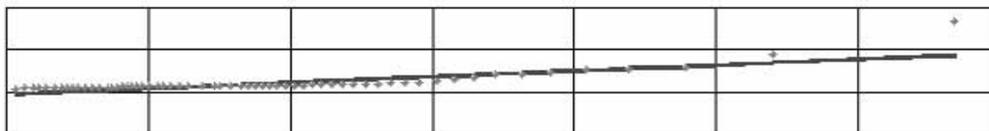
N = 70, Mean = 3.2344, Sd = 0.6723  
Slope = 0.9334, Intercept = 0.0000, Correlation, R = 0.92007766  
Lilliefors Statistic = 0.215, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Vanadium



N = 70, Mean = 34.886, k hat = 1.7216  
Slope = 1.422, Intercept = -14.562, Correlation, R = 0.839  
A-D Test Statistic = 6.597, Critical Value(0.05) = 0.766, Data not Gamma Distributed

Gamma Q-Q Plot for Vanadium



N = 70, Mean = 34.886, k hat = 1.722  
Slope = 1.422, Intercept = -14.562, Correlation, R = 0.839  
K-S Test Statistic = 0.274, Critical Value(0.05) = 0.108, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Vanadium

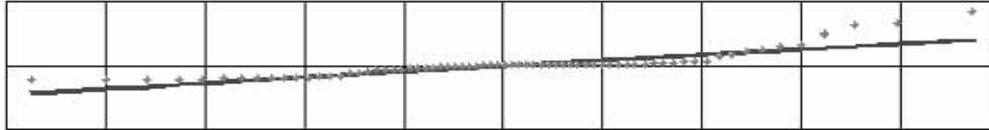
Data File		
Variable:	Vanadium	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	61	
Minimum	5.6	
Maximum	332	
Mean	34.88571	
Standard Deviation	45.32367	
Variance	2054.235	
Coefficient of Variation	1.299204	
Skewness	4.777758	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.326009	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	43.9175	
Gamma Statistics		
k hat	1.721626	
k star (bias corrected)	1.657366	
Theta hat	20.26323	
Theta star	21.04889	
nu hat	241.0277	
nu star	232.0312	
5% Approximate Chi Square Value	197.7636	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	197.1023	
Anderson-Darling Test Statistic	6.596767	
Anderson-Darling 5% Critical Value	0.766447	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.274292	
Kolmogrov-Smirnov 5% Critical Value	0.108142	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	40.93056	
95% Adjusted Gamma UCL	41.06789	
Lognormal Statistics		
Minimum of log data	1.722767	
Maximum of log data	5.805135	
Mean of log data	3.234371	
Standard Deviation of log data	0.672319	
Variance of log data	0.452013	
Lilliefors Test Statistic	0.215263	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	31.82898	
MLE Standard Deviation	24.06138	
MLE Coefficient of Variation	0.755958	
MLE Skewness	2.699883	
MLE Median	25.39039	

OABG Area Surface and Subsurface Soil  
Vanadium

MLE 80% Quantile	44.8122	
MLE 90% Quantile	60.23785	
MLE 95% Quantile	76.73331	
MLE 99% Quantile	121.2901	
MVU Estimate of Median	25.30854	
MVU Estimate of Mean	31.70439	
MVU Estimate of Standard Deviation	23.60621	
MVU Estimate of SE of Mean	2.78451	
95% H-UCL	37.32954	
95% Chebyshev (MVUE) UCL	43.84179	
97.5% Chebyshev (MVUE) UCL	49.09365	
99% Chebyshev (MVUE) UCL	59.40992	
Non-parametric Statistics		
95% CLT UCL	43.79624	
95% Adjusted-CLT UCL	47.1017	
95% Modified-t UCL	44.43309	
95% Jackknife UCL	43.9175	
95% Chebyshev (Mean, Sd) UCL	58.4988	
97.5% Chebyshev (Mean, Sd) UCL	68.71621	
99% Chebyshev (Mean, Sd) UCL	88.78632	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	43.60015	
95% Bootstrap-t UCL	51.04835	
95% Hall's Bootstrap UCL	80.94673	
95% Percentile Bootstrap UCL	45.18143	
95% BCA Bootstrap UCL	48.69286	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	58.4988	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Thallium

Normal Q-Q Plot for Thallium



N = 70, Mean = 0.8693, Sd = 0.5502  
 Slope = 0.8952, Intercept = 0.0000, Correlation, R = 0.88240553  
 Lilliefors Statistic = 0.263, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Thallium



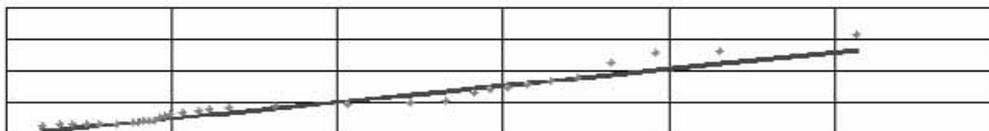
N = 70, Mean = -0.3107, Sd = 0.5962  
 Slope = 0.9701, Intercept = 0.0000, Correlation, R = 0.95621195  
 Lilliefors Statistic = 0.187, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Thallium



N = 70, Mean = 0.869, k hat = 3.0875  
 Slope = 1.049, Intercept = -0.040, Correlation, R = 0.951  
 A-D Test Statistic = 2.696, Critical Value(0.05) = 0.757, Data not Gamma Distributed

Gamma Q-Q Plot for Thallium



N = 70, Mean = 0.869, k hat = 3.087  
 Slope = 1.049, Intercept = -0.040, Correlation, R = 0.951  
 K-S Test Statistic = 0.187, Critical Value(0.05) = 0.107, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Thallium

Data File

Variable:

Thallium

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	32
Minimum	0.23
Maximum	3.1
Mean	0.869286
Standard Deviation	0.550188
Variance	0.302707
Coefficient of Variation	0.63292
Skewness	1.981511
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.263246	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.978923	

Gamma Statistics

k hat	3.087476	
k star (bias corrected)	2.964679	
Theta hat	0.281552	
Theta star	0.293214	
nu hat	432.2466	
nu star	415.0551	
5% Approximate Chi Square Value	368.8186	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	367.9087	
Anderson-Darling Test Statistic	2.695932	
Anderson-Darling 5% Critical Value	0.757311	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.186827	
Kolmogrov-Smirnov 5% Critical Value	0.107088	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.978263	
95% Adjusted Gamma UCL	0.980682	

Lognormal Statistics

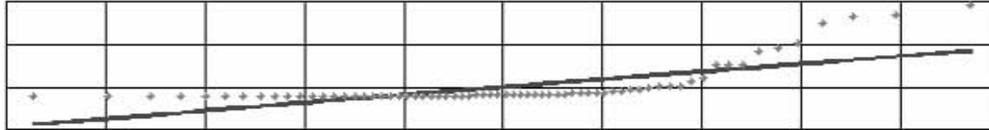
Minimum of log data	-1.469676	
Maximum of log data	1.131402	
Mean of log data	-0.310682	
Standard Deviation of log data	0.596193	
Variance of log data	0.355446	
Lilliefors Test Statistic	0.186938	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.8755	
MLE Standard Deviation	0.571975	
MLE Coefficient of Variation	0.653312	
MLE Skewness	2.238781	
MLE Median	0.732947	

OABG Area Surface and Subsurface Soil  
Thallium

MLE 80% Quantile	1.213005	
MLE 90% Quantile	1.576844	
MLE 95% Quantile	1.954344	
MLE 99% Quantile	2.933106	
MVU Estimate of Median	0.731088	
MVU Estimate of Mean	0.872906	
MVU Estimate of Standard Deviation	0.563764	
MVU Estimate of SE of Mean	0.066821	
95% H-UCL	1.004472	
95% Chebyshev (MVUE) UCL	1.164173	
97.5% Chebyshev (MVUE) UCL	1.290204	
99% Chebyshev (MVUE) UCL	1.537769	
Non-parametric Statistics		
95% CLT UCL	0.977451	
95% Adjusted-CLT UCL	0.994093	
95% Modified-t UCL	0.981519	
95% Jackknife UCL	0.978923	
95% Chebyshev (Mean, Sd) UCL	1.155927	
97.5% Chebyshev (Mean, Sd) UCL	1.279957	
99% Chebyshev (Mean, Sd) UCL	1.52359	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.974135	
95% Bootstrap-t UCL	0.999445	
95% Hall's Bootstrap UCL	1.009882	
95% Percentile Bootstrap UCL	0.975571	
95% BCA Bootstrap UCL	0.986571	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.155927	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

OABG Area Surface and Subsurface Soil  
Silver

Normal Q-Q Plot for Silver



N = 68, Mean = 13.8143, Sd = 28.1343  
Slope = 0.7423, Intercept = 0.0000, Correlation, R = 0.73145344  
Lilliefors Statistic = 0.338, Critical Value(0.05) = 0.107, Data not Normal

Lognormal Q-Q Plot for Silver



N = 68, Mean = 0.9074, Sd = 1.8493  
Slope = 0.9786, Intercept = 0.0000, Correlation, R = 0.96429475  
Lilliefors Statistic = 0.167, Critical Value(0.05) = 0.107, Data not Lognormal

Gamma Q-Q Plot for Silver



N = 68, Mean = 13.814, k hat = 0.3853  
Slope = 1.262, Intercept = -3.410, Correlation, R = 0.964  
A-D Test Statistic = 5.151, Critical Value(0.05) = 0.844, Data not Gamma Distributed

Gamma Q-Q Plot for Silver



N = 68, Mean = 13.814, k hat = 0.385  
Slope = 1.262, Intercept = -3.410, Correlation, R = 0.964  
K-S Test Statistic = 0.224, Critical Value(0.05) = 0.116, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Silver

Data File

Variable: Silver

Raw Statistics

Number of Observations	68
Number of Missing Data	0
Number of Valid Observations	68
Number of Distinct Observations	52
Minimum	0.11
Maximum	121
Mean	13.81434
Standard Deviation	28.13428
Variance	791.538
Coefficient of Variation	2.0366
Skewness	2.540616
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.337854	
Lilliefors 5% Critical Value	0.107443	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	19.50491	

Gamma Statistics

k hat	0.385274	
k star (bias corrected)	0.37808	
Theta hat	35.85592	
Theta star	36.53812	
nu hat	52.3972	
nu star	51.4189	
5% Approximate Chi Square Value	35.94758	
Adjusted Level of Significance	0.046471	
Adjusted Chi Square Value	35.66754	
Anderson-Darling Test Statistic	5.151367	
Anderson-Darling 5% Critical Value	0.84448	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.223858	
Kolmogrov-Smirnov 5% Critical Value	0.116104	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	19.75983	
95% Adjusted Gamma UCL	19.91497	

Lognormal Statistics

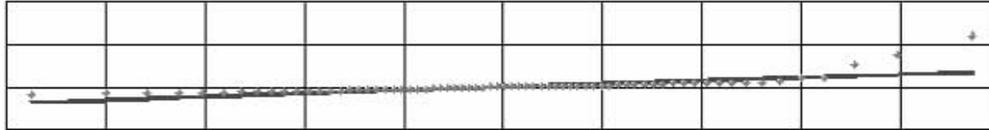
Minimum of log data	-2.207275	
Maximum of log data	4.795791	
Mean of log data	0.907358	
Standard Deviation of log data	1.849272	
Variance of log data	3.419808	
Lilliefors Test Statistic	0.167403	
Lilliefors 5% Critical Value	0.107443	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	13.69816	
MLE Standard Deviation	74.48015	
MLE Coefficient of Variation	5.437237	
MLE Skewness	177.0557	
MLE Median	2.477767	

OABG Area Surface and Subsurface Soil  
Silver

MLE 80% Quantile	11.82236	
MLE 90% Quantile	26.67355	
MLE 95% Quantile	51.90476	
MLE 99% Quantile	182.8681	
MVU Estimate of Median	2.416216	
MVU Estimate of Mean	12.85042	
MVU Estimate of Standard Deviation	53.81366	
MVU Estimate of SE of Mean	4.242884	
95% H-UCL	28.39784	
95% Chebyshev (MVUE) UCL	31.34473	
97.5% Chebyshev (MVUE) UCL	39.34722	
99% Chebyshev (MVUE) UCL	55.06658	
Non-parametric Statistics		
95% CLT UCL	19.42622	
95% Adjusted-CLT UCL	20.54939	
95% Modified-t UCL	19.6801	
95% Jackknife UCL	19.50491	
95% Chebyshev (Mean, Sd) UCL	28.68596	
97.5% Chebyshev (Mean, Sd) UCL	35.12092	
99% Chebyshev (Mean, Sd) UCL	47.76115	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	19.28923	
95% Bootstrap-t UCL	21.62803	
95% Hall's Bootstrap UCL	20.09457	
95% Percentile Bootstrap UCL	19.68787	
95% BCA Bootstrap UCL	21.0625	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	35.12092	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

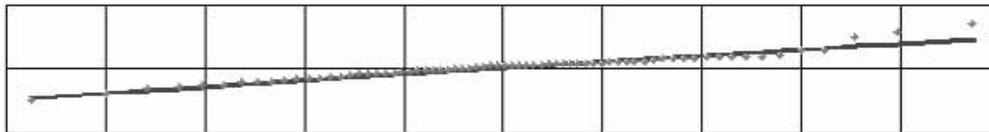
OABG Area Surface and Subsurface Soil  
Nickel

Normal Q-Q Plot for Nickel



N = 70, Mean = 59.4229, Sd = 48.6448  
Slope = 0.7662, Intercept = 0.0000, Correlation, R = 0.75527089  
Lilliefors Statistic = 0.254, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Nickel



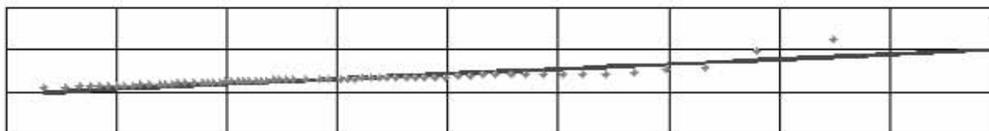
N = 70, Mean = 3.9052, Sd = 0.5621  
Slope = 0.9840, Intercept = 0.0000, Correlation, R = 0.96993066  
Lilliefors Statistic = 0.116, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Nickel



N = 70, Mean = 59.423, k hat = 2.9425  
Slope = 1.194, Intercept = -11.414, Correlation, R = 0.860  
A-D Test Statistic = 2.057, Critical Value(0.05) = 0.758, Data not Gamma Distributed

Gamma Q-Q Plot for Nickel



N = 70, Mean = 59.423, k hat = 2.942  
Slope = 1.194, Intercept = -11.414, Correlation, R = 0.860  
K-S Test Statistic = 0.151, Critical Value(0.05) = 0.107, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Nickel

Data File

Variable: Nickel

Raw Statistics

Number of Observations	70
Number of Missing Data	0
Number of Valid Observations	70
Number of Distinct Observations	65
Minimum	11.4
Maximum	347
Mean	59.42286
Standard Deviation	48.64483
Variance	2366.319
Coefficient of Variation	0.818622
Skewness	4.029304
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	0.254188	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	69.11646	

Gamma Statistics

k hat	2.942466	
k star (bias corrected)	2.825884	
Theta hat	20.19492	
Theta star	21.02806	
nu hat	411.9452	
nu star	395.6237	
5% Approximate Chi Square Value	350.5108	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	349.6242	
Anderson-Darling Test Statistic	2.056584	
Anderson-Darling 5% Critical Value	0.757811	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.151402	
Kolmogrov-Smirnov 5% Critical Value	0.107149	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	67.07096	
95% Adjusted Gamma UCL	67.24103	

Lognormal Statistics

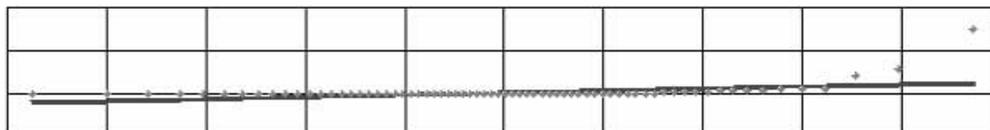
Minimum of log data	2.433613	
Maximum of log data	5.849325	
Mean of log data	3.905234	
Standard Deviation of log data	0.562117	
Variance of log data	0.315976	
Lilliefors Test Statistic	0.115567	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	58.16141	
MLE Standard Deviation	35.45448	
MLE Coefficient of Variation	0.609588	
MLE Skewness	2.055284	
MLE Median	49.66171	

OABG Area Surface and Subsurface Soil  
Nickel

MLE 80% Quantile	79.85587	
MLE 90% Quantile	102.2637	
MLE 95% Quantile	125.2006	
MLE 99% Quantile	183.5926	
MVU Estimate of Median	49.54975	
MVU Estimate of Mean	58.01059	
MVU Estimate of Standard Deviation	35.00872	
MVU Estimate of SE of Mean	4.156475	
95% H-UCL	66.104	
95% Chebyshev (MVUE) UCL	76.12824	
97.5% Chebyshev (MVUE) UCL	83.96776	
99% Chebyshev (MVUE) UCL	99.36699	
Non-parametric Statistics		
95% CLT UCL	68.98631	
95% Adjusted-CLT UCL	71.97823	
95% Modified-t UCL	69.58314	
95% Jackknife UCL	69.11646	
95% Chebyshev (Mean, Sd) UCL	84.76623	
97.5% Chebyshev (Mean, Sd) UCL	95.73233	
99% Chebyshev (Mean, Sd) UCL	117.2731	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	69.15098	
95% Bootstrap-t UCL	76.48688	
95% Hall's Bootstrap UCL	111.0141	
95% Percentile Bootstrap UCL	69.49286	
95% BCA Bootstrap UCL	73.86429	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	84.76623	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

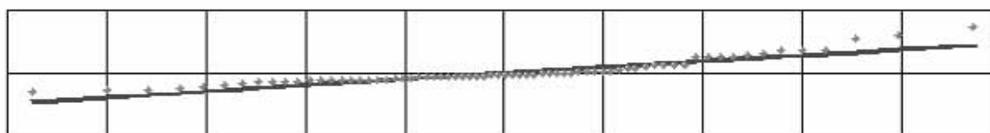
OABG Area Surface and Subsurface Soil  
Mercury

Normal Q-Q Plot for Mercury



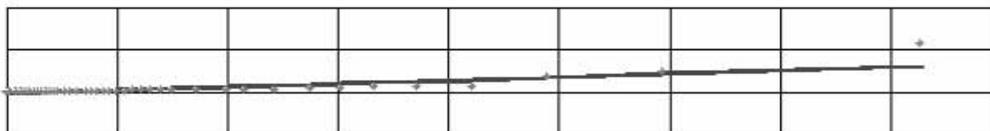
N = 70, Mean = 2.0538, Sd = 7.4053  
 Slope = 0.5035, Intercept = 0.0000, Correlation, R = 0.49626680  
 Lilliefors Statistic = 0.394, Critical Value(0.05) = 0.106, Data not Normal

Lognormal Q-Q Plot for Mercury



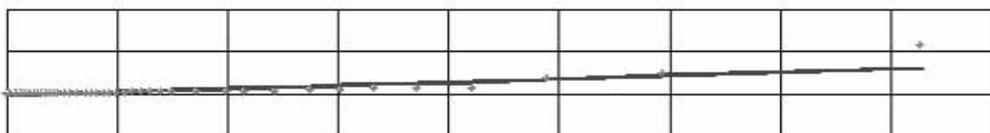
N = 70, Mean = -0.8252, Sd = 1.3725  
 Slope = 0.9501, Intercept = 0.0000, Correlation, R = 0.93651717  
 Lilliefors Statistic = 0.188, Critical Value(0.05) = 0.106, Data not Lognormal

Gamma Q-Q Plot for Mercury



N = 70, Mean = 2.054, k hat = 0.4223  
 Slope = 1.985, Intercept = -1.977, Correlation, R = 0.821  
 A-D Test Statistic = 9.257, Critical Value(0.05) = 0.836, Data not Gamma Distributed

Gamma Q-Q Plot for Mercury



N = 70, Mean = 2.054, k hat = 0.422  
 Slope = 1.985, Intercept = -1.977, Correlation, R = 0.821  
 K-S Test Statistic = 0.302, Critical Value(0.05) = 0.114, Data not Gamma Distributed

OABG Area Surface and Subsurface Soil  
Mercury

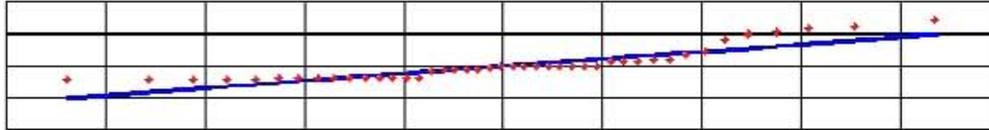
Data File		
Variable:	Mercury	
Raw Statistics		
Number of Observations	70	
Number of Missing Data	0	
Number of Valid Observations	70	
Number of Distinct Observations	51	
Minimum	0.055	
Maximum	56.3	
Mean	2.0538	
Standard Deviation	7.405262	
Variance	54.83791	
Coefficient of Variation	3.60564	
Skewness	6.295955	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	0.393612	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	3.529469	
Gamma Statistics		
k hat	0.422268	
k star (bias corrected)	0.413694	
Theta hat	4.863741	
Theta star	4.964537	
nu hat	59.11745	
nu star	57.91718	
5% Approximate Chi Square Value	41.4188	
Adjusted Level of Significance	0.046571	
Adjusted Chi Square Value	41.12577	
Anderson-Darling Test Statistic	9.256865	
Anderson-Darling 5% Critical Value	0.835769	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.301998	
Kolmogrov-Smirnov 5% Critical Value	0.113777	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	2.871892	
95% Adjusted Gamma UCL	2.892355	
Lognormal Statistics		
Minimum of log data	-2.900422	
Maximum of log data	4.030695	
Mean of log data	-0.825153	
Standard Deviation of log data	1.372542	
Variance of log data	1.883872	
Lilliefors Test Statistic	0.187802	
Lilliefors 5% Critical Value	0.105897	
Shapiro-Wilk Test Statistic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.123875	
MLE Standard Deviation	2.654565	
MLE Coefficient of Variation	2.361975	
MLE Skewness	20.26321	
MLE Median	0.438168	

OABG Area Surface and Subsurface Soil  
Mercury

MLE 80% Quantile	1.397444	
MLE 90% Quantile	2.556306	
MLE 95% Quantile	4.189906	
MLE 99% Quantile	10.6694	
MVU Estimate of Median	0.43231	
MVU Estimate of Mean	1.095902	
MVU Estimate of Standard Deviation	2.342054	
MVU Estimate of SE of Mean	0.23651	
95% H-UCL	1.740012	
95% Chebyshev (MVUE) UCL	2.126823	
97.5% Chebyshev (MVUE) UCL	2.572904	
99% Chebyshev (MVUE) UCL	3.449143	
Non-parametric Statistics		
95% CLT UCL	3.509657	
95% Adjusted-CLT UCL	4.221336	
95% Modified-t UCL	3.640477	
95% Jackknife UCL	3.529469	
95% Chebyshev (Mean, Sd) UCL	5.911853	
97.5% Chebyshev (Mean, Sd) UCL	7.581236	
99% Chebyshev (Mean, Sd) UCL	10.86042	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	3.500933	
95% Bootstrap-t UCL	6.500839	
95% Hall's Bootstrap UCL	7.63928	
95% Percentile Bootstrap UCL	3.551329	
95% BCA Bootstrap UCL	4.4598	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	7.581236	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

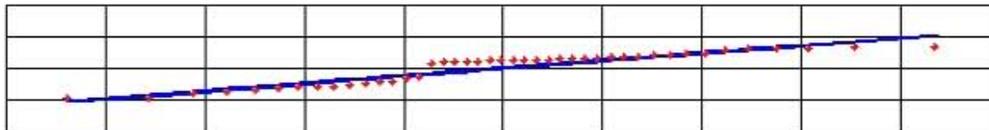
ABG Area Surface and Subsurface Soil  
Total 2,3,7,8-TCDD

Normal Q-Q Plot for T2,3,7,8-TCDD equivalents



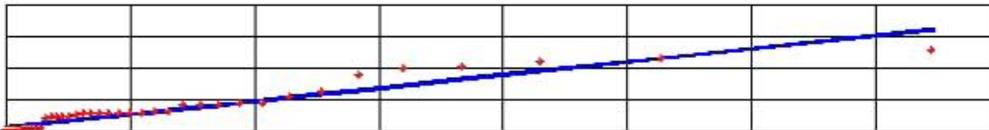
N = 43, Mean = 0.0001, Sd = 0.0001  
Slope = 0.9169, Intercept = 0.0000, Correlation, R = 0.89787069  
Shapiro-Wilk Statistic = 0.798, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for T2,3,7,8-TCDD equivalents



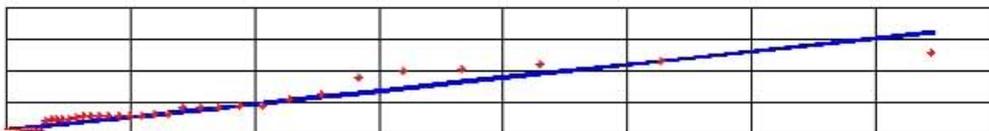
N = 43, Mean = -10.7429, Sd = 1.8873  
Slope = 0.9588, Intercept = 0.0000, Correlation, R = 0.93884712  
Shapiro-Wilk Statistic = 0.863, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for T2,3,7,8-TCDD equivalents



N = 43, Mean = 0.000, k hat = 0.5856  
Slope = 0.841, Intercept = 0.000, Correlation, R = 0.959  
A-D Test Statistic = 1.518, Critical Value(0.05) = 0.805, Data not Gamma Distributed

Gamma Q-Q Plot for T2,3,7,8-TCDD equivalents



N = 43, Mean = 0.000, k hat = 0.586  
Slope = 0.841, Intercept = 0.000, Correlation, R = 0.959  
K-S Test Statistic = 0.184, Critical Value(0.05) = 0.142, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Total 2,3,7,8-TCDD

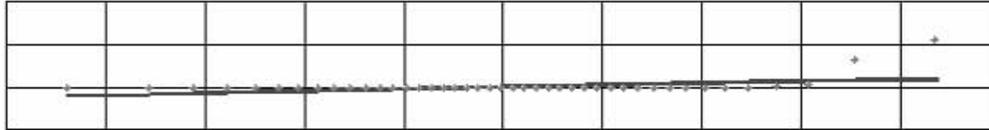
Data File		
Variable:	2,3,7,8-TCDD equivalents	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	43	
Minimum	5.15E-07	
Maximum	0.000254	
Mean	6.23E-05	
Standard Deviation	6.90E-05	
Variance	4.76E-09	
Coefficient of Variation	1.107406	
Skewness	1.403854	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.797512	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	8.00E-05	
Gamma Statistics		
k hat	0.585564	
k star (bias corrected)	0.560214	
Theta hat	0.000106	
Theta star	0.000111	
nu hat	50.35848	
nu star	48.17843	
5% Approximate Chi Square Value	33.24376	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	32.81208	
Anderson-Darling Test Statistic	1.518068	
Anderson-Darling 5% Critical Value	0.805141	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.183577	
Kolmogrov-Smirnov 5% Critical Value	0.141783	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	9.03E-05	
95% Adjusted Gamma UCL	9.14E-05	
Lognormal Statistics		
Minimum of log data	-14.47857	
Maximum of log data	-8.279185	
Mean of log data	-10.74289	
Standard Deviation of log data	1.88725	
Variance of log data	3.561714	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.862788	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.000128	
MLE Standard Deviation	0.00075	
MLE Coefficient of Variation	5.850087	
MLE Skewness	2.18E+02	
MLE Median	2.16E-05	

ABG Area Surface and Subsurface Soil  
 Total 2,3,7,8-TCDD

MLE 80% Quantile	0.000106	
MLE 90% Quantile	0.000244	
MLE 95% Quantile	0.000482	
MLE 99% Quantile	0.001741	
MVU Estimate of Median	2.07E-05	
MVU Estimate of Mean	0.000116	
MVU Estimate of Standard Deviation	0.000456	
MVU Estimate of SE of Mean	4.67E-05	
95% H-UCL	0.000354	
95% Chebyshev (MVUE) UCL	0.000319	
97.5% Chebyshev (MVUE) UCL	0.000407	
99% Chebyshev (MVUE) UCL	0.00058	
Non-parametric Statistics		
95% CLT UCL	7.96E-05	
95% Adjusted-CLT UCL	8.20E-05	
95% Modified-t UCL	8.03E-05	
95% Jackknife UCL	8.00E-05	
95% Chebyshev (Mean, Sd) UCL	0.000108	
97.5% Chebyshev (Mean, Sd) UCL	0.000128	
99% Chebyshev (Mean, Sd) UCL	0.000167	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	7.92E-05	
95% Bootstrap-t UCL	8.40E-05	
95% Hall's Bootstrap UCL	8.13E-05	
95% Percentile Bootstrap UCL	7.99E-05	
95% BCA Bootstrap UCL	8.86E-05	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.000167	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

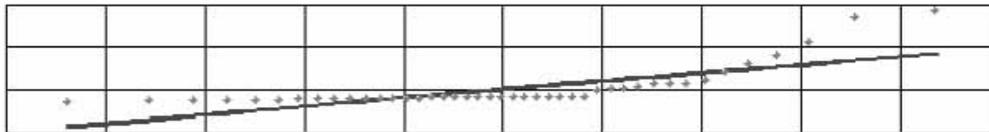
ABG Area Surface and Subsurface Soil  
Perchlorate

Normal Q-Q Plot for Perchlorate



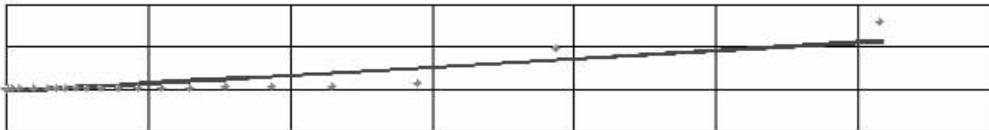
N = 43, Mean = 1293.5140, Sd = 5495.7311  
Slope = 0.4873, Intercept = 0.0000, Correlation, R = 0.47713964  
Shapiro-Wilk Statistic = 0.259, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Perchlorate



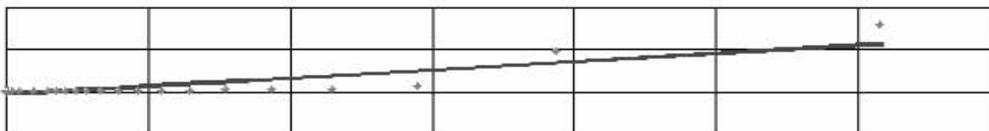
N = 43, Mean = 4.1491, Sd = 1.6633  
Slope = 0.7834, Intercept = 0.0000, Correlation, R = 0.76710946  
Shapiro-Wilk Statistic = 0.599, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Perchlorate



N = 43, Mean = 1293.514, k hat = 0.2375  
Slope = 1.959, Intercept = -1165.265, Correlation, R = 0.865  
A-D Test Statistic = 11.305, Critical Value(0.05) = 0.888, Data not Gamma Distributed

Gamma Q-Q Plot for Perchlorate



N = 43, Mean = 1293.514, k hat = 0.237  
Slope = 1.959, Intercept = -1165.265, Correlation, R = 0.865  
K-S Test Statistic = 0.418, Critical Value(0.05) = 0.148, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Perchlorate

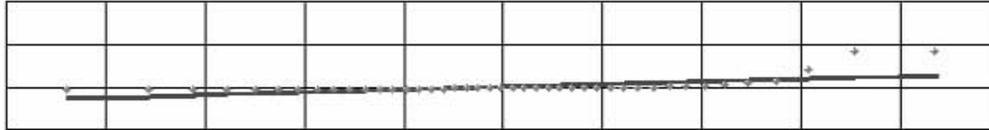
Data File	Perchlorate	
Variable:	Perchlorate	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	33	
Minimum	22.7	
Maximum	31300	
Mean	1293.514	
Standard Deviation	5495.731	
Variance	30203061	
Coefficient of Variation	4.248683	
Skewness	4.860627	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.259332	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2703.143	
Gamma Statistics		
k hat	0.237464	
k star (bias corrected)	0.2364	
Theta hat	5447.21	
Theta star	5471.712	
nu hat	20.42187	
nu star	20.33042	
5% Approximate Chi Square Value	11.09357	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	10.85575	
Anderson-Darling Test Statistic	11.30542	
Anderson-Darling 5% Critical Value	0.88783	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.41778	
Kolmogrov-Smirnov 5% Critical Value	0.148329	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	2370.533	
95% Adjusted Gamma UCL	2422.465	
Lognormal Statistics		
Minimum of log data	3.122365	
Maximum of log data	10.35137	
Mean of log data	4.149118	
Standard Deviation of log data	1.663293	
Variance of log data	2.766545	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.59925	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	252.7472	
MLE Standard Deviation	975.7348	
MLE Coefficient of Variation	3.860516	
MLE Skewness	69.11708	
MLE Median	63.37805	

ABG Area Surface and Subsurface Soil  
Perchlorate

MLE 80% Quantile	258.4237	
MLE 90% Quantile	537.2425	
MLE 95% Quantile	977.7315	
MLE 99% Quantile	3034.912	
MVU Estimate of Median	61.37024	
MVU Estimate of Mean	235.4913	
MVU Estimate of Standard Deviation	695.998	
MVU Estimate of SE of Mean	80.80507	
95% H-UCL	571.1228	
95% Chebyshev (MVUE) UCL	587.7124	
97.5% Chebyshev (MVUE) UCL	740.1188	
99% Chebyshev (MVUE) UCL	1039.492	
Non-parametric Statistics		
95% CLT UCL	2672.051	
95% Adjusted-CLT UCL	3335.84	
95% Modified-t UCL	2806.681	
95% Jackknife UCL	2703.143	
95% Chebyshev (Mean, Sd) UCL	4946.669	
97.5% Chebyshev (Mean, Sd) UCL	6527.391	
99% Chebyshev (Mean, Sd) UCL	9632.416	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	2653.645	
95% Bootstrap-t UCL	18513.3	
95% Hall's Bootstrap UCL	19051.41	
95% Percentile Bootstrap UCL	2793.649	
95% BCA Bootstrap UCL	3746.652	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	9632.416	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

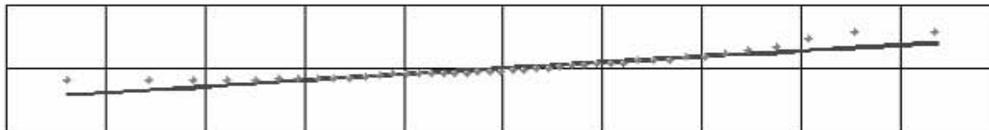
ABG Area Surface and Subsurface Soil  
Lead

Normal Q-Q Plot for Lead



N = 43, Mean = 158.3465, Sd = 384.5726  
Slope = 0.6347, Intercept = 0.0000, Correlation, R = 0.62154406  
Shapiro-Wilk Statistic = 0.405, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Lead



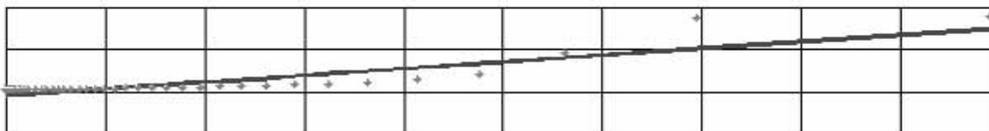
N = 43, Mean = 3.8952, Sd = 1.2622  
Slope = 0.9448, Intercept = 0.0000, Correlation, R = 0.92519349  
Shapiro-Wilk Statistic = 0.849, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Lead



N = 43, Mean = 158.347, k hat = 0.5371  
Slope = 1.629, Intercept = -95.963, Correlation, R = 0.889  
A-D Test Statistic = 5.075, Critical Value(0.05) = 0.810, Data not Gamma Distributed

Gamma Q-Q Plot for Lead



N = 43, Mean = 158.347, k hat = 0.537  
Slope = 1.629, Intercept = -95.963, Correlation, R = 0.889  
K-S Test Statistic = 0.255, Critical Value(0.05) = 0.142, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Lead

Data File	Lead	
Variable:	Lead	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	41	
Minimum	12.8	
Maximum	1760	
Mean	158.3465	
Standard Deviation	384.5726	
Variance	147896.1	
Coefficient of Variation	2.428678	
Skewness	3.6727	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.405393	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	256.9876	
Gamma Statistics		
k hat	0.537133	
k star (bias corrected)	0.515163	
Theta hat	294.7993	
Theta star	307.3719	
nu hat	46.19346	
nu star	44.30399	
5% Approximate Chi Square Value	30.03546	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	29.62655	
Anderson-Darling Test Statistic	5.075128	
Anderson-Darling 5% Critical Value	0.809759	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.254773	
Kolmogrov-Smirnov 5% Critical Value	0.142251	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	233.57	
95% Adjusted Gamma UCL	236.7938	
Lognormal Statistics		
Minimum of log data	2.549445	
Maximum of log data	7.473069	
Mean of log data	3.895202	
Standard Deviation of log data	1.262161	
Variance of log data	1.59305	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.84868	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	109.0413	
MLE Standard Deviation	215.8557	
MLE Coefficient of Variation	1.979578	
MLE Skewness	13.69616	
MLE Median	49.16598	

ABG Area Surface and Subsurface Soil  
Lead

MLE 80% Quantile	142.8404	
MLE 90% Quantile	248.9068	
MLE 95% Quantile	392.0763	
MLE 99% Quantile	926.1052	
MVU Estimate of Median	48.26324	
MVU Estimate of Mean	105.6394	
MVU Estimate of Standard Deviation	185.6849	
MVU Estimate of SE of Mean	25.28794	
95% H-UCL	182.9671	
95% Chebyshev (MVUE) UCL	215.867	
97.5% Chebyshev (MVUE) UCL	263.5625	
99% Chebyshev (MVUE) UCL	357.2512	
Non-parametric Statistics		
95% CLT UCL	254.8119	
95% Adjusted-CLT UCL	289.9093	
95% Modified-t UCL	262.4621	
95% Jackknife UCL	256.9876	
95% Chebyshev (Mean, Sd) UCL	413.9819	
97.5% Chebyshev (Mean, Sd) UCL	524.5955	
99% Chebyshev (Mean, Sd) UCL	741.8746	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	255.4002	
95% Bootstrap-t UCL	397.4788	
95% Hall's Bootstrap UCL	669.2418	
95% Percentile Bootstrap UCL	263.8698	
95% BCA Bootstrap UCL	297.9953	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	741.8746	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

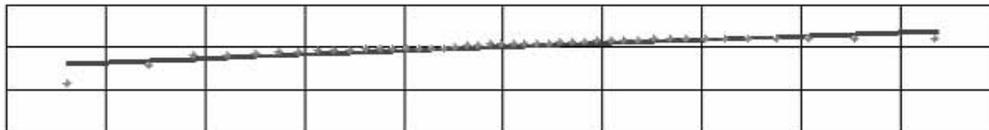
ABG Area Surface and Subsurface Soil  
Iron

Normal Q-Q Plot for Iron



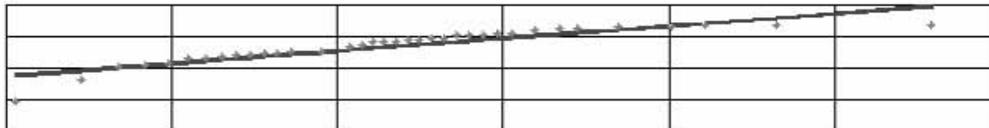
N = 43, Mean = 27260.0000, Sd = 5199.6190  
Slope = 0.9666, Intercept = 0.0000, Correlation, R = 0.94653572  
Shapiro-Wilk Statistic = 0.901, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Iron



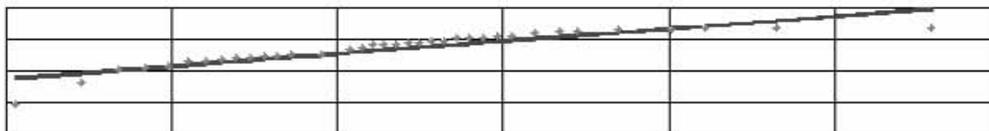
N = 43, Mean = 10.1897, Sd = 0.2390  
Slope = 0.8885, Intercept = 0.0000, Correlation, R = 0.87004553  
Shapiro-Wilk Statistic = 0.781, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Iron



N = 43, Mean = 27260.000, k hat = 21.4324  
Slope = 0.788, Intercept = 5803.195, Correlation, R = 0.918  
A-D Test Statistic = 1.498, Critical Value(0.05) = 0.748, Data not Gamma Distributed

Gamma Q-Q Plot for Iron



N = 43, Mean = 27260.000, k hat = 21.432  
Slope = 0.788, Intercept = 5803.195, Correlation, R = 0.918  
K-S Test Statistic = 0.145, Critical Value(0.05) = 0.135, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Iron

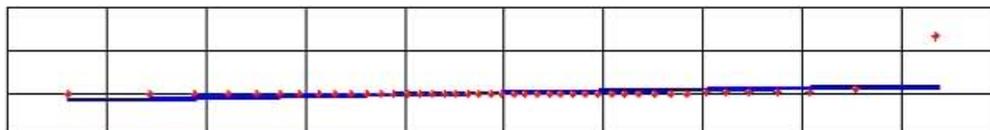
Data File	Iron	
Variable:	Iron	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	36	
Minimum	8980	
Maximum	33500	
Mean	27260	
Standard Deviation	5199.619	
Variance	27036038	
Coefficient of Variation	0.190742	
Skewness	-1.209947	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.901345	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	28593.68	
Gamma Statistics		
k hat	21.43242	
k star (bias corrected)	19.95264	
Theta hat	1271.905	
Theta star	1366.235	
nu hat	1843.188	
nu star	1715.927	
5% Approximate Chi Square Value	1620.698	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	1617.501	
Anderson-Darling Test Statistic	1.497699	
Anderson-Darling 5% Critical Value	0.747593	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.144799	
Kolmogrov-Smirnov 5% Critical Value	0.134562	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	28861.74	
95% Adjusted Gamma UCL	28918.78	
Lognormal Statistics		
Minimum of log data	9.102755	
Maximum of log data	10.4193	
Mean of log data	10.18967	
Standard Deviation of log data	0.239044	
Variance of log data	0.057142	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.780588	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	27398.3	
MLE Standard Deviation	6644.092	
MLE Coefficient of Variation	0.2425	
MLE Skewness	0.741761	
MLE Median	26626.58	

ABG Area Surface and Subsurface Soil  
Iron

MLE 80% Quantile	32586.64	
MLE 90% Quantile	36200.82	
MLE 95% Quantile	39454.09	
MLE 99% Quantile	46429.12	
MVU Estimate of Median	26608.89	
MVU Estimate of Mean	27379.62	
MVU Estimate of Standard Deviation	6622.245	
MVU Estimate of SE of Mean	1009.664	
95% H-UCL	29219.26	
95% Chebyshev (MVUE) UCL	31780.64	
97.5% Chebyshev (MVUE) UCL	33684.97	
99% Chebyshev (MVUE) UCL	37425.65	
Non-parametric Statistics		
95% CLT UCL	28564.26	
95% Adjusted-CLT UCL	28407.93	
95% Modified-t UCL	28569.29	
95% Jackknife UCL	28593.68	
95% Chebyshev (Mean, Sd) UCL	30716.32	
97.5% Chebyshev (Mean, Sd) UCL	32211.87	
99% Chebyshev (Mean, Sd) UCL	35149.6	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	28529.75	
95% Bootstrap-t UCL	28498.8	
95% Hall's Bootstrap UCL	28459.31	
95% Percentile Bootstrap UCL	28455.81	
95% BCA Bootstrap UCL	28376.74	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	28593.68	95% Student's-t UCL
2nd Recommended UCL	28569.29	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

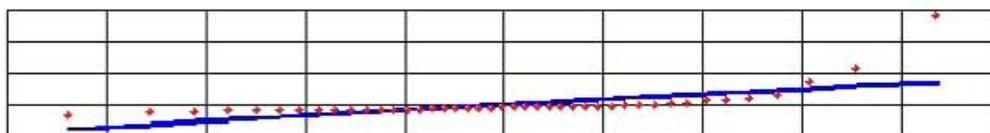
ABG Area Surface and Subsurface Soil  
Copper

Normal Q-Q Plot for Copper



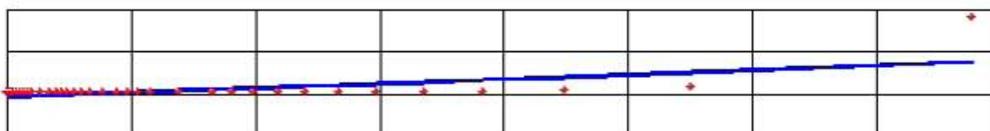
N = 43, Mean = 65.5628, Sd = 274.6077  
Slope = 0.3920, Intercept = 0.0000, Correlation, R = 0.38382130  
Shapiro-Wilk Statistic = 0.183, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Copper



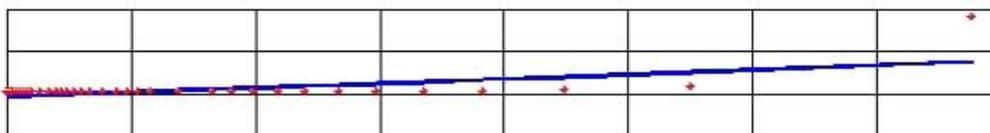
N = 43, Mean = 3.1510, Sd = 0.7847  
Slope = 0.6654, Intercept = 0.0000, Correlation, R = 0.65153789  
Shapiro-Wilk Statistic = 0.464, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Copper



N = 43, Mean = 65.563, k hat = 0.5989  
Slope = 2.187, Intercept = -75.934, Correlation, R = 0.653  
A-D Test Statistic = 12.505, Critical Value(0.05) = 0.804, Data not Gamma Distributed

Gamma Q-Q Plot for Copper



N = 43, Mean = 65.563, k hat = 0.599  
Slope = 2.187, Intercept = -75.934, Correlation, R = 0.653  
K-S Test Statistic = 0.448, Critical Value(0.05) = 0.142, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Copper

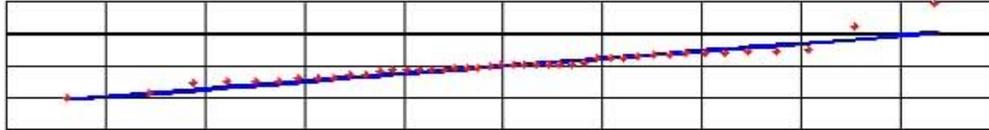
Data File		
Variable:	Copper	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	37	
Minimum	13.7	
Maximum	1820	
Mean	65.56279	
Standard Deviation	274.6077	
Variance	75409.38	
Coefficient of Variation	4.188469	
Skewness	6.50766	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.183299	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	135.9984	
Gamma Statistics		
k hat	0.598879	
k star (bias corrected)	0.5726	
Theta hat	109.4759	
Theta star	114.5001	
nu hat	51.50358	
nu star	49.24364	
5% Approximate Chi Square Value	34.13061	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	33.69282	
Anderson-Darling Test Statistic	12.50502	
Anderson-Darling 5% Critical Value	0.803871	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.448076	
Kolmogrov-Smirnov 5% Critical Value	0.141654	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	94.59399	
95% Adjusted Gamma UCL	95.8231	
Lognormal Statistics		
Minimum of log data	2.617396	
Maximum of log data	7.506592	
Mean of log data	3.151002	
Standard Deviation of log data	0.784705	
Variance of log data	0.615763	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.463806	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	31.78146	
MLE Standard Deviation	29.31946	
MLE Coefficient of Variation	0.922533	
MLE Skewness	3.552738	
MLE Median	23.35946	

ABG Area Surface and Subsurface Soil  
Copper

MLE 80% Quantile	45.33494	
MLE 90% Quantile	64.02979	
MLE 95% Quantile	84.93127	
MLE 99% Quantile	144.9265	
MVU Estimate of Median	23.19277	
MVU Estimate of Mean	31.49104	
MVU Estimate of Standard Deviation	28.06573	
MVU Estimate of SE of Mean	4.189655	
95% H-UCL	41.14896	
95% Chebyshev (MVUE) UCL	49.75332	
97.5% Chebyshev (MVUE) UCL	57.65542	
99% Chebyshev (MVUE) UCL	73.17758	
Non-parametric Statistics		
95% CLT UCL	134.4448	
95% Adjusted-CLT UCL	178.8516	
95% Modified-t UCL	142.9249	
95% Jackknife UCL	135.9984	
95% Chebyshev (Mean, Sd) UCL	248.1016	
97.5% Chebyshev (Mean, Sd) UCL	327.0863	
99% Chebyshev (Mean, Sd) UCL	482.2365	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	134.236	
95% Bootstrap-t UCL	1599.992	
95% Hall's Bootstrap UCL	1177.54	
95% Percentile Bootstrap UCL	148.3535	
95% BCA Bootstrap UCL	147.2372	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	248.1016	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

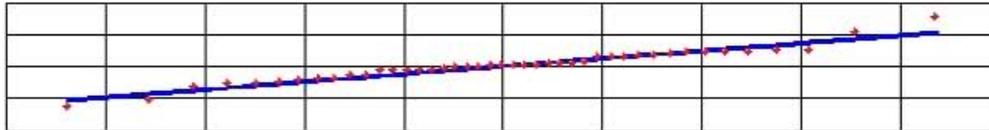
ABG Area Surface and Subsurface Soil  
Chromium

Normal Q-Q Plot for Chromium



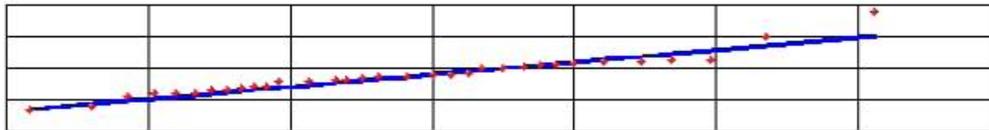
N = 43, Mean = 13.5884, Sd = 2.6620  
Slope = 0.9593, Intercept = 0.0000, Correlation, R = 0.93941565  
Shapiro-Wilk Statistic = 0.909, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Chromium



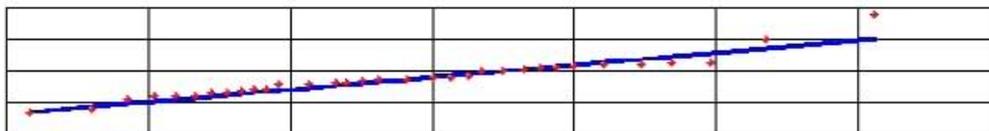
N = 43, Mean = 2.5917, Sd = 0.1881  
Slope = 0.9884, Intercept = 0.0000, Correlation, R = 0.96784026  
Shapiro-Wilk Statistic = 0.958, Critical Value(0.05) = 0.943, Data are Lognormal

Gamma Q-Q Plot for Chromium



N = 43, Mean = 13.588, k hat = 28.6926  
Slope = 0.981, Intercept = 0.267, Correlation, R = 0.954  
A-D Test Statistic = 0.739, Critical Value(0.05) = 0.747, Data are Gamma Distributed

Gamma Q-Q Plot for Chromium



N = 43, Mean = 13.588, k hat = 28.693  
Slope = 0.981, Intercept = 0.267, Correlation, R = 0.954  
K-S Test Statistic = 0.113, Critical Value(0.05) = 0.135, Data are Gamma Distributed

ABG Area Surface and Subsurface Soil  
Chromium

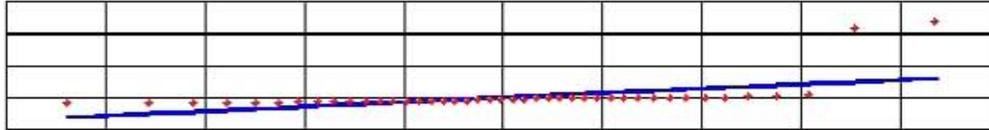
Data File		
Variable:	Chromium	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	33	
Minimum	8.1	
Maximum	23.8	
Mean	13.58837	
Standard Deviation	2.662009	
Variance	7.08629	
Coefficient of Variation	0.195903	
Skewness	1.301783	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.908884	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	14.27116	
Gamma Statistics		
k hat	28.69257	
k star (bias corrected)	26.70627	
Theta hat	0.473585	
Theta star	0.508808	
nu hat	2467.561	
nu star	2296.739	
5% Approximate Chi Square Value	2186.384	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	2182.665	
Anderson-Darling Test Statistic	0.738905	
Anderson-Darling 5% Critical Value	0.747375	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% significance level.
Kolmogrov-Smirnov Test Statistic	0.113042	
Kolmogrov-Smirnov 5% Critical Value	0.134529	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% significance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% significance level
95% Approximate Gamma UCL	14.27423	
95% Adjusted Gamma UCL	14.29855	
Lognormal Statistics		
Minimum of log data	2.091864	
Maximum of log data	3.169686	
Mean of log data	2.591687	
Standard Deviation of log data	0.188128	
Variance of log data	0.035392	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.958378	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	13.59066	
MLE Standard Deviation	2.579571	
MLE Coefficient of Variation	0.189805	
MLE Skewness	0.576252	
MLE Median	13.35228	

ABG Area Surface and Subsurface Soil  
Chromium

MLE 80% Quantile	15.65288	
MLE 90% Quantile	17.0037	
MLE 95% Quantile	18.19519	
MLE 99% Quantile	20.68217	
MVU Estimate of Median	13.34679	
MVU Estimate of Mean	13.58498	
MVU Estimate of Standard Deviation	2.574361	
MVU Estimate of SE of Mean	0.392553	
95% H-UCL	14.2876	
95% Chebyshev (MVUE) UCL	15.29608	
97.5% Chebyshev (MVUE) UCL	16.03648	
99% Chebyshev (MVUE) UCL	17.49084	
Non-parametric Statistics		
95% CLT UCL	14.2561	
95% Adjusted-CLT UCL	14.34222	
95% Modified-t UCL	14.2846	
95% Jackknife UCL	14.27116	
95% Chebyshev (Mean, Sd) UCL	15.35788	
97.5% Chebyshev (Mean, Sd) UCL	16.12354	
99% Chebyshev (Mean, Sd) UCL	17.62755	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	14.23432	
95% Bootstrap-t UCL	14.38106	
95% Hall's Bootstrap UCL	14.49654	
95% Percentile Bootstrap UCL	14.27209	
95% BCA Bootstrap UCL	14.11163	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	GAMMA	
1st Recommended UCL	14.27423	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

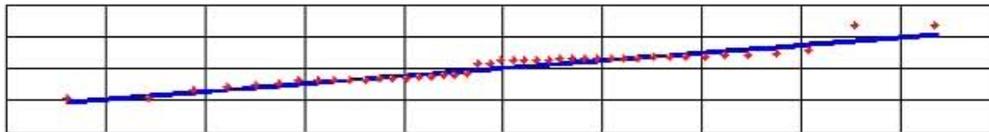
ABG Area Surface and Subsurface Soil  
Cadmium

Normal Q-Q Plot for Cadmium



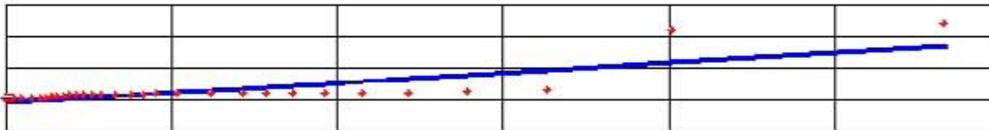
N = 43, Mean = 0.9474, Sd = 2.3618  
Slope = 0.5777, Intercept = 0.0000, Correlation, R = 0.56570268  
Shapiro-Wilk Statistic = 0.346, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Cadmium



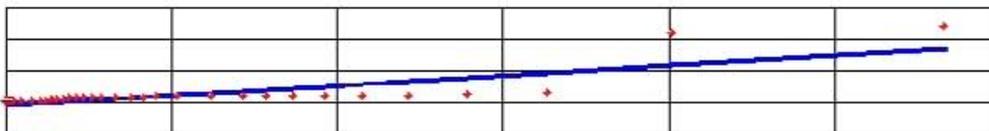
N = 43, Mean = -1.1116, Sd = 1.3373  
Slope = 0.9743, Intercept = 0.0000, Correlation, R = 0.95410063  
Shapiro-Wilk Statistic = 0.915, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Cadmium



N = 43, Mean = 0.947, k hat = 0.5862  
Slope = 1.599, Intercept = -0.547, Correlation, R = 0.810  
A-D Test Statistic = 3.380, Critical Value(0.05) = 0.805, Data not Gamma Distributed

Gamma Q-Q Plot for Cadmium



N = 43, Mean = 0.947, k hat = 0.586  
Slope = 1.599, Intercept = -0.547, Correlation, R = 0.810  
K-S Test Statistic = 0.246, Critical Value(0.05) = 0.142, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Cadmium

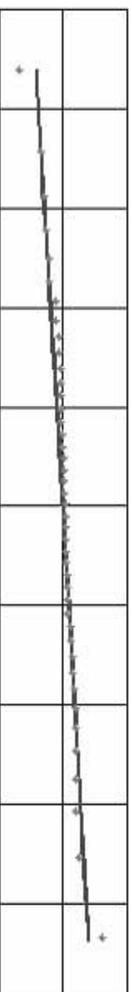
Data File		
Variable:	Cadmium	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	35	
Minimum	0.023	
Maximum	11.9	
Mean	0.947384	
Standard Deviation	2.361842	
Variance	5.578297	
Coefficient of Variation	2.493015	
Skewness	4.336117	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.345629	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.553185	
Gamma Statistics		
k hat	0.58625	
k star (bias corrected)	0.560852	
Theta hat	1.616008	
Theta star	1.689186	
nu hat	50.41746	
nu star	48.2333	
5% Approximate Chi Square Value	33.28939	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	32.85739	
Anderson-Darling Test Statistic	3.380079	
Anderson-Darling 5% Critical Value	0.805075	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.245847	
Kolmogrov-Smirnov 5% Critical Value	0.141776	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.372673	
95% Adjusted Gamma UCL	1.39072	
Lognormal Statistics		
Minimum of log data	-3.772261	
Maximum of log data	2.476538	
Mean of log data	-1.111623	
Standard Deviation of log data	1.337311	
Variance of log data	1.7884	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.914513	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.80459	
MLE Standard Deviation	1.795493	
MLE Coefficient of Variation	2.231564	
MLE Skewness	17.8076	
MLE Median	0.329025	

ABG Area Surface and Subsurface Soil  
Cadmium

MLE 80% Quantile	1.018575	
MLE 90% Quantile	1.834591	
MLE 95% Quantile	2.969083	
MLE 99% Quantile	7.381388	
MVU Estimate of Median	0.32225	
MVU Estimate of Mean	0.775123	
MVU Estimate of Standard Deviation	1.50365	
MVU Estimate of SE of Mean	0.199969	
95% H-UCL	1.419231	
95% Chebyshev (MVUE) UCL	1.646767	
97.5% Chebyshev (MVUE) UCL	2.023928	
99% Chebyshev (MVUE) UCL	2.764788	
Non-parametric Statistics		
95% CLT UCL	1.539823	
95% Adjusted-CLT UCL	1.794309	
95% Modified-t UCL	1.59288	
95% Jackknife UCL	1.553185	
95% Chebyshev (Mean, Sd) UCL	2.517361	
97.5% Chebyshev (Mean, Sd) UCL	3.196691	
99% Chebyshev (Mean, Sd) UCL	4.531105	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.516192	
95% Bootstrap-t UCL	4.585013	
95% Hall's Bootstrap UCL	5.326106	
95% Percentile Bootstrap UCL	1.551407	
95% BCA Bootstrap UCL	1.463233	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	4.531105	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

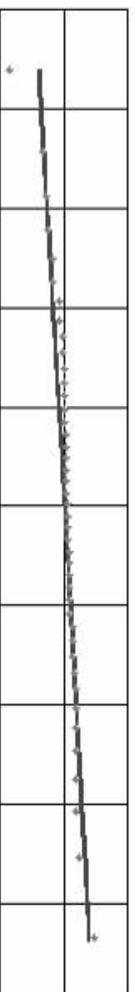
ABG Area Surface and Subsurface Soil  
Arsenic

Normal Q-Q Plot for Arsenic



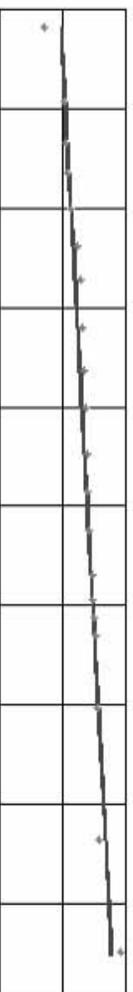
N = 43, Mean = 6.7093, Sd = 0.9398  
Slope = 0.9579, Intercept = 0.0000, Correlation, R = 0.93797635  
Shapiro-Wilk Statistic = 0.917, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Arsenic



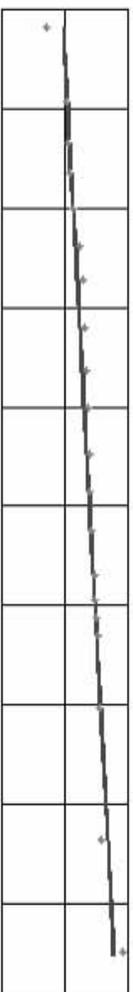
N = 43, Mean = 1.8925, Sd = 0.1564  
Slope = 0.9163, Intercept = 0.0000, Correlation, R = 0.89730638  
Shapiro-Wilk Statistic = 0.945, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Arsenic



N = 43, Mean = 6.709, k hat = 45.7683  
Slope = 0.866, Intercept = 0.900, Correlation, R = 0.936  
A-D Test Statistic= 1.795, Critical Value(0.05) = 0.747, Data not Gamma Distributed

Gamma Q-Q Plot for Arsenic



N = 43, Mean = 6.709, k hat = 45.768  
Slope = 0.866, Intercept = 0.900, Correlation, R = 0.936  
K-S Test Statistic = 0.209, Critical Value(0.05) = 0.134, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Arsenic

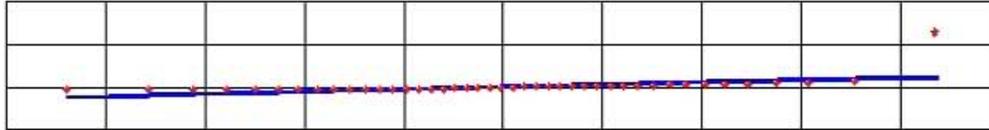
Data File		
Variable:	Arsenic	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	20	
Minimum	3.4	
Maximum	9.5	
Mean	6.709302	
Standard Deviation	0.939811	
Variance	0.883245	
Coefficient of Variation	0.140076	
Skewness	-0.6864	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.916625	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	6.950359	
Gamma Statistics		
k hat	45.76831	
k star (bias corrected)	42.59068	
Theta hat	0.146593	
Theta star	0.15753	
nu hat	3936.075	
nu star	3662.798	
5% Approximate Chi Square Value	3523.132	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	3518.403	
Anderson-Darling Test Statistic	1.794647	
Anderson-Darling 5% Critical Value	0.746861	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.208566	
Kolmogrov-Smirnov 5% Critical Value	0.134453	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	6.975277	
95% Adjusted Gamma UCL	6.984652	
Lognormal Statistics		
Minimum of log data	1.223775	
Maximum of log data	2.251292	
Mean of log data	1.892531	
Standard Deviation of log data	0.156393	
Variance of log data	0.024459	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.844983	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	6.717795	
MLE Standard Deviation	1.057071	
MLE Coefficient of Variation	0.157354	
MLE Skewness	0.475958	
MLE Median	6.636141	

ABG Area Surface and Subsurface Soil  
Arsenic

MLE 80% Quantile	7.573706	
MLE 90% Quantile	8.113223	
MLE 95% Quantile	8.583113	
MLE 99% Quantile	9.547698	
MVU Estimate of Median	6.634254	
MVU Estimate of Mean	6.715863	
MVU Estimate of Standard Deviation	1.055602	
MVU Estimate of SE of Mean	0.160971	
95% H-UCL	7.000875	
95% Chebyshev (MVUE) UCL	7.41752	
97.5% Chebyshev (MVUE) UCL	7.721128	
99% Chebyshev (MVUE) UCL	8.317507	
Non-parametric Statistics		
95% CLT UCL	6.945042	
95% Adjusted-CLT UCL	6.929013	
95% Modified-t UCL	6.947859	
95% Jackknife UCL	6.950359	
95% Chebyshev (Mean, Sd) UCL	7.334019	
97.5% Chebyshev (Mean, Sd) UCL	7.604334	
99% Chebyshev (Mean, Sd) UCL	8.135317	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	6.937074	
95% Bootstrap-t UCL	6.933519	
95% Hall's Bootstrap UCL	6.953477	
95% Percentile Bootstrap UCL	6.94186	
95% BCA Bootstrap UCL	6.934884	
Recommendations		
Human Inspection Recommended?	YES	Users must select one of the recommended UCLS
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6.950359	95% Student's-t UCL
2nd Recommended UCL	6.947859	95% Modified-t UCL
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

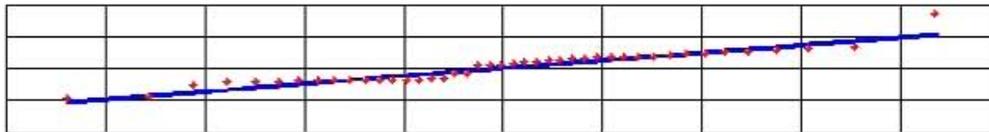
ABG Area Surface and Subsurface Soil  
Antimony

Normal Q-Q Plot for Antimony



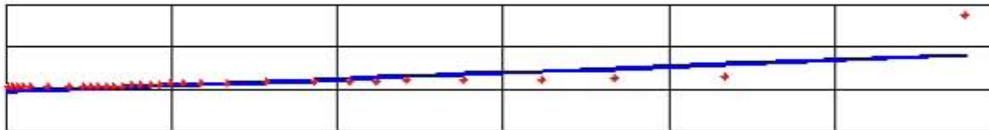
N = 43, Mean = 1.2794, Sd = 2.5637  
Slope = 0.5657, Intercept = 0.0000, Correlation, R = 0.55395317  
Shapiro-Wilk Statistic = 0.350, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Antimony



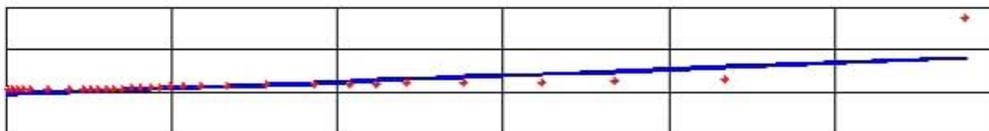
N = 43, Mean = -0.3169, Sd = 0.9433  
Slope = 0.9743, Intercept = 0.0000, Correlation, R = 0.95402427  
Shapiro-Wilk Statistic = 0.926, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Antimony



N = 43, Mean = 1.279, k hat = 1.0221  
Slope = 1.522, Intercept = -0.650, Correlation, R = 0.742  
A-D Test Statistic = 2.164, Critical Value(0.05) = 0.777, Data not Gamma Distributed

Gamma Q-Q Plot for Antimony



N = 43, Mean = 1.279, k hat = 1.022  
Slope = 1.522, Intercept = -0.650, Correlation, R = 0.742  
K-S Test Statistic = 0.149, Critical Value(0.05) = 0.139, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Antimony

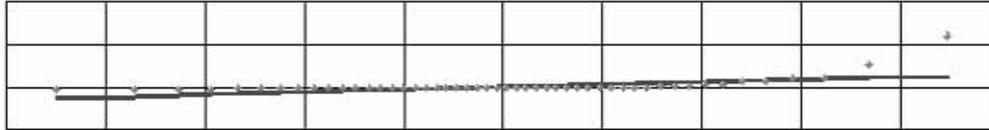
Data File		
Variable:	Antimony	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	31	
Minimum	0.115	
Maximum	17.2	
Mean	1.279419	
Standard Deviation	2.56365	
Variance	6.572303	
Coefficient of Variation	2.003762	
Skewness	5.959181	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.350148	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.936983	
Gamma Statistics		
k hat	1.022122	
k star (bias corrected)	0.966315	
Theta hat	1.251728	
Theta star	1.324018	
nu hat	87.90251	
nu star	83.10311	
5% Approximate Chi Square Value	63.08999	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	62.48425	
Anderson-Darling Test Statistic	2.164027	
Anderson-Darling 5% Critical Value	0.777146	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.14901	
Kolmogrov-Smirnov 5% Critical Value	0.138797	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.68527	
95% Adjusted Gamma UCL	1.701608	
Lognormal Statistics		
Minimum of log data	-2.162823	
Maximum of log data	2.844909	
Mean of log data	-0.316878	
Standard Deviation of log data	0.943344	
Variance of log data	0.889899	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.925666	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.136634	
MLE Standard Deviation	1.361535	
MLE Coefficient of Variation	1.197866	
MLE Skewness	5.312396	

ABG Area Surface and Subsurface Soil  
Antimony

MLE Median	0.728419	
MLE 80% Quantile	1.616475	
MLE 90% Quantile	2.448118	
MLE 95% Quantile	3.438115	
MLE 99% Quantile	6.536102	
MVU Estimate of Median	0.720919	
MVU Estimate of Mean	1.120232	
MVU Estimate of Standard Deviation	1.270717	
MVU Estimate of SE of Mean	0.185907	
95% H-UCL	1.586883	
95% Chebyshev (MVUE) UCL	1.930581	
97.5% Chebyshev (MVUE) UCL	2.28122	
99% Chebyshev (MVUE) UCL	2.969982	
Non-parametric Statistics		
95% CLT UCL	1.922479	
95% Adjusted-CLT UCL	2.302106	
95% Modified-t UCL	1.996197	
95% Jackknife UCL	1.936983	
95% Chebyshev (Mean, Sd) UCL	2.983543	
97.5% Chebyshev (Mean, Sd) UCL	3.720919	
99% Chebyshev (Mean, Sd) UCL	5.169352	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.926717	
95% Bootstrap-t UCL	3.426536	
95% Hall's Bootstrap UCL	4.453214	
95% Percentile Bootstrap UCL	2.045	
95% BCA Bootstrap UCL	1.94907	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	2.983543	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

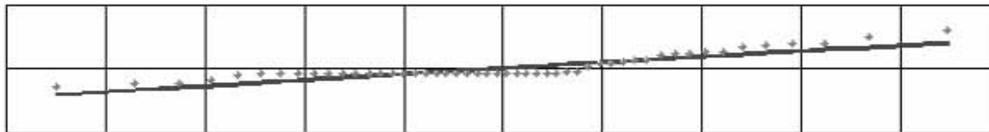
ABG Area Surface and Subsurface Soil  
RDX

Normal Q-Q Plot for RDX



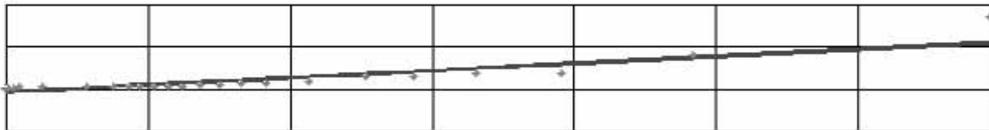
N = 50, Mean = 1943.7400, Sd = 5356.3619  
Slope = 0.6004, Intercept = 0.0000, Correlation, R = 0.58929042  
Shapiro-Wilk Statistic = 0.385, Critical Value(0.05) = 0.947, Data not Normal

Lognormal Q-Q Plot for RDX



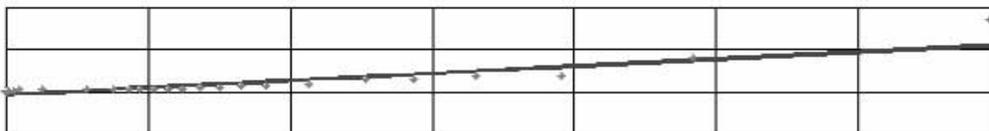
N = 50, Mean = 6.1400, Sd = 1.4451  
Slope = 0.9225, Intercept = 0.0000, Correlation, R = 0.90541013  
Shapiro-Wilk Statistic = 0.821, Critical Value(0.05) = 0.947, Data not Lognormal

Gamma Q-Q Plot for RDX



N = 50, Mean = 1943.740, k hat = 0.4507  
Slope = 1.716, Intercept = -1332.590, Correlation, R = 0.895  
A-D Test Statistic = 6.652, Critical Value(0.05) = 0.826, Data not Gamma Distributed

Gamma Q-Q Plot for RDX



N = 50, Mean = 1943.740, k hat = 0.451  
Slope = 1.716, Intercept = -1332.590, Correlation, R = 0.895  
K-S Test Statistic = 0.353, Critical Value(0.05) = 0.133, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
RDX

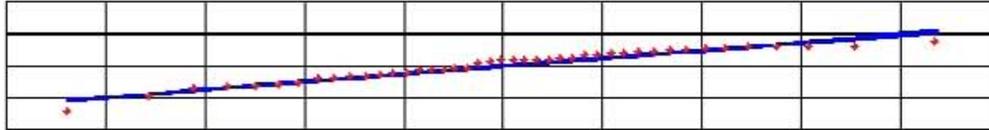
Data File		
Variable:	RDX	
Raw Statistics		
Number of Observations	50	
Number of Missing Data	0	
Number of Valid Observations	50	
Number of Distinct Observations	27	
Minimum	49	
Maximum	34000	
Mean	1943.74	
Standard Deviation	5356.362	
Variance	28690613	
Coefficient of Variation	2.755699	
Skewness	4.960038	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.384928	
Shapiro-Wilk 5% Critical Value	0.947	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	3213.734	
Gamma Statistics		
k hat	0.450724	
k star (bias corrected)	0.437014	
Theta hat	4312.481	
Theta star	4447.773	
nu hat	45.07243	
nu star	43.70142	
5% Approximate Chi Square Value	29.5391	
Adjusted Level of Significance	0.0452	
Adjusted Chi Square Value	29.19269	
Anderson-Darling Test Statistic	6.651582	
Anderson-Darling 5% Critical Value	0.826128	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.352725	
Kolmogrov-Smirnov 5% Critical Value	0.133302	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	2875.653	
95% Adjusted Gamma UCL	2909.776	
Lognormal Statistics		
Minimum of log data	3.89182	
Maximum of log data	10.43412	
Mean of log data	6.140009	
Standard Deviation of log data	1.445102	
Variance of log data	2.088319	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.821036	
Shapiro-Wilk 5% Critical Value	0.947	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1318.393	
MLE Standard Deviation	3505.868	
MLE Coefficient of Variation	2.659198	
MLE Skewness	26.78167	
MLE Median	464.0579	

ABG Area Surface and Subsurface Soil  
RDX

MLE 80% Quantile	1573.598	
MLE 90% Quantile	2971.924	
MLE 95% Quantile	5000.042	
MLE 99% Quantile	13377.32	
MVU Estimate of Median	454.4635	
MVU Estimate of Mean	1266.158	
MVU Estimate of Standard Deviation	2882.986	
MVU Estimate of SE of Mean	339.2203	
95% H-UCL	2360.772	
95% Chebyshev (MVUE) UCL	2744.785	
97.5% Chebyshev (MVUE) UCL	3384.588	
99% Chebyshev (MVUE) UCL	4641.357	
Non-parametric Statistics		
95% CLT UCL	3189.723	
95% Adjusted-CLT UCL	3757.484	
95% Modified-t UCL	3302.293	
95% Jackknife UCL	3213.734	
95% Chebyshev (Mean, Sd) UCL	5245.623	
97.5% Chebyshev (Mean, Sd) UCL	6674.351	
99% Chebyshev (Mean, Sd) UCL	9480.809	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	3140.072	
95% Bootstrap-t UCL	5564.238	
95% Hall's Bootstrap UCL	8027.44	
95% Percentile Bootstrap UCL	3342.03	
95% BCA Bootstrap UCL	3801.64	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6674.351	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

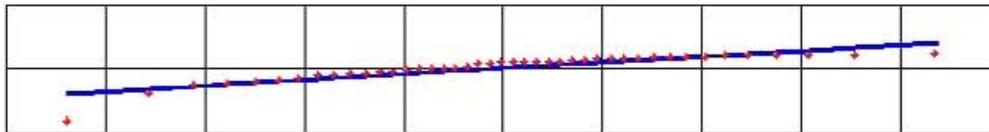
ABG Area Surface and Subsurface Soil  
Manganese

Normal Q-Q Plot for Manganese



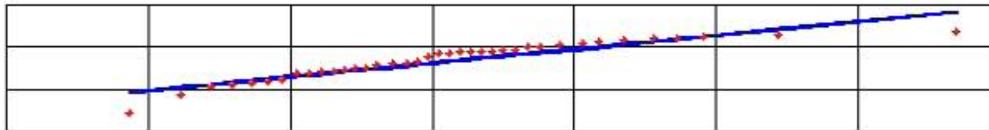
N = 43, Mean = 851.1395, Sd = 219.0792  
Slope = 0.9931, Intercept = 0.0000, Correlation, R = 0.97246126  
Shapiro-Wilk Statistic = 0.943, Critical Value(0.05) = 0.943, Data are Normal

Lognormal Q-Q Plot for Manganese



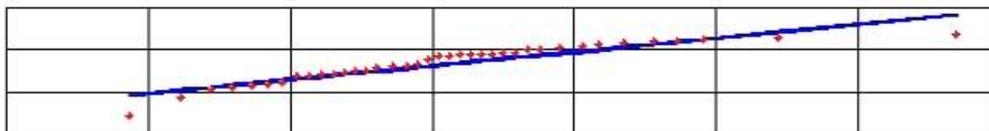
N = 43, Mean = 6.7032, Sd = 0.3270  
Slope = 0.9226, Intercept = 0.0000, Correlation, R = 0.90345205  
Shapiro-Wilk Statistic = 0.834, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Manganese



