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FINAL SITE INSPECTION REPORT FOR MRP SITES MACHING GUN BORESIGHT RANGE
AND SKEET RANGE NAS BRUNSWICK ME
4/1/2013
TETRA TECH

**Site Inspection Report
for
Munitions Response Program Sites**

- MACHINE GUN BORESIGHT RANGE
- SKEET RANGE

**Former Naval Air Station
Brunswick
Brunswick, Maine**



**Naval Facilities Engineering Command
Mid-Atlantic**

**Contract Number N62472-03-D-0057
Contract Task Order 69**

April 2013

**SITE INSPECTION REPORT
FOR
MUNITIONS RESPONSE PROGRAM SITES**

- Machine Gun Boresight Range
- Skeet Range

**FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Naval Facilities Engineering Command Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511**

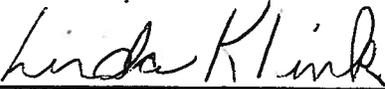
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**CONTRACT NUMBER N62472-03-D-0057
CONTRACT TASK ORDER 69**

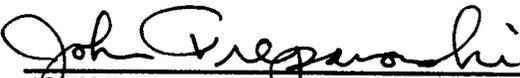
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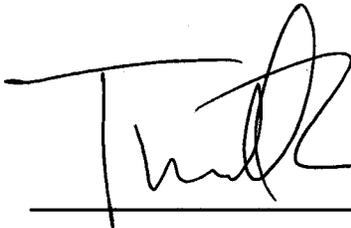
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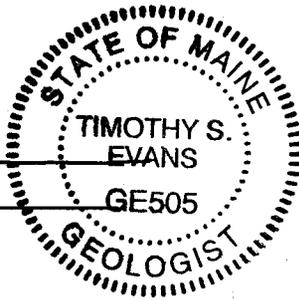
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**CERTIFIED MAINE GEOLOGIST
CERTIFICATION**

By affixing my seal to the "*Site Inspection Report for Munitions Response Program Sites Machine Gun Boresight Range and Skeet Range, Former Naval Air Station Brunswick, Brunswick, Maine*", prepared by Tetra Tech and dated April 2013, I certify that the geologic information and interpretations herein are true and correct to the best of my knowledge. I further certify that I am licensed to practice in the State of Maine and that it is within my professional expertise to verify the correctness of the information.



Timothy S. Evans, C.G.
Registration Number GE505



4/23/13
Date

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ACRONYMS

AOC	Area of Concern
bgs	below ground surface
BRAC	Base Realignment and Closure
°C	degrees Celsius
CDC	Center for Disease Control
CEC	cation exchange capacity
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
CSM	Conceptual Site Model
CTO	Contract Task Order
DERP	Defense Environmental Restoration Program
DI	deionized
DNT	dinitrotoluene
DO	dissolved oxygen
DoD	Department of Defense
DON	Department of Navy
DPT	direct-push technology
DQI	data quality indicator
DQR	data quality review
EA	EA Engineering
°F	degrees Fahrenheit
FBL	fixed-base laboratory
FOL	Field Operations Leader
FUDS	Formerly Used Defense Sites
FY	Fiscal Year
gpm	gallon per minute
GPS	Global Positioning System
HASP	Health and Safety Plan
ID	inside diameter
IDW	investigation-derived waste
INRMP	Integrated Natural Resources Management Plan
LCS	laboratory control sample
MC	Munitions Constituents

MCL	Maximum Contaminant Level
MDL	method detection limit
MEC	Munitions and Explosives of Concern
MEDEP	Maine Department of Environmental Protection
MEG	Maximum Exposure Guidelines
MGBR	Machine Gun Boresight Range
mg/kg	milligram per kilogram
mg/l	milligram per liter
mL/min	milliliter per minute
mph	mile per hour
MRP	Munitions Response Program
MRS	Munitions Response Site
MS	matrix spike
msl	mean sea level
NAD	North American Datum
NAS	Naval Air Station
NASB	Naval Air Station Brunswick
NAVD	North American Vertical Datum
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NFESC	Naval Facilities Engineering Service Center
NIST	National Institute of Standards and Technology
NTU	nephelometric turbidity unit
OD	outside diameter
ORP	oxidation-reduction potential
PA	Preliminary Assessment
PAH	polynuclear aromatic hydrocarbon
PAL	Project Action Limit
PID	photoionization detector
ppt	part per thousand
PQLG	project quantitation limit goal
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
%R	Percent Recovery
RAG	Remedial Action Guidelines

RPD	Relative Percent Difference
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SDZ	surface danger zone
SI	Site Inspection
SKT	Skeet Range
SOP	Standard Operating Procedure
TAL	Target Analyte List
TASKT	Topsham Annex Skeet Range
Tetra Tech	Tetra Tech NUS, Inc.
TOC	total organic carbon
UFP	Uniform Federal Policy
µg/kg	microgram per kilogram
µg/L	microgram per liter
USACE	United States Army Corps of Engineers
U.S.C	United States Code
USCS	Unified Soil Classification System
USDA-SCS	United States Department of Agriculture, Soil Conservation Service
USEPA	United States Environmental Protection Agency
XRF	x-ray fluorescence

EXECUTIVE SUMMARY

This report describes Site Inspection (SI) activities performed to assess Munitions Constituents (MC) at three Munitions Response Sites (MRSs) under the Munitions Response Program (MRP) at Former Naval Air Station Brunswick (NASB) Cumberland County, Maine, including the following:

- Machine Gun Boresight Range (MGBR)
- Skeet Range (SKT)

Field activities included MC sampling and analysis of shallow and deep surface soil, subsurface soil, sediment, and surface water samples, and well installation and groundwater samples at MGBR. Tetra Tech NUS, Inc. (Tetra Tech) personnel mobilized to NASB in summer 2009 to initiate the MC investigation. Several field events were required due to various delays (e.g., consensus on fixed-base sampling locations and winter weather). Personnel demobilized in spring 2010 after completion of SI activities. This work was performed by Tetra Tech under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62472-03-D-0057, Contract Task Order (CTO) 69.

This document addresses the MC activities associated with the SI. Following MC sample collection and analysis, data management, including data validation and database management, was conducted.

The MC SI work is based on Department of Defense (DoD) and United States Environmental Protection Agency (USEPA) guidance for performing response actions at military ranges (2000), Navy Munitions Response Program Guidance (2005), Defense Environmental Restoration Program (DERP) Management Guidance (2001), USEPA Guidance for Performing Site Inspections (1992), and applicable United States Army Corps of Engineers (USACE) guidance on ordnance and explosive response actions (USACE, 2002, 2003a through f, and 2004).

The following recommendations were made for the MGBR and SKT at NASB:

TABLE ES-1

**SUMMARY RECOMMENDATIONS
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

Machine Gun Boresight Range

Soil: There are two “hot spots” of lead and other metals contamination in surface soil (SB22 and SB01), although the locations are infrequent and sporadic (not adjacent to each other). While it appears that metals contamination is present in soil at and near the former source berm location, the berm material has been removed and the remaining contamination is residual and limited to these two small areas. The two hot spots warrant remediation via excavation and proper disposal.

Groundwater: For groundwater, lead concentrations were not of concern, and only chromium and manganese were detected at concentrations greater than both Maine MEGs and USEPA tapwater RSLs. However, chromium was only a potential concern at one location (MW03); moreover, the concentration of chromium at this location was 35.1 micrograms per liter ($\mu\text{g/L}$), only slightly exceeding the Maine MEG value of 20 $\mu\text{g/L}$. While the maximum concentration of manganese, 551 $\mu\text{g/L}$, was only slightly greater than the Maine MEG of 500 $\mu\text{g/L}$. There were no analytes detected at concentrations greater than MCLs. The low levels of inorganics found in groundwater do warrant groundwater use restrictions.

Skeet Range

Further characterization of shallow surface soil is recommended for the SKT.

Soil: Shallow surface soil (0 to 3 inches bgs) is contaminated with metals and PAHs (primarily antimony, arsenic, lead, and benzo(a)pyrene) at unacceptable concentrations. The contamination appears to be located within the combined middle area of the pre-1950 and post-1950 range fans overlap. Contamination is present from the firing points extending outward to encompass the shotfall zones in this central area. Additional shallow surface soil sampling to refine the area is recommended.

Analytes for further sampling should include antimony, arsenic, lead, and select PAHs.

Groundwater: Groundwater was not investigated, pending evaluation of soil results. Because only shallow surface soils (0 to 3 inches bgs) are of primary concern, it does not appear that contamination has migrated to deeper soils at concentrations of concern and, therefore, the migration pathway from soil to groundwater is not complete. Therefore, for groundwater no investigation is warranted.

Surface Water: Metals were detected at elevated concentrations in surface water. Further assessment is recommended for the site pond.

Sediment: Metals were detected at elevated concentrations in sediment. Further assessment is recommended for the site pond.

1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

This report describes Site Inspection (SI) activities performed to assess Munitions Constituents (MC) at two Munitions Response Sites (MRSs) under the Munitions Response Program (MRP) associated with the Former Naval Air Station Brunswick (NASB) Cumberland County, Maine (Figure 1-1), including the following:

- Machine Gun Boresight Range (MGBR) (Figure 1-2)
- Skeet Range (SKT) (Figure 1-3)

Field activities included MC sampling and analysis of surface soil, subsurface soil, sediment, and surface water samples, and well installation and groundwater samples at MGBR which were conducted in accordance with the Site Inspection (SI) Work Plan, Munitions Constituents at Three Munitions Response Sites (Tetra Tech, 2009). This work was performed by Tetra Tech NUS, Inc. (Tetra Tech) under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62472-03-D-0057, Contract Task Order (CTO) 69.

1.2 SCOPE OF WORK

This document addresses the MC activities associated with the SI. Following MC sample collection and analysis, data management, including data validation and database management, was conducted.

The MC SI work is based on Department of Defense (DoD) and United States Environmental Protection Agency (USEPA) guidance for performing response actions at military ranges (2000), Navy Munitions Response Program Guidance (2005), Defense Environmental Restoration Program (DERP) Management Guidance (2001), USEPA Guidance for Performing Site Inspections (1992), and applicable United States Army Corps of Engineers (USACE) guidance on ordnance and explosive response actions (USACE, 2003a through f, and 2004).

The media sampled at each MRS during the SI are summarized in Table 1-1.

Machine Gun Boresight Range

The MGBR is located on the eastern portion of former NASB and encompasses approximately 0.3 acre from the firing line to the berm, with an approximately 1,029.4-acre surface danger zone (SDZ) during historical operations. The former range was used during the 1950s to align and test fire aircraft-mounted guns. Naval aircraft of the 1950s would have fired .30-caliber and .50-caliber machine gun ammunition. At the time the range was active, the area east of the range was undeveloped and wooded. The range is visible on a 1957 aerial photograph of the installation; however, there are currently no visible remnants of the MGBR or range berm. A map believed to be from the late 1950s to early 1960s found at the National Archives had the range labeled as a pistol range; however, the exact history or use of the range as a pistol range is unknown. In the early 1960s, the layout of the installation was changed, and eventually taxiways connecting the runways to the range area were removed and the range was abandoned. Building 55 and the associated parking lot appear to be located on the approximate area of the compass rose and part of the former range floor; however, the former location of the backstop for the range is not currently covered. The primary MC of concern associated with machine gun and small arms ranges is lead. Other metals of concern included antimony, arsenic, and copper. Perchlorate is also a potential contaminant of concern because every fifth round fired from a machine gun was a tracer round that would have contained pyrotechnics. The MC investigation at MGBR included surface and subsurface soil, and groundwater sampling.

Skeet Range

SKT is located on 78 acres in the southeastern portion of former NASB in an open field approximately 75 meters north and 100 meters east of Building 55. The former range was located adjacent to Range Road just northeast of the taxiway intersection. The former SKT was used for the training of military personnel during the 1950s. Navy Programming Guidance from the 1950s defined the SDZ of a skeet range as a 900-foot radius from the shooting field. On range maps from 1952, the range is shown with the direction of fire to the north; however, in a 1957 aerial photograph, the range is shown with the direction of fire to the east. It appears that the layout of the range and direction of fire were changed to maintain a safe distance from the shooting field outlined in the Programming Guide because the area east of the range was undeveloped. The primary potential constituent of concern was lead from shotgun ammunition and polynuclear aromatic hydrocarbons (PAHs) from the clay targets. Other potential MC that were less of a concern included antimony, arsenic, nickel, lead azide, propellants, and plasticizers. The MC investigation at SKT included shallow and deep surface soil, sediment, and surface water sampling.

1.3 OBJECTIVES

The objective of the SI described was to conduct an on-site investigation and gather sufficient data to determine the presence or absence of MC that may remain from activities conducted by the DoD during site operation and that may subsequently pose a threat to human health and/or the environment (Tetra Tech, 2009). Under the MRP, the primary goal of the SI is to collect the appropriate amount of information necessary to make one of the following decisions: 1) whether a Remedial Investigation (RI) is required at a site; 2) whether an immediate response is needed; or 3) whether the site qualifies for no further action (NFA).

1.4 REPORT ORGANIZATION

The following information is contained in this document:

- Section 1.0 discusses the purpose of the report, presents brief MRS descriptions and SI scope information, and summarizes the objectives of the SI.
- Section 2.0 discusses the facility background and physical setting.
- Section 3.0 discusses the general MC SI methodology.
- Section 4.0 discusses the MGBR.
- Section 5.0 discusses the SKT.
- Section 6.0 presents the references used in preparation of this document.

The following appendices are included in this report and provide technical information compiled during the SI:

- Appendix A: Project Personnel Sign-Off Sheet
- Appendix B: Photographic Log
- Appendix C: MC Field Documentation
- Appendix D: Validated Analytical Results
- Appendix E: MC Data Usability Assessment
- Appendix F: X-Ray Fluorescence/Fixed-Base Laboratory Correlation Statistical Evaluation
- Appendix G: Project Action Limits and Screening Levels Supporting Documentation
- Appendix H: Responses to Stakeholder Comments on Draft Version of SI Report

TABLE 1-1

**SUMMARY OF SI FIELD WORK SCOPE
FORMER NAVAL AIR STATION, BRUNSWICK
BRUNSWICK, MAINE**

MRS	Media Sampled for MC				
	Shallow Surface Soil	Deep Surface Soil and/or Subsurface Soil	Sediment	Surface Water	Groundwater
MGBR	✓	✓	--	--	✓
SKT	✓	✓	✓	✓	--

✓ = Performed.

-- = Not Performed.

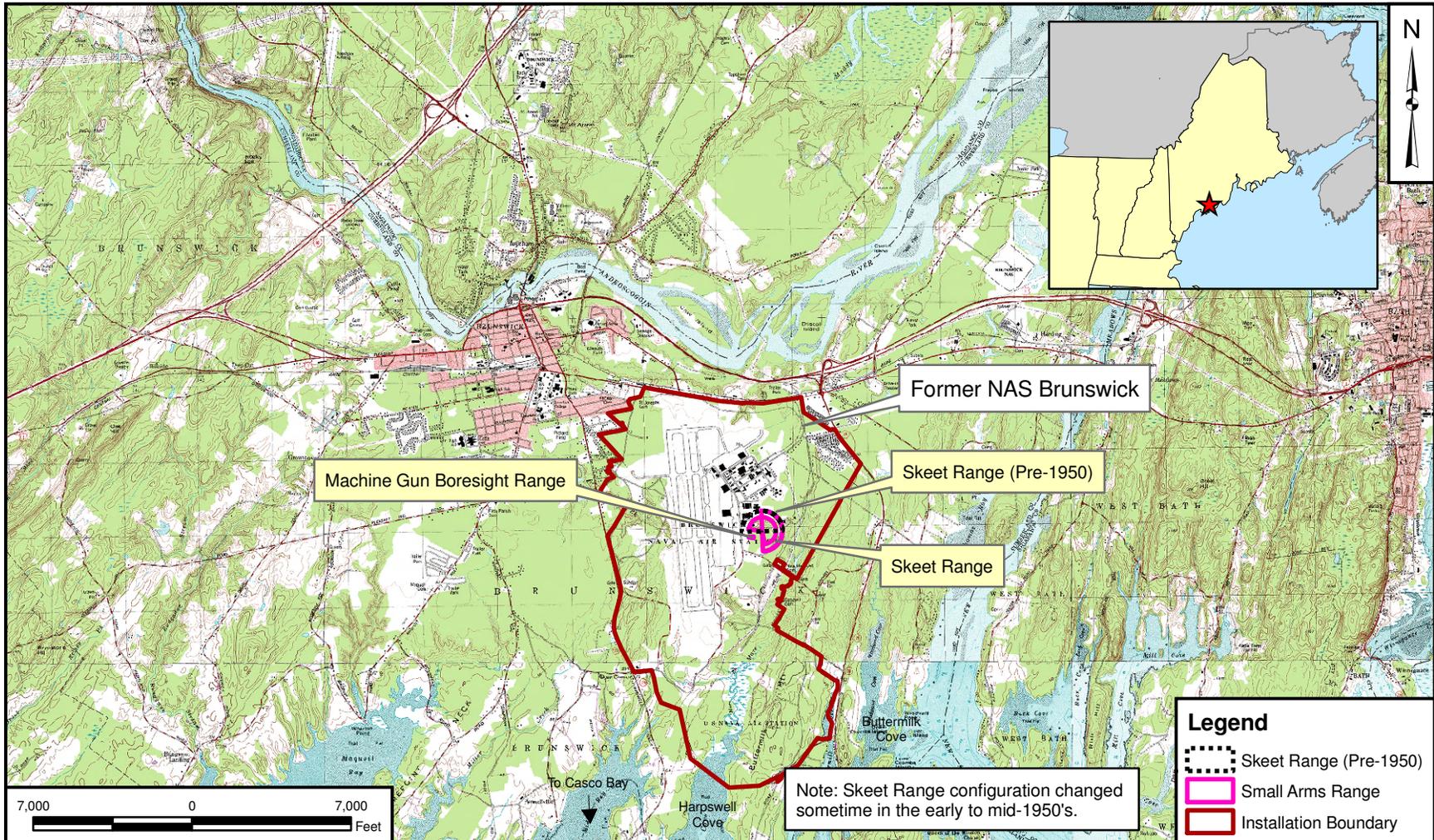
MRS = Munitions Response Site.

MC = Munitions Constituent.

NASB = Naval Air Station Brunswick.

MGBR = Machine Gun Boresight Range.

SKT = Skeet Range.



Legend

- Skeet Range (Pre-1950)
- Small Arms Range
- Installation Boundary

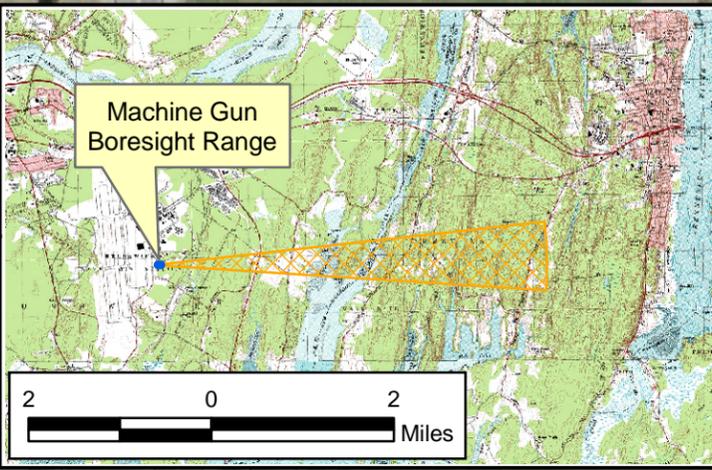
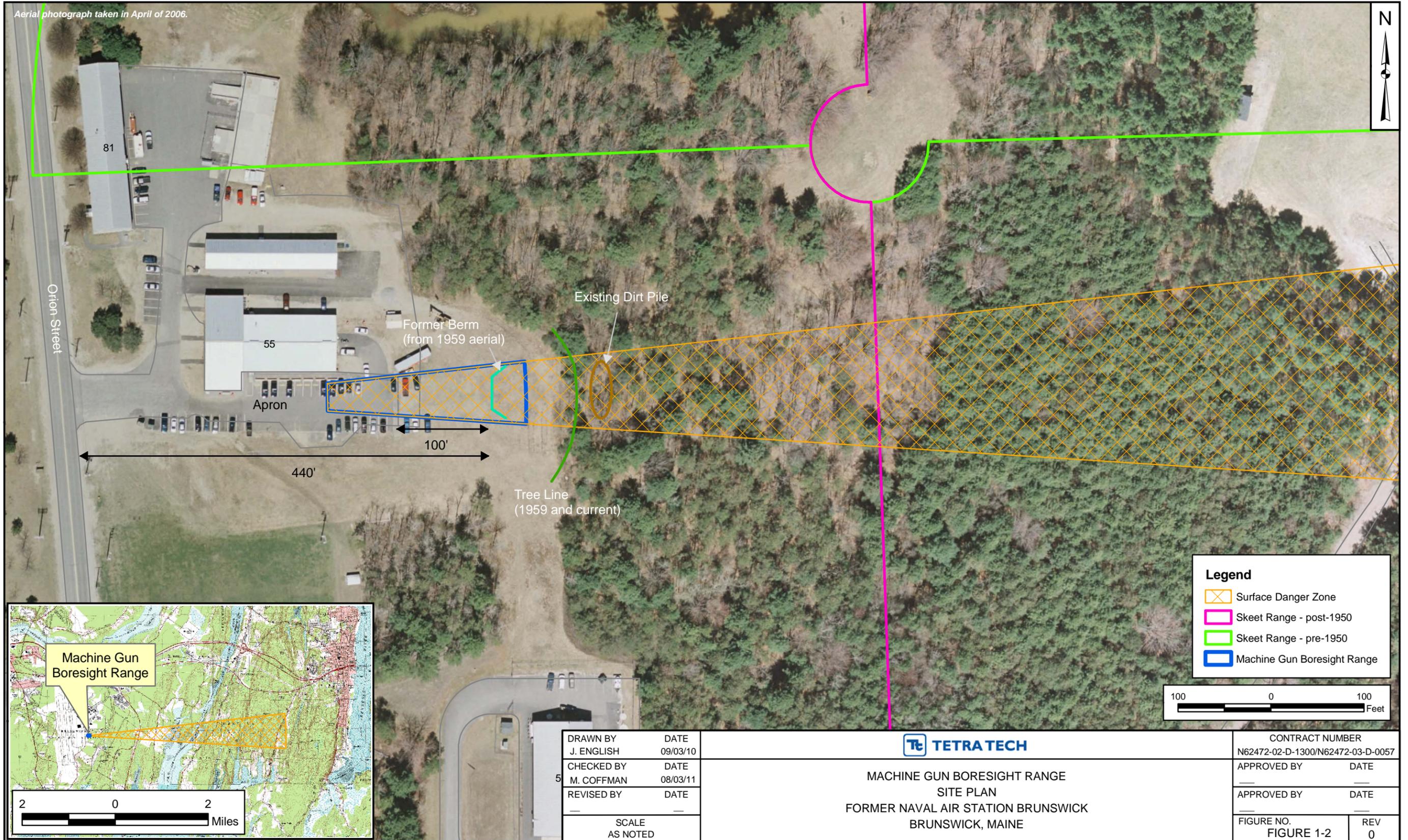
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M. COFFMAN	7/7/11
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K. MOORE	7/7/11
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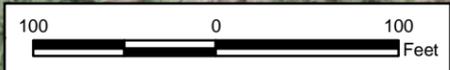
SITE LOCATION MAP
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
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FIGURE NO.	REV
FIGURE 1-1	0

Aerial photograph taken in April of 2006.



Legend	
	Surface Danger Zone
	Skeet Range - post-1950
	Skeet Range - pre-1950
	Machine Gun Boresight Range



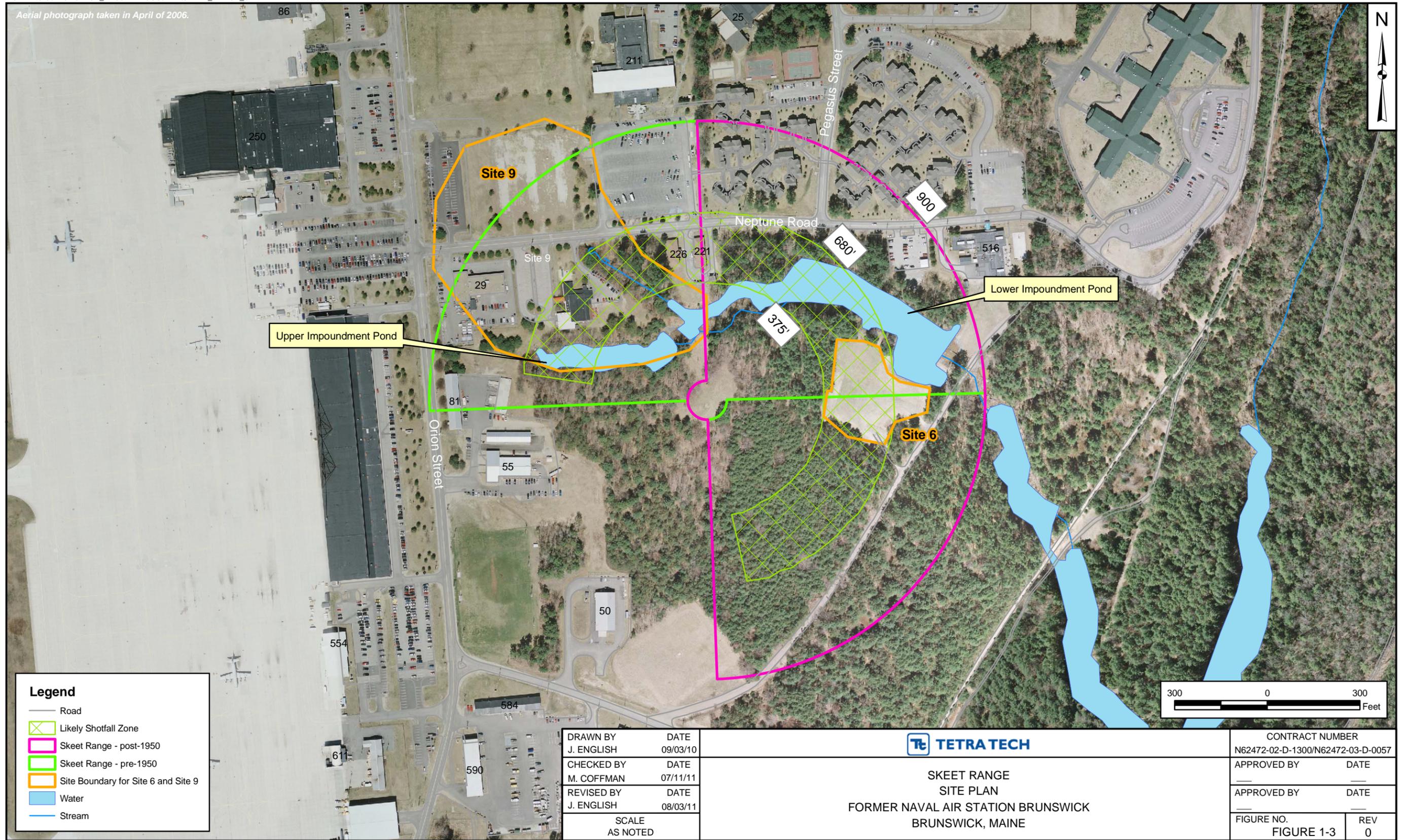
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CHECKED BY M. COFFMAN	DATE 08/03/11
REVISED BY	DATE
SCALE AS NOTED	



MACHINE GUN BORESIGHT RANGE
SITE PLAN
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 1-2	REV 0

Aerial photograph taken in April of 2006.



Legend	
	Road
	Likely Shotfall Zone
	Skeet Range - post-1950
	Skeet Range - pre-1950
	Site Boundary for Site 6 and Site 9
	Water
	Stream

DRAWN BY J. ENGLISH	DATE 09/03/10
CHECKED BY M. COFFMAN	DATE 07/11/11
REVISED BY J. ENGLISH	DATE 08/03/11
SCALE AS NOTED	

TETRA TECH

SKEET RANGE
SITE PLAN
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER N62472-02-D-1300/N62472-03-D-0057	
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FIGURE NO. FIGURE 1-3	REV 0

2.0 FACILITY BACKGROUND AND PHYSICAL SETTING

2.1 GENERAL FACILITY BACKGROUND AND PHYSICAL SETTING

2.1.1 Regulatory Framework

The regulatory process for managing Navy MRP sites is guided by a complex mixture of federal, state, and local laws, as well as DoD and Navy regulations and guidance. The key legislation, policy, and guidance directing the program includes, but is not limited to, the following:

- Navy Munitions Response Program Guidance (Navy, 2005), which states that munitions response will be conducted “in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).”
- Management Guidance for the DERP (DERP, 2001). The history of the DERP dates back to the Superfund Amendments and Reauthorization Act (SARA) of 1986. The scope of the DERP is defined in 10 United States Code (U.S.C.) 2701(b), which states the following:

“Goals of the program shall include the following: (1) The identification, investigation, research and development, and cleanup of contamination from hazardous substances, and pollutants and contaminants. (2) Correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment...”
- Fiscal year (FY) 2002 National Defense Authorization Act (Sections 311 and 312) reinforced DoD’s 2001 DERP Management Guidance by tasking the DoD to develop and maintain an inventory of defense sites that are known or suspected to contain Munitions and Explosives of Concern (MEC) and MC. Section 311 requires DoD to develop a protocol for prioritizing defense sites for response activities in consultation with states and tribes, and Section 312 requires DoD to create a separate program element to ensure that DoD can identify and track munitions response funding. The 2001 Management Guidance for the DERP and 2002 National Defense Authorization Act, described here, established the MRP. The Navy baseline inventory of sites was completed in FY 2002 and was used to establish the sites or Areas of Concern (AOCs) where PAs were needed to further evaluate the potential for MEC and MC.