N = 43, Mean = 851.140, k hat = 11.7028  
Slope = 0.823, Intercept = 151.533, Correlation, R = 0.940  
A-D Test Statistic = 1.194, Critical Value(0.05) = 0.748, Data not Gamma Distributed

Gamma Q-Q Plot for Manganese



N = 43, Mean = 851.140, k hat = 11.703  
Slope = 0.823, Intercept = 151.533, Correlation, R = 0.940  
K-S Test Statistic = 0.166, Critical Value(0.05) = 0.135, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Manganese

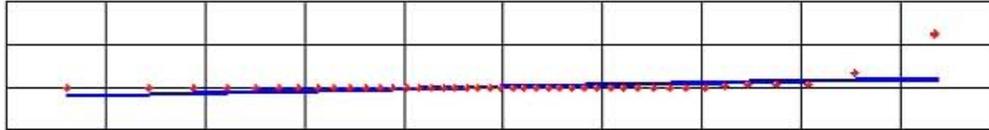
Data File		
Variable:	Manganese	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	38	
Minimum	208	
Maximum	1170	
Mean	851.1395	
Standard Deviation	219.0792	
Variance	47995.69	
Coefficient of Variation	0.257395	
Skewness	-0.760756	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.943067	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	907.3323	
Gamma Statistics		
k hat	11.70281	
k star (bias corrected)	10.90184	
Theta hat	72.72952	
Theta star	78.07304	
nu hat	1006.441	
nu star	937.5579	
5% Approximate Chi Square Value	867.4718	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	865.1417	
Anderson-Darling Test Statistic	1.193695	
Anderson-Darling 5% Critical Value	0.748142	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.16648	
Kolmogrov-Smirnov 5% Critical Value	0.134736	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	919.9061	
95% Adjusted Gamma UCL	922.3838	
Lognormal Statistics		
Minimum of log data	5.337538	
Maximum of log data	7.064759	
Mean of log data	6.703243	
Standard Deviation of log data	0.327004	
Variance of log data	0.106931	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.834149	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	859.8079	
MLE Standard Deviation	288.8467	
MLE Coefficient of Variation	0.335943	
MLE Skewness	1.045744	
MLE Median	815.0449	

ABG Area Surface and Subsurface Soil  
Manganese

MLE 80% Quantile	1074.447	
MLE 90% Quantile	1240.715	
MLE 95% Quantile	1395.718	
MLE 99% Quantile	1743.855	
MVU Estimate of Median	814.0321	
MVU Estimate of Mean	858.6864	
MVU Estimate of Standard Deviation	287.0356	
MVU Estimate of SE of Mean	43.73985	
95% H-UCL	940.9864	
95% Chebyshev (MVUE) UCL	1049.344	
97.5% Chebyshev (MVUE) UCL	1131.842	
99% Chebyshev (MVUE) UCL	1293.892	
Non-parametric Statistics		
95% CLT UCL	906.0929	
95% Adjusted-CLT UCL	901.9514	
95% Modified-t UCL	906.6863	
95% Jackknife UCL	907.3323	
95% Chebyshev (Mean, Sd) UCL	996.7671	
97.5% Chebyshev (Mean, Sd) UCL	1059.78	
99% Chebyshev (Mean, Sd) UCL	1183.558	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	905.0428	
95% Bootstrap-t UCL	905.4852	
95% Hall's Bootstrap UCL	903.908	
95% Percentile Bootstrap UCL	904.6744	
95% BCA Bootstrap UCL	891.5581	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	907.3323	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

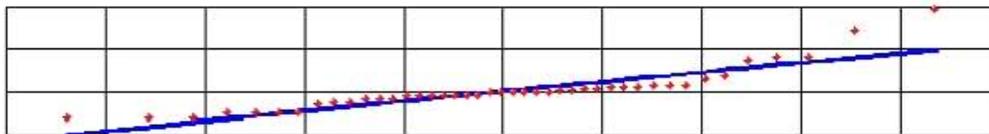
ABG Area Surface and Subsurface Soil  
Mercury

Normal Q-Q Plot for Mercury



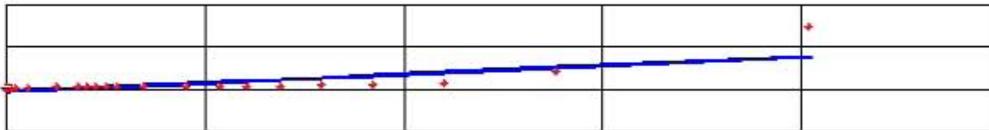
N = 43, Mean = 0.2933, Sd = 1.1216  
Slope = 0.4751, Intercept = 0.0000, Correlation, R = 0.46528254  
Shapiro-Wilk Statistic = 0.254, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Mercury



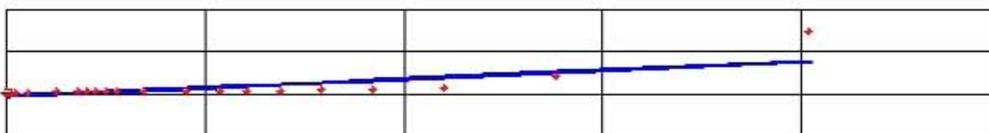
N = 43, Mean = -2.6787, Sd = 1.2032  
Slope = 0.9126, Intercept = 0.0000, Correlation, R = 0.89366014  
Shapiro-Wilk Statistic = 0.814, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Mercury



N = 43, Mean = 0.293, k hat = 0.4455  
Slope = 2.089, Intercept = -0.308, Correlation, R = 0.779  
A-D Test Statistic = 7.507, Critical Value(0.05) = 0.826, Data not Gamma Distributed

Gamma Q-Q Plot for Mercury



N = 43, Mean = 0.293, k hat = 0.445  
Slope = 2.089, Intercept = -0.308, Correlation, R = 0.779  
K-S Test Statistic = 0.387, Critical Value(0.05) = 0.144, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Mercury

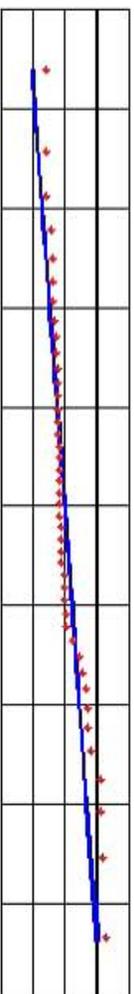
Data File		
Variable:	Mercury	
Raw Statistics		
Number of Observations	43	
Number of Missing Data	0	
Number of Valid Observations	43	
Number of Distinct Observations	23	
Minimum	0.015	
Maximum	7.2	
Mean	0.293256	
Standard Deviation	1.121635	
Variance	1.258065	
Coefficient of Variation	3.824767	
Skewness	5.909174	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.254497	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.58095	
Gamma Statistics		
k hat	0.445459	
k star (bias corrected)	0.429885	
Theta hat	0.658322	
Theta star	0.682173	
nu hat	38.3095	
nu star	36.97008	
5% Approximate Chi Square Value	24.04856	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	23.68564	
Anderson-Darling Test Statistic	7.507423	
Anderson-Darling 5% Critical Value	0.826095	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.38675	
Kolmogrov-Smirnov 5% Critical Value	0.143675	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.450825	
95% Adjusted Gamma UCL	0.457733	
Lognormal Statistics		
Minimum of log data	-4.199705	
Maximum of log data	1.974081	
Mean of log data	-2.678702	
Standard Deviation of log data	1.203222	
Variance of log data	1.447743	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.814296	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.141589	
MLE Standard Deviation	0.25539	
MLE Coefficient of Variation	1.803747	
MLE Skewness	11.27974	
MLE Median	0.068652	

ABG Area Surface and Subsurface Soil  
Mercury

MLE 80% Quantile	0.189763	
MLE 90% Quantile	0.322207	
MLE 95% Quantile	0.496883	
MLE 99% Quantile	1.127489	
MVU Estimate of Median	0.067506	
MVU Estimate of Mean	0.137713	
MVU Estimate of Standard Deviation	0.223859	
MVU Estimate of SE of Mean	0.031001	
95% H-UCL	0.228828	
95% Chebyshev (MVUE) UCL	0.272843	
97.5% Chebyshev (MVUE) UCL	0.331314	
99% Chebyshev (MVUE) UCL	0.446169	
Non-parametric Statistics		
95% CLT UCL	0.574604	
95% Adjusted-CLT UCL	0.739303	
95% Modified-t UCL	0.60664	
95% Jackknife UCL	0.58095	
95% Chebyshev (Mean, Sd) UCL	1.038836	
97.5% Chebyshev (Mean, Sd) UCL	1.361449	
99% Chebyshev (Mean, Sd) UCL	1.99516	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.574115	
95% Bootstrap-t UCL	2.918784	
95% Hall's Bootstrap UCL	2.195489	
95% Percentile Bootstrap UCL	0.605721	
95% BCA Bootstrap UCL	0.606558	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.99516	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

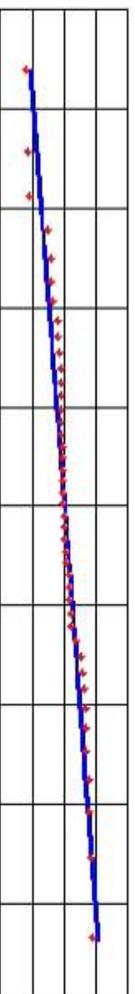
ABG Area Surface and Subsurface Soil  
Thallium

Normal Q-Q Plot for Thallium



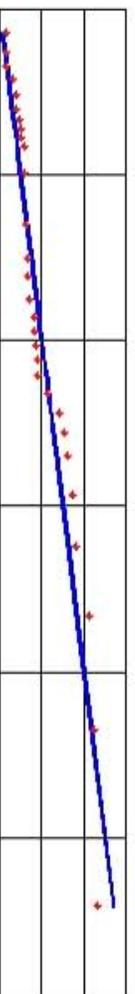
N = 43, Mean = 0.8580, Sd = 0.5975  
Slope = 0.9368, Intercept = 0.0000, Correlation, R = 0.91731795  
Shapiro-Wilk Statistic = 0.830, Critical Value(0.05) = 0.943, Data not Normal

Lognormal Q-Q Plot for Thallium



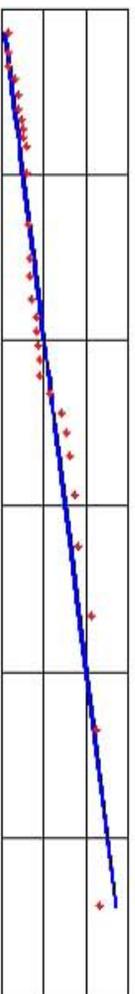
N = 43, Mean = -0.3916, Sd = 0.7352  
Slope = 0.9818, Intercept = 0.0000, Correlation, R = 0.96137373  
Shapiro-Wilk Statistic = 0.917, Critical Value(0.05) = 0.943, Data not Lognormal

Gamma Q-Q Plot for Thallium



N = 43, Mean = 0.858, k hat = 2.2494  
Slope = 1.005, Intercept = -0.000, Correlation, R = 0.965  
A-D Test Statistic = 1.359, Critical Value(0.05) = 0.759, Data not Gamma Distributed

Gamma Q-Q Plot for Thallium



N = 43, Mean = 0.858, k hat = 2.249  
Slope = 1.005, Intercept = -0.000, Correlation, R = 0.965  
K-S Test Statistic = 0.171, Critical Value(0.05) = 0.136, Data not Gamma Distributed

ABG Area Surface and Subsurface Soil  
Thallium

Data File

Variable: Thallium

Raw Statistics

Number of Observations	43
Number of Missing Data	0
Number of Valid Observations	43
Number of Distinct Observations	29
Minimum	0.11
Maximum	2.3
Mean	0.858023
Standard Deviation	0.597492
Variance	0.356997
Coefficient of Variation	0.696359
Skewness	1.148273
Too Few Distinct Observations?	NO

Normal Statistics

Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.83029	
Shapiro-Wilk 5% Critical Value	0.943	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	1.011277	

Gamma Statistics

k hat	2.249361	
k star (bias corrected)	2.107933	
Theta hat	0.381452	
Theta star	0.407045	
nu hat	193.445	
nu star	181.2822	
5% Approximate Chi Square Value	151.1338	
Adjusted Level of Significance	0.044419	
Adjusted Chi Square Value	150.1797	
Anderson-Darling Test Statistic	1.358538	
Anderson-Darling 5% Critical Value	0.758741	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.170825	
Kolmogrov-Smirnov 5% Critical Value	0.136363	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	1.029183	
95% Adjusted Gamma UCL	1.035722	

Lognormal Statistics

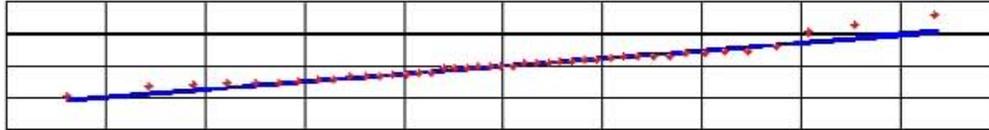
Minimum of log data	-2.207275	
Maximum of log data	0.832909	
Mean of log data	-0.39158	
Standard Deviation of log data	0.735244	
Variance of log data	0.540584	
Lilliefors Test Statistic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic	0.917372	
Shapiro-Wilk 5% Critical Value	0.943	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.885779	
MLE Standard Deviation	0.750045	
MLE Coefficient of Variation	0.846764	
MLE Skewness	3.147427	
MLE Median	0.675988	

ABG Area Surface and Subsurface Soil  
Thallium

MLE 80% Quantile	1.258224	
MLE 90% Quantile	1.738823	
MLE 95% Quantile	2.265728	
MLE 99% Quantile	3.738174	
MVU Estimate of Median	0.671752	
MVU Estimate of Mean	0.878856	
MVU Estimate of Standard Deviation	0.722518	
MVU Estimate of SE of Mean	0.108349	
95% H-UCL	1.122464	
95% Chebyshev (MVUE) UCL	1.35114	
97.5% Chebyshev (MVUE) UCL	1.555498	
99% Chebyshev (MVUE) UCL	1.956919	
Non-parametric Statistics		
95% CLT UCL	1.007897	
95% Adjusted-CLT UCL	1.024945	
95% Modified-t UCL	1.013936	
95% Jackknife UCL	1.011277	
95% Chebyshev (Mean, Sd) UCL	1.255192	
97.5% Chebyshev (Mean, Sd) UCL	1.427047	
99% Chebyshev (Mean, Sd) UCL	1.764623	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.007673	
95% Bootstrap-t UCL	1.036335	
95% Hall's Bootstrap UCL	1.020811	
95% Percentile Bootstrap UCL	1.001047	
95% BCA Bootstrap UCL	0.98093	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	1.255192	95% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

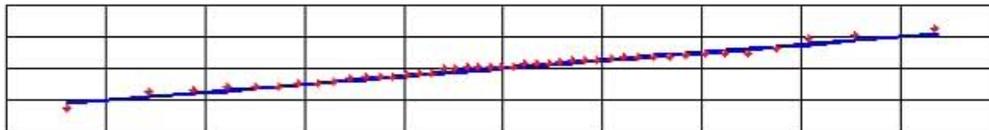
ABG Area Surface and Subsurface Soil  
Vanadium

Normal Q-Q Plot for Vanadium



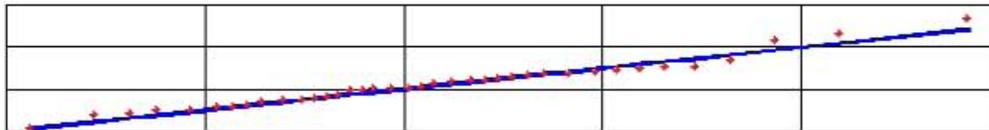
N = 43, Mean = 20.6023, Sd = 5.2109  
Slope = 0.9910, Intercept = 0.0000, Correlation, R = 0.97041265  
Shapiro-Wilk Statistic = 0.951, Critical Value(0.05) = 0.943, Data are Normal

Lognormal Q-Q Plot for Vanadium



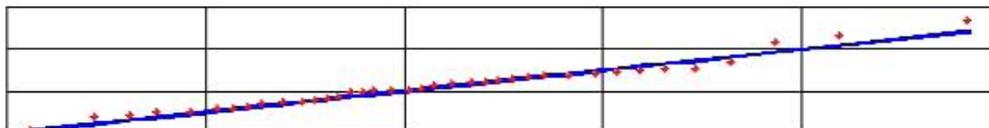
N = 43, Mean = 2.9952, Sd = 0.2487  
Slope = 1.0096, Intercept = 0.0000, Correlation, R = 0.98866444  
Shapiro-Wilk Statistic = 0.987, Critical Value(0.05) = 0.943, Data are Lognormal

Gamma Q-Q Plot for Vanadium



N = 43, Mean = 20.602, k hat = 16.7412  
Slope = 0.998, Intercept = 0.050, Correlation, R = 0.985  
A-D Test Statistic = 0.315, Critical Value(0.05) = 0.748, Data are Gamma Distributed

Gamma Q-Q Plot for Vanadium



N = 43, Mean = 20.602, k hat = 16.741  
Slope = 0.998, Intercept = 0.050, Correlation, R = 0.985  
K-S Test Statistic = 0.092, Critical Value(0.05) = 0.135, Data are Gamma Distributed

ABG Area Surface and Subsurface Soil  
Vanadium

Data File	Variable:	Vanadium	
Raw Statistics			
Number of Observations		43	
Number of Missing Data		0	
Number of Valid Observations		43	
Number of Distinct Observations		38	
Minimum		10.3	
Maximum		36.7	
Mean		20.60233	
Standard Deviation		5.210908	
Variance		27.15357	
Coefficient of Variation		0.252928	
Skewness		0.876033	
Too Few Distinct Observations?		NO	
Normal Statistics			
Lilliefors Test Statistic		N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value		N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic		0.951485	
Shapiro-Wilk 5% Critical Value		0.943	
5% Normality Test Result		NORMAL	Data are normal at 5% significance level
95% Student's-t UCL		21.9389	
Gamma Statistics			
k hat		16.74122	
k star (bias corrected)		15.58873	
Theta hat		1.230634	
Theta star		1.321616	
nu hat		1439.745	
nu star		1340.631	
5% Approximate Chi Square Value		1256.593	
Adjusted Level of Significance		0.044419	
Adjusted Chi Square Value		1253.782	
Anderson-Darling Test Statistic		0.315477	
Anderson-Darling 5% Critical Value		0.747835	
Anderson-Darling 5% Gamma Test Result		AD GAMMA	Data follow gamma distribution at 5% significance level.
Kolmogrov-Smirnov Test Statistic		0.091514	
Kolmogrov-Smirnov 5% Critical Value		0.134634	
Kolmogrov-Smirnov 5% Gamma Test Result		KS GAMMA	Data follow gamma distribution at 5% significance level
5% Gamma Test Result		GAMMA	Data follow gamma distribution at 5% significance level
95% Approximate Gamma UCL		21.98015	
95% Adjusted Gamma UCL		22.02944	
Lognormal Statistics			
Minimum of log data		2.332144	
Maximum of log data		3.602777	
Mean of log data		2.99524	
Standard Deviation of log data		0.248674	
Variance of log data		0.061839	
Lilliefors Test Statistic		N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value		N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statistic		0.986638	
Shapiro-Wilk 5% Critical Value		0.943	
5% Lognormality Test Result		LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean		20.6179	
MLE Standard Deviation		5.207422	
MLE Coefficient of Variation		0.252568	
MLE Skewness		0.773816	
MLE Median		19.99016	

ABG Area Surface and Subsurface Soil  
Vanadium

MLE 80% Quantile	24.66461	
MLE 90% Quantile	27.5165	
MLE 95% Quantile	30.09348	
MLE 99% Quantile	35.64665	
MVU Estimate of Median	19.97579	
MVU Estimate of Mean	20.60265	
MVU Estimate of Standard Deviation	5.188858	
MVU Estimate of SE of Mean	0.791093	
95% H-UCL	22.049	
95% Chebyshev (MVUE) UCL	24.05095	
97.5% Chebyshev (MVUE) UCL	25.54303	
99% Chebyshev (MVUE) UCL	28.47393	
Non-parametric Statistics		
95% CLT UCL	21.90942	
95% Adjusted-CLT UCL	22.02285	
95% Modified-t UCL	21.95659	
95% Jackknife UCL	21.9389	
95% Chebyshev (Mean, Sd) UCL	24.06615	
97.5% Chebyshev (Mean, Sd) UCL	25.56495	
99% Chebyshev (Mean, Sd) UCL	28.50905	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	21.90668	
95% Bootstrap-t UCL	22.10158	
95% Hall's Bootstrap UCL	21.99081	
95% Percentile Bootstrap UCL	21.92558	
95% BCA Bootstrap UCL	21.71628	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	21.9389	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

**Appendix G**  
**Ecological Risk Assessment**

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TABLE G-1

## Physical Parameter Measurements - Surface Soil - Site 1

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Area	Sample ID	Date	Total Organic Carbon (mg/kg)	pH	Grain Size (percent)								
					Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt and Clay	
Floodplain	HCS-B2-4-4	01/01/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-11-S	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-3-S	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-3-S/DUP	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-4-S	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-C	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-10	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-3-4	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-5-3	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-6-3	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-7-3	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-7-S	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B2-C	07/17/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-16S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-84S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-23S	06/21/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-23S/DUP	06/21/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-113S	11/15/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-113S/DUP	11/15/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-12-1	11/16/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-B1-13-1	11/16/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-102S	11/16/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-110S	11/16/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-98S	11/16/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	22C-1-T	10/26/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	22C-2-T	10/26/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	22D-1-T	10/26/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-152	10/20/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE G-1

## Physical Parameter Measurements - Surface Soil - Site 1

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Area	Sample ID	Date	Total Organic Carbon (mg/kg)	pH	Grain Size (percent)								
					Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt and Clay	
Floodplain	HCS-BG-153	10/20/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-161	10/20/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-162	10/20/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-165	10/20/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-171	10/21/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-179	10/21/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	HCS-BG-179/DUP	10/21/1998	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS21-(0-1)	10/25/2001	9,000	7.96	8.18	18.8	18.8	12.2	9.73	10.3	13.8	8.18	8.18
Floodplain	AS01-SS21P-(0-1)	10/25/2001	9,500	7.38	9.36	21.7	18.4	11.9	9.18	8.82	12.7	8.11	8.11
Floodplain	AS01-SS22-(0-1)	10/25/2001	7,000	7.04	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS23-(0-1)	10/26/2001	8,600	6.88	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS24-(0-1)	10/24/2001	7,300	6.39	6.41	13.5	11.8	14.0	12.6	16.2	19.3	6.24	6.24
Floodplain	AS01-SS25-(0-1)	10/24/2001	8,700	6.40	21.0	29.0	20.6	10.6	6.41	4.61	4.71	3.01	3.01
Floodplain	AS01-SS26-(0-1)	10/23/2001	9,300	5.67	7.47	40.2	23.9	10.5	5.19	3.84	4.88	4.15	4.15
Floodplain	AS01-SS27-(0-1)	10/23/2001	8,300	6.25	11.2	25.8	17.7	9.75	7.39	9.56	12.1	6.40	6.40
Floodplain	AS01-SS28-(0-1)	10/26/2001	9,600	7.43	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS29-(0-1)	10/26/2001	7,000	6.47	3.51	24.3	21.1	14.5	10.1	9.89	10.7	5.91	5.91
Floodplain	AS01-SS30-(0-1)	10/24/2001	8,300	7.28	3.14	21.3	19.6	10.9	11.3	16.9	13.3	3.65	3.65
Floodplain	AS01-SS33-(0-1)	10/26/2001	9,000	7.31	4.40	28.2	15.3	8.71	7.08	10.4	15.4	10.4	10.4
Floodplain	AS01-SS34-(0-1)	10/25/2001	8,300	6.74	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS34P-(0-1)	10/25/2001	6,100	6.52	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS35-(0-1)	10/26/2001	8,300	6.95	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS36-(0-1)	10/25/2001	7,400	6.79	27.5	35.0	14.4	7.52	4.53	4.05	4.63	2.41	2.41
Floodplain	AS01-SS37-(0-1)	10/26/2001	7,900	7.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS38-(0-1)	10/26/2001	8,200	6.11	32.1	43.5	10.8	3.10	1.73	2.09	3.37	3.28	3.28
Floodplain	AS01-SS38P-(0-1)	10/26/2001	7,700	6.60	15.2	39.5	19.3	7.78	4.07	3.98	5.37	4.81	4.81
Floodplain	AS01-SS39-(0-1)	10/23/2001	7,500	6.56	18.3	41.2	19.5	8.77	4.09	2.79	3.29	2.09	2.09
Floodplain	AS01-SS40-(0-1)	10/24/2001	7,300	8.23	18.3	33.3	16.2	9.22	5.57	4.93	6.76	5.75	5.75

TABLE G-1

## Physical Parameter Measurements - Surface Soil - Site 1

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Area	Sample ID	Date	Total Organic Carbon (mg/kg)	pH	Grain Size (percent)							
					Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt and Clay
Floodplain	AS01-SS41-(0-1)	10/24/2001	7,700	6.76	9.79	23.1	18.0	12.8	8.85	8.57	11.7	7.25
Floodplain	AOCM-1-T	10/26/2001	8,300	7.06	26.7	36.8	16.7	7.44	4.21	3.62	3.23	1.27
Floodplain	AOCM-2-T	10/26/2001	7,100	6.65	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS46-0-1	07/20/2004	114,500	6.80	0.00	--	--	0.00	7.70	49.0	--	43.4
Floodplain	AS01-SS47-0-1	07/20/2004	82,800	6.90	0.50	--	--	0.10	8.90	36.0	--	54.6
Floodplain	AS01-SS48-0-1	07/20/2004	64,800	6.90	0	--	--	0.00	8.30	30.2	--	61.7
Floodplain	AS01-SS49-0-1	07/20/2004	98,400	6.80	0	--	--	0.00	6.90	21.7	--	71.3
Floodplain	AS01-SS50-0-1	07/21/2004	67,900	5.10	0	--	--	0.10	2.20	37.3	--	60.5
Floodplain	AS01-SS50P-0-1	07/21/2004	29,700	5.00	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS51-0-1	07/21/2004	64,100	7.00	1.80	--	--	4.00	8.30	26.6	--	59.2
Floodplain	AS01-SS52-0-1	07/21/2004	82,500	6.80	2.00	--	--	3.40	7.30	33.8	--	53.6
Floodplain	AS01-SS53-0-1	07/21/2004	58,700	7.90	9.70	--	--	4.70	10.1	22.4	--	53.1
Floodplain	AS01-SS54-0-1	07/21/2004	113,200	7.00	0.00	--	--	0.10	7.20	25.2	--	67.6
Floodplain	AS01-SS56-0-1	07/21/2004	103,600	6.90	4.00	--	--	0.10	6.50	28.5	--	60.9
Floodplain	AS01-SS57-0-1	07/21/2004	45,800	7.50	10.5	--	--	6.00	9.30	25.0	--	49.1
Floodplain	AS01-SS58-0-1	07/21/2004	110,600	6.50	0.00	--	--	0.20	6.70	51.0	--	41.9
Floodplain	AS01-SS59-0-1	07/21/2004	98,700	6.40	0.00	--	--	0.00	7.40	30.1	--	62.7
Floodplain	AS01-SS71-0-0.5	09/23/2004	27,000	7.60	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS72-0-0.5	09/23/2004	23,000	6.50	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS72P-0-0.5	09/23/2004	25,000	7.20	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS73-0-0.5	09/23/2004	19,000	7.20	NS	NS	NS	NS	NS	NS	NS	NS
Floodplain	AS01-SS74-0-0.5	09/23/2004	10,000	7.90	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-1	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-2	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-3	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-4	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-4/DUP	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-5	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE G-1

## Physical Parameter Measurements - Surface Soil - Site 1

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Area	Sample ID	Date	Total Organic Carbon (mg/kg)	pH	Grain Size (percent)								
					Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt and Clay	
Upland	HCS-BP-6	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-7	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BP-8	07/13/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-10S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-25S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-33S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-34S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-4S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-55S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	HCS-BG-8S	06/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS01-R01X	02/21/2001	78,400	7.30	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS02-R01X	02/21/2001	35,300	7.50	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS03-R01X	02/21/2001	23,400	7.10	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS04-R01X	02/21/2001	21,200	6.30	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS05-R01X	02/21/2001	19,000	7.10	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS06-R01X	02/21/2001	42,100	5.70	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS08-R01X	02/21/2001	31,300	6.50	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS14-R01X	02/21/2001	41,400	7.50	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS15-R01X	02/21/2001	42,700	7.60	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS07-R01X	02/22/2001	32,700	7.50	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS09P-R01X	02/22/2001	42,800	6.80	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS09-R01X	02/22/2001	42,800	7.00	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS10-R01X	02/22/2001	30,400	7.60	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS11-R01X	02/22/2001	7,420	6.90	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS12-R01X	02/22/2001	29,300	6.90	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS13-R01X	02/22/2001	23,900	7.50	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS16P-R01X	02/22/2001	24,300	7.90	NS	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS16-R01X	02/22/2001	19,300	7.80	NS	NS	NS	NS	NS	NS	NS	NS	NS

TABLE G-1

## Physical Parameter Measurements - Surface Soil - Site 1

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Area	Sample ID	Date	Total Organic Carbon (mg/kg)	pH	Grain Size (percent)							
					Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt and Clay
Upland	AS01-SS17-R01X	02/22/2001	35,000	7.60	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS18-R01X	02/22/2001	38,100	7.70	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS19-R01X	02/22/2001	35,300	7.60	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS20-R01X	02/22/2001	47,300	7.20	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS60-0-0.5	09/21/2004	30,000	6.10	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS61-0-0.5	09/21/2004	24,000	5.70	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS62-0-0.5	09/21/2004	25,000	8.00	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS63-0-0.5	09/22/2004	11,000	6.40	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS64-0-0.5	09/22/2004	12,000	4.80	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS65-0-0.5	09/22/2004	13,000	5.80	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS66-0-0.5	09/23/2004	9,300	7.20	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS67-0-0.5	09/23/2004	2,400	7.70	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS68-0-0.5	09/23/2004	11,000	7.30	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS69-0-0.5	09/23/2004	8,700	7.60	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS69P-0-0.5	09/23/2004	14,000	7.90	NS	NS	NS	NS	NS	NS	NS	NS
Upland	AS01-SS70-0-0.5	09/23/2004	9,100	7.50	NS	NS	NS	NS	NS	NS	NS	NS

TABLE G-2

## Physical Parameter Measurements - Surface Water - Site 1

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Location	Date	Hardness (mg/L)	pH	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature (C)	Conductivity (ms/cm)	EH/ORP (MV)
SW-01	06/14/2001	171	7.60	0	8.25	20.5	0.371	--
SW-01	02/28/2002	--	8.66	--	16.3	5.70	0.306	142
SW-01A	06/14/2001	163	7.82	0	8.23	20.5	0.371	--
SW-01A	02/28/2002	--	8.96	--	16.9	5.90	0.396	160
SW-02	06/14/2001	156	--	--	--	--	--	--
SW-02	02/27/2002	--	8.81	--	17.6	9.80	0.421	208
SW-02A	06/14/2001	144	7.69	0	8.13	20.4	0.368	--
SW-02A	02/28/2002	--	8.61	--	16.4	5.60	0.398	176
SW-03	06/14/2001	162	6.56	1	8.15	20.3	0.369	--
SW-03	02/27/2002	--	8.64	--	18.1	8.00	0.426	216
SW-03A	06/14/2001	140	7.08	1	8.00	20.3	0.366	--
SW-03A	02/28/2002	--	8.48	--	16.3	5.40	0.400	176
SW-04	06/13/2001	155	7.51	3	8.21	21.7	0.361	--
SW-04	02/27/2002	--	6.86	--	16.2	11.2	0.422	286
SW-04A	06/13/2001	161	7.66	0	8.74	21.5	0.358	--
SW-04A	02/28/2002	--	8.08	--	17.3	5.30	0.400	176
SW-05	06/13/2001	163	7.87	2	7.79	21.6	0.361	--
SW-05	02/28/2002	--	7.12	--	18.9	4.90	0.409	249
SW-05A	02/28/2002	--	7.50	--	19.0	5.00	0.402	194
SW-05C	06/13/2001	155	--	--	--	--	--	--
SW-06	06/14/2001	169	7.53	0	8.10	20.3	0.372	--
SW-07	06/14/2001	154	7.33	1	7.95	20.3	0.371	--
SW-08	06/13/2001	158	6.93	17	8.15	21.8	0.360	--
SW-09	06/13/2001	162	7.31	4	7.52	21.7	0.359	--

TABLE G-3

## Physical Parameter Measurements - Sediment - Site 1

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Location	Date	Total Organic Carbon (mg/kg)	pH	Grain Size (percent)							
				Gravel	Fine Gravel	Very Coarse Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine Sand	Silt and Clay
SD-01	06/15/2001	43,000	7.13	66.6	11.7	10.7	5.51	3.86	1.21	0.44	0.00
SD-01A	06/15/2001	42,000	7.30	74.2	18.0	7.24	0.28	0.29	0.00	0.00	0.00
SD-02	06/15/2001	67,000	7.36	8.21	23.5	51.4	11.1	5.73	0.00	0.00	0.00
SD-02A	06/15/2001	60,000	7.35	--	--	--	--	--	--	--	--
SD-02B	06/15/2001	39,000	7.33	78.2	17.5	4.26	0.04	0.02	0.00	0.00	0.00
SD-02C	06/15/2001	47,000	8.00	79.6	6.54	3.59	3.62	3.05	2.03	1.33	0.25
SD-02D	06/15/2001	51,000	7.48	--	--	--	--	--	--	--	--
SD-03	06/15/2001	28,000	5.94	0.00	2.74	5.86	9.27	22.5	35.3	21.4	2.91
SD-03A	06/14/2001	20,000	7.19	49.9	21.3	6.04	11.4	8.71	1.99	0.55	0.06
SD-03B	06/14/2001	79,000	6.86	--	--	--	--	--	--	--	--
SD-04	06/15/2001	46,000	7.23	81.4	14.6	2.72	0.43	0.60	0.22	0.00	0.00
SD-04 (Duplicate)	06/15/2001	140,000	7.04	71.4	17.9	8.10	1.52	0.43	0.28	0.29	0.00
SD-04A	06/14/2001	23,000	6.77	18.5	19.6	15.2	28.3	15.0	2.55	0.90	0.11
SD-04B	06/14/2001	78,000	6.84	--	--	--	--	--	--	--	--
SD-05	06/14/2001	14,000	6.89	43.5	18.6	13.9	21.9	1.25	0.53	0.29	0.00
SD-05C	06/14/2001	17,000	6.69	--	--	--	--	--	--	--	--
SD-06	06/15/2001	51,000	6.89	58.9	21.9	14.3	3.60	0.63	0.41	0.29	0.00
SD-06 (Duplicate)	06/15/2001	110,000	7.19	66.5	19.7	9.39	3.36	0.64	0.40	0.00	0.00
SD-06A	06/15/2001	15,000	7.00	59.2	30.8	6.65	1.56	1.01	0.44	0.32	0.00
SD-06B	06/15/2001	39,000	6.51	--	--	--	--	--	--	--	--
SD-07	06/15/2001	14,000	7.12	34.9	31.2	18.9	12.1	2.00	0.72	0.31	0.00
SD-07 (Duplicate)	06/15/2001	74,000	7.09	--	--	--	--	--	--	--	--
SD-07A	06/15/2001	40,000	7.26	72.0	8.64	13.0	3.98	0.67	0.62	0.77	0.34
SD-07B	06/15/2001	14,000	7.17	--	--	--	--	--	--	--	--
SD-07B (Duplicate)	06/15/2001	66,000	6.98	--	--	--	--	--	--	--	--
SD-08	06/14/2001	63,000	6.81	95.5	3.91	0.60	0.00	0.00	0.00	0.00	0.00
SD-08A	06/14/2001	3,600	7.14	--	--	--	--	--	--	--	--
SD-09	06/14/2001	28,000	6.92	19.8	30.0	16.2	20.4	9.21	3.74	0.66	0.00
SD-09A	06/14/2001	23,000	6.54	--	--	--	--	--	--	--	--

TABLE G-4  
 Wildlife Species Observed at ABL  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name
<b>Birds</b>	
American crow	<i>Corvus brachyrhynchos</i>
American goldfinch	<i>Carduelis tristis</i>
American kestrel	<i>Falco sparverius</i>
American robin	<i>Turdus migratorius</i>
Barn swallow	<i>Hirundo rustica</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Black-capped chickadee	<i>Poecile atricapillus</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Chipping sparrow	<i>Spizella passerina</i>
Common grackle	<i>Quiscalus quiscula</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Eastern meadowlark	<i>Sturnella magna</i>
Eastern phoebe	<i>Sayornis phoebe</i>
Eastern towhee	<i>Pipilo erythrophthalmus</i>
European starling	<i>Sturnus vulgaris</i>
Field sparrow	<i>Spizella pusilla</i>
Great blue heron	<i>Ardea herodias</i>
House sparrow	<i>Passer domesticus</i>
Indigo bunting	<i>Passerina cyanea</i>
Killdeer	<i>Charadrius vociferus</i>
Mallard	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaida macroura</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Northern flicker	<i>Colaptes auratus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Rock dove	<i>Columba livia</i>
Song sparrow	<i>Melospiza melodia</i>
Tree swallow	<i>Tachycineta bicolor</i>
Tufted titmouse	<i>Parus bicolor</i>
Turkey vulture	<i>Cathartes aura</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Wild turkey	<i>Meleagris gallopavo</i>
Wood duck	<i>Aix sponsa</i>
Wood thrush	<i>Hylocichla mustelina</i>
Yellow warbler	<i>Dendroica petechia</i>
<b>Mammals</b>	
Eastern chipmunk	<i>Tamias striatus</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>
Eastern fox squirrel	<i>Sciurus niger</i>

TABLE G-4  
 Wildlife Species Observed at ABL  
*Site 1 Focused Remedial Investigation for Soil*  
*Allegheny Ballistics Laboratory, Rocket Center, WV*

Common Name	Scientific Name
Eastern harvest mouse	<i>Reithrodontomys humulis</i>
Gray squirrel	<i>Sciurus carolinensis</i>
Meadow vole	<i>Microtus pennsylvanicus</i>
Raccoon	<i>Procyon lotor</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Woodchuck	<i>Marmota monax</i>
Reptiles/Amphibians	
Black rat snake	<i>Elaphe o. obsoleta</i>
Bullfrog	<i>Rana catesbeiana</i>
Corn snake	<i>Elaphe g. guttata</i>

TABLE G-5  
Breeding Bird Atlas Data from the Site Vicinity  
Site 1 Focused Remedial Investigation for Soil  
Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Breeding Status <sup>a</sup>
Great blue heron	<i>Ardea herodias</i>	Ob
Green heron	<i>Butorides virescens</i>	Pr
Wood duck	<i>Aix sponsa</i>	C
American black duck	<i>Anas rubripes</i>	C
Mallard	<i>Anas platyrhynchos</i>	C
Turkey vulture	<i>Cathartes aura</i>	Pr
Cooper's hawk	<i>Accipiter cooperii</i>	C
Red-shouldered hawk	<i>Buteo lineatus</i>	C
Broad-winged hawk	<i>Buteo platypterus</i>	C
Red-tailed hawk	<i>Buteo jamaicensis</i>	Pr
American kestrel	<i>Falco sparverius</i>	C
Wild turkey	<i>Meleagris gallopavo</i>	C
Northern bobwhite	<i>Colinus virginianus</i>	Pr
Virginia rail	<i>Rallus limicola</i>	C
Sora	<i>Porzana carolina</i>	C
Killdeer	<i>Charadrius vociferus</i>	C
Spotted sandpiper	<i>Actitis macularia</i>	Po
American woodcock	<i>Scolopax minor</i>	Po
Rock dove	<i>Columba livia</i>	C
Mourning dove	<i>Zenaida macroura</i>	C
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Pr
Barn owl	<i>Tyto alba</i>	C
Eastern screech-owl	<i>Otus asio</i>	C
Great horned owl	<i>Bubo virginianus</i>	Po
Barred owl	<i>Strix varia</i>	Po
Common nighthawk	<i>Chordeiles minor</i>	Po
Whip-poor-will	<i>Caprimulgus vociferus</i>	Pr
Chimney swift	<i>Chaetura pelagica</i>	Pr
Ruby-throated hummingbird	<i>Archilochus colubris</i>	Pr
Belted kingfisher	<i>Ceryle alcyon</i>	Pr
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	C
Downy woodpecker	<i>Picoides pubescens</i>	C
Hairy woodpecker	<i>Picoides villosus</i>	Po
Northern flicker	<i>Colaptes auratus</i>	C
Pileated woodpecker	<i>Dryocopus pileatus</i>	Pr
Eastern wood-pewee	<i>Contopus virens</i>	Pr
Acadian flycatcher	<i>Empidonax virescens</i>	Pr
Willow flycatcher	<i>Empidonax traillii</i>	Pr
Eastern phoebe	<i>Sayornis phoebe</i>	C
Great crested flycatcher	<i>Myiarchus crinitus</i>	Pr
Eastern kingbird	<i>Tyrannus tyrannus</i>	C
Tree swallow	<i>Tachycineta bicolor</i>	C
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	Pr
Barn swallow	<i>Hirundo rustica</i>	C

TABLE G-5  
Breeding Bird Atlas Data from the Site Vicinity  
Site 1 Focused Remedial Investigation for Soil  
Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Breeding Status <sup>a</sup>
Blue jay	<i>Cyanocitta cristata</i>	C
American crow	<i>Corvus brachyrhynchos</i>	C
Fish crow	<i>Corvus ossifragus</i>	Pr
Common raven	<i>Corvus corax</i>	C
Black-capped chickadee	<i>Parus atricapillus</i>	Pr
Tufted titmouse	<i>Parus bicolor</i>	C
White-breasted nuthatch	<i>Sitta carolinensis</i>	C
Carolina wren	<i>Thryothorus ludovicianus</i>	C
House wren	<i>Troglodytes aedon</i>	Pr
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	C
Eastern bluebird	<i>Sialia sialis</i>	C
Wood thrush	<i>Hylocichla mustelina</i>	Pr
American robin	<i>Turdus migratorius</i>	C
Gray catbird	<i>Dumetella carolinensis</i>	Pr
Northern mockingbird	<i>Mimus polyglottos</i>	Pr
Brown thrasher	<i>Toxostoma rufum</i>	C
Cedar waxwing	<i>Bombycilla cedrorum</i>	C
European starling	<i>Sturnus vulgaris</i>	C
White-eyed vireo	<i>Vireo griseus</i>	C
Solitary vireo	<i>Vireo solitarius</i>	Po
Yellow-throated vireo	<i>Vireo flavifrons</i>	Pr
Warbling vireo	<i>Vireo gilvus</i>	Pr
Red-eyed vireo	<i>Vireo olivaceus</i>	Pr
Blue-winged warbler	<i>Vermivora pinus</i>	Po
Golden-winged warbler	<i>Vermivora chrysoptera</i>	Pr
Nashville warbler	<i>Vermivora ruficapilla</i>	Po
Northern parula	<i>Parula americana</i>	Pr
Yellow warbler	<i>Dendroica petechia</i>	Pr
Prairie warbler	<i>Dendroica discolor</i>	Pr
Cerulean warbler	<i>Dendroica cerulea</i>	Pr
American redstart	<i>Setophaga ruticilla</i>	Pr
Worm-eating warbler	<i>Helmitheros vermivorus</i>	Pr
Ovenbird	<i>Seiurus aurocapillus</i>	Pr
Louisiana waterthrush	<i>Seiurus motacilla</i>	C
Kentucky warbler	<i>Oporornis formosus</i>	Pr
Common yellowthroat	<i>Geothlypis trichas</i>	C
Yellow-breasted chat	<i>Icteria virens</i>	C
Scarlet tanager	<i>Piranga olivacea</i>	C
Northern cardinal	<i>Cardinalis cardinalis</i>	C
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	Po
Blue grosbeak	<i>Guiraca caerulea</i>	C
Indigo bunting	<i>Passerina cyanea</i>	C
Eastern towhee	<i>Pipilo erythrophthalmus</i>	Pr
Chipping sparrow	<i>Spizella passerina</i>	C

TABLE G-5  
Breeding Bird Atlas Data from the Site Vicinity  
Site 1 Focused Remedial Investigation for Soil  
Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Breeding Status <sup>a</sup>
Field sparrow	<i>Spizella pusilla</i>	Pr
Vesper sparrow	<i>Poocetes gramineus</i>	Pr
Savannah sparrow	<i>Passerculus sandwichensis</i>	C
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Pr
Henslow's sparrow	<i>Ammodramus henslowii</i>	Po
Song sparrow	<i>Melospiza melodia</i>	C
Swamp sparrow	<i>Melospiza georgiana</i>	C
Red-winged blackbird	<i>Agelaius phoeniceus</i>	C
Eastern meadowlark	<i>Sturnella magna</i>	Pr
Common grackle	<i>Quiscalus quiscula</i>	C
Brown-headed cowbird	<i>Molothrus ater</i>	C
Orchard oriole	<i>Icterus spurius</i>	Pr
Northern oriole	<i>Icterus galbula</i>	C
House finch	<i>Carpodacus mexicanus</i>	C
American goldfinch	<i>Carduelis tristis</i>	C
House sparrow	<i>Passer domesticus</i>	C

<sup>a</sup>C - Confirmed breeding; Pr - Probable breeding; Po - Possible breeding; Ob - Observed  
Source: Buckelew and Hall (1994); Robbins and Blom (1996)

TABLE G-6

Christmas Bird Count Data (1995-2000), Allegany County, MD/WV Census Plot

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	Average
European starling	<i>Sturnus vulgaris</i>	1,416	668	1,337	543	907	974
Rock dove	<i>Columba livia</i>	1,017	823	1,584	444	975	969
American crow	<i>Corvus brachyrhynchos</i>	885	343	405	239	380	450
Dark-eyed junco	<i>Junco hyemalis</i>	351	531	505	497	242	425
Canada goose	<i>Branta canadensis</i>	475	165	815	410	243	422
Mallard	<i>Anas platyrhynchos</i>	532	278	726	197	185	384
Northern cardinal	<i>Cardinalis cardinalis</i>	190	165	193	165	205	184
Mourning dove	<i>Zenaidra macroura</i>	168	92	146	255	172	167
House sparrow	<i>Passer domesticus</i>	138	156	211	110	106	144
Black-capped chickadee	<i>Parus atricapillus</i>	124	75	170	177	147	139
Tufted titmouse	<i>Parus bicolor</i>	118	122	141	148	102	126
American goldfinch	<i>Carduelis tristis</i>	103	57	92	163	205	124
Blue jay	<i>Cyanocitta cristata</i>	210	110	56	111	80	113
House finch	<i>Carpodacus mexicanus</i>	140	40	47	118	198	109
White-throated sparrow	<i>Zonotrichia albicollis</i>	106	86	90	103	92	95.4
Song sparrow	<i>Melospiza melodia</i>	51	58	67	131	73	76.0
Eastern bluebird	<i>Sialia sialis</i>	92	38	48	66	106	70.0
Downy woodpecker	<i>Picoides pubescens</i>	66	54	82	60	71	66.6
White-breasted nuthatch	<i>Sitta carolinensis</i>	59	36	74	46	75	58.0
Carolina wren	<i>Thryothorus ludovicianus</i>	37	32	69	82	68	57.6
American tree sparrow	<i>Spizella arborea</i>	27	43	74	68	42	50.8
Northern mockingbird	<i>Mimus polyglottos</i>	79	40	34	31	51	47.0
Cedar waxwing	<i>Bombycilla cedrorum</i>	35	36	2	122	11	41.2
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	27	29	35	41	45	35.4
Northern flicker	<i>Colaptes auratus</i>	59	18	23	42	26	33.6
Yellow-rumped warbler	<i>Dendroica coronata</i>	97	1	9	43	14	32.8
Wild turkey	<i>Meleagris gallopavo</i>	1	80	18	25	36	32.0
Pileated woodpecker	<i>Dryocopus pileatus</i>	23	16	22	31	26	23.6
Golden-crowned kinglet	<i>Regulus satrapa</i>	17	33	9	33	7	19.8
Red-winged blackbird	<i>Agelaius phoeniceus</i>	5	0	18	35	35	18.6
White-crowned sparrow	<i>Zonotrichia leucophrys</i>	20	9	19	10	25	16.6

TABLE G-6

Christmas Bird Count Data (1995-2000), Allegany County, MD/WV Census Plot

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	Average
Red-tailed hawk	<i>Buteo jamaicensis</i>	23	15	17	4	23	16.4
American robin	<i>Turdus migratorius</i>	1	0	2	70	4	15.4
Ruddy duck	<i>Oxyura jamaicensis</i>	5	0	10	3	52	14.0
Hairy woodpecker	<i>Picoides villosus</i>	7	7	23	22	7	13.2
Winter wren	<i>Troglodytes troglodytes</i>	10	6	11	13	18	11.6
Killdeer	<i>Charadrius vociferus</i>	10	2	14	9	21	11.2
Hooded merganser	<i>Lophodytes cucullatus</i>	0	16	11	5	19	10.2
Brown creeper	<i>Certhia americana</i>	7	8	13	13	8	9.8
Brown-headed cowbird	<i>Molothrus ater</i>	41	0	0	4	0	9.0
Purple finch	<i>Carpodacus purpureus</i>	1	1	6	18	12	7.6
Field sparrow	<i>Spizella pusilla</i>	12	8	6	6	4	7.2
American coot	<i>Fulica americana</i>	0	0	8	7	20	7.0
Ruby-crowned kinglet	<i>Regulus calendula</i>	9	2	10	7	5	6.6
Black vulture	<i>Coragyps atratus</i>	3	0	3	0	24	6.0
Hermit thrush	<i>Catharus guttatus</i>	3	6	1	16	4	6.0
Pine siskin	<i>Carduelis pinus</i>	0	0	0	0	30	6.0
Common raven	<i>Corvus corax</i>	2	1	5	12	9	5.8
Great blue heron	<i>Ardea herodias</i>	7	2	9	3	7	5.6
American black duck	<i>Anas rubripes</i>	10	1	12	1	3	5.4
Belted kingfisher	<i>Ceryle alcyon</i>	8	3	2	9	5	5.4
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	3	3	7	8	5	5.2
Chipping sparrow	<i>Spizella passerina</i>	0	5	2	5	5	3.4
Swamp sparrow	<i>Melospiza georgiana</i>	4	1	3	5	4	3.4
Red-shouldered hawk	<i>Buteo lineatus</i>	3	0	6	2	4	3.0
Pied-billed grebe	<i>Podilymbus podiceps</i>	4	1	0	4	5	2.8
Ruffed grouse	<i>Bonasa umbellus</i>	2	0	2	1	8	2.6
Common grackle	<i>Quiscalus quiscula</i>	10	0	2	0	0	2.4
Cooper's hawk	<i>Accipiter cooperii</i>	3	3	1	2	3	2.4
Eastern phoebe	<i>Sayornis phoebe</i>	6	1	1	2	2	2.4
Sharp-shinned hawk	<i>Accipiter striatus</i>	2	4	2	2	2	2.4
Common goldeneye	<i>Bucephala clangula</i>	1	1	0	0	8	2.0

TABLE G-6

Christmas Bird Count Data (1995-2000), Allegany County, MD/WV Census Plot

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	Average
American green-winged teal	<i>Anas crecca</i>	2	0	0	3	4	1.8
Eastern towhee	<i>Pipilo erythrophthalmus</i>	3	0	1	3	2	1.8
Bufflehead	<i>Bucephala albeola</i>	1	0	0	0	7	1.6
Eastern screech-owl	<i>Otus asio</i>	1	1	1	2	2	1.4
Red-breasted nuthatch	<i>Sitta canadensis</i>	6	0	1	0	0	1.4
Evening grosbeak	<i>Hesperiphona vespertina</i>	6	0	0	0	0	1.2
Ring-billed gull	<i>Larus delawarensis</i>	1	1	1	3	0	1.2
Thrush spp.	<i>Catharus spp</i>	0	0	1	5	0	1.2
Horned grebe	<i>Podiceps auritus</i>	0	0	0	5	0	1.0
Loggerhead shrike	<i>Lanius ludovicianus</i>	2	1	1	1	0	1.0
Wood duck	<i>Aix sponsa</i>	3	1	0	1	0	1.0
American kestrel	<i>Falco sparverius</i>	7	7	8	5	8	7.0
House wren	<i>Troglodytes aedon</i>	2	0	0	2	0	0.8
Tundra swan	<i>Cygnus columbianus</i>	0	0	1	1	2	0.8
Bonaparte's gull	<i>Larus philadelphia</i>	1	0	0	0	2	0.6
Common redpoll	<i>Carduelis flammea</i>	2	0	0	0	0	0.4
Great horned owl	<i>Bubo virginianus</i>	0	1	0	0	1	0.4
Northern harrier	<i>Circus cyaneus</i>	0	2	0	0	0	0.4
Rusty blackbird	<i>Euphagus carolinus</i>	0	0	0	2	0	0.4
Turkey vulture	<i>Cathartes aura</i>	0	0	0	0	3	0.6
Common merganser	<i>Mergus merganser</i>	0	1	0	0	0	0.2
Eastern meadowlark	<i>Sturnella magna</i>	0	0	1	0	0	0.2
Gray catbird	<i>Dumetella carolinensis</i>	0	0	0	1	0	0.2
Lesser scaup	<i>Aythya affinis</i>	0	0	0	1	0	0.2
Merlin	<i>Falco columbarius</i>	0	0	1	0	0	0.2
Palm warbler	<i>Dendroica palmarum</i>	1	0	0	0	0	0.2
Rough-legged hawk	<i>Buteo lagopus</i>	1	0	0	0	0	0.2
Total Species		73	60	67	71	69	68
Total Individuals		6,904	4,346	7,327	4,834	5,302	5,743

Source: BirdSource (2000)

TABLE G-7

Amphibian and Reptile Species Known to Occur in Mineral County, West Virginia

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name
<b>Amphibians</b>	
Appalachian seal salamander	<i>Desmognathus m. monticola</i>
Bullfrog	<i>Rana catesbeiana</i>
Eastern American toad	<i>Bufo a. americanus</i>
Eastern newt	<i>Notophthalmus v. viridescens</i>
Four-toed salamander	<i>Hemidactylum scutatum</i>
Fowler's toad	<i>Bufo woodhousei fowleri</i>
Gray treefrog	<i>Hyla chrysoscelis</i>
Green frog	<i>Rana clamitans melanota</i>
Jefferson salamander	<i>Ambystoma jeffersonianum</i>
Longtail salamander	<i>Eurycea l. longicauda</i>
Mountain dusky salamander	<i>Desmognathus ochrophaeus</i>
Northern cricket frog	<i>Acris c. crepitans</i>
Northern dusky salamander	<i>Desmognathus f. fuscus</i>
Northern red salamander	<i>Pseudotriton r. ruber</i>
Northern spring peeper	<i>Pseudacris c. crucifer</i>
Northern spring salamander	<i>Gyrinophilus p. porphyriticus</i>
N. two-lined salamander	<i>Eurycea b. bislineata</i>
Pickerel frog	<i>Rana palustris</i>
Redback salamander	<i>Plethodon cinereus</i>
Slimy salamander	<i>Plethodon g. glutinosus</i>
Spotted salamander	<i>Ambystoma maculatum</i>
Upland chorus frog	<i>Pseudacris triseriata feriarum</i>
Valley and ridge salamander	<i>Plethodon hoffmani</i>
Wood frog	<i>Rana sylvatica</i>
<b>Reptiles</b>	
Black rat snake	<i>Elaphe o. obsoleta</i>
Common musk turtle	<i>Sternotherus odoratus</i>
Common snapping turtle	<i>Chelydra s. serpentina</i>
Eastern box turtle	<i>Terrapene c. carolina</i>
Eastern earth snake	<i>Virginia v. valeriae</i>
Eastern garter snake	<i>Thamnophis s. sirtalis</i>
Eastern hognose snake	<i>Heterodon platirhinos</i>
Eastern milk snake	<i>Lampropeltis t. triangulum</i>
Eastern painted turtle	<i>Chrysemys p. picta</i>
Eastern smooth green snake	<i>Opheodrys v. vernalis</i>
Eastern worm snake	<i>Carphophis a. amoenus</i>
Five-lined skink	<i>Eumeces fasciatus</i>
Northern black racer	<i>Coluber c. constrictor</i>
Northern brown snake	<i>Storeria d. dekayi</i>
Northern copperhead	<i>Agkistrodon contortrix mokasen</i>
Northern fence lizard	<i>Sceloporus undulatus hyacinthinus</i>
Northern redbelly snake	<i>Storeria o. occipitamaculata</i>
Northern ringneck snake	<i>Diadophis punctatus edwardsii</i>
Northern water snake	<i>Nerodia s. sipedon</i>

TABLE G-7

Amphibian and Reptile Species Known to Occur in Mineral County, West Virginia

*Site 1 Focused Remedial Investigation for Soil*

*Allegheny Ballistics Laboratory, Rocket Center, WV*

Common Name	Scientific Name
Timber rattlesnake	<i>Crotalus horridus</i>
Wood turtle	<i>Clemmys insculpta</i>

Source: Green and Pauley (1987)

TABLE G-8

Fish Catch Per Unit Effort (Individuals/Hour) at Station 5 (Upstream), Station 6 (Pinto), and Station 7 (Downstream)

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	1988			1989			1990			1992			1993		
		5	6	7	5	6	7	5	6	7	5	6	7	5	6	7
American eel	<i>Anguilla rostrata</i>	0	0	0	0	0	0	0	0	1	0	0	2	0	0	0
Chain pickerel	<i>Esox niger</i>	0	0	1.5	0	0	0	0	0	1	0	0	0	0	0	0
Carp	<i>Cyprinus carpio</i>	0	0	A	0	30	0	0	0	44	0	0	51	0	23.8	0
Cutlips minnow	<i>Exoglossum maxillingua</i>	0	0	0	2	0	0	1	0	0	0	1	0	0	0	0
Golden shiner	<i>Notomigonous crysoleucas</i>	2.5	45.9	A	0	44	7	0	44	7	0	3	1	0	16.8	1.4
River chub	<i>Nocomis micropogon</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Common shiner	<i>Notropis cornutus</i>	0	0	A	6	0	0	3	0	1	0	0	2	0	2.2	0
Spotfin shiner	<i>Notropis spilopterus</i>	0	0	0	0	0	0	0	0	79	0	0	0	0	0	0
Rosyface shiner	<i>Notropis rubellus</i>	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0
Spottail shiner	<i>Notropis hudsonius</i>	0	33.5	A	0	0	25	0	0	0	0	0	0	0	0	0
Bluntnose minnow	<i>Pimephales promelas</i>	0	0	0	0	30	0	0	10	0	0	48	0	0	35	0
Blacknose dace	<i>Rhinichthys atratulus</i>	42	2.5	0	244	0	0	47	1	0	4	41	0	21	22	142
Longnose dace	<i>Rinichthys cataractae</i>	14	0	0	10	0	0	1	0	0	20	6	0	6	17	0
Creek chub	<i>Semotilus atromaculatus</i>	56	19.9	0	80	40	0	31	15	0	54	43	0	30	44	0
Fallfish	<i>Semotilus corporalis</i>	0	0	16.3	0	0	9	0	0	10	0	0	26	0	0	2.8
White sucker	<i>Catostomus commersoni</i>	84	176	1.5	58	97	106	47	165	110	70	95	3	165	121	4.2
Creek chubsucker	<i>Erimyzon oblongus</i>	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1.4
Northern hogsucker	<i>Hypentilium nigricans</i>	0	0	3	0	0	2	0	0	1	0	0	0	0	0	0
Golden redhorse	<i>Moxostoma erythrum</i>	0	0	A	0	0	107	0	0	101	0	0	23	0	0	8.4
Yellow bullhead	<i>Ictalurus natalis</i>	0.7	0	1.5	0	0	1	0	1	3	0	2	2	0	0	2.8
Brown bullhead	<i>Ictalurus nebulosus</i>	0	0	3	0	2	2	0	3	6	0	0	1	0	2	2.8
Channel catfish	<i>Ictalurus punctatus</i>	0	0	1.5	0	0	3	0	0	0	0	0	2	0	0	4.2
Rock bass	<i>Ambloplites rupestris</i>	1.3	0	22.3	4	0	26	3	0	21	0	0	8	0	0	32
Redbreast sunfish	<i>Lepomis auritus</i>	0	1.2	47.5	0	0	38	0	0	47	0	2	22	0	0.7	8.4
Green sunfish	<i>Lepomis cyanellus</i>	0	0	0	8	0	6	0	2	0	0	0	0	0	0	0
Pumpkinseed	<i>Lepomis gibbosus</i>	25.5	34.8	8.9	2	23	15	5	20	19	2	3	7	1.5	82	22
Bluegill	<i>Lepomis macrochirus</i>	0	0	31.2	0	0	17	0	1	15	0	0	18	0	1.3	20
Smallmouth bass	<i>Micropterus dolomieu</i>	0	0	23.7	0	0	19	0	0	5	0	0	10	0	0.7	5.6
Largemouth bass	<i>Micropterus salmoides</i>	0	0	19.3	0	0	16	0	0	3	0	0	10	4.5	21	7

TABLE G-8

Fish Catch Per Unit Effort (Individuals/Hour) at Station 5 (Upstream), Station 6 (Pinto), and Station 7 (Downstream)

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	1988			1989			1990			1992			1993		
		5	6	7	5	6	7	5	6	7	5	6	7	5	6	7
Yellow perch	<i>Perca flavescens</i>	0	0	1.5	0	0	0	0	0	0	0	0	0	0	0	0
Walleye	<i>Stizostedion vitreum</i>	0	0	5.9	0	0	5	0	0	0	0	0	3	0	0	2.8
Greenside darter	<i>Etheostoma blenniodes</i>	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Tesselated darter	<i>Etheostoma olmstedi</i>	0	0	0	0	0	1	0	0	0	0	3	1	0	7.3	0
Note: A = Abundant																

Source: CH2M HILL (1995)

TABLE G-9

Results of Benthic Invertebrate Sampling in the North Branch Potomac River - July 1994

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Taxa	Station 1			Station 2			Station 3			Station 4		
	A	B	Total									
Annelida												
Oligochaeta												
Tubificidae w.o.h.c.	4	2	6	1	0	1	2	5	7	0	0	0
Limnodrilus sp.	0	0	0	1	0	1	0	0	0	0	0	0
Limnodrilus hoffmeisteri	0	0	0	0	2	2	0	1	1	0	0	0
Arthropoda												
Crustacea												
Orconectes sp.	0	0	0	1	0	1	0	2	2	1	7	8
Insecta												
Ephemeroptera												
Stenacron sp.	1	0	1	0	0	0	1	0	1	0	0	0
Odonata												
Gomphidae												
Gomphus sp.	0	0	0	0	0	0	0	0	0	0	1	1
Megaloptera												
Corydalidae												
Nigronia serricornis	0	1	1	0	0	0	0	0	0	0	0	0
Sialidae												
Sialis sp.	0	0	0	0	0	0	0	1	1	0	0	0
Trichoptera												
Hydropsychidae												
Ceratopsyche morosa	0	0	0	0	0	0	0	0	0	0	3	3
Cheumatopsyche sp.	0	0	0	0	0	0	0	0	0	0	5	5
Diptera												
Chironomidae	0	0	0	0	0	0	0	0	0	1	0	1
Conchapelopia sp.	0	0	0	0	0	0	0	0	0	1	0	1
Cricotopus sp.	0	0	0	0	0	0	0	0	0	0	5	5
Procladius sp.	0	0	0	0	0	0	0	1	1	0	0	0
Mollusca												

TABLE G-9

Results of Benthic Invertebrate Sampling in the North Branch Potomac River - July 1994

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station 1			Station 2			Station 3			Station 4		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total
Gastropoda												
Ferrissia sp.	1	0	1	0	4	4	0	0	0	0	13	13
Total No. of Organisms	6	3	9	3	6	9	3	10	13	3	34	37
Total No. Of Taxa	3	2	4	3	2	5	2	5	6	3	6	8

Note: A, B = two replicates at each station

Source: CH2M HILL (1995)

TABLE G-10

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 1998

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
MOLLUSCA	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0
Basommatophora	0	0	0	0	0	0
Ancylidae	0	0	0	0	0	0
<i>Ferrissia rivularis</i>	3	6	7	13	12	10
ANNELIDA	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0	0
Haplotaxida	0	0	0	0	0	0
Enchytraeidae	0	0	2	0	1	0
Lumbricidae	0	0	0	0	0	0
Naididae	4	1	10	1	1	5
<i>Nais behningi</i>	2	1	0	0	0	2
<i>Nais bretscheri</i>	0	4	0	0	0	0
<i>Nais communis</i>	10	4	6	1	0	1
<i>Slavina appendiculata</i>	0	0	0	2	0	0
Tubificidae w.o.h.c.	1	0	1	0	2	3
Lumbriculida	0	0	0	0	0	0
Lumbriculidae	0	0	0	0	0	0
<i>Lumbriculus sp.</i>	0	0	2	0	0	0
ARTHROPODA	0	0	0	0	0	0
Insecta	0	0	0	0	0	0
Ephemeroptera	0	0	0	0	0	0
Heptageniidae	4	2	5	1	2	0
<i>Stenacron interpunctatum</i>	8	2	1	2	1	0
<i>Stenonema sp.</i>	0	0	1	0	0	0
Megaloptera	0	0	0	0	0	0
Sialidae	0	0	0	0	0	0
<i>Nigronia serricornis</i>	2	0	5	3	15	12
<i>Sialis sp.</i>	0	2	2	2	1	2

TABLE G-10

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 1998

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
Trichoptera	0	0	0	0	0	0
Brachycentridae	0	0	0	0	0	0
<i>Brachycentrus sp.</i>	0	0	0	0	0	1
Hydropsychidae	11	5	33	1	18	25
<i>Ceratopsyche morosa</i>	10	2	33	4	23	32
<i>Cheumatopsyche sp.</i>	18	7	54	9	30	30
<i>Hydropsyche sp.</i>	0	0	0	0	3	1
<i>Hydropsyche betteni</i>	0	0	0	0	1	0
Psychomyiidae	0	0	0	2	0	0
<i>Lype diversa</i>	2	0	0	0	0	0
Coleoptera	0	0	0	0	0	0
Gyrinidae	0	0	0	0	0	0
<i>Gyrinus sp.</i>	1	0	0	0	0	0
Diptera	0	0	0	0	0	0
Athericidae	0	0	0	0	0	0
<i>Atherix lantha</i>	1	0	1	0	0	0
Chironomidae	13	4	16	8	7	11
<i>Ablabesmyia mallochii</i>	0	6	0	4	0	0
<i>Brillia flavifrons</i>	3	2	1	2	0	0
<i>Chironomus sp.</i>	0	0	0	0	0	1
<i>Cricotopus sp.</i>	43	42	29	8	45	79
<i>Cricotopus bicinctus</i>	0	0	0	0	0	1
<i>Cricotopus tremulus</i>	10	11	3	0	4	7
<i>Diamesa sp.</i>	0	0	0	0	0	1
<i>Labrundinia sp.</i>	0	0	0	0	0	1
<i>Nanocladius sp.</i>	15	3	20	6	11	19
<i>Parakiefferiella sp.</i>	0	0	0	0	0	2
<i>Paratendipes sp.</i>	0	0	1	1	0	0
<i>Phaenopsectra sp.</i>	3	2	5	5	5	1

TABLE G-10

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 1998

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
<i>Polypedilum sp.</i>	0	4	2	0	1	0
<i>Polypedilum fallax</i>	5	7	5	9	4	13
<i>Polypedilum halterale</i>	120	272	94	226	88	107
<i>Rheocricotopus robacki</i>	98	48	77	38	67	66
<i>Rheotanytarsus sp.</i>	122	31	55	42	102	66
<i>Robackia demeijerei</i>	0	0	1	0	0	0
<i>Tanytarsus sp.</i>	1	0	0	0	0	0
<i>Thienemannimyia gp.</i>	39	42	19	31	42	58
<i>Xylotopus par</i>	0	0	1	0	0	0
Empididae	0	0	1	0	0	0
<i>Hemerodromia sp.</i>	3	1	0	0	5	8
TOTAL NUMBER OF ORGANISMS	552	511	493	421	491	565
TOTAL NUMBER OF TAXA	27	25	31	24	25	28

<sup>a</sup>Total of 3 replicates

TABLE G-11

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2000

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
PLATYHELMINTHES	0	0	0	0	0	0
Turbellaria	0	0	0	0	0	0
Tricladida	0	0	0	0	0	0
Planariidae	0	0	0	0	0	0
<i>Dugesia tigrina</i>	10	0	0	0	0	1
MOLLUSCA	0	0	0	0	0	0
Bivalvia	0	0	0	0	0	0
Veneroida	0	0	0	0	0	0
Sphaeriidae	0	0	1	0	0	0
Gastropoda	0	0	0	0	0	0
Basommatophora	0	0	0	0	0	0
Ancylidae	0	0	0	0	0	0
<i>Ferrissia rivularis</i>	51	19	56	90	11	2
Planorbidae	0	0	0	0	0	0
<i>Menetus dilatatus</i>	5	1	0	0	0	0
Physidae	0	0	0	0	0	0
<i>Physella sp.</i>	0	2	1	0	0	3
ANNELIDA	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0	0
Haplotaxida	0	0	0	0	0	0
Lumbricidae	0	0	0	0	0	0
Naididae	5	174	112	24	33	2
<i>Nais sp.</i>	3	1	18	0	0	0
<i>Nais communis</i>	3	0	0	0	0	2
<i>Pristina sp.</i>	0	0	0	38	0	0
<i>Pristina leidy</i>	58	265	643	155	239	4
<i>Slavina appendiculata</i>	2	2	3	1	43	13
<i>Stylaria lacustris</i>	1	1	0	0	0	2
Tubificidae w.o.h.c.	0	0	0	1	0	0

TABLE G-11

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2000

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
Hirudinea	0	0	6	0	0	0
ARTHROPODA	0	0	0	0	0	0
Insecta	0	0	0	0	0	0
Collembola	0	0	0	0	0	0
Isotomidae	0	0	0	0	1	1
Ephemeroptera	0	0	0	0	0	0
Baetidae	0	0	1	0	0	0
<i>Baetis intercalaris</i>	0	0	1	0	0	0
Heptageniidae	4	0	2	0	0	1
<i>Stenacron interpunctatum</i>	152	2	17	18	3	35
Leptophlebiidae	0	0	0	0	0	0
<i>Paraleptophlebia sp.</i>	0	0	2	0	0	0
Odonata	0	0	0	0	0	0
Aeshnidae	0	0	0	0	0	0
<i>Boyeria vinosa</i>	0	0	0	0	0	1
Calopterygidae	0	0	0	0	0	2
<i>Calopteryx sp.</i>	0	1	0	0	0	0
Plecoptera	0	0	0	0	0	0
Pteronarcidae	0	0	0	0	0	0
<i>Pteronarcys dorsata</i>	0	0	0	0	0	1
Hemiptera	0	0	0	0	0	0
Corixidae	1	0	0	0	0	0
Veliidae	0	0	0	0	0	0
<i>Rhagovelia obesa</i>	0	0	0	0	0	1
Megaloptera	0	0	0	0	0	0
Corydalidae	0	0	1	0	0	0
<i>Corydalis cornutus</i>	0	0	1	1	0	0
<i>Nigronia serricornis</i>	7	18	21	15	12	1
Sialidae	0	0	0	0	0	0

TABLE G-11

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2000

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
<i>Sialis sp.</i>	0	0	0	0	1	0
Trichoptera	0	0	0	0	0	0
Hydropsychidae	55	3	100	21	0	0
<i>Cheumatopsyche sp.</i>	94	19	115	48	1	0
<i>Hydropsyche sp.</i>	0	1	11	9	0	0
<i>Hydropsyche betteni</i>	0	0	15	3	0	1
<i>Hydropsyche venularis</i>	51	2	157	28	1	0
Polycentropodidae	0	0	0	1	0	0
<i>Polycentropus sp.</i>	8	3	2	0	6	1
Coleoptera	0	0	0	0	0	0
Elmidae	0	0	1	0	0	0
Gyrinidae	0	0	0	0	0	0
<i>Dineutus sp.</i>	1	0	0	0	0	0
Diptera	0	0	0	0	0	0
Athericidae	0	0	0	0	0	0
<i>Atherix lantha</i>	1	0	0	0	0	0
Ceratopogonidae	0	0	0	0	0	0
<i>Bezzia/Palpomyia gp.</i>	1	1	0	1	0	0
Chironomidae	32	38	60	36	27	18
<i>Ablabesmyia mallochi</i>	0	2	10	2	12	21
<i>Chironomus sp.</i>	0	3	0	0	0	0
<i>Cricotopus sp.</i>	3	57	21	9	34	3
<i>Cricotopus bicinctus</i>	0	3	0	0	15	1
<i>Cryptochironomus fulvus</i>	0	0	0	2	0	0
<i>Dicrotendipes sp.</i>	0	0	0	0	0	1
<i>Nanocladius sp.</i>	0	0	5	6	0	2
<i>Nilotanypus sp.</i>	0	3	10	2	9	0
<i>Phaenopsectra sp.</i>	0	0	0	0	4	10
<i>Polypedilum fallax</i>	0	0	4	11	11	0

TABLE G-11

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2000

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
<i>Polypedilum halterale</i>	412	182	437	376	280	58
<i>Polypedilum illinoense</i>	0	123	23	0	71	137
<i>Procladius sp.</i>	0	0	0	0	0	1
<i>Rheocricotopus robacki</i>	263	328	611	164	286	40
<i>Rheotanytarsus sp.</i>	31	16	58	32	4	0
<i>Stenochironomus sp.</i>	10	3	56	7	0	0
<i>Synorthocladius semivirens</i>	0	10	0	0	0	0
<i>Tanytarsus sp.</i>	0	3	0	0	0	0
<i>Thienemannimyia gp.</i>	114	101	110	83	132	24
Empididae	0	1	0	0	0	0
<i>Hemerodromia sp.</i>	0	0	2	0	0	0
Muscidae	0	0	0	0	0	1
<b>TOTAL NUMBER OF ORGANISMS</b>	<b>1,378</b>	<b>1,388</b>	<b>2,694</b>	<b>1,184</b>	<b>1,236</b>	<b>391</b>
<b>TOTAL NUMBER OF TAXA</b>	<b>27</b>	<b>32</b>	<b>36</b>	<b>28</b>	<b>23</b>	<b>31</b>

<sup>a</sup>Total of 3 replicates

TABLE G-12

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2002

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
PLATYHELMINTHES	0	0	0	0	0	0
Turbellaria	0	0	0	0	0	0
Tricladida	0	0	0	0	0	0
Planariidae	0	0	0	0	0	0
<i>Dugesia tigrina</i>	0	0	0	0	3	10
MOLLUSCA	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0
Basommatophora	0	0	0	0	0	0
Ancylidae	0	0	0	0	0	0
<i>Ferrissia rivularis</i>	21	36	12	0	4	30
Physidae	0	0	0	0	0	0
<i>Physella sp.</i>	0	1	1	0	2	0
ANNELIDA	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0	0
Haplotaxida	0	0	0	0	0	0
Lumbricidae	0	5	0	0	0	0
Naididae	10	10	0	0	6	0
<i>Dero sp.</i>	0	0	0	0	2	0
<i>Nais sp.</i>	20	10	0	0	2	0
<i>Pristina sp.</i>	0	0	0	0	1	0
<i>Pristina leidy</i>	0	120	60	3	1	0
<i>Slavina appendiculata</i>	0	0	0	3	7	0
Tubificidae w.h.c.	0	0	0	3	0	0
Tubificidae w.o.h.c.	0	0	0	3	0	0
ARTHROPODA	0	0	0	0	0	0
Crustacea	0	0	0	0	0	0
Copepoda	0	10	0	0	0	0
Cyclopoida	0	0	1	0	0	0
Ostracoda	0	0	1	0	0	0
Amphipoda	0	0	0	0	0	0
Crangonyctidae	0	0	0	0	0	0

TABLE G-12

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2002

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
<i>Crangonyx sp.</i>	0	0	0	0	1	0
<b>Insecta</b>	0	0	0	0	0	0
<b>Ephemeroptera</b>	0	0	0	0	0	0
<b>Baetidae</b>	0	0	0	0	1	10
<i>Baetis intercalaris</i>	1	0	0	0	0	0
<i>Plauditus sp.</i>	0	5	0	0	0	0
<b>Heptageniidae</b>	0	0	0	0	0	50
<i>Leucrocuta sp.</i>	0	0	0	0	0	1
<i>Stenacron interpunctatum</i>	2	0	3	0	3	15
<i>Stenonema mediopunctatum</i>	0	0	0	0	0	2
<i>Stenonema modestum</i>	1	0	0	0	0	0
<b>Odonata</b>	0	0	0	0	0	0
<b>Aeshnidae</b>	0	0	0	0	0	0
<i>Boyeria vinosa</i>	0	1	0	0	1	0
<b>Megaloptera</b>	0	0	0	0	0	0
<b>Corydalidae</b>	0	0	0	0	0	0
<i>Nigronia serricornis</i>	13	1	0	0	0	0
<b>Sialidae</b>	0	0	0	0	0	0
<i>Sialis sp.</i>	0	0	1	0	1	0
<b>Trichoptera</b>	0	0	0	0	0	0
<b>Brachycentridae</b>	0	0	0	0	0	0
<i>Brachycentrus sp.</i>	0	1	0	0	0	0
<b>Hydropsychidae</b>	990	15	0	0	0	220
<i>Ceratopsyche morosa</i>	10	0	0	0	0	0
<i>Cheumatopsyche sp.</i>	62	11	1	0	0	69
<i>Hydropsyche sp.</i>	126	0	0	0	0	52
<i>Hydropsyche betteni gp.</i>	13	0	0	0	0	13
<b>Hydroptilidae</b>	0	0	0	0	0	0
<i>Hydroptila sp.</i>	0	0	0	0	0	10
<b>Polycentropodidae</b>	0	0	0	0	0	0
<i>Nyctiophylax</i>	0	1	0	0	0	0