2.1.2 History

In 2005, NASB was designated for closure under the authority of the Defense Base Realignment and Closure (BRAC) Act of 1990, Public Law 101-510, as amended. BRAC legislation requires that base closure be in full compliance with CERCLA. The operational closure date for NASB is September 15, 2011, and relocation of mission operations to Naval Air Station (NAS) Jacksonville, Florida, began in 2008.

NASB was first commissioned on April 15, 1943 with a primary mission of training British Naval Command pilots. The station carried out a secondary mission of anti-submarine warfare during World War II. The first U.S. squadron to arrive at NASB was an air scouting squadron. When the squadron began operations, the station consisted of only one-half mile of runway and had no hangars or operations tower. When Royal Canadian Air Force crews arrived, construction was still underway on the runways and various other parts of the station. Over the next few years, the station experienced tremendous growth and expansion of available facilities and infrastructure. At the height of its wartime operations, the station supported three auxiliary landing fields, one at Sanford, one at Lewiston, and one at Rockland, Maine.

The base remained active for 4 years and was subsequently deactivated in 1947. The land and buildings were leased jointly to the University of Maine and Bowdoin College as annexes to ease overcrowding caused by the G.I. Bill student influx. The University of Maine and Bowdoin College terminated their leases in 1949, and the station was taken over by the Brunswick Flying Service. At this time, the buildings that had housed military personnel and equipment were put to other uses. Hangar One was converted to a skating rink, Hangar Two and the operations tower were used for a civilian flying school, Hangar Three housed automobiles, ammunitions magazines became mushroom farms, and shrubbery nurseries were located in the northern portion of the station.

Following this period, the station was selected by the Navy as a prime center for development. During the development period, the United States Air Force reached an agreement with the Navy authorizing the construction of an Air Force Control and Warning Facility at the station as a part of the continental circumferential radar screen.

On March 15, 1951, the dormant air station was recommissioned as a Naval Air Facility with the established mission of supporting three land-plane patrol squadrons, one Fleet Aircraft Service Squadron, and a planned future mission as a master jet air station. The station also retained the mission of anti-submarine warfare. In December 1950, the Navy requested funds from Congress to be used for this master jet project. Such a base required dual 8,000-foot runways and two outlying fields, one for gunnery

and one for carrier practice landings. In addition, the Secretary of Defense submitted a request to Congress for approximately \$20,000,000 in June 1951 to be used for additional barracks, officers' quarters, enlisted men's clubs, a control tower, storage, communication buildings, and new galleys and mess facilities.

Following the reactivation period, several new permanent facilities were erected to replace the World War II "temporary" buildings. New facilities included a modern operations tower, three-deck barracks, and a large mess hall. In addition to these facilities, a new enlisted men's club, Navy Exchange, and Bachelor Officers' Quarters were constructed. In 1951, the designation of the facility was officially changed to Naval Air Station, and the Arctic Survival Training School was established in September 1956 to train personnel deploying to the Arctic in north country survival.

To practice rocket and bombing training, the Navy acquired by condemnation Seal Island, located south of the main facility, in 1958. Bombing and rocket training continued through the early 1960s along with anti-submarine warfare training. Units trained at NASB served in action during the Lebanon crisis in fall 1958, when squadrons of Fleet Air Wing Three provided anti-submarine protection for the Sixth Fleet, then operating in the Mediterranean Sea. Also in 1958, a small detachment of Marines of the 2nd Marine Division from Camp Lejeune, North Carolina, was assigned to NASB. In March 1959, the Marine detachment became the Marine Barracks of NASB. The Marine Barracks eventually assumed full surveillance of the entrances from the civilian security police.

The Navy declared Seal Island excess property in 1965 and began to transfer the island to the National Park Service (Department of Interior) through the General Services Administration. The transfer was completed sometime after 1972. Today, Seal Island is in the Formerly Used Defense Sites (FUDS) program managed by USACE.

On July 1, 1971, Commander Patrol Wings United States Atlantic Fleet/Commander Patrol Wing Five established its headquarters at NASB. In the late 1990s, base consolidation efforts resulted in the demolition of surplus buildings around the installation. For over 40 years, six squadrons (Patrol Squadrons 8, 10, 11, 23, 26, and 44) were based at NASB. The BRAC process resulted in the decommissioning of three squadrons (11, 23, and 44), and reserve squadrons VP-92 and VR-62. Through 2009, three patrol squadrons flying the P3 Orion performed their duties at NASB. In addition, two reserve squadrons were also based at NASB along with VPU-1 mission, the Naval Reserve Center, and the Air Reserve Center. NASB also provided support for ships at Bath, Maine, and various northeastern Naval activities.

2.1.3 Location and Setting

The former NASB Main Base is located in Cumberland County, Maine, and comprises approximately 2,834 acres situated between the Androscoggin River and Casco Bay southeast of the town center of Brunswick, approximately 25 miles northeast of Portland, Maine. It is located approximately 5 miles inland from the Atlantic Ocean, and this proximity to the ocean is a major influence on the climate and ecology at the site. It is bordered by Route 123 and Route 1 on the western and northern sides, respectively, and is adjacent to Route 124 on the eastern side. Former NASB was comprised of the Main Base shown on Figure 1-1 and the following five remote properties:

- McKeen Street Housing Complex, located in Brunswick, approximately 3 miles west of the Main Base, which consists of approximately 70 acres of land and improvements.
- Former East Brunswick Remote Radio Transmitter Site, located in Brunswick, approximately 3.2 miles northeast of the Main Base, which consists of approximately 66 acres of land.
- Topsham Annex, located in the Town of Topsham, approximately 4 miles north of the Main Base, which consists of approximately 74 acres of land and facilities. Originally, Topsham Annex consisted of 125 acres; however, 51 acres were transferred.
- Sabino Hill Rake Station No. 1, approximately 0.23 acre of land located near Phippsburg, approximately 14 miles southeast of the Main Base.
- Small Point Rake Station No. 2, approximately 0.23 acre of land located near Phippsburg, approximately 14 miles southeast of the Main Base.

2.1.4 Current Land Use and Anticipated Future Land Use

The NASB is scheduled for closure in 2011, per the 2005 BRAC committee decision. The last aircraft took off on November 28, 2009, and the runways were permanently closed in January 2010. NASB includes undeveloped property with forest and grass cover (for recreational use), redeveloped buildings (for commercial use), and residential areas. Currently, central, southern, and western portions of the SKT will be used for business and technology industries, and the eastern portion will be used for outdoor recreation. MGBR will be used for business and technology industries.

2.2 GENERAL FACILITY PHYSICAL/ENVIRONMENTAL CHARACTERISTICS

2.2.1 Climate

The State of Maine is divided into three major climatic divisions. Former NASB is located in the Coastal Division, which is strongly influenced by its proximity to the Atlantic Ocean to the east and the White Mountains to the northwest. The Atlantic Ocean moderates extremes in temperature and increases the amount of precipitation received by the area. The White Mountains keep considerable snow from reaching the area from the northwest and also moderate temperatures.

Information obtained from the National Climatic Data Center station in Portland, Maine (approximately 25 miles southwest of Brunswick) provides representative climatic data for the area in which the former installation is located. Average temperatures range from 21.7 degrees Fahrenheit (°F) in January to 68.7°F in July, with an annual average of 45.7°F. Mean daily maximum and minimum temperatures of 78.8°F in July and 12.5°F in January have been recorded. During extreme conditions, a daily maximum of 100°F in July and a daily minimum of minus 26°F in January have been recorded. There are, on average, 13 days of zero or subzero temperatures per year.

The annual average precipitation is 45.83 inches, with monthly average peaks as high as 5.17 inches in the fall and as low as 2.87 inches in the summer. The annual average relative humidity ranges from 65 and 77 percent. The mean seasonal snowfall is 67.3 inches. Because of the proximity to the Atlantic Ocean, winter precipitation in southern midcoastal Maine is often in the form of rain or wet snow. Fog occurs frequently along the Maine coast at all times during the year except winter. On average, there are 49 days with heavy fog, defined as visibility less than one-fourth of a mile. Days with the possibility of sunshine range from 48 percent in November to 64 percent in August; the annual percentage of days with sunshine is 57.

Prevailing winds are from the south from April to September, from the north in November and December, and from the west to northwest for the remainder of the year. The annual average wind speed is approximately 9 miles per hour (mph), with monthly average wind speeds not varying considerably (7.7 mph in the summer to 10.1 mph in the spring). Strong winds in the winter, generated by coastal storms, can produce abnormally high wind-driven tides. Regional diurnal and seasonal variations may moderately influence wind directions and wind speeds.

2.2.2 Topography

In the developed portion of the former installation, the topography has been altered so that the area is relatively level. Elevations are in the range from 60 to 75 feet above mean sea level (msl). In undeveloped portions of former NASB, slopes vary between 0 and 15 percent. Slopes between 3 and 8 percent are common in the southern and western margins of the former installation. Steeper slopes occur primarily along stream banks and are isolated occurrences on hills, which generally have more gentle slopes. The highest elevations at former NASB occur in the southeastern and southwestern portions of the former installation. A northeast-trending ridge with an elevation of approximately 120 feet above msl occurs near Dyer Corner. A more extensive ridge, Buttermilk Mountain, occurs northeast of Harpswell Cove. At the southern boundary of the former installation at the Harpswell Cove shoreline, the elevation is at sea level. However, elevations rise rapidly to 60 feet above msl.

2.2.3 Regional Geology

The geology of the area around former NASB is characterized by Pleistocene and Holocene unconsolidated sediments overlying Paleozoic bedrock. Thicknesses of surficial unconsolidated sediments vary from as little as a few feet over much of the southern portion of the former installation and along the eastern and western former installation boundaries up to or exceeding 100 feet in the northern half of the former installation and in a glacially scoured sediment-filled trough trending approximately north-northeast to south-southwest through the center of the southern half of the former installation.

As indicated in Weddle (2001), most of the northern portion of the former installation and those areas within the previously described glacially scoured trough are underlain by Pleistocene-aged regressive marine delta deposits described as interbedded sandy and silty units. Individual beds dip gently to the east. Much of the remainder of the former installation is underlain by either Pleistocene-aged marine near-shore deposits (consisting of gravel, sand, or mud), the Presumpscot formation (consisting of massive to laminated silty clays), or, primarily in elevated areas where bedrock is close to the ground surface, thin drift consisting of glacial till and/or thin layers of near-shore deposits. Sediments deposited in freshwater wetlands and recent alluvial material are present locally.

The predominant bedrock type at former NASB is the Ordovician metamorphic Cape Elizabeth Formation, which is described as a rusty-weathering, thinly bedded, micaceous schist or gneiss with interbeds of mica-quartz schist. The Cape Elizabeth Formation underlies all but the northwestern one-third of the former facility. The northwestern portion of the former installation is underlain by the Ordovician

metamorphic Cushing Formation-Peaks Island Member, which is described as a feldspar-quartz-biotite granofels gneiss.

According to Hussey and Marvinney (2002), most outcrop contacts, faults, compositional layering, and schistosity strike north-northeast to south-southwest, and numerous high-angle and thrust faults cut the area around the former installation. Both bedrock formations at the former installation are characterized by very limited primary porosity, generally in the saprolite or weathered zone. Secondary porosity results from structurally controlled fractures and foliations or planes of schistosity. Such structures at the former installation strike north-northeast to south-southwest and dip to the southeast. Hager GeoScience, Inc. (2004) also identified a secondary set of fracturing that trends east to west.

2.2.4 Soil and Vegetation

The United States Department of Agriculture, Soil Conservation Service (USDA-SCS) Soil Survey for Cumberland County, Maine (1974) shows soils in the vicinity of former NASB as belonging to the Windsor-Hinckley-Deerfield Association. These soils are described as deep, excessively drained to moderately well drained, nearly level to steep, and coarse textured. They occur on bottomlands, glacial terraces, outwash plains, and a few hills and ridges. The major soils in the association are rapidly permeable with a seasonal high water table.

Terrestrial vegetation in the undeveloped sections of former NASB consists predominantly of woodland species. The individual stand compositions are the result of a combination of natural seeding, forest management, and planting. Because former NASB's forest management program established timber stands suited to conditions at the former installation, forested areas of the former facility contain the species typical of the New England coastal area. Differences in species composition generally coincide with differences in soil and physiographic conditions. The majority of former NASB's trees are conifers (white pine, pitch pine, hemlock, spruce, and fir), with lesser numbers of hardwoods (oak, maple, ash, poplar, and birch).

2.2.5 Hydrology

Surface water from former NASB ultimately flows to nearby wetlands or to Mere Brook. In developed areas of the former installation, most natural drainage is directed to the storm water system. Former NASB is included in four major drainage basins: the Androscoggin River, Mere Brook, Middle Bay Cove, and Buttermilk Cove. Approximately 74 percent of former NASB is in the Mere Brook-Harpswell Cove watershed. Mere Brook enters former NASB at the northwestern boundary as a natural stream and is

culverted for approximately 0.5 mile under the runways to an outfall to the southeast and then through the southern end of former NASB. Merriconeag Stream and a number of other very small intermittent streams flow into Mere Brook, which flows into Harpswell Cove at the head of the cove. The southern reach of Mere Brook is tidal, and its channel is wide and bordered by extensive tidal flats.

The Androscoggin River is the major surface water body in the Brunswick area. It is one of the three major rivers that drain into the Atlantic Ocean on the Maine coast; the Kennebec River and Penobscot River are the others. Portions of Brunswick are located in the lower Androscoggin River Basin. The Androscoggin River flows to the east along the northern boundary of former NASB and forms the boundary between Cumberland and Sagadahoc Counties. At the closest point, the Androscoggin River is approximately 3,000 feet from the northern boundary of former NASB. Approximately 13 percent of former installation runoff flows into the Androscoggin River watershed, 4 percent flows into Middle Bay Cove (separated from Harpswell Cove by a northeast-trending ridge), and approximately 9 percent flows into the Buttermilk Cover watershed.

2.2.6 Regional Hydrogeology

Groundwater in the area occurs in both unconsolidated overburden and underlying bedrock. The most productive aquifers in the area are the unconsolidated sand and gravel aquifers. Much of the northern half of the former installation is underlain by a significant sand and gravel aquifer, as indicated in Neil and Locke (1999). On the former installation, the presence of this significant sand and gravel aquifer largely correlates with the presence of regressive marine delta deposits. These units are also present north and west of the former installation. The sand and gravel aquifers are reported to yield in excess of 10 gallons per minute (gpm) and may yield in excess of 50 gpm. The specific units are discontinuous and are obscured by development in some areas. Drillers' logs for test borings and water wells on and near former NASB show that the most common sequence encountered includes glacial outwash of variable thickness (5 to 90 feet) overlying glacio-marine clays (Presumpscot Formation). The remainder of the former installation (southern half and western and eastern boundaries) are outside of the area described as underlain by a significant aquifer. These areas either do not contain water within unconsolidated sediments due to the lack of a significant thickness of unconsolidated material, or the units in these areas are sufficiently fine grained that wells installed in these areas yield less than 10 gpm.

Groundwater well yields from wells screened in bedrock beneath and surrounding former NASB vary greatly, from less than 10 to over 50 gpm, with well depths in the vicinity varying between 100 and 500 feet. However, the majority of bedrock wells immediately adjacent to the former installation produce less than 5 gpm. Even these low well yields may prove suitable as residential supply wells for single

residences. Well yields in the crystalline bedrock underlying the former installation are primarily controlled by the presence and connectedness of fracture and joint systems within the bedrock (Loiselle, 2002).

2.3 REGIONAL ECOLOGICAL SUMMARY

2.3.1 Endangered/Threatened Species

No federal endangered or threatened species are listed as being present at former NASB. One state endangered bird species, the grasshopper sparrow, and one state threatened bird species, the upland sandpiper, may exist in grassland habitat at former NASB. The grasshopper sparrow is a small sparrow that inhabits open grassy and weedy meadows, pastures, and plains. The upland sandpiper is a pigeon-sized bird that inhabits open grassland, prairies, and hayfields in breeding season and open country during migration. The state-listed Blanding's turtle and spotted turtle (threatened) may reside in wetlands, vernal pools, or streams on or near the former installation.

As documented in the Integrated Natural Resources Management Plan (INRMP) Department of the Navy (DON) 2006, one state endangered plant species, the clothed sedge, may occur on the former installation. The clothed sedge inhabits dry, semi-open conditions and may exist in the grassland habitat at the former installation. It is a low-growing, herbaceous, grass-like plant, and artificial areas that are routinely cut, such as under electric power lines, often provide suitable habitat.

2.3.2 Wetlands

According to the United States Fish and Wildlife Service, three primary types of wetlands occur at former NASB. The wetland classifications include PFO4E in the north, PUBHh near the center, and PFO1C toward the southwest. All of the wetlands are classified as Palustrine systems, which include all nontidal wetlands dominated by trees, shrubs, emergents, mosses, or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is less than 0.5 part per thousand (ppt). Wetlands lacking such vegetation are also included if they exhibit all of the following characteristics:

- Are less than 20 acres (8 hectares)
- Do not have an active wave-formed or bedrock shoreline feature
- Have at low water a depth less than 6.6 feet (2 meters) in the deepest part of the basin
- Have a salinity due to ocean-derived salts of less than 0.5 ppt

Wetlands PFO1C and PFO4E are forested and characterized by woody vegetation that is 6 meters or taller. The number one indicates the presence of broad-leafed deciduous trees or shrubs, and the number four indicates that the dominant species are needle-leafed evergreens. These wetland types are seasonally flooded, saturated, and a combination of seasonally flooded and saturated, respectively.

The classification PUBHh includes wetlands with unconsolidated bottoms and a vegetative cover less than 30 percent. The wetland is permanently flooded but has been created or modified by a man-made barrier or dam that obstructs the inflow or outflow of water.

2.3.3 Cultural and Natural Resources

Former NASB is included in the Maine Department of Environmental Protection's (MEDEP) Coastal Zone Management Program, which incorporates regulations regarding development and use of the coastal zone (i.e., point-source discharges, land use, solid waste management, air quality, stream alteration, and spill prevention and control).

A cemetery is located just south of Picnic Pond. An ancient cemetery is located immediately north of the confluence of Merriconeag Stream and Mere Brook.

2.3.4 Water Resources

Former NASB lies within four major drainage basins: the Androscoggin River, Mere Brook, Middle Bay Cove, and Buttermilk Cove. None of the waterways that flow through the former air station are suitable for drinking water supply or recreation (e.g., swimming) [Naval Energy and Environmental Support Activity (NEESA), 1983]. Groundwater serves as the primary source of drinking water for former NASB and the surrounding community, as follows:

- Former NASB drinking water wells: Two water wells which were formerly used by NASB are located at former NASB. One is currently leased to the golf course on the western side of the air station. The other is a bedrock well, which is no longer operating, that supplied drinking water to the guardhouse facilities at Dyer's Gate. Most residents and employees of former NASB obtain their drinking water from an off-base municipal water supply.
- Municipal water supply: Former NASB, residences, and businesses to the north, northeast, and northwest of the former air station obtain drinking water from the Brunswick/Topsham Water District municipal water supply (NEESA, 1983). Groundwater used for the municipal water supply is drawn

from the shallow or overburden aquifer. The closest public well field is the 138 Jordan Avenue well field operated by the Brunswick/Topsham Water District, less than 0.5 mile from the northern boundary of the former air station (USEPA, 1987).

- Private wells: Some people living in the Brunswick community south of the former air station rely on private wells for their drinking water. The most recent complete private well survey, conducted in 1990, identified 23 off-base private wells within a 1-mile radius of the site. Since the survey, a new residence was built on Purington Road, located east of former NASB. This residence has a bedrock private well reportedly used for drinking water. The Maine Geological Survey also maintains drilling information on private wells. Their database identified 12 private bedrock wells located south and east of the former base boundary, including five private wells located on Coombs Road. According to the Maine Geological Survey, the database is not comprehensive and lacks information on other existing wells in the area (Maine Geological Survey, 2005).

3.0 GENERAL METHODOLOGY

3.1 SITE INSPECTION APPROACH

This section describes the sampling design and methods and documentation utilized during the SI field activities performed in December 2009 at the MGBR and SKT located at former NASB. All SI field work was conducted in accordance with the procedures and methodologies described in the Uniform Federal Policy (UFP) site-specific Sampling and Analysis Plan (SAP), which was approved by USEPA and MEDEP (Tetra Tech, 2009). Standard Operating Procedures (SOPs) that governed the field work are included in Appendix A of the approved UFP-SAP.

Project personnel sign-off sheet associated with the SI is provided in Appendix A of this SI report. Sample Log Sheets, field documentation, site photographs, and other supporting information associated with the SI are provided in Appendices B and C of this SI Report.

3.1.1 Site Preparation Activities

Following approval of the UFP-SAP, Tetra Tech personnel began mobilization activities in summer 2009. The field team members reviewed the approved UFP-SAP, associated appendices, supplemental soil sampling work plan, and Health and Safety Plan (HASP) prior to the start of project activities. In addition, the Field Operations Leader (FOL) held a field team orientation meeting to ensure that personnel were familiar with the scope of the field activities.

Prior to collecting any samples at the site, the FOL arrived at the site and began on-site mobilization activities. On-site mobilization activities included the receipt of all field equipment directly from vendors. Upon receipt, each piece of equipment was checked to verify that it was in proper working condition.

3.1.1.1 Permitting/Site Access

All personnel were required to have security clearance for site access. All on-site personnel presented proof of United States Citizenship (i.e., birth certificate or passport), photo identification card, vehicle registration information, and proof of automobile insurance before entry to the facility was allowed.

3.1.1.2 Utility Clearance

Before any intrusive drilling or subsurface sampling activities were performed, utility maps of the facility were obtained from the Navy and thoroughly reviewed. The Navy provided clearance for all site-specific utilities and Tetra Tech pre-marked proposed sampling locations. Predefined coordinates based on the sample location maps were provided to a State of Maine licensed site surveying subcontractor and each location was identified with a pin flag. Locations were moved as necessary to provide proper utility clearance.

3.1.1.3 Mobilization/Demobilization

Tetra Tech personnel mobilized to former NASB in summer 2009 to initiate the MC investigation. The FOL held a field team orientation meeting to ensure that personnel were familiar with the scope of MC field activities. Several field events were required due to various delays (e.g., consensus on fixed-base sampling locations and winter weather). Personnel demobilized in spring 2010 after completion of SI sampling field activities.

3.1.1.4 Vegetation Management

The amount of clearing required at the sites to facilitate sampling activities during SI sampling varied. Hand-held brush cutters/weed eaters (string or blade) were used to clear light vegetation and small grassy areas, and chain saws and a brush hog were used to remove heavier brush and small (less than 2-inch-diameter) trees. Brush/vegetation cuttings were left at each site at the edge of the area cleared.

3.1.2 Field Investigation Methods

3.1.2.1 Hand Auger

The hand auger system consisted of a stainless steel bucket bit (i.e. a cylinder 6.5 inches long and 2.75 inches in diameter), a 3- or 4-foot extension rod, and a cross handle. A properly decontaminated bucket bit was attached to a clean extension rod and then to the cross handle. The area to be sampled was cleared of any surface debris (i.e., leaves, twigs), the hand auger was turned into the ground, and the sample material was removed and placed into a zip-lock bag. This process was repeated until the hand auger reached the final desired depth. Larger debris such as twigs, roots, or stones was removed from the sample. The sample ID, date, time, and depth were marked on the bag with an indelible marker. Excess soil core material was returned to the hole.

3.1.2.2 XRF

Prior to analyzing samples in the field via x-ray fluorescence (XRF) the instrument was standardized in accordance with the manufacturer's instructions, and three known lead concentrations [National Institute of Standards and Technology (NIST) standards] were analyzed to verify the accuracy of the instrument and to assess the stability and consistency of the results.

Sample processing prior to field XRF analysis consisted of homogenizing each soil sample within a large zip-lock bag, removing rocks and other debris and then physically processing the sample material to eliminate clods and produce a fine uniform particle size. Each sample was then transferred to a smaller zip-lock bag from which three separate XRF measurements were made, one from each end and one from the center of the sample zip-lock bag. The average lead concentration of the three readings was used as the final XRF lead concentration for the sample.

During sample collection activities, all soil material was visually inspected in the field for the presence of lead shot or lead shot fragments. The soil material was again visually monitored in the field laboratory during processing for XRF analysis.

3.1.2.3 Direct-Push Technology Drilling

A GeoProbe® rig with a Macro-Core® sampler was the type of direct push technology (DPT) activities during the SI. During DPT drilling, each area to be sampled was cleared of any surface debris, a new clear acetate liner was placed in the detachable Macro-Core® core barrel, and a coring device was attached to the GeoProbe® rig. Macro-Core® samplers (lined with acetate) were driven into the ground to a specified depth using hydraulic pressure. The 0- to 3-inch and 3- to 12-inch soil intervals are considered to be shallow and deep surface soil, respectively; subsurface soil samples were collected at depths greater than 1 foot below ground surface (bgs). The sampler was retracted from the borehole, and the acetate liner and the soil core were removed from the Macro-Core® barrel. The acetate liner containing the soil core was placed in a metal trough, and the acetate liner was cut through its entire length. The soil core was logged on the Soil Boring Log Sheet, and the desired interval of the soil core was placed in a sealable polyethylene bag. The sample material was thoroughly homogenized, and the sample ID, date, and time were written on the bag with an indelible marker. The required information was completed on the Soil Sample Log Sheet, and a chain-of-custody form was updated. The steps were repeated for the next depth intervals, if required. The depth to water table, if encountered, was recorded on the Boring Log, and the estimated moisture content of the soil and the presence or absence of water in the boring were noted. All soil core materials were returned to the hole, and if insufficient soil was

available to fill the hole to the ground surface, bentonite pellets mixed with the soil were used to backfill the hole and hydrated per manufacturer recommendations. All soil sampling equipment was decontaminated prior to collecting the next sample. Appendix C includes completed Soil Boring Log Sheets and Soil Sample Log Sheets, respectively.

3.1.2.4 Soil Boring Advancement

Soil borings at MGBR (NASB-MGBR-MW01 through NASB-MGBR-MW05) were drilled using a DPT rig in preparation for monitoring well installation and to assess lithology. A Tetra Tech geologist observed the soil boring program activities and documented findings.

Soil samples were collected continuously to the maximum depth of each boring with a GeoProbe® Macro-Core® piston rod soil sampling system or dual-tube soil sampling system. The Macro-Core® samplers consisted of a 1.5-inch inside diameter (ID) 5-foot long core barrel with a clear plastic liner, and the dual-tube samplers consisted of a 1-inch ID 5-foot long core barrel with a clear plastic liner. As each sampler was opened, an aliquot was collected for jar headspace screening using a photoionization detector (PID). Headspace screening results are summarized in the boring logs included in Appendix C.

Soil cores were collected at continuous 5-foot intervals from each boring. Soil samples collected from soil borings for head space analysis were collected directly from the acetate liner. Soil cores were characterized according to the Unified Soil Classification System (USCS), and Soil Boring Logs Sheets are presented in Appendix C.

3.1.2.5 Monitoring Well Installation

All new monitoring wells were completed in the overburden, with the well screen intervals selected to intersect the groundwater table. Copies of Well Construction Logs are provided in Appendix C.

Manufactured pre-packed well screens consisting of 2.5-inch outer diameter (OD), 1-inch ID flush-threaded, Schedule 40 polyvinyl chloride (PVC) machine-slotted well screen (0.010-inch slot openings) with silica sand surrounding the well screen were utilized for each new well. Two 5-foot-long pre-packed well screens were threaded together for three of the wells to create 10-foot-long well screen intervals. Each monitoring well was fitted with a bottom plug. Steel outer protective casing (4.5-inch ID by 5-feet long) was installed and grouted in place around NASB-MGBR-MW05. The four remaining monitoring wells were finished with 4.0-inch ID by 8-inch long flush mount road boxes grouted in place. New monitoring wells were locked with keyed-alike locks.

A black mark was drawn onto the top of the PVC well riser, using a permanent marker, to serve as a reference point for the well survey and groundwater depth measurements upon completion of each well. The horizontal and vertical locations of all new wells were surveyed following the completion of well construction (see Section 3.1.7).

3.1.2.6 Well Development

The newly installed wells were developed using a peristaltic pump. Fine-grained material around the pre-packed well screen was drawn into the well using the peristaltic pump and removed by agitating the well water while simultaneously pumping water from the well at a discharge rate of approximately 0.1 gpm.

Groundwater extracted from the new monitoring wells during development was monitored for turbidity at 5- to 10-minute intervals. In accordance with the SAP, well development continued until the turbidity was less than 10 nephelometric turbidity units (NTUs) or well development was performed for 2 hours, whichever occurred first. Turbidities in all wells stabilized at less than 10 NTUs within approximately 1 hour from the start of development. Additional details regarding well development is provided on the log sheets in Appendix C.

3.1.2.7 Water-Level Measurements

Water-level measurements were collected for each site from newly installed wells. Well construction sheets are provided in Appendix C. The synoptic water-level measurements were collected within a short time period (maximum 4 hours) for each of the two events. Measurements were taken with an electronic water-level indicator using the top of the riser as the reference point for determining depths to water in each well. Water-level measurements were recorded to the nearest 0.01 foot on groundwater-level measurement forms provided in Appendix C.