TABLE G-12

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - July 2002

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>					
	BIOTA 1	BIOTA 2	BIOTA 3	BIOTA 4	BIOTA 5	BIOTA 6
<i>Polycentropus sp.</i>	10	34	94	67	21	50
Psychomyiidae	0	0	0	0	0	0
<i>Lype diversa</i>	0	1	10	0	2	0
<i>Psychomyia flavida</i>	0	5	0	0	0	30
Coleoptera	0	0	0	0	0	0
Gyrinidae	0	0	0	0	0	0
<i>Dineutus sp.</i>	0	0	0	0	0	1
Diptera	0	0	0	0	0	0
Chironomidae	70	55	150	40	12	40
<i>Ablabesmyia mallochi</i>	20	12	2	90	50	20
<i>Cricotopus sp.</i>	140	24	0	0	0	80
<i>Cricotopus bicinctus</i>	0	12	0	0	0	0
<i>Nanocladius sp.</i>	20	0	0	0	0	0
<i>Parakiefferiella sp.</i>	0	12	0	0	0	0
<i>Phaenopsectra sp.</i>	0	0	0	35	34	20
<i>Polypedilum fallax</i>	20	12	0	0	0	40
<i>Polypedilum halterale</i>	40	428	157	335	206	170
<i>Polypedilum illinoense</i>	140	274	20	25	88	110
<i>Rheocricotopus robacki</i>	1,180	178	4	0	0	1,140
<i>Rheotanytarsus sp.</i>	480	95	4	0	0	300
<i>Stenochironomus sp.</i>	0	0	0	0	0	20
<i>Tanytarsus sp.</i>	20	0	2	0	0	20
<i>Thienemanniella xena</i>	20	0	0	0	0	0
<i>Thienemannimyia gp.</i>	40	131	12	5	4	190
Tipulidae	0	0	0	0	0	0
<i>Antocha sp.</i>	20	0	0	0	0	10
<b>TOTAL NUMBER OF ORGANISMS</b>	<b>3,489</b>	<b>1,500</b>	<b>535</b>	<b>609</b>	<b>452</b>	<b>2,723</b>
<b>TOTAL NUMBER OF TAXA</b>	<b>26</b>	<b>28</b>	<b>18</b>	<b>11</b>	<b>22</b>	<b>28</b>

<sup>a</sup>Total of 3 replicates

TABLE G-13

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - June/August 2004

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>							
	BIOTA 01	BIOTA 01B	BIOTA 02	BIOTA 03	BIOTA 04	BIOTA 04B	BIOTA 05	BIOTA 06
NEMATODA <sup>1</sup>	0	1	0	0	0	0	0	0
MOLLUSCA	0	0	0	0	0	0	0	0
Bivalvia	0	0	0	0	0	0	0	0
Gastropoda	0	0	0	0	0	0	0	0
Basommatophora	0	0	0	0	0	0	0	0
Ancylidae	0	0	0	0	0	0	0	0
<i>Ferrissia rivularis</i>	144	22	8	1	0	0	13	18
ANNELIDA	0	0	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0	0	0	0
Tubificida	0	0	0	0	0	0	0	0
Naididae	0	0	0	0	0	0	0	0
<i>Nais communis</i>	80	0	39	30	57	0	0	0
<i>Nais sp.</i> <sup>2</sup>	0	4	0	0	0	0	0	1
<i>Slavina appendiculata</i>	0	1	14	1	0	1	0	0
Tubificidae w.o.h.c. <sup>3</sup>	0	1	3	2	0	0	0	0
Tubificidae w.h.c. <sup>4</sup>	0	0	0	0	7	0	0	0
ARTHROPODA	0	0	0	0	0	0	0	0
Arachnoidea	0	0	0	0	0	0	0	0
Acariformes <sup>1</sup>	0	0	0	0	0	0	0	1
Crustacea	0	0	0	0	0	0	0	0
Cladocera	0	0	0	0	0	0	0	0
Chydoridae <sup>1</sup>	0	0	0	9	0	0	0	0
Copepoda	0	0	0	0	0	0	0	0
Cyclopoida <sup>1</sup>	0	2	0	5	0	0	0	0
Ostracoda <sup>1</sup>	0	1	0	3	0	0	0	0
Amphipoda	0	0	0	0	0	0	0	0
Crangonyctidae	0	0	0	0	0	0	0	0
<i>Crangonyx sp.</i>	0	1	0	0	0	0	0	0

TABLE G-13

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - June/August 2004

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>							
	BIOTA 01	BIOTA 01B	BIOTA 02	BIOTA 03	BIOTA 04	BIOTA 04B	BIOTA 05	BIOTA 06
Decapoda	0	0	0	0	0	0	0	0
Cambaridae	0	0	0	0	0	0	0	0
<i>Orconectes sp.</i>	0	1	0	0	0	0	0	0
Insecta	0	0	0	0	0	0	0	0
Ephemeroptera	0	0	0	0	0	0	0	0
Baetidae	0	0	0	0	0	0	0	0
<i>Baetis sp.</i>	0	0	0	0	3	0	0	0
Heptageniidae	0	0	0	0	0	0	0	0
<i>Stenacron interpunctatum</i>	0	12	12	16	11	1	21	9
<i>Stenonema mediopunctatum</i>	0	0	0	0	0	0	1	1
Odonata	0	0	0	0	0	0	0	0
Calopterygidae	0	0	0	0	0	0	0	0
<i>Calopteryx sp.</i>	0	1	0	0	0	0	0	0
Plecoptera	0	0	0	0	0	0	0	0
Perlidae	0	0	0	0	0	0	0	0
<i>Acroneuria abnormis</i>	0	0	0	0	0	0	0	1
Megaloptera	0	0	0	0	0	0	0	0
Corydalidae	0	0	0	0	0	0	0	0
<i>Corydalus cornutus</i>	0	0	0	0	0	0	0	1
<i>Nigronia serricornis</i>	2	3	1	2	0	3	4	11
Sialidae	0	0	0	0	0	0	0	0
<i>Sialis sp.</i>	0	2	0	4	3	0	0	0
Trichoptera	0	0	0	0	0	0	0	0
Hydropsychidae	0	0	0	0	0	0	0	0
<i>Ceratopsyche morosa</i>	8	1	1	0	0	0	0	12
<i>Cheumatopsyche sp.</i>	16	0	2	0	1	0	0	1
<i>Hydropsyche betteni gp.</i>	36	0	0	0	0	0	0	1
Limnephilidae	0	0	0	0	0	0	0	0
<i>Pycnopsyche sp.</i>	0	1	0	0	0	0	0	0
Polycentropodidae	0	0	0	0	0	0	0	0

TABLE G-13

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - June/August 2004

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>							
	BIOTA 01	BIOTA 01B	BIOTA 02	BIOTA 03	BIOTA 04	BIOTA 04B	BIOTA 05	BIOTA 06
<i>Polycentropus sp.</i>	0	5	0	9	37	8	6	2
Psychomyiidae	0	0	0	0	0	0	0	0
<i>Lype diversa</i>	0	0	0	0	3	0	0	3
<i>Psychomyia flavida</i>	4	0	0	0	1	0	0	0
Coleoptera	0	0	0	0	0	0	0	0
Elmidae	0	0	0	0	0	0	0	0
<i>Macronychus glabratus</i>	0	0	0	0	0	1	0	0
<i>Stenelmis sp.</i>	0	0	0	0	4	0	0	0
Gyrinidae	0	0	0	0	0	0	0	0
<i>Dineutus sp.</i>	4	0	0	0	0	1	0	0
Diptera	0	0	0	0	0	0	0	0
Ceratopogonidae	0	0	0	0	0	0	0	0
<i>Atrichopogon sp.</i>	0	0	0	0	0	1	0	0
Chironomidae <sup>5</sup>	8	12	6	15	40	6	3	1
<i>Ablabesmyia annulata</i>	0	0	0	0	7	0	0	0
<i>Ablabesmyia mallochi</i>	0	0	0	2	23	0	5	0
<i>Chironomus sp.</i>	0	0	0	0	0	0	0	3
<i>Conchapelopia sp.</i>	52	54	28	112	50	16	14	28
<i>Cricotopus bicinctus</i>	68	0	5	0	7	3	1	2
<i>Cricotopus sp.</i> <sup>6</sup>	32	0	0	2	0	7	0	3
<i>Cryptochironomus sp.</i>	0	2	0	2	0	0	0	0
<i>Endochironomus sp.</i>	0	0	2	5	0	0	1	0
<i>Nilotanypus sp.</i>	4	0	5	2	7	3	0	2
<i>Orthocladius (Euorthocladius) sp.</i>	4	0	0	0	0	0	0	2
<i>Polypedilum fallax</i>	4	5	21	10	20	6	2	8
<i>Polypedilum halterale</i>	60	146	66	177	203	18	36	31
<i>Polypedilum illinoense</i>	12	10	80	3	13	11	2	7
<i>Rheocricotopus robacki</i>	260	12	56	5	33	56	0	130
<i>Rheotanytarsus sp.</i>	48	2	0	2	0	11	0	11

TABLE G-13

Results of Benthic Invertebrate Sampling (Hester-Dendy) in the North Branch Potomac River - June/August 2004

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Taxa	Station <sup>a</sup>							
	BIOTA 01	BIOTA 01B	BIOTA 02	BIOTA 03	BIOTA 04	BIOTA 04B	BIOTA 05	BIOTA 06
<i>Tanytarsus sp.</i>	0	0	0	2	3	0	0	0
<i>Tribelos sp.</i>	0	0	0	2	0	0	0	2
<i>Tvetenia discoloripes gp.</i>	4	0	0	0	0	0	0	0
<b>TOTAL NO. ORGANISMS</b>	<b>850</b>	<b>302</b>	<b>349</b>	<b>423</b>	<b>533</b>	<b>153</b>	<b>109</b>	<b>292</b>
<b>TOTAL NO. TAXA</b>	<b>20</b>	<b>24</b>	<b>17</b>	<b>25</b>	<b>21</b>	<b>17</b>	<b>13</b>	<b>26</b>

<sup>a</sup>Total of 3 replicates

<sup>1</sup>Lowest practical taxonomic unit (LPTU)

<sup>2</sup>Not *N. communis*

<sup>3</sup>Unidentified Tubificidae without hair chaeta

<sup>4</sup>Unidentified Tubificidae with hair chaeta

<sup>5</sup>Pupae, included in metric calculations

<sup>6</sup>Small immature specimens not *C. bicinctus*

TABLE G-14

Rare, Threatened, and Endangered Species from Mineral County, West Virginia

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Taxa	State Rank <sup>a</sup>	Federal Status	Comments
Eastern cricket frog	<i>Acris c. crepitans</i>	Amphibian	S2	--	
Jefferson salamander	<i>Ambystoma jeffersonianum</i>	Amphibian	S3	--	
Peregrine falcon	<i>Falco peregrinus</i>	Bird	S1B/S2N	--	Removed from federal list 8/25/99
Loggerhead shrike	<i>Lanius ludovicianus</i>	Bird	S1B/S1N	--	State rank for <i>migrans</i> subspecies
Bald eagle	<i>Lhaliaeetus leucocephalus</i>	Bird	S2B/S2N	Threatened	Proposed for delisting (7/6/99)
Northern metalmark	<i>Calephelis boarealis</i>	Butterfly	S2	--	
Columbine duskywing	<i>Erynnis lucilius</i>	Butterfly	S2	--	
Olympia marble	<i>Euchloe olympia</i>	Butterfly	S2/S3	--	
Grizzled skipper	<i>Pyrgus wyanpot</i>	Butterfly	S1	--	
Allegheny woodrat	<i>Noetoma magister</i>	Mammal	S3	--	Found on ABL
Meadow jumping mouse	<i>Zapus hudsonius</i>	Mammal	S3	--	
Lesser snakeroot	<i>Ageratine aromaticum var aromaticum</i>	Plant	S1	--	
Bent milk-vetch	<i>Astragalus distortus</i>	Plant	S2	--	
Side-oats grama	<i>Bouteloua curtipendula</i>	Plant	S3	--	Found on ABL
American harebell (Bluebell)	<i>Campanula rotundifolia</i>	Plant	S2	--	Found on ABL
Hoary sedge	<i>Carex canescens</i>	Plant	S3	--	
Ebony sedge	<i>Carex eburnea</i>	Plant	S3	--	Found on ABL
Troublesome sedge	<i>Carex molesta</i>	Plant	S1	--	
Necklace sedge	<i>Carex projecta</i>	Plant	S1	--	
Goldthread	<i>Coptis trifolia groenlandica</i>	Plant	S2	--	
Roundleaf dogwood	<i>Cornus rugosa</i>	Plant	S1	--	
Beaked dodder	<i>Cuscuta rostrata</i>	Plant	S2	--	
Reflexed flatsedge	<i>Cyperus refractus</i>	Plant	S2	--	
Tall larkspur	<i>Delphinium exaltatum</i>	Plant	S2	--	
Nuttall waterweed	<i>Elodea nuttallii</i>	Plant	S1	--	
Blue ash	<i>Fraxinus quadrangulata</i>	Plant	S1	--	
Flatleaf rush	<i>Juncus platyphyllus</i>	Plant	Not listed	--	
Torrey's rush	<i>Juncus torreyi</i>	Plant	S1	--	
False pimpinell	<i>Lindernai dubia var anagallidea</i>	Plant	SH	--	
Shale barren evening primrose	<i>Oenothera argillicola</i>	Plant	S3	--	

TABLE G-14

Rare, Threatened, and Endangered Species from Mineral County, West Virginia

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Taxa	State Rank <sup>a</sup>	Federal Status	Comments
Black-fruit mountain ricegrass	<i>Oryzopsis racemosa</i>	Plant	S2	--	
Canby's mountain-lover	<i>Paxistima canbyi</i>	Plant	S2	--	
Jacobs ladder	<i>Polemonium vanbruntiae</i>	Plant	S2	--	
Allegheny plum	<i>Prunus alleghaniensis</i>	Plant	S3	--	Found on ABL
Basil mountain-mint	<i>Pycnanthemum clinopodioides</i>	Plant	SH	--	
Bristly black currant	<i>Ribes lacustre</i>	Plant	S1	--	
Swamp red currant	<i>Ribes triste</i>	Plant	SH	--	
Glaucous willow	<i>Salix discolor</i>	Plant	S2	--	
Swamp saxifrage	<i>Saxifraga pensylvanica</i>	Plant	S2	--	
Balsam squaw-weed	<i>Senecio pauperculus</i>	Plant	S1	--	
Poison sumac	<i>Toxicodendron vernix</i>	Plant	S2	--	
Kates mountain clover	<i>Trifolium virginicum</i>	Plant	S3	--	
Marsh speedwell	<i>Veronica scutellata</i>	Plant	S1	--	
Netted chainfern	<i>Woodwardia areolata</i>	Plant	S1	--	
Oceanorous	<i>Zigadenus leimanthoides</i>	Plant	S2	--	

<sup>a</sup>State rank (June 2000): S1 - Extremely rare; S2 - Very rare; S3 - Somewhat vulnerable to extirpation; SH - Historical. B - Breeding populations; N - Non-breeding populations

TABLE G-15

Rare, Threatened, and Endangered Species from Maryland

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Taxa	State Rank <sup>a</sup>	State Status <sup>b</sup>	Federal Status	Comments
Sora	<i>Porzana carolina</i>	Bird	S1B	--	--	
Eastern small-footed bat	<i>Myotis leibii</i>	Mammal	S1B	I	--	No longer federal candidate
Side-oats grama	<i>Bouteloua curtipendula</i>	Plant	S2	--	--	
Harebell	<i>Campanula rotundifolia</i>	Plant	S2	--	--	
Virginia mountain mint	<i>Pycnanthemum virginianum</i>	Plant	S2	--	--	
Cliff stonecrop	<i>Sedum glaucophyllum</i>	Plant	S1B	E	--	

<sup>a</sup>State rank (October 1997 [animals]; December 1996 [plants]): S1 - Highly rare; S2 - Rare. B - Breeding populations

<sup>b</sup>E - Endangered; I - In need of conservation

TABLE G-16

## Plant Species Present on Site 1

Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Common Name	Scientific Name	Wetland Status <sup>a</sup>	East/Central	North	West
<b>Herbaceous Plants</b>					
Broad-leaf cattail	<i>Typha latifolia</i>	OBL			X
Cinnamon fern	<i>Osmunda cinnamomea</i>	FACW		X	
Common bog nettle	<i>Stachys tenuifolia</i>	FACW+		X	
Crown vetch	<i>Coronilla varia</i>	UPL	X		X
Deptford pink	<i>Dianthus armeria</i>	UPL	X		
Dwarf St. John's Wort	<i>Hypericum mutilum</i>	FACW		X	
English plantain	<i>Plantago lanceolata</i>	UPL	X		X
Eulalia	<i>Microstegium vimineum</i>	FAC		X	X
False nettle	<i>Boehmeria cylindrica</i>	FACW+		X	
Fescue	<i>Festuca spp.</i>	--	X		
Field garlic	<i>Allium vineale</i>	FACU-	X		X
Goldenrod	<i>Solidago spp.</i>	--			X
Henbit	<i>Lamium amplexicaule</i>	UPL	X		
Horse balm	<i>Collinsonia canadensis</i>	FAC+		X	
Horse nettle	<i>Solanum carolinense</i>	UPL	X		
Japanese knotweed	<i>Polygonum cuspidatum</i>	FACU-		X	
Least hop clover	<i>Trifolium dubium</i>	UPL	X		
Orchard grass	<i>Dactylis glomerata</i>	FACU	X		X
Ox-eye daisy	<i>Chrysanthemum leucanthemum</i>	UPL	X		
Quackgrass	<i>Agropyron repens</i>	FACU-			X
Red fescue	<i>Festuca rubra</i>	FACU			X
Red top	<i>Agrostis alba</i>	FACW	X		
Rough-stemmed goldenrod	<i>Solidago rugosa</i>	FAC		X	
Timothy	<i>Phleum pratense</i>	FACU	X		
White snakeroot	<i>Eupatorium rugosum</i>	FACU-		X	
Yarrow	<i>Achillea millefolium</i>	FACU	X		X
<b>Woody Plants</b>					
Tree-of-heaven	<i>Ailanthus altissima</i>	FACU		X	
American sycamore	<i>Platanus occidentalis</i>	FACW-		X	X

TABLE G-16

## Plant Species Present on Site 1

*Site 1 Focused Remedial Investigation for Soil  
Allegany Ballistics Laboratory, Rocket Center, WV*

Common Name	Scientific Name	Wetland Status <sup>a</sup>	East/Central	North	West
Black cherry	<i>Prunus serotina</i>	FACU		X	
Black locust	<i>Robinia pseudoacacia</i>	FACU-		X	X
Boxelder	<i>Acer negundo</i>	FAC+		X	
Eastern cottonwood	<i>Populus deltoides</i>	FAC		X	
Green ash	<i>Fraxinus pennsylvanica</i>	FACW		X	
Silver maple	<i>Acer saccharinum</i>	FACW		X	X
Spicebush	<i>Lindera benzoin</i>	FACW-		X	

<sup>a</sup>OBL - Obligate wetland (>99% probability of occurring in wetlands); FACW - Facultative Wetland (67-99%); FAC - Facultative (34-66%); FACU - Facultative Upland (1-33%); UPL - Obligate Upland (<1%); Minus sign - tends to lower end of range; Plus sign - tends to higher end of range (Reed 1988)

TABLE G-17

Summary of Data Selected for Use in the Site 1 Ecological Risk Assessment

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Floodplain Surface Soil						Upland Surface Soil - Burning Grounds					Upland Surface Soil - Solvent Disposal Pits				
VOCs	SVOCs	Inorganics	Dioxins	Explosives	PCBs	VOCs	SVOCs	Inorganics	Dioxins	Explosives	VOCs	SVOCs	Inorganics	Dioxins	Explosives
	<i>1 (1/92)</i>														
	<i>2 (7/92)</i>	<i>9 (7/92)</i>	<i>2 (7/92)</i>				<i>8 (7/92)</i>			<i>8 (7/92)</i>					
<i>3 (6/94)</i>						<i>5 (6/94)</i>					<i>2 (6/94)</i>				
<i>4 (11/94)</i>	<i>6 (11/94)</i>	<i>4 (11/94)</i>													
		<i>3 (1995)</i>		<i>2 (1995)</i>											
					<i>7 (1998)</i>										
<i>21 (2001)</i>	<i>21 (2001)</i>	<i>21 (2001)</i>	<i>8 (2001)</i>	<i>10 (2001)</i>		<i>20 (2/01)</i>	<i>20 (2/01)</i>	<i>20 (2/01)</i>	<i>20 (2/01)</i>	<i>20 (2/01)</i>					
<i>9 (7/04)</i>	<i>13 (7/04)</i>	<i>13 (7/04)</i>	<i>9 (7/04)</i>												
<i>4 (9/04)</i>	<i>4 (9/04)</i>	<i>4 (9/04)</i>	<i>4 (9/04)</i>	<i>4 (9/04)</i>		<i>8 (9/04)</i>	<i>8 (9/04)</i>	<i>8 (9/04)</i>	<i>8 (9/04)</i>	<i>8 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>

Bold and italics entries - Data used in the ecological risk assessment

TABLE G-17

Summary of Data Selected for Use in the Site 1 Ecological Risk Assessment

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Floodplain Subsurface Soil					Upland Subsurface Soil - Burning Grounds					Upland Subsurface Soil - Solvent Disposal Pits					Earthworm Tissue
VOCs	SVOCs	Inorganics	Dioxins	Explosives	VOCs	SVOCs	Inorganics	Dioxins	Explosives	VOCs	SVOCs	Inorganics	Dioxins	Explosives	Dioxins
<i>3 (7/92)</i>		<i>2 (7/92)</i>													
	<i>1 (6/94)</i>														
<i>5 (11/94)</i>	<i>1 (11/94)</i>	<i>1 (11/94)</i>													
<i>1 (1998)</i>															
<i>11 (2001)</i>	<i>11 (2001)</i>	<i>11 (2001)</i>	<i>6 (2001)</i>	<i>6 (2001)</i>	<i>7 (2001)</i>	<i>7 (2001)</i>	<i>7 (2001)</i>	<i>7 (2001)</i>	<i>7 (2001)</i>	<i>3 (2001)</i>	<i>3 (2001)</i>	<i>3 (2001)</i>	<i>3 (2001)</i>	<i>3 (2001)</i>	
<i>2 (9/04)</i>	<i>2 (9/04)</i>	<i>2 (9/04)</i>	<i>2 (9/04)</i>	<i>2 (9/04)</i>	<i>6 (9/04)</i>	<i>6 (9/04)</i>	<i>6 (9/04)</i>	<i>6 (9/04)</i>	<i>6 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>3 (9/04)</i>	<i>5 (9/04)</i>

Bold and italics entries - Data used in the ecological risk assessment

TABLE G-17

Summary of Data Selected for Use in the Site 1 Ecological Risk Assessment

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Adjacent/Downgradient Sediment					Upgradient Sediment				
VOCs	SVOCs	Inorganics	Dioxins	Explosives	VOCs	SVOCs	Inorganics	Dioxins	Explosives
7 (1992)		1 (1992)			1 (1992)				
6 (1994)	4 (1994)	4 (1994)				1 (1994)	1 (1994)		
8 (1998)	8 (1998)	8 (1998)			2 (1998)	2 (1998)	2 (1998)		
8 (2/99)	8 (2/99)	8 (2/99)			2 (2/99)	2 (2/99)	2 (2/99)		
8 (11/99)	8 (11/99)	8 (11/99)			2 (11/99)	2 (11/99)	2 (11/99)		
<i>8 (2000)</i>	<i>8 (2000)</i>	<i>8 (2000)</i>			<i>2 (2000)</i>	<i>2 (2000)</i>	<i>2 (2000)</i>		
<b>23 (2001)</b>	<b>23 (2001)</b>	<b>23 (2001)</b>	<b>7 (2001)</b>	<b>13 (2001)</b>	<b>2 (2001)</b>	<b>2 (2001)</b>	<b>2 (2001)</b>	<b>2 (2001)</b>	<b>2 (2001)</b>
<i>8 (2/02)</i>	<i>8 (2/02)</i>	<i>8 (2/02)</i>			<i>2 (2/02)</i>	<i>2 (2/02)</i>	<i>2 (2/02)</i>		
<i>8 (10/02)</i>	<i>8 (10/02)</i>	<i>8 (10/02)</i>			<i>2 (10/02)</i>	<i>2 (10/02)</i>	<i>2 (10/02)</i>		
<i>8 (7/03)</i>	<i>8 (7/03)</i>	<i>8 (7/03)</i>			<i>2 (7/03)</i>	<i>2 (7/03)</i>	<i>2 (7/03)</i>		
<i>8 (4/04)</i>	<i>8 (4/04)</i>	<i>8 (4/04)</i>			<i>2 (4/04)</i>	<i>2 (4/04)</i>	<i>2 (4/04)</i>		

Bold and italics entries - Data used in the ecological risk assessment. Shaded cells indicate that data are not fully validated or validation status is unknown

TABLE G-17

Summary of Data Selected for Use in the Site 1 Ecological Risk Assessment

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Adjacent/Downgradient Surface Water				Upgradient Surface Water			
VOCs	SVOCs	Inorganics	Dissolved Metals	VOCs	SVOCs	Inorganics	Dissolved Metals
3 (1992)		2 (1992)		1 (1992)		1 (1992)	
2 (1994)	2 (1994)	2 (1994)			1 (1994)	1 (1994)	
8 (1998)		8 (1998)		2 (1998)		2 (1998)	
8 (2/99)		8 (2/99)		2 (2/99)		2 (2/99)	
8 (11/99)		8 (11/99)		2 (11/99)		2 (11/99)	
8 (2000)		8 (2000)		2 (2000)		2 (2000)	
12 (2001)	9 (2001)	12 (2001)	12 (2001)	2 (2001)	1 (2001)	2 (2001)	2 (2001)
8 (2/02)		8 (2/02)		2 (2/02)		2 (2/02)	
8 (10/02)		8 (10/02)		2 (10/02)		2 (10/02)	
8 (7/03)		8 (7/03)		2 (7/03)		2 (7/03)	
8 (4/04)		8 (4/04)		2 (4/04)		2 (4/04)	

Bold and italics entries - Data used in the ecological risk assessment. Shaded cells indicate that data are not fully validated or validation status is unknown

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Inorganics (mg/kg)</b>									
Aluminum	2.42 - 60.6	54 / 54	96,900	HCS-B1-4-S	12,876	15,707	16,458	9,332	14,289
Antimony	2.09 - 18.2	20 / 54	25.1	HCS-B2-10	3.82	5.09	4.98	1.88	6.02
Arsenic	1.13 - 3.00	53 / 54	24.9	AS01-SS40-(0-1)	11.9	4.22	12.9	10.9	14.1
Barium	0.45 - 60.6	53 / 54	758	HCS-B1-4-S	218	141	250	182	267
Beryllium	0.02 - 1.50	41 / 54	2.10	AOCM-1-T	1.22	0.59	1.36	1.01	1.59
Cadmium	0.58 - 3.50	25 / 54	373	AS01-SS72-0-0.5	15.2	55.5	27.9	1.23	24.7
Calcium	1.99 - 1,510	54 / 54	246,000	22C-2-T	13,033	38,112	21,725	5,419	11,247
Chromium	1.13 - 3.00	54 / 54	319	AS01-SS72-0-0.5	35.0	52.9	47.1	22.5	38.5
Cobalt	1.13 - 15.1	51 / 54	60.0	AS01-SS34-(0-1)	31.8	14.0	35.0	26.6	44.8
Copper	0.54 - 7.60	53 / 54	2,150	HCS-B2-7-S	231	439	331	84.0	319
Cyanide	0.55 - 1.40	12 / 42	1.90	AS01-SS23-(0-1)	0.55	0.45	0.66	0.40	0.74
Iron	0.16 - 30.3	54 / 54	122,000	HCS-B1-4-S	32,552	16,443	36,302	29,764	36,157
Lead	0.66 - 0.91	54 / 54	12,100	HCS-B1-4-S	616	1,951	1,061	109	614
Magnesium	6.25 - 1,510	51 / 54	14,100	22D-1-T	2,435	2,851	3,086	1,698	2,809
Manganese	0.11 - 4.50	54 / 54	2,320	AS01-SS25-(0-1)	1,262	566	1,391	1,095	1,557
Mercury	0.11 - 1.40	50 / 54	56.3	AS01-SS72-0-0.5	2.09	7.91	3.89	0.44	2.02
Nickel	0.91 - 12.1	53 / 54	240	AS01-SS22-(0-1)	58.4	36.9	66.8	48.2	79.1
Potassium	14.2 - 1,510	46 / 54	1,710	HCS-B2-10	934	354	1,015	844	1,111
Selenium	0.44 - 1.50	14 / 52	3.90	HCS-B1-4-S	0.73	0.54	0.85	0.63	0.81
Silver	1.13 - 3.00	33 / 52	121	HCS-B2-7-S	12.9	26.3	19.0	2.62	31.6
Sodium	43.3 - 1,510	18 / 54	9,740	HCS-B1-4-S	291	1,323	592	76.0	196
Thallium	0.46 - 3.00	2 / 54	3.10	AS01-SS56-0-1	0.89	0.62	1.04	0.72	1.09
Vanadium	0.59 - 15.1	53 / 54	332	AS01-SS22-(0-1)	36.8	49.7	48.1	26.2	40.7
Zinc	0.25 - 6.10	54 / 54	4,230	HCS-B2-10	577	846	770	314	727
<b>Pesticide/Polychlorinated Biphenyls (µg/kg)</b>									
Aroclor-1016	33.0 - 33.0	0 / 7	--	--	16.5	0.0	16.5	16.5	16.5
Aroclor-1221	67.0 - 67.0	0 / 7	--	--	33.5	0.0	33.5	33.5	33.5

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Aroclor-1232	33.0 - 33.0	0 / 7	--	--	16.5	0.0	16.5	16.5	16.5
Aroclor-1242	33.0 - 33.0	0 / 7	--	--	16.5	0.0	16.5	16.5	16.5
Aroclor-1248	33.0 - 33.0	0 / 7	--	--	16.5	0.0	16.5	16.5	16.5
Aroclor-1254	33.0 - 33.0	0 / 7	--	--	16.5	0.0	16.5	16.5	16.5
Aroclor-1260	33.0 - 33.0	0 / 7	--	--	16.5	0.0	16.5	16.5	16.5
Semivolatile Organic Compounds (µg/kg)									
1,1-Biphenyl	370 - 500	5 / 25	88.0	AS01-SS25-(0-1)	179	62.6	201	161	235
2,4,5-Trichlorophenol	910 - 2,400	0 / 34	--	--	566	162	613	550	602
2,4,6-Trichlorophenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
2,4-Dichlorophenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
2,4-Dimethylphenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
2,4-Dinitrophenol	910 - 2,400	0 / 32	--	--	567	167	617	550	606
2-Chloronaphthalene	370 - 500	0 / 34	--	--	208	16.6	213	207	213
2-Chlorophenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
2-Methylnaphthalene	370 - 500	16 / 34	170	AS01-SS24-(0-1)	147	72.7	168	125	191
2-Methylphenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
2-Nitroaniline	910 - 2,400	0 / 34	--	--	566	162	613	550	602
2-Nitrophenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
3,3'-Dichlorobenzidine	370 - 970	0 / 34	--	--	227	66.5	246	220	242
3- and 4-Methylphenol	370 - 460	1 / 21	110	AS01-SS30-(0-1)	198	23.1	207	196	210
3-Nitroaniline	910 - 2,400	0 / 34	--	--	566	162	613	550	602
4,6-Dinitro-2-methylphenol	910 - 2,400	0 / 34	--	--	566	162	613	550	602
4-Bromophenyl-phenylether	370 - 500	0 / 34	--	--	208	16.6	213	207	213
4-Chloro-3-methylphenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
4-Chloroaniline	370 - 500	0 / 34	--	--	208	16.6	213	207	213
4-Chlorophenyl-phenylether	370 - 500	0 / 34	--	--	208	16.6	213	207	213
4-Methylphenol	370 - 500	0 / 13	--	--	215	20.7	225	214	226
4-Nitroaniline	910 - 2,400	0 / 34	--	--	566	162	613	550	602

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
4-Nitrophenol	910 - 2,400	0 / 34	--	--	566	162	613	550	602
Acenaphthene	370 - 8,900	6 / 47	4,100	AS01-SS57-0-1	368	835	572	206	376
Acenaphthylene	370 - 8,900	5 / 47	630	AS01-SS49-0-1	246	302	320	197	278
Acetophenone	370 - 500	1 / 25	55.0	AS01-SS72-0-0.5	199	33.4	211	194	223
Anthracene	370 - 8,900	24 / 47	8,300	AS01-SS57-0-1	353	1,196	646	126	447
Atrazine	370 - 500	0 / 25	--	--	206	15.1	211	206	211
Benzaldehyde	370 - 500	4 / 24	600	AS01-SS24-(0-1)	242	99	277	230	268
Benzo(a)anthracene	370 - 8,900	42 / 47	8,100	AS01-SS57-0-1	526	1,575	912	159	474
Benzo(a)pyrene	370 - 17,000	34 / 47	12,000	AS01-SS57-0-1	621	2,142	1,146	141	487
Benzo(b)fluoranthene	370 - 22,000	42 / 47	21,000	AS01-SS49-0-1	1,021	3,770	1,945	220	668
Benzo(g,h,i)perylene	370 - 8,900	33 / 47	4,200	AS01-SS57-0-1	283	797	478	92	279
Benzo(k)fluoranthene	370 - 8,900	34 / 47	8,600	AS01-SS49-0-1	505	1,605	898	130	491
Benzoic acid	1,900 - 2,400	0 / 3	--	--	1,050	132	1,273	1,045	1,349
Benzyl alcohol	390 - 490	0 / 3	--	--	213	27.5	260	212	277
Bis(2-chloro-1-methylethyl) ether	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Butylbenzylphthalate	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Caprolactam	370 - 500	1 / 25	68.0	AS01-SS71-0-0.5	199	29.8	209	195	218
Carbazole	370 - 500	6 / 31	210	AS01-SS25-(0-1)	186	55.8	203	172	229
Chrysene	370 - 8,900	42 / 47	10,000	AS01-SS49-0-1	639	1,863	1,096	216	586
Di-n-butylphthalate	370 - 500	4 / 34	150	AS01-SS41-(0-1)	195	43.7	208	187	222
Di-n-octylphthalate	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Dibenz(a,h)anthracene	370 - 500	4 / 34	430	AS01-SS26-(0-1)	206	56.5	223	196	235
Dibenzofuran	370 - 500	5 / 34	260	HCS-B2-4-4	195	48.6	210	185	227
Diethylphthalate	370 - 910	7 / 34	1,300	AS01-SS72-0-0.5	225	198	282	189	270
Dimethyl phthalate	370 - 500	1 / 34	1,100	AS01-SS41-(0-1)	234	154	279	218	250
Fluoranthene	370 - 8,900	44 / 47	12,000	AS01-SS57-0-1	657	1,833	1,107	246	666
Fluorene	370 - 8,900	8 / 47	5,500	AS01-SS57-0-1	400	983	641	207	399
Hexachlorobenzene	370 - 500	0 / 34	--	--	208	16.6	213	207	213

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Hexachlorobutadiene	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Hexachlorocyclopentadiene	370 - 500	0 / 33	--	--	208	16.8	213	207	213
Hexachloroethane	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Indeno(1,2,3-cd)pyrene	370 - 8,900	39 / 47	5,400	AS01-SS57-0-1	340	1,045	596	104	301
Isophorone	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Naphthalene	370 - 500	8 / 34	120	AS01-SS24-(0-1)	177	63.1	196	160	219
Pentachlorophenol	910 - 2,400	0 / 34	--	--	566	162	613	550	602
Phenanthrene	370 - 17,000	42 / 47	31,000	AS01-SS57-0-1	932	4,498	2,035	201	570
Phenol	370 - 500	0 / 34	--	--	208	16.6	213	207	213
Pyrene	370 - 17,000	42 / 47	21,000	AS01-SS57-0-1	933	3,198	1,716	259	827
bis(2-Chloroethoxy)methane	370 - 500	0 / 34	--	--	208	16.6	213	207	213
bis(2-Chloroethyl)ether	370 - 500	0 / 34	--	--	208	16.6	213	207	213
bis(2-Ethylhexyl)phthalate	370 - 500	9 / 34	940	AS01-SS41-(0-1)	152	162	199	105	218
n-Nitroso-di-n-propylamine	370 - 500	0 / 34	--	--	208	16.6	213	207	213
n-Nitrosodiphenylamine	370 - 500	1 / 34	440	AS01-SS41-(0-1)	215	43.1	227	212	224
<b>Explosives (µg/kg)</b>									
1,3,5-Trinitrobenzene	250 - 25,000	0 / 14	--	--	1,142	3,270	2,690	333	1,556
1,3-Dinitrobenzene	250 - 25,000	0 / 14	--	--	1,142	3,270	2,690	333	1,556
2,4,6-Trinitrotoluene	38.0 - 25,000	0 / 16	--	--	1,002	3,068	2,347	237	2,086
2,4-Dinitrotoluene	250 - 25,000	0 / 34	--	--	560	2,110	1,173	222	379
2,6-Dinitrotoluene	250 - 25,000	0 / 34	--	--	560	2,110	1,173	222	379
2-Amino-4,6-dinitrotoluene	250 - 25,000	0 / 14	--	--	1,142	3,270	2,690	333	1,556
2-Nitrotoluene	250 - 25,000	0 / 14	--	--	1,142	3,270	2,690	333	1,556
3-Nitrotoluene	250 - 25,000	0 / 14	--	--	1,142	3,270	2,690	333	1,556
4-Amino-2,6-dinitrotoluene	250 - 25,000	0 / 14	--	--	1,142	3,270	2,690	333	1,556
4-Nitrotoluene	250 - 25,000	0 / 4	--	--	3,219	6,188	10,498	395	3.42E+15
HMX	500 - 50,000	3 / 14	530,000	AS01-SS72-0-0.5	38,141	141,567	105,148	503	56,664
Nitrobenzene	250 - 25,000	0 / 31	--	--	619	2,206	1,291	246	451

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Nitroglycerin	38.0 - 67,000	1 / 16	500	AS01-SS72-0-0.5	19,706	15,230	26,380	5,315	7,861,907
Nitroguanidine	120,000 - 130,000	0 / 10	--	--	62,000	2,582	63,497	61,952	63,564
PETN	38.0 - 250,000	0 / 16	--	--	27,487	29,697	40,502	7,505	13,149,320
Perchlorate	47.8 - 70.0	1 / 14	311	AS01-SS72-0-0.5	49.7	75.2	85.3	34.9	63.5
RDX	38.0 - 50,000	2 / 16	7,300	AS01-SS72-0-0.5	690	1,766	1,464	244	1,614
Tetryl	580 - 65,000	0 / 14	--	--	2,613	8,602	6,685	437	2,860
<b>Volatile Organic Compounds (µg/kg)</b>									
1,1,1-Trichloroethane	11.0 - 1,800	5 / 41	3.10	AS01-SS36-(0-1)	149	283	223	17.1	458
1,1,2,2-Tetrachloroethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
1,1,2-Trichloroethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
1,1-Dichloroethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
1,1-Dichloroethene	11.0 - 1,800	5 / 41	2.60	AS01-SS28-(0-1)	149	283	223	16.4	498
1,2,4-Trichlorobenzene	11.0 - 1,800	1 / 43	79.0	AS01-SS72-0-0.5	117	188	165	25.2	370
1,2-Dibromo-3-chloropropane	11.0 - 15.0	0 / 27	--	--	6.33	0.48	6.49	6.32	6.50
1,2-Dibromoethane	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
1,2-Dichlorobenzene	11.0 - 1,800	0 / 44	--	--	122	193	171	25.3	403
1,2-Dichloroethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
1,2-Dichloroethene (total)	11.0 - 1,800	1 / 6	16,000	HCS-BG-110S	2,974	6,396	8,236	155	3.32E+12
1,2-Dichloropropane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
1,3-Dichlorobenzene	11.0 - 1,800	0 / 43	--	--	125	194	175	26.2	434
1,4-Dichlorobenzene	11.0 - 1,800	0 / 43	--	--	125	194	175	26.2	434
2-Butanone	11.0 - 1,800	2 / 41	2.80	AS01-SS46-0-1	149	283	223	18.3	412
2-Hexanone	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
4-Methyl-2-pentanone	11.0 - 1,800	1 / 41	430	AS01-SS72-0-0.5	149	283	223	19.3	382
Acetone	11.0 - 1,800	2 / 41	30.0	AS01-SS50-0-1	83.4	225	143	13.7	115
Benzene	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Bromodichloromethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Bromoform	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Bromomethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Carbon disulfide	11.0 - 1,800	0 / 40	--	--	152	286	228	19.0	410
Carbon tetrachloride	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Chlorobenzene	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Chloroethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Chloroform	11.0 - 1,800	1 / 41	1.00	HCS-BG-84S	149	283	223	18.5	421
Chloromethane	11.0 - 1,800	1 / 41	370	HCS-BG-98S	136	259	204	18.9	334
Cumene	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
Cyclohexane	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
Dibromochloromethane	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Dichlorodifluoromethane(Freon-12)	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
Ethylbenzene	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Methyl acetate	11.0 - 1,800	7 / 34	1,600	AS01-SS72-0-0.5	154	353	257	16.1	335
Methyl-tert-butyl ether (MTBE)	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
Methylcyclohexane	11.0 - 1,800	2 / 34	1.50	AS01-SS46-0-1	102	213	163	13.8	224
Methylene chloride	11.0 - 1,800	2 / 41	5.00	HCS-BG-84S	106	237	168	9.05	434
Styrene	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Tetrachloroethene	11.0 - 1,800	4 / 41	730	AS01-SS51-0-1	163	301	242	19.8	452
Toluene	11.0 - 1,800	2 / 41	150	AS01-SS72-0-0.5	142	279	215	18.1	363
Trichloroethene	11.0 - 15,000	24 / 41	82,000	AS01-SS21-(0-1)	6,966	17,529	11,576	89.6	749,474
Trichlorofluoromethane(Freon-11)	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194
Vinyl chloride	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Xylene, total	11.0 - 1,800	1 / 41	1.40	AS01-SS28-(0-1)	149	283	223	18.6	411
cis-1,2-Dichloroethene	11.0 - 1,800	5 / 34	120	AS01-SS52-0-1	96	209	156	14.6	176
cis-1,3-Dichloropropene	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
o-Xylene	11.0 - 14.0	0 / 21	--	--	6.29	0.44	6.45	6.27	6.46
trans-1,2-Dichloroethene	11.0 - 1,800	0 / 34	--	--	102	213	164	15.1	194

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

## Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
trans-1,3-Dichloropropene	11.0 - 1,800	0 / 41	--	--	149	283	224	19.3	383
Dioxin/Furans (µg/kg)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00019 - 0.0076	23 / 23	1.100	AS01-SS53-0-1	0.240	0.268	0.336	0.143	0.473
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00013 - 0.0076	23 / 23	1.400	AS01-SS72-0-0.5	0.186	0.358	0.314	0.056	0.467
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00015 - 0.0320	19 / 23	0.240	AS01-SS72-0-0.5	0.021	0.052	0.039	0.005	0.058
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00016 - 0.1300	19 / 23	0.054	AS01-SS72-0-0.5	0.012	0.019	0.019	0.005	0.032
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00013 - 0.4100	20 / 23	0.360	AS01-SS72-0-0.5	0.060	0.095	0.094	0.020	0.184
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00013 - 0.1200	19 / 23	0.130	AS01-SS72-0-0.5	0.023	0.035	0.036	0.010	0.067
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00012 - 0.3600	20 / 23	0.420	AS01-SS72-0-0.5	0.044	0.094	0.078	0.011	0.132
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.00013 - 0.0680	19 / 23	0.130	AS01-SS53-0-1	0.020	0.033	0.032	0.008	0.045
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00016 - 0.1400	10 / 23	0.031	AS01-SS72-0-0.5	0.006	0.016	0.012	0.001	0.024
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00012 - 0.1100	19 / 23	0.056	HCS-B1-C	0.012	0.019	0.019	0.004	0.047
1,2,3,7,8-Pentachlorodibenzofuran	0.00016 - 0.0076	22 / 23	0.250	AS01-SS72-0-0.5	0.036	0.068	0.060	0.010	0.107
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00014 - 0.1400	20 / 23	0.330	AS01-SS72-0-0.5	0.029	0.069	0.053	0.007	0.084
2,3,4,7,8-Pentachlorodibenzofuran	0.00014 - 0.0580	22 / 23	0.300	AS01-SS72-0-0.5	0.040	0.076	0.068	0.012	0.113
2,3,7,8-TCDD (dioxin)	0.00015 - 0.1000	18 / 23	0.016	AS01-SS53-0-1	0.006	0.010	0.009	0.002	0.015
2,3,7,8-Tetrachlorodibenzofuran	0.00011 - 0.1200	22 / 23	0.190	AS01-SS72-0-0.5	0.039	0.049	0.057	0.020	0.082
Octachlorodibenzo-p-dioxin	0.00015 - 0.0150	23 / 23	3.866	AS01-SS37-(0-1)	1.678	1.084	2.066	1.287	2.775
Octachlorodibenzofuran	0.00010 - 0.0150	23 / 23	1.700	HCS-B1-C	0.205	0.375	0.339	0.086	0.364
Total heptachlorodibenzo-p-dioxin	0.00019 - 0.0076	23 / 23	2.600	AS01-SS53-0-1	0.531	0.591	0.743	0.318	1.049
Total heptachlorodibenzofuran	0.00013 - 0.0076	23 / 23	2.300	AS01-SS72-0-0.5	0.293	0.545	0.488	0.104	0.736
Total hexachlorodibenzo-p-dioxin	0.00013 - 0.0076	23 / 23	1.800	HCS-B2-C	0.310	0.498	0.488	0.104	0.940
Total hexachlorodibenzofuran	0.00013 - 0.0069	22 / 23	3.100	AS01-SS72-0-0.5	0.369	0.712	0.624	0.108	1.264
Total pentachlorodibenzo-p-dioxin	0.00012 - 0.0069	21 / 23	0.830	HCS-B1-C	0.149	0.245	0.236	0.032	2.279
Total pentachlorodibenzofuran	0.00015 - 0.0076	23 / 23	2.800	AS01-SS72-0-0.5	0.350	0.632	0.577	0.106	1.336
Total tetrachlorodibenzo-p-dioxin	0.00015 - 0.0015	23 / 23	0.660	HCS-B1-C	0.141	0.177	0.205	0.061	0.572
Total tetrachlorodibenzofuran	0.00019 - 0.0015	23 / 23	3.300	HCS-B1-C	0.541	0.892	0.861	0.173	1.924

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-18

Surface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Other Parameters									
Total organic carbon (mg/kg)	130 - 760	39 / 39	114,500	AS01-SS46-0-1	36,390	38,338	46,290	19,527	56,343
pH	0.10 - 0.10	39 / 39	8.23	AS01-SS40-(0-1)	6.92	0.59	7.08	6.89	7.09

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Inorganics (mg/kg)</b>									
Aluminum	0.66 - 54.9	31 / 31	19,000	AS01-SS67-0-0.5	7,973	2,433	8,715	7,704	8,648
Antimony	0.22 - 16.5	20 / 31	2.50	AS01-SS70-0-0.5	0.87	0.59	1.05	0.68	1.21
Arsenic	0.22 - 2.70	31 / 31	9.50	AS01-SS01-R01X	6.67	1.21	7.04	6.54	7.17
Barium	0.22 - 54.9	31 / 31	255	AS01-SS64-0-0.5	156	46.6	170	149	176
Beryllium	0.11 - 1.40	21 / 31	1.20	AS01-SS01-R01X	0.81	0.32	0.91	0.72	1.03
Cadmium	0.11 - 1.40	22 / 31	10.9	AS01-SS15-R01X	0.88	1.89	1.45	0.43	1.46
Calcium	1,170 - 6,360	11 / 11	266,000	AS01-SS62-0-0.5	63,331	102,342	119,244	9,052	4,952,466
Chromium	0.11 - 2.70	31 / 31	23.8	AS01-SS07-R01X	12.9	3.02	13.8	12.5	14.0
Cobalt	0.11 - 13.7	31 / 31	16.5	AS01-SS13-R01X	12.4	3.05	13.4	11.9	14.2
Copper	0.11 - 6.90	31 / 31	1,820	AS01-SS67-0-0.5	79.8	323	178	23.9	48.9
Cyanide	0.050 - 0.69	27 / 31	0.91	AS01-SS61-0-0.5	0.31	0.15	0.35	0.27	0.38
Iron	8.30 - 27.4	31 / 31	33,200	AS01-SS11-R01X	25,827	5,920	27,631	24,905	28,801
Lead	0.11 - 0.82	31 / 31	1,730	AS01-SS02-R01X	121	307	214	53.5	137
Magnesium	1,130 - 1,370	11 / 11	18,400	AS01-SS69-0-0.5	4,420	6,412	7,923	2,096	14,284
Manganese	0.11 - 4.10	31 / 31	1,120	AS01-SS09-R01X	815	241	889	765	956
Mercury	0.020 - 0.25	30 / 31	7.20	AS01-SS70-0-0.5	0.31	1.28	0.70	0.08	0.20
Nickel	0.11 - 11.0	31 / 31	33.4	AS01-SS11-R01X	21.3	4.67	22.7	20.7	23.3
Potassium	1,130 - 1,370	11 / 11	1,040	AS01-SS64-0-0.5	907	116	971	900	979
Selenium	0.33 - 1.40	8 / 31	1.10	AS01-SS60-0-0.5	0.31	0.20	0.37	0.27	0.36
Silver	0.11 - 2.70	10 / 31	3.00	AS01-SS69-0-0.5	0.25	0.53	0.41	0.13	0.31
Sodium	1,130 - 1,370	1 / 11	139	AS01-SS62-0-0.5	50.2	34.5	69.1	43.3	71.3
Thallium	0.22 - 2.70	20 / 31	2.30	AS01-SS64-0-0.5	0.70	0.50	0.85	0.56	0.94
Tin	2.60 - 3.10	20 / 20	8.40	AS01-SS14-R01X	5.46	1.25	5.94	5.34	5.94
Vanadium	0.11 - 13.7	31 / 31	36.7	AS01-SS19-R01X	20.8	5.83	22.6	20.0	22.8
Zinc	0.33 - 5.50	31 / 31	271	AS01-SS02-R01X	94.9	45.5	109	87.5	108
<b>Semivolatile Organic Compounds (µg/kg)</b>									
1,1-Biphenyl	340 - 450	1 / 31	20.0	AS01-SS19-R01X	193	34.6	203	184	232

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TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,2,4,5-Tetrachlorobenzene	340 - 420	0 / 20	--	--	195	10.1	198	194	199
1,4-Naphthoquinone	340 - 420	0 / 20	--	--	195	10.1	198	194	199
1-Naphthylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2,3,4,6-Tetrachlorophenol	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2,4,5-Trichlorophenol	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
2,4,6-Trichlorophenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2,4-Dichlorophenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2,4-Dimethylphenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2,4-Dinitrophenol	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
2,6-Dichlorophenol	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2-Acetylaminofluorene	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2-Chloronaphthalene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2-Chlorophenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2-Methyl-5-nitroaniline	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2-Methylaniline	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2-Methylnaphthalene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2-Methylphenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2-Naphthylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
2-Nitroaniline	860 - 21,000	2 / 39	13,000	HCS-BP-7	883	2,002	1,424	573	870
2-Nitrophenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
2-Picoline	340 - 420	0 / 20	--	--	195	10.1	198	194	199
3,3'-Dichlorobenzidine	340 - 8,700	0 / 39	--	--	343	664	523	245	340
3,3'-Dimethylbenzidine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
3-Methylcholanthrene	340 - 420	0 / 20	--	--	195	10.1	198	194	199
3-Methylphenol	340 - 420	0 / 20	--	--	195	10.1	198	194	199
3-Nitroaniline	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
4,6-Dinitro-2-methylphenol	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
4-Aminobiphenyl	340 - 420	0 / 20	--	--	195	10.1	198	194	199

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TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
4-Bromophenyl-phenylether	340 - 4,300	0 / 39	--	--	250	313	334	212	256
4-Chloro-3-methylphenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
4-Chloroaniline	340 - 4,300	0 / 39	--	--	250	313	334	212	256
4-Chlorophenyl-phenylether	340 - 4,300	0 / 39	--	--	250	313	334	212	256
4-Methylphenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
4-Nitroaniline	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
4-Nitrophenol	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
4-Nitroquinoline-1-oxide	890 - 1,000	0 / 14	--	--	482	18.1	490	481	491
7,12-Dimethylbenz(a)anthracene	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Acenaphthene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Acenaphthylene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Acetophenone	340 - 450	0 / 31	--	--	199	12.9	203	198	203
Aniline	330 - 330	0 / 20	--	--	165	0.0	165	165	165
Anthracene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Aramite	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
Atrazine	370 - 450	0 / 11	--	--	206	14.3	214	206	215
Benzaldehyde	370 - 450	0 / 11	--	--	206	14.3	214	206	215
Benzo(a)anthracene	340 - 4,300	7 / 39	66.0	AS01-SS01-R01X	220	324	308	155	289
Benzo(a)pyrene	340 - 4,300	8 / 39	54.0	AS01-SS01-R01X	215	325	303	145	296
Benzo(b)fluoranthene	340 - 4,300	3 / 39	68.0	AS01-SS69-0-0.5	238	317	324	192	259
Benzo(g,h,i)perylene	340 - 4,300	1 / 39	65.0	AS01-SS69-0-0.5	246	314	331	206	257
Benzo(k)fluoranthene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Benzoic acid	860 - 21,000	0 / 28	--	--	954	1,887	1,561	608	1,067
Benzyl alcohol	340 - 4,300	0 / 28	--	--	267	369	386	214	281
Bis(2-chloro-1-methylethyl) ether	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Butylbenzylphthalate	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Caprolactam	370 - 450	2 / 11	46.0	AS01-SS67-0-0.5	179	68.1	216	157	311
Carbazole	330 - 450	0 / 31	--	--	180	21.8	186	178	186

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TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Chlorobenzilate	360 - 410	0 / 14	--	--	194	8.36	198	194	198
Chrysene	340 - 4,300	16 / 39	110	AS01-SS01-R01X	188	332	277	114	248
Di-n-butylphthalate	340 - 4,300	0 / 39	--	--	308	471	435	226	313
Di-n-octylphthalate	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Diallate	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Dibenz(a,h)anthracene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Dibenzofuran	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Diethylphthalate	340 - 4,300	3 / 39	270	AS01-SS67-0-0.5	249	313	334	209	258
Dimethoate	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Dimethyl phthalate	340 - 4,300	4 / 39	2,300	AS01-SS02-R01X	372	511	510	256	404
Dinoseb	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Diphenylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Disulfoton	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Ethyl methanesulfonate	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Famphur	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Fluoranthene	340 - 4,300	4 / 39	93.0	AS01-SS62-0-0.5	236	317	322	190	256
Fluorene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Hexachlorobenzene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Hexachlorobutadiene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Hexachlorocyclopentadiene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Hexachloroethane	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Hexachlorophene	14,000 - 17,000	0 / 20	--	--	7,725	380	7,872	7,716	7,879
Hexachloropropene	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
Indeno(1,2,3-cd)pyrene	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Isodrin	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Isophorone	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Isosafrole	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Kepone	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491

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TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Methapyrilene	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
Methyl parathion	340 - 420	0 / 20	--	--	195	10.1	198	194	199
N-Nitrosomorpholine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
N-Nitrosopiperidine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Naphthalene	340 - 4,300	1 / 39	40.0	AS01-SS01-R01X	245	314	330	203	262
O,O,O-Triethyl phosphorothioate	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Parathion	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Pentachlorobenzene	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Pentachloronitrobenzene	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
Pentachlorophenol	860 - 21,000	0 / 39	--	--	841	1,600	1,273	605	833
Phenacetin	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Phenanthrene	340 - 4,300	17 / 39	140	AS01-SS01-R01X	189	330	279	123	229
Phenol	340 - 4,300	0 / 39	--	--	250	313	334	212	256
Phorate	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Pronamide	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Pyrene	340 - 4,300	3 / 39	100	AS01-SS69-0-0.5	239	316	325	195	255
Pyridine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Safrole	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Sulfotepp	340 - 420	0 / 20	--	--	195	10.1	198	194	199
Thionazin	340 - 420	0 / 20	--	--	195	10.1	198	194	199
a,a-Dimethylphenethylamine	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
bis(2-Chloroethoxy)methane	340 - 4,300	0 / 39	--	--	250	313	334	212	256
bis(2-Chloroethyl)ether	340 - 4,300	0 / 39	--	--	250	313	334	212	256
bis(2-Ethylhexyl)phthalate	340 - 4,300	15 / 39	1,600	HCS-BP-1	344	411	455	221	444
n-Nitroso-di-n-butylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
n-Nitroso-di-n-propylamine	340 - 4,300	0 / 39	--	--	250	313	334	212	256
n-Nitroso-n-methylethylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
n-Nitrosodiethylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199

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TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
n-Nitrosodimethylamine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
n-Nitrosodiphenylamine	340 - 4,300	2 / 39	3,000	HCS-BP-7	271	449	392	213	268
n-Nitrosopyrrolidine	340 - 420	0 / 20	--	--	195	10.1	198	194	199
p-Dimethylaminoazobenzene	340 - 420	0 / 20	--	--	195	10.1	198	194	199
p-Phenylenediamine	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
<b>Explosives (µg/kg)</b>									
1,3,5-Trinitrobenzene	250 - 2,500	2 / 25	30,000	HCS-BP-7	1,388	5,965	3,429	186	805
1,3-Dinitrobenzene	250 - 2,500	0 / 39	--	--	196	180	245	171	211
2,4,6-Trinitrotoluene	250 - 2,500	0 / 39	--	--	210	180	259	183	231
2,4-Dinitrotoluene	250 - 2,500	1 / 39	720	HCS-BP-1	227	194	280	197	249
2,6-Dinitrotoluene	250 - 2,500	1 / 39	130	HCS-BP-1	212	177	260	189	230
2-Amino-4,6-dinitrotoluene	250 - 2,500	0 / 31	--	--	232	197	292	202	261
2-Nitrotoluene	250 - 2,500	0 / 39	--	--	210	180	259	183	231
3-Nitrotoluene	250 - 2,500	0 / 39	--	--	210	180	259	183	231
4-Amino-2,6-dinitrotoluene	250 - 2,500	0 / 31	--	--	232	197	292	202	261
4-Nitrotoluene	250 - 2,500	0 / 31	--	--	232	197	292	202	261
HMX	417 - 5,000	24 / 39	51,000	AS01-SS64-0-0.5	3,506	8,879	5,905	765	6,371
Nitrobenzene	250 - 4,300	0 / 39	--	--	262	357	358	201	278
Nitroglycerin	417 - 2,500	1 / 31	98,000	AS01-SS64-0-0.5	3,709	17,506	9,045	475	2,058
PETN	2,500 - 25,000	0 / 11	--	--	2,500	3,400	4,358	1,703	4,049
Perchlorate	45.4 - 2,380	8 / 31	31,300	AS01-SS64-0-0.5	1,080	5,611	2,790	51.2	298
RDX	417 - 5,000	20 / 39	34,000	HCS-BP-6	2,333	5,983	3,949	544	3,666
Tetryl	417 - 6,500	1 / 39	540	HCS-BP-7	370	492	503	296	391
<b>Volatile Organic Compounds (µg/kg)</b>									
1,1,1,2-Tetrachloroethane	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
1,1,1-Trichloroethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,1,2,2-Tetrachloroethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432

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Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

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1,1,2-Trichloroethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,1-Dichloroethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,1-Dichloroethene	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,2,3-Trichloropropane	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
1,2,4-Trichlorobenzene	11.0 - 4,300	0 / 39	--	--	222	332	312	109	718
1,2-Dibromo-3-chloropropane	6.00 - 18.0	0 / 28	--	--	4.02	1.73	4.57	3.74	4.55
1,2-Dibromoethane	6.00 - 910	0 / 31	--	--	40.7	115	75.8	5.85	35.5
1,2-Dichlorobenzene	11.0 - 4,300	0 / 40	--	--	217	330	305	101	749
1,2-Dichloroethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,2-Dichloroethene (total)	6.00 - 14.0	0 / 26	--	--	3.69	1.32	4.13	3.52	4.10
1,2-Dichloropropane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
1,3-Dichlorobenzene	11.0 - 4,300	0 / 39	--	--	222	332	312	109	718
1,4-Dichlorobenzene	11.0 - 4,300	0 / 39	--	--	222	332	312	109	718
1,4-Dioxane	660 - 660	0 / 1	--	--	330	--	--	--	--
2-Butanone	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
2-Chloro-1,3-butadiene	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
2-Chloroethyl vinyl ether	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
2-Hexanone	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
4-Methyl-2-pentanone	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Acetone	6.00 - 910	5 / 34	52.0	AS01-SS61-0-0.5	12.2	23.3	19.0	4.68	17.0
Acetonitrile	230 - 260	0 / 20	--	--	123	3.80	124	122	124
Acrolein	66.0 - 66.0	0 / 1	--	--	33.0	--	--	--	--
Acrylonitrile	57.0 - 66.0	0 / 20	--	--	30.6	1.01	31.0	30.6	31.0
Allyl chloride	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Benzene	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Bromodichloromethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Bromoform	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Bromomethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Carbon disulfide	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Carbon tetrachloride	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Chlorobenzene	6.00 - 910	1 / 34	6.00	HCS-BG-4S	37.6	110	69.6	5.83	29.3
Chloroethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Chloroform	6.00 - 910	1 / 34	1.00	HCS-BG-55S	37.5	110	69.5	5.55	30.0
Chloromethane	6.00 - 910	0 / 34	--	--	37.6	110	69.64	5.83	29.3
Cumene	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432
Cyclohexane	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432
Dibromochloromethane	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Dibromomethane	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Dichlorodifluoromethane(Freon-12)	6.00 - 910	0 / 31	--	--	40.7	115	75.8	5.85	35.5
Ethyl methacrylate	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Ethylbenzene	6.00 - 910	1 / 34	5.00	HCS-BG-4S	37.6	110	69.6	5.80	29.2
Iodomethane	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Isobutanol	260 - 260	0 / 1	--	--	130	--	--	--	--
Methacrylonitrile	110 - 130	0 / 20	--	--	60.8	2.45	61.7	60.7	61.7
Methyl acetate	11.0 - 910	5 / 11	180	AS01-SS62-0-0.5	69.2	139	145	13.3	1,375
Methyl methacrylate	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Methyl methanesulfonate	860 - 1,000	0 / 20	--	--	483	20.7	490	482	491
Methyl-tert-butyl ether (MTBE)	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432
Methylcyclohexane	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432
Methylene chloride	6.00 - 910	1 / 34	4.00	HCS-BG-55S	21.0	58.2	37.9	4.06	19.2
Pentachloroethane	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Propionitrile	130 - 130	0 / 1	--	--	65.0	--	--	--	--
Styrene	6.00 - 910	2 / 34	3.00	HCS-BG-4S	37.4	110	69.4	5.44	29.6
Tetrachloroethene	6.00 - 910	1 / 34	420	AS01-SS69-0-0.5	40.0	118	74.1	5.87	30.7
Toluene	6.00 - 910	1 / 34	4.00	HCS-BG-4S	37.6	110	69.6	5.76	29.1
Trichloroethene	6.00 - 910	12 / 34	1,800	AS01-SS60-0-0.5	138	419	259	9.18	180

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-19

## Surface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Trichlorofluoromethane(Freon-11)	6.00 - 910	0 / 31	--	--	40.7	115	75.8	5.85	35.5
Vinyl acetate	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
Vinyl chloride	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
Xylene, total	6.00 - 910	1 / 34	15.0	HCS-BG-4S	37.9	110	69.9	5.99	30.7
cis-1,2-Dichloroethene	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432
cis-1,3-Dichloropropene	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
trans-1,2-Dichloroethene	11.0 - 910	0 / 11	--	--	109	178	207	19.7	2,432
trans-1,3-Dichloropropene	6.00 - 910	0 / 34	--	--	37.6	110	69.6	5.83	29.3
trans-1,4-Dichloro-2-butene	6.00 - 6.00	0 / 20	--	--	3.00	0.0	3.00	3.00	3.00
<b>Dioxin/Furans (µg/kg)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00570 - 0.7950	13 / 31	0.11	AS01-SS60-0-0.5	0.0549	0.0673	0.0755	0.0394	0.0767
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00042 - 0.3890	10 / 31	0.039	AS01-SS02-R01X	0.0251	0.0328	0.0351	0.0155	0.0649
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00043 - 0.4550	2 / 31	0.0061	AS01-SS62-0-0.5	0.0236	0.0400	0.0358	0.0082	0.1388
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00056 - 0.6650	0 / 31	--	--	0.0421	0.0606	0.0605	0.0106	0.7888
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00036 - 0.2080	6 / 31	0.012	AS01-SS60-0-0.5	0.0106	0.0179	0.0161	0.0058	0.0208
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00056 - 0.5950	2 / 31	0.0054	AS01-SS60-0-0.5	0.0378	0.0539	0.0543	0.0121	0.3456
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00036 - 0.1800	5 / 31	0.0081	AS01-SS62-0-0.5	0.0088	0.0156	0.0136	0.0045	0.0189
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.00055 - 0.7640	1 / 31	0.0058	AS01-SS60-0-0.5	0.0418	0.0677	0.0624	0.0124	0.4048
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00037 - 0.1900	0 / 31	--	--	0.0094	0.0167	0.0145	0.0033	0.0428
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00077 - 0.2640	0 / 31	--	--	0.0213	0.0264	0.0293	0.0074	0.1395
1,2,3,7,8-Pentachlorodibenzofuran	0.00045 - 0.3930	4 / 31	0.0082	AS01-SS60-0-0.5	0.0261	0.0354	0.0369	0.0105	0.1401
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00031 - 0.1960	3 / 31	0.0056	AS01-SS62-0-0.5	0.0101	0.0171	0.0153	0.0046	0.0306
2,3,4,7,8-Pentachlorodibenzofuran	0.00052 - 0.3390	4 / 31	0.0079	AS01-SS62-0-0.5	0.0226	0.0305	0.0319	0.0093	0.1143
2,3,7,8-TCDD (dioxin)	0.00033 - 0.0590	1 / 31	7.70E-04	AS01-SS60-0-0.5	0.0032	0.0052	0.0048	0.0015	0.0080
2,3,7,8-Tetrachlorodibenzofuran	0.00030 - 0.0450	9 / 31	0.0078	AS01-SS60-0-0.5	0.0036	0.0038	0.0048	0.0027	0.0054
Octachlorodibenzo-p-dioxin	0.01100 - 1.1840	31 / 31	1.30	AS01-SS70-0-0.5	0.4011	0.2625	0.4811	0.3270	0.5426
Octachlorodibenzofuran	0.00110 - 0.7090	11 / 31	0.080	AS01-SS02-R01X	0.0459	0.0599	0.0641	0.0291	0.1012
Total heptachlorodibenzo-p-dioxin	0.00570 - 0.7950	12 / 31	0.23	AS01-SS60-0-0.5	0.0679	0.0766	0.0912	0.0480	0.0928

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-19

## Surface Soil Summary Statistics - Upland

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Total heptachlorodibenzofuran	0.00057 - 0.3890	10 / 31	0.067	AS01-SS60-0-0.5	0.0293	0.0335	0.0395	0.0190	0.0692
Total hexachlorodibenzo-p-dioxin	0.00056 - 0.5950	8 / 31	0.052	AS01-SS60-0-0.5	0.0427	0.0516	0.0585	0.0239	0.1363
Total hexachlorodibenzofuran	0.00037 - 0.1800	7 / 31	0.057	AS01-SS62-0-0.5	0.0141	0.0192	0.0199	0.0072	0.0316
Total pentachlorodibenzo-p-dioxin	0.00079 - 0.0069	3 / 11	0.0086	AS01-SS60-0-0.5	0.0021	0.0025	0.0035	0.0013	0.0057
Total pentachlorodibenzofuran	0.00052 - 0.0069	7 / 11	0.069	AS01-SS62-0-0.5	0.0174	0.0230	0.0300	0.0051	0.8376
Total tetrachlorodibenzo-p-dioxin	0.00040 - 0.0059	6 / 11	0.015	AS01-SS60-0-0.5	0.0048	0.0052	0.0077	0.0018	0.0991
Total tetrachlorodibenzofuran	0.00030 - 0.0014	9 / 11	0.094	AS01-SS62-0-0.5	0.0266	0.0302	0.0431	0.0091	3.0384
Other Parameters									
Total organic carbon (mg/kg)	110 - 658	31 / 31	78,400	AS01-SS01-R01X	27,165	15,547	31,904	22,381	37,660
pH	0.10 - 0.10	31 / 31	8.00	AS01-SS62-0-0.5	7.05	0.78	7.28	7.00	7.32

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Inorganics (mg/kg)</b>									
Aluminum	2.30 - 53.6	16 / 16	19,900	HCS-B1-11-2	9,020	5,426	11,398	7,766	12,218
Antimony	2.00 - 16.1	4 / 16	12.9	HCS-B1-11-2	2.52	3.26	3.95	1.50	4.86
Arsenic	1.08 - 2.70	16 / 16	31.0	AS01-SB30-(1-2)	12.9	6.75	15.9	11.5	16.8
Barium	0.43 - 53.6	16 / 16	1,510	HCS-B1-11-2	268	359	425	177	408
Beryllium	0.02 - 1.30	14 / 16	1.90	AS01-SB26-(1-2)	1.17	0.44	1.37	1.09	1.48
Cadmium	0.64 - 2.10	7 / 16	46.8	HCS-B1-11-2	5.08	11.8	10.3	1.01	20.3
Calcium	1.89 - 1,340	16 / 16	20,400	HCS-B1-11-2	5,266	4,847	7,390	4,001	8,062
Chromium	1.08 - 2.70	16 / 16	112	AS01-SB30-(1-2)	29.2	31.7	43.1	20.3	44.9
Cobalt	1.08 - 13.4	16 / 16	40.7	AS01-SB34-(1-2)	22.5	8.56	26.2	21.2	26.7
Copper	0.52 - 6.70	16 / 16	1,390	HCS-B1-11-2	204	400	380	67.5	464
Cyanide	0.50 - 1.10	0 / 14	--	--	0.31	0.07	0.35	0.31	0.34
Iron	0.15 - 26.8	16 / 16	122,000	AS01-SB30-(1-2)	36,838	27,031	48,684	31,666	46,969
Lead	0.65 - 0.80	16 / 16	2,540	AS01-SB30-(1-2)	279	648	563	79.0	621
Magnesium	5.94 - 1,340	15 / 16	9,160	HCS-B1-11-2	1,798	2,120	2,727	1,263	2,790
Manganese	0.11 - 4.00	16 / 16	1,920	HCS-B1-11-2	838	378	1,003	776	1,017
Mercury	0.11 - 0.13	15 / 16	4.60	HCS-B1-11-2	0.87	1.45	1.51	0.41	1.85
Nickel	0.86 - 10.7	16 / 16	102	HCS-B1-11-2	38.1	22.9	48.2	33.6	48.8
Potassium	13.5 - 1,340	15 / 16	1,750	HCS-B1-11-2	839	362	998	756	1,128
Selenium	0.42 - 1.30	5 / 16	1.30	AS01-SB39-(1-2)	0.63	0.23	0.73	0.60	0.76
Silver	1.08 - 2.70	9 / 16	104	HCS-B1-11-2	16.2	34.3	31.2	2.00	116
Sodium	31.3 - 1,340	8 / 16	268	AS01-SB34-(1-2)	119	154	187	74.4	222
Thallium	0.47 - 2.70	1 / 16	0.49	HCS-B1-3-1	0.71	0.20	0.80	0.67	0.87
Vanadium	0.56 - 13.4	16 / 16	97.5	HCS-B1-11-2	26.0	25.1	37.0	20.4	35.1
Zinc	0.24 - 5.40	16 / 16	3,350	HCS-B1-11-2	469	828	832	223	877
<b>Semivolatile Organic Compounds (µg/kg)</b>									
1,1-Biphenyl	320 - 440	6 / 13	890	AS01-SB25-(1-2)	193	221	302	131	376
2,4,5-Trichlorophenol	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
2,4,6-Trichlorophenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
2,4-Dichlorophenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
2,4-Dimethylphenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
2,4-Dinitrophenol	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
2-Chloronaphthalene	320 - 440	0 / 15	--	--	187	14.0	194	187	194
2-Chlorophenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
2-Methylnaphthalene	320 - 440	8 / 15	1,900	AS01-SB25-(1-2)	267	455	474	164	393
2-Methylphenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
2-Nitroaniline	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
2-Nitrophenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
3,3'-Dichlorobenzidine	320 - 440	0 / 15	--	--	187	14.0	194	187	194
3- and 4-Methylphenol	320 - 400	1 / 11	64.0	AS01-SB40-(1-2)	173	37.8	193	166	215
3-Nitroaniline	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
4,6-Dinitro-2-methylphenol	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
4-Bromophenyl-phenylether	320 - 440	0 / 15	--	--	187	14.0	194	187	194
4-Chloro-3-methylphenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
4-Chloroaniline	320 - 440	0 / 15	--	--	187	14.0	194	187	194
4-Chlorophenyl-phenylether	320 - 440	0 / 15	--	--	187	14.0	194	187	194
4-Methylphenol	360 - 440	0 / 4	--	--	198	17.1	218	197	222
4-Nitroaniline	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
4-Nitrophenol	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
Acenaphthene	350 - 3,200	4 / 15	12,000	AS01-SB25-(1-2)	951	3,057	2,341	195	1,246
Acenaphthylene	320 - 440	5 / 15	350	AS01-SB25-(1-2)	167	77.1	203	147	242
Acetophenone	320 - 440	0 / 13	--	--	188	14.9	195	187	195
Anthracene	350 - 3,200	7 / 15	21,000	AS01-SB25-(1-2)	1,545	5,382	3,992	202	1,668
Atrazine	320 - 440	0 / 13	--	--	188	14.9	195	187	195
Benzaldehyde	320 - 440	2 / 13	390	AS01-SB30-(1-2)	198	61.6	228	191	226
Benzo(a)anthracene	350 - 32,000	11 / 15	58,000	AS01-SB25-(1-2)	4,054	14,924	10,840	267	4,305

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Benzo(a)pyrene	350 - 32,000	11 / 15	55,000	AS01-SB25-(1-2)	3,851	14,150	10,285	264	4,072
Benzo(b)fluoranthene	350 - 32,000	11 / 15	65,000	AS01-SB25-(1-2)	4,546	16,724	12,150	289	5,613
Benzo(g,h,i)perylene	350 - 3,200	10 / 15	17,000	AS01-SB25-(1-2)	1,256	4,356	3,237	166	1,459
Benzo(k)fluoranthene	350 - 32,000	11 / 15	54,000	AS01-SB25-(1-2)	3,805	13,886	10,119	291	3,976
Bis(2-chloro-1-methylethyl) ether	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Butylbenzylphthalate	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Caprolactam	320 - 440	1 / 13	66.0	AS01-SB71-1.5-2	176	34.9	193	171	209
Carbazole	350 - 3,200	6 / 15	9,500	AS01-SB25-(1-2)	773	2,415	1,871	181	973
Chrysene	350 - 32,000	11 / 15	63,000	AS01-SB25-(1-2)	4,452	16,197	11,817	345	5,002
Di-n-butylphthalate	320 - 440	2 / 15	280	AS01-SB38-(1-2)	187	44.4	207	179	226
Di-n-octylphthalate	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Dibenz(a,h)anthracene	320 - 440	1 / 15	2,100	AS01-SB25-(1-2)	317	493	541	222	390
Dibenzofuran	350 - 3,200	5 / 15	6,800	AS01-SB25-(1-2)	598	1,717	1,379	183	805
Diethylphthalate	320 - 440	1 / 15	51.0	HCS-B1-CS	178	37.8	195	171	216
Dimethyl phthalate	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Fluoranthene	350 - 32,000	13 / 15	97,000	AS01-SB25-(1-2)	6,767	24,963	18,118	365	10,682
Fluorene	350 - 3,200	6 / 15	11,000	AS01-SB25-(1-2)	869	2,803	2,144	174	1,142
Hexachlorobenzene	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Hexachlorobutadiene	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Hexachlorocyclopentadiene	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Hexachloroethane	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Indeno(1,2,3-cd)pyrene	350 - 3,200	9 / 15	18,000	AS01-SB25-(1-2)	1,332	4,611	3,428	182	1,453
Isophorone	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Naphthalene	320 - 440	8 / 15	650	AS01-SB25-(1-2)	171	146	238	134	268
Pentachlorophenol	800 - 1,100	0 / 15	--	--	466	35.9	482	465	483
Phenanthrene	350 - 32,000	13 / 15	96,000	AS01-SB25-(1-2)	6,679	24,711	17,915	316	12,457
Phenol	320 - 440	0 / 15	--	--	187	14.0	194	187	194
Pyrene	350 - 32,000	12 / 15	160,000	AS01-SB25-(1-2)	10,996	41,221	29,739	408	17,516