3.1.3 Site Sampling Operations

3.1.3.1 Surface and Subsurface Soil

Shallow surface, deep surface, and/or subsurface soil samples were collected at all three sites for chemical analysis (site-specific) and lithologic analysis. Samples from selected intervals were sent for fixed-base laboratory (FBL) analysis in accordance with the UFP-SAP (Tetra Tech, 2009). Depending on depth of a sample and need to collect lithology information, a variety of sampling methods were used

including DPT, polyethylene scoop, and hand auger. Upon advancement to the planned depth and completion of soil sample collection, borings were backfilled with native soil core material.

Boring logs and Soil Sample Log Sheets are provided in Appendix C.

3.1.3.2 Sediment

During sediment sampling, vegetative matter or debris, if present, was removed from the sample location prior to using a stainless steel hand auger. Sediment samples collected were a composite of two samples to help improve characterization. Three sediment samples (SD02 through SD04) were collected from a retention pond located at the SKT using a 6 by 6 inch Wildco Ponar Sample Dredge. One sediment sample (SD01) at the SKT located in a tributary stream flowing into the retention pond was collected using a stainless steel hand auger. All sediment samples were collected to a depth of 6 inches. Samples were homogenized, decanted if necessary, and transferred into appropriate bottleware. The sample ID, date, time, and sampler initials were written on the bottleware with an indelible marker. Required information was completed on the Sediment Sample Log Sheet and the chain-of-custody form was updated. Appendix C includes Sediment Sample Log Sheets.

3.1.3.3 Surface Water

Surface water samples were obtained using a Kemmler sampler or direct dip and polyethylene gloves. Surface water samples were co-located with sediment samples and collected in accordance with Tetra Tech SOP S12 (SA-1.2). Three of the four surface water samples, from impoundment ponds at SKT, were composite samples. The composite surface water samples were collected in the middle of the water body and from the mid to deep portion of the water column where there is direct interaction with contaminants in the sediment. The fourth sample was a grab sample from the tributary stream. The samples were collected and placed directly in the appropriate sample containers, labeled, and placed in an ice chest chilled to a maximum temperature of 4 degrees Celsius (°C). Water quality parameters such as temperature, pH, specific conductance, dissolved oxygen (DO), and salinity were measured during sample collection using a YSI Model 650 MDS water quality meter and flow-through cell. Turbidity was measured using a Lamotte 2020. Analytical laboratory analysis was site-specific. Copies of Surface Water Sample Log Sheets are included in Appendix C.

3.1.3.4 Groundwater

Groundwater samples were collected using USEPA low-flow purging and sampling procedures. Fluid produced during sampling was containerized in 55-gallon drums and stored in the Hazardous Material Building (Building 45) on base until characterized and transferred for off-site disposal.

Peristaltic pumps with dedicated 1/4-inch OD Teflon tubing was used for groundwater sampling. The monitoring wells were purged at flow rates between 200 and 500 milliliters per minute (mL/min), depending on the drawdown observed during purging. Water quality parameters including pH, temperature, oxidation/reduction potential (ORP), specific conductance, turbidity, and DO were monitored at 5- to 10- minute intervals during groundwater sampling. Low-flow sampling continued until pH, temperature, specific conductance, and turbidity had stabilized in each of the wells. Groundwater samples were placed in laboratory supplied containers and shipped to the laboratory for analysis.

Boring logs, temporary well construction forms, and groundwater purge and Sample Log Sheets are provided in Appendix C.

3.1.4 Quality Assurance/Quality Control Samples

Quality assurance/quality control (QA/QC) samples were generated during SI sampling activities to monitor both field and laboratory procedures, in accordance with the approved UFP-SAP. QA/QC samples included field duplicates, equipment rinsate blanks, and temperature blanks (Table 3-1). Duplicate sample analysis and the locations where they were collected are summarized in the site-specific sections of this report. The following types of QA/QC samples were collected during the SI:

- Field Duplicates consisted of a single sample split into two portions. Field duplicates were collected at the rate of 1 in 10 during this field investigation to assess the overall precision of the sampling and analysis program.
- Equipment Rinsate Blanks were obtained under representative field conditions by collecting the rinse water generated by running analyte-free water through or over sample collection equipment after decontamination of reusable sample collection equipment and before use. Equipment rinsate blanks were analyzed for the same chemical constituents as the associated environmental samples.

- Temperature Blanks were used to determine if samples were adequately cooled during shipment. One temperature blank was submitted to the laboratory in each cooler, and the temperature was checked upon receipt at the laboratory.
- Field Blanks were collected to assess contamination resulting from field conditions during sampling.

Sample log sheets were generated for each QA/QC sample and are provided in Appendix C.

3.1.5 Field Sample Documentation

The sample numbering scheme and sample labeling was in accordance with the UFP-SAP. Sample documentation consisted of the completion of Sample Log Sheets, chain-of-custody forms, field logbooks, and health and safety documentation. The Sample Log Sheets contain information such as sample location and sample ID number, container requirements and analyses performed, and sample type, time, and date. Any unusually circumstances encountered during sample collection were noted on the form. Chain-of-custody forms (Appendix D) were used to track each sample from collection in the field to receipt and analysis at the laboratory.

3.1.6 Sample Handling, Packaging, and Shipping

Sample containers, preservation, packaging, and shipping were in accordance with the UFP-SAP. All sample containers shipped to the laboratory were sealed in plastic zip-lock bags, placed in a cooler lined with a large plastic garbage bag, and covered with ice. A temperature blank was placed in each cooler prior to shipment. The plastic garbage bag was sealed with tape, and the chain-of-custody form was sealed in a zip-lock bag taped to the inside of the cooler lid. A signed and dated custody seal was applied to each end of the cooler and then covered with strapping tape to provide a tamper-evident seal. A FedEx[®] air bill was applied to the shipping cooler. Tetra Tech maintained custody of the samples until they were relinquished to FedEx[®]. All samples were shipped to the laboratory for overnight delivery and were received within sample holding times.

Laboratory sample custody procedures (receipt of samples, archiving, and disposal) were in accordance with Empirical Laboratories, LLC, SOPs.

3.1.7 Surveying

A State of Maine licensed surveyor documented the horizontal locations and elevations of all soil and groundwater sample points. Survey control was maintained by tying into the Maine State Grid coordinate

North American Datum (NAD) 83 West Zone for horizontal datum and the North American Vertical Datum (NAVD) 1988 system for vertical datum. Surveyed features were horizontally located to within +/-0.01 foot and vertical accuracy was +/-0.01 foot. A global positioning system (GPS) unit was used to locate surface water and sediment sampling locations. Appendix C provides SI survey data.

3.1.8 Decontamination Procedures

Small reusable (non-dedicated) sampling equipment (e.g., ponar dredge, kemmler sampler, hand auger) was decontaminated prior to beginning sampling and between sample locations in accordance with the UFP-SAP using potable and deionized (DI) water with Liquinox detergent. Large drilling equipment was steam cleaned.

At the conclusion of SI field activities, the FOL completed a final decontamination of all non-drilling equipment, which was then shipped back to the appropriate vendor(s).

3.1.9 Investigation-Derived Waste Handling

Investigation-derived waste (IDW) materials generated during the field investigation included soil cuttings, excess soil sample material, wash water from steam cleaning, decontamination fluid, spent calibration fluid, and well purge fluid. IDW was containerized into 55-gallon drums and stored at the hazardous material building (Building 45) on base. The three containers (one aqueous and two solid) of IDW were labeled with points of origin and dates collected (note the MGBR and SKT field investigation was completed concurrently with that conducted at Topsham Annex Skeet Range (TASKT); therefore, IDW described herein was combined for these three sites). ENPRO was subcontracted to characterize, transport, and dispose of the IDW generated during the investigation. On March 15, 2010, two drums of aqueous IDW and one drum of solid IDW were removed from the hazardous material building and transported under a bill of lading to the ENPRO Services, Inc., facility in South Portland, Maine, for disposal as non-hazardous waste.

3.1.10 Record Keeping

SI records include field forms, included in Appendix C, chain-of-custody forms, included in Appendix D, and field log books. Information recorded daily in field logbooks included field activities, weather conditions, identity and arrival and departure times of personnel, management issues, etc.

3.2 ANALYTICAL METHODOLOGY

3.2.1 Analytical Methods

Chemical analysis for Target Analyte List (TAL) Metals (SW-846 Method 6010B), propellants [dinitrotoluene (DNT) and nitroglycerin] and explosives analysis by SW-846 Methods 8330A and 8332, total organic carbon (TOC) (Lloyd Kahn Method), pH (SW-846 9046D), cation exchange capacity (CEC) (SW-846 9081), and PAHs (USEPA Method 8270C SIM) were performed by Empirical Laboratories, LLC, of Nashville, Tennessee and perchlorate chemical analysis in groundwater (USEPA Method 6850 with filtration at the laboratory) was performed by Columbia Analytical Services of Rochester, New York under approval by the Naval Facilities Engineering Service Center (NFESC).

3.2.2 Data Usability General Methodology

Data review processes were used to determine whether analytical laboratory data were of acceptable technical quality for use in decision making. The review began with data validation, which is a comparison of data quality indicators (DQIs) to prescribed acceptance criteria. The DQIs used are measures to assess the bias and precision of the analytical calibrations and sample analyses. The output of this review was a set of alphabetic flags such as U, J, R, or combinations thereof that may have been assigned to individual results based on the validation effort. These flags were used to infer the general quality of the data. Also evaluated were the measures of data completeness, sensitivity, comparability, and representativeness. Validated analytical results are provided in Appendix D, and the MC data usability report is provided in Appendix E.

3.2.3 Data Validation Process

Data validation conducted to evaluate false positives included evaluations of data completeness, holding time compliance, calibrations, field QC and laboratory-generated blank results, field duplicate precision, and detection limits for the data collected during the SI. The data packages provided by the analytical laboratory are expansive enough to allow future complete formal data validation, if necessary.

Assignment of data qualification flags conformed to USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (2008), and USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Validation (2004) guidelines to the greatest extent practicable for non-Contract Laboratory Program data. Data validation specifications require that various data qualifiers be assigned when a deficiency is detected or when a result is less than its detection limit.

If no qualifier is assigned to a result that has been validated, the data user is assured that no technical deficiencies were identified during validation. The qualification flags used are defined as follows:

U – Indicates that the chemical was not detected at the numerical detection limit (sample-specific detection limit) noted. Non-detected results from the laboratory are reported in this manner. This qualifier is also added to a positive result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – Indicates that the chemical was not detected; however, the detection limit (sample-specific detection limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate or imprecise.

J – Indicates that the chemical was detected; however, the associated numerical result is not a precise representation of the concentration that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.

UR – Indicates that the chemical may or may not be present. The non-detected analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross technical deficiencies (e.g., holding time missed by a factor of two times the specified time limit, severe calibration non-compliance, and extremely low analyte recovery).

R – Indicates that the chemical may or may not be present. The positive analytical result reported by the laboratory is considered to be unreliable and unusable. This qualifier is applied in cases of gross technical deficiencies.

The preceding data qualifiers may be categorized as indicative of major or minor problems. Major problems are defined as issues that result in the rejection of data and qualification with UR or R qualifiers. These data are considered invalid and are not used for decision-making purposes unless they are used in a qualitative way and the use is justified and documented. Minor problems are defined as issues resulting in the estimation of data and qualification with U, J, and UJ qualifiers. Estimated analytical results are considered to be suitable for decision-making purposes unless the data use requirements are very stringent and the qualifier indicates a deficiency that is incompatible with the intended data use. A U qualifier does not necessarily indicate that a data deficiency exists because all non-detect values are flagged with the U qualifier regardless of whether a quality deficiency has been detected.

3.2.4 Data Validation Outputs

After data were validated, a list was developed of non-conformities requiring data qualifier flags used to alert the data user to inaccurate or imprecise data. The reviewer then prepared a technical memorandum presenting qualification of the data, if necessary, and the rationale for making such qualifications (see Appendix E). The net result was a data package that had been carefully reviewed for its adherence to prescribed technical requirements. Pertinent quality estimates are summarized in a more quantitative format in the following section.

3.2.5 Data Quality Review

DQIs are parameters monitored to help establish the quality of data generated during an investigation. Some of the DQIs are generated from analysis of field samples (e.g., field duplicates), and some are generated from the analysis of laboratory samples (e.g., laboratory duplicates). Individually, field and laboratory DQIs provide measures of the performance of the respective investigative operations. During data validation, individual QC results were evaluated. If individual QC results were acceptable, no validation flag was assigned to an analytical result; otherwise, a flag indicating the type of QC deficiency was assigned to the result.

3.2.5.1 Completeness

Completeness is a measure of the number of valid samples or measurements that are available relative to the number of samples or measurements that were intended to be generated. For this project, completeness was measured on two different bases:

Samples collected - measure of the usable samples collected compared to those intended to be collected.

Laboratory measurements - measure of the amount of usable valid laboratory measurements per matrix for each target analyte.

Usable valid samples (or results) were those judged, after data assessment, to represent the sampling populations and to have not been disqualified for use through data validation or additional data review. Completeness was determined using the following equation:

$$\%C = \frac{V}{T} \times 100$$

where %C = percent completeness
V = number of samples (or results) determined to be valid
T = total number of planned samples (or results)

3.2.5.2 Sensitivity and Quantitation Limits

Sensitivity is a comparison of the project quantitation limit goals (PQLGs) to the laboratory's method detection limits (MDLs) listed in Worksheet #15 in the UFP-SAP (Tetra Tech, 2009).

3.2.5.3 Accuracy

Accuracy requirements for field measurements are typically ensured through control over sample collection and handling and through routine instrument calibration. Field accuracies were monitored with blanks to detect cross-contamination and by monitoring adherence to procedures that prevent sample contamination or degradation. Equipment rinsate blanks were collected during the SI to assess cross-contamination via reusable sample collection equipment. The blanks were obtained under representative field conditions by collecting the rinse water generated by running analyte-free water through sample collection equipment after decontamination and before use. The rinsate blanks were analyzed for the same chemical constituents as the associated environmental samples.

Accuracy in the laboratory was measured through the comparison of a spiked sample or laboratory control sample (LCS) result to a known or calculated value and was expressed as a percent recovery (%R). It was also assessed by monitoring the analytical recovery of select surrogate compounds added to samples that are analyzed by organic chromatographic methods. LCSs were used to assess the accuracy of laboratory operations with minimal sample matrix effects. Matrix spike (MS) and surrogate compound analyses measure the combined accuracy effects of the sample matrix, sample preparation, and sample measurement. LCS and MS analyses were performed at a frequency of 1 per 20 associated samples of like matrix. Laboratory accuracy was assessed by comparing calculated %R values to accuracy control limits specified by the laboratory using SW-846 methods.

Percent recovery is calculated using the following equation:

$$\%R = \frac{S_s - S_o}{S} \times 100$$

where %R = percent recovery
S_s = result of spiked sample
S_o = result of non-spiked sample
S = concentration of spiked amount

3.2.5.4 Precision

Precision is a measure of the degree to which two or more measurements are in agreement and describes the reproducibility of measurements of the same parameter for samples analyzed under similar conditions. Precision for chemical parameters is expressed as a Relative Percent Difference (RPD), which is defined as the ratio of the difference to the mean for the two values being evaluated. RPDs are used to evaluate both field and laboratory duplicate precision and are calculated as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where RPD = relative percent difference
V1, V2 = two results obtained by analyzing duplicate samples

The precision estimates obtained from duplicate field samples encompass the combined uncertainty associated with sample collection, homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis. In contrast, precision estimates obtained from analyzing duplicate laboratory samples incorporate only homogenization, sub-sampling, preparation for analysis, laboratory storage (if applicable), and analysis uncertainties.

3.2.5.5 Comparability

Comparability is defined as the confidence with which one data set can be compared to another (e.g., among sampling points and among sampling events). Comparability was achieved by using standardized sampling and analysis methods and standardized data reporting formats. Comparability of field data was guaranteed by following the UFP-SAP (Tetra Tech, 2009), and comparability of laboratory measurements was achieved primarily through the use and documentation of standard sampling and analytical methods. Results were reported in units that ensured comparability with previous data and with current state and federal standards and guidelines. Comparability of laboratory measurements was assessed primarily with QC samples and through adherence to the laboratory's QA plans.

3.2.5.6 Representativeness

Representativeness is an expression of the degree to which data accurately and precisely depict the actual characteristics of a population or environmental condition existing at the site. The UFP-SAP (Tetra Tech, 2009) and use of standardized sampling, sample handling, sample analysis, and data reporting procedures were designed so that the final data would accurately represent actual site conditions. It is believed that all reported data are adequately representative of site conditions.

3.3 CORRELATION BETWEEN XRF AND FIXED-BASE LABORATORY DATA

Using data from samples analyzed in the field using XRF and also at the FBL, a regression analysis was conducted to evaluate the correlation between the FBL lead results and XRF lead results. To evaluate the regression analysis, the Pearson Correlation and Rsquared value were calculated. The Pearson Correlation is a measure of the strength of the linear relationship between two or more variables with a range of -1 to +1. The value of -1 represents a perfect negative correlation (i.e., as one variable decreases the other increases proportionally); whereas, a value of +1 represents a perfect positive correlation (i.e., as one variable increases the other increases proportionally). A value of 0 represents a lack of correlation.

The correlation analysis results for MGBR and SKT are presented in Sections 4.4.1 and 5.4.1 with supporting documentation included in Appendix F.

3.4 DATA COMPARISON TO SCREENING LEVELS AND PROJECT ACTION LIMITS

The screening levels and project action limits (PALs) used to evaluate the chemical concentrations detected in site media and to decide whether further site investigation is warranted are presented in Appendix G. The screening levels evaluated for soil include Residential Soil Regional Screening Levels (RSLs) (June, 2011) and Maine Remedial Action Guidelines for Soil (RAGS) for Multiple Contaminants, all Scenarios and all Pathways (January, 2010). The screening levels evaluated for groundwater include Tapwater RSLs (June, 2011), Federal Maximum Contaminant Levels (MCLs) (January, 2011), and Maine Center for Disease Control (CDC) Maximum Exposure Guidelines (MEG) for Drinking Water (February, 2011). For surface water and sediment samples, screening levels include values established by EA Engineering (EA) (EA, 2006) and other ecological screening levels. Based on the decision-making process set forth in the UFP-SAP, if an analyte concentration in any sample within the study area boundary exceeded screening levels and PALs, the project team evaluated the data and determined whether further investigation was warranted for a given media. If analyte concentrations were less than screening levels and PALs, the project team recommended no further investigation at a given site.

Detailed discussions regarding site-specific data evaluations are presented in Sections 4.4.2 and 5.4.2 of this report.

TABLE 3-1

SUMMARY OF QA/QC SAMPLES
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Sample Number	Date Collected	Medium	Type	Analyses
NASB-SKT-SO-RB01-121509	12-15-09	Solid	Rinsate Blank: Aluminum Pan/Plastic Scoop/Stainless Steel Hand Auger	TAL Metals, PAHs, Dinitrotoluene, and Nitroglycerine
NASB-SKT-SO-RB02-121509	12-15-09	Solid	Rinsate Blank: Aluminum Pan/Plastic Scoop/Stainless Steel Hand Auger	TAL Metals and PAHs
NASB-SKT-SO-RB03-121509	12-15-09	Solid	Rinsate Blank: Aluminum Pan/Plastic Scoop/Stainless Steel Hand Auger	TAL Metals and PAHs
NASB-MGBR-SO-RB01-121609	12-16-09	Solid	Rinsate Blank: Aluminum Pan/Plastic Scoop/Stainless Steel Hand Auger	TAL Metals, PAHs, Dinitrotoluene, and Nitroglycerine
NASB-MGBR-SO-RB02-121609	12-16-09	Solid	Rinsate Blank: Aluminum Pan/Plastic Scoop/Stainless Steel Hand Auger	TAL Metals and Nitroglycerine
NASB-MGBR-GW-RB01-122909	12-29-09	Aqueous	Rinsate Blank: Teflon/Silastic Tubing	TAL Metals, PAHs, Dinitrotoluene, and Nitroglycerine
NASB-MGBR-GW-RB02-122909	12-29-09	Aqueous	Rinsate Blank: Teflon/Silastic Tubing	TAL Metals, PAHs, Dinitrotoluene, and Nitroglycerine
NASB-MGBR-GW-FB-122909	12-29-09	Aqueous	Field Blank: Source Water Blank	TAL Metals, PAHs, Dinitrotoluene, and Nitroglycerine

Duplicate samples are included in site-specific sample tables.

QA/QC = Quality assurance/quality control.
TAL = Target Analyte List.

PAHs = Polynuclear aromatic hydrocarbons.

4.0 MACHINE GUN BORESIGHT RANGE

4.1 SITE BACKGROUND

4.1.1 Historical Information

The MGBR is located in the eastern portion of former NASB and comprises approximately 0.3 acre from the firing line to the berm, with an approximately 1,029.4 acre SDZ. The SDZ is the area extending from a firing point to a distance downrange based on the projectiles fired, it extends lengthwise to the ultimate ballistic distance of the round fired. The SI area of investigation is located from the firing point to near the berm where the majority of fired bullets would have landed. The former range was used in the 1950s to align and test fire aircraft mounted guns. A map of the area from the late 1950s to early 1960s found at the National Archives labels the range as a pistol range. There is uncertainty about the use of the land as a pistol range during that time, and in the early 1960s the layout of the installation was changed and the range was abandoned. The area has been inactive for more than 50 years, and there are no visible remnants of the range or berm.

4.1.2 Munitions Constituents

The sources of potential MC contamination at the MGBR are the former berm area and the area between the firing line and the berm. As a result, metals, propellants, nitroglycerin, and perchlorate could have impacted surface soil, subsurface soil, and groundwater.

4.1.3 Current Land Use and Anticipated Future Land Use

Currently, the site is not in use, except for Building 55 that is leased, but in the future anticipated land use will include redeveloped buildings for business and technology industry use.

4.2 FIELD WORK

4.2.1 Site Field Activities

Surface (shallow and deep) and subsurface soil and groundwater samples were collected and submitted for FBL analysis to determine whether site activities have resulted in contamination of the site and adjacent areas. Table 4-1 provides a summary of the samples collected, including sampling depths, and the analytical program. Survey and synoptic groundwater level data were collected from the wells to determine the groundwater flow direction at the site. The MC sampling locations are shown on

Figure 4-1 and include those locations where XRF and FBL confirmation samples were collected by the USEPA in support of the SI (see Appendix F).

4.2.2 Work Plan Deviations

All SI activities at the MGBR were performed in accordance with the UFP-SAP (Tetra Tech, 2009). An extra groundwater level data collection event was conducted to verify data initially collected since the gradient was unusually flat, resulting in questionable potentiometric contouring.

4.2.3 Field Data Collection

4.2.3.1 Surface and Subsurface Soil Sampling

A total of 29 soil samples [22 surface (up to one 1 foot bgs) and seven subsurface (greater than 1 foot bgs)] were collected from 15 locations during the SI for analysis of TAL metals and nitroglycerin in accordance with the UFP-SAP and as detailed in Table 4-1. Surface soil sample NASB-MGBR-SS07-0003, a background location for both MGBR and SKT, was analyzed for TAL metals and PAHs (results are presented in Appendix D). Surface soil samples were collected from 0 to 3 and 3 to 12 inches bgs, and subsurface soil samples were collected from 12 to 18 inches bgs. Three surface soil samples (MGBR-SS01-003, MGBR-SB05-0003, and MGBR-SB06-0003) were collected using a DPT drill rig with a Geoprobe® Macrocore acetate sleeve. The remaining surface soil samples were each collected with a disposable sterile polyethylene scoop. One surface and two subsurface soil samples were collected at MGBR-SB01 through MGBR-SB07. Four of the subsurface soil samples (MGBR-SB-05-0312, MGBR-SB-05-1218, MGBR-SB-06-0312, and MGBR-SB-06-0218) were collected using a DPT drill rig with a Geoprobe® Macrocore acetate sleeve. The remaining subsurface soil samples were collected with a stainless steel auger.

Boring Logs and Sample Log Sheets are included as Appendix C.

4.2.3.2 Groundwater Sampling

Five soil borings (NASB-MGBR-MW01 through NASB-MGBR-MW05) were advanced at MGBR to install groundwater monitoring wells. Table 4-2 provides a summary of well construction details for the newly installed monitoring wells, and copies of well construction logs are provided in Appendix C. Sections 3.1.2.5 and 3.1.2.6 provide the general methodology for monitoring well installation and well development, respectively. Monitoring well locations were selected to characterize site groundwater quality, and to provide groundwater elevation control points to evaluate site groundwater flow direction.

Well NASB-MGBR-MW01 is positioned at the former firing point, NASB-MGBR-MW03 is located behind the former berm, NASB-MGBR-MW02 and NASB-MGBR-MW04 are located north and south of the former berm, respectively, and NASB-MGBR-MW05 is located east of the former berm. Following development, groundwater samples were collected from the five monitoring wells on December 29, 2009. Field water-quality parameter measurements are summarized on Table 4-3 and provided in Appendix C. Groundwater samples were analyzed for TAL metals, nitroglycerin, and perchlorate.

4.2.3.3 Surveying

A State of Maine licensed surveyor documented the horizontal and vertical locations and elevations of all sample points at the MGBR. Survey control was maintained by tying into the Maine State Grid coordinate NAD83 West Zone for horizontal datum and the NAVD1988 system for vertical datum. Survey elevations for each of the wells are summarized on Table 4-2. Using a Trimble® handheld GPS, Tetra Tech recorded the position of the dirt pile located at the MGBR. The position of the soil pile is presented on Figure 4-1.

4.2.3.4 Synoptic Water Level Measurements

Synoptic water level measurements events were conducted on December 29, 2009 and July 22, 2010, to provide data for an evaluation of overburden groundwater flow direction and hydraulic gradients. General methodology is provided in Section 3.1.2.7. Water level measurements are summarized in Table 4-2 and Appendix C. Monitoring well locations are shown on Figure 4-1.

4.3 GEOLOGY/HYDROGEOLOGY EVALUATION

The topography of the site is generally level, sloping slightly to the northeast from NASB-MGBR-MW-01(58.2 feet above msl) and NASB-MGBR-MW04 (58.21 feet above msl) to NASB-MGBR-MW-02 (57.5 feet above msl) and NASB-MGBR-MW-05 (57.3 feet above msl).

Geologic cross sections were developed for the MGBR based on the site boring logs. Figure 4-2 depicts an east-west cross section (A-A'), and Figure 4-3 depicts a north-south cross section (B-B'). The site is principally underlain by fine to medium-grained sand with trace silt. Thin discontinuous lenses of silt or silt and sand occur at shallow depths (less than 14 feet bgs) in the southwestern portion of the site and at intermediate depths (approximately 14 to 15 feet bgs) in the central portion of the site. The sandy subsurface is consistent with the interbedded sandy and silty units identified in the area.

Groundwater potentiometric surface contour maps were developed for water level measurements collected at the site on December 29, 2009, and July 22, 2010. The additional round of water levels on July 22, 2010, was collected to confirm conditions at the site, based on the groundwater flow directions observed in December 2009. Given the small size of the area under investigation and low hydraulic gradient, some uncertainty may exist for the groundwater flow, specifically for the December 9, 2009 measurements. Figure 4-4 depicts the groundwater potentiometric surface interpreted for December 9, 2009, and Figure 4-5 depicts the groundwater potentiometric surface interpreted for July 22, 2010. Groundwater at the site generally flows from the north and south into the central portion of the site. A westerly component of flow was measured during the earlier December event, whereas, an easterly component was measured during the later July event.

The difference in the east-west component of flow may be attributable to the low hydraulic gradient due to the small difference in head elevations (maximum head difference of 0.34 foot in December 2009 and 0.55 foot in July 2010). The Upper Impoundment Basin (shown to the far north on Figures 4-4 and 4-5) may also influence groundwater flow at the site. Regardless, of the potential uncertainties of groundwater flow, specifically December 2009, the overall groundwater flow for the area is expected to be to the east-southeast toward the retention ponds and/or Picnic Pond based on topography and previous groundwater investigations in the area of MGBR (Sites 11 and 13, south of the MGBR, and Site 9, north of the MGBR).

4.4 ANALYTICAL RESULTS

4.4.1 Correlation Between Field XRF Analysis and Fixed-Base Laboratory Lead Data

XRF data was previously collected by the USEPA in support of this project (Appendix F), so this data, along with FBL data, was examined as part of the SI to determine its usability. To determine whether XRF concentrations could be used to predict FBL concentrations a statistical correlation analysis was conducted. The correlation analysis for the MGBR is presented in Appendix F. Based on the correlation analysis, it was concluded that correlation between the FBL and field XRF results was acceptable for lead and zinc that predicted FBL concentrations could be meaningfully calculated. XRF results were also collected for copper and nickel. A weak linear relationship between the copper and nickel XRF and laboratory concentrations was calculated; therefore, these XRF results were not used to predict laboratory concentrations.

4.4.2 MC Sampling Results and Comparisons with Screening Levels and PALs

This section presents the analytical results of soil and groundwater sampling conducted at the MGBR and comparisons of analytical results to applicable screening levels. A summary of the analytical program for

the SI samples collected at the MGBR is provided in Table 4-1 excluding USEPA results (see Appendix F) and soil and groundwater sample locations are shown on Figure 4-1 (including USEPA locations).

4.4.2.1 Surface and Subsurface Soil

Excluding the USEPA collected samples, 28 soil samples were collected and analyzed for TAL metals. Also, one background soil sample was analyzed for TAL metals and PAHs. An additional 50 XRF samples were collected by the USEPA and 5 FBL samples for correlation purposes. Summary statistics for these soil samples are provided in Table 4-4, and concentrations of analytes detected in at least one soil sample are summarized in Table 4-5. Metals and nitroglycerin were detected at concentrations greater than screening criteria. Positive detections of metals, with the exception of the essential nutrients calcium, magnesium, potassium, and sodium, are presented on Figures 4-6 and 4-7, respectively. Also presented on these figures are positive detections in the background sample (NASB-MGBR-SS07-0003).