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
bis(2-Chloroethoxy)methane	320 - 440	0 / 15	--	--	187	14.0	194	187	194
bis(2-Chloroethyl)ether	320 - 440	0 / 15	--	--	187	14.0	194	187	194
bis(2-Ethylhexyl)phthalate	320 - 1,700	4 / 15	7,000	AS01-SB38-(1-2)	583	1,776	1,391	138	886
n-Nitroso-di-n-propylamine	320 - 440	0 / 15	--	--	187	14.0	194	187	194
n-Nitrosodiphenylamine	320 - 440	0 / 15	--	--	187	14.0	194	187	194
<b>Explosives (µg/kg)</b>									
1,3,5-Trinitrobenzene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
1,3-Dinitrobenzene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
2,4,6-Trinitrotoluene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
2,4-Dinitrotoluene	250 - 400	0 / 15	--	--	176	22.9	186	174	189
2,6-Dinitrotoluene	250 - 400	0 / 15	--	--	176	22.9	186	174	189
2-Amino-4,6-dinitrotoluene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
2-Nitrotoluene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
3-Nitrotoluene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
4-Amino-2,6-dinitrotoluene	250 - 600	0 / 8	--	--	246	75.4	297	233	346
4-Nitrotoluene	250 - 250	0 / 2	--	--	125	0.0	125	125	125
HMX	500 - 600	2 / 8	1,500	AS01-SB71-1.5-2	412	446	711	299	1,023
Nitrobenzene	250 - 600	0 / 12	--	--	190	54.2	219	184	222
Nitroglycerin	2,500 - 60,000	0 / 8	--	--	21,813	12,724	30,338	13,094	497,817
Nitroguanidine	110,000 - 120,000	0 / 6	--	--	57,500	2,739	59,753	57,446	59,966
PETN	2,500 - 60,000	0 / 8	--	--	21,813	12,724	30,338	13,094	497,817
Perchlorate	48.1 - 60.0	0 / 8	--	--	28.2	2.55	29.9	28.1	30.2
RDX	500 - 600	1 / 8	140	AS01-SB71-1.5-2	264	52.4	299	258	322
Tetryl	540 - 650	0 / 8	--	--	296	20.0	310	296	311
<b>Volatile Organic Compounds (µg/kg)</b>									
1,1,1-Trichloroethane	11.0 - 12,000	5 / 22	410	HCS-BG-113	515	1,271	982	42.1	21,689
1,1,2,2-Tetrachloroethane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,1,2-Trichloroethane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
1,1-Dichloroethane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
1,1-Dichloroethene	11.0 - 12,000	1 / 22	1.00	AS01-SB26-(1-2)	516	1,271	983	40.5	25,334
1,2,4-Trichlorobenzene	11.0 - 12,000	0 / 15	--	--	429	1,542	1,131	14.7	1,598
1,2-Dibromo-3-chloropropane	11.0 - 14.0	0 / 12	--	--	5.88	0.43	6.10	5.86	6.10
1,2-Dibromoethane	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
1,2-Dichlorobenzene	11.0 - 12,000	0 / 15	--	--	429	1,542	1,131	14.7	1,598
1,2-Dichloroethane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
1,2-Dichloroethene (total)	11.0 - 1,600	5 / 9	27,000	HCS-BG-110	6,094	11,031	12,933	759	34,824,368
1,2-Dichloropropane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
1,3-Dichlorobenzene	11.0 - 12,000	0 / 15	--	--	429	1,542	1,131	14.7	1,598
1,4-Dichlorobenzene	11.0 - 12,000	0 / 15	--	--	429	1,542	1,131	14.7	1,598
2-Butanone	11.0 - 12,000	1 / 22	1,400	HCS-BG-110	603	1,287	1,076	49.6	37,148
2-Hexanone	11.0 - 12,000	0 / 22	--	--	576	1,276	1,044	48.3	30,914
4-Methyl-2-pentanone	11.0 - 12,000	0 / 22	--	--	576	1,276	1,044	48.3	30,914
Acetone	11.0 - 12,000	1 / 22	820	HCS-BG-113	340	414	492	40.9	19,925
Benzene	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Bromodichloromethane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Bromoform	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Bromomethane	11.0 - 12,000	0 / 22	--	--	576	1,276	1,044	48.3	30,914
Carbon disulfide	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Carbon tetrachloride	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Chlorobenzene	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Chloroethane	11.0 - 12,000	0 / 22	--	--	576	1,276	1,044	48.3	30,914
Chloroform	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Chloromethane	11.0 - 12,000	1 / 22	1,300	HCS-BG-150	601	1,285	1,073	49.6	36,576
Cumene	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
Cyclohexane	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Dibromochloromethane	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Dichlorodifluoromethane(Freon-12)	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
Ethylbenzene	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Methyl acetate	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
Methyl-tert-butyl ether (MTBE)	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
Methylcyclohexane	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
Methylene chloride	11.0 - 12,000	1 / 22	7.00	HCS-BG-166	470	825	773	33.9	88,010
Styrene	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Tetrachloroethene	11.0 - 12,000	7 / 22	2,200	HCS-BG-146	577	1,331	1,065	47.4	17,946
Toluene	11.0 - 12,000	1 / 22	210	HCS-BG-148	490	1,270	956	41.4	12,813
Trichloroethene	11.0 - 12,000	17 / 22	170,000	AS01-SB73-1.5-2	28,614	42,903	44,356	1,174	1.00E+10
Trichlorofluoromethane(Freon-11)	11.0 - 12,000	0 / 13	--	--	467	1,662	1,289	10.0	846
Vinyl acetate	1,600 - 1,800	0 / 3	--	--	867	57.7	964	865	990
Vinyl chloride	11.0 - 12,000	0 / 22	--	--	576	1,276	1,044	48.3	30,914
Xylene, total	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
cis-1,2-Dichloroethene	11.0 - 12,000	3 / 13	80.0	AS01-SB26-(1-2)	478	1,659	1,298	16.2	2,037
cis-1,3-Dichloropropene	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
o-Xylene	11.0 - 12.0	0 / 11	--	--	5.77	0.26	5.92	5.77	5.92
trans-1,2-Dichloroethene	11.0 - 12,000	1 / 13	2.00	AS01-SB26-(1-2)	467	1,663	1,288	9.18	965
trans-1,3-Dichloropropene	11.0 - 12,000	0 / 22	--	--	517	1,271	983	43.9	17,568
Dioxin/Furans (µg/kg)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00011 - 0.00670	8 / 8	0.2620	AS01-SB34-(1-2)	0.0720	0.0895	0.1320	0.0348	0.7387
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00008 - 0.00220	6 / 8	0.2545	AS01-SB34-(1-2)	0.0493	0.0877	0.1080	0.0094	18.479
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00009 - 0.00100	3 / 8	0.0168	AS01-SB34-(1-2)	0.0032	0.0058	0.0070	0.0006	0.9388
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00011 - 0.00130	6 / 8	0.0147	AS01-SB34-(1-2)	0.0029	0.0049	0.0061	0.0012	0.0309
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00007 - 0.00120	6 / 8	0.1772	AS01-SB34-(1-2)	0.0278	0.0610	0.0687	0.0041	7.0398
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00009 - 0.00120	6 / 8	0.0291	AS01-SB34-(1-2)	0.0058	0.0097	0.0123	0.0019	0.1551
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00007 - 0.00110	6 / 8	0.0458	AS01-SB34-(1-2)	0.0083	0.0156	0.0188	0.0019	0.6645

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-20

## Subsurface Soil Summary Statistics - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.00009 - 0.00120	6 / 8	0.0390	AS01-SB34-(1-2)	0.0069	0.0132	0.0158	0.0021	0.1343
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00008 - 0.00110	2 / 8	0.0028	AS01-SB34-(1-2)	0.0006	0.0009	0.0012	0.0003	0.0065
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00008 - 0.00220	4 / 8	0.0080	AS01-SB34-(1-2)	0.0016	0.0026	0.0034	0.0006	0.0875
1,2,3,7,8-Pentachlorodibenzofuran	0.00009 - 0.00080	6 / 8	0.0533	AS01-SB34-(1-2)	0.0081	0.0183	0.0204	0.0016	0.2979
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00008 - 0.00090	6 / 8	0.0670	AS01-SB34-(1-2)	0.0103	0.0231	0.0258	0.0015	1.6684
2,3,4,7,8-Pentachlorodibenzofuran	0.00010 - 0.00091	6 / 8	0.0633	AS01-SB34-(1-2)	0.0099	0.0217	0.0244	0.0019	0.6196
2,3,7,8-TCDD (dioxin)	0.00010 - 0.00084	2 / 8	0.0038	AS01-SB36-(1-2)	0.0010	0.0014	0.0019	0.0004	0.0201
2,3,7,8-Tetrachlorodibenzofuran	0.00009 - 0.00130	8 / 8	0.0314	AS01-SB36-(1-2)	0.0094	0.0133	0.0183	0.0037	0.1305
Octachlorodibenzo-p-dioxin	0.00012 - 0.01300	8 / 8	2.0160	AS01-SB36-(1-2)	0.7540	0.5702	1.1360	0.6114	1.5616
Octachlorodibenzofuran	0.00007 - 0.01300	8 / 8	0.1501	AS01-SB30-(1-2)	0.0481	0.0557	0.0854	0.0212	0.9753
Total heptachlorodibenzo-p-dioxin	0.00011 - 0.00670	8 / 8	0.5816	AS01-SB34-(1-2)	0.1563	0.2032	0.2925	0.0721	1.7132
Total heptachlorodibenzofuran	0.00008 - 0.00290	6 / 8	0.2864	AS01-SB34-(1-2)	0.0697	0.1009	0.1373	0.0160	40.671
Total hexachlorodibenzo-p-dioxin	0.00009 - 0.00150	6 / 8	0.9868	AS01-SB34-(1-2)	0.1421	0.3423	0.3714	0.0119	532.87
Total hexachlorodibenzofuran	0.00007 - 0.00130	6 / 8	0.5240	AS01-SB34-(1-2)	0.0917	0.1792	0.2117	0.0119	416.10
Total pentachlorodibenzo-p-dioxin	0.00008 - 0.00220	4 / 8	0.2618	AS01-SB34-(1-2)	0.0359	0.0914	0.0971	0.0020	1,790.9
Total pentachlorodibenzofuran	0.00009 - 0.00180	6 / 8	0.5711	AS01-SB34-(1-2)	0.0905	0.1966	0.2223	0.0102	174.03
Total tetrachlorodibenzo-p-dioxin	0.00010 - 0.00084	6 / 8	0.3623	AS01-SB34-(1-2)	0.0543	0.1253	0.1382	0.0046	326.43
Total tetrachlorodibenzofuran	0.00009 - 0.00130	8 / 8	0.7053	AS01-SB34-(1-2)	0.1169	0.2407	0.2781	0.0209	41.722
Other Parameters									
Total organic carbon (mg/kg)	120 - 300	12 / 12	12,000	AS01-SB71-1.5-2	8,275	1,699	9,156	8,134	9,188
pH	0.10 - 0.10	3 / 3	7.40	AS01-SB71-1.5-2	6.96	0.41	7.66	6.95	7.81

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Inorganics (mg/kg)</b>									
Aluminum	0.68 - 54.6	19 / 19	50,500	AS01-SB68-1.5-2	11,056	10,005	15,025	9,295	13,457
Antimony	0.23 - 16.4	6 / 19	17.2	AS01-SB70-2.5-3	1.73	3.80	3.23	0.76	2.92
Arsenic	0.23 - 2.70	19 / 19	10.6	AS01-SB42-(1-2)	6.64	1.27	7.15	6.54	7.17
Barium	0.23 - 54.6	19 / 19	207	AS01-SB16-R01X	175	27.8	186	173	189
Beryllium	0.02 - 1.40	10 / 19	1.30	AS01-SB18-R01X	0.80	0.35	0.94	0.72	1.00
Cadmium	0.22 - 1.40	3 / 19	11.9	AS01-SB70-2.5-3	0.79	2.69	1.86	0.16	1.14
Calcium	2.03 - 1,360	12 / 12	93,200	AS01-SB67-1.5-2	10,698	26,234	24,300	3,265	23,228
Chromium	0.11 - 2.70	19 / 19	19.9	AS01-SB68-1.5-2	13.5	2.72	14.6	13.2	14.7
Cobalt	0.11 - 13.6	19 / 19	16.4	AS01-SB18-R01X	14.0	2.11	14.8	13.8	15.0
Copper	0.11 - 6.80	19 / 19	136	AS01-SB70-2.5-3	24.4	27.5	35.3	19.7	28.9
Cyanide	0.06 - 0.68	2 / 19	0.21	AS01-SB70-2.5-3	0.22	0.10	0.26	0.19	0.30
Iron	0.80 - 27.3	19 / 19	33,500	AS01-SB20-R01X	27,300	5,458	29,465	26,712	30,094
Lead	0.11 - 0.82	19 / 19	1,760	AS01-SB70-2.5-3	169	439	343	30.4	294
Magnesium	6.36 - 1,360	12 / 12	2,790	AS01-SB70-2.5-3	1,209	592	1,516	1,120	1,502
Manganese	0.11 - 4.10	19 / 19	1,170	AS01-SB18-R01X	913	171	981	896	999
Mercury	0.02 - 0.14	6 / 19	2.00	AS01-SB68-1.5-2	0.19	0.46	0.37	0.05	0.35
Nickel	0.11 - 10.9	19 / 19	27.1	AS01-SB18-R01X	22.0	3.50	23.4	21.7	23.9
Potassium	14.4 - 1,360	12 / 12	1,180	AS01-SB70-2.5-3	934	183	1,029	914	1,067
Selenium	0.34 - 1.40	8 / 19	9.00	AS01-SB67-1.5-2	1.15	1.95	1.93	0.66	1.76
Silver	0.11 - 2.70	3 / 19	4.10	AS01-SB70-2.5-3	0.53	1.07	0.95	0.18	1.10
Sodium	64.8 - 1,360	1 / 12	66.1	AS01-SB42-(1-2)	36.0	9.94	41.1	35.1	40.6
Thallium	0.23 - 2.70	8 / 19	2.10	AS01-SB14-R01X	1.13	0.58	1.36	1.00	1.45
Tin	0.11 - 0.12	0 / 7	--	--	1.99	0.05	2.02	1.99	2.02
Vanadium	0.11 - 13.6	19 / 19	24.8	AS01-SB19-R01X	18.4	4.02	20.0	17.9	20.3
Zinc	0.25 - 5.50	19 / 19	222	AS01-SB68-1.5-2	82.1	47.9	101	74.0	98.2
<b>Semivolatile Organic Compounds (µg/kg)</b>									
1,1-Biphenyl	340 - 450	0 / 19	--	--	198	14.0	204	198	204

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,2,4,5-Tetrachlorobenzene	370 - 400	0 / 7	--	--	194	5.56	198	194	198
1,4-Naphthoquinone	370 - 400	0 / 7	--	--	194	5.56	198	194	198
1-Naphthylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2,3,4,6-Tetrachlorophenol	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2,4,5-Trichlorophenol	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
2,4,6-Trichlorophenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2,4-Dichlorophenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2,4-Dimethylphenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2,4-Dinitrophenol	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
2,6-Dichlorophenol	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2-Acetylaminofluorene	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2-Chloronaphthalene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2-Chlorophenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2-Methyl-5-nitroaniline	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2-Methylaniline	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2-Methylnaphthalene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2-Methylphenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2-Naphthylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
2-Nitroaniline	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
2-Nitrophenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
2-Picoline	370 - 400	0 / 7	--	--	194	5.56	198	194	198
3,3'-Dichlorobenzidine	340 - 450	0 / 19	--	--	198	14.0	204	198	204
3,3'-Dimethylbenzidine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
3- and 4-Methylphenol	340 - 370	0 / 3	--	--	180	8.66	195	180	198
3-Methylcholanthrene	370 - 400	0 / 7	--	--	194	5.56	198	194	198
3-Methylphenol	370 - 400	0 / 7	--	--	194	5.56	198	194	198
3-Nitroaniline	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
4,6-Dinitro-2-methylphenol	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
4-Aminobiphenyl	370 - 400	0 / 7	--	--	194	5.56	198	194	198
4-Bromophenyl-phenylether	340 - 450	0 / 19	--	--	198	14.0	204	198	204
4-Chloro-3-methylphenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
4-Chloroaniline	340 - 450	0 / 19	--	--	198	14.0	204	198	204
4-Chlorophenyl-phenylether	340 - 450	0 / 19	--	--	198	14.0	204	198	204
4-Methylphenol	370 - 450	0 / 16	--	--	202	12.1	207	202	207
4-Nitroaniline	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
4-Nitrophenol	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
4-Nitroquinoline-1-oxide	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
7,12-Dimethylbenz(a)anthracene	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Acenaphthene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Acenaphthylene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Acetophenone	340 - 450	1 / 19	55.0	AS01-SB65-1.5-2	191	35.8	205	185	221
Aniline	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Anthracene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Aramite	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Atrazine	340 - 450	0 / 12	--	--	201	16.8	210	201	211
Benzaldehyde	340 - 450	0 / 12	--	--	201	16.8	210	201	211
Benzo(a)anthracene	340 - 450	1 / 19	51.0	AS01-SB68-1.5-2	190	36.4	204	184	222
Benzo(a)pyrene	340 - 450	1 / 19	44.0	AS01-SB68-1.5-2	190	37.9	205	182	227
Benzo(b)fluoranthene	340 - 450	1 / 19	67.0	AS01-SB68-1.5-2	191	33.0	204	186	215
Benzo(g,h,i)perylene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Benzo(k)fluoranthene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Benzoic acid	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Benzyl alcohol	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Bis(2-chloro-1-methylethyl) ether	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Butylbenzylphthalate	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Caprolactam	340 - 450	0 / 12	--	--	201	16.8	210	201	211

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TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Carbazole	340 - 450	0 / 12	--	--	201	16.8	210	201	211
Chlorobenzilate	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Chrysene	340 - 450	1 / 19	69.0	AS01-SB68-1.5-2	191	32.6	204	187	214
Di-n-butylphthalate	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Di-n-octylphthalate	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Diallate	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Dibenz(a,h)anthracene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Dibenzofuran	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Diethylphthalate	340 - 450	3 / 19	340	AS01-SB70-2.5-3	209	39.2	225	206	223
Dimethoate	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Dimethyl phthalate	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Dinoseb	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Diphenylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Disulfoton	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Ethyl methanesulfonate	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Famphur	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Fluoranthene	340 - 450	2 / 19	150	AS01-SB68-1.5-2	188	39.2	203	180	225
Fluorene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Hexachlorobenzene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Hexachlorobutadiene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Hexachlorocyclopentadiene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Hexachloroethane	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Hexachlorophene	15,000 - 16,000	0 / 7	--	--	7,786	267	7,982	7,782	7,996
Hexachloropropene	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Indeno(1,2,3-cd)pyrene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Isodrin	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Isophorone	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Isosafrole	370 - 400	0 / 7	--	--	194	5.56	198	194	198

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TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Kepone	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Methapyrilene	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Methyl parathion	370 - 400	0 / 7	--	--	194	5.56	198	194	198
N-Nitrosomorpholine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
N-Nitrosopiperidine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Naphthalene	340 - 450	0 / 19	--	--	198	14.0	204	198	204
O,O,O-Triethyl phosphorothioate	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Parathion	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Pentachlorobenzene	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Pentachloronitrobenzene	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Pentachlorophenol	850 - 1,100	0 / 19	--	--	497	33.8	510	496	511
Phenacetin	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Phenanthrene	340 - 450	2 / 19	120	AS01-SB68-1.5-2	186	40.5	203	179	222
Phenol	340 - 450	0 / 19	--	--	198	14.0	204	198	204
Phorate	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Pronamide	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Pyrene	340 - 450	1 / 19	95.0	AS01-SB68-1.5-2	192	27.3	203	190	208
Pyridine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Safrole	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Sulfotepp	370 - 400	0 / 7	--	--	194	5.56	198	194	198
Thionazin	370 - 400	0 / 7	--	--	194	5.56	198	194	198
a,a-Dimethylphenethylamine	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
bis(2-Chloroethoxy)methane	340 - 450	0 / 19	--	--	198	14.0	204	198	204
bis(2-Chloroethyl)ether	340 - 450	0 / 19	--	--	198	14.0	204	198	204
bis(2-Ethylhexyl)phthalate	340 - 1,800	2 / 19	2,300	AS01-SB70-2.5-3	284	492	479	177	407
n-Nitroso-di-n-butylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
n-Nitroso-di-n-propylamine	340 - 450	0 / 19	--	--	198	14.0	204	198	204
n-Nitroso-n-methylethylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198

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TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
n-Nitrosodiethylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
n-Nitrosodimethylamine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
n-Nitrosodiphenylamine	340 - 450	0 / 19	--	--	198	14.0	204	198	204
n-Nitrosopyrrolidine	370 - 400	0 / 7	--	--	194	5.56	198	194	198
p-Dimethylaminoazobenzene	370 - 400	0 / 7	--	--	194	5.56	198	194	198
p-Phenylenediamine	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
<b>Explosives (µg/kg)</b>									
1,3,5-Trinitrobenzene	250 - 570	0 / 19	--	--	175	57.9	198	167	201
1,3-Dinitrobenzene	250 - 570	0 / 19	--	--	175	57.9	198	167	201
2,4,6-Trinitrotoluene	250 - 570	0 / 19	--	--	187	63.6	212	176	219
2,4-Dinitrotoluene	250 - 400	0 / 19	--	--	159	33.7	172	156	174
2,6-Dinitrotoluene	250 - 400	0 / 19	--	--	159	33.7	172	156	174
2-Amino-4,6-dinitrotoluene	250 - 570	0 / 19	--	--	187	63.6	212	176	219
2-Nitrotoluene	250 - 570	0 / 19	--	--	187	63.6	212	176	219
3-Nitrotoluene	250 - 570	0 / 19	--	--	187	63.6	212	176	219
4-Amino-2,6-dinitrotoluene	250 - 570	0 / 19	--	--	187	63.6	212	176	219
4-Nitrotoluene	250 - 476	0 / 16	--	--	169	51.3	191	161	195
HMX	417 - 570	8 / 19	5,200	AS01-SB68-1.5-2	1,017	1,476	1,602	514	1,858
Nitrobenzene	250 - 400	0 / 16	--	--	155	35.3	170	151	172
Nitroglycerin	435 - 57,000	2 / 19	4,500	AS01-SB70-2.5-3	5,361	10,269	9,434	1,200	22,025
Nitroguanidine	110,000 - 110,000	0 / 3	--	--	55,000	0.0	55,000	55,000	55,000
PETN	2,500 - 57,000	0 / 12	--	--	8,021	12,250	14,372	2,727	35,861
Perchlorate	47.5 - 61.0	9 / 19	2,500	AS01-SB17-R01X	206	566	430	58.9	303
RDX	417 - 570	7 / 19	5,200	AS01-SB69-1-1.5	638	1,199	1,114	304	1,045
Tetryl	417 - 650	0 / 19	--	--	281	47.3	300	277	303
<b>Volatile Organic Compounds (µg/kg)</b>									
1,1,1,2-Tetrachloroethane	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
1,1,1-Trichloroethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,1,2,2-Tetrachloroethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
1,1,2-Trichloroethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,1-Dichloroethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,1-Dichloroethene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,2,3-Trichloropropane	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
1,2,4-Trichlorobenzene	11.0 - 12,000	0 / 19	--	--	444	1,351	980	59.2	5,550
1,2-Dibromo-3-chloropropane	6.00 - 14.0	0 / 15	--	--	4.67	1.64	5.41	4.38	5.69
1,2-Dibromoethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,2-Dichlorobenzene	11.0 - 12,000	0 / 19	--	--	444	1,351	980	59.2	5,550
1,2-Dichloroethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,2-Dichloroethene (total)	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
1,2-Dichloropropane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
1,3-Dichlorobenzene	11.0 - 12,000	0 / 19	--	--	444	1,351	980	59.2	5,550
1,4-Dichlorobenzene	11.0 - 12,000	0 / 19	--	--	444	1,351	980	59.2	5,550
2-Butanone	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
2-Chloro-1,3-butadiene	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
2-Chloroethyl vinyl ether	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
2-Hexanone	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
4-Methyl-2-pentanone	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Acetone	6.00 - 12,000	0 / 19	--	--	343	1,372	887	7.87	972
Acetonitrile	240 - 250	0 / 7	--	--	121	1.89	122	121	122
Acrylonitrile	59.0 - 62.0	0 / 7	--	--	30.1	0.48	30.5	30.1	30.5
Allyl chloride	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
Benzene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Bromodichloromethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Bromoform	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Bromomethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Carbon disulfide	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Carbon tetrachloride	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Chlorobenzene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Chloroethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Chloroform	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Chloromethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Cumene	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
Cyclohexane	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
Dibromochloromethane	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Dibromomethane	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
Dichlorodifluoromethane(Freon-12)	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Ethyl methacrylate	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
Ethylbenzene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Iodomethane	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
Methacrylonitrile	120 - 120	0 / 7	--	--	60.0	0.0	60.0	60.0	60.0
Methyl acetate	11.0 - 12,000	1 / 12	82.0	AS01-SB69-1-1.5	564	1,716	1,454	26.0	22,681
Methyl methacrylate	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
Methyl methanesulfonate	930 - 1,000	0 / 7	--	--	486	11.7	494	486	495
Methyl-tert-butyl ether (MTBE)	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
Methylcyclohexane	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
Methylene chloride	6.00 - 12,000	0 / 19	--	--	350	1,370	894	7.99	1,555
Pentachloroethane	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
Styrene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Tetrachloroethene	6.00 - 12,000	1 / 19	5,800	AS01-SB69-1-1.5	658	1,850	1,392	14.7	7,964
Toluene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Trichloroethene	6.00 - 12,000	9 / 19	25,000	AS01-SB62-1-3	2,110	6,185	4,563	29.9	185,583
Trichlorofluoromethane(Freon-11)	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Vinyl acetate	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00

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TABLE G-21

## Subsurface Soil Summary Statistics - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Vinyl chloride	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
Xylene, total	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
cis-1,2-Dichloroethene	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
cis-1,3-Dichloropropene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
o-Xylene	12.0 - 12.0	0 / 3	--	--	6.00	0.0	6.00	6.00	6.00
trans-1,2-Dichloroethene	11.0 - 12,000	0 / 12	--	--	590	1,710	1,477	29.7	49,309
trans-1,3-Dichloropropene	6.00 - 12,000	0 / 19	--	--	374	1,368	917	12.8	1,809
trans-1,4-Dichloro-2-butene	6.00 - 6.00	0 / 7	--	--	3.00	0.0	3.00	3.00	3.00
<b>Dioxin/Furans (µg/kg)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00006 - 0.3950	11 / 19	1.800	AS01-SB62-1-3	0.1577	0.4048	0.3182	0.0263	1.76
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00006 - 0.2000	5 / 19	1.700	AS01-SB62-1-3	0.1245	0.3840	0.2768	0.0057	91.0
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00007 - 0.2620	3 / 19	0.400	AS01-SB62-1-3	0.0599	0.0976	0.0986	0.0039	117
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00007 - 0.4140	2 / 19	0.075	AS01-SB62-1-3	0.0600	0.0818	0.0925	0.0035	165
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00005 - 0.0930	3 / 19	1.000	AS01-SB62-1-3	0.0692	0.2264	0.1590	0.0032	18.3
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00006 - 0.3640	2 / 19	0.170	AS01-SB62-1-3	0.0587	0.0765	0.0891	0.0035	223
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00005 - 0.0800	3 / 19	0.760	AS01-SB62-1-3	0.0535	0.1720	0.1217	0.0024	13.9
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.00006 - 0.3800	2 / 19	0.160	AS01-SB62-1-3	0.0610	0.0782	0.0921	0.0039	244
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00006 - 0.1020	2 / 19	0.056	AS01-SB62-1-3	0.0179	0.0226	0.0269	0.0019	6.84
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00007 - 0.2410	2 / 19	0.094	AS01-SB62-1-3	0.0374	0.0484	0.0566	0.0035	28.4
1,2,3,7,8-Pentachlorodibenzofuran	0.00007 - 0.1770	3 / 19	0.710	AS01-SB62-1-3	0.0642	0.1601	0.1277	0.0036	57.2
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00006 - 0.0950	2 / 19	0.290	AS01-SB62-1-3	0.0307	0.0657	0.0567	0.0021	27.5
2,3,4,7,8-Pentachlorodibenzofuran	0.00007 - 0.1580	2 / 19	0.600	AS01-SB62-1-3	0.0559	0.1353	0.1096	0.0032	67.7
2,3,7,8-TCDD (dioxin)	0.00009 - 0.0170	2 / 19	0.016	AS01-SB62-1-3	0.0036	0.0045	0.0054	0.0009	0.07
2,3,7,8-Tetrachlorodibenzofuran	0.00008 - 0.0120	6 / 19	0.380	AS01-SB62-1-3	0.0237	0.0866	0.0580	0.0015	0.20
Octachlorodibenzo-p-dioxin	0.00010 - 0.1550	19 / 19	8.900	AS01-SB62-1-3	0.6373	2.0028	1.4317	0.1939	0.68
Octachlorodibenzofuran	0.00011 - 0.4410	6 / 19	1.400	AS01-SB62-1-3	0.1345	0.3161	0.2598	0.0132	30.0
Total heptachlorodibenzo-p-dioxin	0.00006 - 0.3950	11 / 19	3.400	AS01-SB62-1-3	0.2495	0.7663	0.5535	0.0428	1.23
Total heptachlorodibenzofuran	0.00006 - 0.2000	6 / 19	3.300	AS01-SB62-1-3	0.2137	0.7494	0.5109	0.0073	96.7

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-21

## Subsurface Soil Summary Statistics - Upland

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Total hexachlorodibenzo-p-dioxin	0.00006 - 0.3640	5 / 19	1.400	AS01-SB62-1-3	0.1327	0.3159	0.2580	0.0074	216
Total hexachlorodibenzofuran	0.00005 - 0.0800	3 / 19	4.600	AS01-SB62-1-3	0.2690	1.0508	0.6858	0.0037	83.8
Total pentachlorodibenzo-p-dioxin	0.00007 - 0.0061	2 / 12	0.680	AS01-SB62-1-3	0.0688	0.1966	0.1707	0.0009	84.5
Total pentachlorodibenzofuran	0.00007 - 0.0068	4 / 12	4.500	AS01-SB62-1-3	0.3993	1.2939	1.0701	0.0015	3,813
Total tetrachlorodibenzo-p-dioxin	0.00009 - 0.0060	3 / 12	0.450	AS01-SB62-1-3	0.0496	0.1315	0.1177	0.0007	114
Total tetrachlorodibenzofuran	0.00008 - 0.0014	6 / 12	3.90	AS01-SB62-1-3	0.3469	1.1209	0.9280	0.0016	4,090
<b>Other Parameters</b>									
Total organic carbon (mg/kg)	120 - 614	17 / 17	14,000	AS01-SB61-1-3	10,526	1,986	11,368	10,355	11,448
pH	0.10 - 0.10	16 / 16	7.60	AS01-SB20-R01X	7.09	0.37	7.25	7.08	7.26

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-22

## Earthworm Tissue Summary Statistics

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Dioxin/Furans (PG/G Dry Weight)</b>									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1.10 - 1.60	5 / 5	460	AS01-TI57	147	175	314	100	1,010
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.60 - 0.83	5 / 5	60.0	AS01-TI57	21.5	21.8	42.3	16.0	107
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.79 - 1.10	3 / 5	5.50	AS01-TI57	2.19	2.05	4.15	1.47	34.0
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.93 - 1.10	4 / 5	16.0	AS01-TI57	4.25	6.58	10.5	2.02	178
1,2,3,4,7,8-Hexachlorodibenzofuran	0.62 - 0.84	5 / 5	45.0	AS01-TI57	17.7	16.0	32.9	13.5	82.8
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.99 - 1.10	5 / 5	33.0	AS01-TI57	10.2	12.8	22.4	6.37	110
1,2,3,6,7,8-Hexachlorodibenzofuran	0.75 - 0.96	5 / 5	11.0	AS01-TI57	3.76	4.29	7.85	2.31	69.6
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.90 - 1.10	4 / 5	45.0	AS01-TI57	10.7	19.2	29.0	3.31	5,671
1,2,3,7,8,9-Hexachlorodibenzofuran	0.83 - 1.00	1 / 5	0.81	AS01-TI57	0.54	0.15	0.68	0.52	0.72
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.89 - 1.20	1 / 5	14.0	AS01-TI57	3.23	6.02	8.97	1.02	511
1,2,3,7,8-Pentachlorodibenzofuran	0.79 - 0.94	3 / 5	33.0	AS01-TI58	10.8	14.8	24.8	2.59	806,379
2,3,4,6,7,8-Hexachlorodibenzofuran	0.67 - 0.86	3 / 5	8.00	AS01-TI57	2.44	3.17	5.47	1.31	112
2,3,4,7,8-Pentachlorodibenzofuran	0.63 - 0.78	4 / 5	22.0	AS01-TI58	9.09	10.5	19.1	3.61	20,502
2,3,7,8-TCDD (dioxin)	2.20 - 2.60	3 / 5	5.10	AS01-TI57	3.04	1.77	4.73	2.55	12.1
2,3,7,8-Tetrachlorodibenzofuran	1.70 - 2.60	5 / 5	130	AS01-TI58	42.7	52.6	92.9	19.9	14,124
Octachlorodibenzo-p-dioxin	1.20 - 2.00	5 / 5	3,100	AS01-TI57	1,344	1,024	2,321	1,116	4,119
Octachlorodibenzofuran	1.10 - 1.60	5 / 5	100	AS01-TI57	41.2	33.0	72.7	34.4	113
Total heptachlorodibenzo-p-dioxin	1.10 - 1.60	5 / 5	1,200	AS01-TI57	346	478	802	202	4,370
Total heptachlorodibenzofuran	0.68 - 0.94	5 / 5	180	AS01-TI57	69.0	62.2	128	55.1	228
Total hexachlorodibenzo-p-dioxin	0.94 - 1.10	5 / 5	430	AS01-TI57	105	182	279	39.5	14,344
Total hexachlorodibenzofuran	0.71 - 0.91	5 / 5	220	AS01-TI57	75.6	81.4	153	54.0	435
Total pentachlorodibenzo-p-dioxin	0.89 - 1.20	4 / 5	190	AS01-TI57	42.8	82.3	121	8.78	1,362,605
Total pentachlorodibenzofuran	0.70 - 0.86	5 / 5	370	AS01-TI57	127	144	265	78.0	2,257
Total tetrachlorodibenzo-p-dioxin	2.20 - 2.60	5 / 5	150	AS01-TI57	51.5	56.9	106	32.1	1,316
Total tetrachlorodibenzofuran	1.80 - 2.20	5 / 5	780	AS01-TI57	244	323	552	106	57,635
<b>Other Parameters (Percent Wet Weight)</b>									
Moisture	0.10 - 0.10	5 / 5	83.8	AS01-TI59	82.3	1.27	83.5	82.3	83.6
Lipids	1.00 - 1.00	5 / 5	2.40	AS01-TI55	1.88	0.37	2.23	1.85	2.35

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-23

## Surface Water Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Inorganics (µg/L)</b>									
Aluminum	8.50 - 19.2	26 / 28	998	AS01-SW06	407	228	481	342	546
Antimony	4.90 - 5.90	2 / 28	5.90	AS01-SW02-R05	2.90	0.90	3.19	2.81	3.13
Arsenic	3.20 - 3.80	4 / 28	6.80	AS01-SW03A-R05	2.51	1.21	2.90	2.31	2.86
Barium	0.20 - 1.60	28 / 28	65.0	AS01-SW04-R06	52.8	6.72	54.9	52.4	55.0
Beryllium	0.10 - 0.20	7 / 28	0.20	AS01-SW06	0.13	0.06	0.15	0.12	0.16
Cadmium	0.40 - 0.60	3 / 28	0.74	AS01-SW03-R06	0.27	0.16	0.32	0.25	0.31
Calcium	6.30 - 15.9	28 / 28	56,700	AS01-SW05-R06	48,282	4,932	49,869	48,036	49,965
Chromium	0.70 - 0.90	5 / 28	1.40	AS01-SW02-R06	0.56	0.38	0.68	0.48	0.67
Cobalt	1.00 - 1.10	12 / 28	4.10	AS01-SW05C	1.50	0.96	1.81	1.24	1.93
Copper	0.70 - 1.60	12 / 28	3.30	AS01-SW03-R06	1.68	0.93	1.98	1.42	2.22
Cyanide	10.0 - 10.0	0 / 24	--	--	5.00	0.0	5.00	5.00	5.00
Iron	15.9 - 17.3	28 / 28	1,460	AS01-SW06	490	387	615	362	710
Lead	2.00 - 2.50	5 / 28	2.60	AS01-SW03-R05	1.37	0.54	1.54	1.29	1.53
Magnesium	7.30 - 13.6	28 / 28	13,000	AS01-SW03-R04	11,757	603	11,951	11,742	11,956
Manganese	0.30 - 0.40	28 / 28	383	AS01-SW05C	264	36.0	276	262	276
Mercury	0.10 - 0.20	0 / 28	--	--	0.09	0.02	0.09	0.08	0.10
Nickel	2.00 - 2.10	9 / 28	11.2	AS01-SW03-R04	3.89	2.82	4.80	2.76	6.31
Potassium	49.7 - 137	28 / 28	4,080	AS01-SW05-R06	2,926	601	3,120	2,868	3,139
Selenium	2.20 - 3.40	4 / 28	4.70	AS01-SW04-R06	1.64	0.94	1.94	1.48	1.89
Silver	0.60 - 1.60	0 / 28	--	--	0.47	0.22	0.54	0.42	0.55
Sodium	290 - 308	28 / 28	40,700	AS01-SW05-R06	24,571	9,119	27,506	23,121	27,769
Thallium	2.30 - 5.70	1 / 28	6.20	AS01-SW02A-R05	1.82	1.16	2.19	1.58	2.15
Vanadium	1.00 - 1.50	5 / 28	2.80	AS01-SW02A-R06	1.12	0.70	1.35	0.94	1.44
Zinc	1.30 - 32.2	22 / 28	55.9	AS01-SW04A-R04	32.0	16.1	37.2	25.9	48.2
<b>Dissolved Metals (µg/L)</b>									
Aluminum	19.2 - 19.2	12 / 12	408	AS01-SW07	325	68.2	360	318	366
Antimony	4.90 - 4.90	5 / 12	8.00	AS01-SW09	4.31	2.25	5.48	3.81	6.07
Arsenic	3.70 - 3.70	2 / 12	5.60	AS01-SW03A-R05	2.38	1.25	3.02	2.18	2.98
Barium	0.20 - 0.20	12 / 12	53.3	AS01-SW05C	46.5	3.37	48.3	46.4	48.4

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-23

## Surface Water Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Beryllium	0.10 - 0.10	0 / 12	--	--	0.05	0.0	0.05	0.05	0.05
Cadmium	0.40 - 0.40	0 / 12	--	--	0.20	0.0	0.20	0.20	0.20
Calcium	15.9 - 15.9	12 / 12	49,200	AS01-SW05C	43,142	2,991	44,692	43,048	44,767
Chromium	0.70 - 0.70	0 / 12	--	--	0.35	0.0	0.35	0.35	0.35
Cobalt	1.10 - 1.10	0 / 12	--	--	0.55	0.0	0.55	0.55	0.55
Copper	0.70 - 0.70	2 / 12	1.20	AS01-SW07	0.48	0.31	0.65	0.43	0.64
Iron	15.9 - 15.9	12 / 12	236	AS01-SW03-R05	140	71.5	177	122	208
Lead	2.00 - 2.00	0 / 12	--	--	1.00	0.0	1.00	1.00	1.00
Magnesium	13.6 - 13.6	12 / 12	13,000	AS01-SW05C	11,558	777	11,961	11,534	11,983
Manganese	0.30 - 0.30	12 / 12	216	AS01-SW05C	152	47.0	177	146	185
Mercury	0.20 - 0.20	1 / 12	0.24	AS01-SW04A-R05	0.11	0.04	0.13	0.11	0.13
Nickel	2.00 - 2.00	0 / 12	--	--	1.00	0.0	1.00	1.00	1.00
Potassium	49.7 - 49.7	12 / 12	3,070	AS01-SW05C	2,728	171	2,816	2,723	2,820
Selenium	2.20 - 2.20	1 / 12	2.60	AS01-SW06	1.23	0.43	1.45	1.18	1.40
Silver	0.60 - 0.60	1 / 12	2.10	AS01-SW06	0.45	0.52	0.72	0.35	0.60
Sodium	308 - 308	12 / 12	24,300	AS01-SW05C	20,967	1,560	21,776	20,915	21,806
Thallium	2.30 - 2.30	1 / 12	8.70	AS01-SW04-R05	1.78	2.18	2.91	1.36	2.40
Vanadium	1.00 - 1.00	0 / 12	--	--	0.50	0.0	0.50	0.50	0.50
Zinc	1.50 - 32.2	7 / 12	13.1	AS01-SW07	5.45	3.88	7.46	4.18	10.8
<b>Semivolatile Organic Compounds (µg/L)</b>									
1,1-Biphenyl	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2,2'-Oxybis(1-chloropropane)	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2,4,5-Trichlorophenol	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
2,4,6-Trichlorophenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2,4-Dichlorophenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2,4-Dimethylphenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2,4-Dinitrophenol	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
2-Chloronaphthalene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2-Chlorophenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2-Methylnaphthalene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-23

Surface Water Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
2-Methylphenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2-Nitroaniline	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
2-Nitrophenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
3,3'-Dichlorobenzidine	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
3- and 4-Methylphenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
3-Nitroaniline	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
4,6-Dinitro-2-methylphenol	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
4-Bromophenyl-phenylether	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
4-Chloro-3-methylphenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
4-Chloroaniline	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
4-Chlorophenyl-phenylether	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
4-Nitroaniline	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
4-Nitrophenol	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
Acenaphthene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Acenaphthylene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Acetophenone	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Anthracene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Atrazine	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Benzaldehyde	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Benzo(a)anthracene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Benzo(a)pyrene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Benzo(b)fluoranthene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Benzo(g,h,i)perylene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Benzo(k)fluoranthene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Butylbenzylphthalate	10.0 - 10.0	1 / 9	1.20	AS01-SW04-R05	4.58	1.27	5.36	4.27	7.00
Carbazole	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Chrysene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Di-n-butylphthalate	10.0 - 10.0	2 / 9	1.60	AS01-SW06	2.79	2.13	4.11	1.95	9.25
Di-n-octylphthalate	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Dibenz(a,h)anthracene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-23

Surface Water Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Dibenzofuran	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Diethylphthalate	10.0 - 10.0	1 / 9	1.50	AS01-SW05C	4.61	1.17	5.33	4.37	6.43
Dimethyl phthalate	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Fluoranthene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Fluorene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Hexachlorobenzene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Hexachlorobutadiene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Hexachlorocyclopentadiene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Hexachloroethane	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Indeno(1,2,3-cd)pyrene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Isophorone	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Naphthalene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Pentachlorophenol	25.0 - 25.0	0 / 9	--	--	12.5	0.0	12.5	12.5	12.5
Phenanthrene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Phenol	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Pyrene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
bis(2-Chloroethoxy)methane	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
bis(2-Chloroethyl)ether	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
bis(2-Ethylhexyl)phthalate	10.0 - 10.0	4 / 9	1.90	AS01-SW07	2.42	1.68	3.46	1.92	5.19
n-Nitroso-di-n-propylamine	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
n-Nitrosodiphenylamine	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Explosives (µg/L)									
2,4-Dinitrotoluene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
2,6-Dinitrotoluene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Nitrobenzene	10.0 - 10.0	0 / 9	--	--	5.00	0.0	5.00	5.00	5.00
Volatile Organic Compounds (µg/L)									
1,1,1-Trichloroethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,1,2,2-Tetrachloroethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
1,1,2-Trichloroethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-23

Surface Water Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,1-Dichloroethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,1-Dichloroethene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,2,4-Trichlorobenzene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,2-Dibromo-3-chloropropane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,2-Dibromoethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,2-Dichlorobenzene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,2-Dichloroethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,2-Dichloropropane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,3-Dichlorobenzene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
1,4-Dichlorobenzene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
2-Butanone	5.00 - 10.0	0 / 21	--	--	3.93	1.27	4.41	3.71	4.58
2-Hexanone	5.00 - 10.0	0 / 28	--	--	3.57	1.26	3.98	3.36	4.05
4-Methyl-2-pentanone	5.00 - 10.0	0 / 28	--	--	3.57	1.26	3.98	3.36	4.05
Acetone	5.00 - 10.0	1 / 21	2.50	AS01-SW03A-R04	3.93	1.27	4.41	3.71	4.58
Benzene	1.00 - 10.0	0 / 27	--	--	2.50	2.28	3.25	1.39	5.10
Bromochloromethane	1.00 - 1.00	0 / 16	--	--	0.50	0.0	0.50	0.50	0.50
Bromodichloromethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Bromoform	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Bromomethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Carbon disulfide	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Carbon tetrachloride	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Chlorobenzene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Chloroethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Chloroform	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Chloromethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Cumene	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Cyclohexane	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Dibromochloromethane	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Dichlorodifluoromethane(Freon-12)	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Ethylbenzene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-23

Surface Water Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Methyl acetate	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Methyl-tert-butyl ether (MTBE)	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Methylcyclohexane	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Methylene chloride	2.00 - 10.0	0 / 28	--	--	2.59	2.13	3.27	1.68	4.38
Styrene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Tetrachloroethene	1.00 - 10.0	1 / 28	1.00	AS01-SW06	2.29	2.23	3.00	1.27	4.27
Toluene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Trichloroethene	1.00 - 10.0	1 / 28	5.20	AS01-SW06	2.44	2.28	3.17	1.34	4.80
Trichlorofluoromethane(Freon-11)	10.0 - 10.0	0 / 12	--	--	5.00	0.0	5.00	5.00	5.00
Vinyl chloride	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Xylene, total	1.00 - 10.0	0 / 20	--	--	3.20	2.26	4.07	1.99	8.24
cis-1,2-Dichloroethene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
cis-1,3-Dichloropropene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
m- and p-Xylene	1.00 - 1.00	0 / 8	--	--	0.50	0.0	0.50	0.50	0.50
o-Xylene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
trans-1,2-Dichloroethene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
trans-1,3-Dichloropropene	1.00 - 10.0	0 / 28	--	--	2.43	2.27	3.16	1.34	4.78
Other Parameters (mg/L)									
Hardness	1.00 - 1.00	12 / 12	169	AS01-SW06	157	8.10	161	156	161

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
<b>Inorganics (mg/kg)</b>									
Aluminum	2.20 - 10.3	39 / 39	14,000	AS01-SD04B	5,787	2,747	6,529	5,235	6,634
Antimony	1.10 - 2.60	11 / 39	4.20	AS01-SD07B	1.51	0.94	1.76	1.29	1.79
Arsenic	0.84 - 17.1	39 / 39	22.6	AS01-SD03A-R04	10.6	4.44	11.8	9.6	12.6
Barium	0.02 - 0.57	39 / 39	201	AS01-SD08	88.6	46.3	101	78.6	103
Beryllium	0.02 - 0.07	39 / 39	4.20	AS01-SD03A-R04	1.60	0.75	1.81	1.48	1.79
Cadmium	0.07 - 0.21	10 / 39	6.00	AS01-SD02D	0.36	0.95	0.61	0.14	0.45
Calcium	1.70 - 8.50	39 / 39	19,700	AS01-SD06	3,956	3,865	5,000	2,923	4,885
Chromium	0.16 - 0.37	38 / 39	23.5	AS01-SD06	11.0	5.19	12.4	9.18	18.2
Cobalt	0.25 - 0.59	39 / 39	140	AS01-SD06A	41.0	24.8	47.7	36.0	47.2
Copper	0.16 - 0.57	39 / 39	2,130	AS01-SD02A-R04	103	339	195	36.9	92.8
Cyanide	0.60 - 1.30	0 / 27	--	--	0.38	0.08	0.40	0.37	0.40
Iron	3.63 - 8.50	39 / 39	60,600	AS01-SD02A-R05	30,999	11,178	34,019	28,750	35,659
Lead	0.46 - 1.07	39 / 39	149	AS01-SD02-R06	37.9	31.3	46.3	30.9	44.2
Magnesium	1.90 - 7.27	39 / 39	2,660	AS01-SD02-R06	936	535	1,080	820	1,086
Manganese	0.07 - 0.16	39 / 39	2,920	AS01-SD08	1,060	599	1,221	915	1,273
Mercury	0.06 - 0.23	14 / 39	2.30	AS01-SD02A-R04	0.28	0.49	0.42	0.13	0.36
Nickel	0.46 - 1.07	39 / 39	211	AS01-SD03-R04	64.1	34.8	73.5	57.8	72.4
Potassium	11.4 - 48.6	39 / 39	1,510	AS01-SD08	603	276	677	548	689
Selenium	0.50 - 1.20	9 / 39	2.10	AS01-SD02A-R06	0.69	0.52	0.83	0.54	0.84
Silver	0.14 - 17.5	24 / 39	103	AS01-SD02-R05	6.91	22.6	13.0	0.48	8.55
Sodium	70.3 - 164	15 / 39	868	AS01-SD07	126	147	165	84.7	162
Thallium	0.51 - 2.00	6 / 39	9.90	AS01-SD02A-R04	1.15	1.66	1.60	0.73	1.41
Vanadium	0.23 - 0.53	39 / 39	33.6	AS01-SD02A-R05	17.2	6.36	18.9	16.0	19.4
Zinc	0.34 - 0.80	39 / 39	572	AS01-SD02D	215	114	246	193	246
<b>Semivolatile Organic Compounds (µg/kg)</b>									
1,1-Biphenyl	380 - 780	6 / 31	290	AS01-SD02D	244	85.4	270	225	291
2,2'-Oxybis(1-chloropropane)	380 - 900	0 / 39	--	--	262	62.4	279	255	278

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
2,4,5-Trichlorophenol	960 - 2,300	0 / 39	--	--	652	158	695	636	693
2,4,6-Trichlorophenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2,4-Dichlorophenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2,4-Dimethylphenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2,4-Dinitrophenol	960 - 2,300	0 / 39	--	--	652	158	695	636	693
2-Chloronaphthalene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2-Chlorophenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2-Methylnaphthalene	380 - 900	6 / 39	1,000	AS01-SD02D	272	141	310	250	305
2-Methylphenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2-Nitroaniline	960 - 2,300	0 / 39	--	--	652	158	695	636	693
2-Nitrophenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
3,3'-Dichlorobenzidine	380 - 900	0 / 39	--	--	262	62.4	279	255	278
3- and 4-Methylphenol	380 - 900	2 / 31	1,300	AS01-SD07	300	199	360	272	332
3-Nitroaniline	960 - 2,300	0 / 39	--	--	652	158	695	636	693
4,6-Dinitro-2-methylphenol	960 - 2,300	0 / 39	--	--	652	158	695	636	693
4-Bromophenyl-phenylether	380 - 900	0 / 39	--	--	262	62.4	279	255	278
4-Chloro-3-methylphenol	380 - 900	0 / 39	--	--	262	62.4	279	255	278
4-Chloroaniline	380 - 900	0 / 39	--	--	262	62.4	279	255	278
4-Chlorophenyl-phenylether	380 - 900	0 / 39	--	--	262	62.4	279	255	278
4-Methylphenol	440 - 580	5 / 8	330	AS01-SD02A-R06	180	102	249	151	384
4-Nitroaniline	960 - 2,300	0 / 39	--	--	652	158	695	636	693
4-Nitrophenol	960 - 2,300	0 / 39	--	--	652	158	695	636	693
Acenaphthene	380 - 900	3 / 39	2,300	AS01-SD02D	306	336	396	256	335
Acenaphthylene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Acetophenone	380 - 780	0 / 31	--	--	263	58.3	281	257	281
Anthracene	380 - 2,400	4 / 39	5,100	AS01-SD02D	386	778	596	271	381
Atrazine	380 - 780	0 / 28	--	--	263	60.6	283	257	283
Benzaldehyde	380 - 780	7 / 31	670	AS01-SD05-R06	278	106	310	263	309

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Benzo(a)anthracene	380 - 2,400	7 / 39	9,500	AS01-SD02D	506	1,486	907	265	454
Benzo(a)pyrene	380 - 2,400	6 / 39	7,600	AS01-SD02D	464	1,186	784	270	436
Benzo(b)fluoranthene	380 - 2,400	8 / 39	11,000	AS01-SD02D	548	1,730	1,016	260	479
Benzo(g,h,i)perylene	380 - 900	4 / 39	2,100	AS01-SD02D	306	304	388	261	337
Benzo(k)fluoranthene	380 - 900	6 / 39	1,900	AS01-SD02D	306	288	383	253	353
Butylbenzylphthalate	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Caprolactam	380 - 780	0 / 23	--	--	263	59.1	284	257	285
Carbazole	380 - 900	3 / 39	3,200	AS01-SD02D	331	477	460	263	345
Chrysene	380 - 2,400	11 / 39	8,400	AS01-SD02D	478	1,319	834	248	465
Di-n-butylphthalate	380 - 900	21 / 39	760	AS01-SD02A-R04	208	151	249	164	270
Di-n-octylphthalate	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Dibenz(a,h)anthracene	380 - 900	2 / 39	310	AS01-SD02D	259	68.5	277	250	281
Dibenzofuran	380 - 900	2 / 39	1,800	AS01-SD02D	297	256	367	261	326
Diethylphthalate	380 - 900	0 / 39	--	--	241	94.4	266	208	329
Dimethyl phthalate	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Fluoranthene	380 - 2,400	16 / 39	19,000	AS01-SD02D	738	3,012	1,552	220	545
Fluorene	380 - 900	6 / 39	2,700	AS01-SD02D	306	403	415	238	353
Hexachlorobenzene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Hexachlorobutadiene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Hexachlorocyclopentadiene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Hexachloroethane	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Indeno(1,2,3-cd)pyrene	380 - 900	4 / 39	2,500	AS01-SD02D	318	367	417	264	347
Isophorone	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Naphthalene	380 - 900	5 / 39	800	AS01-SD02D	263	118	295	242	301
Pentachlorophenol	960 - 2,300	0 / 39	--	--	652	158	695	636	693
Phenanthrene	380 - 2,400	15 / 39	17,000	AS01-SD02D	709	2,685	1,435	257	565
Phenol	380 - 900	5 / 39	170	AS01-SD07	232	67.9	251	222	256
Pyrene	380 - 2,400	14 / 39	14,000	AS01-SD02D	601	2,211	1,198	219	508

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TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
bis(2-Chloroethoxy)methane	380 - 900	0 / 39	--	--	262	62.4	279	255	278
bis(2-Chloroethyl)ether	380 - 900	0 / 39	--	--	262	62.4	279	255	278
bis(2-Ethylhexyl)phthalate	380 - 900	21 / 39	230	AS01-SD06	145	96.2	171	118	179
n-Nitroso-di-n-propylamine	380 - 900	0 / 39	--	--	262	62.4	279	255	278
n-Nitrosodiphenylamine	380 - 900	0 / 39	--	--	262	62.4	279	255	278
<b>Explosives (µg/kg)</b>									
1,3,5-Trinitrobenzene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
1,3-Dinitrobenzene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
2,4,6-Trinitrotoluene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
2,4-Dinitrotoluene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2,6-Dinitrotoluene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
2-Amino-4,6-dinitrotoluene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
2-Nitrotoluene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
3-Nitrotoluene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
4-Amino-2,6-dinitrotoluene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
4-Nitrotoluene	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
HMX	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
Nitrobenzene	380 - 900	0 / 39	--	--	262	62.4	279	255	278
Nitroglycerin	9,000 - 110,000	0 / 13	--	--	34,000	11,475	39,671	30,543	54,121
Nitroguanidine	110,000 - 210,000	0 / 13	--	--	73,846	15,021	81,270	72,532	81,892
PETN	9,000 - 110,000	0 / 13	--	--	34,000	11,475	39,671	30,543	54,121
Perchlorate	6.00 - 10.0	0 / 14	--	--	3.61	0.68	3.93	3.55	3.95
RDX	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
Tetryl	570 - 1,100	0 / 13	--	--	371	76.6	409	365	411
<b>Volatile Organic Compounds (µg/kg)</b>									
1,1,1-Trichloroethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
1,1,2,2-Tetrachloroethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,1,2-Trichloroethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
1,1-Dichloroethane	11.0 - 27.0	1 / 39	8.20	AS01-SD03A-R04	7.70	1.63	8.14	7.54	8.14
1,1-Dichloroethene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
1,2,4-Trichlorobenzene	11.0 - 900	0 / 39	--	--	58.8	107	87.8	15.7	87.1
1,2-Dibromo-3-chloropropane	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
1,2-Dibromoethane	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
1,2-Dichlorobenzene	11.0 - 900	0 / 39	--	--	58.8	107	87.8	15.7	87.1
1,2-Dichloroethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
1,2-Dichloropropane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
1,3-Dichlorobenzene	11.0 - 900	0 / 39	--	--	58.8	107	87.8	15.7	87.1
1,4-Dichlorobenzene	11.0 - 900	0 / 39	--	--	58.8	107	87.8	15.7	87.1
2-Butanone	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
2-Hexanone	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
4-Methyl-2-pentanone	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Acetone	11.0 - 27.0	1 / 39	13.0	AS01-SD04B	7.90	2.01	8.44	7.68	8.42
Benzene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Bromodichloromethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Bromoform	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Bromomethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Carbon disulfide	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Carbon tetrachloride	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Chlorobenzene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Chloroethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Chloroform	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Chloromethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Cumene	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Cyclohexane	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Dibromochloromethane	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
Dichlorodifluoromethane(Freon-12)	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Ethylbenzene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Methyl acetate	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Methyl-tert-butyl ether (MTBE)	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Methylcyclohexane	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Methylene chloride	11.0 - 27.0	4 / 39	11.0	AS01-SD05-R06	7.82	2.27	8.43	7.46	8.64
Styrene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Tetrachloroethene	11.0 - 27.0	1 / 39	3.40	AS01-SD04A-R05	7.77	1.99	8.30	7.53	8.36
Toluene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Trichloroethene	11.0 - 27.0	2 / 39	19.0	AS01-SD02A-R04	8.24	2.70	8.97	7.91	8.89
Trichlorofluoromethane(Freon-11)	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
Vinyl chloride	11.0 - 27.0	1 / 39	73.0	AS01-SD03A-R04	9.36	10.6	12.2	7.98	9.85
Xylene, total	11.0 - 23.0	0 / 31	--	--	7.87	1.76	8.41	7.69	8.43
cis-1,2-Dichloroethene	11.0 - 27.0	5 / 39	660	AS01-SD03A-R04	24.4	104	52.6	8.35	14.5
cis-1,3-Dichloropropene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
m- and p-Xylene	12.0 - 27.0	0 / 8	--	--	7.69	2.43	9.32	7.44	9.37
o-Xylene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
trans-1,2-Dichloroethene	11.0 - 27.0	1 / 39	3.70	AS01-SD03A-R04	7.58	1.75	8.06	7.39	8.10
trans-1,3-Dichloropropene	11.0 - 27.0	0 / 39	--	--	7.83	1.88	8.34	7.64	8.33
Dioxin/Furans (µg/kg)									
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.0070 - 0.0300	0 / 7	--	--	0.008	0.004	0.0107	0.0068	0.0133
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0040 - 0.0200	1 / 7	0.06	AS01-SD02-R05	0.013	0.021	0.0283	0.0067	0.0659
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0050 - 0.0200	0 / 7	--	--	0.006	0.003	0.0082	0.0055	0.0099
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.0090 - 0.0300	0 / 7	--	--	0.009	0.004	0.0113	0.0078	0.0137
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0030 - 0.0100	0 / 7	--	--	0.004	0.001	0.0047	0.0036	0.0057
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.0080 - 0.0300	0 / 7	--	--	0.008	0.004	0.0113	0.0076	0.0141
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0030 - 0.0100	0 / 7	--	--	0.003	0.001	0.0043	0.0032	0.0050
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.0080 - 0.0300	0 / 7	--	--	0.008	0.004	0.0113	0.0076	0.0141

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-24

## Sediment Summary Statistics - Adjacent and Downgradient Samples

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean	95% UCL (Normal Distribution)	Geometric Mean <sup>1</sup>	95% UCL (Log Normal Distribution)
1,2,3,7,8,9-Hexachlorodibenzofuran	0.0030 - 0.0100	0 / 7	--	--	0.004	0.001	0.0044	0.0034	0.0053
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.0200 - 0.0600	0 / 7	--	--	0.016	0.007	0.0211	0.0145	0.0235
1,2,3,7,8-Pentachlorodibenzofuran	0.0100 - 0.0600	0 / 7	--	--	0.014	0.008	0.0201	0.0126	0.0260
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0030 - 0.0100	0 / 7	--	--	0.004	0.001	0.0047	0.0036	0.0057
2,3,4,7,8-Pentachlorodibenzofuran	0.0100 - 0.0500	0 / 7	--	--	0.012	0.006	0.0168	0.0109	0.0201
2,3,7,8-TCDD (dioxin)	0.0100 - 0.0400	0 / 7	--	--	0.011	0.006	0.0155	0.0102	0.0207
2,3,7,8-Tetrachlorodibenzofuran	0.0080 - 0.0300	0 / 7	--	--	0.008	0.004	0.0113	0.0076	0.0141
Total heptachlorodibenzo-p-dioxin	0.0070 - 0.0300	0 / 7	--	--	0.008	0.004	0.0107	0.0068	0.0133
Total heptachlorodibenzofuran	0.0040 - 0.0200	1 / 7	0.06	AS01-SD02-R05	0.013	0.021	0.0283	0.0067	0.0659
Total hexachlorodibenzo-p-dioxin	0.0080 - 0.0300	0 / 7	--	--	0.008	0.004	0.0113	0.0076	0.0141
Total hexachlorodibenzofuran	0.0030 - 0.0100	0 / 7	--	--	0.003	0.001	0.0043	0.0032	0.0050
Total octachlorodibenzo-p-dioxin	0.0100 - 0.0500	2 / 7	2.00	AS01-SD06	0.421	0.699	0.9350	0.2046	2.6666
Total octachlorodibenzofuran	0.0070 - 0.0300	0 / 7	--	--	0.008	0.004	0.0107	0.0068	0.0133
Total pentachlorodibenzo-p-dioxin	0.0200 - 0.0600	0 / 7	--	--	0.016	0.007	0.0211	0.0145	0.0235
Total pentachlorodibenzofuran	0.0100 - 0.0500	0 / 7	--	--	0.012	0.006	0.0168	0.0109	0.0201
Total tetrachlorodibenzo-p-dioxin	0.0100 - 0.0400	0 / 7	--	--	0.011	0.006	0.0155	0.0102	0.0207
Total tetrachlorodibenzofuran	0.0080 - 0.0300	0 / 7	--	--	0.008	0.004	0.0113	0.0076	0.0141
Other Parameters									
Total organic carbon (mg/kg)	285 - 580	23 / 23	140,000	AS01-SD04-R05	48,896	33,117	60,752	37,720	78,845
pH	-- - --	23 / 23	8.00	AS01-SD02C	7.03	0.41	7.21	7.04	7.22

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-25  
 Samples Used in the ERA  
*Site 1 Focused Remedial Investigation for Soil*  
*Allegany Ballistics Laboratory, Rocket Center, WV*

Station ID	Sample ID	Sample Date	Depth	Area
Surface Water - Quantitative Samples				
1SD-1/1SW-1	AS01-SW01-R04	08/04/2000	--	Upgradient
1SD-1/1SW-1	AS01-SW01-R05	06/14/2001	--	Upgradient
1SD-1/1SW-1	AS01-SW01-R06	02/28/2002	--	Upgradient
1SD-1/1SW-1	AS01-SW01P-R06	02/27/2002	--	Upgradient
1SD-1A/1SW-1A	AS01-SW01A-R04	08/04/2000	--	Upgradient
1SD-1A/1SW-1A	AS01-SW01AP-R04	08/04/2000	--	Upgradient
1SD-1A/1SW-1A	AS01-SW01A-R05	06/14/2001	--	Upgradient
1SD-1A/1SW-1A	AS01-SW01A-R06	02/28/2002	--	Upgradient
1SD-2/1SW-2	AS01-SW02-R04	08/04/2000	--	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SW02-R05	06/14/2001	--	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SW02-R06	02/27/2002	--	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SW02P-R06	02/27/2002	--	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SW02A-R04	08/04/2000	--	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SW02A-R05	06/14/2001	--	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SW02A-R06	02/28/2002	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03-R04	08/04/2000	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03-R05	06/14/2001	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03P-R05	06/14/2001	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03-R06	02/27/2002	--	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SW03A-R04	08/04/2000	--	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SW03A-R05	06/14/2001	--	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SW03A-R06	02/28/2002	--	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SW04-R04	08/04/2000	--	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SW04-R05	06/13/2001	--	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SW04-R06	02/27/2002	--	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SW04A-R04	08/04/2000	--	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SW04A-R05	06/13/2001	--	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SW04A-R06	02/28/2002	--	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SW05-R04	08/04/2000	--	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SW05-R05	06/13/2001	--	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SW05-R06	02/28/2002	--	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SW05A-R04	08/04/2000	--	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SW05A-R06	02/28/2002	--	Adjacent/Downgradient
1SD-5C/1SW-5C	AS01-SW05C	06/13/2001	--	Adjacent/Downgradient
1SD-6/1SW-6	AS01-SW06	06/14/2001	--	Adjacent/Downgradient
1SD-6/1SW-6	AS01-SW06P	06/14/2001	--	Adjacent/Downgradient
1SD-7/1SW-7	AS01-SW07	06/14/2001	--	Adjacent/Downgradient
1SD-8/1SW-8	AS01-SW08	06/13/2001	--	Adjacent/Downgradient
1SD-9/1SW-9	AS01-SW09	06/13/2001	--	Adjacent/Downgradient
Surface Water - Qualitative Samples				
1SD-1/1SW-1	AS01-SW01-R07	10/09/2002	--	Upgradient
1SD-1/1SW-1	AS01-SW01-R08	07/30/2003	--	Upgradient
1SD-1/1SW-1	AS01-SW01-R09	04/23/2004	--	Upgradient
1SD-1/1SW-1	AS01-SW01P-R09	04/23/2004	--	Upgradient

Shaded samples are field duplicates

TABLE G-25

## Samples Used in the ERA

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Station ID	Sample ID	Sample Date	Depth	Area
1SD-1A/1SW-1A	AS01-SW01A-R07	10/09/2002	--	Upgradient
1SD-1A/1SW-1A	AS01-SW01A-R08	07/30/2003	--	Upgradient
1SD-1A/1SW-1A	AS01-SW01A-R09	04/23/2004	--	Upgradient
1SD-2/1SW-2	AS01-SW02-R07	10/09/2002	--	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SW02-R08	07/30/2003	--	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SW02-R09	04/22/2004	--	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SW02A-R07	10/09/2002	--	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SW02A-R08	07/30/2003	--	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SW02A-R09	04/22/2004	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03-R07	10/08/2002	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03P-R07	10/08/2002	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03-R08	07/30/2003	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03P-R08	07/30/2003	--	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SW03-R09	04/22/2004	--	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SW03A-R07	10/08/2002	--	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SW03A-R08	07/30/2003	--	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SW03A-R09	04/22/2004	--	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SW04-R07	10/08/2002	--	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SW04-R08	07/30/2003	--	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SW04-R09	04/22/2004	--	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SW04A-R07	10/08/2002	--	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SW04A-R08	07/30/2003	--	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SW04A-R09	04/22/2004	--	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SW05-R07	10/08/2002	--	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SW05-R08	07/30/2003	--	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SW05-R09	04/22/2004	--	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SW05A-R07	10/08/2002	--	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SW05A-R08	07/30/2003	--	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SW05A-R09	04/22/2004	--	Adjacent/Downgradient
Sediment - Quantitative Samples				
1SD-1/1SW-1	AS01-SD01-R04	08/07/2000	0 - 4 inches	Upgradient
1SD-1/1SW-1	AS01-SD01-R05	06/15/2001	0 - 4 inches	Upgradient
1SD-1/1SW-1	AS01-SD01-R06	02/28/2002	0 - 4 inches	Upgradient
1SD-1A/1SW-1A	AS01-SD01A-R04	08/04/2000	0 - 4 inches	Upgradient
1SD-1A/1SW-1A	AS01-SD01A-R05	06/15/2001	0 - 4 inches	Upgradient
1SD-1A/1SW-1A	AS01-SD01A-R06	02/28/2002	0 - 4 inches	Upgradient
1SD-2/1SW-2	AS01-SD02-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SD02-R05	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SD02-R06	02/27/2002	0 - 4 inches	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SD02P-R06	02/27/2002	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02A-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02AP-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02A-R05	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02A-R06	02/28/2002	0 - 4 inches	Adjacent/Downgradient
1SD-2B	AS01-SD02B	06/15/2001	0 - 4 inches	Adjacent/Downgradient

Shaded samples are field duplicates

TABLE G-25

## Samples Used in the ERA

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Station ID	Sample ID	Sample Date	Depth	Area
1SD-2C	AS01-SD02C	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-2D	AS01-SD02D	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03-R05	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03-R06	02/27/2002	0 - 4 inches	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SD03A-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SD03A-R05	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SD03A-R06	02/28/2002	0 - 4 inches	Adjacent/Downgradient
1SD-3B	AS01-SD03B	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04-R05	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04P-R05	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04-R06	02/27/2002	0 - 4 inches	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SD04A-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SD04A-R05	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SD04A-R06	02/28/2002	0 - 4 inches	Adjacent/Downgradient
1SD-4B	AS01-SD04B	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SD05-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SD05-R05	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SD05-R06	02/28/2002	0 - 4 inches	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SD05A-R04	08/04/2000	0 - 4 inches	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SD05A-R06	02/28/2002	0 - 4 inches	Adjacent/Downgradient
1SD-5C/1SW-5C	AS01-SD05C	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-6/1SW-6	AS01-SD06	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-6/1SW-6	AS01-SD06P	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-6A	AS01-SD06A	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-6B	AS01-SD06B	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-7/1SW-7	AS01-SD07	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-7/1SW-7	AS01-SD07P	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-7A	AS01-SD07A	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-7B	AS01-SD07B	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-7B	AS01-SD07BP	06/15/2001	0 - 4 inches	Adjacent/Downgradient
1SD-8/1SW-8	AS01-SD08	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-8A	AS01-SD08A	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-9/1SW-9	AS01-SD09	06/14/2001	0 - 4 inches	Adjacent/Downgradient
1SD-9A	AS01-SD09A	06/14/2001	0 - 4 inches	Adjacent/Downgradient
Sediment - Qualitative Samples				
1SD-1/1SW-1	AS01-SD01-R07	10/09/2002	0 - 4 inches	Upgradient
1SD-1/1SW-1	AS01-SD01-R08	07/30/2003	0 - 4 inches	Upgradient
1SD-1/1SW-1	AS01-SD01-R09	04/23/2004	0 - 4 inches	Upgradient
1SD-1/1SW-1	AS01-SD01P-R09	04/23/2004	0 - 4 inches	Upgradient
1SD-1A/1SW-1A	AS01-SD01A-R07	10/09/2002	0 - 4 inches	Upgradient
1SD-1A/1SW-1A	AS01-SD01A-R08	07/30/2003	0 - 4 inches	Upgradient
1SD-1A/1SW-1A	AS01-SD01A-R09	04/23/2004	0 - 4 inches	Upgradient
1SD-2/1SW-2	AS01-SD02-R07	10/09/2002	0 - 4 inches	Adjacent/Downgradient

Shaded samples are field duplicates

TABLE G-25

## Samples Used in the ERA

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Station ID	Sample ID	Sample Date	Depth	Area
1SD-2/1SW-2	AS01-SD02-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-2/1SW-2	AS01-SD02-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02A-R07	10/09/2002	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02A-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-2A/1SW-2A	AS01-SD02A-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03P-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03P-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-3/1SW-3	AS01-SD03-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SD03A-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SD03A-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-3A/1SW-3A	AS01-SD03A-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-4/1SW-4	AS01-SD04-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SD04A-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SD04A-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-4A/1SW-4A	AS01-SD04A-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SD05-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SD05-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-5/1SW-5	AS01-SD05-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SD05A-R07	10/08/2002	0 - 4 inches	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SD05A-R08	07/30/2003	0 - 4 inches	Adjacent/Downgradient
1SD-5A/1SW-5A	AS01-SD05A-R09	04/22/2004	0 - 4 inches	Adjacent/Downgradient
Earthworm Tissue				
AS01-SB55	AS01-TI55	09/01/2004	--	Floodplain (Reference)
AS01-SB56	AS01-TI56	09/01/2004	--	Floodplain
AS01-SB57	AS01-TI57	09/01/2004	--	Floodplain
AS01-SB58	AS01-TI58	09/01/2004	--	Floodplain
AS01-SB59	AS01-TI59	09/01/2004	--	Floodplain
Surface Soil				
AS01-SB31	AS01-SS31-(0-1)	10/25/2001	0 - 12 inches	Floodplain (Reference)
AS01-SB32	AS01-SS32-(0-1)	10/25/2001	0 - 12 inches	Floodplain (Reference)
AS01-SB45	AS01-SS45-0-1	07/20/2004	0 - 12 inches	Floodplain (Reference)
AS01-SB55	AS01-SS55-0-1	07/21/2004	0 - 12 inches	Floodplain (Reference)
AS01-SB55	AS01-SS55P-0-1	07/21/2004	0 - 12 inches	Floodplain (Reference)
22C-1	22C-1-T	10/26/1995	0 - 12 inches	Floodplain
22C-2	22C-2-T	10/26/1995	0 - 12 inches	Floodplain
22D-1	22D-1-T	10/26/1995	0 - 12 inches	Floodplain
AOCM-1	AOCM-1-T	10/26/2001	0 - 12 inches	Floodplain
AOCM-2	AOCM-2-T	10/26/2001	0 - 12 inches	Floodplain
AS01-SB21	AS01-SS21-(0-1)	10/25/2001	0 - 12 inches	Floodplain
AS01-SB21	AS01-SS21P-(0-1)	10/25/2001	0 - 12 inches	Floodplain
AS01-SB22	AS01-SS22-(0-1)	10/25/2001	0 - 12 inches	Floodplain

TABLE G-25

## Samples Used in the ERA

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Station ID	Sample ID	Sample Date	Depth	Area
AS01-SB23	AS01-SS23-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB24	AS01-SS24-(0-1)	10/24/2001	0 - 12 inches	Floodplain
AS01-SB25	AS01-SS25-(0-1)	10/24/2001	0 - 12 inches	Floodplain
AS01-SB26	AS01-SS26-(0-1)	10/23/2001	0 - 12 inches	Floodplain
AS01-SB27	AS01-SS27-(0-1)	10/23/2001	0 - 12 inches	Floodplain
AS01-SB28	AS01-SS28-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB29	AS01-SS29-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB30	AS01-SS30-(0-1)	10/24/2001	0 - 12 inches	Floodplain
AS01-SB33	AS01-SS33-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB34	AS01-SS34-(0-1)	10/25/2001	0 - 12 inches	Floodplain
AS01-SB34	AS01-SS34P-(0-1)	10/25/2001	0 - 12 inches	Floodplain
AS01-SB35	AS01-SS35-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB36	AS01-SS36-(0-1)	10/25/2001	0 - 12 inches	Floodplain
AS01-SB37	AS01-SS37-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB38	AS01-SS38-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB38	AS01-SS38P-(0-1)	10/26/2001	0 - 12 inches	Floodplain
AS01-SB39	AS01-SS39-(0-1)	10/23/2001	0 - 12 inches	Floodplain
AS01-SB40	AS01-SS40-(0-1)	10/24/2001	0 - 12 inches	Floodplain
AS01-SB41	AS01-SS41-(0-1)	10/24/2001	0 - 12 inches	Floodplain
AS01-SB46	AS01-SS46-0-1	07/20/2004	0 - 12 inches	Floodplain
AS01-SB47	AS01-SS47-0-1	07/20/2004	0 - 12 inches	Floodplain
AS01-SB48	AS01-SS48-0-1	07/20/2004	0 - 12 inches	Floodplain
AS01-SB49	AS01-SS49-0-1	07/20/2004	0 - 12 inches	Floodplain
AS01-SB50	AS01-SS50-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB50	AS01-SS50P-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB51	AS01-SS51-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB52	AS01-SS52-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB53	AS01-SS53-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB54	AS01-SS54-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB56	AS01-SS56-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB57	AS01-SS57-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB58	AS01-SS58-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB59	AS01-SS59-0-1	07/21/2004	0 - 12 inches	Floodplain
AS01-SB71	AS01-SS71-0-0.5	09/23/2004	0 - 6 inches	Floodplain
AS01-SB72	AS01-SS72-0-0.5	09/23/2004	0 - 6 inches	Floodplain
AS01-SB72	AS01-SS72P-0-0.5	09/23/2004	0 - 6 inches	Floodplain
AS01-SB73	AS01-SS73-0-0.5	09/23/2004	0 - 6 inches	Floodplain
AS01-SB74	AS01-SS74-0-0.5	09/23/2004	0 - 6 inches	Floodplain
B1-011	HCS-B1-11-S	07/17/1992	6 - 12 inches	Floodplain
B1-12S/12	HCS-B1-12-1	11/16/1994	0 - 12 inches	Floodplain
B1-13S/13	HCS-B1-13-1	11/16/1994	0 - 12 inches	Floodplain
B1-003	HCS-B1-3-S	07/17/1992	6 - 12 inches	Floodplain
B1-003	HCS-B1-3-S/DUP	07/17/1992	6 - 12 inches	Floodplain
B1-004	HCS-B1-4-S	07/17/1992	6 - 12 inches	Floodplain
B1-C	HCS-B1-C	07/17/1992	6 - 12 inches	Floodplain

Shaded samples are field duplicates

TABLE G-25

## Samples Used in the ERA

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Station ID	Sample ID	Sample Date	Depth	Area
B2-010	HCS-B2-10	07/17/1992	0 - 6 inches	Floodplain
B2-003	HCS-B2-3-4	07/17/1992	0 - 6 inches	Floodplain
B2-004	HCS-B2-4-4	01/01/1992	0 - 6 inches	Floodplain
B2-005	HCS-B2-5-3	07/17/1992	0 - 6 inches	Floodplain
B2-006	HCS-B2-6-3	07/17/1992	0 - 6 inches	Floodplain
B2-007	HCS-B2-7-3	07/17/1992	0 - 6 inches	Floodplain
B2-007	HCS-B2-7-S	07/17/1992	0 - 6 inches	Floodplain
B2-C	HCS-B2-C	07/17/1992	0 - 6 inches	Floodplain
BG-102/102S	HCS-BG-102S	11/16/1994	0 - 12 inches	Floodplain
BG-110/110S	HCS-BG-110S	11/16/1994	0 - 12 inches	Floodplain
BG-113	HCS-BG-113S	11/15/1994	0 - 12 inches	Floodplain
BG-113	HCS-BG-113S/DUP	11/15/1994	0 - 12 inches	Floodplain
BG-152	HCS-BG-152	10/20/1998	0 - 6 inches	Floodplain
BG-153	HCS-BG-153	10/20/1998	0 - 6 inches	Floodplain
BG-161	HCS-BG-161	10/20/1998	0 - 6 inches	Floodplain
BG-162	HCS-BG-162	10/20/1998	0 - 6 inches	Floodplain
BG-165	HCS-BG-165	10/20/1998	0 - 6 inches	Floodplain
BG-016/016S/054	HCS-BG-16S	06/20/1994	0 - 12 inches	Floodplain
BG-171	HCS-BG-171	10/21/1998	0 - 6 inches	Floodplain
BG-179	HCS-BG-179	10/21/1998	0 - 6 inches	Floodplain
BG-179	HCS-BG-179/DUP	10/21/1998	0 - 6 inches	Floodplain
BG-023/023S/083	HCS-BG-23S	06/21/1994	0 - 12 inches	Floodplain
BG-023/023S/083	HCS-BG-23S/DUP	06/21/1994	0 - 12 inches	Floodplain
BG-084/084S/106	HCS-BG-84S	06/20/1994	0 - 12 inches	Floodplain
BG-098/098S	HCS-BG-98S	11/16/1994	0 - 12 inches	Floodplain
AS01-SB01	AS01-SS01-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB02	AS01-SS02-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB03	AS01-SS03-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB04	AS01-SS04-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB05	AS01-SS05-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB06	AS01-SS06-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB07	AS01-SS07-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB08	AS01-SS08-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB09	AS01-SS09-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB09	AS01-SS09P-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB10	AS01-SS10-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB11	AS01-SS11-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB12	AS01-SS12-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB13	AS01-SS13-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB14	AS01-SS14-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB15	AS01-SS15-R01X	02/21/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB16	AS01-SS16-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB16	AS01-SS16P-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB17	AS01-SS17-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB18	AS01-SS18-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)

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TABLE G-25

## Samples Used in the ERA

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Station ID	Sample ID	Sample Date	Depth	Area
AS01-SB19	AS01-SS19-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB20	AS01-SS20-R01X	02/22/2001	0 - 12 inches	Upland (Burning Grounds)
AS01-SB60	AS01-SS60-0-0.5	09/21/2004	0 - 6 inches	Upland (Solvent Pits)
AS01-SB61	AS01-SS61-0-0.5	09/21/2004	0 - 6 inches	Upland (Solvent Pits)
AS01-SB62	AS01-SS62-0-0.5	09/21/2004	0 - 6 inches	Upland (Solvent Pits)
AS01-SB63	AS01-SS63-0-0.5	09/22/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB64	AS01-SS64-0-0.5	09/22/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB65	AS01-SS65-0-0.5	09/22/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB66	AS01-SS66-0-0.5	09/23/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB67	AS01-SS67-0-0.5	09/23/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB68	AS01-SS68-0-0.5	09/23/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB69	AS01-SS69-0-0.5	09/23/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB69	AS01-SS69P-0-0.5	09/23/2004	0 - 6 inches	Upland (Burning Grounds)
AS01-SB70	AS01-SS70-0-0.5	09/23/2004	0 - 6 inches	Upland (Burning Grounds)
BG-004/004S/005/039	HCS-BG-4S	06/20/1994	0 - 12 inches	Upland (Solvent Pits)
BG-008/008S/009/038	HCS-BG-8S	06/20/1994	0 - 12 inches	Upland (Solvent Pits)
BG-010/010S/053	HCS-BG-10S	06/20/1994	0 - 12 inches	Upland (Burning Grounds)
BG-025/025S/048	HCS-BG-25S	06/20/1994	0 - 12 inches	Upland (Burning Grounds)
BG-033/033S	HCS-BG-33S	06/20/1994	0 - 12 inches	Upland (Burning Grounds)
BG-034/034S	HCS-BG-34S	06/20/1994	0 - 12 inches	Upland (Burning Grounds)
BG-055/055S	HCS-BG-55S	06/20/1994	0 - 12 inches	Upland (Burning Grounds)
BP-01	HCS-BP-1	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-02	HCS-BP-2	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-03	HCS-BP-3	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-04	HCS-BP-4	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-04	HCS-BP-4/DUP	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-05	HCS-BP-5	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-06	HCS-BP-6	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-07	HCS-BP-7	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
BP-08	HCS-BP-8	07/13/1992	6 - 12 inches	Upland (Burning Grounds)
Subsurface Soil				
AS01-SB31	AS01-SB31-(1-2)	10/25/01	12-24 inches	Floodplain (Reference)
AS01-SB24	AS01-SB24-(1-2)	10/24/01	12-24 inches	Floodplain
AS01-SB25	AS01-SB25-(1-2)	10/24/01	12-24 inches	Floodplain
AS01-SB26	AS01-SB26-(1-2)	10/23/01	12-24 inches	Floodplain
AS01-SB27	AS01-SB27-(1-2)	10/23/01	12-24 inches	Floodplain
AS01-SB30	AS01-SB30-(1-2)	10/24/01	12-24 inches	Floodplain
AS01-SB34	AS01-SB34-(1-2)	10/25/01	12-24 inches	Floodplain
AS01-SB34	AS01-SB34P-(1-2)	10/25/01	12-24 inches	Floodplain
AS01-SB36	AS01-SB36-(1-2)	10/25/01	12-24 inches	Floodplain
AS01-SB38	AS01-SB38-(1-2)	10/26/01	12-24 inches	Floodplain
AS01-SB38	AS01-SB38P-(1-2)	10/26/01	12-24 inches	Floodplain
AS01-SB39	AS01-SB39-(1-2)	10/23/01	12-24 inches	Floodplain
AS01-SB40	AS01-SB40-(1-2)	10/24/01	12-24 inches	Floodplain
AS01-SB41	AS01-SB41-(1-2)	10/24/01	12-24 inches	Floodplain

TABLE G-25  
 Samples Used in the ERA  
*Site 1 Focused Remedial Investigation for Soil*  
*Allegany Ballistics Laboratory, Rocket Center, WV*

Station ID	Sample ID	Sample Date	Depth	Area
AS01-SB71	AS01-SB71-1.5-2	09/23/04	18-24 inches	Floodplain
AS01-SB73	AS01-SB73-1.5-2	09/23/04	18-24 inches	Floodplain
B1-011	HCS-B1-11-2	07/17/92	24 inches	Floodplain
B1-003	HCS-B1-3-1	07/17/92	12-24 inches	Floodplain
B1-003	HCS-B1-3-1/DUP	07/17/92	12-24 inches	Floodplain
B1-CS	HCS-B1-CS	06/20/94	12-24 inches	Floodplain
BG-102/102S	HCS-BG-102	07/13/92	24 inches	Floodplain
BG-110/110S	HCS-BG-110	07/13/92	24-36 inches	Floodplain
BG-113	HCS-BG-113	07/13/92	24-36 inches	Floodplain
BG-146	HCS-BG-146	11/16/94	24-36 inches	Floodplain
BG-147	HCS-BG-147	11/16/94	24-36 inches	Floodplain
BG-148	HCS-BG-148	11/16/94	24-36 inches	Floodplain
BG-149	HCS-BG-149	11/16/94	24-36 inches	Floodplain
BG-150	HCS-BG-150	11/15/94	24-36 inches	Floodplain
BG-166	HCS-BG-166	10/27/98	24-36 inches	Floodplain
AS01-SB42	AS01-SB42-(1-2)	10/24/01	12-24 inches	Upland (Solvent Pits)
AS01-SB43	AS01-SB43-(1-2)	10/24/01	12-24 inches	Upland (Solvent Pits)
AS01-SB44	AS01-SB44-(1-2)	10/24/01	12-24 inches	Upland (Solvent Pits)
AS01-SB60-1-3	AS01-SB60-1-3	09/22/04	12-36 inches	Upland (Solvent Pits)
AS01-SB61-1-3	AS01-SB61-1-3	09/22/04	12-36 inches	Upland (Solvent Pits)
AS01-SB61-1-3/DUP	AS01-SB61-1-3/DUP	09/22/04	12-36 inches	Upland (Solvent Pits)
AS01-SB62-1-3	AS01-SB62-1-3	09/22/04	12-36 inches	Upland (Solvent Pits)
AS01-SB14	AS01-SB14-R01X	02/21/01	12-24 inches	Upland (Burning Grounds)
AS01-SB14	AS01-SB14P-R01X	02/21/01	12-24 inches	Upland (Burning Grounds)
AS01-SB15	AS01-SB15-R01X	02/21/01	12-24 inches	Upland (Burning Grounds)
AS01-SB16	AS01-SB16-R01X	02/22/01	12-24 inches	Upland (Burning Grounds)
AS01-SB17	AS01-SB17-R01X	02/22/01	12-24 inches	Upland (Burning Grounds)
AS01-SB18	AS01-SB18-R01X	02/22/01	12-24 inches	Upland (Burning Grounds)
AS01-SB19	AS01-SB19-R01X	02/22/01	12-24 inches	Upland (Burning Grounds)
AS01-SB20	AS01-SB20-R01X	02/22/01	12-24 inches	Upland (Burning Grounds)
AS01-SB65	AS01-SB65-1.5-2	09/22/04	18-24 inches	Upland (Burning Grounds)
AS01-SB66	AS01-SB66-1.5-2	09/23/04	18-24 inches	Upland (Burning Grounds)
AS01-SB67	AS01-SB67-1.5-2	09/23/04	18-24 inches	Upland (Burning Grounds)
AS01-SB68	AS01-SB68-1.5-2	09/23/04	18-24 inches	Upland (Burning Grounds)
AS01-SB69	AS01-SB69-1-1.5	09/23/04	12-18 inches	Upland (Burning Grounds)
AS01-SB70	AS01-SB70-2.5-3	09/23/04	30-36 inches	Upland (Burning Grounds)

TABLE G-26

## Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints for Terrestrial Habitats

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Floodplain Habitats (Area Outside of Burning Grounds)			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soils sufficient to adversely affect soil invertebrate communities?	Comparison of chemical concentrations in surface soil with soil screening values	Soil invertebrates (earthworms)
		Comparison of results of 28-day soil toxicity tests (growth, survival, and reproduction) with the earthworm, <i>Eisenia fetida</i> , using site and reference soils	
		Existence of significant correlations between laboratory toxicity test results and concentrations of COCs or other chemical and physical characteristics of the soils	
Survival, growth, and reproduction of floodplain plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely affect floodplain plant communities?	Comparison of chemical concentrations in surface soil with soil screening values	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile populations	Are site-related chemical concentrations in surface soil sufficient to adversely affect terrestrial reptile populations?	Comparison of chemical concentrations in surface soil with soil screening values	Reptiles
	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to terrestrial reptile populations?	Evidence of potential risk to other upper trophic level terrestrial receptors evaluated in the ERA	
Survival, growth, and reproduction of avian terrestrial invertivore/omnivore populations	Are site-related chemical concentrations in surface soils sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of modeled dietary intakes using surface soil concentrations and field-collected invertebrates (tissue residues) with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	American robin
Survival, growth, and reproduction of avian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using surface soil concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Red-shouldered hawk
Survival, growth, and reproduction of mammalian terrestrial herbivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume plants from the site?	Comparison of modeled dietary intakes using surface soil concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Meadow vole

TABLE G-26

## Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints for Terrestrial Habitats

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of mammalian terrestrial invertivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume soil invertebrates from the site?	Comparison of modeled dietary intakes using surface soil concentrations and field-collected invertebrates (tissue residues) with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Short-tailed shrew
Survival, growth, and reproduction of mammalian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using surface soil concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Long-tailed weasel
<b>Upland Habitats (Active Burning Grounds/Solvent Pit Areas)</b>			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soils sufficient to adversely affect soil invertebrate communities?	Comparison of chemical concentrations in surface soil with soil screening values	Soil invertebrates (earthworms)
Survival, growth, and reproduction of terrestrial plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely affect upland plant communities?	Comparison of chemical concentrations in surface soil with soil screening values	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile populations	Are site-related chemical concentrations in surface soil sufficient to adversely affect terrestrial reptile populations?	Comparison of chemical concentrations in surface soil with soil screening values	Reptiles
	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to terrestrial reptile populations?	Evidence of potential risk to other upper trophic level terrestrial receptors evaluated in the ERA	
Survival, growth, and reproduction of avian terrestrial invertivore/omnivore populations	Are site-related chemical concentrations in surface soils sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of modeled dietary intakes using surface soil concentrations and field-collected invertebrates (tissue residues) with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	American robin
Survival, growth, and reproduction of avian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using surface soil concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	American kestrel

TABLE G-26

Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints for Terrestrial Habitats

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of mammalian terrestrial herbivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume plants from the site?	Comparison of modeled dietary intakes using surface soil concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Meadow vole
Survival, growth, and reproduction of mammalian terrestrial invertivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume soil invertebrates from the site?	Comparison of modeled dietary intakes using surface soil concentrations and field-collected invertebrates (tissue residues) with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Short-tailed shrew
Survival, growth, and reproduction of mammalian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume small mammals from the site?	Comparison of modeled dietary intakes using surface soil concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Red fox

TABLE G-27

Bioaccumulative Chemicals List and Log K<sub>ow</sub> Values for Relevant Chemicals*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	CAS Number	Log K <sub>ow</sub> Range	Selected log K <sub>ow</sub>	Reference
<b>Metals</b>				
Arsenic	7440-38-2	-- - --	--	--
Cadmium	7440-43-9	-- - --	--	--
Chromium	7440-47-3	-- - --	--	--
Copper	7440-50-8	-- - --	--	--
Lead	7439-92-1	-- - --	--	--
Mercury	7439-97-6	-- - --	--	--
Nickel	7440-02-0	-- - --	--	--
Selenium	7782-49-2	-- - --	--	--
Silver	7440-22-4	-- - --	--	--
Zinc	7440-66-6	-- - --	--	--
<b>Volatile and Semivolatile Organics</b>				
1,1,1,2-Tetrachloroethane	630-20-6	2.47 - 2.51	2.48	USEPA 1995b
1,1,2,2-Tetrachloroethane	79-34-5	2.31 - 2.64	2.39	USEPA 1995b
1,2,4-Trichlorobenzene	120-82-1	3.89 - 4.23	4.01	USEPA 1995b
1,2-Dichlorobenzene	95-50-1	3.20 - 3.61	3.43	USEPA 1995b
1,3-Dichlorobenzene	541-73-1	-- - --	3.50	USEPA 1996a
1,4-Dichlorobenzene	106-46-7	3.26 - 3.62	3.42	USEPA 1995b
4-Bromophenyl-phenylether	101-55-3	4.89 - 5.24	5.00	USEPA 1995b
4-Chlorophenyl-phenylether	7005-72-3	4.08 - 5.09	4.95	USEPA 1995b
Acenaphthene	83-32-9	3.77 - 4.49	3.92	USEPA 1995b
Acenaphthylene	208-96-8	-- - --	4.10	USEPA 1996a
Anthracene	120-12-7	4.44 - 4.80	4.55	USEPA 1995b
Benzo(a)anthracene	56-55-3	5.61 - 5.79	5.70	USEPA 1995b
Benzo(a)pyrene	50-32-8	5.98 - 6.34	6.11	USEPA 1995b
Benzo(b)fluoranthene	205-99-2	5.79 - 6.40	6.20	USEPA 1995b
Benzo(g,h,i)perylene	191-24-2	6.58 - 7.05	6.70	USEPA 1995b
Benzo(k)fluoranthene	207-08-9	6.12 - 6.27	6.20	USEPA 1995b
Chrysene	218-01-9	5.41 - 5.79	5.70	USEPA 1995b
Dibenz(a,h)anthracene	53-70-3	6.50 - 6.88	6.69	USEPA 1995b

TABLE G-27

Bioaccumulative Chemicals List and Log  $K_{ow}$  Values for Relevant Chemicals*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	CAS Number	Log $K_{ow}$ Range	Selected log $K_{ow}$	Reference
Fluoranthene	206-44-0	4.84 - 5.39	5.12	USEPA 1995b
Fluorene	86-73-7	4.04 - 4.40	4.21	USEPA 1995b
Hexachlorobenzene	118-74-1	5.23 - 6.92	5.89	USEPA 1995b
Hexachlorobutadiene	87-68-3	4.74 - 5.16	4.81	USEPA 1995b
Hexachlorocyclopentadiene	77-47-4	5.05 - 5.51	5.39	USEPA 1995b
Hexachloroethane	67-72-1	3.82 - 4.14	4.00	USEPA 1995b
Indeno(1,2,3-cd)pyrene	193-39-5	6.58 - 6.72	6.65	USEPA 1995b
Pentachlorophenol	87-86-5	5.01 - 5.24	5.09	USEPA 1995b
Phenanthrene	85-01-8	4.37 - 4.57	4.55	USEPA 1995b
Pyrene	129-00-0	4.76 - 5.52	5.11	USEPA 1995b
<b>Dioxin/Furans</b>				
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	6.42 - 7.02	6.53	USEPA 1995b

TABLE G-28

Toxicity Equivalency Factors for Dioxin and Furan Congeners

*Site 1 Focused Remedial Investigation for Soil*

*Allegany Ballistics Laboratory, Rocket Center, WV*

Congener	Fish TEF	Mammal TEF	Bird TEF
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.001	0.01	0.001
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01	0.01	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01	0.01	0.01
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.5	0.1	0.05
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1	0.1	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.01	0.1	0.01
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1	0.1	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.01	0.1	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1	0.1	0.1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1.0	1.0	1.0
1,2,3,7,8-Pentachlorodibenzofuran	0.05	0.05	0.1
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1	0.1	0.1
2,3,4,7,8-Pentachlorodibenzofuran	0.5	0.5	1.0
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1.0	1.0	1.0
2,3,7,8-Tetrachlorodibenzofuran	0.05	0.1	1.0
Total octachlorodibenzo-p-dioxin	0.0001	0.0001	0.0001
Total octachlorodibenzofuran	0.0001	0.0001	0.0001

TABLE G-29

Soil Bioconcentration Factors for Terrestrial Plants (Dry Weight)

*Site 1 Focused Remedial Investigation for Soil**Allogany Ballistics Laboratory, Rocket Center, WV*

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
<b>Metals</b>					
Arsenic	1.103	90th percentile	0.037	Geometric mean	Bechtel Jacobs 1998a
Cadmium	3.250	90th percentile	0.514	Geometric mean	Bechtel Jacobs 1998a
Chromium	0.084	90th percentile	0.048	Geometric mean	Bechtel Jacobs 1998a
Copper	0.625	90th percentile	0.123	Geometric mean	Bechtel Jacobs 1998a
Lead	0.468	90th percentile	0.038	Geometric mean	Bechtel Jacobs 1998a
Mercury	5.000	90th percentile	0.344	Geometric mean	Bechtel Jacobs 1998a
Nickel	1.411	90th percentile	0.034	Geometric mean	Bechtel Jacobs 1998a
Selenium	3.012	90th percentile	0.567	Geometric mean	Bechtel Jacobs 1998a
Silver	0.037	90th percentile	0.013	Geometric mean	Bechtel Jacobs 1998a
Zinc	1.820	90th percentile	0.358	Geometric mean	Bechtel Jacobs 1998a
<b>Volatile and Semivolatile Organics</b>					
1,1,1,2-Tetrachloroethane	1.4274	Calculated	1.4274	Calculated	Travis and Arms 1988
1,1,2,2-Tetrachloroethane	1.6091	Calculated	1.6091	Calculated	Travis and Arms 1988
1,2,4-Trichlorobenzene	0.1863	Calculated	0.1863	Calculated	Travis and Arms 1988
1,2-Dichlorobenzene	0.4031	Calculated	0.4031	Calculated	Travis and Arms 1988
1,3-Dichlorobenzene	0.3673	Calculated	0.3673	Calculated	Travis and Arms 1988
1,4-Dichlorobenzene	0.4085	Calculated	0.4085	Calculated	Travis and Arms 1988
4-Bromophenyl-Phenylether	0.0499	Calculated	0.0499	Calculated	Travis and Arms 1988
4-Chlorophenyl-Phenylether	0.0533	Calculated	0.0533	Calculated	Travis and Arms 1988
Acenaphthene	0.2100	Calculated	0.2100	Calculated	Travis and Arms 1988
Acenaphthylene	0.1653	Calculated	0.1653	Calculated	Travis and Arms 1988
Anthracene	0.0908	Calculated	0.0908	Calculated	Travis and Arms 1988
Benzo(a)anthracene	0.0197	Calculated	0.0197	Calculated	Travis and Arms 1988
Benzo(a)pyrene	0.0114	Calculated	0.0114	Calculated	Travis and Arms 1988
Benzo(b)fluoranthene	0.0101	Calculated	0.0101	Calculated	Travis and Arms 1988
Benzo(g,h,i)perylene	0.0052	Calculated	0.0052	Calculated	Travis and Arms 1988
Benzo(k)fluoranthene	0.0101	Calculated	0.0101	Calculated	Travis and Arms 1988
Chrysene	0.0197	Calculated	0.0197	Calculated	Travis and Arms 1988

TABLE G-29

Soil Bioconcentration Factors for Terrestrial Plants (Dry Weight)

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
Dibenz(a,h)anthracene	0.0053	Calculated	0.0053	Calculated	Travis and Arms 1988
Fluoranthene	0.0425	Calculated	0.0425	Calculated	Travis and Arms 1988
Fluorene	0.1428	Calculated	0.1428	Calculated	Travis and Arms 1988
Hexachlorobenzene	0.0153	Calculated	0.0153	Calculated	Travis and Arms 1988
Hexachlorobutadiene	0.0642	Calculated	0.0642	Calculated	Travis and Arms 1988
Hexachlorocyclopentadiene	0.0297	Calculated	0.0297	Calculated	Travis and Arms 1988
Hexachloroethane	0.1888	Calculated	0.1888	Calculated	Travis and Arms 1988
Indeno(1,2,3-cd)pyrene	0.0056	Calculated	0.0056	Calculated	Travis and Arms 1988
Pentachlorophenol	0.0443	Calculated	0.0443	Calculated	Travis and Arms 1988
Phenanthrene	0.0908	Calculated	0.0908	Calculated	Travis and Arms 1988
Pyrene	0.0431	Calculated	0.0431	Calculated	Travis and Arms 1988
Dioxin/Furans					
2,3,7,8-TCDD	0.0065	Calculated	0.0065	Calculated	Travis and Arms 1988

TABLE G-30

Soil Bioconcentration/Bioaccumulation Factors for Soil Invertebrates (Dry Weight)

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
<b>Metals</b>					
Arsenic	0.52	90th percentile	0.26	Arithmetic mean	Sample et al. 1998a
Cadmium	40.7	90th percentile	7.66	Geometric mean	Sample et al. 1998a
Chromium	3.16	90th percentile	0.32	Geometric mean	Sample et al. 1998a
Copper	1.53	90th percentile	0.47	Geometric mean	Sample et al. 1998a
Lead	1.52	90th percentile	0.31	Geometric mean	Sample et al. 1998a
Mercury	20.6	90th percentile	1.19	Geometric mean	Sample et al. 1998a
Nickel	4.73	90th percentile	1.66	Arithmetic mean	Sample et al. 1998a
Selenium	1.34	90th percentile	0.98	Geometric mean	Sample et al. 1998a
Silver	15.3	90th percentile	2.05	Median	Sample et al. 1998a
Zinc	12.9	90th percentile	2.48	Geometric mean	Sample et al. 1998a
<b>Volatile and Semivolatile Organics</b>					
1,1,1,2-Tetrachloroethane	1.00	Assumed	1.00	Assumed	--
1,1,2,2-Tetrachloroethane	1.00	Assumed	1.00	Assumed	--
1,2,4-Trichlorobenzene	0.56	Mean	0.56	Mean	Beyer 1996
1,2-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,3-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,4-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
4-Bromophenyl-Phenylether	1.00	Assumed	1.00	Assumed	--
4-Chlorophenyl-Phenylether	1.00	Assumed	1.00	Assumed	--
Acenaphthene	0.30	Median	0.30	Median	Beyer and Stafford 1993
Acenaphthylene	0.22	Median	0.22	Median	Beyer and Stafford 1993
Anthracene	0.32	Median	0.32	Median	Beyer and Stafford 1993
Benzo(a)anthracene	0.27	Median	0.27	Median	Beyer and Stafford 1993
Benzo(a)pyrene	0.34	Median	0.34	Median	Beyer and Stafford 1993
Benzo(b)fluoranthene	0.21	Median	0.21	Median	Beyer and Stafford 1993
Benzo(g,h,i)perylene	0.15	Median	0.15	Median	Beyer and Stafford 1993
Benzo(k)fluoranthene	0.21	Median	0.21	Median	Beyer and Stafford 1993
Chrysene	0.44	Median	0.44	Median	Beyer and Stafford 1993

TABLE G-30

Soil Bioconcentration/Bioaccumulation Factors for Soil Invertebrates (Dry Weight)

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
Dibenz(a,h)anthracene	0.49	Median	0.49	Median	Beyer and Stafford 1993
Fluoranthene	0.37	Median	0.37	Median	Beyer and Stafford 1993
Fluorene	0.20	Median	0.20	Median	Beyer and Stafford 1993
Hexachlorobenzene	1.69	Mean	1.69	Mean	Beyer 1996
Hexachlorobutadiene	1.00	Assumed	1.00	Assumed	--
Hexachlorocyclopentadiene	1.00	Assumed	1.00	Assumed	--
Hexachloroethane	1.00	Assumed	1.00	Assumed	--
Indeno(1,2,3-cd)pyrene	0.41	Median	0.41	Median	Beyer and Stafford 1993
Pentachlorophenol	8.00	Maximum	5.18	Arithmetic mean	van Gestel and Ma 1988
Phenanthrene	0.28	Median	0.28	Median	Beyer and Stafford 1993
Pyrene	0.39	Median	0.39	Median	Beyer and Stafford 1993
Dioxin/Furans					
Dioxin/furan (TEQ) - Mammal	1.83	90th percentile	0.92	Geometric mean	Site-specific (floodplain) <sup>1</sup>
Dioxin/furan (TEQ) - Bird	1.51	90th percentile	0.78	Geometric mean	Site-specific (floodplain) <sup>1</sup>

<sup>1</sup> These calculated values were used in the upland food web models. Measured tissue concentrations were used in the floodplain food web models.

TABLE G-31

## Soil Bioaccumulation Factors for Small Mammals (Dry-Weight)

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Omnivores (Mouse)				Herbivores (Vole)				Insectivores (Shrew)				Reference
	Screening		Baseline		Screening		Baseline		Screening		Baseline		
	Value	Basis	Value	Basis	Value	Basis	Value	Basis	Value	Basis	Value	Basis	
Metals													
Arsenic	0.014	90th percentile	0.003	Geometric mean	0.016	90th percentile	0.005	Geometric mean	0.015	90th percentile	0.004	Geometric mean	Sample et al. 1998b
Cadmium	0.462	90th percentile	0.144	Geometric mean	0.448	90th percentile	0.134	Geometric mean	7.017	90th percentile	2.212	Geometric mean	Sample et al. 1998b
Chromium	0.349	90th percentile	0.092	Geometric mean	0.309	90th percentile	0.125	Arithmetic mean	0.333	90th percentile	0.094	Geometric mean	Sample et al. 1998b
Copper	0.554	90th percentile	0.111	Geometric mean	1.290	90th percentile	0.109	Geometric mean	1.117	90th percentile	0.502	Geometric mean	Sample et al. 1998b
Lead	0.286	90th percentile	0.055	Geometric mean	0.187	90th percentile	0.041	Geometric mean	0.339	90th percentile	0.148	Geometric mean	Sample et al. 1998b
Mercury	0.130	90th percentile	0.073	Arithmetic mean	0.192	90th percentile	0.067	Geometric mean	0.192	90th percentile	0.067	Geometric mean	Sample et al. 1998b
Nickel	0.589	90th percentile	0.259	Arithmetic mean	0.898	90th percentile	0.263	Geometric mean	0.578	90th percentile	0.349	Arithmetic mean	Sample et al. 1998b
Selenium	1.263	90th percentile	0.258	Geometric mean	0.155	90th percentile	0.022	Arithmetic mean	1.187	90th percentile	0.273	Geometric mean	Sample et al. 1998b
Silver	0.810	90th percentile	0.151	Median	0.007	90th percentile	0.006	Geometric mean	0.501	90th percentile	0.004	Median	Sample et al. 1998b
Zinc	2.782	90th percentile	0.509	Geometric mean	2.317	90th percentile	0.293	Geometric mean	2.901	90th percentile	0.862	Geometric mean	Sample et al. 1998b
Volatile and Semivolatile Organic Compounds													
1,1,1,2-Tetrachloroethane	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
1,1,2,2-Tetrachloroethane	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
1,2,4-Trichlorobenzene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
1,2-Dichlorobenzene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
1,3-Dichlorobenzene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
1,4-Dichlorobenzene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
4-Bromophenyl-phenylether	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
4-Chlorophenyl-phenylether	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Acenaphthene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Acenaphthylene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Anthracene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Benzo(a)anthracene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Benzo(a)pyrene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Benzo(b)fluoranthene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Benzo(g,h,i)perylene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text

TABLE G-31

## Soil Bioaccumulation Factors for Small Mammals (Dry-Weight)

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Omnivores (Mouse)				Herbivores (Vole)				Insectivores (Shrew)				Reference
	Screening		Baseline		Screening		Baseline		Screening		Baseline		
	Value	Basis	Value	Basis	Value	Basis	Value	Basis	Value	Basis	Value	Basis	
Benzo(k)fluoranthene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Chrysene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Dibenz(a,h)anthracene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Fluoranthene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Fluorene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Hexachlorobenzene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Hexachlorobutadiene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Hexachlorocyclopentadiene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Hexachloroethane	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Indeno(1,2,3-cd)pyrene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Pentachlorophenol	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Phenanthrene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Pyrene	NA	--	NA	--	NA	--	NA	--	NA	--	NA	--	See text
Dioxin/Furans													
2,3,7,8-TCDD	2.20	90th percentile	1.02	Arithmetic mean	2.20	90th percentile	1.07	Arithmetic mean	2.20	90th percentile	1.07	Arithmetic mean	Sample et al. 1998b

TABLE G-32

## Exposure Parameters for Terrestrial Upper Trophic Level Ecological Receptors - Screening

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
<b>Birds</b>						
American robin	0.0635	USEPA 1993a	0.0129	allometric equation	0.0074	Levey and Karasov 1989
American kestrel	0.0830	Palmer 1988	0.0168	allometric equation	0.0119	USEPA 1993a
Red-shouldered hawk	0.4750	Dunning 1993	0.0439	allometric equation	0.0437	allometric equation
<b>Mammals</b>						
Long-tailed weasel	0.0925	Sample et al. 1997	0.0229	allometric equation	0.0180	allometric equation
Meadow vole	0.0300	Silva and Downing 1995	0.0133	USEPA 1993a	0.0031	USEPA 1993a
Red fox	3.1700	Silva and Downing 1995	0.4115	allometric equation	0.1499	Sample and Suter 1994
Short-tailed shrew	0.0133	USEPA 1993a	0.0048	USEPA 1993a	0.0019	USEPA 1993a

TABLE G-32

## Exposure Parameters for Terrestrial Upper Trophic Level Ecological Receptors - Screening

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Receptor	Dietary Composition (percent)						Soil Ingestion (percent)		
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Benthic Invert.	Reference	Value	Reference
<b>Birds</b>									
American robin	51.6	43.6	0	0	0	0	Martin et al. 1951	4.8	Sample and Suter 1994
American kestrel	0	38.0	60.0	0	0	0	USEPA 1993a	2.0	Assumed based on diet
Red-shouldered hawk	0	0	100	0	0	0	Martin et al. 1951	0	Assumed based on diet
<b>Mammals</b>									
Long-tailed weasel	0	0.0	97.2	0	0	0	Sample et al. 1997	2.8	Sample et al. 1997
Meadow vole	95.6	2.0	0	0	0	0	USEPA 1993a	2.4	Beyer et al. 1994
Red fox	7.0	0	90.2	0	0	0	USEPA 1993a	2.8	Beyer et al. 1994
Short-tailed shrew	4.7	82.3	0	0	0	0	USEPA 1993a; Sample and Suter 1994	13.0	Sample and Suter 1994

TABLE G-33

Exposure Parameters for Terrestrial Upper Trophic Level Ecological Receptors - Baseline

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
<b>Birds</b>						
American robin	0.0773	USEPA 1993a	0.0106	allometric equation	0.0055	Levey and Karasov 1989
American kestrel	0.1140	USEPA 1993a	0.0138	allometric equation	0.0088	USEPA 1993a
Red-shouldered hawk	0.5590	Dunning 1993	0.0400	allometric equation	0.0399	allometric equation
<b>Mammals</b>						
Long-tailed weasel	0.1470	Sample et al. 1997	0.0176	allometric equation	0.0142	allometric equation
Meadow vole	0.0428	Silva and Downing 1995	0.0090	USEPA 1993a	0.0021	USEPA 1993a
Red fox	4.0600	Silva and Downing 1995	0.3494	allometric equation	0.1250	Sample and Suter 1994
Short-tailed shrew	0.0169	USEPA 1993a	0.0038	USEPA 1993a	0.0015	USEPA 1993a

TABLE G-33

Exposure Parameters for Terrestrial Upper Trophic Level Ecological Receptors - Baseline

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Receptor	Dietary Composition (percent)						Soil Ingestion (percent)		
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Benthic Invert.	Reference	Value	Reference
<b>Birds</b>									
American robin	51.6	43.6	0	0	0	0	Martin et al. 1951	4.8	Sample and Suter 1994
American kestrel	0	38.0	60.0	0	0	0	USEPA 1993a	2.0	Assumed based on diet
Red-shouldered hawk	0	0	100	0	0	0	Martin et al. 1951	0	Assumed based on diet
<b>Mammals</b>									
Long-tailed weasel	0	0	97.2	0	0	0	Sample et al. 1997	2.8	Sample et al. 1997
Meadow vole	95.6	2.0	0	0	0	0	USEPA 1993a	2.4	Beyer et al. 1994
Red fox	7.0	0	90.2	0	0	0	USEPA 1993a	2.8	Beyer et al. 1994
Short-tailed shrew	4.7	82.3	0	0	0	0	USEPA 1993a; Sample and Suter 1994	13.0	Sample and Suter 1994

TABLE G-34

Surface Soil Screening Values Used in the ERA  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Total Organic Carbon (%)
1,1,1-Trichloroethane	300	µg/kg	USEPA 1995a	
1,1,2,2-Tetrachloroethane	300	µg/kg	USEPA 1995a	
1,1,2-Trichloroethane	300	µg/kg	USEPA 1995a	
1,1-Biphenyl	6,800	µg/kg	Efroymsen et al. 1997a	
1,1-Dichloroethane	300	µg/kg	USEPA 1995a	
1,2,4-Trichlorobenzene	1,270	µg/kg	Efroymsen et al. 1997b	
1,2-Dibromoethane	5,000	µg/kg	USEPA 1995a	
1,2-Dichlorobenzene	100	µg/kg	USEPA 1995a	
1,2-Dichloroethane (upland)	545	µg/kg	MHSPE 1994	2.72
1,2-Dichloroethane (floodplain)	730	µg/kg	MHSPE 1994	3.64
1,2-Dichloroethene (total)	300	µg/kg	USEPA 1995a	
1,2-Dichloropropane	38,800	µg/kg	Efroymsen et al. 1997b	
1,4-Dichlorobenzene	1,280	µg/kg	Efroymsen et al. 1997b	
2,3,7,8-TCDD	10.0	µg/kg	USEPA 1995a	
2,4,5-Trichlorophenol	430	µg/kg	Efroymsen et al. 1997a	
2,4,6-Trichlorophenol	580	µg/kg	Efroymsen et al. 1997b	
2,4,6-Trinitrotoluene	30,000	µg/kg	Talmage et al. 1999	
2,4-Dichlorophenol	13,400	µg/kg	Efroymsen et al. 1997b	
2,4-Dimethylphenol	100	µg/kg	USEPA 1995a	
2,4-Dinitrophenol	10,000	µg/kg	Efroymsen et al. 1997a	
2-Chloronaphthalene (upland)	1,405	µg/kg	MHSPE 1994	2.72
2-Chloronaphthalene (floodplain)	1,880	µg/kg	MHSPE 1994	3.64
2-Chlorophenol	750	µg/kg	Efroymsen et al. 1997b	
2-Methylnaphthalene	100	µg/kg	USEPA 1995a (value for other PAHs)	
2-Methylphenol	100	µg/kg	USEPA 1995a	
4-Methyl-2-pentanone	10,000	µg/kg	USEPA 1995a (with safety factor of 10)	
4-Methylphenol	100	µg/kg	USEPA 1995a	
4-Nitrophenol	380	µg/kg	Efroymsen et al. 1997b	
Acenaphthene	2,500	µg/kg	Efroymsen et al. 1997a	
Acenaphthylene	100	µg/kg	USEPA 1995a	
Aluminum	50.0	mg/kg	Efroymsen et al. 1997a	

TABLE G-34

Surface Soil Screening Values Used in the ERA  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Total Organic Carbon (%)
Anthracene	100	µg/kg	USEPA 1995a	
Antimony	5.00	mg/kg	Efroymsen et al. 1997a	
Aroclor-1016	100	µg/kg	USEPA 1995a	
Aroclor-1221	100	µg/kg	USEPA 1995a	
Aroclor-1232	100	µg/kg	USEPA 1995a	
Aroclor-1242	100	µg/kg	USEPA 1995a	
Aroclor-1248	100	µg/kg	USEPA 1995a	
Aroclor-1254	100	µg/kg	USEPA 1995a	
Aroclor-1260	100	µg/kg	USEPA 1995a	
Arsenic	60.0	mg/kg	Efroymsen et al. 1997b	
Barium	500	mg/kg	Efroymsen et al. 1997a	
Benzene (upland)	143	µg/kg	MHSPE 1994	2.72
Benzene (floodplain)	191	µg/kg	MHSPE 1994	3.64
Benzo(a)anthracene	100	µg/kg	USEPA 1995a	
Benzo(a)pyrene	100	µg/kg	USEPA 1995a	
Benzo(b)fluoranthene	100	µg/kg	USEPA 1995a	
Benzo(g,h,i)perylene	100	µg/kg	USEPA 1995a	
Benzo(k)fluoranthene	100	µg/kg	USEPA 1995a	
Beryllium	10.0	mg/kg	Efroymsen et al. 1997a	
bis(2-ethylhexyl)phthalate	10,000	µg/kg	IPCS 1992	
Bromodichloromethane	45,000	µg/kg	USEPA 1995a (with safety factor of 10)	
Bromoform (Tribromomethane)	114,700	µg/kg	USEPA 1995a (with safety factor of 10)	
Cadmium	4.00	mg/kg	Efroymsen et al. 1997a	
Carbon tetrachloride	1,000,000	µg/kg	Efroymsen et al. 1997b	
Chlorobenzene	2,400	µg/kg	Efroymsen et al. 1997b	
Chloroform (upland)	1,360	µg/kg	MHSPE 1994	2.72
Chloroform (floodplain)	1,820	µg/kg	MHSPE 1994	3.64
Chromium	0.40	mg/kg	Efroymsen et al. 1997b	
Chrysene	100	µg/kg	USEPA 1995a	
cis-1,2-Dichloroethene	300	µg/kg	USEPA 1995a	
cis-1,3-Dichloropropene	300	µg/kg	USEPA 1995a	

TABLE G-34

Surface Soil Screening Values Used in the ERA  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Total Organic Carbon (%)
Cobalt	100	mg/kg	USEPA 1995a	
Copper	50.0	mg/kg	Efroymsen et al. 1997b	
Cyanide	27.5	mg/kg	MHSPE 1994	
Dibenz(a,h)anthracene	100	µg/kg	USEPA 1995a	
Diethylphthalate	13,400	µg/kg	Efroymsen et al. 1997a	
Dimethyl phthalate	10,640	µg/kg	Efroymsen et al. 1997b	
Di-n-butylphthalate	200,000	µg/kg	Efroymsen et al. 1997a	
Ethylbenzene (upland)	6,807	µg/kg	MHSPE 1994	2.72
Ethylbenzene (floodplain)	9,109	µg/kg	MHSPE 1994	3.64
Fluoranthene	100	µg/kg	USEPA 1995a	
Fluorene	1,700	µg/kg	Efroymsen et al. 1997b	
Hexachlorocyclopentadiene	1,000	µg/kg	Efroymsen et al. 1997a	
HMX	5,000	µg/kg	Talmage et al. 1999	
Indeno(1,2,3-cd)pyrene	100	µg/kg	USEPA 1995a	
Iron	200	mg/kg	Efroymsen et al. 1997b	
Lead	50.0	mg/kg	Efroymsen et al. 1997a	
Manganese	500	mg/kg	Efroymsen et al. 1997a	
Mercury	0.10	mg/kg	Efroymsen et al. 1997b	
Methylene chloride (upland)	1,361	µg/kg	MHSPE 1994	2.72
Methylene chloride (floodplain)	1,822	µg/kg	MHSPE 1994	3.64
Naphthalene	100	µg/kg	USEPA 1995a	
Nickel	30.0	mg/kg	Efroymsen et al. 1997a	
Nitrobenzene	2,260	µg/kg	Efroymsen et al. 1997b	
n-Nitrosodiphenylamine	1,090	µg/kg	Efroymsen et al. 1997b	
PAH, total (upland)	5,576	µg/kg	MHSPE 1994	2.72
PAH, total (floodplain)	7,462	µg/kg	MHSPE 1994	3.64
Pentachlorophenol	3,000	µg/kg	Efroymsen et al. 1997a	
Perchlorate	1,000	µg/kg	USEPA 2002a	
Phenanthrene	100	µg/kg	USEPA 1995a	
Phenol	1,880	µg/kg	Efroymsen et al. 1997b	
Pyrene	100	µg/kg	USEPA 1995a	

TABLE G-34

Surface Soil Screening Values Used in the ERA  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Total Organic Carbon (%)
RDX	1,000	µg/kg	Talmage et al. 1999	
Selenium	1.80	mg/kg	USEPA 1995a	
Silver	2.00	mg/kg	Efroymsen et al. 1997a	
Styrene (upland)	13,614	µg/kg	MHSPE 1994	2.72
Styrene (floodplain)	18,218	µg/kg	MHSPE 1994	3.64
Tetrachloroethene (upland)	545	µg/kg	MHSPE 1994	2.72
Tetrachloroethene (floodplain)	730	µg/kg	MHSPE 1994	3.64
Tetryl	25,000	µg/kg	Talmage et al. 1999	
Thallium	1.00	mg/kg	Efroymsen et al. 1997a	
Tin	50.0	mg/kg	Efroymsen et al. 1997a	
Toluene (upland)	17,687	µg/kg	MHSPE 1994	2.72
Toluene (floodplain)	23,669	µg/kg	MHSPE 1994	3.64
trans-1,2-Dichloroethene	300	µg/kg	USEPA 1995a	
trans-1,3-Dichloropropene	300	µg/kg	USEPA 1995a	
Trichloroethene (upland)	8,160	µg/kg	MHSPE 1994	2.72
Trichloroethene (floodplain)	10,920	µg/kg	MHSPE 1994	3.64
Vanadium	2.00	mg/kg	Efroymsen et al. 1997a	
Vinyl chloride	300	µg/kg	USEPA 1995a	
Xylene, total (upland)	3,407	µg/kg	MHSPE 1994	2.72
Xylene, total (floodplain)	4,559	µg/kg	MHSPE 1994	3.64
Zinc	50.0	mg/kg	Efroymsen et al. 1997a	

TABLE G-35

## Ingestion Screening Values for Mammals

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
<b>Metals</b>								
Arsenic	mouse	0.03	3 generations	oral in water	reproduction	1.26	0.13	Sample et al. 1996
Cadmium	dog	10.0	3 months	oral in diet	reproduction	7.5	0.75	ATSDR 1993
Cadmium	rat	0.30	6 weeks	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Chromium	rat	0.35	3 months	oral in water	survival	131	13.1	Sample et al. 1996
Copper	mink	1.00	357 days	oral in diet	reproduction	15.1	11.7	Sample et al. 1996
Lead	rat	0.35	3 generations	oral in diet	reproduction	80.0	8.00	Sample et al. 1996
Mercury	mink	1.00	93 days	oral in diet	survival/weight loss	0.25	0.15	Sample et al. 1996
Mercury	rat	0.35	3 generations	oral in diet	reproduction	0.16	0.032	Sample et al. 1996
Nickel	rat	0.35	3 generations	oral in diet	reproduction	80.0	40.0	Sample et al. 1996
Selenium	rat	0.35	1 year	oral in water	reproduction	0.33	0.20	Sample et al. 1996
Silver	rat	0.35	2 weeks	oral in water	survival	181	18.1	ATSDR 1990
Zinc	mink	1.00	25 weeks	oral	reproduction	208	20.8	ATSDR 1994a
Zinc	rat	0.35	GD 1-16	oral in diet	reproduction	320	160	Sample et al. 1996
<b>Volatile and Semivolatile Organics</b>								
1,1,1,2-Tetrachloroethane	rat	0.35	78 weeks	oral (gavage)	reproduction	760	76.0	ATSDR 1996a
1,1,2,2-Tetrachloroethane	rat	0.35	78 weeks	oral (gavage)	reproduction	760	76.0	ATSDR 1996a
1,2,4-Trichlorobenzene	rat	0.35	3 generations	oral in water	reproduction	106	53.0	Coulston and Kolbye 1994
1,2-Dichlorobenzene	rat	0.35	chronic	oral (gavage)	liver/kidney	857	85.7	Coulston and Kolbye 1994
1,3-Dichlorobenzene	rat	0.35	chronic	oral (gavage)	liver/kidney	857	85.7	Coulston and Kolbye 1994
1,4-Dichlorobenzene	rat	0.35	GD 6-15	oral (gavage)	reproduction	500	250	Coulston and Kolbye 1994
4-Bromophenyl-phenylether	--	--	--	--	--	NA	NA	--
4-Chlorophenyl-phenylether	--	--	--	--	--	NA	NA	--
Acenaphthene	mouse	0.03	13 weeks	oral (gavage)	reproduction	700	350	ATSDR 1995
Acenaphthylene	mouse	0.03	13 weeks	oral (gavage)	reproduction	700	350	ATSDR 1995
Anthracene	mouse	0.03	13 weeks	oral (gavage)	reproduction	10,000	1,000	ATSDR 1995
Benzo(a)anthracene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Benzo(a)pyrene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Benzo(b)fluoranthene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996

TABLE G-35

## Ingestion Screening Values for Mammals

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Benzo(g,h,i)perylene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Benzo(k)fluoranthene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Chrysene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Dibenz(a,h)anthracene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Fluoranthene	mouse	0.03	13 weeks	oral (gavage)	reproduction	5,000	500	ATSDR 1995
Fluorene	mouse	0.03	13 weeks	oral (gavage)	reproduction	5,000	500	ATSDR 1995
Hexachlorobenzene	rat	0.35	4 generations	oral in diet	reproduction	2.00	1.00	ATSDR 1996b
Hexachlorobutadiene	rat	0.35	GD 1-22; LD 1-21	oral in diet	developmental	20.0	2.00	ATSDR 1994b
Hexachlorocyclopentadiene	rat	0.35	GD 6-15	oral	reproduction	30.0	10.0	USEPA 1984
Hexachloroethane	rat	0.35	GD 6-16	oral (gavage)	reproduction	500	100	ATSDR 1997
Indeno(1,2,3-cd)pyrene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Pentachlorophenol	rat	0.35	2 generations	oral in diet	developmental	25.0	2.50	ATSDR 1994c
Phenanthrene	mouse	0.03	13 weeks	oral (gavage)	reproduction	5,000	500	ATSDR 1995
Pyrene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Dioxin/Furans								
2,3,7,8-TCDD	rat	0.35	3 generations	oral in diet	reproduction	0.00001	0.000001	Sample et al. 1996

TABLE G-36

## Ingestion Screening Values for Birds

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
<b>Metals</b>								
Arsenic	brown-headed cowbird	0.05	7 months	oral in diet	survival	7.38	2.46	Sample et al. 1996
Arsenic	mallard	1.00	128 days	oral in diet	survival	12.8	5.14	Sample et al. 1996
Cadmium	mallard	1.15	90 days	oral in diet	reproduction	20.0	1.45	Sample et al. 1996
Chromium	American black duck	1.25	10 months	oral in diet	reproduction	5.00	1.00	Sample et al. 1996
Copper	chicks	0.53	10 weeks	oral in diet	growth/survival	61.7	47.0	Sample et al. 1996
Lead	American kestrel	0.13	7 months	oral in diet	reproduction	38.5	3.85	Sample et al. 1996
Lead	Japanese quail	0.15	12 weeks	oral in diet	reproduction	11.3	1.13	Sample et al. 1996
Mercury	Japanese quail	0.15	1 year	oral in diet	reproduction	0.90	0.45	Sample et al. 1996
Mercury	mallard	1.00	3 generations	oral in diet	reproduction	0.078	0.026	USEPA 1997b
Nickel	mallard	0.78	90 days	oral in diet	growth/survival	107	77.4	Sample et al. 1996
Selenium	mallard	1.00	100 days	oral in diet	reproduction	0.80	0.40	Sample et al. 1996
Selenium	screech owl	0.20	13.7 weeks	oral in diet	reproduction	1.50	0.44	Sample et al. 1996
Silver	mallard	1.10	14 days	oral in diet	survival	1,780	178	USEPA 1999c
Zinc	chicken	1.94	44 weeks	oral in diet	reproduction	131	14.5	Sample et al. 1996
<b>Volatile and Semivolatile Organics</b>								
1,1,1,2-Tetrachloroethane	--	--	--	--	--	NA	NA	--
1,1,2,2-Tetrachloroethane	--	--	--	--	--	NA	NA	--
1,2,4-Trichlorobenzene	northern bobwhite	0.157	14 days	oral (gavage)	growth/survival	2,500	250	Grimes and Jaber 1989
1,2-Dichlorobenzene	northern bobwhite	0.157	14 days	oral (gavage)	growth/survival	2,500	250	Grimes and Jaber 1989
1,3-Dichlorobenzene	northern bobwhite	0.157	14 days	oral (gavage)	growth/survival	2,500	250	Grimes and Jaber 1989
1,4-Dichlorobenzene	northern bobwhite	0.157	14 days	oral (gavage)	growth/survival	2,500	250	Grimes and Jaber 1989
4-Bromophenyl-phenylether	--	--	--	--	--	NA	NA	--
4-Chlorophenyl-phenylether	--	--	--	--	--	NA	NA	--
Acenaphthene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Acenaphthylene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Anthracene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(a)anthracene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(a)pyrene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963

TABLE G-36

## Ingestion Screening Values for Birds

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Benzo(b)fluoranthene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(g,h,i)perylene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Benzo(k)fluoranthene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Chrysene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Dibenz(a,h)anthracene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluoranthene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Fluorene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Hexachlorobenzene	Japanese quail	0.15	90 days	oral in diet	reproduction	0.57	0.11	Coulston and Kolbye 1994
Hexachlorobutadiene	Japanese quail	0.15	90 days	oral in diet	reproduction	33.9	3.39	Coulston and Kolbye 1994
Hexachlorocyclopentadiene	--	--	--	--	--	NA	NA	--
Hexachloroethane	--	--	--	--	--	NA	NA	--
Indeno(1,2,3-cd)pyrene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pentachlorophenol	chicken	1.50	8 weeks	oral in diet	systemic/growth	85.2	42.6	Eisler 1989
Phenanthrene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Pyrene	chicken	1.50	34 days	oral in diet	reproduction	395	39.5	Rigdon and Neal 1963
Dioxin/Furans								
2,3,7,8-TCDD	ring-necked pheasant	1.00	10 weeks	injection	reproduction	0.00014	0.000014	Sample et al. 1996

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Inorganics (mg/kg)</b>								
Aluminum	2.42 - 60.6	54 / 54	96,900	HCS-B1-4-S	50.0	54 / 54	1,938	YES
Antimony	2.09 - 18.2	20 / 54	25.1	HCS-B2-10	5.00	9 / 54	5.02	YES
Arsenic	1.13 - 3.00	53 / 54	24.9	AS01-SS40-(0-1)	60.0	0 / 54	0.42	NO
Barium	0.45 - 60.6	53 / 54	758	HCS-B1-4-S	500	3 / 54	1.52	YES
Beryllium	0.02 - 1.50	41 / 54	2.10	AOCM-1-T	10.0	0 / 54	0.21	NO
Cadmium	0.58 - 3.50	25 / 54	373	AS01-SS72-0-0.5	4.00	13 / 54	93.3	YES
Calcium <sup>2</sup>	1.99 - 1,510	54 / 54	246,000	22C-2-T	NSV	-- / --	NSV	NO
Chromium	1.13 - 3.00	54 / 54	319	AS01-SS72-0-0.5	0.40	54 / 54	798	YES
Cobalt	1.13 - 15.1	51 / 54	60.0	AS01-SS34-(0-1)	100	0 / 54	0.60	NO
Copper	0.54 - 7.60	53 / 54	2,150	HCS-B2-7-S	50.0	24 / 54	43.0	YES
Cyanide	0.55 - 1.40	12 / 42	1.90	AS01-SS23-(0-1)	27.5	0 / 42	0.07	NO
Iron	0.16 - 30.3	54 / 54	122,000	HCS-B1-4-S	200	54 / 54	610	YES
Lead	0.66 - 0.91	54 / 54	12,100	HCS-B1-4-S	50.0	29 / 54	242	YES
Magnesium <sup>2</sup>	6.25 - 1,510	51 / 54	14,100	22D-1-T	NSV	-- / --	NSV	NO
Manganese	0.11 - 4.50	54 / 54	2,320	AS01-SS25-(0-1)	500	50 / 54	4.64	YES
Mercury	0.11 - 1.40	50 / 54	56.3	AS01-SS72-0-0.5	0.10	49 / 54	563	YES
Nickel	0.91 - 12.1	53 / 54	240	AS01-SS22-(0-1)	30.0	47 / 54	8.00	YES
Potassium <sup>2</sup>	14.2 - 1,510	46 / 54	1,710	HCS-B2-10	NSV	-- / --	NSV	NO
Selenium	0.44 - 1.50	14 / 52	3.90	HCS-B1-4-S	1.80	1 / 52	2.17	YES
Silver	1.13 - 3.00	33 / 52	121	HCS-B2-7-S	2.00	27 / 52	60.5	YES
Sodium <sup>2</sup>	43.3 - 1,510	18 / 54	9,740	HCS-B1-4-S	NSV	-- / --	NSV	NO
Thallium	0.46 - 3.00	2 / 54	3.10	AS01-SS56-0-1	1.00	2 / 54	3.10	YES
Vanadium	0.59 - 15.1	53 / 54	332	AS01-SS22-(0-1)	2.00	53 / 54	166	YES
Zinc	0.25 - 6.10	54 / 54	4,230	HCS-B2-10	50.0	53 / 54	84.6	YES

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Pesticide/Polychlorinated Biphenyls (µg/kg)</b>								
Aroclor-1016	33.0 - 33.0	0 / 7	--	--	100	-- / --	0.33	NO
Aroclor-1221	67.0 - 67.0	0 / 7	--	--	100	-- / --	0.67	NO
Aroclor-1232	33.0 - 33.0	0 / 7	--	--	100	-- / --	0.33	NO
Aroclor-1242	33.0 - 33.0	0 / 7	--	--	100	-- / --	0.33	NO
Aroclor-1248	33.0 - 33.0	0 / 7	--	--	100	-- / --	0.33	NO
Aroclor-1254	33.0 - 33.0	0 / 7	--	--	100	-- / --	0.33	NO
Aroclor-1260	33.0 - 33.0	0 / 7	--	--	100	-- / --	0.33	NO
<b>Semivolatile Organic Compounds (µg/kg)</b>								
1,1-Biphenyl	370 - 500	5 / 25	88.0	AS01-SS25-(0-1)	6,800	0 / 25	0.01	NO
2,4,5-Trichlorophenol	910 - 2,400	0 / 34	--	--	430	-- / --	5.58	-- <sup>3</sup>
2,4,6-Trichlorophenol	370 - 500	0 / 34	--	--	580	-- / --	0.86	NO
2,4-Dichlorophenol	370 - 500	0 / 34	--	--	13,400	-- / --	0.04	NO
2,4-Dimethylphenol	370 - 500	0 / 34	--	--	100	-- / --	5.00	-- <sup>3</sup>
2,4-Dinitrophenol	910 - 2,400	0 / 32	--	--	10,000	-- / --	0.24	NO
2-Chloronaphthalene	370 - 500	0 / 34	--	--	1,880	-- / --	0.27	NO
2-Chlorophenol	370 - 500	0 / 34	--	--	750	-- / --	0.67	NO
2-Methylnaphthalene	370 - 500	16 / 34	170	AS01-SS24-(0-1)	100	3 / 34	1.70	YES
2-Methylphenol	370 - 500	0 / 34	--	--	100	-- / --	5.00	-- <sup>3</sup>
2-Nitroaniline	910 - 2,400	0 / 34	--	--	NSV	-- / --	NSV	NO
2-Nitrophenol	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
3,3'-Dichlorobenzidine	370 - 970	0 / 34	--	--	NSV	-- / --	NSV	NO
3- and 4-Methylphenol	370 - 460	1 / 21	110	AS01-SS30-(0-1)	100	1 / 21	1.10	YES
3-Nitroaniline	910 - 2,400	0 / 34	--	--	NSV	-- / --	NSV	NO
4,6-Dinitro-2-methylphenol	910 - 2,400	0 / 34	--	--	NSV	-- / --	NSV	NO
4-Bromophenyl-phenylether	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
4-Chloro-3-methylphenol	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
4-Chloroaniline	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
4-Chlorophenyl-phenylether	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
4-Methylphenol	370 - 500	0 / 13	--	--	100	-- / --	5.00	-- <sup>3</sup>
4-Nitroaniline	910 - 2,400	0 / 34	--	--	NSV	-- / --	NSV	NO
4-Nitrophenol	910 - 2,400	0 / 34	--	--	380	-- / --	6.32	-- <sup>3</sup>
Acenaphthene	370 - 8,900	6 / 47	4,100	AS01-SS57-0-1	2,500	1 / 47	1.64	YES
Acenaphthylene	370 - 8,900	5 / 47	630	AS01-SS49-0-1	100	1 / 47	6.30	YES
Acetophenone	370 - 500	1 / 25	55.0	AS01-SS72-0-0.5	NSV	-- / --	NSV	YES
Anthracene	370 - 8,900	24 / 47	8,300	AS01-SS57-0-1	100	8 / 47	83.0	YES
Atrazine	370 - 500	0 / 25	--	--	NSV	-- / --	NSV	NO
Benzaldehyde	370 - 500	4 / 24	600	AS01-SS24-(0-1)	NSV	-- / --	NSV	YES
Benzo(a)anthracene	370 - 8,900	42 / 47	8,100	AS01-SS57-0-1	100	21 / 47	81.0	YES
Benzo(a)pyrene	370 - 17,000	34 / 47	12,000	AS01-SS57-0-1	100	17 / 47	120	YES
Benzo(b)fluoranthene	370 - 22,000	42 / 47	21,000	AS01-SS49-0-1	100	31 / 47	210	YES
Benzo(g,h,i)perylene	370 - 8,900	33 / 47	4,200	AS01-SS57-0-1	100	7 / 47	42.0	YES
Benzo(k)fluoranthene	370 - 8,900	34 / 47	8,600	AS01-SS49-0-1	100	16 / 47	86.0	YES
Benzoic acid	1,900 - 2,400	0 / 3	--	--	NSV	-- / --	NSV	NO
Benzyl alcohol	390 - 490	0 / 3	--	--	NSV	-- / --	NSV	NO
bis(2-Chloroisopropyl)ether	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Butylbenzylphthalate	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Caprolactam	370 - 500	1 / 25	68.0	AS01-SS71-0-0.5	NSV	-- / --	NSV	YES
Carbazole	370 - 500	6 / 31	210	AS01-SS25-(0-1)	NSV	-- / --	NSV	YES
Chrysene	370 - 8,900	42 / 47	10,000	AS01-SS49-0-1	100	34 / 47	100	YES
Di-n-butylphthalate	370 - 500	4 / 34	150	AS01-SS41-(0-1)	200,000	0 / 34	0.001	NO
Di-n-octylphthalate	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Dibenz(a,h)anthracene	370 - 500	4 / 34	430	AS01-SS26-(0-1)	100	2 / 34	4.30	YES

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Dibenzofuran	370 - 500	5 / 34	260	HCS-B2-4-4	NSV	-- / --	NSV	YES
Diethylphthalate	370 - 910	7 / 34	1,300	AS01-SS72-0-0.5	13,400	0 / 34	0.10	NO
Dimethyl phthalate	370 - 500	1 / 34	1,100	AS01-SS41-(0-1)	10,640	0 / 34	0.10	NO
Fluoranthene	370 - 8,900	44 / 47	12,000	AS01-SS57-0-1	100	37 / 47	120	YES
Fluorene	370 - 8,900	8 / 47	5,500	AS01-SS57-0-1	1,700	1 / 47	3.24	YES
Hexachlorobenzene	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Hexachlorobutadiene	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Hexachlorocyclopentadiene	370 - 500	0 / 33	--	--	1,000	-- / --	0.50	NO
Hexachloroethane	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Indeno(1,2,3-cd)pyrene	370 - 8,900	39 / 47	5,400	AS01-SS57-0-1	100	9 / 47	54.0	YES
Isophorone	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
Naphthalene	370 - 500	8 / 34	120	AS01-SS24-(0-1)	100	2 / 34	1.20	YES
PAH, total	-- - --	44 / 47	145,600	AS01-SS57-0-1	7,462	6 / 47	19.5	YES
Pentachlorophenol	910 - 2,400	0 / 34	--	--	3,000	-- / --	0.80	NO
Phenanthrene	370 - 17,000	42 / 47	31,000	AS01-SS57-0-1	100	32 / 47	310	YES
Phenol	370 - 500	0 / 34	--	--	1,880	-- / --	0.27	NO
Pyrene	370 - 17,000	42 / 47	21,000	AS01-SS57-0-1	100	36 / 47	210	YES
bis(2-Chloroethoxy)methane	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
bis(2-Chloroethyl)ether	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
bis(2-Ethylhexyl)phthalate	370 - 500	9 / 34	940	AS01-SS41-(0-1)	10,000	0 / 34	0.09	NO
n-Nitroso-di-n-propylamine	370 - 500	0 / 34	--	--	NSV	-- / --	NSV	NO
n-Nitrosodiphenylamine	370 - 500	1 / 34	440	AS01-SS41-(0-1)	1,090	0 / 34	0.40	NO
<b>Explosives (µg/kg)</b>								
1,3,5-Trinitrobenzene	250 - 25,000	0 / 14	--	--	NSV	-- / --	NSV	NO
1,3-Dinitrobenzene	250 - 25,000	0 / 14	--	--	NSV	-- / --	NSV	NO
2,4,6-Trinitrotoluene	38.0 - 25,000	0 / 16	--	--	30,000	-- / --	0.83	NO
2,4-Dinitrotoluene	250 - 25,000	0 / 34	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
2,6-Dinitrotoluene	250 - 25,000	0 / 34	--	--	NSV	-- / --	NSV	NO
2-Amino-4,6-dinitrotoluene	250 - 25,000	0 / 14	--	--	NSV	-- / --	NSV	NO
2-Nitrotoluene	250 - 25,000	0 / 14	--	--	NSV	-- / --	NSV	NO
3-Nitrotoluene	250 - 25,000	0 / 14	--	--	NSV	-- / --	NSV	NO
4-Amino-2,6-dinitrotoluene	250 - 25,000	0 / 14	--	--	NSV	-- / --	NSV	NO
4-Nitrotoluene	250 - 25,000	0 / 4	--	--	NSV	-- / --	NSV	NO
HMX	500 - 50,000	3 / 14	530,000	AS01-SS72-0-0.5	5,000	1 / 14	106	YES
Nitrobenzene	250 - 25,000	0 / 31	--	--	2,260	-- / --	11.1	-- <sup>3</sup>
Nitroglycerin	38.0 - 67,000	1 / 16	500	AS01-SS72-0-0.5	NSV	-- / --	NSV	YES
Nitroguanidine	120,000 - 130,000	0 / 10	--	--	NSV	-- / --	NSV	NO
PETN	38.0 - 250,000	0 / 16	--	--	NSV	-- / --	NSV	NO
Perchlorate	47.8 - 70.0	1 / 14	311	AS01-SS72-0-0.5	1,000	0 / 14	0.31	NO
RDX	38.0 - 50,000	2 / 16	7,300	AS01-SS72-0-0.5	1,000	1 / 16	7.30	YES
Tetryl	580 - 65,000	0 / 14	--	--	25,000	-- / --	2.60	-- <sup>3</sup>
<b>Volatile Organic Compounds (µg/kg)</b>								
1,1,1-Trichloroethane	11.0 - 1,800	5 / 41	3.10	AS01-SS36-(0-1)	300	0 / 41	0.01	NO
1,1,2,2-Tetrachloroethane	11.0 - 1,800	0 / 41	--	--	300	-- / --	6.00	-- <sup>3</sup>
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 1,800	0 / 34	--	--	NSV	-- / --	NSV	NO
1,1,2-Trichloroethane	11.0 - 1,800	0 / 41	--	--	300	-- / --	6.00	-- <sup>3</sup>
1,1-Dichloroethane	11.0 - 1,800	0 / 41	--	--	300	-- / --	6.00	-- <sup>3</sup>
1,1-Dichloroethene	11.0 - 1,800	5 / 41	2.60	AS01-SS28-(0-1)	NSV	-- / --	NSV	YES
1,2,4-Trichlorobenzene	11.0 - 1,800	1 / 43	79.0	AS01-SS72-0-0.5	1,270	0 / 43	0.06	NO
1,2-Dibromo-3-chloropropane	11.0 - 15.0	0 / 27	--	--	NSV	-- / --	NSV	NO
1,2-Dibromoethane	11.0 - 1,800	0 / 34	--	--	5,000	-- / --	0.36	NO
1,2-Dichlorobenzene	11.0 - 1,800	0 / 44	--	--	100	-- / --	18.0	-- <sup>3</sup>
1,2-Dichloroethane	11.0 - 1,800	0 / 41	--	--	730	-- / --	2.47	-- <sup>3</sup>

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
1,2-Dichloroethene (total)	11.0 - 1,800	1 / 6	16,000	HCS-BG-110S	300	1 / 6	53.3	YES
1,2-Dichloropropane	11.0 - 1,800	0 / 41	--	--	38,800	-- / --	0.05	NO
1,3-Dichlorobenzene	11.0 - 1,800	0 / 43	--	--	NSV	-- / --	NSV	NO
1,4-Dichlorobenzene	11.0 - 1,800	0 / 43	--	--	1,280	-- / --	1.41	-- <sup>3</sup>
2-Butanone	11.0 - 1,800	2 / 41	2.80	AS01-SS46-0-1	NSV	-- / --	NSV	YES
2-Hexanone	11.0 - 1,800	0 / 41	--	--	NSV	-- / --	NSV	NO
4-Methyl-2-pentanone	11.0 - 1,800	1 / 41	430	AS01-SS72-0-0.5	10,000	0 / 41	0.04	NO
Acetone	11.0 - 1,800	2 / 41	30.0	AS01-SS50-0-1	NSV	-- / --	NSV	YES
Benzene	11.0 - 1,800	0 / 41	--	--	191	-- / --	9.42	-- <sup>3</sup>
Bromodichloromethane	11.0 - 1,800	0 / 41	--	--	45,000	-- / --	0.04	NO
Bromoform	11.0 - 1,800	0 / 41	--	--	114,700	-- / --	0.02	NO
Bromomethane	11.0 - 1,800	0 / 41	--	--	NSV	-- / --	NSV	NO
Carbon disulfide	11.0 - 1,800	0 / 40	--	--	NSV	-- / --	NSV	NO
Carbon tetrachloride	11.0 - 1,800	0 / 41	--	--	1,000,000	-- / --	0.002	NO
Chlorobenzene	11.0 - 1,800	0 / 41	--	--	2,400	-- / --	0.75	NO
Chloroethane	11.0 - 1,800	0 / 41	--	--	NSV	-- / --	NSV	NO
Chloroform	11.0 - 1,800	1 / 41	1.00	HCS-BG-84S	1,820	0 / 41	0.001	NO
Chloromethane	11.0 - 1,800	1 / 41	370	HCS-BG-98S	NSV	-- / --	NSV	YES
Cumene	11.0 - 1,800	0 / 34	--	--	NSV	-- / --	NSV	NO
Cyclohexane	11.0 - 1,800	0 / 34	--	--	NSV	-- / --	NSV	NO
Dibromochloromethane	11.0 - 1,800	0 / 41	--	--	NSV	-- / --	NSV	NO
Dichlorodifluoromethane(Freon-12)	11.0 - 1,800	0 / 34	--	--	NSV	-- / --	NSV	NO
Ethylbenzene	11.0 - 1,800	0 / 41	--	--	9,109	-- / --	0.20	NO
Methyl acetate	11.0 - 1,800	7 / 34	1,600	AS01-SS72-0-0.5	NSV	-- / --	NSV	YES
Methyl-tert-butyl ether (MTBE)	11.0 - 1,800	0 / 34	--	--	NSV	-- / --	NSV	NO
Methylcyclohexane	11.0 - 1,800	2 / 34	1.50	AS01-SS46-0-1	NSV	-- / --	NSV	YES
Methylene chloride	11.0 - 1,800	2 / 41	5.00	HCS-BG-84S	1,822	0 / 41	0.003	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Styrene	11.0 - 1,800	0 / 41	--	--	18,218	-- / --	0.10	NO
Tetrachloroethene	11.0 - 1,800	4 / 41	730	AS01-SS51-0-1	730	0 / 41	1.00	NO
Toluene	11.0 - 1,800	2 / 41	150	AS01-SS72-0-0.5	23,669	0 / 41	0.01	NO
Trichloroethene	11.0 - 15,000	24 / 41	82,000	AS01-SS21-(0-1)	10,920	6 / 41	7.51	YES
Trichlorofluoromethane(Freon-11)	11.0 - 1,800	0 / 34	--	--	NSV	-- / --	NSV	NO
Vinyl chloride	11.0 - 1,800	0 / 41	--	--	300	-- / --	6.00	-- <sup>3</sup>
Xylene, total	11.0 - 1,800	1 / 41	1.40	AS01-SS28-(0-1)	4,559	0 / 41	0.0003	NO
cis-1,2-Dichloroethene	11.0 - 1,800	5 / 34	120	AS01-SS52-0-1	300	0 / 34	0.40	NO
cis-1,3-Dichloropropene	11.0 - 1,800	0 / 41	--	--	300	-- / --	6.00	-- <sup>3</sup>
o-Xylene	11.0 - 14.0	0 / 21	--	--	NSV	-- / --	NSV	NO
trans-1,2-Dichloroethene	11.0 - 1,800	0 / 34	--	--	300	-- / --	6.00	-- <sup>3</sup>
trans-1,3-Dichloropropene	11.0 - 1,800	0 / 41	--	--	300	-- / --	6.00	-- <sup>3</sup>
<b>Dioxin/Furans (µg/kg)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00019 - 0.0076	23 / 23	1.100	AS01-SS53-0-1	NSV	-- / --	NSV	NO
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00013 - 0.0076	23 / 23	1.400	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00015 - 0.0320	19 / 23	0.240	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00016 - 0.1300	19 / 23	0.054	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00013 - 0.4100	20 / 23	0.360	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00013 - 0.1200	19 / 23	0.130	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00012 - 0.3600	20 / 23	0.420	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.00013 - 0.0680	19 / 23	0.130	AS01-SS53-0-1	NSV	-- / --	NSV	NO
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00016 - 0.1400	10 / 23	0.031	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00012 - 0.1100	19 / 23	0.056	HCS-B1-C	NSV	-- / --	NSV	NO
1,2,3,7,8-Pentachlorodibenzofuran	0.00016 - 0.0076	22 / 23	0.250	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00014 - 0.1400	20 / 23	0.330	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
2,3,4,7,8-Pentachlorodibenzofuran	0.00014 - 0.0580	22 / 23	0.300	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-37

## Step 2 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
2,3,7,8-TCDD (dioxin)	0.00015 - 0.1000	18 / 23	0.016	AS01-SS53-0-1	10.0	0 / 23	0.002	NO
2,3,7,8-Tetrachlorodibenzofuran	0.00011 - 0.1200	22 / 23	0.190	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
Total Octachlorodibenzo-p-dioxin	0.00015 - 0.0150	23 / 23	3.866	AS01-SS37-(0-1)	NSV	-- / --	NSV	NO
Total Octachlorodibenzofuran	0.00010 - 0.0150	23 / 23	1.700	HCS-B1-C	NSV	-- / --	NSV	NO
Total heptachlorodibenzo-p-dioxin	0.00019 - 0.0076	23 / 23	2.600	AS01-SS53-0-1	NSV	-- / --	NSV	NO
Total heptachlorodibenzofuran	0.00013 - 0.0076	23 / 23	2.300	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
Total hexachlorodibenzo-p-dioxin	0.00013 - 0.0076	23 / 23	1.800	HCS-B2-C	NSV	-- / --	NSV	NO
Total hexachlorodibenzofuran	0.00013 - 0.0069	22 / 23	3.100	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
Total pentachlorodibenzo-p-dioxin	0.00012 - 0.0069	21 / 23	0.830	HCS-B1-C	NSV	-- / --	NSV	NO
Total pentachlorodibenzofuran	0.00015 - 0.0076	23 / 23	2.800	AS01-SS72-0-0.5	NSV	-- / --	NSV	NO
Total tetrachlorodibenzo-p-dioxin	0.00015 - 0.0015	23 / 23	0.660	HCS-B1-C	NSV	-- / --	NSV	NO
Total tetrachlorodibenzofuran	0.00019 - 0.0015	23 / 23	3.300	HCS-B1-C	NSV	-- / --	NSV	NO
Dioxin/Furan TEQ	-- - --	23 / 23	0.413	AS01-SS72P-0-0.5	10.0	0 / 23	0.04	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-38