Three metals, (cadmium, chromium, and lead) were detected at concentrations exceeding Maine RAGs while nine metals (aluminum, arsenic, cadmium, chromium, cobalt, iron, lead, manganese, and vanadium) were detected at concentrations greater than USEPA RSLs. All concentrations of cadmium, chromium, and lead which exceeded both Maine RAGs and USEPA RSLs were detected in the first 3 inches of soil with the maximum concentrations in samples NASB-MGBR-XRF-SB01 and NASB-MGBR-XRF-SB22. Exceedances of USEPA RSLs were noted at all sample depths up to 1.5 feet bgs. Nitroglycerin was detected in two samples, the original and duplicate sample at NASB-MGBR-SS01-0003, at concentrations exceeding the USEPA RSL.

4.4.2.2 Groundwater

Five groundwater samples were collected and analyzed for TAL metals, nitroglycerin, and perchlorate. Summary statistics for these groundwater samples are provided in Table 4-6, and concentrations of analytes detected in at least one soil sample are summarized in Table 4-7.

Metals were detected in all five wells. Positive detections for metals are presented on Figure 4-8. Chromium and manganese were detected at concentrations exceeding Maine MEGs. Antimony, arsenic, chromium, cobalt, and manganese were detected at concentrations exceeding USEPA tapwater RSLs. There were no exceedances of MCLs. Exceedances of a Maine MEGs occurred in wells NASB-MGBR-MW03 and NASB-MGBR-MW05 while exceedances of USEPA RSLs occurred in all wells. Perchlorate

and nitroglycerin were either not detected in or were detected at concentrations less than screening levels in groundwater samples collected at the MGBR.

4.4.2.3 Data Usability

Data usability was evaluated based on the results of data validation and the data quality review (DQR), which are discussed in Appendix E. Based on the DQR for the MGBR, SI data are of acceptable quality to make decisions on the path forward for the site. The following summarizes the evaluation for the individual DQIs for the MGBR analytical results:

- Validation process - In accordance with the UFP-SAP, full data validation was conducted. Based on the validation results, no data collected for the MGBR were rejected.
- Completeness - Sample collection completeness for all sample types was 100 percent. The sample analytical completeness for all sample types was also 100 percent.
- Sensitivity - All of the non-detected nitroglycerin and mercury groundwater results were greater than corresponding screening. Sensitivity for all other analytes and matrices was sufficient for the purposes of this investigation.
- Laboratory Accuracy - There were no significant laboratory accuracy concerns for the MGBR samples. See Appendix E for discussions on site data qualified due to laboratory accuracy issues and corresponding result biases if any.
- Precision - No significant QC deficiencies were noted. See Appendix E for discussions on site data qualified due to precision issues.
- Comparability - No comparability issues were noted.
- Representativeness - The reported data are adequately representative of site conditions and intended populations at the MGBR.

4.5 CONCLUSIONS

4.5.1 Surface and Subsurface Soil

For shallow surface soil (0 to 3 inches bgs), the metals cadmium, chromium, and lead were detected at concentrations exceeding both MEDEP criteria and USEPA RSLs. Aluminum, arsenic, chromium, cobalt, iron, lead, and manganese were detected at concentrations greater than USEPA RSLs in few samples at depths up to 1.5 feet bgs and vanadium was detected at concentrations greater than USEPA RSLs at depths up to 3 inches bgs.

4.5.2 Groundwater

For groundwater, chromium and manganese were detected at concentrations exceeding both Maine MEGs and USEPA tapwater RSLs. Antimony, arsenic, and cobalt were detected at concentrations that exceeded USEPA tapwater RSLs only. There were no exceedances of MCLs.

4.6 UPDATED CONCEPTUAL SITE MODEL

Malcolm Pirnie developed a Conceptual Site Model (CSM) describing the MGBR and its environmental setting in the Preliminary Assessment (PA) Report (2006). The CSM has been updated based on the findings of this SI and is summarized in Table 4-8. Exposure pathways by which site receptors could be exposed to or contaminated by MC are shown on Figure 4-9, and Figure 4-10 presents a graphical representation of the CSM.

4.7 RECOMMENDATIONS

Soil: There are two “hot spots” of lead and other metals contamination in surface soil (SB22 and SB01), although the locations are infrequent and sporadic (not adjacent to each other). While it appears that metals contamination is present in soil at and near the former source berm location, the berm material has been removed and the remaining contamination is residual and limited to these two small areas. The two hot spots warrant remediation via excavation and proper disposal.

Groundwater: For groundwater, lead concentrations were not of concern, and only chromium and manganese were detected at concentrations greater than both Maine MEGs and USEPA tapwater RSLs. However, chromium was only a potential concern at one location (MW03); moreover, the concentration of chromium at this location was 35.1 micrograms per liter ($\mu\text{g/L}$), only slightly exceeding the Maine MEG value of 20 $\mu\text{g/L}$. While the maximum concentration of manganese, 551 $\mu\text{g/L}$, was only slightly greater

than the Maine MEG of 500 µg/L. There were no analytes detected at concentrations greater than MCLs. The low levels of inorganics found in groundwater do warrant groundwater use restrictions.

TABLE 4-1

**SAMPLE COLLECTION AND ANALYSIS SUMMARY
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE METHOD	SAMPLE DEPTH (feet bgs)	XRF (SELECT METALS) ⁽²⁾	FBL ANALYSIS			
						TAL METALS (SW 846-6010B)	Nitroglycerin (SW 846-8332)	PERCHLORATE (SW 846-6850)	PAHs (USEPA-8270C SIM)
SOIL									
MGBR-SS01	NASB-MGBR-SS01-0003	12/16/2009	DPT	0 - 0.25	--	X	X	--	--
MGBR-SS02	NASB-MGBR-SS02-0003	12/16/2009	PS	0 - 0.25	--	X	X	--	--
MGBR-SS03	NASB-MGBR-SS03-0003	12/16/2009	PS	0 - 0.25	--	X	X	--	--
MGBR-SS04	NASB-MGBR-SS04-0003	12/16/2009	PS	0 - 0.25	--	X	X	--	--
MGBR-SS05	NASB-MGBR-SS05-0003	12/16/2009	PS	0 - 0.25	--	X	X	--	--
MGBR-SS06	NASB-MGBR-SS06-0003	12/16/2009	PS	0 - 0.25	--	X	X	--	--
MGBR/SKT-SS07 ⁽¹⁾	NASB-MGBR-SS07-0003	12/16/2009	PS	0 - 0.25	--	X	--	--	X
MGBR-SS08	NASB-MGBR-SS08-0003	12/16/2009	PS	0 - 0.25	--	X	X	--	--
MGBR-SB01	NASB-MGBR-SB01-0003/0312	12/16/2009	PS	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB01-0003/0312	12/16/2009	HA	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB01-1218	12/16/2009	HA	1.0 - 1.5	--	X	X	--	--
MGBR-SB02	NASB-MGBR-SB02-0003/0312	12/16/2009	PS	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB02-0003/0312	12/16/2009	HA	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB02-0312	12/16/2009	HA	1.0 - 1.5	--	X	X	--	--
MGBR-SB03	NASB-MGBR-SB03-0003/0312	12/16/2009	PS	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB03-0003/0312	12/16/2009	HA	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB03-1218	12/16/2009	HA	1.0 - 1.5	--	X	X	--	--
MGBR-SB04	NASB-MGBR-SB04-0003/0312	12/16/2009	PS	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB04-0003/0312	12/16/2009	HA	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB04-1218	12/16/2009	HA	1.0 - 1.5	--	X	X	--	--
MGBR-SB05	NASB-MGBR-SB05-0003/0312	12/16/2009	DPT	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB05-0003/0312	12/16/2009	DPT	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB05-1218	12/16/2009	DPT	1.0 - 1.5	--	X	X	--	--
MGBR-SB06	NASB-MGBR-SB06-0003/0312	12/16/2009	DPT	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB06-0003/0312	12/16/2009	DPT	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB06-1218	12/16/2009	DPT	1.0 - 1.5	--	X	X	--	--
MGBR-SB07	NASB-MGBR-SB07-0003/0312	12/16/2009	PS	0 - 0.25	--	X	X	--	--
	NASB-MGBR-SB07-0003/0312	12/16/2009	HA	0.25 - 1.0	--	X	X	--	--
	NASB-MGBR-SB07-1218	12/16/2009	HA	1.0 - 1.5	--	X	X	--	--
GROUNDWATER									
MGBR-MW01	NASB-MGBR-MW01-122909	12/29/2009	LF	11.0	--	X	X	X	--
MGBR-MW02	NASB-MGBR-MW02-122909	12/29/2009	LF	9.0	--	X	X	X	--
MGBR-MW03	NASB-MGBR-MW03-122909	12/29/2009	LF	10.0	--	X	X	X	--
MGBR-MW04	NASB-MGBR-MW04-122909	12/29/2009	LF	9.0	--	X	X	X	--
MGBR-MW05	NASB-MGBR-MW05-122909	12/29/2009	LF	9.0	--	X	X	X	--

X = Indicates sample was collected and analyzed as proposed in the UFP-SAP (Tetra Tech, 2009).

bgs = Below ground surface.

MGBR = Machine Gun Boresight Range.

FBL = Fixed-base laboratory.

HA = Hand auger.

TAL = Target Analyte List.

XRF = X-ray fluorescence.

SS = Surface Soil.

SB = Soil Boring.

DPT = Direct-push technology.

PS = Polyethylene Scoop.

LF = Low Flow (peristaltic pump).

1. Common background location for MGBR and SKT. Results presented in Appendix D.

2. No XRF samples were collected by Tetra Tech as part of the SI. However, the USEPA collected XRF data and FBL confirmation samples in support of the SI, which are included in the evaluation of data. If good correlation was achieved for a given analyte, calculated values were developed (See Appendix F).

TABLE 4-2

**WELL CONSTRUCTION SUMMARY AND WATER-LEVEL DATA
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

Location ID	Installation Date	Aquifer Screened	Well Inside Diameter (in)	PVC Riser Elevation ⁽¹⁾ (ft above msl)	Ground Elevation ⁽¹⁾ (ft above msl)	Depth to Top of Well Screen (ft bgs)	Depth to Bottom of Well Screen (ft bgs)	Elevation of Top of Well Screen ⁽¹⁾ (ft above msl)	Elevation of Bottom of Well Screen ⁽¹⁾ (ft above msl)	December 29, 2009		July 22, 2010	
										Depth to Groundwater (ft from TPVC)	Groundwater Elevation ⁽¹⁾ (ft above msl)	Depth to Groundwater (ft from TPVC)	Groundwater Elevation ⁽¹⁾ (ft above msl)
NASB-MGBR-MW01	12/14/2009	Upper Sand	1	57.94	58.20	6.0	16.0	51.94	42.20	5.31	52.63	7.08	50.86
NASB-MGBR-MW02	12/14/2009	Upper Sand	1	57.05	57.47	4.0	14.0	53.05	43.47	4.08	52.97	6.10	50.95
NASB-MGBR-MW03	12/14/2009	Upper Sand	1	57.83	58.31	5.0	15.0	52.83	43.31	5.03	52.80	7.10	50.73
NASB-MGBR-MW04	12/14/2009	Upper Sand	1	57.65	58.21	4.0	14.0	53.65	44.21	4.70	52.95	6.65	51.00
NASB-MGBR-MW05	12/14/2009	Upper Sand	1	59.68	57.28	4.0	14.0	55.68	43.28	6.86	52.82	9.23	50.45

¹ Elevations in feet above mean sea level relative to the North American Vertical Datum of 1988.

bgs = Below ground surface.

PVC = Polyvinyl chloride.

TPVC = Top of PVC riser.

msl = Mean sea level.

TABLE 4-3

GROUNDWATER SAMPLING FIELD PARAMETERS - DECEMBER 2009
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE

Well Identification	Sample Date	Depth Sampled (ft bgs)	Pump Type Bladder/ Peristaltic	Initial Clock Time	Final Clock Time	Time of Reading	Water Depth Below MP (ft)	Purge Rate (mL/min)	Total Volume Purged (gal)	Temp (°C)	Spec. Cond. (µS/cm)	pH	ORP (mV)	DO (mg/L)	Turbidity (NTU)
NASB-MGBR-MW01	12/29/09	11	Peristaltic	915	940	925	5.50	480	1.0	8.65	115	5.54	201.8	9.28	3.63
						940	5.48	480	4.0	8.69	111	5.43	213.6	9.32	0.56
NASB-MGBR-MW02	12/29/09	9	Peristaltic	920	945	930	4.07	200	0.5	7.47	37	6.16	225.5	9.52	9.48
						945	4.07	200	1.0	7.80	35	6.06	228.8	9.47	2.10
NASB-MGBR-MW03	12/29/09	10	Peristaltic	1025	1100	1035	5.08	400	1.0	8.30	190	9.87	49.0	9.16	32.90
						1100	5.08	400	3.7	8.37	168	9.41	9.8	9.30	3.20
NASB-MGBR-MW04	12/29/09	9	Peristaltic	1010	1035	1015	4.74	410	1.5	8.41	180	5.70	208.3	5.59	2.86
						1035	4.76	410	6.0	8.67	185	5.68	199.8	5.24	0.03
NASB-MGBR-MW05	12/29/09	9	Peristaltic	1125	1155	1135	6.92	500	1.0	6.62	73	5.50	192.5	5.70	64.80
						1155	6.94	500	5.0	7.07	61	5.43	194.5	6.27	3.33

°C = Degrees Centigrade.
 µS/cm = MicroSiemens per centimeter.
 DO = Dissolved oxygen.
 ft bgs = Feet below ground surface.
 gal = Gallons.
 mg/L = Milligrams per liter.

mL/min = Milliliters per minute.
 MP = Measuring point.
 mV = Millivolts.
 NTU = Nephelometric turbidity units.
 ORP = Oxidation/reduction potential.

TABLE 4-4

**FREQUENCY OF DETECTION IN SOIL
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 2**

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽⁴⁾	Maximum Non-Detection ⁽⁴⁾	MAINE RAGS (Appendix 3) ⁽¹⁾	USEPA RSL ⁽²⁾
METALS (MG/KG)									
ALUMINUM	33/33	4480	23000	NASB-MGBR-SB05	NASB-MGBR-SB05-1218	--	--	69000	7700 N
ANTIMONY	1/33	0.275 J	0.275 J	NASB-MGBR-SS01	NASB-MGBR-SS01-0003	0.264	9.8	14	3.1 N
ARSENIC	28/33	1.78 J	8.89	NASB-MGBR-SS01	NASB-MGBR-SS01-0003	19	20	9	0.39 C
BARIUM	33/33	11.2	127	NASB-MGBR-SS03	NASB-MGBR-SS03-0003	--	--	6800	1500 N
BERYLLIUM	28/33	0.193 J	0.933	NASB-MGBR-SB05	NASB-MGBR-SB05-1218	0.95	0.98	68	16 N
CADMIUM	17/33	0.0618 J	22	NASB-MGBR-XRF-SB22	NASB-MGBR-XRF-SB22-0003	0.0549	2.9	2.1	7 N
CALCIUM	33/33	137 J	5600 J	NASB-MGBR-SS01	NASB-MGBR-SS01-0003	--	--	NC	NC
CHROMIUM	33/33	5.72	320	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0003	--	--	100	0.29 C
COBALT	32/33	0.858	9.37	NASB-MGBR-SB05	NASB-MGBR-SB05-1218	2.9	2.9	15	2.3 N
COPPER	33/33	1.89 J	53	NASB-MGBR-XRF-SB35	NASB-MGBR-XRF-SB35-0003	--	--	480	310 N
IRON	33/33	6960	24600	NASB-MGBR-SB05	NASB-MGBR-SB05-1218	--	--	31000	5500 N
LEAD	28/33	6.7 J	1000	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0003	4.61	5.55	170	400 N
LEAD-CALC	45/45	117.64	455.6	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-1216	--	--	170	400
MAGNESIUM	33/33	413 J	5930 J	NASB-MGBR-SS01	NASB-MGBR-SS01-0003-D	--	--	NC	NC
MANGANESE	33/33	43.2 J	345 J	NASB-MGBR-SB04	NASB-MGBR-SB04-1218	--	--	1100	180 N
MERCURY	26/28	0.0163 J	0.119	NASB-MGBR-SB05	NASB-MGBR-SB05-0003	0.0122	0.0164	10	1 N
NICKEL	30/33	2.84 J	27.3	NASB-MGBR-SS01	NASB-MGBR-SS01-0003-D	5.7	5.8	100	150 N
POTASSIUM	28/28	207 J	2430 J	NASB-MGBR-SS01	NASB-MGBR-SS01-0003-D	--	--	NC	NC
SELENIUM	19/33	0.168 J	0.856 J	NASB-MGBR-SB03	NASB-MGBR-SB03-0312	0.163	20	68	39 N
SILVER	2/33	0.169 J	0.352 J	NASB-MGBR-SB07	NASB-MGBR-SB07-1218	0.107	2.9	170	39 N
SODIUM	5/28	54.5 J	218 J	NASB-MGBR-SS01	NASB-MGBR-SS01-0003	54.9	86.1	NC	NC
VANADIUM	33/33	11.1	44	NASB-MGBR-SS01	NASB-MGBR-SS01-0003-D	--	--	240	39 N
ZINC	33/33	7.78	56.9	NASB-MGBR-SS01	NASB-MGBR-SS01-0003	--	--	10000	2300 N
ZINC-CALC	45/45	25.82	51.92	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0612	--	--	10000	2300 N
EXPLOSIVES (MG/KG)									
NITROGLYCERIN	2/28	0.55 J	1.2 J	NASB-MGBR-SS01	NASB-MGBR-SS01-0003-D	1.5	1.5	NC	0.61 N
XRF⁽³⁾ (MG/KG)									
COPPER	12/50	33	204	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0003	31	100	480	310 N
LEAD	47/50	17	1640	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0003	13	16	170	400 N
NICKEL	1/50	430	430	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0003	33	210	100	150 N
ZINC	16/50	24	245	NASB-MGBR-XRF-SB01	NASB-MGBR-XRF-SB01-0003	17	37	10000	2300 N

J = Value is estimated.

NC = No criteria.

ug/kg = Micrograms per kilogram.

mg/kg = Milligrams per kilogram.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

3 No XRF samples were collected by Tetra Tech as part of the Site Inspection. However, the

TABLE 4-4

FREQUENCY OF DETECTION IN SOIL
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

USEPA collected XRF data and FBL confirmation samples in support of the SI, which are included in the evaluation of data. If good correlation was achieved for a given analyte, calculated values were developed (See Appendix F).

4 Minimum and maximum non-detections are for all samples in the data set.

Note: Chromium screening values are for hexavalent chromium.

Note that a sample and its duplicate sample were considered separately when determining the maximum concentration, and the average concentration of a sample and its duplicate were used in determining frequency of detection.

Associated Samples:

NASB-MGBR-SB01-0003	NASB-MGBR-SS04-0003	NASB-MGBR-XRF-SB18-0003	NASB-MGBR-XRF-SB36-0003
NASB-MGBR-SB01-0312	NASB-MGBR-SS05-0003	NASB-MGBR-XRF-SB18-0003-AVG	NASB-MGBR-XRF-SB37-0003
NASB-MGBR-SB01-0312-AVG	NASB-MGBR-SS06-0003	NASB-MGBR-XRF-SB18-0003-D	NASB-MGBR-XRF-SB37-0003-AVG
NASB-MGBR-SB01-0312-D	NASB-MGBR-SS08-0003	NASB-MGBR-XRF-SB19-0003	NASB-MGBR-XRF-SB37-0003-D
NASB-MGBR-SB01-1218	NASB-MGBR-XRF-SB01-0003	NASB-MGBR-XRF-SB20-0003	NASB-MGBR-XRF-SB38-0003
NASB-MGBR-SB02-0003	NASB-MGBR-XRF-SB01-0612	NASB-MGBR-XRF-SB20-0003-AVG	NASB-MGBR-XRF-SB39-0003
NASB-MGBR-SB02-0312	NASB-MGBR-XRF-SB01-1216	NASB-MGBR-XRF-SB20-0003-D	
NASB-MGBR-SB02-1218	NASB-MGBR-XRF-SB02-0003	NASB-MGBR-XRF-SB21-0003	
NASB-MGBR-SB03-0003	NASB-MGBR-XRF-SB02-0003-AVG	NASB-MGBR-XRF-SB22-0003	
NASB-MGBR-SB03-0312	NASB-MGBR-XRF-SB02-0003-D	NASB-MGBR-XRF-SB22-0612	
NASB-MGBR-SB03-1218	NASB-MGBR-XRF-SB03-0003	NASB-MGBR-XRF-SB22-1218	
NASB-MGBR-SB04-0003	NASB-MGBR-XRF-SB04-0003	NASB-MGBR-XRF-SB22-1824	
NASB-MGBR-SB04-0312	NASB-MGBR-XRF-SB04-0003-AVG	NASB-MGBR-XRF-SB23-0003	
NASB-MGBR-SB04-1218	NASB-MGBR-XRF-SB04-0003-D	NASB-MGBR-XRF-SB24-0003	
NASB-MGBR-SB04-1218-AVG	NASB-MGBR-XRF-SB05-0003	NASB-MGBR-XRF-SB25-0003	
NASB-MGBR-SB04-1218-D	NASB-MGBR-XRF-SB06-0003	NASB-MGBR-XRF-SB26-0003	
NASB-MGBR-SB05-0003	NASB-MGBR-XRF-SB07-0003	NASB-MGBR-XRF-SB27-0003	
NASB-MGBR-SB05-0312	NASB-MGBR-XRF-SB08-0003	NASB-MGBR-XRF-SB28-0003	
NASB-MGBR-SB05-1218	NASB-MGBR-XRF-SB09-0003	NASB-MGBR-XRF-SB29-0003	
NASB-MGBR-SB06-0003	NASB-MGBR-XRF-SB10-0003	NASB-MGBR-XRF-SB30-0003	
NASB-MGBR-SB06-0312	NASB-MGBR-XRF-SB10-0612	NASB-MGBR-XRF-SB30-0003-AVG	
NASB-MGBR-SB06-1218	NASB-MGBR-XRF-SB10-1218	NASB-MGBR-XRF-SB30-0003-D	
NASB-MGBR-SB07-0003	NASB-MGBR-XRF-SB10-1824	NASB-MGBR-XRF-SB30-0612	
NASB-MGBR-SB07-0312	NASB-MGBR-XRF-SB11-0003	NASB-MGBR-XRF-SB30-1218	
NASB-MGBR-SB07-1218	NASB-MGBR-XRF-SB12-0003	NASB-MGBR-XRF-SB30-1824	
NASB-MGBR-SS01-0003	NASB-MGBR-XRF-SB13-0003	NASB-MGBR-XRF-SB31-0003	
NASB-MGBR-SS01-0003-AVG	NASB-MGBR-XRF-SB14-0003	NASB-MGBR-XRF-SB32-0003	
NASB-MGBR-SS01-0003-D	NASB-MGBR-XRF-SB15-0003	NASB-MGBR-XRF-SB33-0003	
NASB-MGBR-SS02-0003	NASB-MGBR-XRF-SB16-0003	NASB-MGBR-XRF-SB34-0003	
NASB-MGBR-SS03-0003	NASB-MGBR-XRF-SB17-0003	NASB-MGBR-XRF-SB35-0003	

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
MACHINE GUN BORESIGHT RANGE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR							
			SB01-0003	SB01-0312			SB01-1218	SB02-0003	SB02-0312	
				0.25 - 1 ft bgs	0.25 - 1 ft bgs	0.25 - 1 ft bgs				
				0 - 0.25 ft bgs	Sample	Average				Duplicate
Dec-09										
Inorganics (mg/kg)										
ALUMINUM	69000	7700 N	4480	13400	13400	13400	10900	5240	9920	
ANTIMONY	14	3.1 N	0.319 UJ	0.294 UJ	0.3015 UJ	0.309 UJ	0.274 UJ	0.326 UJ	0.307 UJ	
ARSENIC	9	0.39 C	2.33	2.41 J	2.385 J	2.36 J	2.29	2.25	1.78 J	
BARIIUM	6800	1500 N	19.6	13.2	12.75 J	12.3 J	13.5	20.3	11.2	
BERYLLIUM	68	16 N	0.193 J	0.459	0.4575	0.456	0.427	0.221 J	0.358	
CADMIUM	2.1	7 N	0.149 J	0.0588 U	0.0603 U	0.0618 U	0.0549 U	0.0932 J	0.0614 U	
CALCIUM	NC	NC	182 J	225 J	219 J	213 J	281 J	227 J	137 J	
CHROMIUM	100	0.29 C	5.72	9.74	9.68	9.62	10.3	5.83	7.59	
COBALT	15	2.3 N	0.9	2.31	2.185	2.06	3.24	0.858	0.945	
COPPER	480	310 N	9.62	3.58 J	3.39 J	3.2 J	4.17 J	5.11	1.89 J	
IRON	31000	5500 N	8810	12200	12550	12900	10200	9050	12500	
LEAD	170	400 N	63.9 J	9.9 J	9.425 J	8.95 J	4.61 UJ	26.7 J	5.47 UJ	
LEAD-CALC	170	400 N	NA	NA	NA	NA	NA	NA	NA	
MAGNESIUM	NC	NC	427 J	886 J	852.5 J	819 J	1450 J	446 J	475 J	
MANGANESE	1100	180 N	43.2 J	102 J	106.5 J	111 J	108 J	57.6 J	63.4 J	
MERCURY	10	1 N	0.0926	0.0336 J	0.0319 J	0.0302 J	0.0208 J	0.0544	0.0325 J	
NICKEL	100	150 N	4.74 J	5.18 J	4.99 J	4.8 J	7.61	3.76 J	2.84 J	
POTASSIUM	NC	NC	222 J	294 J	289.5 J	285 J	456 J	247 J	207 J	
SELENIUM	68	39 N	0.425 J	0.407 J	0.421 J	0.435 J	0.165 UJ	0.364 J	0.518 J	
SILVER	170	39 N	0.191 UJ	0.235 UJ	0.21 UJ	0.185 UJ	0.165 UJ	0.195 UJ	0.245 UJ	
SODIUM	NC	NC	63.8 U	58.8 U	60.3 U	61.8 U	54.9 U	65.1 U	61.4 U	
VANADIUM	240	39 N	18.5	18.8	19.55	20.3	16	20.1	20.7	
ZINC	10000	2300 N	11.3	15.3	14.6	13.9	17.5	9.47	10.2	
ZINC-CALC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA	
Explosives (mg/kg)										
NITROGLYCERIN	NC	0.61 N	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	
Field XRF⁽³⁾ (mg/kg)										
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	NA	
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	NA	
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	NA	
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA	

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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR						
			SB02-1218	SB03-0003	SB03-0312	SB03-1218	SB04-0003	SB04-0312	SB04-1218
			1 - 1.5 ft bgs Dec-09	0 - 0.25 ft bgs	0.25 - 1 ft bgs Dec-09	1 - 1.5 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs Dec-09	1 - 1.5 ft bgs SAMPLE
Inorganics (mg/kg)									
ALUMINUM	69000	7700 N	13500	8250	20800	17200	7110	12200	15800
ANTIMONY	14	3.1 N	0.306 UJ	0.358 UJ	0.315 UJ	0.314 UJ	0.359 UJ	0.294 UJ	0.295 UJ
ARSENIC	9	0.39 C	2.4 J	2.6 J	3.24 J	3.36 J	3.53 J	3.16	3.42 J
BARIUM	6800	1500 N	14.9	25.8	24	26	45.5	23.8	26.7
BERYLLIUM	68	16 N	0.485	0.276 J	0.604	0.583	0.297 J	0.462	0.568
CADMIUM	2.1	7 N	0.0612 U	0.137 J	0.0629 U	0.0628 U	0.246 J	0.0587 U	0.0591 U
CALCIUM	NC	NC	181 J	244 J	226 J	234 J	1530 J	276 J	270 J
CHROMIUM	100	0.29 C	11.2	8.45	15.8	18	11.9	14.1	16.1
COBALT	15	2.3 N	2.63	1.17	2.52	4.2	2.78	3.56	5.57
COPPER	480	310 N	2.65 J	7.36	4.61 J	7.45	25.6	6.94	7.7
IRON	31000	5500 N	13500	12700	17600	15800	11500	14100	15900
LEAD	170	400 N	5.55 UJ	27.6 J	7.69 J	6.7 J	106 J	7.58 J	8.13 J
LEAD-CALC	170	400	NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NC	NC	935 J	594 J	1110 J	2100 J	1550 J	1850 J	2170 J
MANGANESE	1100	180 N	108 J	101 J	162 J	130 J	309 J	168 J	345 J
MERCURY	10	1 N	0.0622	0.0656	0.0383 J	0.0444	0.0875	0.0364 J	0.0307 J
NICKEL	100	150 N	5.88 J	5.34 J	7.37 J	12	9.72	9.78	12.5
POTASSIUM	NC	NC	325 J	278 J	366 J	588 J	614 J	512 J	673 J
SELENIUM	68	39 N	0.384 J	0.555 J	0.856 J	0.678 J	0.538 J	0.261 J	0.411 J
SILVER	170	39 N	0.245 UJ	0.286 UJ	0.252 UJ	0.314 UJ	0.215 UJ	0.235 UJ	0.236 UJ
SODIUM	NC	NC	61.2 U	71.5 U	62.9 U	62.8 U	71.7 U	58.7 U	59.1 U
VANADIUM	240	39 N	21.9	24.3	27.3	26.4	27.1	22.8	24.9
ZINC	10000	2300 N	17	17.4	19.8	23.6	30.2	18.7	21.5
ZINC-CALC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61 N	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	NA
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA

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SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR							
			SB04-1218		SB05-0003	SB05-0312	SB05-1218	SB06-0003	SB06-0312	
			1 - 1.5 ft bgs							
			AVERAGE	DUPLICATE	0 - 0.25 ft bgs	0.25 - 1 ft bgs	1 - 1.5 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	
			Dec-09		Dec-09		Dec-09			
Inorganics (mg/kg)										
ALUMINUM	69000	7700 N	14950	14100	6410	19500	23000	5700	13500	
ANTIMONY	14	3.1 N	0.295 UJ	0.295 UJ	0.43 UJ	0.336 UJ	0.323 UJ	0.317 UJ	0.305 UJ	
ARSENIC	9	0.39 C	3.29 J	3.16	5.38	4.14 J	4.96 J	2.14	2.23 J	
BARIUM	6800	1500 N	25.05 J	23.4 J	35.7	29.5	66.3	19.1	13.5	
BERYLLIUM	68	16 N	0.5385	0.509	0.257 J	0.644	0.933	0.226 J	0.484	
CADMIUM	2.1	7 N	0.0591 U	0.0591 U	0.157 J	0.0672 U	0.129 U	0.0634 U	0.0609 U	
CALCIUM	NC	NC	271.5 J	273 J	1070 J	302 J	367 J	236 J	195 J	
CHROMIUM	100	0.29 C	15.4	14.7	10.9	18.8	28.4	6.17	9.77	
COBALT	15	2.3 N	4.635	3.7	1.74	4.06	9.37	1	1.96	
COPPER	480	310 N	7.8	7.9	18.5	6.9 J	18.2	6.75	2.53 J	
IRON	31000	5500 N	15100	14300	9790	20600	24600	7880	12300	
LEAD	170	400 N	8.1 J	8.07 J	218 J	12.6 J	8.74 J	29.1 J	5.21 UJ	
LEAD-CALC	170	400 N	NA	NA	NA	NA	NA	NA	NA	
MAGNESIUM	NC	NC	2055 J	1940 J	991 J	2160 J	5260 J	413 J	758 J	
MANGANESE	1100	180 N	243 J	141 J	165 J	162 J	258 J	51.1 J	74.6 J	
MERCURY	10	1 N	0.0307 J	0.0307 J	0.119	0.0345 J	0.0291 J	0.0452	0.0289 J	
NICKEL	100	150 N	11.4	10.3	7.21	13.1	26	3.72 J	5.67 J	
POTASSIUM	NC	NC	645 J	617 J	575 J	649 J	1820 J	242 J	280 J	
SELENIUM	68	39 N	0.4355 J	0.46 J	0.653 J	0.482 J	0.194 UJ	0.472 J	0.365 J	
SILVER	170	39 N	0.236 UJ	0.236 UJ	0.344 UJ	0.269 UJ	0.19 UJ	0.387 UJ	0.244 UJ	
SODIUM	NC	NC	59.1 U	59.1 U	86.1 U	67.2 U	64.5 U	63.4 U	60.9 U	
VANADIUM	240	39 N	24.1	23.3	32.8	31.6	38.8	17	20.3	
ZINC	10000	2300 N	20.35	19.2	19.2	25.7	41.7	7.78	12.1	
ZINC-CALC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA	
Explosives (mg/kg)										
NITROGLYCERIN	NC	0.61 N	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	
Field XRF⁽³⁾ (mg/kg)										
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	NA	
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	NA	
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	NA	
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA	

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SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
MACHINE GUN BORESIGHT RANGE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR						NASB-MGBR-XRF
			SS02-0003	SS03-0003	SS04-0003	SS05-0003	SS06-0003	SS08-0003	SB01-0003
			0 - 0.25 ft bgs Dec-09	0 - 0.25 ft bgs May-08					
Inorganics (mg/kg)									
ALUMINUM	69000	7700 N	7190	8570	9840	6620	6210	6650	5800
ANTIMONY	14	3.1 N	0.286 UJ	0.3 UJ	0.296 UJ	0.282 UJ	0.274 UJ	0.277 UJ	9.6 U
ARSENIC	9	0.39 C	2.44	2.53	3.73	2.07	2.05	1.92	19 U
BARIUM	6800	1500 N	18.9	127	28.9	16	16	13.1	26
BERYLLIUM	68	16 N	0.338	0.41	0.382	0.282 J	0.281	0.307	0.96 U
CADMIUM	2.1	7 N	0.255 J	0.599 J	0.771 J	0.85 J	0.168 J	0.0618 J	4.9
CALCIUM	NC	NC	854 J	2980 J	600 J	489 J	727 J	464 J	2600
CHROMIUM	100	0.29 C	9.69	17.4	14.9	13.4	7.67	6.57	320
COBALT	15	2.3 N	3.2	3.26	3.78	2.68	2.68	2.61	3.3
COPPER	480	310 N	15.1	13.7	8.46	7.6	6.69	6.36	14
IRON	31000	5500 N	8600	10700	11900	7380	7020	6960	17000
LEAD	170	400 N	86.9 J	44.6 J	29.7 J	38.8 J	13.6 J	8.01 J	1000
LEAD-CALC	170	400 N	NA						
MAGNESIUM	NC	NC	1420 J	1630 J	1910 J	1270 J	1330 J	1120 J	1800
MANGANESE	1100	180 N	174 J	138 J	223 J	143 J	150 J	155 J	170
MERCURY	10	1 N	0.0199 J	0.0164 U	0.0326 J	0.0208 J	0.0163 J	0.02 J	NA
NICKEL	100	150 N	7.55	8.49	9.44	6.56	6.95	6.19	5.8 U
POTASSIUM	NC	NC	645 J	838 J	765 J	545 J	652 J	538 J	NA
SELENIUM	68	39 N	0.172 UJ	0.18 UJ	0.28 J	0.237 J	0.168 J	0.166 UJ	19 U
SILVER	170	39 N	0.115 UJ	0.169 J	0.178 UJ	0.169 UJ	0.11 UJ	0.166 UJ	2.9 UJ
SODIUM	NC	NC	57.3 U	214 J	59.2 U	56.5 U	54.9 U	55.4 U	NA
VANADIUM	240	39 N	13.7	15.6	19.5	11.8	11.4	11.1	14
ZINC	10000	2300 N	22.7	32.7	35.5	24	21	15.5	52
ZINC-CALC	10000	2300 N	NA						
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61 N	1.5 U	0.55 J	NA				
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	204
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	1640
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	430
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	245

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SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF								
			SB01-0612	SB01-1216	SB02-0003			SB03-0003			
			0.5 - 1 ft bgs	1 - 1.33 ft bgs	0 - 0.25 ft bgs			0 - 0.25 ft bgs			
			May-08		SAMPLE	AVERAGE	DUPLICATE	May-08			
Inorganics (mg/kg)											
ALUMINUM	69000	7700	N	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1	N	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39	C	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500	N	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16	N	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7	N	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29	C	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	15	2.3	N	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	480	310	N	NA	NA	NA	NA	NA	NA	NA	NA
IRON	31000	5500	N	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	170	400	N	NA	NA	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400		240.56	455.6	NA	124.64	NA	NA	162.16	NA
MAGNESIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1100	180	N	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	10	1	N	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150	N	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39	N	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	170	39	N	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39	N	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	2300	N	NA	NA	NA	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300	N	51.29	39.8	NA	NA	NA	NA	NA	27.68
Explosives (mg/kg)											
NITROGLYCERIN	NC	0.61	N	NA	NA	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)											
COPPER	480	310	N	62	74 U	43 U	43 U	43 U	43 U	45	
LEAD	170	400	N	226	610	17	19	21	21	86	
NICKEL	100	150	N	53 U	130 U	51 U	51.5 U	52 U	52 U	39 U	
ZINC	10000	2300	N	226	125	26 U	26.5 U	27 U	27 U	24	

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SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF						
			SB04-0003			SB05-0003	SB06-0003	SB07-0003	
			0 - 0.25 ft bgs						
			SAMPLE	AVERAGE	DUPLICATE	0 - 0.25 ft bgs May-08	0 - 0.25 ft bgs May-08	0 - 0.25 ft bgs May-08	
Inorganics (mg/kg)									
ALUMINIUM	69000	7700	N	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1	N	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39	C	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500	N	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16	N	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7	N	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC		NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29	C	NA	NA	NA	NA	NA	NA
COBALT	15	2.3	N	NA	NA	NA	NA	NA	NA
COPPER	480	310	N	NA	NA	NA	NA	NA	NA
IRON	31000	5500	N	NA	NA	NA	NA	NA	NA
LEAD	170	400	N	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400		NA	158.24	NA	157.12	123.52	148.16
MAGNESIUM	NC	NC		NA	NA	NA	NA	NA	NA
MANGANESE	1100	180	N	NA	NA	NA	NA	NA	NA
MERCURY	10	1	N	NA	NA	NA	NA	NA	NA
NICKEL	100	150	N	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC		NA	NA	NA	NA	NA	NA
SELENIUM	68	39	N	NA	NA	NA	NA	NA	NA
SILVER	170	39	N	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC		NA	NA	NA	NA	NA	NA
VANADIUM	240	39	N	NA	NA	NA	NA	NA	NA
ZINC	10000	2300	N	NA	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300	N	NA	NA	NA	26.06	26.24	26.24
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61	N	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310	N	58	38.25	37 U	40	39 U	39 U
LEAD	170	400	N	76	79	82	77	17	61
NICKEL	100	150	N	40 U	41 U	42 U	36 U	46 U	45 U
ZINC	10000	2300	N	22 U	22.5 U	23 U	21 U	24 U	24 U

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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF					
			SB08-0003	SB09-0003	SB10-0003	SB10-0612	SB10-1218	SB10-1824
			0 - 0.25 ft bgs May-08	0 - 0.25 ft bgs May-08	0 - 0.25 ft bgs	0.5 - 1 ft bgs	1 - 1.5 ft bgs	1.5 - 2 ft bgs
Inorganics (mg/kg)								
ALUMINUM	69000	7700 N	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1 N	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39 C	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500 N	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16 N	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7 N	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC	NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29 C	NA	NA	NA	NA	NA	NA
COBALT	15	2.3 N	NA	NA	NA	NA	NA	NA
COPPER	480	310 N	NA	NA	NA	NA	NA	NA
IRON	31000	5500 N	NA	NA	NA	NA	NA	NA
LEAD	170	400 N	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400	160.48	138.08	128	124.64	117.92	118.48
MAGNESIUM	NC	NC	NA	NA	NA	NA	NA	NA
MANGANESE	1100	180 N	NA	NA	NA	NA	NA	NA
MERCURY	10	1 N	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC	NA	NA	NA	NA	NA	NA
SELENIUM	68	39 N	NA	NA	NA	NA	NA	NA
SILVER	170	39 N	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC	NA	NA	NA	NA	NA	NA
VANADIUM	240	39 N	NA	NA	NA	NA	NA	NA
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300 N	25.88	26.18	26.42	26.42	26.54	26.6
Explosives (mg/kg)								
NITROGLYCERIN	NC	0.61 N	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)								
COPPER	480	310 N	31 U	53	43 U	44 U	46 U	48 U
LEAD	170	400 N	83	43	25	19	14 U	16 U
NICKEL	100	150 N	37 U	45 U	51 U	52 U	54 U	60 U
ZINC	10000	2300 N	18 U	23 U	27 U	27 U	29 U	30 U

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF						
			SB11-0003	SB12-0003	SB13-0003	SB14-0003	SB15-0003	SB16-0003	
			0 - 0.25 ft bgs May-08						
Inorganics (mg/kg)									
ALUMINIUM	69000	7700 N	NA	5700	NA	NA	NA	NA	NA
ANTIMONY	14	3.1 N	NA	9.7 U	NA	NA	NA	NA	NA
ARSENIC	9	0.39 C	NA	19 U	NA	NA	NA	NA	NA
BARIUM	6800	1500 N	NA	30	NA	NA	NA	NA	NA
BERYLLIUM	68	16 N	NA	0.97 U	NA	NA	NA	NA	NA
CADMIUM	2.1	7 N	NA	2.9 U	NA	NA	NA	NA	NA
CALCIUM	NC	NC	NA	340	NA	NA	NA	NA	NA
CHROMIUM	100	0.29 C	NA	8.7	NA	NA	NA	NA	NA
COBALT	15	2.3 N	NA	2.9 U	NA	NA	NA	NA	NA
COPPER	480	310 N	NA	9.3	NA	NA	NA	NA	NA
IRON	31000	5500 N	NA	8300	NA	NA	NA	NA	NA
LEAD	170	400 N	NA	57	NA	NA	NA	NA	NA
LEAD-CALC	170	400	128.56	NA	140.88	168.88	137.52	158.24	158.24
MAGNESIUM	NC	NC	NA	740	NA	NA	NA	NA	NA
MANGANESE	1100	180 N	NA	64	NA	NA	NA	NA	NA
MERCURY	10	1 N	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	5.8 U	NA	NA	NA	NA	NA
POTASSIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39 N	NA	19 U	NA	NA	NA	NA	NA
SILVER	170	39 N	NA	2.9 U	NA	NA	NA	NA	NA
SODIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39 N	NA	22	NA	NA	NA	NA	NA
ZINC	10000	2300 N	NA	20	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300 N	28.4	NA	28.04	28.16	26.6	26.18	26.18
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61 N	NA	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310 N	43 U	33 U	33	43 U	50 U	43	43
LEAD	170	400 N	26	49	48	98	42	79	79
NICKEL	100	150 N	50 U	39 U	34 U	51 U	58 U	44 U	44 U
ZINC	10000	2300 N	30	21 U	27	28	30 U	23 U	23 U

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF						
			SB17-0003	SB18-0003			SB19-0003	SB20-0003	
			0 - 0.25 ft bgs	0 - 0.25 ft bgs			0 - 0.25 ft bgs	0 - 0.25 ft bgs	
			May-08	SAMPLE	AVERAGE	DUPLICATE	May-08	SAMPLE	
Inorganics (mg/kg)									
ALUMINUM	69000	7700 N	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1 N	NA	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39 C	NA	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500 N	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16 N	NA	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7 N	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29 C	NA	NA	NA	NA	NA	NA	NA
COBALT	15	2.3 N	NA	NA	NA	NA	NA	NA	NA
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	NA
IRON	31000	5500 N	NA	NA	NA	NA	NA	NA	NA
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400	133.04	NA	132.2	NA	128	NA	NA
MAGNESIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1100	180 N	NA	NA	NA	NA	NA	NA	NA
MERCURY	10	1 N	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39 N	NA	NA	NA	NA	NA	NA	NA
SILVER	170	39 N	NA	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39 N	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300 N	26.3	NA	NA	NA	26.12	NA	NA
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61 N	NA	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310 N	40 U	49 U	46 U	43 U	35 U	32 U	
LEAD	170	400 N	34	28	32.5	37	25	33	
NICKEL	100	150 N	46 U	61 U	58.5 U	56 U	42 U	39 U	
ZINC	10000	2300 N	25 U	30 U	28.5 U	27 U	22 U	20 U	

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF						
			SB20-0003		SB21-0003	SB22-0003	SB22-0612	SB22-1218	
			0 - 0.25 ft bgs						
			AVERAGE	DUPLICATE	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.5 - 1 ft bgs	1 - 1.5 ft bgs	
May-08		May-08		May-08					
Inorganics (mg/kg)									
ALUMINUM	69000	7700	N	NA	NA	NA	6400	NA	NA
ANTIMONY	14	3.1	N	NA	NA	NA	9.5 UJ	NA	NA
ARSENIC	9	0.39	C	NA	NA	NA	19 U	NA	NA
BARIUM	6800	1500	N	NA	NA	NA	55	NA	NA
BERYLLIUM	68	16	N	NA	NA	NA	0.95 U	NA	NA
CADMIUM	2.1	7	N	NA	NA	NA	22	NA	NA
CALCIUM	NC	NC		NA	NA	NA	1900	NA	NA
CHROMIUM	100	0.29	C	NA	NA	NA	170	NA	NA
COBALT	15	2.3	N	NA	NA	NA	3.5	NA	NA
COPPER	480	310	N	NA	NA	NA	11	NA	NA
IRON	31000	5500	N	NA	NA	NA	14000	NA	NA
LEAD	170	400	N	NA	NA	NA	490	NA	NA
LEAD-CALC	170	400		131.08	NA	156.56	NA	176.72	138.64
MAGNESIUM	NC	NC		NA	NA	NA	1700	NA	NA
MANGANESE	1100	180	N	NA	NA	NA	160	NA	NA
MERCURY	10	1	N	NA	NA	NA	NA	NA	NA
NICKEL	100	150	N	NA	NA	NA	5.7 U	NA	NA
POTASSIUM	NC	NC		NA	NA	NA	NA	NA	NA
SELENIUM	68	39	N	NA	NA	NA	19 U	NA	NA
SILVER	170	39	N	NA	NA	NA	2.8 UJ	NA	NA
SODIUM	NC	NC		NA	NA	NA	NA	NA	NA
VANADIUM	240	39	N	NA	NA	NA	14	NA	NA
ZINC	10000	2300	N	NA	NA	NA	46	NA	NA
ZINC-CALC	10000	2300	N	NA	NA	25.82	NA	26.9	26.48
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61	N	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310	N	33.5 U	35 U	33	100 U	57 U	44 U
LEAD	170	400	N	30.5	28	76	401	112	44
NICKEL	100	150	N	40 U	41 U	33 U	210 U	85 U	55 U
ZINC	10000	2300	N	21 U	22 U	17 U	109	35 U	28 U

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF							
			SB22-1824	SB23-0003	SB24-0003	SB25-0003	SB26-0003	SB27-0003	SB28-0003	
			1.5 - 2 ft bgs May-08	0 - 0.25 ft bgs May-08						
Inorganics (mg/kg)										
ALUMINIUM	69000	7700 N	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1 N	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39 C	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500 N	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16 N	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7 N	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29 C	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	15	2.3 N	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	NA	NA
IRON	31000	5500 N	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400	163.28	128.56	126.88	135.28	166.64	130.8	127.44	
MAGNESIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1100	180 N	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	10	1 N	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39 N	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	170	39 N	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39 N	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300 N	26.36	26.42	29.36	26.42	27.92	26.42	27.68	
Explosives (mg/kg)										
NITROGLYCERIN	NC	0.61 N	NA	NA	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)										
COPPER	480	310 N	42 U	43 U	39 U	45 U	41 U	44 U	40 U	
LEAD	170	400 N	88	26	23	38	94	30	24	
NICKEL	100	150 N	52 U	53 U	48 U	54 U	50 U	50 U	47 U	
ZINC	10000	2300 N	26 U	27 U	38	27 U	26	27 U	24	

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF							
			SB29-0003	SB30-0003			SB30-0612	SB30-1218		
			0 - 0.25 ft bgs	0 - 0.25 ft bgs		0.5 - 1 ft bgs	1 - 1.5 ft bgs			
			May-08	SAMPLE	AVERAGE	DUPLICATE	May-08			
Inorganics (mg/kg)										
ALUMINIUM	69000	7700 N	NA	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1 N	NA	NA	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39 C	NA	NA	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500 N	NA	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16 N	NA	NA	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7 N	NA	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29 C	NA	NA	NA	NA	NA	NA	NA	NA
COBALT	15	2.3 N	NA	NA	NA	NA	NA	NA	NA	NA
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	NA	NA
IRON	31000	5500 N	NA	NA	NA	NA	NA	NA	NA	NA
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400	117.64	NA	240.56	NA	NA	143.12	NA	139.76
MAGNESIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
MANGANESE	1100	180 N	NA	NA	NA	NA	NA	NA	NA	NA
MERCURY	10	1 N	NA	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39 N	NA	NA	NA	NA	NA	NA	NA	NA
SILVER	170	39 N	NA	NA	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39 N	NA	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	NA	NA
ZINC-CALC	10000	2300 N	26.36	NA	NA	NA	NA	23.36	NA	26.42
Explosives (mg/kg)										
NITROGLYCERIN	NC	0.61 N	NA	NA	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)										
COPPER	480	310 N	42 U	58 U	58 U	58 U	58 U	42 U	44 U	44 U
LEAD	170	400 N	13 U	226	226	226	226	52	46	46
NICKEL	100	150 N	50 U	74 U	73 U	72 U	72 U	51 U	50 U	50 U
ZINC	10000	2300 N	26 U	56	75	94	94	26 U	27 U	27 U

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF						
			SB30-1824	SB31-0003	SB32-0003	SB33-0003	SB34-0003	SB35-0003	
			1.5 - 2 ft bgs May-08	0 - 0.25 ft bgs May-08					
Inorganics (mg/kg)									
ALUMINUM	69000	7700 N	NA	NA	NA	NA	NA	NA	8200
ANTIMONY	14	3.1 N	NA	NA	NA	NA	NA	NA	9.6 U
ARSENIC	9	0.39 C	NA	NA	NA	NA	NA	NA	19 U
BARIUM	6800	1500 N	NA	NA	NA	NA	NA	NA	33
BERYLLIUM	68	16 N	NA	NA	NA	NA	NA	NA	0.96 U
CADMIUM	2.1	7 N	NA	NA	NA	NA	NA	NA	2.9 U
CALCIUM	NC	NC	NA	NA	NA	NA	NA	NA	1200
CHROMIUM	100	0.29 C	NA	NA	NA	NA	NA	NA	17
COBALT	15	2.3 N	NA	NA	NA	NA	NA	NA	3.7
COPPER	480	310 N	NA	NA	NA	NA	NA	NA	53
IRON	31000	5500 N	NA	NA	NA	NA	NA	NA	8600
LEAD	170	400 N	NA	NA	NA	NA	NA	NA	160
LEAD-CALC	170	400	134.16	130.8	153.76	145.92	156.56	NA	NA
MAGNESIUM	NC	NC	NA	NA	NA	NA	NA	NA	1300
MANGANESE	1100	180 N	NA	NA	NA	NA	NA	NA	110
MERCURY	10	1 N	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150 N	NA	NA	NA	NA	NA	NA	7.1
POTASSIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39 N	NA	NA	NA	NA	NA	NA	19 U
SILVER	170	39 N	NA	NA	NA	NA	NA	NA	2.9 UJ
SODIUM	NC	NC	NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39 N	NA	NA	NA	NA	NA	NA	14
ZINC	10000	2300 N	NA	NA	NA	NA	NA	NA	26
ZINC-CALC	10000	2300 N	26.12	27.92	26.54	30.92	26.48	NA	NA
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61 N	NA	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310 N	38 U	39 U	48 U	54 U	45 U	84	
LEAD	170	400 N	36	30	71	57	76	160	
NICKEL	100	150 N	44 U	46 U	55 U	61 U	54 U	64 U	
ZINC	10000	2300 N	22 U	26	29 U	51	28 U	33 U	

TABLE 4-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-MGBR-XRF						
			SB36-0003		SB37-0003			SB38-0003	SB39-0003
			0 - 0.25 ft bgs		0 - 0.25 ft bgs			0 - 0.25 ft bgs	0 - 0.25 ft bgs
			May-08		SAMPLE	AVERAGE	DUPLICATE	May-08	May-08
Inorganics (mg/kg)									
ALUMINUM	69000	7700	N	NA	<i>8100</i>	<i>8150</i>	<i>8200</i>	NA	NA
ANTIMONY	14	3.1	N	NA	9.8 U	9.75 U	9.7 U	NA	NA
ARSENIC	9	0.39	C	NA	20 U	19.5 U	19 U	NA	NA
BARIUM	6800	1500	N	NA	28	27.5	27	NA	NA
BERYLLIUM	68	16	N	NA	0.98 U	0.975 U	0.97 U	NA	NA
CADMIUM	2.1	7	N	NA	2.9 U	2.9 U	2.9 U	NA	NA
CALCIUM	NC	NC		NA	1100	1100	1100	NA	NA
CHROMIUM	100	0.29	C	NA	12	12.5	13	NA	NA
COBALT	15	2.3	N	NA	4.3	4.4	4.5	NA	NA
COPPER	480	310	N	NA	30	31	32	NA	NA
IRON	31000	5500	N	NA	<i>9300</i>	<i>9550</i>	<i>9800</i>	NA	NA
LEAD	170	400	N	NA	230	235	240	NA	NA
LEAD-CALC	170	400		152.08	NA	NA	NA	137.52	167.76
MAGNESIUM	NC	NC		NA	1700	1750	1800	NA	NA
MANGANESE	1100	180	N	NA	160	160	160	NA	NA
MERCURY	10	1	N	NA	NA	NA	NA	NA	NA
NICKEL	100	150	N	NA	8.3	8.05	7.8	NA	NA
POTASSIUM	NC	NC		NA	NA	NA	NA	NA	NA
SELENIUM	68	39	N	NA	20 U	19.5 U	19 U	NA	NA
SILVER	170	39	N	NA	2.9 UJ	2.9 UJ	2.9 UJ	NA	NA
SODIUM	NC	NC		NA	NA	NA	NA	NA	NA
VANADIUM	240	39	N	NA	16	16.5	17	NA	NA
ZINC	10000	2300	N	NA	28	29.5	31	NA	NA
ZINC-CALC	10000	2300	N	28.88	NA	NA	NA	28.52	26.6
Explosives (mg/kg)									
NITROGLYCERIN	NC	0.61	N	NA	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)									
COPPER	480	310	N	53 U	49 U	45.75	67	54	51 U
LEAD	170	400	N	68	208	203.5	199	42	96
NICKEL	100	150	N	60 U	59 U	63.5 U	68 U	53 U	63 U
ZINC	10000	2300	N	34	29 U	33 U	37 U	31	30 U

NC = No criterion.
NA = Not available.
J = Value is estimated.
U = Analyte not detected at the reported detection limit.
UJ = Not detected; the detection limit is considered to be estimated.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening values are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).
2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.
3. No XRF samples were collected by Tetra Tech as part of the Site Inspection. However, the USEPA collected XRF data and FBL confirmation samples in support of the SI, which are included in the evaluation of data. If good correlation was achieved for a given analyte, calculated values were developed (See Appendix F).

TABLE 4-6

**FREQUENCY OF DETECTION IN GROUNDWATER
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR SATION BRUNSWICK
BRUNSWICK, MAINE**

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽⁴⁾	Maximum Non-Detection ⁽⁴⁾	Maine MEG for Drinking Water ⁽¹⁾	USEPA Tapwater RSL ⁽²⁾	MCL ⁽³⁾
METALS (UG/L)										
ALUMINUM	5/5	47.1 J	418 J	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	--	--	7000	3700 N	NC
ANTIMONY	1/5	1.63 J	1.63 J	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	1.25	1.25	3	1.5 N	6
ARSENIC	1/5	0.822 J	0.822 J	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	0.75	0.75	10	0.045 C	10
BARIUM	5/5	4.7 J	56.6	NASB-MGBR-MW05	NASB-MGBR-MW05-122909	--	--	1000	730 N	2000
CADMIUM	4/5	0.282 J	0.307 J	NASB-MGBR-MW05	NASB-MGBR-MW05-122909	0.25	0.25	1	1.8 N	5
CALCIUM	5/5	3960 J	20000 J	NASB-MGBR-MW04	NASB-MGBR-MW04-122909	--	--	NC	NC	NC
CHROMIUM	2/5	0.858 J	35.1	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	0.5	0.5	20	0.043 C	100
COBALT	2/5	1.88 J	1.88 J	NASB-MGBR-MW01	NASB-MGBR-MW01-122909	1.25	1.25	10	1.1 N	NC
				NASB-MGBR-MW05	NASB-MGBR-MW05-122909					
COPPER	4/5	1.33 J	2.29 J	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	1.25	1.25	500	150 N	1300
IRON	5/5	30.6 J	322 J	NASB-MGBR-MW05	NASB-MGBR-MW05-122909	--	--	5000	2600 N	NC
MAGNESIUM	5/5	283 J	2050	NASB-MGBR-MW04	NASB-MGBR-MW04-122909	--	--	NC	NC	NC
MANGANESE	5/5	17.9	551	NASB-MGBR-MW05	NASB-MGBR-MW05-122909	--	--	500	88 N	NC
NICKEL	4/5	1.03 J	2.93	NASB-MGBR-MW05	NASB-MGBR-MW05-122909	0.75	0.75	20	73 N	NC
POTASSIUM	5/5	698 J	23600	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	--	--	NC	NC	NC
SELENIUM	1/5	1.1 J	1.1 J	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	0.75	0.75	40	18 N	50
SODIUM	5/5	1490 J	9920 J	NASB-MGBR-MW03	NASB-MGBR-MW03-122909	--	--	20000	NC	NC
ZINC	3/5	1.79 J	7.87	NASB-MGBR-MW01	NASB-MGBR-MW01-122909	1.25	1.25	2000	1100 N	NC
MISCELLANEOUS PARAMETERS (UG/L)										
PERCHLORATE	2/5	0.0737 J	0.165 J	NASB-MGBR-MW04	NASB-MGBR-MW04-122909	0.066	0.066	1	2.6 N	15

J = Value is estimated.
ug/l = Micrograms per liter.

Note that a sample and its duplicate sample were considered separately when determining the maximum concentration, and the average concentration of a sample and its duplicate were used in determining the frequency of detection.

Yellow Shading - concentration greater than Maine MEG criterion.

Italics - concentration greater than RSL criterion.

Note: There are no concentrations greater than MCL criterion.

1 Maine CDC Maximum Exposure Guidelines (MEG) for Drinking Water (February, 2010).

Note: Chromium value is for total chromium.

2 USEPA residential Regional Screening Level (June, 2011).

Non-carcinogen values are divided by 10.

Note: Chromium tapwater RSL value is for hexavalent chromium.