## Step 3 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC?
<b>Inorganics (mg/kg)</b>										
Aluminum	2.42 - 60.6	54 / 54	96,900	HCS-B1-4-S	12,876	50.0	54 / 54	1,938	258	YES
Antimony	2.09 - 18.2	20 / 54	25.1	HCS-B2-10	3.82	5.00	9 / 54	5.02	0.76	YES
Barium	0.45 - 60.6	53 / 54	758	HCS-B1-4-S	218	500	3 / 54	1.52	0.44	NO
Cadmium	0.58 - 3.50	25 / 54	373	AS01-SS72-0-0.5	15.2	4.00	13 / 54	93.3	3.80	YES
Chromium	1.13 - 3.00	54 / 54	319	AS01-SS72-0-0.5	35.0	0.40	54 / 54	798	87.6	YES
Copper	0.54 - 7.60	53 / 54	2,150	HCS-B2-7-S	231	50.0	24 / 54	43.0	4.63	YES
Iron	0.16 - 30.3	54 / 54	122,000	HCS-B1-4-S	32,552	200	54 / 54	610	163	YES
Lead	0.66 - 0.91	54 / 54	12,100	HCS-B1-4-S	616	50.0	29 / 54	242	12.3	YES
Manganese	0.11 - 4.50	54 / 54	2,320	AS01-SS25-(0-1)	1,262	500	50 / 54	4.64	2.52	YES
Mercury	0.11 - 1.40	50 / 54	56.3	AS01-SS72-0-0.5	2.09	0.10	49 / 54	563	20.9	YES
Nickel	0.91 - 12.1	53 / 54	240	AS01-SS22-(0-1)	58.4	30.0	47 / 54	8.00	1.95	YES
Selenium	0.44 - 1.50	14 / 52	3.90	HCS-B1-4-S	0.73	1.80	1 / 52	2.17	0.40	NO
Silver	1.13 - 3.00	33 / 52	121	HCS-B2-7-S	12.9	2.00	27 / 52	60.5	6.43	YES
Thallium	0.46 - 3.00	2 / 54	3.10	AS01-SS56-0-1	0.89	1.00	2 / 54	3.10	0.89	NO
Vanadium	0.59 - 15.1	53 / 54	332	AS01-SS22-(0-1)	36.8	2.00	53 / 54	166	18.4	YES
Zinc	0.25 - 6.10	54 / 54	4,230	HCS-B2-10	577	50.0	53 / 54	84.6	11.5	YES
<b>Semivolatile Organic Compounds (µg/kg)</b>										
2-Methylnaphthalene	370 - 500	16 / 34	170	AS01-SS24-(0-1)	147	100	3 / 34	1.70	1.47	YES
3- and 4-Methylphenol	370 - 460	1 / 21	110	AS01-SS30-(0-1)	198	100	1 / 21	1.10	--	YES
Acenaphthene	370 - 8,900	6 / 47	4,100	AS01-SS57-0-1	368	2,500	1 / 47	1.64	0.15	NO
Acenaphthylene	370 - 8,900	5 / 47	630	AS01-SS49-0-1	246	100	1 / 47	6.30	2.46	YES
Acetophenone	370 - 500	1 / 25	55.0	AS01-SS72-0-0.5	199	NSV	-- / --	NSV	NSV	YES
Anthracene	370 - 8,900	24 / 47	8,300	AS01-SS57-0-1	353	100	8 / 47	83.0	3.53	YES
Benzaldehyde	370 - 500	4 / 24	600	AS01-SS24-(0-1)	242	NSV	-- / --	NSV	NSV	YES
Benzo(a)anthracene	370 - 8,900	42 / 47	8,100	AS01-SS57-0-1	526	100	21 / 47	81.0	5.26	YES
Benzo(a)pyrene	370 - 17,000	34 / 47	12,000	AS01-SS57-0-1	621	100	17 / 47	120	6.21	YES
Benzo(b)fluoranthene	370 - 22,000	42 / 47	21,000	AS01-SS49-0-1	1,021	100	31 / 47	210	10.2	YES

TABLE G-38

## Step 3 Surface Soil Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC?
Benzo(g,h,i)perylene	370 - 8,900	33 / 47	4,200	AS01-SS57-0-1	283	100	7 / 47	42.0	2.83	YES
Benzo(k)fluoranthene	370 - 8,900	34 / 47	8,600	AS01-SS49-0-1	505	100	16 / 47	86.0	5.05	YES
Caprolactam	370 - 500	1 / 25	68.0	AS01-SS71-0-0.5	199	NSV	-- / --	NSV	NSV	YES
Carbazole	370 - 500	6 / 31	210	AS01-SS25-(0-1)	186	NSV	-- / --	NSV	NSV	YES
Chrysene	370 - 8,900	42 / 47	10,000	AS01-SS49-0-1	639	100	34 / 47	100	6.39	YES
Dibenz(a,h)anthracene	370 - 500	4 / 34	430	AS01-SS26-(0-1)	206	100	2 / 34	4.30	2.06	YES
Dibenzofuran	370 - 500	5 / 34	260	HCS-B2-4-4	195	NSV	-- / --	NSV	NSV	YES
Fluoranthene	370 - 8,900	44 / 47	12,000	AS01-SS57-0-1	657	100	37 / 47	120	6.57	YES
Fluorene	370 - 8,900	8 / 47	5,500	AS01-SS57-0-1	400	1,700	1 / 47	3.24	0.24	NO
Indeno(1,2,3-cd)pyrene	370 - 8,900	39 / 47	5,400	AS01-SS57-0-1	340	100	9 / 47	54.0	3.40	YES
Naphthalene	370 - 500	8 / 34	120	AS01-SS24-(0-1)	177	100	2 / 34	1.20	--	YES
PAHs, total	-- - --	44 / 47	145,600	AS01-SS57-0-1	8,355	7,462	6 / 47	19.5	1.12	YES
Phenanthrene	370 - 17,000	42 / 47	31,000	AS01-SS57-0-1	932	100	32 / 47	310	9.32	YES
Pyrene	370 - 17,000	42 / 47	21,000	AS01-SS57-0-1	933	100	36 / 47	210	9.33	YES
<b>Explosives (µg/kg)</b>										
HMX	500 - 50,000	3 / 14	530,000	AS01-SS72-0-0.5	38,141	5,000	1 / 14	106	7.63	YES
Nitroglycerin	38.0 - 67,000	1 / 16	500	AS01-SS72-0-0.5	19,706	NSV	-- / --	NSV	NSV	YES
RDX	38.0 - 50,000	2 / 16	7,300	AS01-SS72-0-0.5	690	1,000	1 / 16	7.30	0.69	YES
<b>Volatile Organic Compounds (µg/kg)</b>										
1,1-Dichloroethene	11.0 - 1,800	5 / 41	2.60	AS01-SS28-(0-1)	149	NSV	-- / --	NSV	NSV	YES
1,2-Dichloroethene (total)	11.0 - 1,800	1 / 6	16,000	HCS-BG-110S	2,974	300	1 / 6	53.3	9.91	YES
2-Butanone	11.0 - 1,800	2 / 41	2.80	AS01-SS46-0-1	149	NSV	-- / --	NSV	NSV	YES
Acetone	11.0 - 1,800	2 / 41	30.0	AS01-SS50-0-1	83.4	NSV	-- / --	NSV	NSV	YES
Chloromethane	11.0 - 1,800	1 / 41	370	HCS-BG-98S	136	NSV	-- / --	NSV	NSV	YES
Methyl acetate	11.0 - 1,800	7 / 34	1,600	AS01-SS72-0-0.5	154	NSV	-- / --	NSV	NSV	YES
Methylcyclohexane	11.0 - 1,800	2 / 34	1.50	AS01-SS46-0-1	102	NSV	-- / --	NSV	NSV	YES
Trichloroethene	11.0 - 15,000	24 / 41	82,000	AS01-SS21-(0-1)	6,966	10,920	6 / 41	7.51	0.64	YES

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Inorganics (mg/kg)</b>								
Aluminum	0.66 - 54.9	31 / 31	19,000	AS01-SS67-0-0.5	50.0	31 / 31	380	YES
Antimony	0.22 - 16.5	20 / 31	2.50	AS01-SS70-0-0.5	5.00	0 / 31	0.50	NO
Arsenic	0.22 - 2.70	31 / 31	9.50	AS01-SS01-R01X	60.0	0 / 31	0.16	NO
Barium	0.22 - 54.9	31 / 31	255	AS01-SS64-0-0.5	500	0 / 31	0.51	NO
Beryllium	0.11 - 1.40	21 / 31	1.20	AS01-SS01-R01X	10.0	0 / 31	0.12	NO
Cadmium	0.11 - 1.40	22 / 31	10.9	AS01-SS15-R01X	4.00	1 / 31	2.73	YES
Calcium <sup>2</sup>	1,170 - 6,360	11 / 11	266,000	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
Chromium	0.11 - 2.70	31 / 31	23.8	AS01-SS07-R01X	0.40	31 / 31	59.5	YES
Cobalt	0.11 - 13.7	31 / 31	16.5	AS01-SS13-R01X	100	0 / 31	0.17	NO
Copper	0.11 - 6.90	31 / 31	1,820	AS01-SS67-0-0.5	50.0	2 / 31	36.4	YES
Cyanide	0.050 - 0.69	27 / 31	0.91	AS01-SS61-0-0.5	27.5	0 / 31	0.03	NO
Iron	8.30 - 27.4	31 / 31	33,200	AS01-SS11-R01X	200	31 / 31	166	YES
Lead	0.11 - 0.82	31 / 31	1,730	AS01-SS02-R01X	50.0	14 / 31	34.6	YES
Magnesium <sup>2</sup>	1,130 - 1,370	11 / 11	18,400	AS01-SS69P-0-0.5	NSV	-- / --	NSV	NO
Manganese	0.11 - 4.10	31 / 31	1,120	AS01-SS09P-R01X	500	28 / 31	2.24	YES
Mercury	0.020 - 0.25	30 / 31	7.20	AS01-SS70-0-0.5	0.10	6 / 31	72.0	YES
Nickel	0.11 - 11.0	31 / 31	33.4	AS01-SS11-R01X	30.0	1 / 31	1.11	YES
Potassium <sup>2</sup>	1,130 - 1,370	11 / 11	1,040	AS01-SS64-0-0.5	NSV	-- / --	NSV	NO
Selenium	0.33 - 1.40	8 / 31	1.10	AS01-SS60-0-0.5	1.80	0 / 31	0.61	NO
Silver	0.11 - 2.70	10 / 31	3.00	AS01-SS69P-0-0.5	2.00	1 / 31	1.50	YES
Sodium <sup>2</sup>	1,130 - 1,370	1 / 11	139	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
Thallium	0.22 - 2.70	20 / 31	2.30	AS01-SS64-0-0.5	1.00	4 / 31	2.30	YES
Tin	2.60 - 3.10	20 / 20	8.40	AS01-SS14-R01X	50.0	0 / 20	0.17	NO
Vanadium	0.11 - 13.7	31 / 31	36.7	AS01-SS19-R01X	2.00	31 / 31	18.4	YES
Zinc	0.33 - 5.50	31 / 31	271	AS01-SS02-R01X	50.0	30 / 31	5.42	YES

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Semivolatile Organic Compounds (µg/kg)</b>								
1,1-Biphenyl	340 - 450	1 / 31	20.0	AS01-SS19-R01X	6,800	0 / 31	0.003	NO
1,2,4,5-Tetrachlorobenzene	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
1,4-Naphthoquinone	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
1-Naphthylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2,3,4,6-Tetrachlorophenol	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2,4,5-Trichlorophenol	860 - 21,000	0 / 39	--	--	430	-- / --	48.8	-- <sup>3</sup>
2,4,6-Trichlorophenol	340 - 4,300	0 / 39	--	--	580	-- / --	7.41	-- <sup>3</sup>
2,4-Dichlorophenol	340 - 4,300	0 / 39	--	--	13,400	-- / --	0.32	NO
2,4-Dimethylphenol	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
2,4-Dinitrophenol	860 - 21,000	0 / 39	--	--	10,000	-- / --	2.10	-- <sup>3</sup>
2,6-Dichlorophenol	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Acetylaminofluorene	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Chloronaphthalene	340 - 4,300	0 / 39	--	--	1,405	-- / --	3.06	-- <sup>3</sup>
2-Chlorophenol	340 - 4,300	0 / 39	--	--	750	-- / --	5.73	-- <sup>3</sup>
2-Methyl-5-nitroaniline	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Methylaniline	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Methylnaphthalene	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
2-Methylphenol	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
2-Naphthylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Nitroaniline	860 - 21,000	2 / 39	13,000	HCS-BP-7	NSV	-- / --	NSV	YES
2-Nitrophenol	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Picoline	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
3,3'-Dichlorobenzidine	340 - 8,700	0 / 39	--	--	NSV	-- / --	NSV	NO
3,3'-Dimethylbenzidine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
3-Methylcholanthrene	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
3-Methylphenol	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
3-Nitroaniline	860 - 21,000	0 / 39	--	--	NSV	-- / --	NSV	NO
4,6-Dinitro-2-methylphenol	860 - 21,000	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Aminobiphenyl	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
4-Bromophenyl-phenylether	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Chloro-3-methylphenol	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Chloroaniline	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Chlorophenyl-phenylether	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Methylphenol	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
4-Nitroaniline	860 - 21,000	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Nitrophenol	860 - 21,000	0 / 39	--	--	380	-- / --	55.3	-- <sup>3</sup>
4-Nitroquinoline-1-oxide	890 - 1,000	0 / 14	--	--	NSV	-- / --	NSV	NO
7,12-Dimethylbenz(a)anthracene	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Acenaphthene	340 - 4,300	0 / 39	--	--	2,500	-- / --	1.72	-- <sup>3</sup>
Acenaphthylene	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
Acetophenone	340 - 450	0 / 31	--	--	NSV	-- / --	NSV	NO
Aniline	330 - 330	0 / 20	--	--	NSV	-- / --	NSV	NO
Anthracene	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
Aramite	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Atrazine	370 - 450	0 / 11	--	--	NSV	-- / --	NSV	NO
Benzaldehyde	370 - 450	0 / 11	--	--	NSV	-- / --	NSV	NO
Benzo(a)anthracene	340 - 4,300	7 / 39	66.0	AS01-SS01-R01X	100	0 / 39	0.66	NO
Benzo(a)pyrene	340 - 4,300	8 / 39	54.0	AS01-SS01-R01X	100	0 / 39	0.54	NO
Benzo(b)fluoranthene	340 - 4,300	3 / 39	68.0	AS01-SS69P-0-0.5	100	0 / 39	0.68	NO
Benzo(g,h,i)perylene	340 - 4,300	1 / 39	65.0	AS01-SS69P-0-0.5	100	0 / 39	0.65	NO
Benzo(k)fluoranthene	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Benzoic acid	860 - 21,000	0 / 28	--	--	NSV	-- / --	NSV	NO
Benzyl alcohol	340 - 4,300	0 / 28	--	--	NSV	-- / --	NSV	NO
Bis(2-chloro-1-methylethyl) ether	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Butylbenzylphthalate	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Caprolactam	370 - 450	2 / 11	46.0	AS01-SS67-0-0.5	NSV	-- / --	NSV	YES
Carbazole	330 - 450	0 / 31	--	--	NSV	-- / --	NSV	NO
Chlorobenzilate	360 - 410	0 / 14	--	--	NSV	-- / --	NSV	NO
Chrysene	340 - 4,300	16 / 39	110	AS01-SS01-R01X	100	1 / 39	1.10	YES
Di-n-butylphthalate	340 - 4,300	0 / 39	--	--	200,000	-- / --	0.02	NO
Di-n-octylphthalate	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Diallate	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Dibenz(a,h)anthracene	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
Dibenzofuran	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Diethylphthalate	340 - 4,300	3 / 39	270	AS01-SS67-0-0.5	13,400	0 / 39	0.02	NO
Dimethoate	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Dimethyl phthalate	340 - 4,300	4 / 39	2,300	AS01-SS02-R01X	10,640	0 / 39	0.22	NO
Dinoseb	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Diphenylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Disulfoton	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Ethyl methanesulfonate	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Famphur	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Fluoranthene	340 - 4,300	4 / 39	93.0	AS01-SS62-0-0.5	100	0 / 39	0.93	NO
Fluorene	340 - 4,300	0 / 39	--	--	1,700	-- / --	2.53	-- <sup>3</sup>
Hexachlorobenzene	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Hexachlorobutadiene	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Hexachlorocyclopentadiene	340 - 4,300	0 / 39	--	--	1,000	-- / --	4.30	-- <sup>3</sup>

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Hexachloroethane	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Hexachlorophene	14,000 - 17,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Hexachloropropene	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Indeno(1,2,3-cd)pyrene	340 - 4,300	0 / 39	--	--	100	-- / --	43.0	-- <sup>3</sup>
Isodrin	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Isophorone	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Isosafrole	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Kepone	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Methapyrilene	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Methyl parathion	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
N-Nitrosomorpholine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
N-Nitrosopiperidine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Naphthalene	340 - 4,300	1 / 39	40.0	AS01-SS01-R01X	100	0 / 39	0.40	NO
O,O,O-Triethyl phosphorothioate	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
PAHs, total	-- - --	18 / 39	3,369	AS01-SS13-R01X	5,576	0 / 39	0.60	NO
Parathion	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Pentachlorobenzene	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Pentachloronitrobenzene	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Pentachlorophenol	860 - 21,000	0 / 39	--	--	3,000	-- / --	7.00	-- <sup>3</sup>
Phenacetin	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Phenanthrene	340 - 4,300	17 / 39	140	AS01-SS01-R01X	100	2 / 39	1.40	YES
Phenol	340 - 4,300	0 / 39	--	--	1,880	-- / --	2.29	-- <sup>3</sup>
Phorate	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Pronamide	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Pyrene	340 - 4,300	3 / 39	100	AS01-SS69P-0-0.5	100	0 / 39	1.00	NO
Pyridine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Safrole	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Sulfotepp	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
Thionazin	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
a,a-Dimethylphenethylamine	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
bis(2-Chloroethoxy)methane	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
bis(2-Chloroethyl)ether	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
bis(2-Ethylhexyl)phthalate	340 - 4,300	15 / 39	1,600	HCS-BP-1	10,000	0 / 39	0.16	NO
n-Nitroso-di-n-butylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
n-Nitroso-di-n-propylamine	340 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
n-Nitroso-n-methylethylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
n-Nitrosodiethylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
n-Nitrosodimethylamine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
n-Nitrosodiphenylamine	340 - 4,300	2 / 39	3,000	HCS-BP-7	1,090	1 / 39	2.75	YES
n-Nitrosopyrrolidine	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
p-Dimethylaminoazobenzene	340 - 420	0 / 20	--	--	NSV	-- / --	NSV	NO
p-Phenylenediamine	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
<b>Explosives (µg/kg)</b>								
1,3,5-Trinitrobenzene	250 - 2,500	2 / 25	30,000	HCS-BP-7	NSV	-- / --	NSV	YES
1,3-Dinitrobenzene	250 - 2,500	0 / 39	--	--	NSV	-- / --	NSV	NO
2,4,6-Trinitrotoluene	250 - 2,500	0 / 39	--	--	30,000	-- / --	0.08	NO
2,4-Dinitrotoluene	250 - 2,500	1 / 39	720	HCS-BP-1	NSV	-- / --	NSV	YES
2,6-Dinitrotoluene	250 - 2,500	1 / 39	130	HCS-BP-1	NSV	-- / --	NSV	YES
2-Amino-4,6-dinitrotoluene	250 - 2,500	0 / 31	--	--	NSV	-- / --	NSV	NO
2-Nitrotoluene	250 - 2,500	0 / 39	--	--	NSV	-- / --	NSV	NO
3-Nitrotoluene	250 - 2,500	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Amino-2,6-dinitrotoluene	250 - 2,500	0 / 31	--	--	NSV	-- / --	NSV	NO
4-Nitrotoluene	250 - 2,500	0 / 31	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
HMX	417 - 5,000	24 / 39	51,000	AS01-SS64-0-0.5	5,000	5 / 39	10.2	YES
Nitrobenzene	250 - 4,300	0 / 39	--	--	2,260	-- / --	1.90	-- <sup>3</sup>
Nitroglycerin	417 - 2,500	1 / 31	98,000	AS01-SS64-0-0.5	NSV	-- / --	NSV	YES
PETN	2,500 - 25,000	0 / 11	--	--	NSV	-- / --	NSV	NO
Perchlorate	45.4 - 2,380	8 / 31	31,300	AS01-SS64-0-0.5	1,000	1 / 31	31.3	YES
RDX	417 - 5,000	20 / 39	34,000	HCS-BP-6	1,000	11 / 39	34.0	YES
Tetryl	417 - 6,500	1 / 39	540	HCS-BP-7	25,000	0 / 39	0.02	NO
<b>Volatile Organic Compounds (µg/kg)</b>								
1,1,1,2-Tetrachloroethane	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
1,1,1-Trichloroethane	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
1,1,2,2-Tetrachloroethane	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 910	0 / 11	--	--	NSV	-- / --	NSV	NO
1,1,2-Trichloroethane	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
1,1-Dichloroethane	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
1,1-Dichloroethene	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
1,2,3-Trichloropropane	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
1,2,4-Trichlorobenzene	11.0 - 4,300	0 / 39	--	--	1,270	-- / --	3.39	-- <sup>3</sup>
1,2-Dibromo-3-chloropropane	6.00 - 18.0	0 / 28	--	--	NSV	-- / --	NSV	NO
1,2-Dibromoethane	6.00 - 910	0 / 31	--	--	5,000	-- / --	0.18	NO
1,2-Dichlorobenzene	11.0 - 4,300	0 / 40	--	--	100	-- / --	43.0	-- <sup>3</sup>
1,2-Dichloroethane	6.00 - 910	0 / 34	--	--	545	-- / --	1.67	-- <sup>3</sup>
1,2-Dichloroethene (total)	6.00 - 14.0	0 / 26	--	--	300	-- / --	0.05	NO
1,2-Dichloropropane	6.00 - 910	0 / 34	--	--	38,800	-- / --	0.02	NO
1,3-Dichlorobenzene	11.0 - 4,300	0 / 39	--	--	NSV	-- / --	NSV	NO
1,4-Dichlorobenzene	11.0 - 4,300	0 / 39	--	--	1,280	-- / --	3.36	-- <sup>3</sup>

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
1,4-Dioxane	660 - 660	0 / 1	--	--	NSV	-- / --	NSV	NO
2-Butanone	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
2-Chloro-1,3-butadiene	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Chloroethyl vinyl ether	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
2-Hexanone	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
4-Methyl-2-pentanone	6.00 - 910	0 / 34	--	--	10,000	-- / --	0.09	NO
Acetone	6.00 - 910	5 / 34	52.0	AS01-SS61-0-0.5	NSV	-- / --	NSV	YES
Acetonitrile	230 - 260	0 / 20	--	--	NSV	-- / --	NSV	NO
Acrolein	66.0 - 66.0	0 / 1	--	--	NSV	-- / --	NSV	NO
Acrylonitrile	57.0 - 66.0	0 / 20	--	--	NSV	-- / --	NSV	NO
Allyl chloride	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
Benzene	6.00 - 910	0 / 34	--	--	143	-- / --	6.36	-- <sup>3</sup>
Bromodichloromethane	6.00 - 910	0 / 34	--	--	45,000	-- / --	0.02	NO
Bromoform	6.00 - 910	0 / 34	--	--	114,700	-- / --	0.01	NO
Bromomethane	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
Carbon disulfide	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
Carbon tetrachloride	6.00 - 910	0 / 34	--	--	1,000,000	-- / --	0.001	NO
Chlorobenzene	6.00 - 910	1 / 34	6.00	HCS-BG-4S	2,400	0 / 34	0.003	NO
Chloroethane	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
Chloroform	6.00 - 910	1 / 34	1.00	HCS-BG-55S	1,360	0 / 34	0.001	NO
Chloromethane	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
Cumene	11.0 - 910	0 / 11	--	--	NSV	-- / --	NSV	NO
Cyclohexane	11.0 - 910	0 / 11	--	--	NSV	-- / --	NSV	NO
Dibromochloromethane	6.00 - 910	0 / 34	--	--	NSV	-- / --	NSV	NO
Dibromomethane	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
Dichlorodifluoromethane(Freon-12)	6.00 - 910	0 / 31	--	--	NSV	-- / --	NSV	NO
Ethyl methacrylate	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Ethylbenzene	6.00 - 910	1 / 34	5.00	HCS-BG-4S	6,807	0 / 34	0.001	NO
Iodomethane	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
Isobutanol	260 - 260	0 / 1	--	--	NSV	-- / --	NSV	NO
Methacrylonitrile	110 - 130	0 / 20	--	--	NSV	-- / --	NSV	NO
Methyl acetate	11.0 - 910	5 / 11	180	AS01-SS62-0-0.5	NSV	-- / --	NSV	YES
Methyl methacrylate	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
Methyl methanesulfonate	860 - 1,000	0 / 20	--	--	NSV	-- / --	NSV	NO
Methyl-tert-butyl ether (MTBE)	11.0 - 910	0 / 11	--	--	NSV	-- / --	NSV	NO
Methylcyclohexane	11.0 - 910	0 / 11	--	--	NSV	-- / --	NSV	NO
Methylene chloride	6.00 - 910	1 / 34	4.00	HCS-BG-55S	1,361	0 / 34	0.003	NO
Pentachloroethane	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
Propionitrile	130 - 130	0 / 1	--	--	NSV	-- / --	NSV	NO
Styrene	6.00 - 910	2 / 34	3.00	HCS-BG-4S	13,614	0 / 34	0.0002	NO
Tetrachloroethene	6.00 - 910	1 / 34	420	AS01-SS69P-0-0.5	545	0 / 34	0.77	NO
Toluene	6.00 - 910	1 / 34	4.00	HCS-BG-4S	17,687	0 / 34	0.0002	NO
Trichloroethene	6.00 - 910	12 / 34	1,800	AS01-SS60-0-0.5	8,160	0 / 34	0.22	NO
Trichlorofluoromethane(Freon-11)	6.00 - 910	0 / 31	--	--	NSV	-- / --	NSV	NO
Vinyl acetate	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO
Vinyl chloride	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
Xylene, total	6.00 - 910	1 / 34	15.0	HCS-BG-4S	3,407	0 / 34	0.004	NO
cis-1,2-Dichloroethene	11.0 - 910	0 / 11	--	--	300	-- / --	3.03	-- <sup>3</sup>
cis-1,3-Dichloropropene	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
trans-1,2-Dichloroethene	11.0 - 910	0 / 11	--	--	300	-- / --	3.03	-- <sup>3</sup>
trans-1,3-Dichloropropene	6.00 - 910	0 / 34	--	--	300	-- / --	3.03	-- <sup>3</sup>
trans-1,4-Dichloro-2-butene	6.00 - 6.00	0 / 20	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-39

## Step 2 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Dioxin/Furans (µg/kg)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.00570 - 0.7950	13 / 31	0.1100	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.00042 - 0.3890	10 / 31	0.0390	AS01-SS02-R01X	NSV	-- / --	NSV	NO
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.00043 - 0.4550	2 / 31	0.0061	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.00056 - 0.6650	0 / 31	--	--	NSV	-- / --	NSV	NO
1,2,3,4,7,8-Hexachlorodibenzofuran	0.00036 - 0.2080	6 / 31	0.0120	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.00056 - 0.5950	2 / 31	0.0054	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
1,2,3,6,7,8-Hexachlorodibenzofuran	0.00036 - 0.1800	5 / 31	0.0081	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.00055 - 0.7640	1 / 31	0.0058	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
1,2,3,7,8,9-Hexachlorodibenzofuran	0.00037 - 0.1900	0 / 31	--	--	NSV	-- / --	NSV	NO
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.00077 - 0.2640	0 / 31	--	--	NSV	-- / --	NSV	NO
1,2,3,7,8-Pentachlorodibenzofuran	0.00045 - 0.3930	4 / 31	0.0082	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
2,3,4,6,7,8-Hexachlorodibenzofuran	0.00031 - 0.1960	3 / 31	0.0056	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
2,3,4,7,8-Pentachlorodibenzofuran	0.00052 - 0.3390	4 / 31	0.0079	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
2,3,7,8-TCDD (dioxin)	0.00033 - 0.0590	1 / 31	0.0008	AS01-SS60-0-0.5	10.0	0 / 31	0.0001	NO
2,3,7,8-Tetrachlorodibenzofuran	0.00030 - 0.0450	9 / 31	0.0078	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
Octachlorodibenzo-p-dioxin	0.01100 - 1.1840	31 / 31	1.3000	AS01-SS70-0-0.5	NSV	-- / --	NSV	NO
Octachlorodibenzofuran	0.00110 - 0.7090	11 / 31	0.0800	AS01-SS02-R01X	NSV	-- / --	NSV	NO
Total heptachlorodibenzo-p-dioxin	0.00570 - 0.7950	12 / 31	0.2300	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
Total heptachlorodibenzofuran	0.00057 - 0.3890	10 / 31	0.0670	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
Total hexachlorodibenzo-p-dioxin	0.00056 - 0.5950	8 / 31	0.0520	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
Total hexachlorodibenzofuran	0.00037 - 0.1800	7 / 31	0.0570	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
Total pentachlorodibenzo-p-dioxin	0.00079 - 0.0069	3 / 11	0.0086	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
Total pentachlorodibenzofuran	0.00052 - 0.0069	7 / 11	0.0690	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
Total tetrachlorodibenzo-p-dioxin	0.00040 - 0.0059	6 / 11	0.0150	AS01-SS60-0-0.5	NSV	-- / --	NSV	NO
Total tetrachlorodibenzofuran	0.00030 - 0.0014	9 / 11	0.0940	AS01-SS62-0-0.5	NSV	-- / --	NSV	NO
Dioxin/Furan TEQ	-- --	31 / 31	0.4065	AS01-SS16-R01X	10.0	0 / 31	0.04	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-40

## Step 3 Surface Soil Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC?
<b>Inorganics (mg/kg)</b>										
Aluminum	0.66 - 54.9	31 / 31	19,000	AS01-SS67-0-0.5	7,973	50.0	31 / 31	380	159	YES
Cadmium	0.11 - 1.40	22 / 31	10.9	AS01-SS15-R01X	0.88	4.00	1 / 31	2.73	0.22	NO
Chromium	0.11 - 2.70	31 / 31	23.8	AS01-SS07-R01X	12.9	0.40	31 / 31	59.5	32.3	YES
Copper	0.11 - 6.90	31 / 31	1,820	AS01-SS67-0-0.5	79.8	50.0	2 / 31	36.4	1.60	YES
Iron	8.30 - 27.4	31 / 31	33,200	AS01-SS11-R01X	25,827	200	31 / 31	166	129	YES
Lead	0.11 - 0.82	31 / 31	1,730	AS01-SS02-R01X	121	50.0	14 / 31	34.6	2.41	YES
Manganese	0.11 - 4.10	31 / 31	1,120	AS01-SS09P-R01X	815	500	28 / 31	2.24	1.63	YES
Mercury	0.02 - 0.25	30 / 31	7.20	AS01-SS70-0-0.5	0.31	0.10	6 / 31	72.0	3.11	YES
Nickel	0.11 - 11.0	31 / 31	33.4	AS01-SS11-R01X	21.3	30.0	1 / 31	1.11	0.71	NO
Silver	0.11 - 2.70	10 / 31	3.00	AS01-SS69P-0-0.5	0.25	2.00	1 / 31	1.50	0.13	NO
Thallium	0.22 - 2.70	20 / 31	2.30	AS01-SS64-0-0.5	0.70	1.00	4 / 31	2.30	0.70	NO
Vanadium	0.11 - 13.7	31 / 31	36.7	AS01-SS19-R01X	20.8	2.00	31 / 31	18.4	10.4	YES
Zinc	0.33 - 5.50	31 / 31	271	AS01-SS02-R01X	94.9	50.0	30 / 31	5.42	1.90	YES
<b>Semivolatile Organic Compounds (µg/kg)</b>										
2-Nitroaniline	860 - 21,000	2 / 39	13,000	HCS-BP-7	883	NSV	-- / --	NSV	NSV	YES
Caprolactam	370 - 450	2 / 11	46.0	AS01-SS67-0-0.5	179	NSV	-- / --	NSV	NSV	YES
Chrysene	340 - 4,300	16 / 39	110	AS01-SS01-R01X	188	100	1 / 39	1.10	--	YES
Phenanthrene	340 - 4,300	17 / 39	140	AS01-SS01-R01X	189	100	2 / 39	1.40	--	YES
n-Nitrosodiphenylamine	340 - 4,300	2 / 39	3,000	HCS-BP-7	271	1,090	1 / 39	2.75	0.25	NO
<b>Explosives (µg/kg)</b>										
1,3,5-Trinitrobenzene	250 - 2,500	2 / 25	30,000	HCS-BP-7	1,388	NSV	-- / --	NSV	NSV	YES
2,4-Dinitrotoluene	250 - 2,500	1 / 39	720	HCS-BP-1	227	NSV	-- / --	NSV	NSV	YES
2,6-Dinitrotoluene	250 - 2,500	1 / 39	130	HCS-BP-1	212	NSV	-- / --	NSV	NSV	YES
HMX	417 - 5,000	24 / 39	51,000	AS01-SS64-0-0.5	3,506	5,000	5 / 39	10.2	0.70	YES
Nitroglycerin	417 - 2,500	1 / 31	98,000	AS01-SS64-0-0.5	3,709	NSV	-- / --	NSV	NSV	YES
Perchlorate	45.4 - 2,380	8 / 31	31,300	AS01-SS64-0-0.5	1,080	1,000	1 / 31	31.3	1.08	YES
RDX	417 - 5,000	20 / 39	34,000	HCS-BP-6	2,333	1,000	11 / 39	34.0	2.33	YES
<b>Volatile Organic Compounds (µg/kg)</b>										
Acetone	6.00 - 910	5 / 34	52.0	AS01-SS61-0-0.5	12.2	NSV	-- / --	NSV	NSV	YES
Methyl acetate	11.0 - 910	5 / 11	180	AS01-SS62-0-0.5	69.2	NSV	-- / --	NSV	NSV	YES

TABLE G-41

Summary of Hazard Quotients for Upper Trophic Level Terrestrial Receptors - Screening - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Short-tailed shrew		Meadow vole		Long-tailed weasel		American robin		Red-shouldered hawk	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
<b>Metals</b>										
Arsenic	17.2	1.72	22.3	2.23	1.67	0.17	0.99	0.33	0.01	<0.01
Cadmium	1,785	178	152	15.2	354	35.4	580	42.0	88.3	6.40
Chromium	9.41	0.94	0.42	0.04	1.61	0.16	54.3	10.9	9.42	1.88
Copper	37.0	28.6	12.4	9.57	42.9	33.2	5.50	4.19	5.06	3.85
Lead	301	30.1	78.4	7.84	83.6	8.36	1,182	118	76.0	7.60
Mercury	4,324	865	948	190	15.7	9.42	168	84.2	2.21	1.10
Nickel	3.48	1.74	0.91	0.45	0.87	0.44	1.02	0.74	0.21	0.15
Selenium	3.81	2.31	5.91	3.58	2.59	1.57	2.25	0.66	0.55	0.16
Silver	12.1	1.21	0.25	0.03	0.36	0.04	0.53	0.05	0.02	<0.01
Zinc	40.5	20.3	5.52	2.76	102	10.2	223	24.7	70.0	7.74
<b>Volatile and Semivolatile Organics</b>										
1,1,2,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
1,2,4-Trichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,4-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	0.41	0.04	0.04	<0.01	0.18	0.02	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	0.70	0.07	0.06	<0.01	0.29	0.03	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	0.91	0.09	0.09	<0.01	0.41	0.04	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	0.15	0.02	0.02	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	0.37	0.04	0.04	<0.01	0.17	0.02	<0.01	<0.01	<0.01	<0.01
Chrysene	0.70	0.07	0.06	<0.01	0.28	0.03	<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	0.04	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE G-41

Summary of Hazard Quotients for Upper Trophic Level Terrestrial Receptors - Screening - Floodplain

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Short-tailed shrew		Meadow vole		Long-tailed weasel		American robin		Red-shouldered hawk	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	0.11	0.06	<0.01	<0.01	0.04	0.02	0.44	0.08	0.16	0.03
Hexachlorobutadiene	0.04	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
Hexachloroethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.36	0.04	0.03	<0.01	0.15	0.01	<0.01	<0.01	<0.01	<0.01
Pentachlorophenol	0.92	0.09	0.03	<0.01	0.29	0.03	0.02	0.01	<0.01	<0.01
Phenanthrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Pyrene	1.35	0.14	0.16	0.02	0.57	0.06	0.01	<0.01	<0.01	<0.01
<b>Dioxin/Furans</b>										
Dioxin/furan (TEQ)	14.2	1.42	1.41	0.14	175	17.5	0.50	0.05	10.5	1.05

TABLE G-42

Summary of Hazard Quotients for Upper Trophic Level Terrestrial Receptors - Baseline - Floodplain

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Short-tailed shrew			Meadow vole			Long-tailed weasel			American robin			Red-shouldered hawk		
	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL
Metals															
Arsenic	2.89	0.91	0.29	0.30	0.10	0.03	0.30	0.09	0.03	--	--	--	--	--	--
Cadmium	8.70	2.75	0.87	0.50	0.16	0.05	2.29	0.72	0.23	2.74	0.74	0.20	0.88	0.24	0.06
Chromium	0.09	0.03	<0.01	--	--	--	0.03	0.01	<0.01	0.53	0.24	0.11	0.27	0.12	0.05
Copper	0.91	0.80	0.70	0.15	0.13	0.11	0.62	0.55	0.48	0.11	0.10	0.08	0.11	0.09	0.08
Lead	2.62	0.83	0.26	0.25	0.08	0.02	0.89	0.28	0.09	7.84	2.48	0.78	1.08	0.34	0.11
Mercury	6.48	2.90	1.30	1.20	0.54	0.24	0.13	0.10	0.08	0.25	0.17	0.12	0.02	0.02	0.01
Nickel	0.19	0.14	0.10	--	--	--	--	--	--	0.04	0.04	0.03	--	--	--
Selenium	0.31	0.24	0.19	0.11	0.08	0.06	0.06	0.05	0.04	0.09	0.05	0.03	--	--	--
Silver	0.11	0.04	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	0.70	0.49	0.35	0.07	0.05	0.04	1.58	0.50	0.16	3.73	1.24	0.41	1.64	0.54	0.18
Volatile and Semivolatile Organics															
Pyrene	0.04	0.01	<0.01	--	--	--	--	--	--	--	--	--	--	--	--
Dioxin/Furans															
Dioxin/furan (TEQ)	2.43	0.77	0.24	0.12	0.04	0.01	7.20	2.28	0.72	--	--	--	0.66	0.21	0.07

TABLE G-43

Summary of Hazard Quotients for Upper Trophic Level Terrestrial Receptors - Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Short-tailed shrew		Meadow vole		Red fox		American robin		American kestrel	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
<b>Metals</b>										
Arsenic	6.56	0.66	8.51	0.85	0.43	0.04	0.38	0.13	0.13	0.04
Cadmium	52.2	5.22	4.44	0.44	2.49	0.25	16.9	1.23	18.4	1.34
Chromium	0.70	0.07	0.03	<0.01	0.03	<0.01	4.05	0.81	4.85	0.97
Copper	31.3	24.2	10.5	8.10	8.51	6.58	4.65	3.55	6.64	5.06
Lead	43.0	4.30	11.2	1.12	3.05	0.30	169	16.9	49.1	4.91
Mercury	553	111	121	24.3	1.25	0.75	21.5	10.8	18.3	9.15
Nickel	0.48	0.24	0.13	0.06	0.03	0.02	0.14	0.10	0.14	0.10
Selenium	1.08	0.65	1.68	1.02	0.22	0.13	0.64	0.19	0.38	0.11
Silver	0.30	0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01
Zinc	2.60	1.30	0.35	0.18	1.55	0.15	14.3	1.58	17.5	1.94
<b>Volatile and Semivolatile Organics</b>										
1,1,1,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
1,2,4-Trichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,4-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	0.19	0.02	0.02	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE G-43

Summary of Hazard Quotients for Upper Trophic Level Terrestrial Receptors - Screening - Upland

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Short-tailed shrew		Meadow vole		Red fox		American robin		American kestrel	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Dibenz(a,h)anthracene	0.33	0.03	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	0.93	0.47	0.04	0.02	0.07	0.04	3.61	0.70	4.68	0.90
Hexachlorobutadiene	0.29	0.03	0.03	<0.01	0.03	<0.01	0.08	<0.01	0.09	<0.01
Hexachlorocyclopentadiene	0.06	0.02	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
Hexachloroethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.29	0.03	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Pentachlorophenol	8.00	0.80	0.20	0.02	0.56	0.06	0.20	0.10	0.27	0.13
Phenanthrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dioxin/Furans										
Dioxin/furan (TEQ)	94.3	9.43	2.81	0.28	38.7	3.87	2.79	0.28	9.32	0.93

TABLE G-44

## Summary of Hazard Quotients for Upper Trophic Level Terrestrial Receptors - Baseline - Upland

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Short-tailed shrew			Meadow vole			Red fox			American robin			American kestrel		
	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL	NOAEL	MATC	LOAEL
Metals															
Arsenic	1.62	0.51	0.16	0.17	0.05	0.02	--	--	--	--	--	--	--	--	--
Cadmium	0.50	0.16	0.05	0.03	<0.01	<0.01	0.04	0.01	<0.01	0.16	0.04	0.01	0.16	0.04	0.01
Chromium	--	--	--	--	--	--	--	--	--	0.20	0.09	0.04	0.20	0.09	0.04
Copper	0.31	0.28	0.24	0.05	0.04	0.04	0.07	0.06	0.05	0.04	0.03	0.03	0.04	0.04	0.03
Lead	0.51	0.16	0.05	0.05	0.02	<0.01	0.05	0.02	<0.01	1.53	0.49	0.15	0.45	0.14	0.04
Mercury	0.96	0.43	0.19	0.18	0.08	0.04	<0.01	<0.01	<0.01	0.04	0.03	0.02	0.03	0.02	0.01
Selenium	0.13	0.10	0.08	0.05	0.04	0.03	--	--	--	--	--	--	--	--	--
Zinc	0.11	0.08	0.06	--	--	--	0.08	0.03	<0.01	0.61	0.20	0.07	0.66	0.22	0.07
Volatile and Semivolatile Organics															
Hexachlorobenzene	--	--	--	--	--	--	--	--	--	0.13	0.06	0.03	0.14	0.06	0.03
Pentachlorophenol	0.13	0.04	0.01	--	--	--	--	--	--	--	--	--	--	--	--
Dioxin/Furans															
Dioxin/furan (TEQ)	4.29	1.36	0.43	0.13	0.04	0.01	1.67	0.53	0.17	0.13	0.04	0.01	0.34	0.11	0.03

TABLE G-45

Summary of the 28-day *Eisenia foetida* Toxicity Test Results

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Sample Site	Mean Survival (%)	Significant Difference			No. of Juveniles	No. of Cocoons	Sign of Reproduction	Mean Weight (mg)	Significant Difference		
		Control	Ref 1	Ref 2					Control	Ref 1	Ref 2
Lab Control	97.5	NA			0.25	11.5	Yes	236	NA		√
Reference 1/AS01-SS45-(0-1)	47.5		NA		0	4.00	Yes	285		NA	
Reference 2/AS01-SS55-(0-1)	12.5	√		NA	0	0	No	775			NA
AS01-SS46-(0-1)	10.0	√			0	0	No	467			
AS01-SS47-(0-1)	7.50	√			0.50	0.25	Yes	475			
AS01-SS48-(0-1)	12.5	√			0	0	No	450			
AS01-SS49-(0-1)	45.0	√			0	2.50	Yes	409			
AS01-SS50-(0-1)	87.5				0.25	0.50	Yes	304			√
AS01-SS51-(0-1)	5.00	√			0	0	No	500			
AS01-SS52-(0-1)	70.0				0	0.50	Yes	253			
AS01-SS53-(0-1)	17.5	√			0	3.75	Yes	489			
AS01-SS54-(0-1)	7.50	√			0.50	1.50	Yes	575			
AS01-SS56-(0-1)	70.0	√			0.25	1.50	Yes	166	√	√	
AS01-SS57-(0-1)	72.5	√			0.50	0.50	Yes	181	√	√	√
AS01-SS58-(0-1)	92.5				0	3.75	Yes	251			√
AS01-SS59-(0-1)	75.0	√			0	0.25	Yes	205		√	√

√ indicates a statistically significant decrease in response

Blank cells indicate statistically insignificant comparison (i.e., site-related response not reduced as compared to control/reference)

TABLE G-46

Multiple Regression and Correlation Summary for *E. foetida* Toxicity Test Results with Soil Chemistry and Physical Parameters

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Endpoint	Analyte	N	Multiple Regression Summary				Simple Correlation Summary			
			R <sup>2</sup>	F	p	B coefficients	r <sup>2</sup>	t	p	Type
Survivorship	Iron	15	0.99	(11,3) 80.5	<0.01	2.58E-05	1.84E-02	-4.93E-01	6.30E-01	Spearman
Survivorship	Zinc	15				-4.89E-04	4.65E-02	-7.96E-01	4.40E-01	Spearman
Survivorship	pH	15				-5.36E-01	3.28E-01	-2.52E+00	2.55E-02	Spearman
Survivorship	% Gravel	15				1.08E-01	9.84E-03	3.59E-01	7.25E-01	Pearson
Survivorship	2-Butanone	10	Test not performed				3.46E-02	-5.35E-01	6.07E-01	Spearman
Survivorship	Acetone	10					1.97E-02	4.01E-01	6.99E-01	Spearman
Survivorship	cis-1,2-Dichloroethene	10					5.48E-02	-6.81E-01	5.15E-01	Pearson
Survivorship	Methyl acetate	10					3.61E-02	-5.48E-01	5.99E-01	Pearson
Survivorship	Methylcyclohexane	10					1.48E-02	-3.47E-01	7.37E-01	Pearson
Survivorship	Tetrachloroethene	10					1.34E-02	-3.30E-01	7.50E-01	Pearson
Survivorship	Trichloroethene	10					4.12E-02	5.87E-01	5.74E-01	Spearman
No. of Juveniles	Cadmium	15					0.51	(4,10) 2.6	0.1	-1.19E-02
No. of Juveniles	Anthracene	15	-3.40E-04	2.13E-01	1.88E+00	8.32E-02				Pearson
No. of Juveniles	Phenanthrene	15	1.04E-04	2.37E-01	2.01E+00	6.55E-02				Pearson
No. of Juveniles	% Fines (Silt + Clay)	15	6.54E-03	7.22E-02	1.01E+00	3.33E-01				Pearson
No. of Juveniles	2-Butanone	10	Test not performed				2.45E-01	-1.61E+00	1.46E-01	Pearson
No. of Juveniles	Acetone	10					3.70E-01	-2.17E+00	6.19E-02	Spearman
No. of Juveniles	cis-1,2-Dichloroethene	10					2.01E-01	-1.42E+00	1.94E-01	Pearson
No. of Juveniles	Methyl acetate	10					2.66E-01	-1.70E+00	1.27E-01	Pearson
No. of Juveniles	Methylcyclohexane	10					2.44E-01	-1.61E+00	1.47E-01	Pearson
No. of Juveniles	Tetrachloroethene	10					2.84E-01	-1.78E+00	1.13E-01	Pearson
No. of Juveniles	Trichloroethene	10					2.00E-01	-1.42E+00	1.95E-01	Spearman
No. Cocoons	Copper	15					1.00	(13,1) 33.000	0.003	-8.14E-04
No. Cocoons	Manganese	15	2.77E-03	1.39E-02	4.29E-01	6.75E-01				Pearson
No. Cocoons	Mercury	15	3.00E+00	1.37E-02	-4.25E-01	6.78E-01				Pearson
No. Cocoons	Nickel	15	-3.96E-02	1.04E-01	1.23E+00	2.41E-01				Pearson
No. Cocoons	Potassium	15	1.60E-02	1.45E-02	4.38E-01	6.69E-01				Spearman
No. Cocoons	Thallium	15	1.45E+00	2.53E-01	2.10E+00	5.61E-02				Spearman
No. Cocoons	Acenaphthene	15	4.58E-03	3.93E-03	2.26E-01	8.24E-01				Pearson

TABLE G-46

Multiple Regression and Correlation Summary for *E. foetida* Toxicity Test Results with Soil Chemistry and Physical Parameters

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Endpoint	Analyte	N	Multiple Regression Summary				Simple Correlation Summary			
			R <sup>2</sup>	F	p	B coefficients	r <sup>2</sup>	t	p	Type
No. Cocoons	Benzo(b)fluoranthene	15	0.78	(7,7) 3.6	0.06	-7.68E-04	1.77E-02	4.84E-01	6.37E-01	Spearman
No. Cocoons	pH	15				-1.87E+00	4.38E-02	7.71E-01	4.54E-01	Pearson
No. Cocoons	% Moisture	15				-2.23E-01	2.67E-02	-5.98E-01	5.60E-01	Pearson
No. Cocoons	% Medium Sand	15				-4.10E-02	5.57E-02	-8.75E-01	3.97E-01	Spearman
No. Cocoons	% Fine Sand	15				5.18E-01	4.82E-02	8.11E-01	4.32E-01	Pearson
No. Cocoons	% Fines (Silt + Clay)	15				2.42E-01	5.70E-02	-8.87E-01	3.91E-01	Pearson
No. Cocoons	2-Butanone	10				Test not performed				1.30E-01
No. Cocoons	Acetone	10	7.88E-02	8.27E-01	4.32E-01					Pearson
No. Cocoons	Methyl acetate	10	3.84E-02	5.65E-01	5.88E-01					Pearson
No. Cocoons	Methylcyclohexane	10	1.30E-01	1.09E+00	3.06E-01					Pearson
No. Cocoons	Tetrachloroethene	10	2.64E-02	4.66E-01	6.54E-01					Pearson
No. Cocoons	Trichloroethene	10	2.34E-01	1.57E+00	1.56E-01					Pearson
Weight	Iron	15	0.78	(7,7) 3.6	0.06					-1.14E-02
Weight	Potassium	15				-7.15E-01	6.25E-04	9.02E-02	9.30E-01	Spearman
Weight	Thallium	15				-2.06E+02	1.28E-03	1.29E-01	8.99E-01	Spearman
Weight	Phenanthrene	15				-1.81E-02	1.11E-01	-1.27E+00	2.25E-01	Pearson
Weight	pH	15				7.27E+02	1.66E-01	1.61E+00	1.31E-01	Spearman
Weight	% Medium Sand	15				-1.23E+02	1.66E-02	4.68E-01	6.48E-01	Spearman
Weight	% Fine Sand	15				-1.45E+01	1.92E-02	5.04E-01	6.22E-01	Pearson
Weight	2-Butanone	10	Test not performed				6.52E-02	7.47E-01	4.76E-01	Spearman
Weight	Acetone	10					3.38E-03	1.65E-01	8.73E-01	Pearson
Weight	cis-1,2-Dichloroethene	10					7.51E-02	8.06E-01	4.44E-01	Pearson
Weight	Methyl acetate	10					2.78E-02	4.78E-01	6.45E-01	Pearson
Weight	Methylcyclohexane	10					1.96E-02	4.00E-01	7.00E-01	Pearson
Weight	Tetrachloroethene	10					1.36E-02	3.32E-01	7.48E-01	Spearman
Weight	Trichloroethene	10					2.56E-02	4.59E-01	6.59E-01	Pearson

Shaded cells indicate statistically significant result

TABLE G-47

Summary of Direct Exposure Soil Screening Values and Toxicity Values Derived from the Site-Specific *E. fetida* Toxicity Site 1 Focused Remedial Investigation for Soil Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Soil Screening Value	Survivorship NOEC	Reproduction NOEC
<b>Metals (mg/kg)</b>			
Aluminum	50.0	23,400	26,000
Antimony	5.00	2.60	3.60
Cadmium	4.00	4.50	11.0
Chromium	0.40	42.7	63.8
Copper	50.0	253	517
Iron	200	57,100	57,100
Lead	50.0	591	1,310
Manganese	500	1,750	1,750
Mercury	0.10	2.10	2.10
Nickel	30.0	62.9	70.5
Silver	2.00	2.40	42.6
Vanadium	2.00	24.9	173
Zinc	50.0	1,170	1,400
<b>Semivolatile Organic Compounds (µg/kg)</b>			
Acenaphthylene	100	220	2,200
Anthracene	100	220	8,300
Benzo(a)anthracene	100	99.0	8,100
Benzo(a)pyrene	100	110	12,000
Benzo(b)fluoranthene	100	200	21,000
Benzo(g,h,i)perylene	100	57.0	4,200
Benzo(k)fluoranthene	100	61.0	8,600
Chrysene	100	120	10,000
Fluoranthene	100	220	12,000
Indeno(1,2,3-cd)pyrene	100	58.0	5,400
Phenanthrene	100	130	31,000
Pyrene	100	160	21,000
Total PAHs	7,462	906	86,800
<b>Volatile Organic Compounds (µg/kg)</b>			
2-Butanone	NSV	335	900
Acetone	NSV	55.0	125
Methyl acetate	NSV	300	900
Methylcyclohexane	NSV	335	900
Trichloroethene	10,920	6,400	36,000
1,2-Dichloroethene	300	120	900

<sup>1</sup> Survivorship NOEC is calculated as the highest concentration in samples that did not have a significant reduction in survivorship as compared to the control

<sup>2</sup> Reproduction NOEC is calculated as the highest concentration in samples that had signs of reproduction

NSV = No Screening Value

TABLE G-48

Summary for COC Exceedances in Samples Collected for Soil Invertebrate Toxicity Tests

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Sample ID <sup>1</sup>	Toxicity Test Result	VOCs					PAHs				
		Screening Value	Survivorship NOEC <sup>2</sup>		Reproduction NOEC <sup>4</sup>		Screening Value	Survivorship NOEC <sup>2</sup>		Reproduction NOEC <sup>4</sup>	
		SUM HQ (n=3)	SUM HQ (n=7)	HQ>1 <sup>3</sup>	SUM HQ (n=7)	HQ>1	SUM HQ (n=12)	SUM HQ (n=12)	HQ>1 <sup>5</sup>	SUM HQ (n=12)	HQ>1
AS01-SB58	No significant difference in survivorship as compared to control	NS	NS		NS		11.5	9.01	NA	0.18	NA
AS01-SB50		0.04	0.68	NA	0.28	NA	6.89	4.36	NA	0.13	NA
AS01-SB59		NS	NS		NS		14.3	11.0	NA	0.20	NA
AS01-SB52		2.86	7.00	NA	2.45	NA	10.1	6.96	NA	0.18	NA
AS01-SB45		0.04	0.15	NA	0.051	NA	11.7	8.74	NA	0.17	NA
AS01-SB57	Significantly less survivorship as compared to control	NS	NS		NS		1,360	1,100	ACY, ANTH, BAA, BAP, BBF, BGHIP, BKF, CHRYS, FLUOR, I123CDP, PHEN, PYR	11.5	NA
AS01-SB56		NS	NS		NS		13.4	10.7	ACY, BGHIP, CHRYS, I123CDP	0.20	NA
AS01-SB49		1.97	8.01	ACE, MA, DCE	2.51	NA	782	712	ACY, ANTH, BAA, BAP, BBF, BGHIP, BKF, CHRYS, FLUOR, I123CDP, PHEN, PYR	7.58	NA
AS01-SB53		11.2	25.4	2BUT, ACE, MA, MCH, TCE, 4TCE, DCE	7.00	NA	8.76	5.75	None	0.16	NA
AS01-SB47		0.04	0.18	None	0.061	NA	17.3	13.9	BAA, BAP, BBF, BGHIP, BKF, CHRYS, FLUOR, I123CDP, PHEN, PYR	0.24	NA
AS01-SB54		0.04	0.17	None	0.053	NA	15.1	11.9	BAP, BBF, BGHIP, BKF, CHRYS, I123CDP	0.21	NA

TABLE G-48

Summary for COC Exceedances in Samples Collected for Soil Invertebrate Toxicity Tests

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Sample ID <sup>1</sup>	Toxicity Test Result	VOCs					PAHs				
		Screening Value	Survivorship NOEC <sup>2</sup>		Reproduction NOEC <sup>4</sup>		Screening Value	Survivorship NOEC <sup>2</sup>		Reproduction NOEC <sup>4</sup>	
		SUM HQ (n=3)	SUM HQ (n=7)	HQ>1 <sup>3</sup>	SUM HQ (n=7)	HQ>1	SUM HQ (n=12)	SUM HQ (n=12)	HQ>1 <sup>5</sup>	SUM HQ (n=12)	HQ>1
AS01-SB48	Significantly less survivorship as compared to control and no sign of reproduction	2.38	9.39	ACE, MA, DCE	2.88	None	10.7	8.32	None	0.17	None
AS01-SB55		NS	NS		NS		12.8	9.57	None	0.19	None
AS01-SB46		0.04	0.32	None	0.126	None	12.0	9.21	None	0.18	None
AS01-SB51		3.44	8.89	2BUT, ACE, MA, MCH, 4TCE, DCE	2.89	None	7.66	4.93	None	0.15	None

<sup>1</sup> Samples are ordered from highest survivorship to lowest survivorship within the 3 groups of toxicity test results<sup>2</sup> Survivorship NOEC calculated as the highest concentration in samples that did not have a significant reduction in survivorship as compared to the control<sup>3</sup> 2BUT=2-Butanone; ACE=Acetone; MA=Methyl Acetate; MCH=Methylcyclohexane; TCE=Trichloroethene; 4TCE=Tetrachloroethene; DCE=1,2-Dichloroethene<sup>4</sup> Reproduction NOEC calculated as the highest concentration in samples that had signs of reproduction<sup>5</sup> ACY=Acenaphthylene; ANTH=Anthracene; BAA=Benzo(a)anthracene; BAP=Benzo(a)pyrene; BBF=Benzo(b)fluoranthene; BGHIP=Benzo(g,h,i)perylene; BKF=Benzo(k)fluoranthene; CHRYS=Chrysene; FLUOR=Fluoranthene; 123CDP=Indeno(1,2,3-cd)pyrene; PHEN=Phenanthrene; PYR=Pyrene

NS = Not sampled

NA = Not applicable because NOEC is the maximum concentration in the group of samples without significant effect

Shaded cells indicated SUM HQ  $\geq$  1

TABLE G-48

Summary for COC Exceedances in Samples Collected for Soil Invertebrate Toxicity Tests  
 Site 1 Focused Remedial Investigation for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Sample ID <sup>1</sup>	Toxicity Test Result	Total PAHs			Metals				
		Screening Value HQ	Survivorship NOEC HQ <sup>2</sup>	Reproduction NOEC HQ <sup>4</sup>	Screening Value	Survivorship NOEC <sup>2</sup>		Reproduction NOEC <sup>4</sup>	
					SUM HQ (n=12)	SUM HQ (n=12)	HQ>1	SUM HQ (n=12)	HQ>1
AS01-SB58	No significant difference in survivorship as compared to control	0.17	0.76	0.01	340	4.34	NA	3.12	NA
AS01-SB50		0.10	0.46	0.005	268	2.45	NA	1.60	NA
AS01-SB59		0.22	1.00	0.01	395	4.92	NA	3.57	NA
AS01-SB52		0.16	0.72	0.01	921	11.1	NA	7.09	NA
AS01-SB45		0.17	0.76	0.01	307	3.62	NA	2.73	NA
AS01-SB57	Significantly less survivorship as compared to control	21.2	95.8	1.00	607	14.0	Cd, Cr, Cu, Pb, Ag, V	6.55	NA
AS01-SB56		0.20	0.92	0.01	389	4.90	None	3.48	NA
AS01-SB49		13.7	62.1	0.65	416	4.70	None	3.40	NA
AS01-SB53		0.13	0.58	0.01	987	37.1	Al, Cd, Cr, Pb, Ni, Ag, V, Zn	10.2	NA
AS01-SB47		0.28	1.27	0.01	395	6.13	Ag	3.82	NA
AS01-SB54		0.23	1.03	0.01	404	4.81	V	3.40	NA

TABLE G-48

Summary for COC Exceedances in Samples Collected for Soil Invertebrate Toxicity Tests

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Sample ID <sup>1</sup>	Toxicity Test Result	Total PAHs			Metals				
		Screening Value HQ	Survivorship NOEC HQ <sup>2</sup>	Reproduction NOEC HQ <sup>4</sup>	Screening Value	Survivorship NOEC <sup>2</sup>		Reproduction NOEC <sup>4</sup>	
					SUM HQ (n=12)	SUM HQ (n=12)	HQ>1	SUM HQ (n=12)	HQ>1
AS01-SB48	Significantly less survivorship as compared to control and no sign of reproduction	0.15	0.70	0.01	349	5.46	Ag	3.04	None
AS01-SB55		0.20	0.89	0.01	309	3.96	Ni	3.02	None
AS01-SB46		0.18	0.82	0.01	344	4.58	Ni	3.33	None
AS01-SB51		0.12	0.52	0.01	528	8.72	Cd, V	5.02	Cd

<sup>1</sup> Samples are ordered from highest survivorship to lowest survivorship within the 3 groups of toxicity test results<sup>2</sup> Survivorship NOEC calculated as the highest concentration in samples that did not have a significant reduction in survivorship as compared to the control<sup>3</sup> 2BUT=2-Butanone; ACE=Acetone; MA=Methyl Acetate; MCH=Methylcyclohexane; TCE=Trichloroethene; 4TCE=Tetrachloroethene; DCE=1,2-Dichloroethene<sup>4</sup> Reproduction NOEC calculated as the highest concentration in samples that had signs of reproduction<sup>5</sup> ACY=Acenaphthylene; ANTH=Anthracene; BAA=Benzo(a)anthracene; BAP=Benzo(a)pyrene; BBF=Benzo(b)fluoranthene; BGHIP=Benzo(g,h,i)perylene; BKF=Benzo(k)fluoranthene; CHRYS=Chrysene; FLUOR=Fluoranthene; 123CDP=Indeno(1,2,3-cd)pyrene; PHEN=Phenanthrene; PYR=Pyrene

NS = Not sampled

NA = Not applicable because NOEC is the maximum concentration in the group of samples without significant effect

Shaded cells indicated SUM HQ  $\geq$  1

TABLE G-49

## Terrestrial Habitats - Summary of Chemicals of Potential Concern

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Upland (Active Burning Grounds/Solvent Pit Areas)							Floodplain (Area Outside of Burning Grounds)						
	Surface Soil				Food Web			Surface Soil				Food Web		
	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	Receptor	Endpoint	Mean HQ	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	Receptor	Endpoint	Mean HQ
Detected Chemicals With Screening Values														
Aluminum	31 / 31	31 / 31	380	159				54 / 54	54 / 54	1,938	258			
Antimony								20 / 54	9 / 54	5.02	0.76			
Cadmium								25 / 54	13 / 54	93.3	3.80	Shrew	MATC	2.75
Chromium	31 / 31	31 / 31	59.5	32.3				54 / 54	54 / 54	798	87.6			
Copper	31 / 31	2 / 31	36.4	1.60				53 / 54	24 / 54	43.0	4.63			
Iron	31 / 31	31 / 31	166	129				54 / 54	54 / 54	610	163			
Lead	31 / 31	14 / 31	34.6	2.41				54 / 54	29 / 54	242	12.3	Robin	MATC	2.48
Manganese	31 / 31	28 / 31	2.24	1.63				54 / 54	50 / 54	4.64	2.52			
Mercury	30 / 31	6 / 31	72.0	3.11				50 / 54	49 / 54	563	20.9	Shrew Shrew	LOAEL MATC	1.30 2.90
Nickel								53 / 54	47 / 54	8.00	1.95			
Silver								33 / 52	27 / 52	60.5	6.43			
Vanadium	31 / 31	31 / 31	18.4	10.4				53 / 54	53 / 54	166	18.4			
Zinc	31 / 31	30 / 31	5.42	1.90				54 / 54	53 / 54	84.6	11.5	Robin	MATC	1.24
2-Methylnaphthalene								16 / 34	3 / 34	1.70	1.47			
3- and 4-Methylphenol								1 / 21	1 / 21	1.10	--			
Acenaphthylene								5 / 47	1 / 47	6.30	2.46			
Anthracene								24 / 47	8 / 47	83.0	3.53			
Benzo(a)anthracene								42 / 47	21 / 47	81.0	5.26			
Benzo(a)pyrene								34 / 47	17 / 47	120	6.21			
Benzo(b)fluoranthene								42 / 47	31 / 47	210	10.2			
Benzo(g,h,i)perylene								33 / 47	7 / 47	42.0	2.83			
Benzo(k)fluoranthene								34 / 47	16 / 47	86.0	5.05			
Chrysene	16 / 39	1 / 39	1.10	--				42 / 47	34 / 47	100	6.39			
Dibenz(a,h)anthracene								4 / 34	2 / 34	4.30	2.06			
Fluoranthene								44 / 47	37 / 47	120	6.57			
Indeno(1,2,3-cd)pyrene								39 / 47	9 / 47	54.0	3.40			
Naphthalene								8 / 34	2 / 34	1.20	1.20			
Phenanthrene	17 / 39	2 / 39	1.40	--				42 / 47	32 / 47	310	9.32			
Pyrene								42 / 47	36 / 47	210	9.33			

FOD - Frequency of Detection  
FOE - Frequency of Exceedance

TABLE G-49

## Terrestrial Habitats - Summary of Chemicals of Potential Concern

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Upland (Active Burning Grounds/Solvent Pit Areas)							Floodplain (Area Outside of Burning Grounds)						
	Surface Soil				Food Web			Surface Soil				Food Web		
	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	Receptor	Endpoint	Mean HQ	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	Receptor	Endpoint	Mean HQ
Total PAHs								44 / 47	6 / 47	19.5	1.12			
HMX	24 / 39	5 / 39	10.2	0.70				3 / 14	1 / 14	106	7.63			
Perchlorate	8 / 31	1 / 31	31.3	1.08										
RDX	20 / 39	11 / 39	34.0	2.33				2 / 16	1 / 16	7.30	0.69			
1,2-Dichloroethene (total)								1 / 6	1 / 6	53.3	9.91			
Trichloroethene								24 / 41	6 / 41	7.51	0.64			
Dioxin/furan (TEQ)												Weasel	MATC	2.28
Detected Chemicals Without Screening Values														
2-Nitroaniline	2 / 39	-- / --	13,000 µg/kg	883 µg/kg										
Acetophenone								1 / 25	-- / --	55.0 µg/kg	--			
Benzaldehyde								4 / 24	-- / --	600 µg/kg	242 µg/kg			
Caprolactam	2 / 11	-- / --	46.0 µg/kg	--				1 / 25	-- / --	68.0 µg/kg	--			
Carbazole								6 / 31	-- / --	210 µg/kg	186 µg/kg			
Dibenzofuran								5 / 34	-- / --	260 µg/kg	195 µg/kg			
1,3,5-Trinitrobenzene	2 / 25	-- / --	30,000 µg/kg	1,388 µg/kg										
2,4-Dinitrotoluene	1 / 39	-- / --	720 µg/kg	227 µg/kg										
2,6-Dinitrotoluene	1 / 39	-- / --	130 µg/kg	--										
Nitroglycerin	1 / 31	-- / --	98,000 µg/kg	3,709 µg/kg				1 / 16	-- / --	500 µg/kg	--			
1,1-Dichloroethene								5 / 41	-- / --	2.60 µg/kg	--			
2-Butanone								2 / 41	-- / --	2.80 µg/kg	--			
Acetone	5 / 34	-- / --	52.0 µg/kg	12.2 µg/kg				2 / 41	-- / --	30.0 µg/kg	--			
Chloromethane								1 / 41	-- / --	370 µg/kg	136 µg/kg			
Methyl acetate	5 / 11	-- / --	180 µg/kg	69.2 µg/kg				7 / 34	-- / --	1,600 µg/kg	154 µg/kg			
Methylcyclohexane								2 / 34	-- / --	1.50 µg/kg	--			

FOD - Frequency of Detection  
FOE - Frequency of Exceedance

TABLE G-50

Statistics for Reference and Background Surface Soil

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Reference			Background		
	Frequency of Detection	Maximum	Arithmetic Mean	Maximum	Arithmetic Mean	Upper Tolerance Limit
<b>Inorganics (mg/kg)</b>						
Aluminum	4 / 4	6,360	5,570	9,710	5,650	7,970
Antimony	0 / 4	--	0.74	1.20	0.29	1.20
Arsenic	4 / 4	15.1	11.3	10.9	5.52	10.9
Barium	4 / 4	152	109	192	133	203
Beryllium	4 / 4	1.90	1.53	1.20	0.85	1.21
Cadmium	0 / 4	--	0.21	0.53	0.28	0.55
Calcium	4 / 4	3,510	2,788	2,640	1,140	3,060
Chromium	4 / 4	15.6	12.9	15.4	10.4	13.9
Cobalt	4 / 4	52.3	42.0	20.9	11.8	20.9
Copper	4 / 4	34.1	27.0	36.7	14.6	36.7
Cyanide	0 / 4	--	0.22	0.31	0.10	0.31
Iron	4 / 4	35,600	31,350	27,600	21,600	27,900
Lead	4 / 4	35.7	29.9	44.4	19.9	44.4
Magnesium	4 / 4	1,030	829	1,930	786	1,930
Manganese	4 / 4	2,090	1,540	1,040	775	1,090
Mercury	2 / 4	0.11	0.08	0.31	0.04	0.31
Nickel	4 / 4	78.4	65.5	32.4	19.0	32.4
Potassium	4 / 4	784	651	1,110	782	1,050
Selenium	0 / 4	--	0.56	1.70	0.90	1.70
Silver	0 / 4	--	0.39	--	--	--
Sodium	2 / 4	121	72.4	31.9	9.27	31.9
Thallium	0 / 4	--	1.20	2.30	0.81	2.30
Vanadium	4 / 4	27.5	18.6	18.4	13.7	17.8
Zinc	4 / 4	239	192	136	66.6	136
<b>Semivolatile Organic Compounds (µg/kg)</b>						
1,1-Biphenyl	0 / 2	--	213	--	--	--
2,4,5-Trichlorophenol	0 / 2	--	545	--	--	--
2,4,6-Trichlorophenol	0 / 2	--	213	--	--	--

TABLE G-50

Statistics for Reference and Background Surface Soil

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Reference			Background		
	Frequency of Detection	Maximum	Arithmetic Mean	Maximum	Arithmetic Mean	Upper Tolerance Limit
2,4-Dichlorophenol	0 / 2	--	213	--	--	--
2,4-Dimethylphenol	0 / 2	--	213	--	--	--
2,4-Dinitrophenol	0 / 2	--	545	--	--	--
2-Chloronaphthalene	0 / 2	--	213	--	--	--
2-Chlorophenol	0 / 2	--	213	--	--	--
2-Methylnaphthalene	0 / 2	--	213	--	--	--
2-Methylphenol	0 / 2	--	213	--	--	--
2-Nitroaniline	0 / 2	--	545	--	--	--
2-Nitrophenol	0 / 2	--	213	--	--	--
3,3'-Dichlorobenzidine	0 / 2	--	213	--	--	--
3- and 4-Methylphenol	0 / 2	--	213	--	--	--
3-Nitroaniline	0 / 2	--	545	--	--	--
4,6-Dinitro-2-methylphenol	0 / 2	--	545	--	--	--
4-Bromophenyl-phenylether	0 / 2	--	213	--	--	--
4-Chloro-3-methylphenol	0 / 2	--	213	--	--	--
4-Chloroaniline	0 / 2	--	213	--	--	--
4-Chlorophenyl-phenylether	0 / 2	--	213	--	--	--
4-Nitroaniline	0 / 2	--	545	--	--	--
4-Nitrophenol	0 / 2	--	545	--	--	--
Acenaphthene	1 / 4	11.0	159	--	--	--
Acenaphthylene	1 / 4	53.0	171	--	--	--
Acetophenone	0 / 2	--	213	--	--	--
Anthracene	4 / 4	69.0	46.0	--	--	--
Atrazine	0 / 2	--	213	--	--	--
Benzaldehyde	0 / 2	--	213	--	--	--
Benzo(a)anthracene	4 / 4	200	105	--	--	--
Benzo(a)pyrene	4 / 4	180	119	--	--	--
Benzo(b)fluoranthene	4 / 4	260	180	--	--	--
Benzo(g,h,i)perylene	4 / 4	59.0	53.0	--	--	--

TABLE G-50

Statistics for Reference and Background Surface Soil

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Reference			Background		
	Frequency of Detection	Maximum	Arithmetic Mean	Maximum	Arithmetic Mean	Upper Tolerance Limit
Benzo(k)fluoranthene	4 / 4	210	109	--	--	--
Bis(2-chloro-1-methylethyl) ether	0 / 2	--	213	--	--	--
Butylbenzylphthalate	0 / 2	--	213	--	--	--
Caprolactam	0 / 2	--	213	--	--	--
Carbazole	1 / 2	46.0	138	--	--	--
Chrysene	4 / 4	280	178	--	--	--
Di-n-butylphthalate	0 / 2	--	213	--	--	--
Di-n-octylphthalate	0 / 2	--	213	--	--	--
Dibenz(a,h)anthracene	0 / 2	--	213	--	--	--
Dibenzofuran	0 / 2	--	213	--	--	--
Diethylphthalate	0 / 2	--	213	--	--	--
Dimethyl phthalate	0 / 2	--	213	--	--	--
Fluoranthene	4 / 4	340	245	--	--	--
Fluorene	2 / 4	8.50	110	--	--	--
Hexachlorobenzene	0 / 2	--	213	--	--	--
Hexachlorobutadiene	0 / 2	--	213	--	--	--
Hexachlorocyclopentadiene	0 / 2	--	213	--	--	--
Hexachloroethane	0 / 2	--	213	--	--	--
Indeno(1,2,3-cd)pyrene	4 / 4	61.0	56.8	--	--	--
Isophorone	0 / 2	--	213	--	--	--
Naphthalene	0 / 2	--	213	--	--	--
Pentachlorophenol	0 / 2	--	545	--	--	--
Phenanthrene	4 / 4	340	177	--	--	--
Phenol	0 / 2	--	213	--	--	--
Pyrene	4 / 4	270	200	--	--	--
bis(2-Chloroethoxy)methane	0 / 2	--	213	--	--	--
bis(2-Chloroethyl)ether	0 / 2	--	213	--	--	--
bis(2-Ethylhexyl)phthalate	2 / 2	50.0	45.0	--	--	--
n-Nitroso-di-n-propylamine	0 / 2	--	213	--	--	--

TABLE G-50

Statistics for Reference and Background Surface Soil

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reference			Background		
	Frequency of Detection	Maximum	Arithmetic Mean	Maximum	Arithmetic Mean	Upper Tolerance Limit
n-Nitrosodiphenylamine	0 / 2	--	213	--	--	--
<b>Explosives (µg/kg)</b>						
1,3,5-Trinitrobenzene	0 / 2	--	323	--	--	--
1,3-Dinitrobenzene	0 / 2	--	323	--	--	--
2,4,6-Trinitrotoluene	0 / 2	--	323	--	--	--
2,4-Dinitrotoluene	0 / 2	--	213	--	--	--
2,6-Dinitrotoluene	0 / 2	--	213	--	--	--
2-Amino-4,6-dinitrotoluene	0 / 2	--	323	--	--	--
2-Nitrotoluene	0 / 2	--	323	--	--	--
3-Nitrotoluene	0 / 2	--	323	--	--	--
4-Amino-2,6-dinitrotoluene	0 / 2	--	323	--	--	--
HMX	0 / 2	--	323	--	--	--
Nitrobenzene	0 / 1	--	345	--	--	--
Nitroglycerin	0 / 2	--	32,250	--	--	--
Nitroguanidine	0 / 2	--	65,000	--	--	--
PETN	0 / 2	--	32,250	--	--	--
Perchlorate	0 / 2	--	32.5	--	--	--
RDX	0 / 2	--	323	--	--	--
Tetryl	0 / 2	--	323	--	--	--
<b>Volatile Organic Compounds (µg/kg)</b>						
1,1,1-Trichloroethane	1 / 3	2.00	4.67	--	--	--
1,1,2,2-Tetrachloroethane	0 / 3	--	6.33	--	--	--
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	0 / 3	--	6.33	--	--	--
1,1,2-Trichloroethane	0 / 3	--	6.33	--	--	--
1,1-Dichloroethane	0 / 3	--	6.33	--	--	--
1,1-Dichloroethene	0 / 3	--	6.33	--	--	--
1,2,4-Trichlorobenzene	0 / 3	--	6.33	--	--	--
1,2-Dibromo-3-chloropropane	0 / 3	--	6.33	--	--	--
1,2-Dibromoethane	0 / 3	--	6.33	--	--	--

TABLE G-50

Statistics for Reference and Background Surface Soil

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Reference			Background		
	Frequency of Detection	Maximum	Arithmetic Mean	Maximum	Arithmetic Mean	Upper Tolerance Limit
1,2-Dichlorobenzene	0 / 3	--	6.33	--	--	--
1,2-Dichloroethane	0 / 3	--	6.33	--	--	--
1,2-Dichloropropane	0 / 3	--	6.33	--	--	--
1,3-Dichlorobenzene	0 / 3	--	6.33	--	--	--
1,4-Dichlorobenzene	0 / 3	--	6.33	--	--	--
2-Butanone	0 / 3	--	6.33	--	--	--
2-Hexanone	0 / 3	--	6.33	--	--	--
4-Methyl-2-pentanone	0 / 3	--	6.33	--	--	--
Acetone	0 / 3	--	5.17	--	--	--
Benzene	0 / 3	--	6.33	--	--	--
Bromodichloromethane	0 / 3	--	6.33	--	--	--
Bromoform	0 / 3	--	6.33	--	--	--
Bromomethane	0 / 3	--	6.33	--	--	--
Carbon disulfide	0 / 3	--	6.33	--	--	--
Carbon tetrachloride	0 / 3	--	6.33	--	--	--
Chlorobenzene	0 / 3	--	6.33	--	--	--
Chloroethane	0 / 3	--	6.33	--	--	--
Chloroform	0 / 3	--	6.33	--	--	--
Chloromethane	0 / 3	--	6.33	--	--	--
Cumene	0 / 3	--	6.33	--	--	--
Cyclohexane	0 / 3	--	6.33	--	--	--
Dibromochloromethane	0 / 3	--	6.33	--	--	--
Dichlorodifluoromethane(Freon-12)	0 / 3	--	6.33	--	--	--
Ethylbenzene	0 / 3	--	6.33	--	--	--
Methyl acetate	1 / 3	3.30	5.43	--	--	--
Methyl-tert-butyl ether (MTBE)	0 / 3	--	6.33	--	--	--
Methylcyclohexane	0 / 3	--	6.33	--	--	--
Methylene chloride	1 / 3	2.10	3.30	--	--	--
Styrene	0 / 3	--	6.33	--	--	--

TABLE G-50

Statistics for Reference and Background Surface Soil

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Reference			Background		
	Frequency of Detection	Maximum	Arithmetic Mean	Maximum	Arithmetic Mean	Upper Tolerance Limit
Tetrachloroethene	0 / 3	--	6.33	--	--	--
Toluene	0 / 3	--	6.33	--	--	--
Trichloroethene	0 / 3	--	6.33	--	--	--
Trichlorofluoromethane(Freon-11)	0 / 3	--	6.33	--	--	--
Vinyl chloride	0 / 3	--	6.33	--	--	--
Xylene, total	0 / 3	--	6.33	--	--	--
cis-1,2-Dichloroethene	0 / 3	--	6.33	--	--	--
cis-1,3-Dichloropropene	0 / 3	--	6.33	--	--	--
o-Xylene	0 / 2	--	6.50	--	--	--
trans-1,2-Dichloroethene	0 / 3	--	6.33	--	--	--
trans-1,3-Dichloropropene	0 / 3	--	6.33	--	--	--
<b>Dioxin/Furans (<math>\mu\text{g}/\text{kg}</math>)</b>						
Dioxin/furan (TEQ)	-- / --	0.0035	0.0025	--	--	--
<b>Other Parameters</b>						
Total organic carbon (mg/kg)	4 / 4	62,000	30,475	--	--	--
pH	4 / 4	6.90	6.69	--	--	--

TABLE G-51

## Reference and Background Comparison - Floodplain Surface Soils

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Floodplain			Background							Reference			
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	UTL	Frequency of Exceedance	Maximum /UTL Ratio	Maximum	Mean	Maximum Ratio	Mean Ratio	Maximum	Mean	Maximum Ratio	Mean Ratio
<b>Inorganics (mg/kg)</b>														
Aluminum	54 / 54	96,900	12,876	7,970	25 / 54	12.2	9,710	5,650	9.98	2.28	6,360	5,570	15.2	2.31
Antimony	20 / 54	25.1	3.82	1.20	18 / 54	20.9	1.20	0.29	20.9	13.4	--	0.74	--	5.17
Cadmium	25 / 54	373	15.2	0.55	25 / 54	677	0.53	0.28	704	54.2	--	0.21	--	74.1
Chromium	54 / 54	319	35.0	13.9	40 / 54	22.9	15.4	10.4	20.7	3.37	15.6	12.9	20.4	2.72
Copper	53 / 54	2,150	231	36.7	44 / 54	58.6	36.7	14.6	58.6	15.8	34.1	27.0	63.0	8.56
Iron	54 / 54	122,000	32,552	27,900	37 / 54	4.37	27,600	21,600	4.42	1.51	35,600	31,350	3.43	1.04
Lead	54 / 54	12,100	616	44.4	39 / 54	273	44.4	19.9	273	31.0	35.7	29.9	339	20.6
Manganese	54 / 54	2,320	1,262	1,090	30 / 54	2.13	1,040	775	2.23	1.63	2,090	1,540	1.11	0.82
Mercury	50 / 54	56.3	2.09	0.31	28 / 54	182	0.31	0.04	182	58.7	0.11	0.08	512	26.8
Nickel	53 / 54	240	58.4	32.4	46 / 54	7.41	32.4	19.0	7.41	3.07	78.4	65.5	3.06	0.89
Silver	33 / 52	121	12.9	--	-- / --	--	--	--	--	--	--	0.39	--	33.4
Vanadium	53 / 54	332	36.8	17.8	45 / 54	18.7	18.4	13.7	18.0	2.68	27.5	18.6	12.1	1.98
Zinc	54 / 54	4,230	577	136	50 / 54	31.1	136	66.6	31.1	8.66	239	192	17.7	3.01
<b>Semivolatile Organic Compounds (µg/kg)</b>														
2-Methylnaphthalene	16 / 34	170	147	--	-- / --	--	--	--	--	--	--	213	--	0.69
3- and 4-Methylphenol	1 / 21	110	198	--	-- / --	--	--	--	--	--	--	213	--	0.93
Acenaphthylene	5 / 47	630	246	--	-- / --	--	--	--	--	--	53.0	171	11.9	1.44
Acetophenone	1 / 25	55.0	199	--	-- / --	--	--	--	--	--	--	213	--	0.94
Anthracene	24 / 47	8,300	353	--	-- / --	--	--	--	--	--	69.0	46.0	120	7.68
Benzaldehyde	4 / 24	600	242	--	-- / --	--	--	--	--	--	--	213	--	1.14
Benzo(a)anthracene	42 / 47	8,100	526	--	-- / --	--	--	--	--	--	200	105	40.5	5.01
Benzo(a)pyrene	34 / 47	12,000	621	--	-- / --	--	--	--	--	--	180	119	66.7	5.23
Benzo(b)fluoranthene	42 / 47	21,000	1,021	--	-- / --	--	--	--	--	--	260	180	80.8	5.67
Benzo(g,h,i)perylene	33 / 47	4,200	283	--	-- / --	--	--	--	--	--	59.0	53.0	71.2	5.34
Benzo(k)fluoranthene	34 / 47	8,600	505	--	-- / --	--	--	--	--	--	210	109	41.0	4.63
Caprolactam	1 / 25	68.0	199	--	-- / --	--	--	--	--	--	--	213	--	0.94
Carbazole	6 / 31	210	186	--	-- / --	--	--	--	--	--	46.0	138	4.57	1.35
Chrysene	42 / 47	10,000	639	--	-- / --	--	--	--	--	--	280	178	35.7	3.60
Dibenz(a,h)anthracene	4 / 34	430	206	--	-- / --	--	--	--	--	--	--	213	--	0.97
Dibenzofuran	5 / 34	260	195	--	-- / --	--	--	--	--	--	--	213	--	0.92

TABLE G-51

## Reference and Background Comparison - Floodplain Surface Soils

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Floodplain			Background							Reference			
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	UTL	Frequency of Exceedance	Maximum /UTL Ratio	Maximum	Mean	Maximum Ratio	Mean Ratio	Maximum	Mean	Maximum Ratio	Mean Ratio
Fluoranthene	44 / 47	12,000	657	--	-- / --	--	--	--	--	--	340	245	35.3	2.68
Indeno(1,2,3-cd)pyrene	39 / 47	5,400	340	--	-- / --	--	--	--	--	--	61.0	56.8	88.5	5.98
Naphthalene	8 / 34	120	177	--	-- / --	--	--	--	--	--	--	213	--	0.83
Phenanthrene	42 / 47	31,000	932	--	-- / --	--	--	--	--	--	340	177	91.2	5.28
Pyrene	42 / 47	21,000	933	--	-- / --	--	--	--	--	--	270	200	77.8	4.66
Total PAHs	44 / 47	145,600	8,355	--	-- / --	--	--	--	--	--	1,796	1,212	81.1	6.89
<b>Explosives (µg/kg)</b>				--			--	--						
HMX	3 / 14	530,000	38,141	--	-- / --	--	--	--	--	--	--	323	--	118
Nitroglycerin	1 / 16	500	19,706	--	-- / --	--	--	--	--	--	--	32,250	--	0.61
RDX	2 / 16	7,300	690	--	-- / --	--	--	--	--	--	--	323	--	2.14
<b>Volatile Organic Compounds (µg/kg)</b>														
1,1-Dichloroethene	5 / 41	2.60	149	--	-- / --	--	--	--	--	--	--	6.33	--	23.5
1,2-Dichloroethene (total)	1 / 6	16,000	2,974	--	-- / --	--	--	--	--	--	--	6.33	--	470
2-Butanone	2 / 41	2.80	149	--	-- / --	--	--	--	--	--	--	6.33	--	23.5
Acetone	2 / 41	30.0	83.4	--	-- / --	--	--	--	--	--	--	5.17	--	16.1
Chloromethane	1 / 41	370	136	--	-- / --	--	--	--	--	--	--	6.33	--	21.5
Methyl acetate	7 / 34	1,600	154	--	-- / --	--	--	--	--	--	3.30	5.43	485	28.4
Methylcyclohexane	2 / 34	1.50	102	--	-- / --	--	--	--	--	--	--	6.33	--	16.1
Trichloroethene	24 / 41	82,000	6,966	--	-- / --	--	--	--	--	--	--	6.33	--	1,100

TABLE G-52

Comparison of Floodplain Surface and Subsurface Soil Concentrations for Detected Chemicals

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
<b>Inorganics (mg/kg)</b>								
Aluminum	54 / 54	96,900	12,876	16 / 16	19,900	9,020	4.87	1.43
Antimony	20 / 54	25.1	3.82	4 / 16	12.9	2.52	1.95	1.51
Arsenic	53 / 54	24.9	11.9	16 / 16	31.0	12.9	0.80	0.92
Barium	53 / 54	758	218	16 / 16	1,510	268	0.50	0.81
Beryllium	41 / 54	2.10	1.22	14 / 16	1.90	1.17	1.11	1.04
Cadmium	25 / 54	373	15.2	7 / 16	46.8	5.08	7.97	2.99
Calcium	54 / 54	246,000	13,033	16 / 16	20,400	5,266	12.1	2.48
Chromium	54 / 54	319	35.0	16 / 16	112	29.2	2.85	1.20
Cobalt	51 / 54	60.0	31.8	16 / 16	40.7	22.5	1.47	1.42
Copper	53 / 54	2,150	231	16 / 16	1,390	204	1.55	1.13
Cyanide	12 / 42	1.90	0.55	0 / 14	--	0.31	--	1.74
Iron	54 / 54	122,000	32,552	16 / 16	122,000	36,838	1.00	0.88
Lead	54 / 54	12,100	616	16 / 16	2,540	279	4.76	2.21
Magnesium	51 / 54	14,100	2,435	15 / 16	9,160	1,798	1.54	1.35
Manganese	54 / 54	2,320	1,262	16 / 16	1,920	838	1.21	1.51
Mercury	50 / 54	56.3	2.09	15 / 16	4.60	0.87	12.2	2.39
Nickel	53 / 54	240	58.4	16 / 16	102	38.1	2.35	1.53
Potassium	46 / 54	1,710	934	15 / 16	1,750	839	0.98	1.11
Selenium	14 / 52	3.90	0.73	5 / 16	1.30	0.63	3.00	1.15
Silver	33 / 52	121	12.9	9 / 16	104	16.2	1.16	0.80
Sodium	18 / 54	9,740	291	8 / 16	268	119	36.3	2.43
Thallium	2 / 54	3.10	0.89	1 / 16	0.49	0.71	6.33	1.26
Vanadium	53 / 54	332	36.8	16 / 16	97.5	26.0	3.41	1.41
Zinc	54 / 54	4,230	577	16 / 16	3,350	469	1.26	1.23
<b>Semivolatile Organic Compounds (µg/kg)</b>								
1,1-Biphenyl	5 / 25	88.0	179	6 / 13	890	193	0.10	0.93

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-52

Comparison of Floodplain Surface and Subsurface Soil Concentrations for Detected Chemicals

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
2-Methylnaphthalene	16 / 34	170	147	8 / 15	1,900	267	0.09	0.55
3- and 4-Methylphenol	1 / 21	110	198	1 / 11	64.0	173	1.72	1.15
Acenaphthene	6 / 47	4,100	368	4 / 15	12,000	951	0.34	0.39
Acenaphthylene	5 / 47	630	246	5 / 15	350	167	1.80	1.47
Acetophenone	1 / 25	55.0	199	0 / 13	--	188	--	1.06
Anthracene	24 / 47	8,300	353	7 / 15	21,000	1,545	0.40	0.23
Benzaldehyde	4 / 24	600	242	2 / 13	390	198	1.54	1.22
Benzo(a)anthracene	42 / 47	8,100	526	11 / 15	58,000	4,054	0.14	0.13
Benzo(a)pyrene	34 / 47	12,000	621	11 / 15	55,000	3,851	0.22	0.16
Benzo(b)fluoranthene	42 / 47	21,000	1,021	11 / 15	65,000	4,546	0.32	0.22
Benzo(g,h,i)perylene	33 / 47	4,200	283	10 / 15	17,000	1,256	0.25	0.23
Benzo(k)fluoranthene	34 / 47	8,600	505	11 / 15	54,000	3,805	0.16	0.13
Caprolactam	1 / 25	68.0	199	1 / 13	66.0	176	1.03	1.13
Carbazole	6 / 31	210	186	6 / 15	9,500	773	0.02	0.24
Chrysene	42 / 47	10,000	639	11 / 15	63,000	4,452	0.16	0.14
Di-n-butylphthalate	4 / 34	150	195	2 / 15	280	187	0.54	1.05
Dibenz(a,h)anthracene	4 / 34	430	206	1 / 15	2,100	317	0.20	0.65
Dibenzofuran	5 / 34	260	195	5 / 15	6,800	598	0.04	0.33
Diethylphthalate	7 / 34	1,300	225	1 / 15	51.0	178	25.5	1.26
Dimethyl phthalate	1 / 34	1,100	234	0 / 15	--	187	--	1.25
Fluoranthene	44 / 47	12,000	657	13 / 15	97,000	6,767	0.12	0.10
Fluorene	8 / 47	5,500	400	6 / 15	11,000	869	0.50	0.46
Indeno(1,2,3-cd)pyrene	39 / 47	5,400	340	9 / 15	18,000	1,332	0.30	0.25
Naphthalene	8 / 34	120	177	8 / 15	650	171	0.18	1.04
PAHs, total	44 / 47	145,600	8,355	13 / 15	732,160	52,207	0.20	0.16
Phenanthrene	42 / 47	31,000	932	13 / 15	96,000	6,679	0.32	0.14
Pyrene	42 / 47	21,000	933	12 / 15	160,000	10,996	0.13	0.08

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-52

Comparison of Floodplain Surface and Subsurface Soil Concentrations for Detected Chemicals

*Site 1 Focused Remedial Investigation for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
bis(2-Ethylhexyl)phthalate	9 / 34	940	152	4 / 15	7,000	583	0.13	0.26
n-Nitrosodiphenylamine	1 / 34	440	215	0 / 15	--	187	--	1.15
<b>Explosives (µg/kg)</b>								
HMX	3 / 14	530,000	38,141	2 / 8	1,500	412	353	92.6
Nitroglycerin	1 / 16	500	19,706	0 / 8	--	21,813	--	0.90
Perchlorate	1 / 14	311	49.7	0 / 8	--	28.2	--	1.76
RDX	2 / 16	7,300	690	1 / 8	140	264	52.1	2.62
<b>Volatile Organic Compounds (µg/kg)</b>								
1,1,1-Trichloroethane	5 / 41	3.10	149	5 / 22	410	515	0.01	0.29
1,1-Dichloroethene	5 / 41	2.60	149	1 / 22	1.00	516	2.60	0.29
1,2,4-Trichlorobenzene	1 / 43	79.0	117	0 / 15	--	429	--	0.27
1,2-Dichloroethene (total)	1 / 6	16,000	2,974	5 / 9	27,000	6,094	0.59	0.49
2-Butanone	2 / 41	2.80	149	1 / 22	1,400	603	0.002	0.25
4-Methyl-2-pentanone	1 / 41	430	149	0 / 22	--	576	--	0.26
Acetone	2 / 41	30.0	83.4	1 / 22	820	340	0.04	0.24
Chloroform	1 / 41	1.00	149	0 / 22	--	517	--	0.29
Chloromethane	1 / 41	370	136	1 / 22	1,300	601	0.28	0.23
Methyl acetate	7 / 34	1,600	154	0 / 13	--	467	--	0.33
Methylcyclohexane	2 / 34	1.50	102	0 / 13	--	467	--	0.22
Methylene chloride	2 / 41	5.00	106	1 / 22	7.00	470	0.71	0.23
Tetrachloroethene	4 / 41	730	163	7 / 22	2,200	577	0.33	0.28
Toluene	2 / 41	150	142	1 / 22	210	490	0.71	0.29
Trichloroethene	24 / 41	82,000	6,966	17 / 22	170,000	28,614	0.48	0.24
Xylene, total	1 / 41	1.40	149	0 / 22	--	517	--	0.29
cis-1,2-Dichloroethene	5 / 34	120	95.6	3 / 13	80.0	478	1.50	0.20
trans-1,2-Dichloroethene	0 / 34	--	102	1 / 13	2.00	467	--	0.22

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-52

Comparison of Floodplain Surface and Subsurface Soil Concentrations for Detected Chemicals

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
Dioxin/Furans (µg/kg)								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	23 / 23	1.100	0.240	8 / 8	0.262	0.072	4.20	3.33
1,2,3,4,6,7,8-Heptachlorodibenzofuran	23 / 23	1.400	0.186	6 / 8	0.255	0.049	5.50	3.77
1,2,3,4,7,8,9-Heptachlorodibenzofuran	19 / 23	0.240	0.021	3 / 8	0.017	0.003	14.3	6.51
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	19 / 23	0.054	0.012	6 / 8	0.015	0.003	3.68	4.33
1,2,3,4,7,8-Hexachlorodibenzofuran	20 / 23	0.360	0.060	6 / 8	0.177	0.028	2.03	2.18
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	19 / 23	0.130	0.023	6 / 8	0.029	0.006	4.47	4.01
1,2,3,6,7,8-Hexachlorodibenzofuran	20 / 23	0.420	0.044	6 / 8	0.046	0.008	9.17	5.31
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19 / 23	0.130	0.020	6 / 8	0.039	0.007	3.33	2.85
1,2,3,7,8,9-Hexachlorodibenzofuran	10 / 23	0.031	0.006	2 / 8	0.003	0.001	11.1	10.4
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	19 / 23	0.056	0.012	4 / 8	0.008	0.002	7.01	7.30
1,2,3,7,8-Pentachlorodibenzofuran	22 / 23	0.250	0.036	6 / 8	0.053	0.008	4.69	4.41
2,3,4,6,7,8-Hexachlorodibenzofuran	20 / 23	0.330	0.029	6 / 8	0.067	0.010	4.93	2.78
2,3,4,7,8-Pentachlorodibenzofuran	22 / 23	0.300	0.040	6 / 8	0.063	0.010	4.74	4.07
2,3,7,8-TCDD (dioxin)	18 / 23	0.016	0.006	2 / 8	0.004	0.001	4.20	5.86
2,3,7,8-Tetrachlorodibenzofuran	22 / 23	0.190	0.039	8 / 8	0.031	0.009	6.06	4.14
Octachlorodibenzo-p-dioxin	23 / 23	3.866	1.678	8 / 8	2.016	0.754	1.92	2.23
Octachlorodibenzofuran	23 / 23	1.700	0.205	8 / 8	0.150	0.048	11.3	4.26
Total heptachlorodibenzo-p-dioxin	23 / 23	2.600	0.531	8 / 8	0.582	0.156	4.47	3.40
Total heptachlorodibenzofuran	23 / 23	2.300	0.293	6 / 8	0.286	0.070	8.03	4.20
Total hexachlorodibenzo-p-dioxin	23 / 23	1.800	0.310	6 / 8	0.987	0.142	1.82	2.18
Total hexachlorodibenzofuran	22 / 23	3.100	0.369	6 / 8	0.524	0.092	5.92	4.02
Total pentachlorodibenzo-p-dioxin	21 / 23	0.830	0.149	4 / 8	0.262	0.036	3.17	4.14
Total pentachlorodibenzofuran	23 / 23	2.800	0.350	6 / 8	0.571	0.091	4.90	3.87
Total tetrachlorodibenzo-p-dioxin	23 / 23	0.660	0.141	6 / 8	0.362	0.054	1.82	2.60
Total tetrachlorodibenzofuran	23 / 23	3.300	0.541	8 / 8	0.705	0.117	4.68	4.63

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-53

## Reference and Background Comparison - Upland Surface Soils

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Upland			Background							Reference			
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	UTL	Frequency of Exceedance	Maximum/UTL Ratio	Maximum	Mean	Maximum Ratio	Mean Ratio	Maximum	Mean	Maximum Ratio	Mean Ratio
<b>Inorganics (mg/kg)</b>														
Aluminum	31 / 31	19,000	7,973	7,970	13 / 31	2.38	9,710	5,650	1.96	1.41	6,360	5,570	2.99	1.43
Chromium	31 / 31	23.8	12.9	13.9	7 / 31	1.71	15.4	10.4	1.55	1.24	15.6	12.9	1.53	1.00
Copper	31 / 31	1,820	79.8	36.7	2 / 31	49.6	36.7	14.6	49.6	5.46	34.1	27.0	53.4	2.95
Iron	31 / 31	33,200	25,827	27,900	13 / 31	1.19	27,600	21,600	1.20	1.20	35,600	31,350	0.93	0.82
Lead	31 / 31	1,730	121	44.4	15 / 31	39.0	44.4	19.9	39.0	6.06	35.7	29.9	48.5	4.03
Manganese	31 / 31	1,120	815	1,090	4 / 31	1.03	1,040	775	1.08	1.05	2,090	1,540	0.54	0.53
Mercury	30 / 31	7.20	0.31	0.31	2 / 31	23.2	0.31	0.04	23.2	8.72	0.11	0.08	65.5	3.98
Vanadium	31 / 31	36.7	20.8	17.8	22 / 31	2.06	18.4	13.7	1.99	1.52	27.5	18.6	1.33	1.12
Zinc	31 / 31	271	94.9	136	2 / 31	1.99	136	66.6	1.99	1.42	239	192	1.13	0.50
<b>Semivolatile Organic Compounds (µg/kg)</b>														
2-Nitroaniline	2 / 39	13,000	883	--	-- / --	--	--	--	--	--	--	545	--	1.62
Caprolactam	2 / 11	46.0	179	--	-- / --	--	--	--	--	--	--	213	--	0.84
Chrysene	16 / 39	110	188	--	-- / --	--	--	--	--	--	280	178	0.39	1.05
Phenanthrene	17 / 39	140	189	--	-- / --	--	--	--	--	--	340	177	0.41	1.07
<b>Explosives (µg/kg)</b>														
1,3,5-Trinitrobenzene	2 / 25	30,000	1,388	--	-- / --	--	--	--	--	--	--	323	--	4.30
2,4-Dinitrotoluene	1 / 39	720	227	--	-- / --	--	--	--	--	--	--	213	--	1.07
2,6-Dinitrotoluene	1 / 39	130	212	--	-- / --	--	--	--	--	--	--	213	--	1.00
HMX	24 / 39	51,000	3,506	--	-- / --	--	--	--	--	--	--	323	--	10.9
Nitroglycerin	1 / 31	98,000	3,709	--	-- / --	--	--	--	--	--	--	32,250	--	0.12
Perchlorate	8 / 31	31,300	1,080	--	-- / --	--	--	--	--	--	--	32.5	--	33.2
RDX	20 / 39	34,000	2,333	--	-- / --	--	--	--	--	--	--	323	--	7.22
<b>Volatile Organic Compounds (µg/kg)</b>														
Acetone	5 / 34	52.0	12.2	--	-- / --	--	--	--	--	--	--	5.17	--	2.35
Methyl acetate	5 / 11	180	69.2	--	-- / --	--	--	--	--	--	3.30	5.43	54.5	12.7

TABLE G-54

Comparison of Upland Surface Soil COPC Concentrations to Toxicity Test NOEC Values

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Upland Surface Soil			Toxicity Test Value					
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Survivorship NOEC	Maximum Ratio	Mean Ratio	Reproduction NOEC	Maximum Ratio	Mean Ratio
<b>Inorganics (mg/kg)</b>									
Aluminum	31 / 31	19,000	7,973	23,400	0.81	0.34	26,000	0.73	0.31
Chromium	31 / 31	23.8	12.9	42.7	0.56	0.30	63.8	0.37	0.20
Copper	31 / 31	1,820	79.8	253	7.19	0.32	517	3.52	0.15
Iron	31 / 31	33,200	25,827	57,100	0.58	0.45	57,100	0.58	0.45
Lead	31 / 31	1,730	121	591	2.93	0.20	1,310	1.32	0.09
Manganese	31 / 31	1,120	815	1,750	0.64	0.47	1,750	0.64	0.47
Mercury	30 / 31	7.20	0.31	2.10	3.43	0.15	2.10	3.43	0.15
Vanadium	31 / 31	36.7	20.8	24.9	1.47	0.83	173	0.21	0.12
Zinc	31 / 31	271	94.9	1,170	0.23	0.08	1,400	0.19	0.07
<b>Semivolatile Organic Compounds (µg/kg)</b>									
Chrysene	16 / 39	110	188	120	0.92	--	10,000	0.01	--
Phenanthrene	17 / 39	140	189	130	1.08	--	31,000	0.005	--
<b>Volatile Organic Compounds (µg/kg)</b>									
Acetone	5 / 34	52.0	12.2	55.0	0.95	0.22	125	0.42	0.10
Methyl acetate	5 / 11	180	69.2	300	0.60	0.23	900	0.20	0.08

TABLE G-55

## Comparison of Upland Surface and Subsurface Soil Concentrations for Detected Chemicals

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
Inorganics (mg/kg)								
Aluminum	31 / 31	19,000	7,973	19 / 19	50,500	11,056	0.38	0.72
Antimony	20 / 31	2.50	0.87	6 / 19	17.2	1.73	0.15	0.50
Arsenic	31 / 31	9.50	6.67	19 / 19	10.6	6.64	0.90	1.00
Barium	31 / 31	255	156	19 / 19	207	175	1.23	0.89
Beryllium	21 / 31	1.20	0.81	10 / 19	1.30	0.80	0.92	1.02
Cadmium	22 / 31	10.9	0.88	3 / 19	11.9	0.79	0.92	1.11
Calcium	11 / 11	266,000	63,331	12 / 12	93,200	10,698	2.85	5.92
Chromium	31 / 31	23.8	12.9	19 / 19	19.9	13.5	1.20	0.96
Cobalt	31 / 31	16.5	12.4	19 / 19	16.4	14.0	1.01	0.89
Copper	31 / 31	1,820	79.8	19 / 19	136	24.4	13.4	3.27
Cyanide	27 / 31	0.91	0.31	2 / 19	0.21	0.22	4.33	1.39
Iron	31 / 31	33,200	25,827	19 / 19	33,500	27,300	0.99	0.95
Lead	31 / 31	1,730	121	19 / 19	1,760	169	0.98	0.71
Magnesium	11 / 11	18,400	4,420	12 / 12	2,790	1,209	6.59	3.66
Manganese	31 / 31	1,120	815	19 / 19	1,170	913	0.96	0.89
Mercury	30 / 31	7.20	0.31	6 / 19	2.00	0.19	3.60	1.68
Nickel	31 / 31	33.4	21.3	19 / 19	27.1	22.0	1.23	0.97
Potassium	11 / 11	1,040	907	12 / 12	1,180	934	0.88	0.97
Selenium	8 / 31	1.10	0.31	8 / 19	9.00	1.15	0.12	0.27
Silver	10 / 31	3.00	0.25	3 / 19	4.10	0.53	0.73	0.48
Sodium	1 / 11	139	50.2	1 / 12	66.1	36.0	2.10	1.40
Thallium	20 / 31	2.30	0.70	8 / 19	2.10	1.13	1.10	0.62
Tin	20 / 20	8.40	5.46	0 / 7	--	1.99	--	2.75
Vanadium	31 / 31	36.7	20.8	19 / 19	24.8	18.4	1.48	1.13
Zinc	31 / 31	271	94.9	19 / 19	222	82.1	1.22	1.16

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-55

Comparison of Upland Surface and Subsurface Soil Concentrations for Detected Chemicals

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
Semivolatile Organic Compounds (µg/kg)								
1,1-Biphenyl	1 / 31	20.0	193	0 / 19	--	198	--	0.97
2-Nitroaniline	2 / 39	13,000	883	0 / 19	--	497	--	1.78
Acetophenone	0 / 31	--	199	1 / 19	55.0	191	--	1.04
Benzo(a)anthracene	7 / 39	66.0	220	1 / 19	51.0	190	1.29	1.16
Benzo(a)pyrene	8 / 39	54.0	215	1 / 19	44.0	190	1.23	1.14
Benzo(b)fluoranthene	3 / 39	68.0	238	1 / 19	67.0	191	1.01	1.25
Benzo(g,h,i)perylene	1 / 39	65.0	246	0 / 19	--	198	--	1.24
Caprolactam	2 / 11	46.0	179	0 / 12	--	201	--	0.89
Chrysene	16 / 39	110	188	1 / 19	69.0	191	1.59	0.98
Diethylphthalate	3 / 39	270	249	3 / 19	340	209	0.79	1.19
Dimethyl phthalate	4 / 39	2,300	372	0 / 19	--	198	--	1.87
Fluoranthene	4 / 39	93.0	236	2 / 19	150	188	0.62	1.26
Naphthalene	1 / 39	40.0	245	0 / 19	--	198	--	1.24
PAHs, total	18 / 39	3,369	4,274	2 / 19	3,050	3,511	1.10	1.22
Phenanthrene	17 / 39	140	189	2 / 19	120	186	1.17	1.02
Pyrene	3 / 39	100	239	1 / 19	95.0	192	1.05	1.24
bis(2-Ethylhexyl)phthalate	15 / 39	1,600	344	2 / 19	2,300	284	0.70	1.21
n-Nitrosodiphenylamine	2 / 39	3,000	271	0 / 19	--	198	--	1.36
Explosives (µg/kg)								
1,3,5-Trinitrobenzene	2 / 25	30,000	1,388	0 / 19	--	175	--	7.92
2,4-Dinitrotoluene	1 / 39	720	227	0 / 19	--	159	--	1.43
2,6-Dinitrotoluene	1 / 39	130	212	0 / 19	--	159	--	1.34
HMX	24 / 39	51,000	3,506	8 / 19	5,200	1,017	9.81	3.45
Nitroglycerin	1 / 31	98,000	3,709	2 / 19	4,500	5,361	21.8	0.69
Perchlorate	8 / 31	31,300	1,080	9 / 19	2,500	206	12.5	5.25
RDX	20 / 39	34,000	2,333	7 / 19	5,200	638	6.54	3.65

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-55

## Comparison of Upland Surface and Subsurface Soil Concentrations for Detected Chemicals

Site 1 Focused Remedial Investigation for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
Tetryl	1 / 39	540	370	0 / 19	--	281	--	1.32
<b>Volatile Organic Compounds (µg/kg)</b>								
Acetone	5 / 34	52.0	12.2	0 / 19	--	343	--	0.04
Chlorobenzene	1 / 34	6.00	37.6	0 / 19	--	374	--	0.10
Chloroform	1 / 34	1.00	37.5	0 / 19	--	374	--	0.10
Ethylbenzene	1 / 34	5.00	37.6	0 / 19	--	374	--	0.10
Methyl acetate	5 / 11	180	69.2	1 / 12	82.0	564	2.20	0.12
Methylene chloride	1 / 34	4.00	21.0	0 / 19	--	350	--	0.06
Styrene	2 / 34	3.00	37.4	0 / 19	--	374	--	0.10
Tetrachloroethene	1 / 34	420	40.0	1 / 19	5,800	658	0.07	0.06
Toluene	1 / 34	4.00	37.6	0 / 19	--	374	--	0.10
Trichloroethene	12 / 34	1,800	138	9 / 19	25,000	2,110	0.07	0.07
Xylene, total	1 / 34	15.0	37.9	0 / 19	--	374	--	0.10
<b>Dioxin/Furans (µg/kg)</b>								
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	13 / 31	0.110	0.0549	11 / 19	1.800	0.1577	0.06	0.35
1,2,3,4,6,7,8-Heptachlorodibenzofuran	10 / 31	0.039	0.0251	5 / 19	1.700	0.1245	0.02	0.20
1,2,3,4,7,8,9-Heptachlorodibenzofuran	2 / 31	0.006	0.0236	3 / 19	0.400	0.0599	0.02	0.39
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0 / 31	--	0.0421	2 / 19	0.075	0.0600	--	0.70
1,2,3,4,7,8-Hexachlorodibenzofuran	6 / 31	0.012	0.0106	3 / 19	1.000	0.0692	0.01	0.15
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	2 / 31	0.005	0.0378	2 / 19	0.170	0.0587	0.03	0.64
1,2,3,6,7,8-Hexachlorodibenzofuran	5 / 31	0.008	0.0088	3 / 19	0.760	0.0535	0.01	0.17
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1 / 31	0.006	0.0418	2 / 19	0.160	0.0610	0.04	0.68
1,2,3,7,8,9-Hexachlorodibenzofuran	0 / 31	--	0.0094	2 / 19	0.056	0.0179	--	0.52
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0 / 31	--	0.0213	2 / 19	0.094	0.0374	--	0.57
1,2,3,7,8-Pentachlorodibenzofuran	4 / 31	0.008	0.0261	3 / 19	0.710	0.0642	0.01	0.41
2,3,4,6,7,8-Hexachlorodibenzofuran	3 / 31	0.006	0.0101	2 / 19	0.290	0.0307	0.02	0.33
2,3,4,7,8-Pentachlorodibenzofuran	4 / 31	0.008	0.0226	2 / 19	0.600	0.0559	0.01	0.40

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-55

## Comparison of Upland Surface and Subsurface Soil Concentrations for Detected Chemicals

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Surface Soils			Subsurface Soils			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean		
2,3,7,8-TCDD (dioxin)	1 / 31	0.001	0.0032	2 / 19	0.016	0.0036	0.05	0.89
2,3,7,8-Tetrachlorodibenzofuran	9 / 31	0.008	0.0036	6 / 19	0.380	0.0237	0.02	0.15
Octachlorodibenzo-p-dioxin	31 / 31	1.300	0.4011	19 / 19	8.900	0.6373	0.15	0.63
Octachlorodibenzofuran	11 / 31	0.080	0.0459	6 / 19	1.400	0.1345	0.06	0.34
Total heptachlorodibenzo-p-dioxin	12 / 31	0.230	0.0679	11 / 19	3.400	0.2495	0.07	0.27
Total heptachlorodibenzofuran	10 / 31	0.067	0.0293	6 / 19	3.300	0.2137	0.02	0.14
Total hexachlorodibenzo-p-dioxin	8 / 31	0.052	0.0427	5 / 19	1.400	0.1327	0.04	0.32
Total hexachlorodibenzofuran	7 / 31	0.057	0.0141	3 / 19	4.600	0.2690	0.01	0.05
Total pentachlorodibenzo-p-dioxin	3 / 11	0.009	0.0021	2 / 12	0.680	0.0688	0.01	0.03
Total pentachlorodibenzofuran	7 / 11	0.069	0.0174	4 / 12	4.500	0.3993	0.02	0.04
Total tetrachlorodibenzo-p-dioxin	6 / 11	0.015	0.0048	3 / 12	0.450	0.0496	0.03	0.10
Total tetrachlorodibenzofuran	9 / 11	0.094	0.0266	6 / 12	3.900	0.3469	0.02	0.08

Shading indicates a surface soil to subsurface soil ratio of 0.50 or lower

TABLE G-56

## Summary of Chemicals of Concern for Terrestrial Habitats

*Site 1 Focused Remedial Investigation for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Floodplain		Upland	
	Surface Soil	Food Web	Surface Soil	Food Web
<b>Metals</b>				
Cadmium	X	X		
Chromium	X			
Copper	X		X	
Lead	X	X	X	
Mercury	X	X	X	
Nickel	X			
Silver	X			
Vanadium	X			
Zinc	X	X		
<b>Semivolatile Organic Compounds</b>				
2-Nitroaniline			X	
PAHs	X			
<b>Explosives</b>				
1,3,5-Trinitrobenzene			X	
HMX	X		X	
Nitroglycerin	X		X	
Perchlorate			X	
RDX	X		X	
<b>Volatile Organic Compounds</b>				
1,2-Dichloroethene	X			
Methyl acetate	X			
Trichloroethene	X			
<b>Dioxin/furans</b>				
Total dioxin/furans (TEQ)		X		

TABLE G-57

Comparison of Floodplain Surface Soil and Sediment Concentrations (Ranks) Along Sampling Transects

Site 1 Focused Remedial Investigation for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Medium	Transect 1		Transect 2		Transect 3		Transect 4		Transect 6		Transect 7		Transect 8		Transect 9	
		Maximum	Mean														
Cadmium	Sediment	ND	6	1	1	ND	3	4	5	2	2	3	4	5	7	6	7
Cadmium	Soil	ND	8	3	3	5	5	ND	6	ND	7	4	4	2	2	1	1
Chromium	Sediment	6	6	2	3	5	5	3	4	1	1	7	8	4	2	8	7
Chromium	Soil	7	7	2	3	5	5	8	8	6	6	3	2	4	4	1	1
Copper	Sediment	8	8	1	1	2	2	4	5	3	3	6	6	5	4	7	7
Copper	Soil	8	8	1	2	5	5	7	7	6	6	4	3	3	4	2	1
Lead	Sediment	1	3	2	2	5	6	6	7	3	1	4	5	7	4	8	8
Lead	Soil	8	8	4	4	5	5	7	7	6	6	2	2	3	3	1	1
Mercury	Sediment	ND	8	1	2	3	3	4	5	2	1	ND	4	5	6	ND	7
Mercury	Soil	8	8	2	2	5	5	4	4	7	7	6	6	3	3	1	1
Nickel	Sediment	8	8	5	7	1	2	4	4	6	5	3	3	2	1	7	6
Nickel	Soil	5	2	2	6	3	3	7	4	6	5	8	8	4	7	1	1
Silver	Sediment	5	6	1	1	3	4	6	7	2	2	4	3	7	5	8	8
Silver	Soil	ND	8	1	1	4	4	ND	6	6	5	3	3	5	7	2	2
Vanadium	Sediment	5	8	1	2	7	5	3	4	4	3	6	6	2	1	8	7
Vanadium	Soil	5	7	2	3	6	4	8	8	7	6	3	2	4	5	1	1
Zinc	Sediment	8	8	1	2	2	4	6	7	3	1	4	3	5	5	7	6
Zinc	Soil	5	6	1	3	7	7	6	8	8	5	4	4	3	2	2	1
Trichloroethene	Sediment	ND	8	1	6	ND	4	2	4	ND	2	ND	1	ND	3	ND	7
Trichloroethene	Soil	ND	6	4	4	2	2	5	5	ND	7	6	8	3	3	1	1
Total PAHs	Sediment	7	8	1	1	3	7	5	5	2	4	4	2	ND	3	6	6
Total PAHs	Soil	7	6	3	3	2	2	6	5	8	7	1	1	5	8	4	4
Total dioxin/furans	Sediment	ND	5	3	6	NS	NS	NS	NS	2	4	ND	2	ND	1	1	3
Total dioxin/furans	Soil	4	4	2	2	NS	NS	NS	NS	6	6	5	5	3	3	1	1
Total Organic Carbon	Sediment	7	5	5	3	2	6	3	4	1	2	4	1	6	7	8	8
Total Organic Carbon	Soil	6	6	1	5	5	3	8	8	4	2	7	7	3	1	2	4

ND - Not Detected

NS - Not Sampled

TABLE G-58

Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints for Riverine Habitats

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of benthic invertebrate communities	Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect benthic invertebrate communities?	Comparison of chemical concentrations in surface water and sediment with medium-specific screening values	Benthic invertebrates
Survival, growth, and reproduction of aquatic plant communities	Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect aquatic plant communities?	Comparison of chemical concentrations in surface water and sediment with medium-specific screening values	Aquatic plants
Survival, growth, and reproduction of fish communities	Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect fish communities?	Comparison of chemical concentrations in surface water and sediment with medium-specific screening values	Fish
Survival, growth, and reproduction of amphibian populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect amphibian communities?	Comparison of chemical concentrations in surface water and sediment with medium-specific screening values	Amphibians
	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to amphibian populations?	Evidence of potential risk to other upper trophic level aquatic receptors evaluated in the ERA	
Survival, growth, and reproduction of aquatic reptile populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect reptilian communities?	Comparison of chemical concentrations in surface water and sediment with medium-specific screening values	Reptiles
	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to aquatic reptile populations?	Evidence of potential risk to other upper trophic level aquatic receptors evaluated in the ERA	
Survival, growth, and reproduction of avian semi-aquatic omnivore populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian omnivore populations that may consume aquatic prey from the portion of the river adjacent to the site?	Comparison of modeled dietary intakes using surface water and sediment concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Mallard
Survival, growth, and reproduction of avian semi-aquatic piscivore populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian piscivore populations that may consume fish from the portion of the river adjacent to the site?	Comparison of modeled dietary intakes using surface water and sediment concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Belted kingfisher Great blue heron

**TABLE G-58**

Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints for Riverine Habitats

*Site 1 Focused RI for Soil*

*Allegany Ballistics Laboratory, Rocket Center, WV*

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of avian semi-aquatic insectivore populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian piscivore populations that may consume aquatic invertebrates from the portion of the river adjacent to the site?	Comparison of modeled dietary intakes using surface water and sediment concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Tree swallow
Survival, growth, and reproduction of mammalian semi-aquatic omnivore populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian omnivore populations that may consume aquatic prey from the portion of the river adjacent to the site?	Comparison of modeled dietary intakes using surface water and sediment concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Raccoon
Survival, growth, and reproduction of mammalian semi-aquatic piscivore populations	Are site-related chemical concentrations in surface water and/or sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian piscivore populations that may consume fish from the portion of the river adjacent to the site?	Comparison of modeled dietary intakes using surface water and sediment concentrations with literature-based ingestion screening values; ratios >1 based upon the NOAEL-LOAEL range indicate an effect	Mink

TABLE G-59

Sediment Bioaccumulation Factors for Benthic Invertebrates (Dry Weight)

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
<b>Metals</b>					
Arsenic	0.68	90th percentile	0.44	Geometric mean	Bechtel Jacobs 1998b
Cadmium	3.07	90th percentile	0.68	Geometric mean	Bechtel Jacobs 1998b
Chromium	0.19	90th percentile	0.09	Arithmetic mean	Bechtel Jacobs 1998b
Copper	7.96	90th percentile	0.92	Geometric mean	Bechtel Jacobs 1998b
Lead	0.33	90th percentile	0.34	Geometric mean	Bechtel Jacobs 1998b
Mercury	1.74	90th percentile	1.02	Geometric mean	Bechtel Jacobs 1998b
Nickel	0.21	90th percentile	0.13	Arithmetic mean	Bechtel Jacobs 1998b
Selenium	1.00	Assumed	1.00	Assumed	--
Silver	0.18	Not specified	0.18	Not specified	Hirsch 1998
Zinc	4.76	90th percentile	0.95	Geometric mean	Bechtel Jacobs 1998b
<b>Volatile and Semivolatile Organics</b>					
1,1,2,2-Tetrachloroethane	1.00	Assumed	1.00	Assumed	--
1,2,4-Trichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,2-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,3-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,4-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
4-Bromophenyl-phenylether	1.00	Assumed	1.00	Assumed	--
4-Chlorophenyl-phenylether	1.00	Assumed	1.00	Assumed	--
Acenaphthene	2.04	Maximum	2.04	Mean	Maruya et al. 1997
Acenaphthylene	1.00	Assumed	1.00	Assumed	--
Anthracene	0.27	Maximum	0.19	Mean	Maruya et al. 1997
Benzo(a)anthracene	1.40	Maximum	0.36	Mean	Maruya et al. 1997
Benzo(a)pyrene	0.19	Maximum	0.13	Mean	Maruya et al. 1997
Benzo(b)fluoranthene	0.16	Maximum	0.15	Mean	Maruya et al. 1997
Benzo(g,h,i)perylene	0.30	Maximum	0.22	Mean	Maruya et al. 1997
Benzo(k)fluoranthene	0.42	Maximum	0.23	Mean	Maruya et al. 1997
Chrysene	0.34	Maximum	0.20	Mean	Maruya et al. 1997
Dibenz(a,h)anthracene	1.00	Assumed	1.00	Assumed	--
Fluoranthene	0.31	Maximum	0.21	Mean	Maruya et al. 1997

**TABLE G-59**

Sediment Bioaccumulation Factors for Benthic Invertebrates (Dry Weight)

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
Fluorene	1.13	Maximum	0.48	Mean	Maruya et al. 1997
Hexachlorobenzene	1.00	Assumed	1.00	Assumed	--
Hexachlorobutadiene	1.00	Assumed	1.00	Assumed	--
Hexachlorocyclopentadiene	1.00	Assumed	1.00	Assumed	--
Hexachloroethane	1.00	Assumed	1.00	Assumed	--
Indeno(1,2,3-cd)pyrene	0.36	Maximum	0.17	Mean	Maruya et al. 1997
Pentachlorophenol	1.00	Assumed	1.00	Assumed	--
Phenanthrene	0.65	Maximum	0.29	Mean	Maruya et al. 1997
Pyrene	0.80	Maximum	0.44	Mean	Maruya et al. 1997
<b>Dioxin/Furans</b>					
2,3,7,8-TCDD	0.36	Not specified	0.36	Not specified	USEPA 1993b

TABLE G-60

Sediment Bioaccumulation Factors for Fish (Dry Weight)

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
<b>Metals</b>					
Arsenic	0.13	Mean	0.13	Mean	Pascoe et al. 1996
Cadmium	0.16	Mean	0.16	Mean	Pascoe et al. 1996
Chromium	0.04	Mean	0.04	Mean	Krantzberg and Boyd 1992
Copper	0.10	Mean	0.10	Mean	Krantzberg and Boyd 1992
Lead	0.07	Mean	0.07	Mean	Krantzberg and Boyd 1992
Mercury	4.58	Maximum	3.25	Mean	Cope et al. 1990
Nickel	1.00	Assumed	1.00	Assumed	--
Selenium	1.00	Assumed	1.00	Assumed	--
Silver	1.00	Assumed	1.00	Assumed	--
Zinc	0.15	Mean	0.15	Mean	Pascoe et al. 1996
<b>Volatile and Semivolatile Organics</b>					
1,1,2,2-Tetrachloroethane	1.00	Assumed	1.00	Assumed	--
1,2,4-Trichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,2-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,3-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
1,4-Dichlorobenzene	1.00	Assumed	1.00	Assumed	--
4-Bromophenyl-Phenylether	1.00	Assumed	1.00	Assumed	--
4-Chlorophenyl-Phenylether	1.00	Assumed	1.00	Assumed	--
Acenaphthene	1.00	Assumed	1.00	Assumed	--
Acenaphthylene	1.00	Assumed	1.00	Assumed	--
Anthracene	1.00	Assumed	1.00	Assumed	--
Benzo(a)anthracene	1.00	Assumed	1.00	Assumed	--
Benzo(a)pyrene	1.00	Assumed	1.00	Assumed	--
Benzo(b)fluoranthene	1.00	Assumed	1.00	Assumed	--
Benzo(g,h,i)perylene	1.00	Assumed	1.00	Assumed	--
Benzo(k)fluoranthene	1.00	Assumed	1.00	Assumed	--
Chrysene	1.00	Assumed	1.00	Assumed	--
Dibenz(a,h)anthracene	1.00	Assumed	1.00	Assumed	--
Fluoranthene	1.00	Assumed	1.00	Assumed	--

TABLE G-60

Sediment Bioaccumulation Factors for Fish (Dry Weight)

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening		Baseline		Reference
	Value	Basis	Value	Basis	
Fluorene	1.00	Assumed	1.00	Assumed	--
Hexachlorobenzene	1.00	Assumed	1.00	Assumed	--
Hexachlorobutadiene	1.00	Assumed	1.00	Assumed	--
Hexachlorocyclopentadiene	1.00	Assumed	1.00	Assumed	--
Hexachloroethane	1.00	Assumed	1.00	Assumed	--
Indeno(1,2,3-cd)pyrene	1.00	Assumed	1.00	Assumed	--
Pentachlorophenol	1.00	Assumed	1.00	Assumed	--
Phenanthrene	1.00	Assumed	1.00	Assumed	--
Pyrene	1.00	Assumed	1.00	Assumed	--
<b>Dioxin/Furans</b>					
2,3,7,8-TCDD	0.39	Best estimate	0.39	Best estimate	USEPA 1990

TABLE G-61

Exposure Parameters for Semi-Aquatic Upper Trophic Level Ecological Receptors - Screening

Site 1 Focused RI for Soil

Allegheny Ballistics Laboratory, Mineral County, WV

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
<b>Birds</b>						
Belted kingfisher	0.125	Dunning 1993	0.0211	allometric equation	0.0262	USEPA 1993a
Great blue heron	2.100	Butler 1992	0.1090	allometric equation	0.4389	allometric equation
Mallard	0.612	Bellrose 1980	0.0850	allometric equation	0.0830	allometric equation
Tree swallow	0.016	Dunning 1993	0.0050	allometric equation	0.0012	Sample et al. 1997
<b>Mammals</b>						
Mink	0.726	Silva and Downing 1995	0.0286	USEPA 1993a	0.0349	USEPA 1993a
Raccoon	4.230	Silva and Downing 1995	0.6092	allometric equation	0.1307	Conover 1989

TABLE G-61

Exposure Parameters for Semi-Aquatic Upper Trophic Level Ecological Receptors - Screening

Site 1 Focused RI for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Receptor	Dietary Composition (percent)						Sediment Ingestion (percent)		
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Benthic Invert.	Reference	Value	Reference
<b>Birds</b>									
Belted kingfisher	0	0	0	84.0	0	16.0	USEPA 1993a	0	Sample and Suter 1994
Great blue heron	0	0	0	100	0	0	USEPA 1993a; Quinney and Smith 1980	0	Sample and Suter 1994
Mallard	0	0	0	0	86.7	10.0	Palmer 1976	3.3	Beyer et al. 1994
Tree swallow	0	0	0	0	0	100.0	Sample et al. 1997	0	Sample et al. 1997
<b>Mammals</b>									
Mink	0	0	0	100	0	0	USEPA 1993a	0	Sample and Suter 1994
Raccoon	0	0	0	7.0	40.0	43.6	USEPA 1993a	9.4	Beyer et al. 1994

**TABLE G-62**

Exposure Parameters for Semi-Aquatic Upper Trophic Level Ecological Receptors - Baseline

*Site 1 Focused RI for Soil*

*Allegheny Ballistics Laboratory, Mineral County, WV*

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
<b>Birds</b>						
Belted kingfisher	0.148	Dunning 1993	0.0164	allometric equation	0.0180	USEPA 1993a
Great blue heron	2.230	Quinney 1982	0.1010	allometric equation	0.3931	allometric equation
Mallard	1.177	Bellrose 1980	0.0658	allometric equation	0.0647	allometric equation
Tree swallow	0.020	Dunning 1993	0.0043	allometric equation	0.0009	Sample et al. 1997
<b>Mammals</b>						
Mink	0.777	Silva and Downing 1995	0.0218	USEPA 1993a	0.0266	USEPA 1993a
Raccoon	5.940	Silva and Downing 1995	0.4921	allometric equation	0.1031	Conover 1989

TABLE G-62

Exposure Parameters for Semi-Aquatic Upper Trophic Level Ecological Receptors - Baseline

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Receptor	Dietary Composition (percent)						Sediment Ingestion (percent)		
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Benthic Invert.	Reference	Value	Reference
<b>Birds</b>									
Belted kingfisher	0	0	0	84.0	0	16.0	USEPA 1993a	0	Sample and Suter 1994
Great blue heron	0	0	0	100	0	0	USEPA 1993a; Quinney and Smith 1980	0	Sample and Suter 1994
Mallard	0	0	0	0	86.7	10.0	Palmer 1976	3.3	Beyer et al. 1994
Tree swallow	0	0	0	0	0	100.0	Sample et al. 1997	0	Sample et al. 1997
<b>Mammals</b>									
Mink	0	0	0	100	0	0	USEPA 1993a	0	Sample and Suter 1994
Raccoon	0	0	0	7.0	40.0	43.6	USEPA 1993a	9.4	Beyer et al. 1994

TABLE G-63

Surface Water and Sediment Screening Values Used in the ERA

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Hardness (mg/L)	pH
<b>Surface Water</b>					
1,1,1-Trichloroethane	9,400	µg/L	USEPA 1995a		
1,1,2,2-Tetrachloroethane	2,400	µg/L	USEPA 1995a		
1,1,2-Trichloroethane	9,400	µg/L	USEPA 1995a		
1,1-Biphenyl	14.0	µg/L	USEPA 1996b		
1,1-Dichloroethane	1,600	µg/L	USEPA 1995a (with safety factor of 100)		
1,1-Dichloroethene	1,160	µg/L	USEPA 1995a (with safety factor of 10)		
1,2,4-Trichlorobenzene	50.0	µg/L	USEPA 1995a		
1,2-Dibromoethane	180	µg/L	USEPA 1995a (with safety factor of 100)		
1,2-Dichlorobenzene	763	µg/L	USEPA 1995a		
1,2-Dichloroethane	20,000	µg/L	USEPA 1995a		
1,2-Dichloropropane	5,700	µg/L	USEPA 1995a		
1,3-Dichlorobenzene	763	µg/L	USEPA 1995a		
1,4-Dichlorobenzene	763	µg/L	USEPA 1995a		
2,4,5-Trichlorophenol	63.0	µg/L	USEPA 1995a		
2,4,6-Trichlorophenol	970	µg/L	USEPA 1995a		
2,4-Dichlorophenol	365	µg/L	USEPA 1995a		
2,4-Dimethylphenol	530	µg/L	Federal Register 59:3762 (1994)		
2,4-Dinitrophenol	150	µg/L	USEPA 1995a		
2,4-Dinitrotoluene	230	µg/L	USEPA 1995a		
2-Butanone	14,000	µg/L	Suter and Tsao 1996		
2-Chloronaphthalene	620	µg/L	USEPA 1995a		
2-Chlorophenol	97.0	µg/L	USEPA 1995a (with safety factor of 10)		
2-Hexanone	4,280	µg/L	USEPA 1995a (with safety factor of 100)		
2-Methylphenol	13.0	µg/L	Suter and Tsao 1996		
2-Nitrophenol	150	µg/L	USEPA 1994		
4,6-Dinitro-2-methylphenol	2.30	µg/L	USEPA 1999a		
4-Bromophenyl-phenylether	1.50	µg/L	USEPA 1996b		
4-Chloro-3-methylphenol	0.30	µg/L	USEPA 1999a		
4-Chloroaniline	50.0	µg/L	Buchman 1999		
4-Methyl-2-pentanone	4,600	µg/L	USEPA 1995a (with safety factor of 100)		
4-Nitrophenol	150	µg/L	USEPA 1995a		
Acenaphthene	520	µg/L	USEPA 1995a		
Acetone	90,000	µg/L	USEPA 1995a (with safety factor of 100)		
Aluminum	87.0	µg/L	USEPA 1999b		
Anthracene	0.73	µg/L	Suter and Tsao 1996		
Antimony	30.0	µg/L	USEPA 1995a		
Arsenic	150	µg/L	USEPA 2002b		
Barium	1,000	µg/L	USEPA 1995a (with safety factor of 10)		
Benzene	530	µg/L	USEPA 1995a (with safety factor of 10)		
Benzo(a)anthracene	6.30	µg/L	USEPA 1995a		
Benzo(a)pyrene	0.014	µg/L	Suter and Tsao 1996		
Beryllium	5.30	µg/L	USEPA 1995a		
bis(2-Chloroethoxy)methane	1,100	µg/L	USEPA 1995a (with safety factor of 10)		
bis(2-Chloroethyl)ether	2,380	µg/L	USEPA 1999a		
bis(2-Ethylhexyl)phthalate	30.0	µg/L	USEPA 1995a		
Bromochloromethane	1,100	µg/L	USEPA 1995a (with safety factor of 10)		
Bromodichloromethane	1,100	µg/L	USEPA 1995a (with safety factor of 10)		

TABLE G-63

Surface Water and Sediment Screening Values Used in the ERA

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Hardness (mg/L)	pH
Bromoform	320	µg/L	USEPA 1996b		
Bromomethane	110	µg/L	USEPA 1999a		
Butylbenzylphthalate	22.0	µg/L	USEPA 1999a		
Cadmium (total)	0.38	µg/L	USEPA 2002b	158	
Cadmium (dissolved)	0.34	µg/L	USEPA 2002b	158	
Carbon disulfide	2.00	µg/L	USEPA 1995a		
Carbon tetrachloride	3,520	µg/L	USEPA 1995a (with safety factor of 10)		
Chlorobenzene	130	µg/L	USEPA 1996b		
Chloroform	1,240	µg/L	USEPA 1995a		
Chloromethane	5,500	µg/L	USEPA 1999a		
Chromium (total)	11.4	µg/L	USEPA 2002b		
Chromium (dissolved)	11.0	µg/L	USEPA 2002b		
cis-1,2-Dichloroethene	1,160	µg/L	USEPA 1995a (with safety factor of 10)		
cis-1,3-Dichloropropene	244	µg/L	USEPA 1995a		
Cobalt	23.0	µg/L	Suter and Tsao 1996		
Copper (total)	13.8	µg/L	USEPA 2002b	158	
Copper (dissolved)	13.2	µg/L	USEPA 2002b	158	
Cyanide	5.20	µg/L	USEPA 1995a		
Dibenzofuran	20.0	µg/L	USEPA 1996b		
Dibromochloromethane	1,100	µg/L	USEPA 1995a (with safety factor of 10)		
Dichlorodifluoromethane	1,100	µg/L	USEPA 1995a (with safety factor of 10)		
Diethylphthalate	220	µg/L	USEPA 1996b		
Dimethyl phthalate	330	µg/L	USEPA 1999a		
Di-n-butylphthalate	33.0	µg/L	USEPA 1996b		
Di-n-octyl phthalate	3.00	µg/L	Buchman 1999		
Ethylbenzene	3,200	µg/L	USEPA 1995a (with safety factor of 10)		
Fluoranthene	398	µg/L	USEPA 1995a (with safety factor of 10)		
Fluorene	430	µg/L	USEPA 1995a		
Hexachlorobenzene	3.68	µg/L	USEPA 1995a		
Hexachlorobutadiene	9.30	µg/L	USEPA 1995a		
Hexachlorocyclopentadiene	5.20	µg/L	USEPA 1995a		
Hexachloroethane	540	µg/L	USEPA 1995a		
Iron	1,000	µg/L	USEPA 2002b		
Isophorone	11,700	µg/L	USEPA 1995a (with safety factor of 10)		
Lead (total)	5.70	µg/L	USEPA 2002b	158	
Lead (dissolved)	4.13	µg/L	USEPA 2002b	158	
Manganese	120	µg/L	Suter and Tsao 1996		
Mercury (total)	0.91	µg/L	USEPA 2002b		
Mercury (dissolved)	0.77	µg/L	USEPA 2002b		
Methylene chloride	2,200	µg/L	Suter and Tsao 1996		
Naphthalene	100	µg/L	USEPA 1995a		
Nickel (total)	76.8	µg/L	USEPA 2002b	158	
Nickel (dissolved)	76.6	µg/L	USEPA 2002b	158	
Nitrobenzene	2,700	µg/L	USEPA 1995a (with safety factor of 10)		
n-Nitrosodiphenylamine	585	µg/L	USEPA 1995a (with safety factor of 10)		
Pentachlorophenol	15.0	µg/L	USEPA 1999b		7.8
Phenanthrene	6.30	µg/L	USEPA 1995a		
Phenol	256	µg/L	USEPA 1999a		

TABLE G-63

Surface Water and Sediment Screening Values Used in the ERA

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Hardness (mg/L)	pH
Selenium (total)	5.00	µg/L	USEPA 2002b		
Selenium (dissolved)	4.60	µg/L	USEPA 2002b		
Silver	0.36	µg/L	Suter and Tsao 1996		
Tetrachloroethene	840	µg/L	USEPA 1995a		
Thallium	40.0	µg/L	USEPA 1995a		
Toluene	1,700	µg/L	USEPA 1995a (with safety factor of 10)		
trans-1,2-Dichloroethene	1,160	µg/L	USEPA 1995a (with safety factor of 10)		
trans-1,3-Dichloropropene	244	µg/L	USEPA 1995a		
Trichloroethene	21,900	µg/L	USEPA 1995a		
Trichlorofluoromethane	1,100	µg/L	USEPA 1995a (with safety factor of 10)		
Vanadium	10,000	µg/L	USEPA 1995a		
Vinyl chloride	1,160	µg/L	USEPA 1995a (with safety factor of 10)		
Xylene, total	130	µg/L	USEPA 1995a		
Zinc (total)	177	µg/L	USEPA 2002b	158	
Zinc (dissolved)	174	µg/L	USEPA 2002b	158	
<b>Sediment</b>					
1,1,1-Trichloroethane	31.0	µg/kg	USEPA 1995a		
1,1,2-Trichloroethane	31.0	µg/kg	USEPA 1995a		
1,1'-Biphenyl	260	µg/kg	Barrick et al. 1988		
1,2,4-Trichlorobenzene	40.0	µg/kg	USEPA 1995a		
1,2-Dichlorobenzene	35.0	µg/kg	USEPA 1995a		
1,4-Dichlorobenzene	110	µg/kg	USEPA 1995a		
2,4-Dimethylphenol	29.0	µg/kg	USEPA 1995a		
2,3,7,8-TCDD	0.0088	µg/kg	Cubbage et al. 1997		
2-Methylnaphthalene	70.0	µg/kg	USEPA 1995a		
2-Methylphenol	63.0	µg/kg	USEPA 1995a		
3- and 4-Methylphenol	670	µg/kg	USEPA 1995a		
4-Methylphenol	670	µg/kg	USEPA 1995a		
Acenaphthene	16.0	µg/kg	USEPA 1995a		
Acenaphthylene	44.0	µg/kg	USEPA 1995a		
Aluminum	25,500	µg/kg	Buchman 1999		
Anthracene	85.3	µg/kg	USEPA 1995a		
Antimony	150	µg/kg	USEPA 1995a		
Arsenic	8.20	µg/kg	USEPA 1995a		
Barium	500	µg/kg	Beyer 1990		
Benzo(a)anthracene	261	µg/kg	USEPA 1995a		
Benzo(a)pyrene	430	µg/kg	USEPA 1995a		
Benzo(b)fluoranthene	3,200	µg/kg	USEPA 1995a		
Benzo(g,h,i)perylene	670	µg/kg	USEPA 1995a		
Benzo(k)fluoranthene	240	µg/kg	Ontario Ministry of the Environment 1993		
bis(2-Ethylhexyl)phthalate	1,300	µg/kg	USEPA 1995a		
Butylbenzylphthalate	63.0	µg/kg	USEPA 1995a		
Cadmium	1.20	µg/kg	USEPA 1995a		
Carbazole	1,800	µg/kg	Cubbage et al. 1997		
Chromium	81.0	µg/kg	Long et al. 1995		
Chrysene	384	µg/kg	USEPA 1995a		

TABLE G-63

Surface Water and Sediment Screening Values Used in the ERA

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Screening Value	Units	Reference	Hardness (mg/L)	pH
Cobalt	50.0	µg/kg	Ontario Ministry of the Environment 1993		
Copper	34.0	µg/kg	USEPA 1995a		
Dibenz(a,h)anthracene	63.4	µg/kg	USEPA 1995a		
Dibenzofuran	540	µg/kg	USEPA 1995a		
Diethylphthalate	200	µg/kg	USEPA 1995a		
Dimethylphthalate	71.0	µg/kg	USEPA 1995a		
Di-n-butylphthalate	1,400	µg/kg	USEPA 1995a		
Di-n-octyl phthalate	6,200	µg/kg	USEPA 1995a		
Ethylbenzene	10.0	µg/kg	USEPA 1995a		
Fluoranthene	600	µg/kg	USEPA 1995a		
Fluorene	19.0	µg/kg	USEPA 1995a		
Hexachlorobenzene	22.0	µg/kg	USEPA 1995a		
Hexachlorobutadiene	11.0	µg/kg	USEPA 1995a		
Indeno(1,2,3-cd)pyrene	600	µg/kg	USEPA 1995a		
Iron	188,400	µg/kg	Buchman 1999		
Lead	46.7	mg/kg	USEPA 1995a		
Manganese	630	mg/kg	Buchman 1999		
Mercury	0.15	mg/kg	USEPA 1995a		
Naphthalene	160	µg/kg	USEPA 1995a		
Nickel	20.9	mg/kg	USEPA 1995a		
n-Nitrosodiphenylamine	28.0	µg/kg	USEPA 1995a		
PAH, total	4,000	µg/kg	Ontario Ministry of the Environment 1993		
Pentachlorophenol	360	µg/kg	USEPA 1995a		
Phenanthrene	240	µg/kg	USEPA 1995a		
Phenol	420	µg/kg	USEPA 1995a		
Pyrene	665	µg/kg	USEPA 1995a		
Selenium	1.00	mg/kg	Buchman 1999		
Silver	1.00	mg/kg	USEPA 1995a		
Tetrachloroethene	57.0	µg/kg	USEPA 1995a		
Trichloroethene	41.0	µg/kg	Buchman 1999		
Vanadium	57.0	mg/kg	Buchman 1999		
Xylene, total	40.0	µg/kg	USEPA 1995a		
Zinc	150	mg/kg	USEPA 1995a		

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Inorganics (µg/L)</b>								
Aluminum	8.50 - 19.2	26 / 28	998	AS01-SW06	87.0	26 / 28	11.5	YES
Antimony	4.90 - 5.90	2 / 28	5.90	AS01-SW02-R05	30.0	0 / 28	0.20	NO
Arsenic	3.20 - 3.80	4 / 28	6.80	AS01-SW03A-R05	150	0 / 28	0.05	NO
Barium	0.20 - 1.60	28 / 28	65.0	AS01-SW04-R06	1,000	0 / 28	0.07	NO
Beryllium	0.10 - 0.20	7 / 28	0.20	AS01-SW06	5.30	0 / 28	0.04	NO
Cadmium	0.40 - 0.60	3 / 28	0.74	AS01-SW03-R06	0.38	3 / 28	1.95	YES
Calcium <sup>2</sup>	6.30 - 15.9	28 / 28	56,700	AS01-SW05-R06	NSV	-- / --	NSV	NO
Chromium	0.70 - 0.90	5 / 28	1.40	AS01-SW02-R06	11.4	0 / 28	0.12	NO
Cobalt	1.00 - 1.10	12 / 28	4.10	AS01-SW05C	23.0	0 / 28	0.18	NO
Copper	0.70 - 1.60	12 / 28	3.30	AS01-SW03-R06	13.8	0 / 28	0.24	NO
Cyanide	10.0 - 10.0	0 / 24	--	--	5.20	-- / --	1.92	-- <sup>3</sup>
Iron	15.9 - 17.3	28 / 28	1,460	AS01-SW06	1,000	3 / 28	1.46	YES
Lead	2.00 - 2.50	5 / 28	2.60	AS01-SW03-R05	5.70	0 / 28	0.46	NO
Magnesium <sup>2</sup>	7.30 - 13.6	28 / 28	13,000	AS01-SW03-R04	NSV	-- / --	NSV	NO
Manganese	0.30 - 0.40	28 / 28	383	AS01-SW05C	120	28 / 28	3.19	YES
Mercury	0.10 - 0.20	0 / 28	--	--	0.91	-- / --	0.22	NO
Nickel	2.00 - 2.10	9 / 28	11.2	AS01-SW03-R04	76.8	0 / 28	0.15	NO
Potassium <sup>2</sup>	49.7 - 137	28 / 28	4,080	AS01-SW05-R06	NSV	-- / --	NSV	NO
Selenium	2.20 - 3.40	4 / 28	4.70	AS01-SW04-R06	5.00	0 / 28	0.94	NO
Silver	0.60 - 1.60	0 / 28	--	--	0.36	-- / --	4.44	-- <sup>3</sup>
Sodium <sup>2</sup>	290 - 308	28 / 28	40,700	AS01-SW05-R06	NSV	-- / --	NSV	NO
Thallium	2.30 - 5.70	1 / 28	6.20	AS01-SW02A-R05	40.0	0 / 28	0.16	NO
Vanadium	1.00 - 1.50	5 / 28	2.80	AS01-SW02A-R06	10,000	0 / 28	0.0003	NO
Zinc	1.30 - 32.2	22 / 28	55.9	AS01-SW04A-R04	177	0 / 28	0.32	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Dissolved Metals (µg/L)</b>								
Aluminum	19.2 - 19.2	12 / 12	408	AS01-SW07	87.0	12 / 12	4.69	YES
Antimony	4.90 - 4.90	5 / 12	8.00	AS01-SW09	30.0	0 / 12	0.27	NO
Arsenic	3.70 - 3.70	2 / 12	5.60	AS01-SW03A-R05	150	0 / 12	0.04	NO
Barium	0.20 - 0.20	12 / 12	53.3	AS01-SW05C	1,000	0 / 12	0.05	NO
Beryllium	0.10 - 0.10	0 / 12	--	--	5.30	-- / --	0.02	NO
Cadmium	0.40 - 0.40	0 / 12	--	--	0.34	-- / --	1.18	-- <sup>3</sup>
Calcium <sup>2</sup>	15.9 - 15.9	12 / 12	49,200	AS01-SW05C	NSV	-- / --	NSV	NO
Chromium	0.70 - 0.70	0 / 12	--	--	11.0	-- / --	0.06	NO
Cobalt	1.10 - 1.10	0 / 12	--	--	23.0	-- / --	0.05	NO
Copper	0.70 - 0.70	2 / 12	1.20	AS01-SW07	13.2	0 / 12	0.09	NO
Iron	15.9 - 15.9	12 / 12	236	AS01-SW03-R05	1,000	0 / 12	0.24	NO
Lead	2.00 - 2.00	0 / 12	--	--	4.13	-- / --	0.48	NO
Magnesium <sup>2</sup>	13.6 - 13.6	12 / 12	13,000	AS01-SW05C	NSV	-- / --	NSV	NO
Manganese	0.30 - 0.30	12 / 12	216	AS01-SW05C	120	7 / 12	1.80	YES
Mercury	0.20 - 0.20	1 / 12	0.24	AS01-SW04A-R05	0.77	0 / 12	0.31	NO
Nickel	2.00 - 2.00	0 / 12	--	--	76.6	-- / --	0.03	NO
Potassium <sup>2</sup>	49.7 - 49.7	12 / 12	3,070	AS01-SW05C	NSV	-- / --	NSV	NO
Selenium	2.20 - 2.20	1 / 12	2.60	AS01-SW06	4.60	0 / 12	0.57	NO
Silver	0.60 - 0.60	1 / 12	2.10	AS01-SW06	0.36	1 / 12	5.83	YES
Sodium <sup>2</sup>	308 - 308	12 / 12	24,300	AS01-SW05C	NSV	-- / --	NSV	NO
Thallium	2.30 - 2.30	1 / 12	8.70	AS01-SW04-R05	40.0	0 / 12	0.22	NO
Vanadium	1.00 - 1.00	0 / 12	--	--	10,000	-- / --	0.0001	NO
Zinc	1.50 - 32.2	7 / 12	13.1	AS01-SW07	174	0 / 12	0.08	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Semivolatile Organic Compounds (µg/L)</b>								
1,1-Biphenyl	10.0 - 10.0	0 / 9	--	--	14.0	-- / --	0.71	NO
2,2'-Oxybis(1-chloropropane)	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
2,4,5-Trichlorophenol	25.0 - 25.0	0 / 9	--	--	63.0	-- / --	0.40	NO
2,4,6-Trichlorophenol	10.0 - 10.0	0 / 9	--	--	970	-- / --	0.01	NO
2,4-Dichlorophenol	10.0 - 10.0	0 / 9	--	--	365	-- / --	0.03	NO
2,4-Dimethylphenol	10.0 - 10.0	0 / 9	--	--	530	-- / --	0.02	NO
2,4-Dinitrophenol	25.0 - 25.0	0 / 9	--	--	150	-- / --	0.17	NO
2-Chloronaphthalene	10.0 - 10.0	0 / 9	--	--	620	-- / --	0.02	NO
2-Chlorophenol	10.0 - 10.0	0 / 9	--	--	97.0	-- / --	0.10	NO
2-Methylnaphthalene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
2-Methylphenol	10.0 - 10.0	0 / 9	--	--	13.0	-- / --	0.77	NO
2-Nitroaniline	25.0 - 25.0	0 / 9	--	--	NSV	-- / --	NSV	NO
2-Nitrophenol	10.0 - 10.0	0 / 9	--	--	150	-- / --	0.07	NO
3,3'-Dichlorobenzidine	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
3- and 4-Methylphenol	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
3-Nitroaniline	25.0 - 25.0	0 / 9	--	--	NSV	-- / --	NSV	NO
4,6-Dinitro-2-methylphenol	25.0 - 25.0	0 / 9	--	--	2.30	-- / --	10.9	-- <sup>3</sup>
4-Bromophenyl-phenylether	10.0 - 10.0	0 / 9	--	--	1.50	-- / --	6.67	-- <sup>3</sup>
4-Chloro-3-methylphenol	10.0 - 10.0	0 / 9	--	--	0.30	-- / --	33.3	-- <sup>3</sup>
4-Chloroaniline	10.0 - 10.0	0 / 9	--	--	50.0	-- / --	0.20	NO
4-Chlorophenyl-phenylether	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
4-Nitroaniline	25.0 - 25.0	0 / 9	--	--	NSV	-- / --	NSV	NO
4-Nitrophenol	25.0 - 25.0	0 / 9	--	--	150	-- / --	0.17	NO
Acenaphthene	10.0 - 10.0	0 / 9	--	--	520	-- / --	0.02	NO
Acenaphthylene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Acetophenone	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Anthracene	10.0 - 10.0	0 / 9	--	--	0.73	-- / --	13.7	-- <sup>3</sup>
Atrazine	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Benzaldehyde	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Benzo(a)anthracene	10.0 - 10.0	0 / 9	--	--	6.30	-- / --	1.59	-- <sup>3</sup>
Benzo(a)pyrene	10.0 - 10.0	0 / 9	--	--	0.014	-- / --	714	-- <sup>3</sup>
Benzo(b)fluoranthene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Benzo(g,h,i)perylene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Benzo(k)fluoranthene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Butylbenzylphthalate	10.0 - 10.0	1 / 9	1.20	AS01-SW04-R05	22.0	0 / 9	0.05	NO
Carbazole	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Chrysene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Di-n-butylphthalate	10.0 - 10.0	2 / 9	1.60	AS01-SW06	33.0	0 / 9	0.05	NO
Di-n-octylphthalate	10.0 - 10.0	0 / 9	--	--	3.00	-- / --	3.33	-- <sup>3</sup>
Dibenz(a,h)anthracene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Dibenzofuran	10.0 - 10.0	0 / 9	--	--	20.0	-- / --	0.50	NO
Diethylphthalate	10.0 - 10.0	1 / 9	1.50	AS01-SW05C	220	0 / 9	0.01	NO
Dimethyl phthalate	10.0 - 10.0	0 / 9	--	--	330	-- / --	0.03	NO
Fluoranthene	10.0 - 10.0	0 / 9	--	--	398	-- / --	0.03	NO
Fluorene	10.0 - 10.0	0 / 9	--	--	430	-- / --	0.02	NO
Hexachlorobenzene	10.0 - 10.0	0 / 9	--	--	3.68	-- / --	2.72	-- <sup>3</sup>
Hexachlorobutadiene	10.0 - 10.0	0 / 9	--	--	9.30	-- / --	1.08	-- <sup>3</sup>
Hexachlorocyclopentadiene	10.0 - 10.0	0 / 9	--	--	5.20	-- / --	1.92	-- <sup>3</sup>
Hexachloroethane	10.0 - 10.0	0 / 9	--	--	540	-- / --	0.02	NO
Indeno(1,2,3-cd)pyrene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Isophorone	10.0 - 10.0	0 / 9	--	--	11,700	-- / --	0.001	NO
Naphthalene	10.0 - 10.0	0 / 9	--	--	100	-- / --	0.10	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Pentachlorophenol	25.0 - 25.0	0 / 9	--	--	15.0	-- / --	1.67	-- <sup>3</sup>
Phenanthrene	10.0 - 10.0	0 / 9	--	--	6.30	-- / --	1.59	-- <sup>3</sup>
Phenol	10.0 - 10.0	0 / 9	--	--	256	-- / --	0.04	NO
Pyrene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
bis(2-Chloroethoxy)methane	10.0 - 10.0	0 / 9	--	--	1,100	-- / --	0.01	NO
bis(2-Chloroethyl)ether	10.0 - 10.0	0 / 9	--	--	2,380	-- / --	0.004	NO
bis(2-Ethylhexyl)phthalate	10.0 - 10.0	4 / 9	1.90	AS01-SW07	30.0	0 / 9	0.06	NO
n-Nitroso-di-n-propylamine	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
n-Nitrosodiphenylamine	10.0 - 10.0	0 / 9	--	--	585	-- / --	0.02	NO
<b>Explosives (µg/L)</b>								
2,4-Dinitrotoluene	10.0 - 10.0	0 / 9	--	--	230	-- / --	0.04	NO
2,6-Dinitrotoluene	10.0 - 10.0	0 / 9	--	--	NSV	-- / --	NSV	NO
Nitrobenzene	10.0 - 10.0	0 / 9	--	--	2,700	-- / --	0.004	NO
<b>Volatile Organic Compounds (µg/L)</b>								
1,1,1-Trichloroethane	1.00 - 10.0	0 / 28	--	--	9,400	-- / --	0.001	NO
1,1,2,2-Tetrachloroethane	1.00 - 10.0	0 / 28	--	--	2,400	-- / --	0.004	NO
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	10.0 - 10.0	0 / 12	--	--	NSV	-- / --	NSV	NO
1,1,2-Trichloroethane	1.00 - 10.0	0 / 28	--	--	9,400	-- / --	0.001	NO
1,1-Dichloroethane	1.00 - 10.0	0 / 28	--	--	1,600	-- / --	0.01	NO
1,1-Dichloroethene	1.00 - 10.0	0 / 28	--	--	1,160	-- / --	0.01	NO
1,2,4-Trichlorobenzene	1.00 - 10.0	0 / 28	--	--	50.0	-- / --	0.20	NO
1,2-Dibromo-3-chloropropane	1.00 - 10.0	0 / 28	--	--	NSV	-- / --	NSV	NO
1,2-Dibromoethane	1.00 - 10.0	0 / 28	--	--	180	-- / --	0.06	NO
1,2-Dichlorobenzene	1.00 - 10.0	0 / 28	--	--	763	-- / --	0.01	NO
1,2-Dichloroethane	1.00 - 10.0	0 / 28	--	--	20,000	-- / --	0.001	NO
1,2-Dichloropropane	1.00 - 10.0	0 / 28	--	--	5,700	-- / --	0.002	NO
1,3-Dichlorobenzene	1.00 - 10.0	0 / 28	--	--	763	-- / --	0.01	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
1,4-Dichlorobenzene	1.00 - 10.0	0 / 28	--	--	763	-- / --	0.01	NO
2-Butanone	5.00 - 10.0	0 / 21	--	--	14,000	-- / --	0.001	NO
2-Hexanone	5.00 - 10.0	0 / 28	--	--	4,280	-- / --	0.002	NO
4-Methyl-2-pentanone	5.00 - 10.0	0 / 28	--	--	4,600	-- / --	0.002	NO
Acetone	5.00 - 10.0	1 / 21	2.50	AS01-SW03A-R04	90,000	0 / 21	0.00003	NO
Benzene	1.00 - 10.0	0 / 27	--	--	530	-- / --	0.02	NO
Bromochloromethane	1.00 - 1.00	0 / 16	--	--	1,100	-- / --	0.001	NO
Bromodichloromethane	1.00 - 10.0	0 / 28	--	--	1,100	-- / --	0.01	NO
Bromoform	1.00 - 10.0	0 / 28	--	--	320	-- / --	0.03	NO
Bromomethane	1.00 - 10.0	0 / 28	--	--	110	-- / --	0.09	NO
Carbon disulfide	1.00 - 10.0	0 / 28	--	--	2.00	-- / --	5.00	-- <sup>3</sup>
Carbon tetrachloride	1.00 - 10.0	0 / 28	--	--	3,520	-- / --	0.003	NO
Chlorobenzene	1.00 - 10.0	0 / 28	--	--	130	-- / --	0.08	NO
Chloroethane	1.00 - 10.0	0 / 28	--	--	NSV	-- / --	NSV	NO
Chloroform	1.00 - 10.0	0 / 28	--	--	1,240	-- / --	0.01	NO
Chloromethane	1.00 - 10.0	0 / 28	--	--	5,500	-- / --	0.002	NO
Cumene	10.0 - 10.0	0 / 12	--	--	NSV	-- / --	NSV	NO
Cyclohexane	10.0 - 10.0	0 / 12	--	--	NSV	-- / --	NSV	NO
Dibromochloromethane	1.00 - 10.0	0 / 28	--	--	1,100	-- / --	0.01	NO
Dichlorodifluoromethane(Freon-12)	10.0 - 10.0	0 / 12	--	--	1,100	-- / --	0.01	NO
Ethylbenzene	1.00 - 10.0	0 / 28	--	--	3,200	-- / --	0.003	NO
Methyl acetate	10.0 - 10.0	0 / 12	--	--	NSV	-- / --	NSV	NO
Methyl-tert-butyl ether (MTBE)	10.0 - 10.0	0 / 12	--	--	NSV	-- / --	NSV	NO
Methylcyclohexane	10.0 - 10.0	0 / 12	--	--	NSV	-- / --	NSV	NO
Methylene chloride	2.00 - 10.0	0 / 28	--	--	2,200	-- / --	0.005	NO
Styrene	1.00 - 10.0	0 / 28	--	--	NSV	-- / --	NSV	NO
Tetrachloroethene	1.00 - 10.0	1 / 28	1.00	AS01-SW06	840	0 / 28	0.001	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-64