3 Federal Maximum Contaminant Level (MCL) (January, 2011).

Note: Chromium value is for total chromium.

4 Minimum and maximum non-detections are for all samples in the data set.

Associated Samples:

NASB-MGBR-MW01-122909	NASB-MGBR-MW03-122909
NASB-MGBR-MW02-122909	NASB-MGBR-MW04-122909
NASB-MGBR-MW02-122909-AVG	NASB-MGBR-MW05-122909
NASB-MGBR-MW02-122909-D	

TABLE 4-7

**SUMMARY OF DETECTED CONCENTRATIONS IN GROUNDWATER
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR SATION BRUNSWICK
BRUNSWICK, MAINE**

PARAMETER	Maine MEG for Drinking Water ⁽¹⁾	USEPA Tapwater RSL ⁽²⁾	MCL ⁽³⁾	NASB-MGBR						
				MW01	MW02			MW03	MW04	MW05
					SAMPLE	AVERAGE	DUPLICATE			
Inorganics (ug/l)				Dec-09	Dec-09	Dec-09	Dec-09	Dec-09	Dec-09	Dec-09
ALUMINUM	7000	3700 N	NC	84.7 J	113 J	80.05 J	47.1 J	418 J	51.1 J	251 J
ANTIMONY	3	1.5 N	6	1.25 U	1.25 U	1.25 U	1.25 U	1.63 J	1.25 U	1.25 U
ARSENIC	10	0.045 C	10	0.75 U	0.75 U	0.75 U	0.75 U	0.822 J	0.75 U	0.75 U
BARIUM	1000	730 N	2000	38.6	9.52 J	9.47 J	9.42 J	4.7 J	38.1	56.6
CADMIUM	1	1.8 N	5	0.298 J	0.25 U	0.25 U	0.25 U	0.282 J	0.301 J	0.307 J
CALCIUM	NC	NC	NC	9510 J	3960 J	3970 J	3980 J	6550 J	20000 J	5210 J
CHROMIUM	20	0.043 C	100	0.5 U	0.5 U	0.5 U	0.5 U	35.1	0.5 U	0.858 J
COBALT	10	1.1 N	NC	1.88 J	1.25 U	1.25 U	1.25 U	1.25 U	1.25 U	1.88 J
COPPER	500	150 N	1300	1.33 J	1.25 U	1.25 U	1.25 U	2.29 J	1.34 J	1.37 J
IRON	5000	2600 N	NC	63.1 J	95.6 J	63.1 J	30.6 J	127 J	44.5 J	322 J
MAGNESIUM	NC	NC	NC	744 J	420 J	414 J	408 J	283 J	2050	750 J
MANGANESE	500	88 N	NC	151	180	180	180	17.9	63.2	551
NICKEL	20	73 N	NC	2.14 J	1.63 J	1.635 J	1.64 J	0.75 U	1.03 J	2.93
POTASSIUM	NC	NC	NC	1400	698 J	698 J	698 J	23600	4880	2730
SELENIUM	40	18 N	50	0.75 U	0.75 U	0.75 U	0.75 U	1.1 J	0.75 U	0.75 U
SODIUM	20000	NC	NC	8100 J	1490 J	1490 J	1490 J	9920 J	9200 J	2750 J
ZINC	2000	1100 N	NC	7.87	1.79 J	1.875 J	1.96 J	1.25 U	1.25 U	4.37 J
Miscellaneous Parameters (ug/l)										
PERCHLORATE	1	2.6 N	15	0.066 U	0.066 U	0.066 U	0.066 U	0.0737 J	0.165 J	0.066 U

NA = Not applicable

ug/l = Micrograms per liter.

J = Value is estimated.

U = Analyte not detected at the reporting limit left of the letter.

Yellow Shading - concentration greater than Maine MEG criterion.

Italics - concentration greater than RSL criterion.

Note: there are no concentrations greater than MCL criterion.

1 Maine CDC Maximum Exposure Guidelines (MEG) for Drinking Water (February, 2011).

Note: Chromium value is for total chromium.

2 USEPA residential Regional Screening Level (June, 2011).

Non-carcinogen values are divided by 10. Chromium value is for hexavalent chromium.

3 Federal Maximum Contaminant Level (MCL) (January, 2011).

Note: Chromium value is for total chromium.

TABLE 4-8

**CONCEPTUAL SITE MODEL INFORMATION PROFILE
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 3**

Profile Type	Information Need	Findings
Range/Site Profile	Installation Name	Former Naval Air Station Brunswick
	Installation Location	Cumberland County, Maine
	Range/Site Name	Machine Gun Boresight Range
	Range/Site Location	The site is located in the eastern portion of the former facility adjacent to Building 55 and extends to an open field behind the building.
	Range/Site History	In the 1950s, pilots used the range to calibrate their aircraft-mounted machine guns.
	Range/Site Area and Layout	Pilots fired toward the east into a berm after taxiing down the runway to the compass rose. The range area encompassed 0.3 acre and had an SDZ of 1,029.4 acres.
	Range/Site Structures	A berm appears on the 1957 aerial photograph of the installation. No other range-related structures are discernable from the 1957 photograph. Based on the site walk, any structures that existed when the range was active are no longer present.
	Range/Site Boundaries	North: Building 55, Building 52, and pond. South: Building 50. East: Open field and forested area. West: Parking lot and Orion Street.
	Range/Site Security	There are no security or access restrictions to the site.
Munitions/Release Profile	Munitions Types	Machine gun (small arms) ammunition including 0.50-caliber and 0.30-caliber and pistol ammunition including 0.20-caliber, 0.22-caliber, and 0.38-caliber.
	Maximum Probability Penetration Depth	Small arms, less than 1 foot. Based on the SI results, the target berm was likely removed and residual contamination is minor.
	MEC Density	Not applicable.
	Munitions Scrap/Fragments/ MDAS	No MEC scrap/fragments were found during the visual survey.
	Associated MC	Soil: TAL metals and nitroglycerin. Groundwater: TAL metals, nitroglycerin, and perchlorate. Note that chromium present in both soil and groundwater is not perceived to be related to MGBR operations, although MGBR should not be discounted as the source, such as a possible source for elevated pH related to a later use.

TABLE 4-8

**CONCEPTUAL SITE MODEL INFORMATION PROFILE
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 3**

Profile Type	Information Need	Findings
	Migration Routes/Release Mechanisms	Erosion: Potential (in non-paved open area). Surface Water Runoff: Potential (in non-paved open area). Human Intervention: Potential (in non-paved open area).
Physical Profile (see Section 2)	Climate	Continental climate with three well-defined seasons. Highest temperatures occur in July (79°F or higher). Coldest temperatures occur in January (21°F or lower).
	Topography	The former Machine Gun Boresight Range is relatively level.
	Geology	Characterized by two primary components: Unconsolidated sediments and Paleozoic bedrock.
	Soil	Suffield-Buxton-Hollis Association. Deep to shallow moderately well-drained to somewhat poorly drained soils with low permeability.
	Hydrogeology	Groundwater is used as the municipal water supply in the residential area north of the installation. Most of the wells in the vicinity are between 101 and 300 feet deep. There are no wells within the boundary of the range.
	Hydrology	Surface water flows off the paved area away from Building 55. The Upper and Lower Impoundment ponds are located north of the site.
	Vegetation	The undeveloped portion of the range is grassy, with various tree species.
Land Use and Exposure Profile	Current Land Use	The site is not in use, except for Building 55 that is leased.
	Current Human Receptors	Current human receptors include: Civilian, visitors, trespassers, and maintenance workers/contractors.
	Current Activities	In the future, the site will include redeveloped buildings for business and technology industry use.
	Potential Future Land Use	In the future, anticipated land use will include redeveloped buildings for business and technology industry use.
	Potential Future Human Receptors	Same as currently planned.
	Potential Future Land Use-Related Activities	No foreseen change to planned use.
	Zoning/Land Use Restrictions	No site specific restrictions or access controls.
	Demographics/Zoning	Cumberland County population density is approximately 50,000 persons per square mile.
	Beneficial Resources	Groundwater is a source of the municipal water supply.
Ecological Profile	Habitat Type	Open field and forested area behind Building 55.
	Degree of Disturbance	Limited to surface activities near Building 55.
	Ecological Receptors and Species of Special Concern	Potential ecological receptors include indigenous species. No species of special concern are known to be present at the site, which is planned for industrial use.

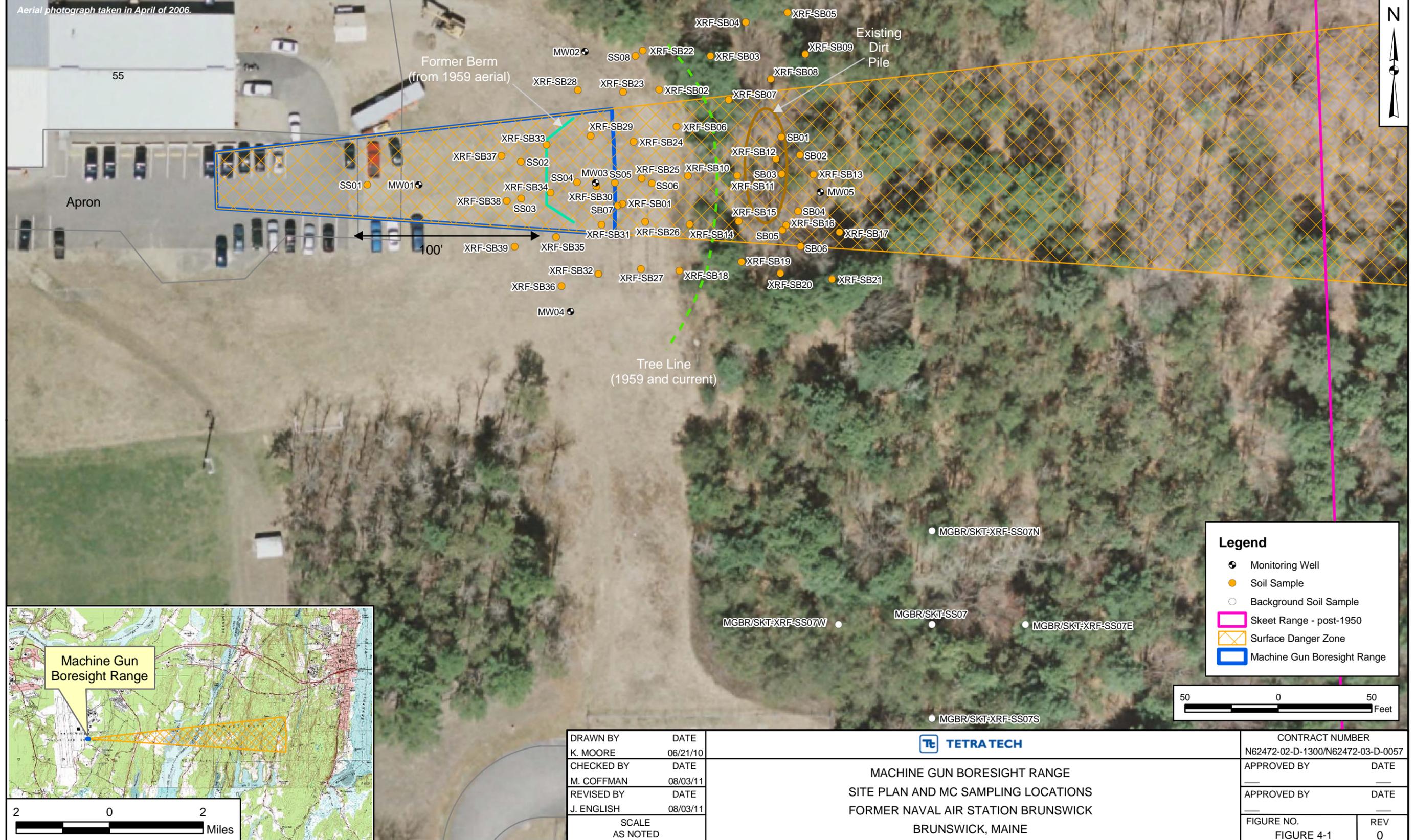
TABLE 4-8

CONCEPTUAL SITE MODEL INFORMATION PROFILE
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 3

Profile Type	Information Need	Findings
General Exposure Profile	Relationship of MC Sources to Habitat and Potential Receptors	MC potential migration pathways include leaching to groundwater, plant/animal uptake, and ingestion, dermal contact, and dust inhalation from surface soil.

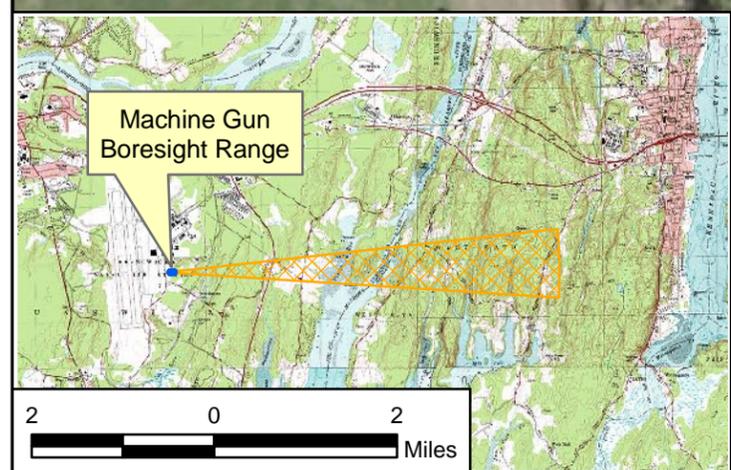
MC = Munitions Constituents.
MDAS = Material Documented as Safe.
MEC = Munitions and Explosives of Concern.

MGBR = Machine Gun Boresight Range.
SDZ = Surface danger zone.
SI = Site Investigation.

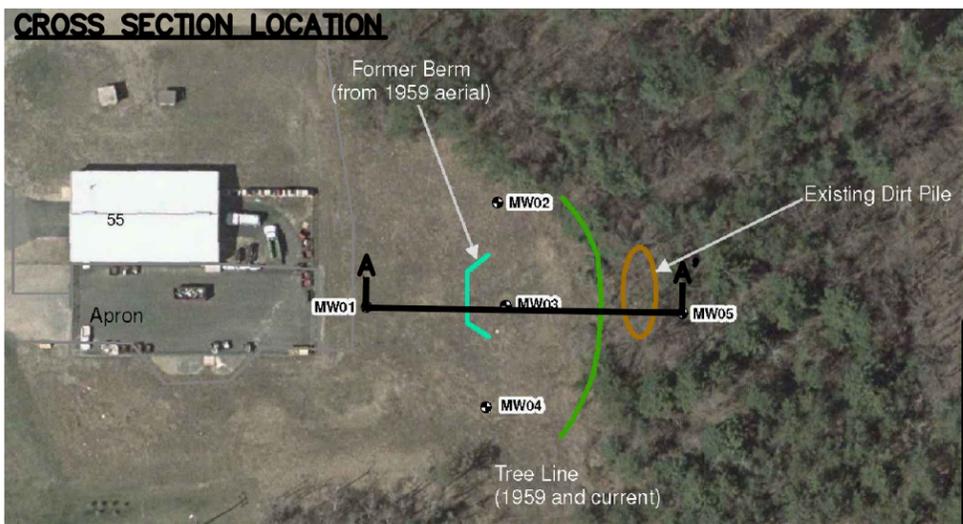
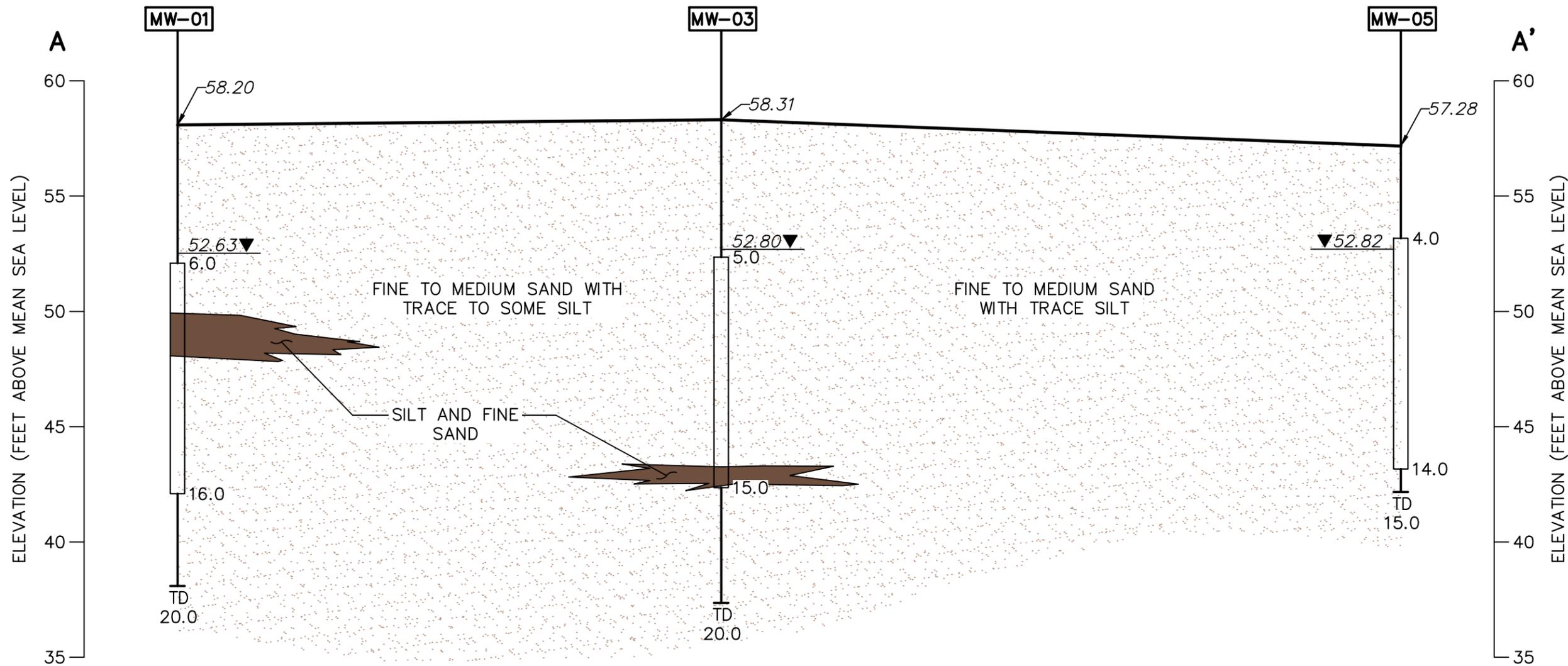


Legend

- Monitoring Well
- Soil Sample
- Background Soil Sample
- ▭ Skeet Range - post-1950
- ▨ Surface Danger Zone
- ▭ Machine Gun Boresight Range



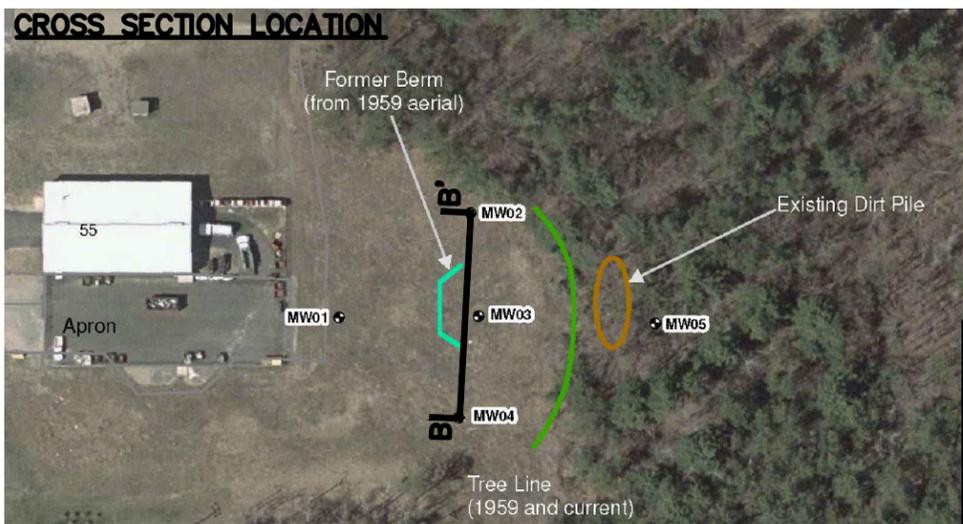
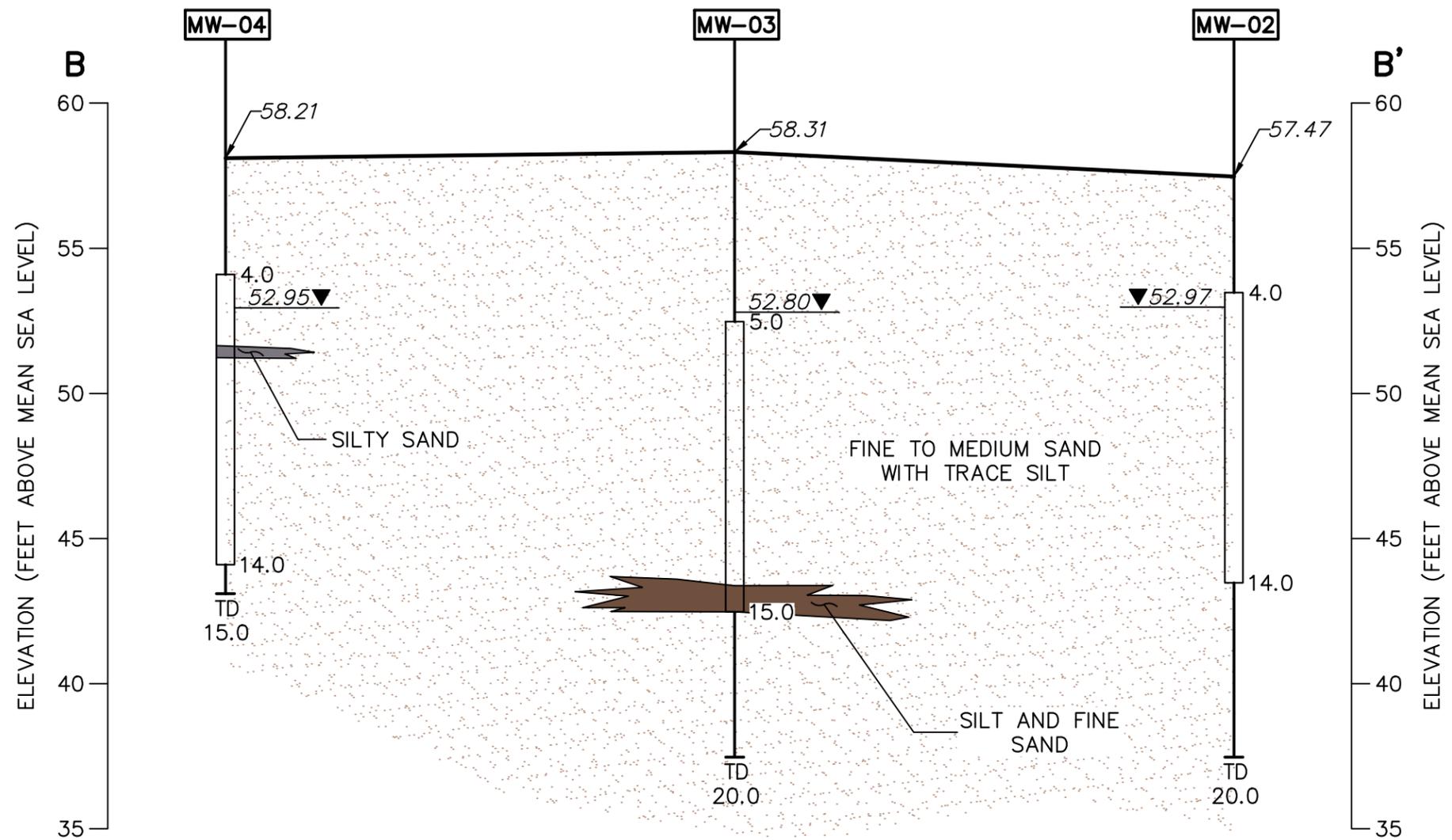
DRAWN BY K. MOORE CHECKED BY M. COFFMAN REVISED BY J. ENGLISH DATE 06/21/10 DATE 08/03/11 DATE 08/03/11 SCALE AS NOTED	<p>TETRA TECH</p> <p>MACHINE GUN BORESIGHT RANGE SITE PLAN AND MC SAMPLING LOCATIONS FORMER NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE</p>	CONTRACT NUMBER N62472-02-D-1300/N62472-03-D-0057 APPROVED BY _____ DATE _____ APPROVED BY _____ DATE _____ FIGURE NO. FIGURE 4-1 REV 0
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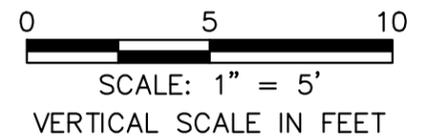
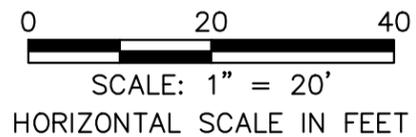
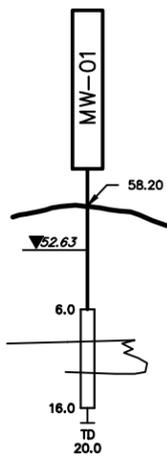
LEGEND:

	MONITORING WELL OR BORING NUMBER
	GROUND SURFACE ELEVATION (FEET MSL)
	GROUNDWATER ELEVATION (FEET MSL)
	TOP OF MONITORED INTERVAL (FT BGS)
	LITHOLOGIC CONTACT (INFERRED BETWEEN BORINGS)
	BOTTOM OF MONITORED INTERVAL (FT BGS)
	TOTAL DEPTH OF WELL OR BORING (FT BGS)

DRAWN BY	DATE		MACHINE GUN BORESIGHT RANGE		CONTRACT NO. 0645	
CHECKED BY	DATE		GEOLOGIC CROSS SECTION A-A'		OWNER NO.	
REVISED BY	DATE		FORMER NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE		APPROVED BY	DATE
SCALE AS NOTED			DRAWING NO. 4-2	REV. 0		



- LEGEND:**
- MONITORING WELL OR BORING NUMBER
 - GROUND SURFACE ELEVATION (FEET MSL)
 - GROUND SURFACE (FEET MSL)
 - GROUNDWATER ELEVATION (FEET MSL)
 - TOP OF MONITORED INTERVAL (FT BGS)
 - LITHOLOGIC CONTACT (INFERRED BETWEEN BORINGS)
 - BOTTOM OF MONITORED INTERVAL (FT BGS)
 - TOTAL DEPTH OF WELL OR BORING (FT BGS)



DRAWN BY	DATE
CHECKED BY	DATE
REVISED BY	DATE
SCALE AS NOTED	



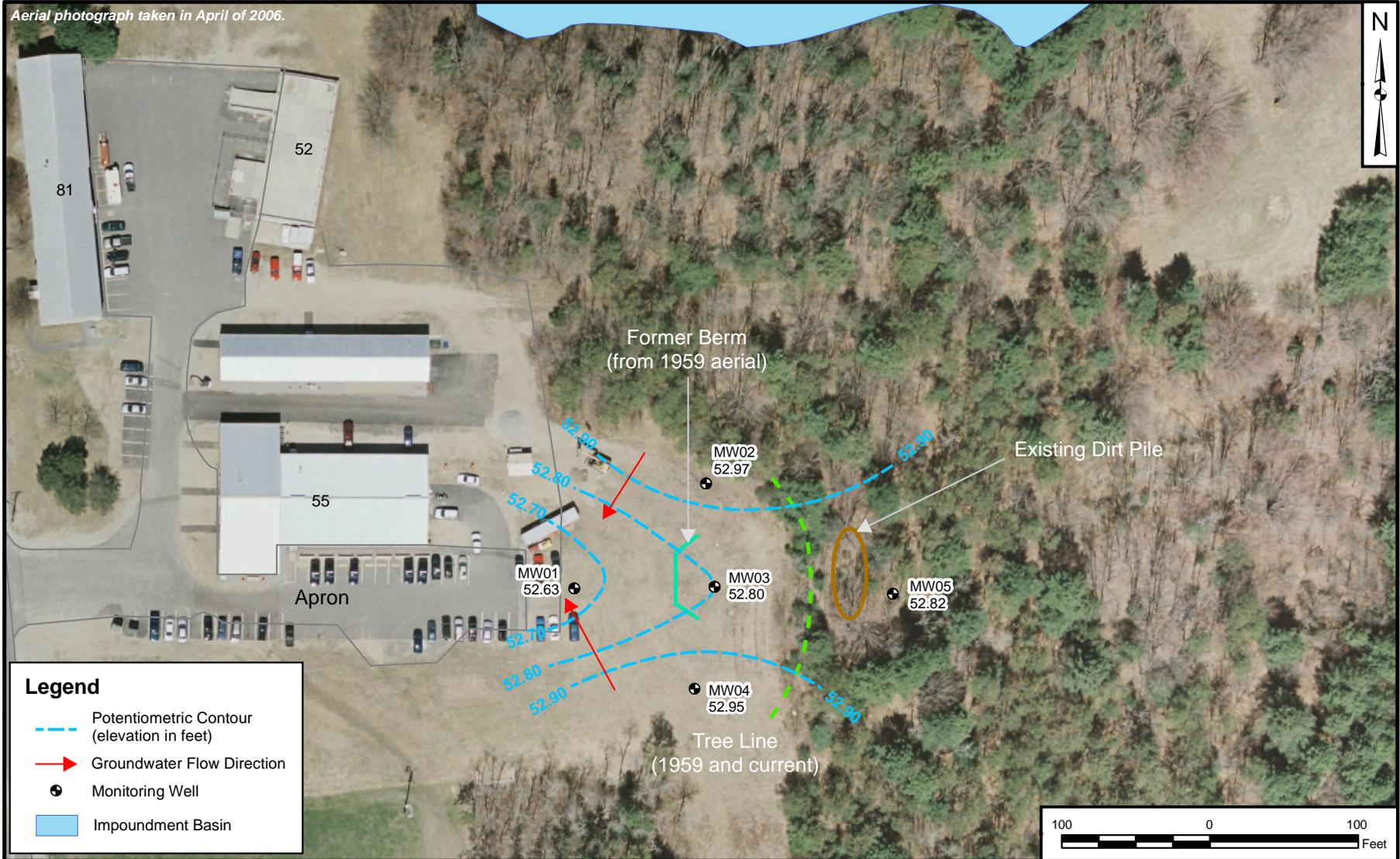
MACHINE GUN BORESIGHT RANGE

GEOLOGIC CROSS SECTION B-B'

FORMER NAVAL AIR STATION BRUNSWICK BRUNSWICK, MAINE

CONTRACT NO. 0645	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. 4-3	REV. 0

Aerial photograph taken in April of 2006.