Step 2 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Toluene	1.00 - 10.0	0 / 28	--	--	1,700	-- / --	0.01	NO
Trichloroethene	1.00 - 10.0	1 / 28	5.20	AS01-SW06	21,900	0 / 28	0.0002	NO
Trichlorofluoromethane(Freon-11)	10.0 - 10.0	0 / 12	--	--	1,100	-- / --	0.01	NO
Vinyl chloride	1.00 - 10.0	0 / 28	--	--	1,160	-- / --	0.01	NO
Xylene, total	1.00 - 10.0	0 / 20	--	--	130	-- / --	0.08	NO
cis-1,2-Dichloroethene	1.00 - 10.0	0 / 28	--	--	1,160	-- / --	0.01	NO
cis-1,3-Dichloropropene	1.00 - 10.0	0 / 28	--	--	244	-- / --	0.04	NO
m- and p-Xylene	1.00 - 1.00	0 / 8	--	--	130	-- / --	0.01	NO
o-Xylene	1.00 - 10.0	0 / 28	--	--	130	-- / --	0.08	NO
trans-1,2-Dichloroethene	1.00 - 10.0	0 / 28	--	--	1,160	-- / --	0.01	NO
trans-1,3-Dichloropropene	1.00 - 10.0	0 / 28	--	--	244	-- / --	0.04	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-65

Step 3 Surface Water Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC?
<b>Inorganics (µg/L)</b>										
Aluminum	8.50 - 19.2	26 / 28	998	AS01-SW06	407	87.0	26 / 28	11.5	4.68	YES
Cadmium	0.40 - 0.60	3 / 28	0.74	AS01-SW03-R06	0.27	0.38	3 / 28	1.95	0.71	NO
Iron	15.9 - 17.3	28 / 28	1,460	AS01-SW06	490	1,000	3 / 28	1.46	0.49	NO
Manganese	0.30 - 0.40	28 / 28	383	AS01-SW05C	264	120	28 / 28	3.19	2.20	YES
Silver	0.60 - 1.60	0 / 28	--	--	0.47	0.36	0 / 28	--	--	NO
<b>Dissolved Metals (µg/L)</b>										
Aluminum	19.2 - 19.2	12 / 12	408	AS01-SW07	325	87.0	12 / 12	4.69	3.73	YES
Cadmium	0.40 - 0.40	0 / 12	--	--	0.20	0.34	-- / --	--	--	NO
Iron	15.9 - 15.9	12 / 12	236	AS01-SW03-R05	140	1,000	0 / 12	0.24	0.14	NO
Manganese	0.30 - 0.30	12 / 12	216	AS01-SW05C	152	120	7 / 12	1.80	1.27	YES
Silver	0.60 - 0.60	1 / 12	2.10	AS01-SW06	0.45	0.36	1 / 12	5.83	1.25	YES

TABLE G-66

Step 2 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Inorganics (mg/kg)</b>								
Aluminum	2.20 - 10.3	39 / 39	14,000	AS01-SD04B	25,500	0 / 39	0.55	NO
Antimony	1.10 - 2.60	11 / 39	4.20	AS01-SD07B	150	0 / 39	0.03	NO
Arsenic	0.84 - 17.1	39 / 39	22.6	AS01-SD03A-R04	8.20	25 / 39	2.76	YES
Barium	0.02 - 0.57	39 / 39	201	AS01-SD08	500	0 / 39	0.40	NO
Beryllium	0.02 - 0.07	39 / 39	4.20	AS01-SD03A-R04	NSV	-- / --	NSV	YES
Cadmium	0.07 - 0.21	10 / 39	6.00	AS01-SD02D	1.20	1 / 39	5.00	YES
Calcium <sup>2</sup>	1.70 - 8.50	39 / 39	19,700	AS01-SD06	NSV	-- / --	NSV	NO
Chromium	0.16 - 0.37	38 / 39	23.5	AS01-SD06	81.0	0 / 39	0.29	NO
Cobalt	0.25 - 0.59	39 / 39	140	AS01-SD06A	50.0	8 / 39	2.80	YES
Copper	0.16 - 0.57	39 / 39	2,130	AS01-SD02A-R04	34.0	14 / 39	62.6	YES
Cyanide	0.60 - 1.30	0 / 27	--	--	NSV	-- / --	NSV	NO
Iron	3.63 - 8.50	39 / 39	60,600	AS01-SD02A-R05	188,400	0 / 39	0.32	NO
Lead	0.46 - 1.07	39 / 39	149	AS01-SD02-R06	46.7	8 / 39	3.19	YES
Magnesium <sup>2</sup>	1.90 - 7.27	39 / 39	2,660	AS01-SD02-R06	NSV	-- / --	NSV	NO
Manganese	0.07 - 0.16	39 / 39	2,920	AS01-SD08	630	30 / 39	4.63	YES
Mercury	0.06 - 0.23	14 / 39	2.30	AS01-SD02A-R04	0.15	11 / 39	15.3	YES
Nickel	0.46 - 1.07	39 / 39	211	AS01-SD03-R04	20.9	39 / 39	10.1	YES
Potassium <sup>2</sup>	11.4 - 48.6	39 / 39	1,510	AS01-SD08	NSV	-- / --	NSV	NO
Selenium	0.50 - 1.20	9 / 39	2.10	AS01-SD02A-R06	1.00	8 / 39	2.10	YES
Silver	0.14 - 17.5	24 / 39	103	AS01-SD02-R05	1.00	8 / 39	103	YES
Sodium <sup>2</sup>	70.3 - 164	15 / 39	868	AS01-SD07	NSV	-- / --	NSV	NO
Thallium	0.51 - 2.00	6 / 39	9.90	AS01-SD02A-R04	NSV	-- / --	NSV	YES
Vanadium	0.23 - 0.53	39 / 39	33.6	AS01-SD02A-R05	57.0	0 / 39	0.59	NO
Zinc	0.34 - 0.80	39 / 39	572	AS01-SD02D	150	27 / 39	3.81	YES

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-66

Step 2 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
<b>Semivolatile Organic Compounds (µg/kg)</b>								
1,1-Biphenyl	380 - 780	6 / 31	290	AS01-SD02D	260	1 / 31	1.12	YES
2,2'-Oxybis(1-chloropropane)	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2,4,5-Trichlorophenol	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
2,4,6-Trichlorophenol	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2,4-Dichlorophenol	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2,4-Dimethylphenol	380 - 900	0 / 39	--	--	29.0	-- / --	31.0	-- <sup>3</sup>
2,4-Dinitrophenol	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Chloronaphthalene	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Chlorophenol	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Methylnaphthalene	380 - 900	6 / 39	1,000	AS01-SD02D	70.0	6 / 39	14.3	YES
2-Methylphenol	380 - 900	0 / 39	--	--	63.0	-- / --	14.3	-- <sup>3</sup>
2-Nitroaniline	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Nitrophenol	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
3,3'-Dichlorobenzidine	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
3- and 4-Methylphenol	380 - 900	2 / 31	1,300	AS01-SD07	670	1 / 31	1.94	YES
3-Nitroaniline	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4,6-Dinitro-2-methylphenol	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Bromophenyl-phenylether	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Chloro-3-methylphenol	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Chloroaniline	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Chlorophenyl-phenylether	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Methylphenol	440 - 580	5 / 8	330	AS01-SD02A-R06	670	0 / 8	0.49	NO
4-Nitroaniline	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Nitrophenol	960 - 2,300	0 / 39	--	--	NSV	-- / --	NSV	NO
Acenaphthene	380 - 900	3 / 39	2,300	AS01-SD02D	16.0	3 / 39	144	YES
Acenaphthylene	380 - 900	0 / 39	--	--	44.0	-- / --	20.5	-- <sup>3</sup>
Acetophenone	380 - 780	0 / 31	--	--	NSV	-- / --	NSV	NO
Anthracene	380 - 2,400	4 / 39	5,100	AS01-SD02D	85.3	3 / 39	59.8	YES

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-66

Step 2 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Atrazine	380 - 780	0 / 28	--	--	NSV	-- / --	NSV	NO
Benzaldehyde	380 - 780	7 / 31	670	AS01-SD05-R06	NSV	-- / --	NSV	YES
Benzo(a)anthracene	380 - 2,400	7 / 39	9,500	AS01-SD02D	261	3 / 39	36.4	YES
Benzo(a)pyrene	380 - 2,400	6 / 39	7,600	AS01-SD02D	430	3 / 39	17.7	YES
Benzo(b)fluoranthene	380 - 2,400	8 / 39	11,000	AS01-SD02D	3,200	1 / 39	3.44	YES
Benzo(g,h,i)perylene	380 - 900	4 / 39	2,100	AS01-SD02D	670	1 / 39	3.13	YES
Benzo(k)fluoranthene	380 - 900	6 / 39	1,900	AS01-SD02D	240	3 / 39	7.92	YES
Butylbenzylphthalate	380 - 900	0 / 39	--	--	63.0	-- / --	14.3	-- <sup>3</sup>
Caprolactam	380 - 780	0 / 23	--	--	NSV	-- / --	NSV	NO
Carbazole	380 - 900	3 / 39	3,200	AS01-SD02D	1,800	1 / 39	1.78	YES
Chrysene	380 - 2,400	11 / 39	8,400	AS01-SD02D	384	3 / 39	21.9	YES
Di-n-butylphthalate	380 - 900	21 / 39	760	AS01-SD02A-R04	1,400	0 / 39	0.54	NO
Di-n-octylphthalate	380 - 900	0 / 39	--	--	6,200	-- / --	0.15	NO
Dibenz(a,h)anthracene	380 - 900	2 / 39	310	AS01-SD02D	63.4	2 / 39	4.89	YES
Dibenzofuran	380 - 900	2 / 39	1,800	AS01-SD02D	540	1 / 39	3.33	YES
Diethylphthalate	380 - 900	0 / 39	--	--	200	-- / --	4.50	-- <sup>3</sup>
Dimethyl phthalate	380 - 900	0 / 39	--	--	71.0	-- / --	12.7	-- <sup>3</sup>
Fluoranthene	380 - 2,400	16 / 39	19,000	AS01-SD02D	600	3 / 39	31.7	YES
Fluorene	380 - 900	6 / 39	2,700	AS01-SD02D	19.0	6 / 39	142	YES
Hexachlorobenzene	380 - 900	0 / 39	--	--	22.0	-- / --	40.9	-- <sup>3</sup>
Hexachlorobutadiene	380 - 900	0 / 39	--	--	11.0	-- / --	81.8	-- <sup>3</sup>
Hexachlorocyclopentadiene	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
Hexachloroethane	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
Indeno(1,2,3-cd)pyrene	380 - 900	4 / 39	2,500	AS01-SD02D	600	1 / 39	4.17	YES
Isophorone	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
Naphthalene	380 - 900	5 / 39	800	AS01-SD02D	160	2 / 39	5.00	YES
PAH, total	-- - --	19 / 39	105,450	AS01-SD02D	4,000	10 / 39	26.4	YES
Pentachlorophenol	960 - 2,300	0 / 39	--	--	360	-- / --	6.39	-- <sup>3</sup>

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-66

Step 2 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Phenanthrene	380 - 2,400	15 / 39	17,000	AS01-SD02D	240	6 / 39	70.8	YES
Phenol	380 - 900	5 / 39	170	AS01-SD07	420	0 / 39	0.40	NO
Pyrene	380 - 2,400	14 / 39	14,000	AS01-SD02D	665	3 / 39	21.1	YES
bis(2-Chloroethoxy)methane	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
bis(2-Chloroethyl)ether	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
bis(2-Ethylhexyl)phthalate	380 - 900	21 / 39	230	AS01-SD06	1,300	0 / 39	0.18	NO
n-Nitroso-di-n-propylamine	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
n-Nitrosodiphenylamine	380 - 900	0 / 39	--	--	28.0	-- / --	32.1	-- <sup>3</sup>
<b>Explosives (µg/kg)</b>								
1,3,5-Trinitrobenzene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
1,3-Dinitrobenzene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
2,4,6-Trinitrotoluene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
2,4-Dinitrotoluene	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2,6-Dinitrotoluene	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Amino-4,6-dinitrotoluene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
2-Nitrotoluene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
3-Nitrotoluene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
4-Amino-2,6-dinitrotoluene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
4-Nitrotoluene	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
HMX	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
Nitrobenzene	380 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
Nitroglycerin	9,000 - 110,000	0 / 13	--	--	NSV	-- / --	NSV	NO
Nitroguanidine	110,000 - 210,000	0 / 13	--	--	NSV	-- / --	NSV	NO
PETN	9,000 - 110,000	0 / 13	--	--	NSV	-- / --	NSV	NO
Perchlorate	6.00 - 10.0	0 / 14	--	--	NSV	-- / --	NSV	NO
RDX	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
Tetryl	570 - 1,100	0 / 13	--	--	NSV	-- / --	NSV	NO
<b>Volatile Organic Compounds (µg/kg)</b>								
1,1,1-Trichloroethane	11.0 - 27.0	0 / 39	--	--	31.0	-- / --	0.87	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-66

Step 2 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
1,1,2,2-Tetrachloroethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
1,1,2-Trichloro-1,2,2-trifluoroethane(Freon-113)	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
1,1,2-Trichloroethane	11.0 - 27.0	0 / 39	--	--	31.0	-- / --	0.87	NO
1,1-Dichloroethane	11.0 - 27.0	1 / 39	8.20	AS01-SD03A-R04	NSV	-- / --	NSV	YES
1,1-Dichloroethene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
1,2,4-Trichlorobenzene	11.0 - 900	0 / 39	--	--	40.0	-- / --	22.5	-- <sup>3</sup>
1,2-Dibromo-3-chloropropane	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
1,2-Dibromoethane	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
1,2-Dichlorobenzene	11.0 - 900	0 / 39	--	--	35.0	-- / --	25.7	-- <sup>3</sup>
1,2-Dichloroethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
1,2-Dichloropropane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
1,3-Dichlorobenzene	11.0 - 900	0 / 39	--	--	NSV	-- / --	NSV	NO
1,4-Dichlorobenzene	11.0 - 900	0 / 39	--	--	110	-- / --	8.18	-- <sup>3</sup>
2-Butanone	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
2-Hexanone	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
4-Methyl-2-pentanone	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Acetone	11.0 - 27.0	1 / 39	13.0	AS01-SD04B	NSV	-- / --	NSV	YES
Benzene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Bromodichloromethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Bromoform	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Bromomethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Carbon disulfide	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Carbon tetrachloride	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Chlorobenzene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Chloroethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Chloroform	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Chloromethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Cumene	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
Cyclohexane	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-66

Step 2 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient <sup>1</sup>	Retained?
Dibromochloromethane	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Dichlorodifluoromethane(Freon-12)	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
Ethylbenzene	11.0 - 27.0	0 / 39	--	--	10.0	-- / --	2.70	-- <sup>3</sup>
Methyl acetate	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
Methyl-tert-butyl ether (MTBE)	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
Methylcyclohexane	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
Methylene chloride	11.0 - 27.0	4 / 39	11.0	AS01-SD05-R06	NSV	-- / --	NSV	YES
Styrene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Tetrachloroethene	11.0 - 27.0	1 / 39	3.40	AS01-SD04A-R05	57.0	0 / 39	0.06	NO
Toluene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
Trichloroethene	11.0 - 27.0	2 / 39	19.0	AS01-SD02A-R04	41.0	0 / 39	0.46	NO
Trichlorofluoromethane(Freon-11)	11.0 - 23.0	0 / 31	--	--	NSV	-- / --	NSV	NO
Vinyl chloride	11.0 - 27.0	1 / 39	73.0	AS01-SD03A-R04	NSV	-- / --	NSV	YES
Xylene, total	11.0 - 23.0	0 / 31	--	--	40.0	-- / --	0.58	NO
cis-1,2-Dichloroethene	11.0 - 27.0	5 / 39	660	AS01-SD03A-R04	NSV	-- / --	NSV	YES
cis-1,3-Dichloropropene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
m- and p-Xylene	12.0 - 27.0	0 / 8	--	--	40.0	-- / --	0.68	NO
o-Xylene	11.0 - 27.0	0 / 39	--	--	40.0	-- / --	0.68	NO
trans-1,2-Dichloroethene	11.0 - 27.0	1 / 39	3.70	AS01-SD03A-R04	NSV	-- / --	NSV	YES
trans-1,3-Dichloropropene	11.0 - 27.0	0 / 39	--	--	NSV	-- / --	NSV	NO
<b>Dioxin/Furans (µg/kg)</b>								
Dioxin/furan (TEQ)	-- - --	3 / 7	0.043	AS01-SD09A	0.0088	3 / 7	4.90	YES

NSV - No Screening Value

1 - Shaded cells indicate hazard quotient based on reporting limits

2 - Macronutrient - Not retained

3 - See Section 7.5 (Uncertainties)

TABLE G-67

Step 3 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC?
<b>Inorganics (mg/kg)</b>										
Arsenic	0.84 - 17.1	39 / 39	22.6	AS01-SD03A-R04	10.6	8.20	25 / 39	2.76	1.30	YES
Beryllium	0.02 - 0.07	39 / 39	4.20	AS01-SD03A-R04	1.60	NSV	-- / --	NSV	NSV	YES
Cadmium	0.07 - 0.21	10 / 39	6.00	AS01-SD02D	0.36	1.20	1 / 39	5.00	0.30	NO
Cobalt	0.25 - 0.59	39 / 39	140	AS01-SD06A	41.0	50.0	8 / 39	2.80	0.82	NO
Copper	0.16 - 0.57	39 / 39	2,130	AS01-SD02A-R04	103	34.0	14 / 39	62.6	3.04	YES
Lead	0.46 - 1.07	39 / 39	149	AS01-SD02-R06	37.9	46.7	8 / 39	3.19	0.81	NO
Manganese	0.07 - 0.16	39 / 39	2,920	AS01-SD08	1,060	630	30 / 39	4.63	1.68	YES
Mercury	0.06 - 0.23	14 / 39	2.30	AS01-SD02A-R04	0.28	0.15	11 / 39	15.3	1.90	YES
Nickel	0.46 - 1.07	39 / 39	211	AS01-SD03-R04	64.1	20.9	39 / 39	10.1	3.07	YES
Selenium	0.50 - 1.20	9 / 39	2.10	AS01-SD02A-R06	0.69	1.00	8 / 39	2.10	0.69	NO
Silver	0.14 - 17.5	24 / 39	103	AS01-SD02-R05	6.91	1.00	8 / 39	103	6.91	YES
Thallium	0.51 - 2.00	6 / 39	9.90	AS01-SD02A-R04	1.15	NSV	-- / --	NSV	NSV	YES
Zinc	0.34 - 0.80	39 / 39	572	AS01-SD02D	215	150	27 / 39	3.81	1.44	YES
<b>Semivolatile Organic Compounds (µg/kg)</b>										
1,1-Biphenyl	380 - 780	6 / 31	290	AS01-SD02D	244	260	1 / 31	1.12	0.94	NO
2-Methylnaphthalene	380 - 900	6 / 39	1,000	AS01-SD02D	272	70.0	6 / 39	14.3	3.89	YES
3- and 4-Methylphenol	380 - 900	2 / 31	1,300	AS01-SD07	300	670	1 / 31	1.94	0.45	NO
Acenaphthene	380 - 900	3 / 39	2,300	AS01-SD02D	306	16.0	3 / 39	144	19.1	YES
Anthracene	380 - 2,400	4 / 39	5,100	AS01-SD02D	386	85.3	3 / 39	59.8	4.52	YES
Benzaldehyde	380 - 780	7 / 31	670	AS01-SD05-R06	278	NSV	-- / --	NSV	NSV	YES
Benzo(a)anthracene	380 - 2,400	7 / 39	9,500	AS01-SD02D	506	261	3 / 39	36.4	1.94	YES
Benzo(a)pyrene	380 - 2,400	6 / 39	7,600	AS01-SD02D	464	430	3 / 39	17.7	1.08	YES
Benzo(b)fluoranthene	380 - 2,400	8 / 39	11,000	AS01-SD02D	548	3,200	1 / 39	3.44	0.17	NO
Benzo(g,h,i)perylene	380 - 900	4 / 39	2,100	AS01-SD02D	306	670	1 / 39	3.13	0.46	NO
Benzo(k)fluoranthene	380 - 900	6 / 39	1,900	AS01-SD02D	306	240	3 / 39	7.92	1.27	YES
Carbazole	380 - 900	3 / 39	3,200	AS01-SD02D	331	1,800	1 / 39	1.78	0.18	NO
Chrysene	380 - 2,400	11 / 39	8,400	AS01-SD02D	478	384	3 / 39	21.9	1.24	YES
Dibenz(a,h)anthracene	380 - 900	2 / 39	310	AS01-SD02D	259	63.4	2 / 39	4.89	4.08	YES

TABLE G-67

Step 3 Sediment Screening - Adjacent and Downgradient Samples

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC?
Dibenzofuran	380 - 900	2 / 39	1,800	AS01-SD02D	297	540	1 / 39	3.33	0.55	NO
Fluoranthene	380 - 2,400	16 / 39	19,000	AS01-SD02D	738	600	3 / 39	31.7	1.23	YES
Fluorene	380 - 900	6 / 39	2,700	AS01-SD02D	306	19.0	6 / 39	142	16.1	YES
Indeno(1,2,3-cd)pyrene	380 - 900	4 / 39	2,500	AS01-SD02D	318	600	1 / 39	4.17	0.53	NO
Naphthalene	380 - 900	5 / 39	800	AS01-SD02D	263	160	2 / 39	5.00	1.65	YES
PAH, total	-- - --	19 / 39	105,450	AS01-SD02D	6,992	4,000	10 / 39	26.4	1.75	YES
Phenanthrene	380 - 2,400	15 / 39	17,000	AS01-SD02D	709	240	6 / 39	70.8	2.96	YES
Pyrene	380 - 2,400	14 / 39	14,000	AS01-SD02D	601	665	3 / 39	21.1	0.90	YES
<b>Volatile Organic Compounds (µg/kg)</b>										
1,1-Dichloroethane	11.0 - 27.0	1 / 39	8.20	AS01-SD03A-R04	7.70	NSV	-- / --	NSV	NSV	YES
Acetone	11.0 - 27.0	1 / 39	13.0	AS01-SD04B	7.90	NSV	-- / --	NSV	NSV	YES
Methylene chloride	11.0 - 27.0	4 / 39	11.0	AS01-SD05-R06	7.82	NSV	-- / --	NSV	NSV	YES
Vinyl chloride	11.0 - 27.0	1 / 39	73.0	AS01-SD03A-R04	9.36	NSV	-- / --	NSV	NSV	YES
cis-1,2-Dichloroethene	11.0 - 27.0	5 / 39	660	AS01-SD03A-R04	24.4	NSV	-- / --	NSV	NSV	YES
trans-1,2-Dichloroethene	11.0 - 27.0	1 / 39	3.70	AS01-SD03A-R04	7.58	NSV	-- / --	NSV	NSV	YES
<b>Dioxin/Furans (µg/kg)</b>										
Dioxin/furan (TEQ)	-- - --	3 / 7	0.043	AS01-SD09A	0.040	0.0088	3 / 7	4.90	4.60	YES

TABLE G-68

Summary of Hazard Quotients for Semi-Aquatic Upper Trophic Level Receptors - Screening

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Raccoon		Mink		Tree swallow		Belted kingfisher		Great blue heron		Mallard	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
<b>Metals</b>												
Arsenic	4.65	0.47	1.09	0.11	0.47	0.16	0.20	0.08	0.12	0.05	0.63	0.25
Cadmium	0.68	0.07	0.06	<0.01	0.97	0.07	0.55	0.04	0.14	0.01	1.77	0.13
Chromium	0.01	<0.01	<0.01	<0.01	0.33	0.07	0.30	0.06	0.19	0.04	0.40	0.08
Copper	21.5	16.6	0.88	0.68	27.5	21.0	12.9	9.81	0.95	0.72	8.42	6.41
Lead	0.25	0.02	0.06	<0.01	3.28	0.33	0.90	0.09	0.57	0.06	2.47	0.25
Mercury	1.50	0.90	3.38	2.03	0.68	0.34	76.4	25.5	84.7	28.2	54.5	18.2
Nickel	0.13	0.07	0.25	0.13	0.04	0.03	0.50	0.36	0.57	0.41	0.47	0.34
Selenium	0.59	0.36	0.51	0.31	0.37	0.11	1.10	0.55	1.10	0.55	1.95	0.98
Silver	0.05	<0.01	0.27	0.03	<0.01	<0.01	0.11	0.01	0.12	0.01	<0.01	<0.01
Zinc	2.47	0.25	0.19	0.02	14.3	1.59	7.31	0.81	1.21	0.13	11.2	1.24
<b>Volatile and Semivolatile Organics</b>												
1,1,2,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,2-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,4-Dichlorobenzene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Acenaphthylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01
Benzo(a)anthracene	0.23	0.02	0.46	0.05	0.03	<0.01	0.05	<0.01	0.05	<0.01	<0.01	<0.01
Benzo(a)pyrene	0.06	<0.01	0.37	0.04	<0.01	<0.01	0.04	<0.01	0.04	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	0.08	<0.01	0.53	0.05	<0.01	<0.01	0.05	<0.01	0.06	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	0.02	<0.01	0.10	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	0.02	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Chrysene	0.08	<0.01	0.40	0.04	<0.01	<0.01	0.04	<0.01	0.04	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.09	<0.01	0.10	0.01	<0.01	<0.01

TABLE G-68

Summary of Hazard Quotients for Semi-Aquatic Upper Trophic Level Receptors - Screening

*Site 1 Focused RI for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Raccoon		Mink		Tree swallow		Belted kingfisher		Great blue heron		Mallard	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Fluorene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	0.02	<0.01	0.04	0.02	0.65	0.13	1.73	0.33	1.71	0.33	0.17	0.03
Hexachlorobutadiene	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.06	<0.01	0.06	<0.01	<0.01	<0.01
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.03	<0.01	0.12	0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Pentachlorophenol	0.02	<0.01	0.04	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Phenanthrene	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.09	<0.01	0.09	<0.01	0.01	<0.01
Pyrene	0.23	0.02	0.67	0.07	0.02	<0.01	0.07	<0.01	0.07	<0.01	<0.01	<0.01
<b>Dioxin/Furans</b>												
Dioxin/furan (TEQ)	0.36	0.04	0.77	0.08	0.19	0.02	0.56	0.06	0.56	0.06	0.07	<0.01

TABLE G-69

Summary of Hazard Quotients For Semi-Aquatic Upper Trophic Level Receptors - Baseline

*Site 1 Focused RI for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Raccoon		Mink		Tree swallow		Belted kingfisher		Great blue heron		Mallard	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
<b>Metals</b>												
Arsenic	0.45	0.05	0.36	0.04	--	--	--	--	--	--	--	--
Cadmium	--	--	--	--	--	--	--	--	--	--	<0.01	<0.01
Copper	0.08	0.07	--	--	0.09	0.07	0.06	0.05	--	--	0.03	0.02
Lead	--	--	--	--	0.53	0.05	--	--	--	--	0.05	<0.01
Mercury	0.03	0.02	0.21	0.13	--	--	3.86	1.29	6.27	2.09	0.26	0.09
Selenium	--	--	--	--	--	--	0.21	0.10	0.30	0.15	0.06	0.03
Zinc	0.12	0.01	--	--	0.67	0.07	0.50	0.06	0.38	0.04	0.36	0.04
<b>Volatile and Semivolatile Organics</b>												
Hexachlorobenzene	--	--	--	--	--	--	0.29	0.06	0.42	0.08	0.02	<0.01

TABLE G-70

Summary of Chemicals of Potential Concern for Riverine Habitats

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Surface Water				Sediment				Food Web		
	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	Receptor	Endpoint	Mean HQ
<b>Detected Chemicals With Screening Values</b>											
Aluminum (total)	26 / 28	26 / 28	11.5	4.68							
Aluminum (dissolved)	12 / 12	12 / 12	4.69	3.73							
Arsenic					39 / 39	25 / 39	2.76	1.30			
Copper					39 / 39	14 / 39	62.6	3.04			
Manganese (total)	28 / 28	28 / 28	3.19	2.20	39 / 39	30 / 39	4.63	1.68			
Manganese (dissolved)	12 / 12	7 / 12	1.80	1.27							
Mercury					14 / 39	11 / 39	15.3	1.90	Kingfisher	LOAEL	1.29
									Heron	LOAEL	2.09
Nickel					39 / 39	39 / 39	10.1	3.07			
Silver (total)					24 / 39	8 / 39	103	6.91			
Silver (dissolved)	1 / 12	1 / 12	5.83	1.25							
Zinc					39 / 39	27 / 39	3.81	1.44			
2-Methylnaphthalene					6 / 39	6 / 39	14.3	3.89			
Acenaphthene					3 / 39	3 / 39	144	19.1			
Anthracene					4 / 39	3 / 39	59.8	4.52			
Benzo(a)anthracene					7 / 39	3 / 39	36.4	1.94			
Benzo(a)pyrene					6 / 39	3 / 39	17.7	1.08			
Benzo(k)fluoranthene					6 / 39	3 / 39	7.92	1.27			
Chrysene					11 / 39	3 / 39	21.9	1.24			
Dibenz(a,h)anthracene					2 / 39	2 / 39	4.89	4.08			
Fluoranthene					16 / 39	3 / 39	31.7	1.23			
Fluorene					6 / 39	6 / 39	142	16.1			
Naphthalene					5 / 39	2 / 39	5.00	1.65			
PAH, total					19 / 39	10 / 39	26.4	1.75			
Phenanthrene					15 / 39	6 / 39	70.8	2.96			
Pyrene					14 / 39	3 / 39	21.1	0.90			
Dioxin/furan (TEQ)					3 / 7	3 / 7	4.90	4.60			

FOD - Frequency of Detection

FOE - Frequency of Exceedance

TABLE G-70

Summary of Chemicals of Potential Concern for Riverine Habitats

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Surface Water				Sediment				Food Web		
	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	FOD	FOE	Maximum HQ or Concentration	Mean HQ or Concentration	Receptor	Endpoint	Mean HQ
<b>Detected Chemicals Without Screening Values</b>											
Beryllium					39 / 39	-- / --	4.20 mg/kg	1.60 mg/kg			
Thallium					6 / 39	-- / --	9.90 mg/kg	1.15 mg/kg			
Benzaldehyde					7 / 31	-- / --	670 µg/kg	278 µg/kg			
1,1-Dichloroethane					1 / 39	-- / --	8.20 µg/kg	7.70 µg/kg			
1,2-Dichloroethene (cis)					5 / 39	-- / --	660 µg/kg	24.4 µg/kg			
1,2-Dichloroethene (trans)					1 / 39	-- / --	3.70 µg/kg	--			
Acetone					1 / 39	-- / --	13.0 µg/kg	7.90 µg/kg			
Methylene chloride					4 / 39	-- / --	11.0 µg/kg	7.82 µg/kg			
Vinyl chloride					1 / 39	-- / --	73.0 µg/kg	9.36 µg/kg			

FOD - Frequency of Detection

FOE - Frequency of Exceedance

TABLE G-71

Statistics for Upgradient Surface Water

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean
<b>Inorganics (µg/L)</b>						
Aluminum	8.50 - 19.2	5 / 6	576	AS01-SW01A-R04	351	192
Manganese	0.30 - 0.40	6 / 6	287	AS01-SW01-R04	244	30.7
<b>Dissolved Metals (µg/L)</b>						
Aluminum	19.2 - 19.2	2 / 2	277	AS01-SW01A-R05	276	2.12
Manganese	0.30 - 0.30	2 / 2	154	AS01-SW01A-R05	153	1.41
Silver	0.60 - 0.60	0 / 2	--	--	0.30	0.0

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-72

Comparison of Site 1 Surface Water COPC Concentrations to Upgradient Concentrations

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Adjacent/Downgradient			Upgradient			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum	Arithmetic Mean	Frequency of Detection	Maximum	Arithmetic Mean		
<b>Metals (µg/L)</b>								
Aluminum (total)	28 / 28	998	407	5 / 6	576	351	1.73	1.16
Aluminum (dissolved)	12 / 12	408	325	2 / 2	277	276	1.47	1.18
Manganese (total)	28 / 28	383	264	6 / 6	287	244	1.33	1.08
Manganese (dissolved)	12 / 12	216	152	2 / 2	154	153	1.40	0.99
Silver (dissolved)	1 / 12	2.10	0.45	0 / 2	--	0.30	--	1.50

TABLE G-73

Statistics for Upgradient Sediment

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean
<b>Metals (mg/kg)</b>						
Arsenic	0.77 - 11.3	6 / 6	12.6	AS01-SD01A-R04	7.33	3.71
Beryllium	0.02 - 0.05	6 / 6	1.30	AS01-SD01A-R05	1.05	0.15
Copper	0.17 - 0.44	6 / 6	26.3	AS01-SD01A-R04	17.3	5.28
Manganese	0.07 - 0.11	6 / 6	1,250	AS01-SD01A-R06	863	282
Mercury	0.06 - 0.14	0 / 6	--	--	0.06	0.01
Nickel	0.49 - 0.61	6 / 6	45.1	AS01-SD01A-R05	38.7	4.47
Silver	0.15 - 2.89	3 / 6	0.97	AS01-SD01-R06	0.39	0.42
Thallium	0.56 - 1.60	1 / 6	1.90	AS01-SD01-R06	0.66	0.63
Zinc	0.31 - 0.46	6 / 6	139	AS01-SD01-R04	117	15.1
<b>Semivolatile Organic Compounds (µg/kg)</b>						
2-Methylnaphthalene	400 - 510	1 / 6	150	AS01-SD01-R06	208	34.4
Acenaphthene	400 - 510	0 / 6	--	--	221	19.3
Anthracene	400 - 510	0 / 6	--	--	221	19.3
Benzaldehyde	400 - 510	2 / 4	310	AS01-SD01-R06	217	96.2
Benzo(a)anthracene	400 - 510	0 / 6	--	--	221	19.3
Benzo(a)pyrene	400 - 510	0 / 6	--	--	221	19.3
Benzo(k)fluoranthene	400 - 510	0 / 6	--	--	221	19.3
Chrysene	400 - 510	1 / 6	61.0	AS01-SD01-R06	194	67.7
Dibenz(a,h)anthracene	400 - 510	0 / 6	--	--	221	19.3
Fluoranthene	400 - 510	1 / 6	49.0	AS01-SD01A-R05	192	72.8
Fluorene	400 - 510	1 / 6	66.0	AS01-SD01-R06	194	65.7
Naphthalene	400 - 510	1 / 6	130	AS01-SD01-R06	205	41.5
PAH, total	-- - --	2 / 6	4,335	AS01-SD01A-R05	3,646	--
Phenanthrene	400 - 510	1 / 6	240	AS01-SD01-R06	223	20.9
Pyrene	400 - 510	0 / 6	--	--	221	19.3
<b>Volatile Organic Compounds (µg/kg)</b>						
1,1-Dichloroethane	12.0 - 15.0	0 / 6	--	--	6.50	0.63
Acetone	12.0 - 15.0	0 / 6	--	--	6.50	0.63

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

**TABLE G-73**

Statistics for Upgradient Sediment

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean <sup>1</sup>	Standard Deviation of Mean
Methylene chloride	12.0 - 15.0	2 / 6	9.20	AS01-SD01-R06	7.23	1.30
Vinyl chloride	12.0 - 15.0	0 / 6	--	--	6.50	0.63
cis-1,2-Dichloroethene	12.0 - 15.0	0 / 6	--	--	6.50	0.63
trans-1,2-Dichloroethene	12.0 - 15.0	0 / 6	--	--	6.50	0.63
<b>Dioxin/Furans (µg/kg)</b>						
Dioxin/furan (TEQ)	-- - --	0 / 2	--	--	0.0276	--

1 - One-half of the reporting limit was used for non-detected samples when calculating the mean

TABLE G-74

Comparison of Site 1 Sediment COPC Concentrations to Upgradient Concentrations

*Site 1 Focused RI for Soil**Allegheny Ballistics Laboratory, Rocket Center, WV*

Chemical	Adjacent/Downgradient			Upgradient			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum	Arithmetic Mean	Frequency of Detection	Maximum	Arithmetic Mean		
<b>Metals (mg/kg)</b>								
Arsenic	39 / 39	22.6	10.6	6 / 6	12.6	7.33	1.79	1.45
Beryllium	39 / 39	4.20	1.60	6 / 6	1.30	1.05	3.23	1.52
Copper	39 / 39	2,130	103	6 / 6	26.3	17.3	81.0	5.95
Manganese	39 / 39	2,920	1,060	6 / 6	1,250	863	2.34	1.23
Mercury	14 / 39	2.30	0.28	0 / 6	--	0.06	--	4.67
Nickel	39 / 39	211	64.1	6 / 6	45.1	38.7	4.68	1.66
Silver	24 / 39	103	6.91	3 / 6	0.97	0.39	106	17.7
Thallium	6 / 39	9.90	1.15	1 / 6	1.90	0.66	5.21	1.74
Zinc	39 / 39	572	215	6 / 6	139	117	4.12	1.84
<b>Organic Chemicals (µg/kg)</b>								
2-Methylnaphthalene	6 / 39	1,000	272	1 / 6	150	208	6.67	1.31
Acenaphthene	3 / 39	2,300	306	0 / 6	--	221	--	1.38
Anthracene	4 / 39	5,100	386	0 / 6	--	221	--	1.75
Benzaldehyde	7 / 31	670	278	2 / 4	310	217	2.16	1.28
Benzo(a)anthracene	7 / 39	9,500	506	0 / 6	--	221	--	2.29
Benzo(a)pyrene	6 / 39	7,600	464	0 / 6	--	221	--	2.10
Benzo(k)fluoranthene	6 / 39	1,900	306	0 / 6	--	221	--	1.38
Chrysene	11 / 39	8,400	478	1 / 6	61.0	194	138	2.46
Dibenz(a,h)anthracene	2 / 39	310	259	0 / 6	--	221	--	1.17
Fluoranthene	16 / 39	19,000	738	1 / 6	49.0	192	388	3.84
Fluorene	6 / 39	2,700	306	1 / 6	66.0	194	40.9	1.58
Naphthalene	5 / 39	800	263	1 / 6	130	205	6.15	1.28
PAH, total	19 / 39	105,450	6,992	2 / 6	4,335	3,646	24.3	1.92
Phenanthrene	15 / 39	17,000	709	1 / 6	240	223	70.8	3.18
Pyrene	14 / 39	14,000	601	0 / 6	--	221	--	2.72
1,1-Dichloroethane	1 / 39	8.20	7.70	0 / 6	--	6.50	--	1.18
1,2-Dichloroethene (cis)	5 / 39	660	24.4	0 / 6	--	6.50	--	3.75
1,2-Dichloroethene (trans)	1 / 39	3.70	7.58	0 / 6	--	6.50	--	1.17

TABLE G-74

Comparison of Site 1 Sediment COPC Concentrations to Upgradient Concentrations

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Adjacent/Downgradient			Upgradient			Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum	Arithmetic Mean	Frequency of Detection	Maximum	Arithmetic Mean		
Acetone	1 / 39	13.0	7.90	0 / 6	--	6.50	--	1.22
Methylene chloride	4 / 39	11.0	7.82	2 / 6	9.20	7.23	1.20	1.08
Vinyl chloride	1 / 39	73.0	9.36	0 / 6	--	6.50	--	1.44
Dioxin/furan (TEQ)	3 / 7	0.0431	0.0405	0 / 2	--	0.0276	--	1.46

TABLE G-75

Comparison of Site 1 Sediment COPC Concentrations with Equilibrium Partitioning-Based Sediment Values

*Site 1 Focused RI for Soil**Allegany Ballistics Laboratory, Rocket Center, WV*

Chemical	Frequency of Detection	Maximum Concentration Detected	Arithmetic Mean	Total Organic Carbon (%)	TOC-Adjusted Screening Value	Reference	Maximum Ratio	Mean Ratio
<b>Semivolatile Organic Compounds (µg/kg)</b>								
Acenaphthene	3 / 39	2,300	306	4.89	3,032	USEPA 1996b	0.76	0.10
Anthracene	4 / 39	5,100	386	4.89	1,076	Jones et al. 1997	4.74	0.36
Benzo(a)anthracene	7 / 39	9,500	506	4.89	538	Jones et al. 1997	17.7	0.94
Benzo(a)pyrene	6 / 39	7,600	464	4.89	685	Jones et al. 1997	11.1	0.68
Fluoranthene	16 / 39	19,000	738	4.89	14,181	USEPA 1996b	1.34	0.05
Fluorene	6 / 39	2,700	306	4.89	2,641	USEPA 1996b	1.02	0.12
Naphthalene	5 / 39	800	263	4.89	2,347	USEPA 1996b	0.34	0.11
Phenanthrene	15 / 39	17,000	709	4.89	5,379	USEPA 1996b	3.16	0.13
<b>Volatile Organic Compounds (µg/kg)</b>								
1,1-Dichloroethane	1 / 39	8.20	7.70	4.89	132	Jones et al. 1997	0.06	0.06
1,2-Dichloroethene (cis)	5 / 39	660	24.4	4.89	1,956	Jones et al. 1997	0.34	0.01
1,2-Dichloroethene (trans)	1 / 39	3.70	--	4.89	1,956	Jones et al. 1997	0.002	--
Methylene chloride	4 / 39	11.0	7.82	4.89	1,809	Jones et al. 1997	0.01	0.004

TABLE G-76

Benthic Invertebrate Metric Values and Bioassessment Scores from Long-Term Monitoring in the North Branch Potomac River  
 Site 1 Focused RI for Soil  
 Allegany Ballistics Laboratory, Rocket Center, WV

Metrics	1998 Stations						2000 Stations					
	1 (Ref)	2	3	4	5	6	1 (Ref)	2	3	4	5	6
<b>Metric Values</b>												
Taxa Richness	27	25	31	24	25	28	27	32	36	28	23	31
HBI	5.36	4.74	5.37	4.76	5.41	5.37	5.09	6.23	5.99	5.53	5.92	5.10
EPT/Chironomidae	0.11	0.04	0.39	0.05	0.21	0.21	0.42	0.03	0.30	0.18	0.01	0.12
% Dominant Taxon	43.2	47.2	34.4	46.2	39.1	39.4	29.9	23.6	23.9	31.8	23.1	35.0
EPT Index	6	5	6	6	7	5	6	6	11	7	4	5
EPT Abundance	53	18	127	19	78	89	364	30	423	128	11	39
Scraper/Filtering Collector Ratio	0.11	0.25	0.10	0.36	0.11	0.09	1.15	0.50	0.21	0.89	1.50	24
<b>% Comparison with Reference</b>												
Taxa Richness <sup>a</sup>	100	92.6	115	88.9	92.6	104	100	119	133	104	85.2	115
HBI <sup>b</sup>	100	113	100	113	99.1	99.8	100	81.7	85.0	92.0	86.0	99.8
EPT/Chironomidae <sup>c</sup>	100	33.9	345	44.6	185	184	100	7.14	71.4	42.9	2.38	28.6
% Dominant Taxon <sup>d</sup>	43.2	47.2	34.4	46.2	39.1	39.4	29.9	23.6	23.9	31.8	23.1	35.0
EPT Index <sup>e</sup>	100	83.3	100	100	117	83.3	100	100	183	117	66.7	83.3
EPT Abundance <sup>f</sup>	100	34.0	240	35.8	147	168	100	8.24	116	35.2	3.02	10.7
Scraper/Filtering Collector Ratio <sup>g</sup>	100	236	93.4	343	107	80.2	100	43.5	18.3	77.4	130	2,087
<b>Bioassessment Score</b>												
Taxa Richness	6	6	6	6	6	6	6	6	6	6	6	6
HBI	6	6	6	6	6	6	6	4	4	6	6	6
EPT/Chironomidae	6	2	6	2	6	6	6	0	4	2	0	2
% Dominant Taxon	0	0	2	0	2	2	4	4	4	2	4	2
EPT Index	6	4	6	6	6	4	6	6	6	6	0	4
EPT Abundance	6	0	6	0	6	6	6	0	6	0	0	0
Scraper/Filtering Collector Ratio	6	6	6	6	6	6	6	4	0	6	6	6
Total Score	36	24	38	26	38	36	40	24	30	28	22	26
Percent of Reference Station	100	67	106	72	106	100	100	60	75	70	55	65
Biological Condition <sup>h</sup>	--	SI	NI	SI	NI	NI	--	SI	SI	SI	SI	SI

HBI = Hilsenhoff Biotic Index

EPT = Ephemeroptera, Plecoptera, Trichoptera

<sup>a</sup> Score is a ratio of study site metric value to reference site metric value x 100.

<sup>b</sup> Score is a ratio of reference site to study site x 100.

<sup>c</sup> Ratio of EPT to Chironomidae abundance. Score is a ratio of study site to reference site x 100.

<sup>d</sup> Scoring criteria evaluate actual percent contribution, not percent comparability to reference site.

<sup>e</sup> Number of distinct taxa within the order Ephemeroptera, Plecoptera, and Trichoptera. Score is a ratio of study site to reference site x 100.

<sup>f</sup> Score is a ratio of study site to reference site X 100.

<sup>g</sup> Score is a ratio of study site to reference site X 100.

<sup>h</sup> Percent of Reference Station                      Biological Condition Category

> 83%	Nonimpaired (NI)
54 - 79%	Slightly Impaired (SI)
21 - 50%	Moderately Impaired (MI)
< 17%	Severely Impaired (Svl)

TABLE G-76

Benthic Invertebrate Metric Values and Bioassessment Scores from Long-Term Monitoring in the North Branch Potomac River

Site 1 Focused RI for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Metrics	2002 Stations						2004 Stations							
	1 (Ref)	2	3	4	5	6	1 (Ref)	1B	2	3	4	4B	5	6
<b>Metric Values</b>														
Taxa Richness	26	28	18	11	22	28	20	24	17	25	21	17	13	26
HBI	5.35	5.53	4.67	4.40	4.80	5.52	7.19	7.30	7.78	7.54	7.11	7.05	6.88	6.87
EPT/Chironomidae	0.55	0.06	0.31	0.13	0.07	0.24	0.12	0.08	0.06	0.07	0.14	0.07	0.44	0.13
% Dominant Taxon	33.8	28.5	29.3	55.0	45.6	41.9	30.6	48.3	22.9	41.8	38.1	36.6	33.0	44.5
EPT Index	9	8	4	1	4	12	4	4	3	2	6	2	3	8
EPT Abundance	1,215	73	108	67	27	522	64	19	15	25	56	9	28	30
Scrapper/Filtering Collector Ratio	0.01	0.24	0.25	0.52	2.05	0.16	2.40	5.67	6.67	1.31	0.44	0.13	5.83	1.72
<b>% Comparison with Reference</b>														
Taxa Richness <sup>a</sup>	100	108	69.2	42.3	84.6	108	100	120	85.0	125	105	85.0	65.0	130
HBI <sup>b</sup>	100	96.7	114	122	111	96.9	100	102	108	105	98.9	98.1	95.7	95.5
EPT/Chironomidae <sup>c</sup>	100	10.7	55.5	22.8	12.4	43.8	100	66.7	50.0	58.3	117	58.3	367	108
% Dominant Taxon <sup>d</sup>	33.8	28.5	29.3	55.0	45.6	41.9	30.6	48.3	22.9	41.9	38.1	36.6	33.0	44.5
EPT Index <sup>e</sup>	100	88.9	44.4	11.1	44.4	133	100	100	75.0	50.0	150	50.0	75.0	200
EPT Abundance <sup>f</sup>	100	6.01	8.89	5.51	2.22	43.0	100	29.7	23.4	39.1	87.5	14.1	43.8	46.9
Scrapper/Filtering Collector Ratio <sup>g</sup>	100	1,680	1,765	3,724	14,598	1,162	100	236	278	55.0	18.0	5.40	243	72.0
<b>Bioassessment Score</b>														
Taxa Richness	6	6	4	2	6	6	6	6	6	6	6	6	4	6
HBI	6	6	6	6	6	6	6	6	6	6	6	6	6	6
EPT/Chironomidae	6	0	4	0	0	2	6	4	4	4	6	4	6	6
% Dominant Taxon	2	4	4	0	0	0	2	0	4	0	2	2	2	0
EPT Index	6	4	0	0	0	6	6	6	2	0	6	0	2	6
EPT Abundance	6	0	0	0	0	0	6	4	2	6	6	0	6	6
Scrapper/Filtering Collector Ratio	6	6	6	6	6	6	6	6	6	6	0	0	6	6
Total Score	38	26	24	14	18	26	38	32	30	28	32	18	32	36
Percent of Reference Station	100	68	63	37	47	68	100	84	79	74	84	47	84	95
Biological Condition <sup>h</sup>	--	SI	SI	MI	MI	SI	--	NI	SI	SI	NI	MI	NI	NI

HBI = Hilsenhoff Biotic Index

EPT = Ephemeroptera, Plecoptera, Trichoptera

<sup>a</sup> Score is a ratio of study site metric value to reference site metric value x 100.

<sup>b</sup> Score is a ratio of reference site to study site x 100.

<sup>c</sup> Ratio of EPT to Chironomidae abundance. Score is a ratio of study site to reference site x 100.

<sup>d</sup> Scoring criteria evaluate actual percent contribution, not percent comparability to reference site.

<sup>e</sup> Number of distinct taxa within the order Ephemeroptera, Plecoptera, and Trichoptera. Score is a ratio of study site to reference site x 100.

<sup>f</sup> Score is a ratio of study site to reference site X 100.

<sup>g</sup> Score is a ratio of study site to reference site X 100.

<sup>h</sup> Percent of Reference Station                      Biological Condition Category

- > 83%    Nonimpaired (NI)
- 54 - 79%                                        Slightly Impaired (SI)
- 21 - 50%                                        Moderately Impaired (MI)
- < 17%     Severely Impaired (Svl)

TABLE G-77

Summary of COCs for Riverine Habitats

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Surface Water	Sediment	Food Web
<b>Metals</b>			
Copper		X	
Mercury		X	X
Nickel		X	
Silver		X	
Zinc		X	
<b>Semivolatile Organic Compounds</b>			
PAHs		X	

TABLE G-78

Reporting Limit to Screening Value Comparison

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
<b>Upland Surface Soil</b>									
2,4,5-Trichlorophenol	µg/kg	0 / 39	860	21,000	841	430	2.00	48.8	1.95
2,4,6-Trichlorophenol	µg/kg	0 / 39	340	4,300	250	580	0.59	7.41	0.43
2,4-Dimethylphenol	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
2,4-Dinitrophenol	µg/kg	0 / 39	860	21,000	841	10,000	0.09	2.10	0.08
2-Chloronaphthalene	µg/kg	0 / 39	340	4,300	250	1,405	0.24	3.06	0.18
2-Chlorophenol	µg/kg	0 / 39	340	4,300	250	750	0.45	5.73	0.33
2-Methylnaphthalene	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
2-Methylphenol	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
4-Methylphenol	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
4-Nitrophenol	µg/kg	0 / 39	860	21,000	841	380	2.26	55.3	2.21
Acenaphthene	µg/kg	0 / 39	340	4,300	250	2,500	0.14	1.72	0.10
Acenaphthylene	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
Anthracene	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
Benzo(k)fluoranthene	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
Dibenz(a,h)anthracene	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
Fluorene	µg/kg	0 / 39	340	4,300	250	1,700	0.20	2.53	0.15
Hexachlorocyclopentadiene	µg/kg	0 / 39	340	4,300	250	1,000	0.34	4.30	0.25
Indeno(1,2,3-cd)pyrene	µg/kg	0 / 39	340	4,300	250	100	3.40	43.0	2.50
Pentachlorophenol	µg/kg	0 / 39	860	21,000	841	3,000	0.29	7.00	0.28
Phenol	µg/kg	0 / 39	340	4,300	250	1,880	0.18	2.29	0.13
Nitrobenzene	µg/kg	0 / 39	250	4,300	262	2,260	0.11	1.90	0.12
1,1,1-Trichloroethane	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
1,1,2,2-Tetrachloroethane	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
1,1,2-Trichloroethane	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
1,1-Dichloroethane	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
1,2,4-Trichlorobenzene	µg/kg	0 / 39	11.0	4,300	222	1,270	0.01	3.39	0.18
1,2-Dichlorobenzene	µg/kg	0 / 40	11.0	4,300	217	100	0.11	43.0	2.17
1,2-Dichloroethane	µg/kg	0 / 34	6.00	910	37.6	545	0.01	1.67	0.07

TABLE G-78

Reporting Limit to Screening Value Comparison

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
1,4-Dichlorobenzene	µg/kg	0 / 39	11.0	4,300	222	1,280	0.01	3.36	0.17
Benzene	µg/kg	0 / 34	6.00	910	37.6	143	0.04	6.36	0.26
Vinyl chloride	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
cis-1,2-Dichloroethene	µg/kg	0 / 11	11.0	910	109	300	0.04	3.03	0.36
cis-1,3-Dichloropropene	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
trans-1,2-Dichloroethene	µg/kg	0 / 11	11.0	910	109	300	0.04	3.03	0.36
trans-1,3-Dichloropropene	µg/kg	0 / 34	6.00	910	37.6	300	0.02	3.03	0.13
<b>Floodplain Surface Soil</b>									
2,4,5-Trichlorophenol	µg/kg	0 / 34	910	2400	566	430	2.12	5.58	1.32
2,4-Dimethylphenol	µg/kg	0 / 34	370	500	208	100	3.70	5.00	2.08
2-Methylphenol	µg/kg	0 / 34	370	500	208	100	3.70	5.00	2.08
4-Methylphenol	µg/kg	0 / 13	370	500	215	100	3.70	5.00	2.15
4-Nitrophenol	µg/kg	0 / 34	910	2400	566	380	2.39	6.32	1.49
Nitrobenzene	µg/kg	0 / 31	250.0	25,000	619	2,260	0.11	11.1	0.27
Tetryl	µg/kg	0 / 14	580.0	65,000	2,613	25,000	0.02	2.60	0.10
1,1,2,2-Tetrachloroethane	µg/kg	0 / 41	11.0	1,800	149	300	0.04	6.00	0.50
1,1,2-Trichloroethane	µg/kg	0 / 41	11.0	1,800	149	300	0.04	6.00	0.50
1,1-Dichloroethane	µg/kg	0 / 41	11.0	1,800	149	300	0.04	6.00	0.50
1,2-Dichlorobenzene	µg/kg	0 / 44	11.0	1,800	122	100	0.11	18.0	1.22
1,2-Dichloroethane	µg/kg	0 / 41	11.0	1,800	149	730	0.02	2.47	0.20
1,4-Dichlorobenzene	µg/kg	0 / 43	11.0	1,800	125	1,280	0.01	1.41	0.10
Benzene	µg/kg	0 / 41	11.0	1,800	149	191	0.06	9.42	0.78
Vinyl chloride	µg/kg	0 / 41	11.0	1,800	149	300	0.04	6.00	0.50
cis-1,3-Dichloropropene	µg/kg	0 / 41	11.0	1,800	149	300	0.04	6.00	0.50
trans-1,2-Dichloroethene	µg/kg	0 / 34	11.0	1,800	102	300	0.04	6.00	0.34
trans-1,3-Dichloropropene	µg/kg	0 / 41	11.0	1,800	149	300	0.04	6.00	0.50
<b>Sediment</b>									
2,4-Dimethylphenol	µg/kg	0 / 39	380	900	262	29.0	13.1	31.0	9.02
2-Methylphenol	µg/kg	0 / 39	380	900	262	63.0	6.03	14.3	4.15

TABLE G-78

Reporting Limit to Screening Value Comparison

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Units	Frequency of Detection	Minimum Reporting Limit	Maximum Reporting Limit	Mean Concentration	Screening Value	Minimum Ratio	Maximum Ratio	Mean Ratio
Acenaphthylene	µg/kg	0 / 39	380	900	262	44.0	8.64	20.5	5.95
Butylbenzylphthalate	µg/kg	0 / 39	380	900	262	63.0	6.03	14.3	4.15
Diethylphthalate	µg/kg	0 / 39	380	900	241	200	1.90	4.50	1.20
Dimethyl phthalate	µg/kg	0 / 39	380	900	262	71.0	5.35	12.7	3.69
Hexachlorobenzene	µg/kg	0 / 39	380	900	262	22.0	17.3	40.9	11.9
Hexachlorobutadiene	µg/kg	0 / 39	380	900	262	11.0	34.5	81.8	23.8
Pentachlorophenol	µg/kg	0 / 39	960	2,300	652	360	2.67	6.39	1.81
n-Nitrosodiphenylamine	µg/kg	0 / 39	380	900	262	28.0	13.6	32.1	9.35
1,2,4-Trichlorobenzene	µg/kg	0 / 39	11.0	900	58.8	40.0	0.28	22.5	1.47
1,2-Dichlorobenzene	µg/kg	0 / 39	11.0	900	58.8	35.0	0.31	25.7	1.68
1,4-Dichlorobenzene	µg/kg	0 / 39	11.0	900	58.8	110	0.10	8.18	0.53
Ethylbenzene	µg/kg	0 / 39	11.0	27.0	7.83	10.0	1.10	2.70	0.78
<b>Surface Water</b>									
Cadmium (dissolved)	µg/L	0 / 24	0.40	0.40	0.20	0.34	1.18	1.18	0.59
Cyanide	µg/L	0 / 24	10.0	10.0	5.00	5.20	1.92	1.92	0.96
Silver (total)	µg/L	0 / 28	0.60	1.60	0.47	0.36	1.67	4.44	1.30
4,6-Dinitro-2-methylphenol	µg/L	0 / 9	25.0	25.0	12.5	2.30	10.9	10.9	5.43
4-Bromophenyl-phenylether	µg/L	0 / 9	10.0	10.0	5.00	1.50	6.67	6.67	3.33
4-Chloro-3-methylphenol	µg/L	0 / 9	10.0	10.0	5.00	0.30	33.3	33.3	16.7
Anthracene	µg/L	0 / 9	10.0	10.0	5.00	0.73	13.7	13.7	6.85
Benzo(a)anthracene	µg/L	0 / 9	10.0	10.0	5.00	6.30	1.59	1.59	0.79
Benzo(a)pyrene	µg/L	0 / 9	10.0	10.0	5.00	0.01	714	714	357
Di-n-octylphthalate	µg/L	0 / 9	10.0	10.0	5.00	3.00	3.33	3.33	1.67
Hexachlorobenzene	µg/L	0 / 9	10.0	10.0	5.00	3.68	2.72	2.72	1.36
Hexachlorobutadiene	µg/L	0 / 9	10.0	10.0	5.00	9.30	1.08	1.08	0.54
Hexachlorocyclopentadiene	µg/L	0 / 9	10.0	10.0	5.00	5.20	1.92	1.92	0.96
Pentachlorophenol	µg/L	0 / 9	25.0	25.0	12.5	15.0	1.67	1.67	0.83
Phenanthrene	µg/L	0 / 9	10.0	10.0	5.00	6.30	1.59	1.59	0.79
Carbon disulfide	µg/L	0 / 28	1.00	10.0	2.43	2.00	0.50	5.00	1.21

TABLE G-79

Surface Water Screening Results (Detects) for Rounds 7 to 9 of Long-Term Monitoring Data at Downgradient Sample Locations

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC Based on LTM Data from Rounds 4 to 6?
<b>Inorganics (µg/L)</b>										
Aluminum	200 - 200	13 / 24	545	AS01-SW04-R09	226	87.0	13 / 24	6.26	2.60	YES
Arsenic	10.0 - 10.0	3 / 24	6.60	AS01-SW02A-R07	2.30	150	0 / 24	0.04	0.02	NO
Barium	200 - 200	24 / 24	78.9	AS01-SW02-R07	56.8	1,000	0 / 24	0.08	0.06	NO
Boron	15.0 - 15.0	8 / 8	21.2	AS01-SW02-R08	20.0	53,000	0 / 8	0.0004	0.0004	Not Sampled
Chromium	10.0 - 10.0	6 / 24	5.10	AS01-SW05-R07	0.98	11.4	0 / 24	0.45	0.09	NO
Cobalt	50.0 - 50.0	13 / 24	3.60	AS01-SW03-R09	1.61	23.0	0 / 24	0.16	0.07	NO
Copper	25.0 - 25.0	13 / 24	87.2	AS01-SW05A-R07	10.3	13.8	3 / 24	6.32	0.75	NO
Iron	100 - 100	16 / 24	458	AS01-SW04-R09	208	1,000	0 / 24	0.46	0.21	NO
Lead	3.00 - 3.00	3 / 24	6.00	AS01-SW05A-R07	1.42	5.70	1 / 24	1.05	0.25	NO
Manganese	15.0 - 15.0	24 / 24	219	AS01-SW04-R09	171	120	24 / 24	1.83	1.42	YES
Nickel	40.0 - 40.0	17 / 24	11.5	AS01-SW04-R09	6.32	76.8	0 / 24	0.15	0.08	NO
Silver	10.0 - 10.0	1 / 24	1.80	AS01-SW04-R07	0.54	0.36	1 / 24	5.00	1.49	YES
Vanadium	50.0 - 50.0	6 / 24	1.60	AS01-SW03A-R07	0.72	10,000	0 / 24	0.0002	0.0001	NO
Zinc	20.0 - 20.0	19 / 24	96.9	AS01-SW05A-R07	17.2	177	0 / 24	0.55	0.10	NO
<b>Volatile Organic Compounds (µg/L)</b>										
Acetone	5.00 - 5.00	5 / 8	3.70	AS01-SW03-R09	2.60	90,000	0 / 8	0.00004	0.00003	NO
Trichloroethene	0.50 - 1.00	1 / 24	0.35	AS01-SW02-R09	0.34	21,900	0 / 24	0.00002	0.00002	NO

TABLE G-80

Comparison of Surface Water COPC Concentrations to Upgradient Concentrations

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Rounds 7 to 9						Rounds 4 to 6			
	Adjacent/Downgradient			Upgradient			Ratio of Maximums	Ratio of Means	Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum	Arithmetic Mean	Frequency of Detection	Maximum	Arithmetic Mean				
<b>Metals (µg/L)</b>										
Aluminum	13 / 24	545	226	4 / 6	454	233	1.20	0.97	1.73	1.16
Manganese	24 / 24	219	171	6 / 6	237	179	0.92	0.95	1.33	1.08
Silver	1 / 24	1.80	0.54	0 / 6	--	0.48	--	1.11	--	0.96

TABLE G-81  
Sediment Screening Results (Detects) for Rounds 7 to 9 of Long-Term Monitoring Data at Downgradient Sample Locations  
Site 1 Focused RI for Soil  
Allegany Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC Based on LTM Data from Rounds 4 to 6?
<b>Inorganics (mg/kg)</b>										
Aluminum	28.4 - 165	24 / 24	8,300	AS01-SD04-R07	5,201	25,500	0 / 24	0.33	0.20	NO
Antimony	8.70 - 49.5	1 / 17	0.84	AS01-SD02A-R09	0.52	150	0 / 17	0.01	0.003	NO
Arsenic	1.40 - 8.30	24 / 24	22.2	AS01-SD04-R07	9.91	8.20	19 / 24	2.71	1.21	YES
Barium	28.4 - 165	24 / 24	415	AS01-SD04-R07	84.3	500	0 / 24	0.83	0.17	NO
Beryllium	0.71 - 4.10	24 / 24	2.50	AS01-SD04-R07	1.39	NSV	-- / --	NSV	NSV	YES
Boron	2.20 - 3.20	7 / 8	3.10	AS01-SD04-R08	1.81	NSV	-- / --	NSV	NSV	Not Sampled
Cadmium	0.71 - 4.10	5 / 24	0.20	AS01-SD03-R09	0.07	1.20	0 / 24	0.17	0.06	NO
Chromium	1.40 - 8.30	24 / 24	20.7	AS01-SD03A-R08	13.3	81.0	0 / 24	0.26	0.16	NO
Cobalt	7.10 - 41.3	24 / 24	251	AS01-SD04-R07	42.1	50.0	1 / 24	5.02	0.84	NO
Copper	3.60 - 20.6	24 / 24	78.4	AS01-SD02-R07	24.7	34.0	3 / 24	2.31	0.73	YES
Iron	14.2 - 82.5	24 / 24	49,500	AS01-SD02A-R08	33,433	188,400	0 / 24	0.26	0.18	NO
Lead	0.43 - 2.50	24 / 24	37.5	AS01-SD04-R07	23.6	46.7	0 / 24	0.80	0.51	NO
Manganese	2.10 - 12.4	24 / 24	7,330	AS01-SD04-R07	1,248	630	24 / 24	11.6	1.98	YES
Mercury	0.02 - 0.42	21 / 24	0.17	AS01-SD03-R07	0.08	0.15	1 / 24	1.13	0.51	YES
Nickel	5.70 - 33.0	24 / 24	316	AS01-SD04-R07	69.2	20.9	24 / 24	15.1	3.31	YES
Selenium	0.71 - 4.10	4 / 16	0.81	AS01-SD05A-R09	0.48	1.00	0 / 16	0.81	0.48	NO
Silver	1.40 - 8.30	13 / 16	2.80	AS01-SD02-R07	0.75	1.00	3 / 16	2.80	0.75	YES
Thallium	1.40 - 8.30	11 / 24	3.90	AS01-SD02A-R07	1.23	NSV	-- / --	NSV	NSV	YES
Vanadium	7.10 - 41.3	23 / 24	22.6	AS01-SD04-R07	15.9	57.0	0 / 24	0.40	0.28	NO
Zinc	2.80 - 16.5	23 / 24	782	AS01-SD04-R07	191	150	18 / 24	5.21	1.28	YES
<b>Semivolatile Organic Compounds (µg/kg)</b>										
2-Methylnaphthalene	400 - 1,400	4 / 24	110	AS01-SD05A-R09	221	70.0	1 / 24	1.57	--	YES
4-Methylphenol	400 - 1,400	1 / 24	84.0	AS01-SD05A-R08	243	670	0 / 24	0.13	--	NO
Acenaphthene	400 - 1,400	1 / 24	190	AS01-SD05A-R09	247	16.0	1 / 24	11.9	--	YES
Anthracene	400 - 1,400	3 / 24	440	AS01-SD05A-R09	254	85.3	3 / 24	5.16	2.98	YES
Benzaldehyde	400 - 1,400	0 / 24	--	--	219	NSV	-- / --	NSV	NSV	YES
Benzo(a)anthracene	400 - 1,400	8 / 24	780	AS01-SD05A-R09	258	261	3 / 24	2.99	0.99	YES
Benzo(a)pyrene	400 - 1,400	8 / 24	530	AS01-SD05A-R09	241	430	1 / 24	1.23	0.56	YES
Benzo(b)fluoranthene	400 - 1,400	9 / 24	570	AS01-SD05A-R09	240	3,200	0 / 24	0.18	0.08	NO
Benzo(g,h,i)perylene	400 - 1,400	6 / 24	290	AS01-SD05A-R09	221	670	0 / 24	0.43	0.33	NO

TABLE G-81

Sediment Screening Results (Detects) for Rounds 7 to 9 of Long-Term Monitoring Data at Downgradient Sample Locations

Site 1 Focused RI for Soil

Allegheny Ballistics Laboratory, Rocket Center, WV

Chemical	Reporting Limit Range	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient	COPC Based on LTM Data from Rounds 4 to 6?
Benzo(k)fluoranthene	400 - 1,400	6 / 24	490	AS01-SD05A-R09	243	240	2 / 24	2.04	1.01	YES
Carbazole	400 - 1,400	2 / 24	460	AS01-SD05A-R09	251	1,800	0 / 24	0.26	0.14	NO
Chrysene	400 - 1,400	10 / 24	780	AS01-SD05A-R09	250	384	2 / 24	2.03	0.65	YES
Di-n-butylphthalate	400 - 1,400	4 / 24	400	AS01-SD02-R09	244	1,400	0 / 24	0.29	0.17	NO
Dibenz(a,h)anthracene	400 - 1,400	1 / 24	110	AS01-SD05A-R09	243	63.4	1 / 24	1.74	--	YES
Dibenzofuran	400 - 1,400	1 / 24	260	AS01-SD05A-R09	250	540	0 / 24	0.48	0.46	NO
Fluoranthene	400 - 1,400	11 / 24	2,100	AS01-SD05A-R09	352	600	2 / 24	3.50	0.59	YES
Fluorene	400 - 1,400	2 / 24	290	AS01-SD05A-R09	245	19.0	2 / 24	15.3	12.9	YES
Indeno(1,2,3-cd)pyrene	400 - 1,400	6 / 24	280	AS01-SD05A-R09	220	600	0 / 24	0.47	0.37	NO
Naphthalene	400 - 1,400	3 / 24	360	AS01-SD05A-R09	239	160	1 / 24	2.25	1.49	YES
PAH, total	-- - --	12 / 24	11,720	AS01-SD05A-R09	4,575	4,000	4 / 24	2.93	1.14	YES
Phenanthrene	400 - 1,400	10 / 24	2,200	AS01-SD05A-R09	329	240	4 / 24	9.17	1.37	YES
Pyrene	400 - 1,400	10 / 24	1,700	AS01-SD05A-R09	308	665	1 / 24	2.56	0.46	YES
bis(2-Ethylhexyl)phthalate	400 - 1,400	3 / 24	280	AS01-SD05A-R09	163	1,300	0 / 24	0.22	0.13	NO
<b>Explosives (µg/kg)</b>										
No Detections										
<b>Volatile Organic Compounds (µg/kg)</b>										
1,1-Dichloroethane	12.0 - 48.0	1 / 24	5.20	AS01-SD03-R09	7.74	NSV	-- / --	NSV	NSV	YES
2-Butanone	12.0 - 48.0	1 / 24	6.30	AS01-SD05A-R09	7.76	NSV	-- / --	NSV	NSV	NO
Acetone	12.0 - 48.0	0 / 24	--	--	6.38	NSV	-- / --	NSV	NSV	YES
Methylene chloride	12.0 - 48.0	0 / 24	--	--	3.61	NSV	-- / --	NSV	NSV	YES
Trichloroethene	12.0 - 48.0	2 / 24	4.00	AS01-SD02-R09	7.38	41.0	0 / 24	0.10	--	NO
Vinyl chloride	12.0 - 69.0	1 / 24	280	AS01-SD03-R09	19.2	NSV	-- / --	NSV	NSV	YES
cis-1,2-Dichloroethene	12.0 - 48.0	6 / 24	200	AS01-SD03-R09	15.1	NSV	-- / --	NSV	NSV	YES
m- and p-Xylene	13.0 - 48.0	1 / 8	5.90	AS01-SD04-R07	6.93	40	0 / 8	0.15	--	NO
trans-1,2-Dichloroethene	12.0 - 48.0	1 / 24	1.80	AS01-SD03-R09	7.60	NSV	-- / --	NSV	NSV	YES

TABLE G-82

Comparison of Sediment COPC Concentrations to Upgradient Concentrations

Site 1 Focused RI for Soil

Allegany Ballistics Laboratory, Mineral County, WV

Chemical	Rounds 7 to 9						Rounds 4 to 6			
	Adjacent/Downgradient			Upgradient			Ratio of Maximums	Ratio of Means	Ratio of Maximums	Ratio of Means
	Frequency of Detection	Maximum	Arithmetic Mean	Frequency of Detection	Maximum	Arithmetic Mean				
<b>Inorganics (mg/kg)</b>										
Arsenic	24 / 24	22.2	9.91	6 / 6	12.4	8.78	1.79	1.13	1.79	1.45
Beryllium	24 / 24	2.50	1.39	6 / 6	1.60	1.21	1.56	1.15	3.23	1.52
Copper	24 / 24	78.4	24.7	6 / 6	26.4	17.5	2.97	1.41	81.0	5.95
Manganese	24 / 24	7,330	1,248	6 / 6	1,690	1,001	4.34	1.25	2.34	1.23
Mercury	21 / 24	0.17	0.08	6 / 6	0.17	0.07	1.00	1.08	--	4.67
Nickel	24 / 24	316	69.2	6 / 6	73.7	51.4	4.29	1.35	4.68	1.66
Silver	13 / 16	2.80	0.75	4 / 4	0.35	0.31	8.00	2.45	106	17.7
Thallium	11 / 24	3.90	1.23	2 / 6	2.40	1.20	1.63	1.03	5.21	1.74
Zinc	23 / 24	782	191	6 / 6	181	143	4.32	1.34	4.12	1.84
<b>Semivolatile Organic Compounds (µg/kg)</b>										
2-Methylnaphthalene	4 / 24	110	221	0 / 6	--	211	--	1.05	6.67	1.31
Acenaphthene	1 / 24	190	247	0 / 6	--	211	--	1.17	--	1.38
Anthracene	3 / 24	440	254	0 / 6	--	211	--	1.21	--	1.75
Benzo(a)anthracene	8 / 24	780	258	0 / 6	--	211	--	1.22	--	2.29
Benzo(a)pyrene	8 / 24	530	241	0 / 6	--	211	--	1.15	--	2.10
Benzo(k)fluoranthene	6 / 24	490	243	0 / 6	--	211	--	1.15	--	1.38
Chrysene	10 / 24	780	250	0 / 6	--	211	--	1.19	138	2.46
Dibenz(a,h)anthracene	1 / 24	110	243	0 / 6	--	211	--	1.15	--	1.17
Fluoranthene	11 / 24	2,100	352	1 / 6	54.0	181	38.9	1.95	388	3.84
Fluorene	2 / 24	290	245	0 / 6	--	211	--	1.16	40.9	1.58
Naphthalene	3 / 24	360	239	0 / 6	--	211	--	1.13	6.15	1.28
PAH, total	12 / 24	11,720	4,575	1 / 6	3,864	3,734	3.03	1.23	24.3	1.92
Phenanthrene	10 / 24	2,200	329	0 / 6	--	211	--	1.56	70.8	3.18
Pyrene	10 / 24	1,700	308	1 / 6	50.0	180	34.0	1.71	--	2.72
<b>Volatile Organic Compounds (µg/kg)</b>										
1,1-Dichloroethane	1 / 24	5.20	7.74	0 / 6	--	6.42	--	1.21	--	1.18
Vinyl chloride	1 / 24	280	19.2	0 / 6	--	6.42	--	2.99	--	1.44
cis-1,2-Dichloroethene	6 / 24	200	15.1	0 / 6	--	6.42	--	2.36	--	3.75
trans-1,2-Dichloroethene	1 / 24	1.80	7.60	0 / 6	--	6.42	--	1.18	--	1.17