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T. WHEATON	07/13/10
CHECKED BY	DATE
M. COFFMAN	04/23/13
REVISED BY	DATE
D. COUCH	04/23/13
SCALE	
AS NOTED	

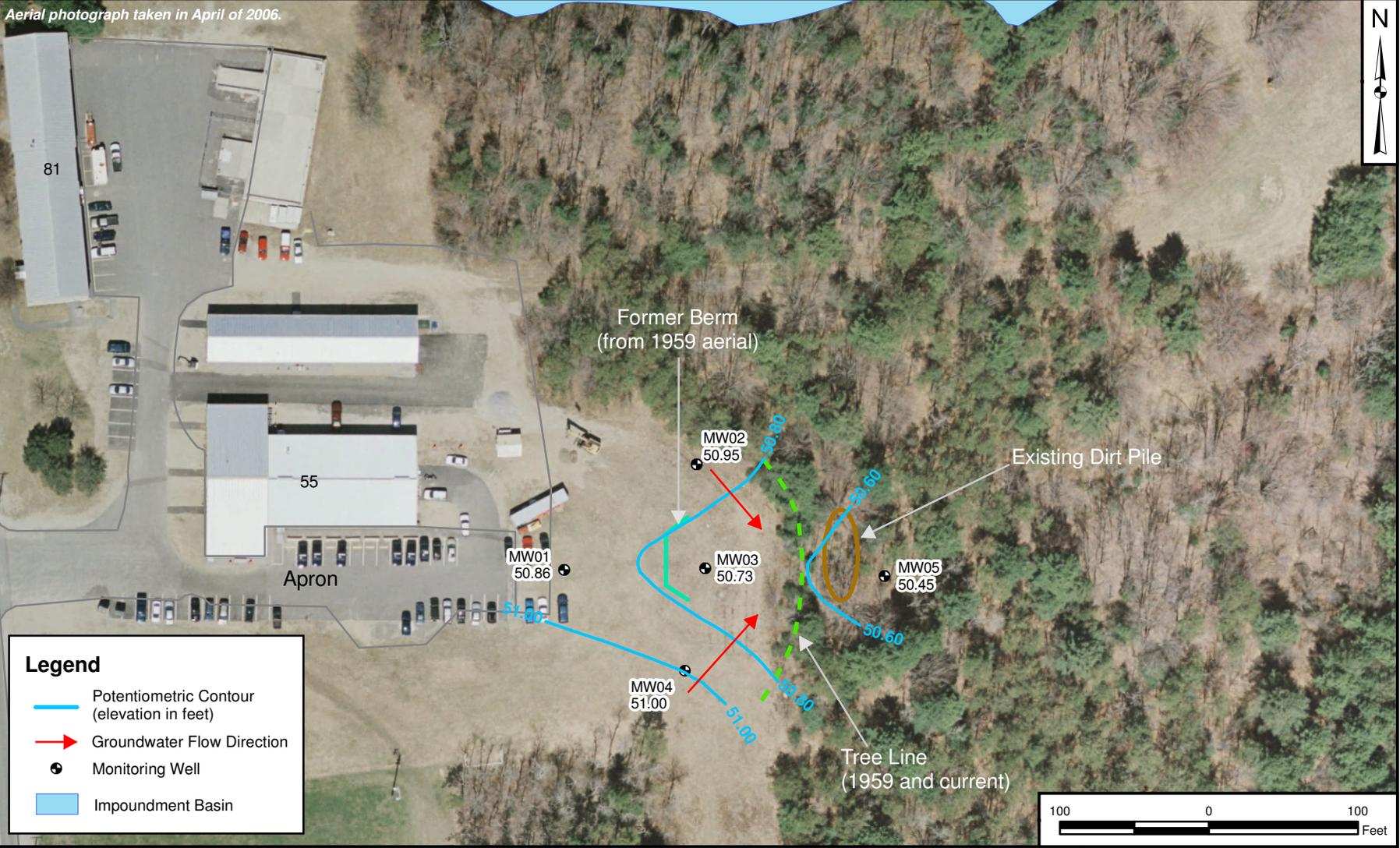


**MACHINE GUN BORESIGHT RANGE
GROUNDWATER POTENTIOMETRIC SURFACE MAP
DECEMBER 29, 2009
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**



CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
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APPROVED BY	DATE
—	—
FIGURE NO.	REV
FIGURE 4-4	0

Aerial photograph taken in April of 2006.

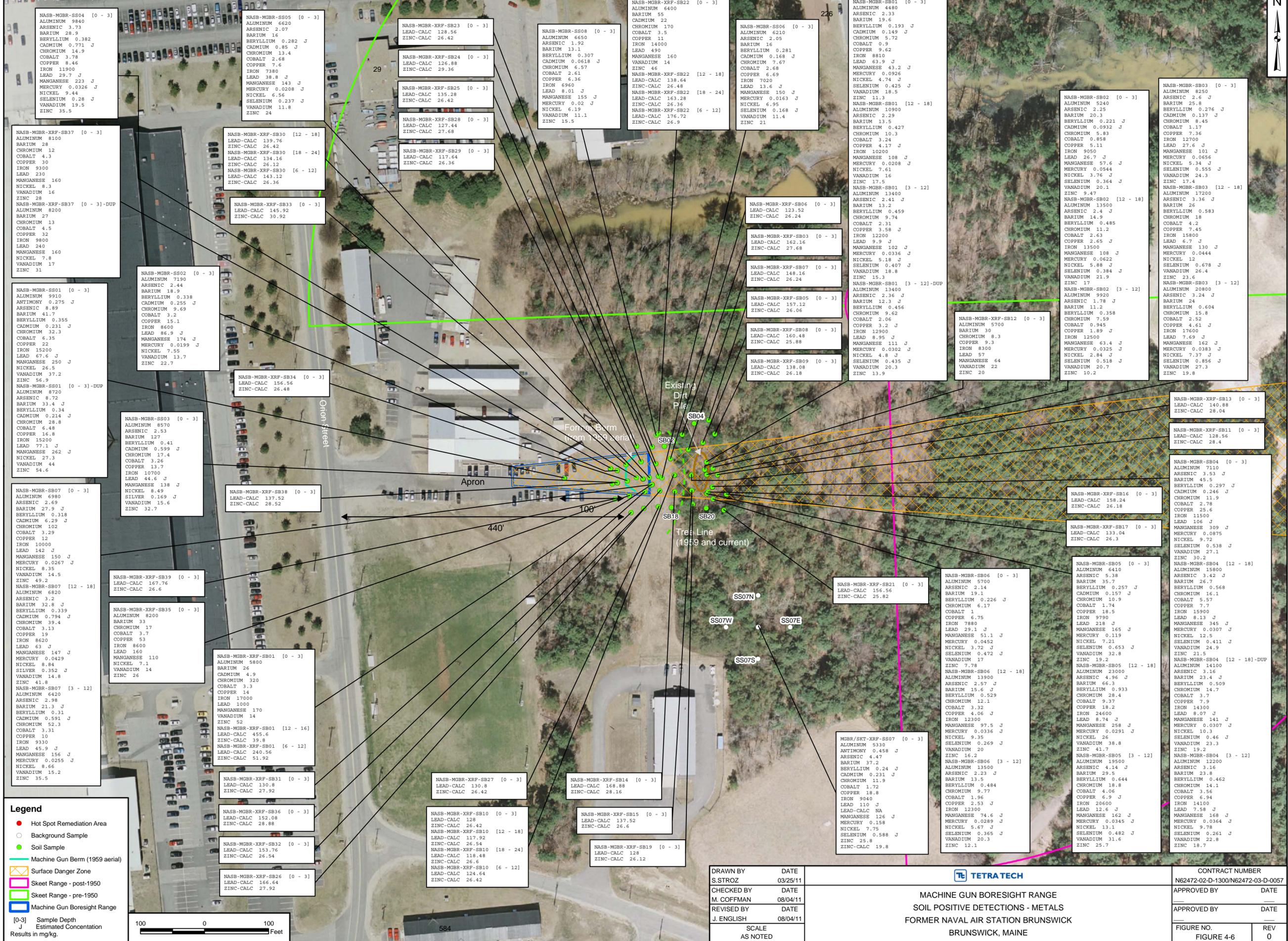


DRAWN BY	DATE
T. WHEATON	07/28/10
CHECKED BY	DATE
M. COFFMAN	7/7/11
REVISED BY	DATE
K. MOORE	7/7/11
SCALE	
AS NOTED	



MACHINE GUN BORESIGHT RANGE
GROUNDWATER POTENTIOMETRIC SURFACE MAP
 JULY 22, 2010
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
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APPROVED BY	DATE
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FIGURE NO.	REV
FIGURE 4-5	0



Legend

- Hot Spot Remediation Area
- Background Sample
- Soil Sample
- Machine Gun Berm (1959 aerial)
- ▨ Surface Danger Zone
- ▨ Skeet Range - post-1950
- ▨ Skeet Range - pre-1950
- ▨ Machine Gun Bore Sight Range

[0-3] Sample Depth
 J Estimated Concentration
 Results in mg/kg.

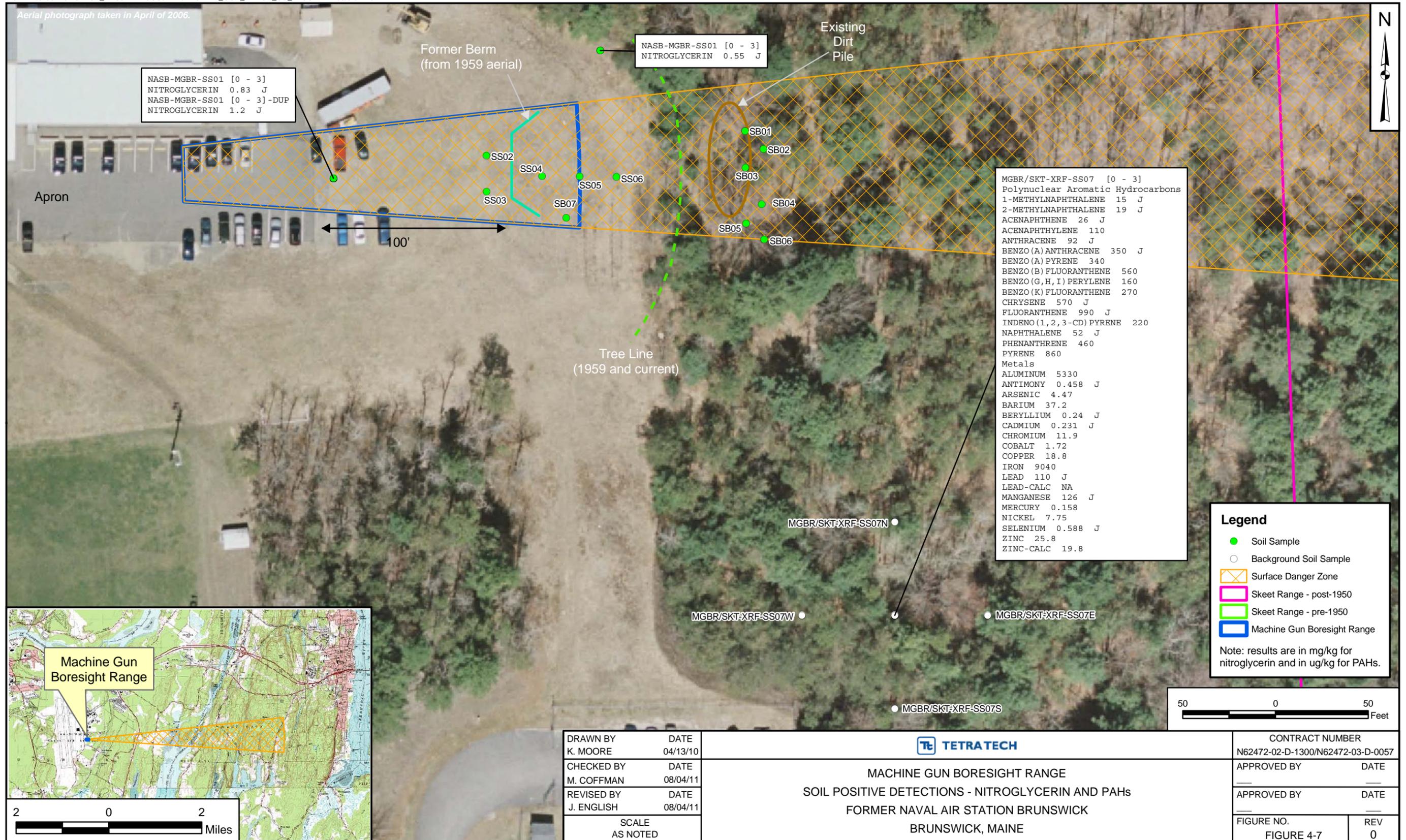


DRAWN BY	DATE
S. STROZ	03/25/11
CHECKED BY	DATE
M. COFFMAN	08/04/11
REVISED BY	DATE
J. ENGLISH	08/04/11
SCALE	AS NOTED

TETRA TECH

MACHINE GUN BORESIGHT RANGE
 SOIL POSITIVE DETECTIONS - METALS
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE

CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 4-6	0



NASB-MGBR-SS01 [0 - 3]
 NITROGLYCERIN 0.83 J
 NASB-MGBR-SS01 [0 - 3]-DUP
 NITROGLYCERIN 1.2 J

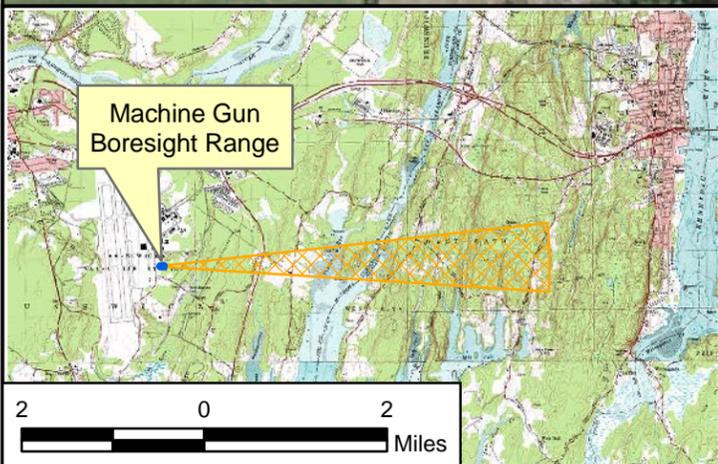
NASB-MGBR-SS01 [0 - 3]
 NITROGLYCERIN 0.55 J

MGBR/SKT-XRF-SS07 [0 - 3]
 Polynuclear Aromatic Hydrocarbons
 1-METHYLNAPHTHALENE 15 J
 2-METHYLNAPHTHALENE 19 J
 ACENAPHTHENE 26 J
 ACENAPHTHYLENE 110
 ANTHRACENE 92 J
 BENZO (A) ANTHRACENE 350 J
 BENZO (A) PYRENE 340
 BENZO (B) FLUORANTHENE 560
 BENZO (G, H, I) PERYLENE 160
 BENZO (K) FLUORANTHENE 270
 CHRYSENE 570 J
 FLUORANTHENE 990 J
 INDENO (1,2,3-CD) PYRENE 220
 NAPHTHALENE 52 J
 PHENANTHRENE 460
 PYRENE 860
 Metals
 ALUMINUM 5330
 ANTIMONY 0.458 J
 ARSENIC 4.47
 BARIUM 37.2
 BERYLLIUM 0.24 J
 CADMIUM 0.231 J
 CHROMIUM 11.9
 COBALT 1.72
 COPPER 18.8
 IRON 9040
 LEAD 110 J
 LEAD-CALC NA
 MANGANESE 126 J
 MERCURY 0.158
 NICKEL 7.75
 SELENIUM 0.588 J
 ZINC 25.8
 ZINC-CALC 19.8

Legend

- Soil Sample
- Background Soil Sample
- ⊞ Surface Danger Zone
- ⊞ Skeet Range - post-1950
- ⊞ Skeet Range - pre-1950
- ⊞ Machine Gun Boresight Range

Note: results are in mg/kg for nitroglycerin and in ug/kg for PAHs.

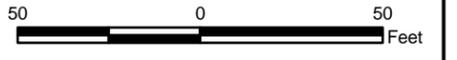


DRAWN BY K. MOORE	DATE 04/13/10
CHECKED BY M. COFFMAN	DATE 08/04/11
REVISED BY J. ENGLISH	DATE 08/04/11
SCALE AS NOTED	

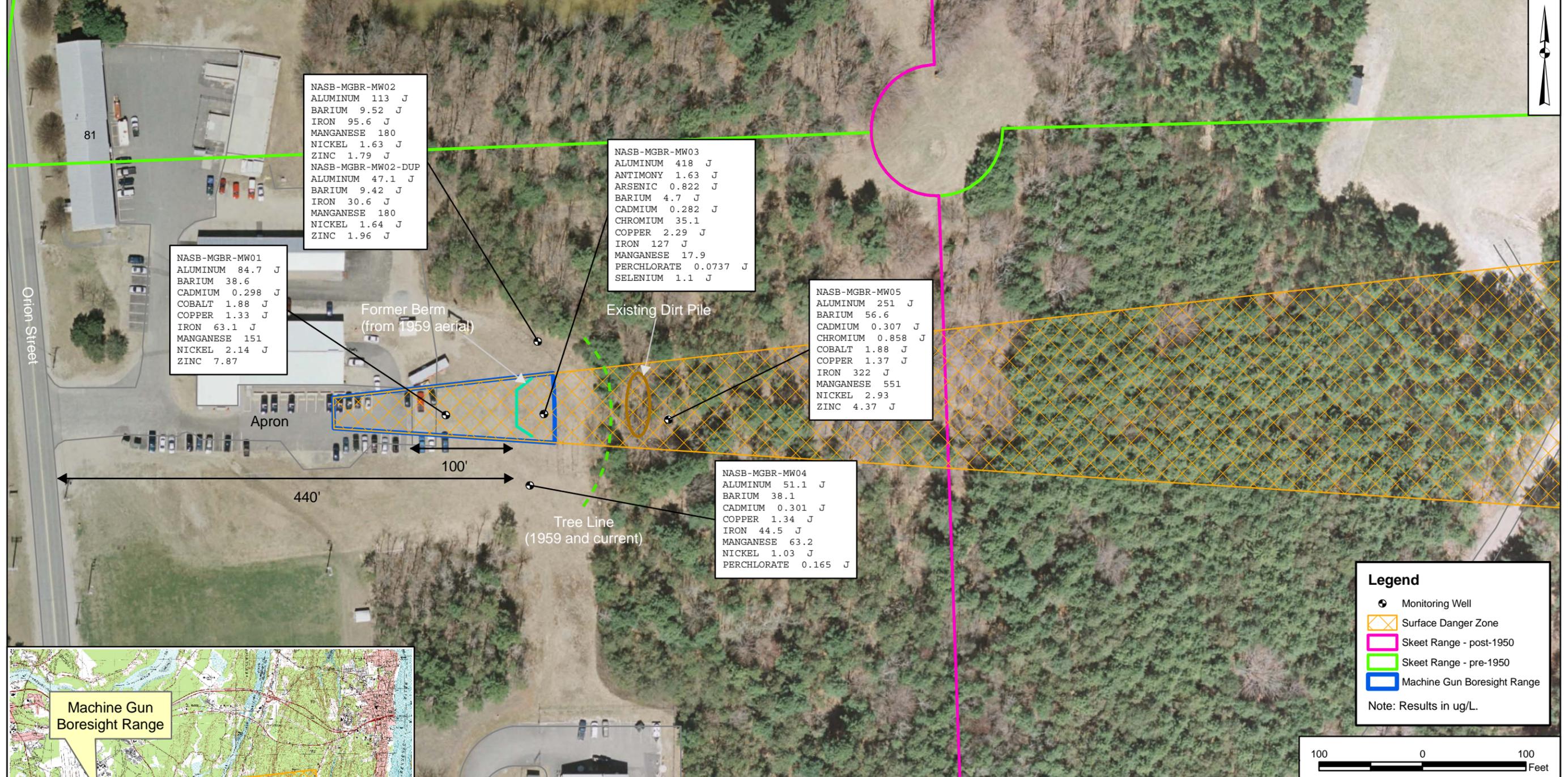
TETRA TECH

**MACHINE GUN BORESIGHT RANGE
 SOIL POSITIVE DETECTIONS - NITROGLYCERIN AND PAHS
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE**

CONTRACT NUMBER N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 4-7	REV 0



Aerial photograph taken in April of 2006.



NASB-MGBR-MW02
 ALUMINUM 113 J
 BARIUM 9.52 J
 IRON 95.6 J
 MANGANESE 180
 NICKEL 1.63 J
 ZINC 1.79 J
 NASB-MGBR-MW02-DUP
 ALUMINUM 47.1 J
 BARIUM 9.42 J
 IRON 30.6 J
 MANGANESE 180
 NICKEL 1.64 J
 ZINC 1.96 J

NASB-MGBR-MW01
 ALUMINUM 84.7 J
 BARIUM 38.6
 CADMIUM 0.298 J
 COBALT 1.88 J
 COPPER 1.33 J
 IRON 63.1 J
 MANGANESE 151
 NICKEL 2.14 J
 ZINC 7.87

NASB-MGBR-MW03
 ALUMINUM 418 J
 ANTIMONY 1.63 J
 ARSENIC 0.822 J
 BARIUM 4.7 J
 CADMIUM 0.282 J
 CHROMIUM 35.1
 COPPER 2.29 J
 IRON 127 J
 MANGANESE 17.9
 PERCHLORATE 0.0737 J
 SELENIUM 1.1 J

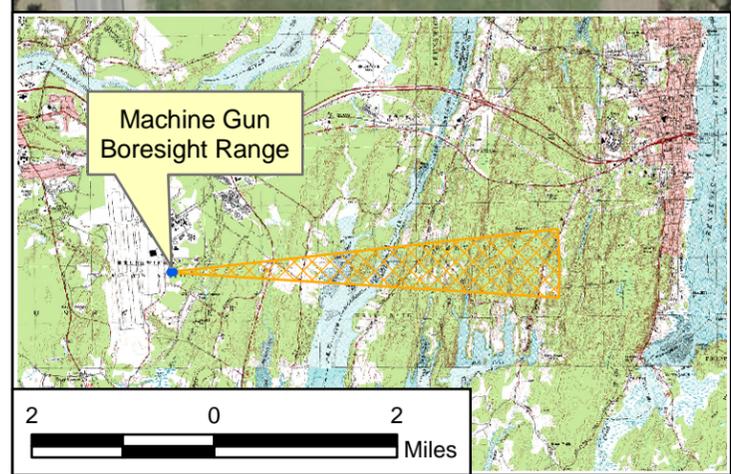
NASB-MGBR-MW05
 ALUMINUM 251 J
 BARIUM 56.6
 CADMIUM 0.307 J
 CHROMIUM 0.858 J
 COBALT 1.88 J
 COPPER 1.37 J
 IRON 322 J
 MANGANESE 551
 NICKEL 2.93
 ZINC 4.37 J

NASB-MGBR-MW04
 ALUMINUM 51.1 J
 BARIUM 38.1
 CADMIUM 0.301 J
 COPPER 1.34 J
 IRON 44.5 J
 MANGANESE 63.2
 NICKEL 1.03 J
 PERCHLORATE 0.165 J

Legend

- Monitoring Well
- ▨ Surface Danger Zone
- ▭ Skeet Range - post-1950
- ▭ Skeet Range - pre-1950
- ▭ Machine Gun Boresight Range

Note: Results in ug/L.



DRAWN BY	DATE
K. MOORE	04/13/10
CHECKED BY	DATE
M. COFFMAN	08/04/11
REVISED BY	DATE
J. ENGLISH	08/04/11
SCALE	
AS NOTED	

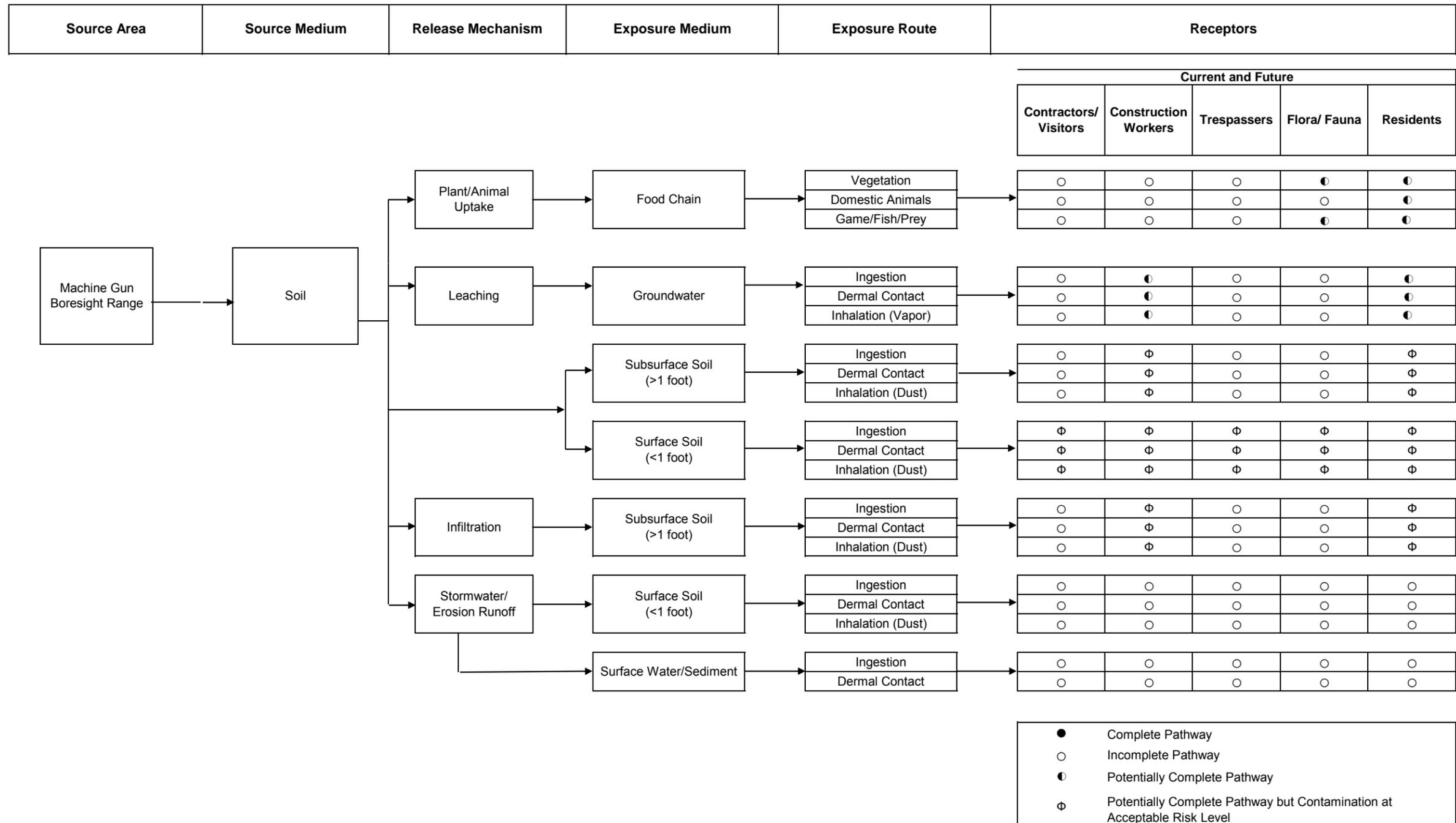
TETRA TECH

MACHINE GUN BORESIGHT RANGE
GROUNDWATER POSITIVE DETECTIONS - METALS AND NITROGLYCERIN
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 4-8	0

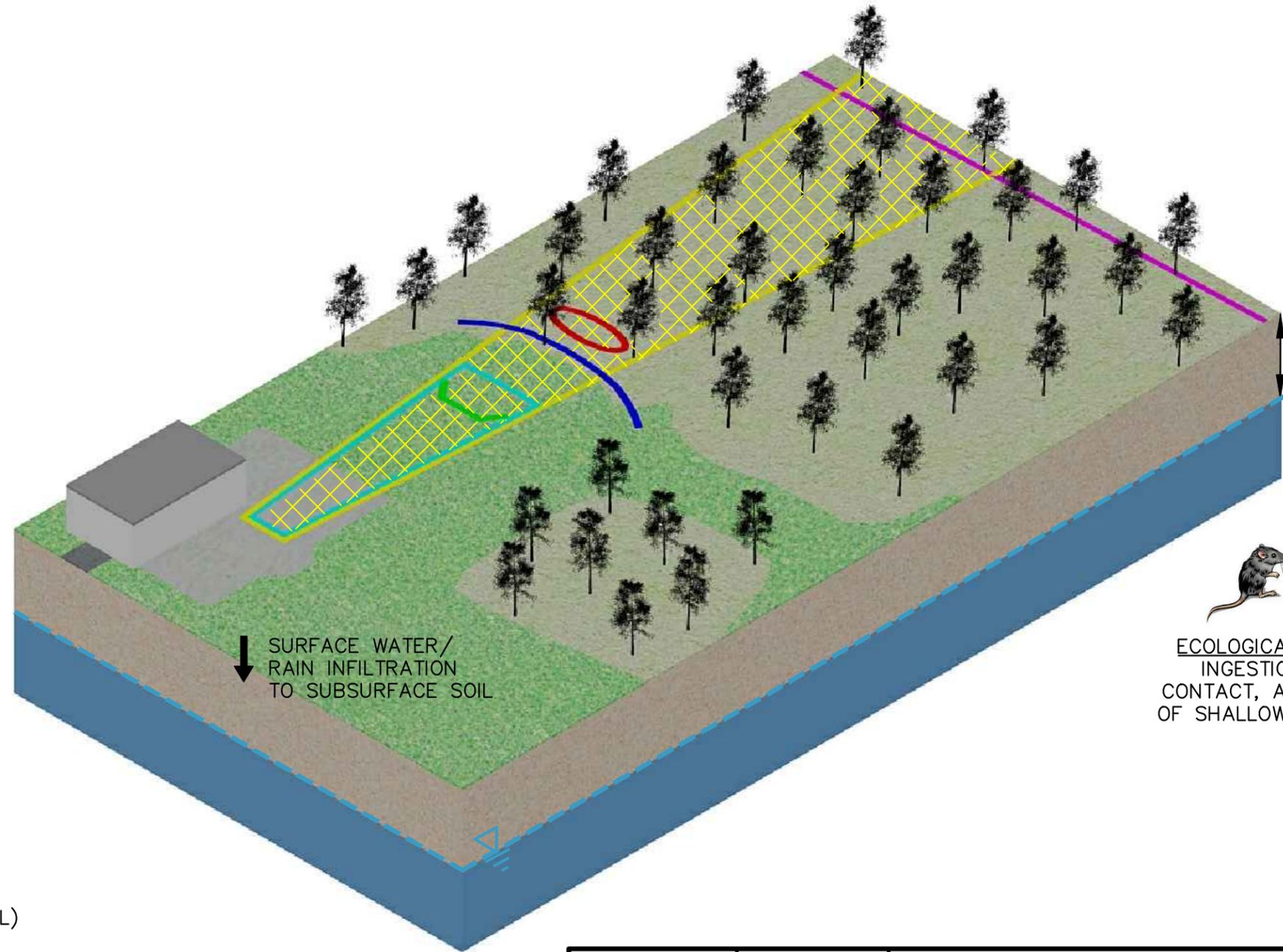
FIGURE 4-9

MC EXPOSURE PATHWAY ANALYSIS
 MACHINE GUN BORESIGHT RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE





CURRENT/ FUTURE
BUSINESS AND TECHNOLOGY
INDUSTRIES WORKER
INGESTION, DERMAL
CONTACT, MIXED USE,
AND INHALATION OF
SHALLOW SURFACE SOIL



APPROXIMATELY
4' TO 5' BGS

ECOLOGICAL RECEPTORS
INGESTION, DERMAL
CONTACT, AND INHALATION
OF SHALLOW SURFACE SOIL

LEGEND

-  SURFACE DANGER ZONE
-  EXISTING DIRT PILE
-  FORMER BERM (FROM 1959 AERIAL)
-  TREE LINE
-  SKEET RANGE – POST-1950
-  MACHINE GUN BORESIGHT RANGE
-  WATER TABLE (ESTIMATED)

DRAWN BY NN	DATE 9/7/10
CHECKED BY	DATE
REVISED BY	DATE
SCALE NOT TO SCALE	



**CONCEPTUAL SITE MODEL
MACHINE GUN BORESIGHT RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

CONTRACT NO. 2407	
OWNER NO.	
APPROVED BY	DATE
DRAWING NO. FIGURE 4-10	REV. 0

5.0 SKEET RANGE

5.1 SITE BACKGROUND

5.1.1 Historical Information

The SKT is located in the southeast portion of the installation in an open field approximately 75 meters north and 100 meters east of Building 55, as shown on Figure 1-3. The former range was located adjacent to Range Road just northeast of the taxiway intersection and was used for the training of military personnel during the 1950s. Navy Programming Guidance from the 1950s defined the SDZ of a skeet range as a 900-foot radius from the shooting field. The orientation of the site changed over the years, giving it an area of 78 acres. The site is now covered by vegetation and includes an open field on the east and two impoundment ponds within the site that are used for treatment of runway runoff.

5.1.2 Munitions Constituents

The source areas of potential MC contamination at the SKT are in and around the likely shotfall zone and firing points within which metals, propellants (nitroglycerin and DNT), and PAHs could have impacted soil, sediment, and surface water as per Table 5-1. Of note, assessment of the contributory effects from PAHs from the SKT at the impoundment ponds is difficult due to other significant sources of potential PAH contamination including stormwater runoff and treatment of runway runoff that potentially contains PAHs.

5.1.3 Current Land Use and Anticipated Future Land Use

Prior to 1950, the SKT was in a highly developed part of the base and included several buildings, shown on Figure 1-3. After 1950, the SKT was undeveloped except for the northernmost portion, which contains a baseball field and is intersected by Neptune Drive. Planned future land uses include Community Mixed Use, Recreation, and Business and Technology.

5.2 FIELD WORK

5.2.1 Site Field Activities

Shallow and deep surface soil, surface water, and sediment samples were collected and submitted for FBL analysis to determine whether site activities have resulted in contamination of the site and adjacent areas. Table 5-1 provides a summary of the samples collected during the SI, including sampling depths, duplicate locations, and the analytical program and the MC sampling locations are shown on Figure 5-1.

5.2.2 Work Plan Deviations

All SI activities at the SKT were performed in accordance with the UFP-SAP (Tetra Tech, 2009).

5.2.3 Field Data Collection

5.2.3.1 Shallow and Deep Surface Soil Sampling

At the former SKT, 60 soil samples were collected for XRF field analysis and 32 surface soil samples (varying intervals, all less than 1 foot bgs) were collected for laboratory analysis of TAL metals and PAHs, in accordance with the UFP-SAP and detailed in Table 5-1. Eight soil samples located in and around the firing points were also analyzed for nitroglycerin and DNT. Selected soil samples (SKT-SS06, SKT-SS07, SKT-SS08, and SKT-SS19) were analyzed for TOC, pH, and CEC, in addition to nitroglycerin and DNT. Uppermost surface soil samples (with SS prefix) included intervals from 0 to 3 inches bgs. Deep surface soil samples (with SB suffix) included intervals from 3 to 12 inches bgs. Soil Sample Log Sheets are included in Appendix C.

5.2.3.2 Sediment Sampling

Sediment samples were collected following Tetra Tech SOP SA-1.2 from four SKT locations to characterize the sediment (Figure 5-1). Three of the sediment samples (SKT-SD02 through SKT-SD04) were collected from within the Lower Impoundment Pond located at the SKT on April 9, 2010, using a 6- by 6-inch Wildco Ponar Sample Dredge to collect sediment samples to a depth of 6 inches. SKT-SD01 was collected from in a tributary stream flowing into the Lower Impoundment Pond using a stainless steel hand auger. Samples were homogenized, decanted if necessary, and transferred into appropriate bottleware. One Sample Log Sheet was completed for each sediment sample collected (included in Appendix C). Chain-of-custody forms are included in Appendix D. Sediment samples were analyzed for TAL metals.

5.2.3.3 Surface Water Sampling

Surface water samples were collected following Tetra Tech SOP SA-1.2 at four locations co-located with sediment samples from the SKT on April 9, 2010 (Figure 5-1). Surface water samples SKT-SW02 through SKT-SW04 were collected from the Lower Impoundment Pond with a Kemmerer sampler due to the depth of water in the pond. In accordance with the UFP-SAP, these surface water samples were collected from two discrete intervals of the water column and composited. Surface water sample

SKT-SW01 from the tributary stream was collected at a location where the depth to water was less than 2.5 feet; therefore, the Kemmerer sampler could not be used. This sample was collected by directly dipping a dedicated unpreserved bottle into the surface water and transferring the sample into appropriate sample bottles. After collection of surface water samples, the pH, temperature, specific conductivity, DO, salinity, ORP, and turbidity of surface water was measured in situ and recorded on Sample Log Sheets. Field parameter measurements are summarized on Table 5-2 and provided in Appendix C. Chain-of-custody forms are included in Appendix D. Surface water samples were analyzed for TAL Metals.

5.2.3.4 Surveying

A State of Maine licensed surveyor documented the horizontal locations of all soil sample points at the SKT. Survey control was maintained by tying into the Maine State Grid coordinate NAD83 West Zone for horizontal datum. Surveyed features were horizontally and vertically located to within +/-0.01 foot.

5.2.3.5 Visual Inspection

During the SI Tetra Tech performed a visual inspection of the SKT to identify any former structures or areas of clay pigeons or lead shot. No structures were evident. Two areas of pigeon fragments were identified and are depicted on Figure 5-1.

5.3 GEOLOGY EVALUATION

The site is relatively level in the area of the former skeet range high house and low house. The land surface in the area of the shooting field slopes to the north and east toward Upper and Lower Impoundment Ponds, respectively.

Soil borings were advanced to maximum depths of 1 foot at the SKT. Based on the soil boring log information, the shallow subsurface at the site is fine- to medium-grained sand with trace to some silt.

Note that hydrogeology was not investigated based on previous groundwater investigations north (Site 9) and south (Sites 11 and 13) of the SKT. Groundwater is expected to flow to the east-southeast toward the impoundment ponds and/or Picnic Pond.

5.4 ANALYTICAL RESULTS

5.4.1 Correlation Between Field XRF Analysis and Fixed-Base Laboratory Lead Data

To determine whether XRF concentrations could be used to predict FBL concentrations, a statistical correlation analysis was conducted. The correlation analysis for the SKT are presented in Appendix F. The XRF samples and FBL samples were not collected from the same sample at this site. The primary purpose of the XRF for this site was to confirm the location and boundaries of the skeet range; first XRF samples were collected and, at a later date, FBL samples were collected. Therefore, correlations for lead in XRF and FBL samples was expected to be lower than typical. Upon evaluation of the data, there appeared to be two groups of data concentrations; one with XRF concentrations greater than 100 mg/kg and one with XRF concentrations less than 100 mg/kg. Based on the correlation analysis, it was concluded that correlation between the FBL and field XRF data was acceptable and that predicted FBL concentrations could be calculated for samples where the XRF concentrations are less than 100 mg/kg. For samples with XRF concentrations greater than 100 mg/kg, a very weak correlation was noted and XRF concentrations could not be used to predict laboratory concentrations. XRF results greater than 100 mg/kg were acceptable for their primary purpose, to confirm the location and boundaries of the skeet range. XRF results are presented in Table 5-3, calculated lead values are included in the summary statistics Table 5-4 and both XRF values and calculated values are shown in Table 5-5 for the individual samples. See Appendix F for details on the correlation effort.

5.4.2 MC Sampling Results and Comparisons with Screening Levels and PALs

This section presents the analytical results from soil, sediment, and surface water samples collected at the SKT and presents comparisons of analytical results to applicable screening levels. A summary of the analytical program for the SI samples collected at the SKT is provided in Table 5-1, and SKT sampling locations are shown on Figure 5-1.

5.4.2.1 Shallow and Deep Surface Soil

Thirty-two soil samples were collected and analyzed for TAL metals and PAHs, and eight samples were analyzed for nitroglycerin, DNTs, TOC, pH, and CEC. Summary statistics for these soil samples collected at the SKT are provided in Table 5-4, and analytical results for target analytes detected at least once in shallow and deep surface soil are presented in Table 5-5.

Five metals (antimony, arsenic, cobalt, lead, and manganese) were detected in both shallow and deep surface soil samples at concentrations exceeding Maine RAGs and USEPA RSLs (with the exception of

manganese which only exceeded in shallow surface soil). Figure 5-2 shows the positive detection in soil. Cadmium was detected at concentrations exceeding only the Maine RAG and aluminum, chromium, and iron were detected at concentrations that exceeded only USEPA RSLs. Antimony and arsenic were detected at concentrations that exceeded Maine RAGS by two orders of magnitude and USEPA RSLs by three orders of magnitude. All concentrations of aluminum, cadmium, cobalt, and manganese were an order of magnitude or less greater than screening levels. All metals concentrations that exceeded the screening levels by more than one order of magnitude were detected in the uppermost surface samples (0 to 3 inches).

Figure 5-3 shows the positive detections of PAHs, nitroglycerin, and DNTs. Nitroglycerin and DNTs were either not detected or were detected at concentrations less than screening levels in all of the soil samples. Several PAHs [benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene] were detected at concentrations that exceeded both Maine RAGS and USEPA RSL by an order of magnitude or more. Concentrations of PAHs that exceeded screening levels by more than one order of magnitude were from uppermost surface soil samples collected from 0 to 3 inches.

5.4.2.2 Sediment

Four sediment samples were collected and analyzed for TAL metals and TOC. Summary statistics for these sediment samples are provided in Table 5-6, and analytical results for target analytes detected at least once in sediment are presented in Table 5-7. Figure 5-4 shows sediment positive detections.

Several metals (aluminum, antimony, arsenic, barium, beryllium, chromium, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium, and zinc) were detected in sediment samples at concentrations exceeding PALs. All metals were detected at concentrations exceeding PALs by an order of magnitude or less with the exception of manganese. Maximum concentrations of all metals were detected in sediment samples (NASB-SKT-SD01, -SD02, and -SD03) located within the central portion of the Lower Impoundment Pond.

5.4.2.3 Surface Water

Four surface water samples were collected and analyzed for TAL metals. Summary statistics for these surface water samples are provided in Table 5-8, and analytical results for target analytes detected at least once in surface water are presented in Table 5-9. Figure 5-4 shows surface water positive detections.

Aluminum, barium, cadmium, iron, lead, and manganese concentrations exceeded PALs in surface water by an order of magnitude or less. The maximum concentrations of barium, cadmium, and manganese were detected at sample NASB-SKT-SW01. The maximum concentrations of aluminum and lead were detected in sample NASB-SKT-SW03 and the maximum concentration of iron was detected in sample NASB-SKT-SW02.

5.4.2.4 Data Usability

Data usability was evaluated based on the results of data validation and the DQR, which are discussed in Appendix E. Based on the DQR for the SKT, SI data are of acceptable quality to make decisions on the path forward for the site. The following summarizes the evaluation for the individual DQIs for SKT analytical results:

- Validation process - In accordance with the UFP-SAP, full data validation was conducted. Based on the validation results, no data collected for SKT were rejected.
- Completeness - Sample collection completeness for all sample types was at least 100 percent. The sample analytical completeness for all sample types was also at least 100 percent.
- Sensitivity - All of the non-detected nitroglycerin soil results and silver surface water results were greater than corresponding screening criteria. Sensitivity for all other analytes and matrices was sufficient for the purposes of this investigation.
- Laboratory Accuracy - There were no significant laboratory accuracy concerns for SKT samples. See Appendix E for discussions on site data qualified due to laboratory accuracy issues and corresponding result biases if any.
- Precision - No significant QC deficiencies were noted. See Appendix E for discussions on site data qualified due to precision issues.
- Comparability - No comparability issues were noted.
- Representativeness - The reported data are adequately representative of site conditions and intended populations at SKT.

5.5 CONCLUSIONS

5.5.1 Shallow and Deep Surface Soil

For shallow and deep surface soil, a total of 14 chemicals (aluminum, antimony, arsenic, cadmium, chromium, cobalt, iron, lead, manganese, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) were detected at concentrations exceeding screening levels. All other analytes were detected at concentrations less than screening levels.

5.5.2 Sediment

Seventeen metals (aluminum, antimony, arsenic, barium, beryllium, chromium, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium, and zinc) were detected in sediment samples at concentrations exceeding PALs. Maximum concentrations of all metals were detected in sediment samples located within the Lower Impoundment Pond.

5.5.3 Surface Water

Aluminum, barium, cadmium, iron, lead, and manganese concentrations exceeded PALs in surface water by an order of magnitude or less. The maximum concentrations of these metals were in samples collected from the Lower Impoundment Pond.

5.6 UPDATED CONCEPTUAL SITE MODEL

A CSM describing the SKT and its environmental setting was established in the PA Report (2006). The CSM has been updated based on the findings of this SI and is summarized in Table 5-19. Exposure pathways by which site receptors could be exposed to or contaminated by MC are shown on Figure 5-5, and Figure 5-6 presents a graphical representation of the CSM.

5.7 RECOMMENDATIONS

Further characterization of shallow surface soil is recommended for the SKT.

Soil: Shallow surface soil (0 to 3 inches bgs) is contaminated with metals and PAHs (primarily antimony, arsenic, lead, and benzo(a)pyrene) at unacceptable concentrations. The contamination appears to be located within the combined middle area of the pre-1950 and post-1950 range fans overlap. Contamination is present from the firing points extending outward to encompass the shotfall zones in this central area. Additional shallow surface soil sampling to refine the area is recommended.

Analytes for further sampling should include antimony, arsenic, lead, and select PAHs.

Groundwater: Groundwater was not investigated, pending evaluation of soil results. Because only shallow surface soils (0 to 3 inches bgs) are of primary concern, it does not appear that contamination has migrated to deeper soils at concentrations of concern and, therefore, the migration pathway from soil to groundwater is not complete. Therefore, for groundwater no investigation is warranted.

Surface Water: Metals were detected at elevated concentrations in surface water. Further assessment is recommended for the site pond.

Sediment: Metals were detected at elevated concentrations in sediment. Further assessment is recommended for the site pond.

TABLE 5-1

SAMPLE COLLECTION AND ANALYSIS SUMMARY
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	SAMPLE METHOD	SAMPLE DEPTH (feet bgs)	XRF (LEAD)	FBL ANALYSIS				
						TAL METALS (SW 846-6010B)	pH, CEC, TOC	Nitroglycerin (SW 846-8332)	DINITROLUENE (SW 846-8330A)	PAHs (USEPA-8270C SIM)
SOIL										
SKT-SS01	NASB-SKT-SS01-0003	12/15/2009	PS	0 - 0.25	--	X	--	X	X	X
SKT-SS02	NASB-SKT-SS02-0003	12/15/2009	PS	0 - 0.25	--	X	--	X	X	X
SKT-SS03	NASB-SKT-SS03-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS04	NASB-SKT-SS04-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS05	NASB-SKT-SS05-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS06	NASB-SKT-SS06-0003	12/15/2009	PS	0 - 0.25	--	X	X	--	--	X
SKT-SS07	NASB-SKT-SS07-0003	12/15/2009	PS	0 - 0.25	--	X	X	--	--	X
SKT-SS08	NASB-SKT-SS08-0003	12/15/2009	PS	0 - 0.25	--	X	X	--	--	X
SKT-SS09	NASB-SKT-SS09-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS10	NASB-SKT-SS10-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS11	NASB-SKT-SS11-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS12	NASB-SKT-SS12-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS17	NASB-SKT-SS17-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS19	NASB-SKT-SS19-0003	12/15/2009	PS	0 - 0.25	--	X	X	X	X	X
SKT-SS21	NASB-SKT-SS21-0003	12/15/2009	PS	0 - 0.25	--	X	--	--	--	X
SKT-SS26	NASB-SKT-SS26-0003	12/15/2009	PS	0 - 0.25	--	X	--	X	X	X
SKT-SB01	NASB-SKT-SB01-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	X	X	X
SKT-SB01	NASB-SKT-SB01-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	X	X	X
SKT-SB02	NASB-SKT-SB02-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	X	X	X
SKT-SB02	NASB-SKT-SB02-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	X	X	X
SKT-SB03	NASB-SKT-SB03-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	--	--	X
SKT-SB03	NASB-SKT-SB03-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	--	--	X
SKT-SB04	NASB-SKT-SB04-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	--	--	X
SKT-SB04	NASB-SKT-SB04-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	--	--	X
SKT-SB05	NASB-SKT-SB05-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	--	--	X
SKT-SB05	NASB-SKT-SB05-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	--	--	X
SKT-SB06	NASB-SKT-SB06-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	--	--	X
SKT-SB06	NASB-SKT-SB06-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	--	--	X
SKT-SB07	NASB-SKT-SB07-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	--	--	X
SKT-SB07	NASB-SKT-SB07-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	--	--	X
SKT-SB08	NASB-SKT-SB08-0003/0312	12/15/2009	PS	0 - 0.25	X	X	--	--	--	X
SKT-SB08	NASB-SKT-SB08-0003/0312	12/15/2009	HA	0.25 - 1.0	X	X	--	--	--	X
SEDIMENT										
SKT-SD01	NASB-SKT-SD01-0006	4/9/2010	HA	0 - 0.5	--	X	X	--	--	--
SKT-SD02	NASB-SKT-SD02-0006	4/9/2010	PD	0 - 0.5	--	X	X	--	--	--
SKT-SD03	NASB-SKT-SD03-0006	4/9/2010	PD	0 - 0.5	--	X	X	--	--	--
SKT-SD04	NASB-SKT-SD04-0006	4/9/2010	PD	0 - 0.5	--	X	X	--	--	--
SURFACE WATER										
SKT-SW01	NASB-SKT-SW01-040910	4/9/2010	PS	Grab ⁽²⁾	--	X	--	--	--	--
SKT-SW02	NASB-SKT-SW02-040910	4/9/2010	KEMMLER	Composite ⁽³⁾	--	X	--	--	--	--
SKT-SW03	NASB-SKT-SW03-040910	4/9/2010	PS	Composite ⁽³⁾	--	X	--	--	--	--
SKT-SW04	NASB-SKT-SW04-040910	4/9/2010	KEMMLER	Composite ⁽³⁾	--	X	--	--	--	--

X = Indicates sample was collected and analyzed as proposed in the Uniform Federal Policy Sampling and Analysis Plan (UFP-SAP) (Tetra Tech, 2009)

bgs = Below ground surface.

CEC = Cation exchange capacity.

FBL = Fixed-base laboratory.

HA = Hand auger.

PD = Ponar Dredge.

PS = Polyethylene scoop.

SPLP = Synthetic precipitation leaching procedure .

TOC = Total organic carbon.

XRF = X-ray fluorescence.

SS = Surface soil.

SB = Soil

SKT = Skeet Range.

TABLE 5-2

**SURFACE WATER SAMPLING FIELD PARAMETERS - APRIL 2010
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

Sample Identification	Sample Date	Time of Collection	Sample Depth (ft bgs)	Depth to Bottom (ft bgs)	Sample Method	Color	pH	Spec. Cond. (mS/cm)	Temp (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (ppm)	ORP (mV)	Notes
NASB-SKT-SW01	4/9/2010	1020	NA	0.3	Direct Dip/Grab	Clear	6.46	255	9.00	1.64	10.7	0.12	170.2	Stream channel 2.5 ft wide.
NASB-SKT-SW02	4/9/2010	900	3.0/1.75	3.5	Kemmler	Clear	4.62	184	9.06	4.31	9.2	0.09	210.1	Collected composite sample from 3 ft bgs and 1.75 ft bgs.
NASB-SKT-SW03	4/9/2010	840	1.25	2.5	Kemmler/Grab	Clear	5.72	154	10.26	4.66	9.03	0.07	226.0	Too shallow to collect composite sample.
NASB-SKT-SW04	4/9/2010	815	4.0/2.5	5.0	Kemmler/Composite	Clear	5.69	169	10.44	4.93	8.76	0.08	240.4	Collected composite sample from 4 ft bgs and 2.5 ft bgs.

°C = Degrees Centigrade.

mS/cm = MilliSiemens per centimeter.

DO = Dissolved oxygen.

ft bgs = Feet below ground surface.

mg/l = Milligrams per liter.

mV = Millivolts.

NTU = Nephelometric turbidity unit.

ORP = Oxidation/reduction potential.

TABLE 5-3

**XRF LEAD DETECTIONS
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 4**

Sample ID	Depth (in-bgs)	Date	Time	XRF Analysis				Qualitative Moisture Content	Description/Comments
				1st (ppm)	2nd (ppm)	3rd (ppm)	Average (ppm) ⁽¹⁾		
Standardized (QA)	N/A	7/6/2009	1030	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/6/2009	1037	18	15	17	17	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/6/2009	1042	5465	5503	5489	5486	N/A	High Concentration Standard
NASB-SKT-XRF-SS02-0003	0-3	7/6/2009	1047	41	36	36	38	Slightly Damp	Brown F-M Sand, some Silt
NASB-SKT-XRF-SB01-0003	0-3	7/6/2009	1053	38	35	34	36	Slightly Damp	Brown F-M Sand, some Silt
NASB-SKT-XRF-SS01-0003	0-3	7/6/2009	1121	165	231	233	210	Slightly Damp	Dk Brown F-M Sand, Some Silt
NASB-SKT-XRF-SS09-0003	0-3	7/6/2009	1205	27	27	21	25	Slightly Damp	Brown F-Sand
NASB-SKT-XRF-SS10-0003	0-3	7/6/2009	1215	332	310	260	301	Slightly Damp	Dk Brown F Sand, some Silt
NASB-SKT-XRF-SS11-0003	0-3	7/6/2009	1220	35	38	37	37	Dry	Dk Brown F Sand, some Silt
NASB-SKT-XRF-SS12-0003	0-3	7/6/2009	1226	217	170	149	179	Slightly Damp	Dk Brown F Sand, some Silt, some fibrous material
NASB-SKT-XRF-SS03-0003	0-3	7/6/2009	1334	49	60	60	56	Damp	Dk Brown F Sand, and Silt
Standardized (QA)	N/A	7/6/2009	1350	PASSED	N/A	N/A	N/A	N/A	Had to standardize-battery died
NASB-SKT-XRF-SS07-0003	0-3	7/6/2009	1355	979	1124	1001	1035	Damp	Dk Brown F Sand, and Silt
NASB-SKT-XRF-SS06-0003	0-3	7/6/2009	1402	1738	1856	1923	1839	Dry	Dk Brown F Sand, some Silt
NASB-SKT-XRF-SS04-0003	0-3	7/6/2009	1412	184	159	177	173	Dry	Dk Brown F Sand, some Silt
Standardized (QA)	N/A	7/6/2009	1420	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/6/2009	1424	11	20	20	17	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/6/2009	1428	5307	5382	5336	5342	N/A	High Concentration Standard
NASB-SKT-XRF-SS08-0003	0-3	7/6/2009	1433	508	566	592	555	Dry	Dk Brown F Sand, some Silt
NASB-SKT-XRF-SS08-0003 (DUP01)	0-3	7/6/2009	1438	550	544	563	552	Dry	Dk Brown F Sand, some Silt
NASB-SKT-XRF-SS05-0003	0-3	7/6/2009	1442	25	22	20	22	Dry	Brown F-Sand, some Silt
Standardized (QA)	N/A	7/7/2009	940	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/7/2009	945	21	21	17	20	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/7/2009	955	5441	5358	5155	5318	N/A	High Concentration Standard
NASB-SKT-XRF-SB01-0312	3-12	7/7/2009	1005	33	21	26	27	Slightly Damp	Brown, F-Sand, trace Silt
NASB-MGBR/SKT-XRF-SS07-0003 (BKG 01)	0-3	7/7/2009	1010	86	65	69	73	Slightly Damp	Dk Brown, F-Sand, Silt, thin fibrous material
NASB-SKT-XRF-SB06-0312	3-12	7/7/2009	1108	21	31	21	24	Damp	Brown, F-Sand and Silt
NASB-SKT-XRF-SB06-0003	0-3	7/7/2009	1120	87	54	66	69	Damp	Dk Brown, F-Sand, some Silt
NASB-SKT-XRF-SB08-0312	3-12	7/7/2009	1130	19	21	31	24	Damp	Brown F-Sand and Silt
NASB-SKT-XRF-SB08-0003	0-3	7/7/2009	1140	91	117	99	102	Dry	Dk Brown F-Sand and Silt
NASB-SKT-XRF-SB07-0312	3-12	7/7/2009	1200	23	15	17	18	Slightly Damp	Lt. Brown F-Sand, some Silt
NASB-SKT-XRF-SB07-0003	0-3	7/7/2009	1208	29	39	39	36	Slightly Damp	Brown F-Sand, some Silt

TABLE 5-3

**XRF LEAD DETECTIONS
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 4**

Sample ID	Depth (in-bgs)	Date	Time	XRF Analysis				Qualitative Moisture Content	Description/Comments
				1st (ppm)	2nd (ppm)	3rd (ppm)	Average (ppm)		
NASB-SKT-XRF-SB02-0312	3-12	7/7/2009	1214	27	16	20	21	Slightly Damp	Brown F-Sand, some Silt
NASB-SKT-XRF-SB02-0003	0-3	7/7/2009	1220	225	210	231	222	Dry	Brown F-Sand, some Silt (Clay pigeon fragments found at sample location)
Standardized (QA)	N/A	7/7/2009	1255	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/7/2009	1258	<9	16	15	16	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/7/2009	1302	5568	5496	5649	5571	N/A	High Concentration Standard
NASB-SKT-XRF-SB04-0312	3-12	7/7/2009	1312	22	34	45	34	Slightly Damp	Brown F-Sand, little Silt
NASB-SKT-XRF-SB04-0003	0-3	7/7/2009	1320	27	26	34	29	Slightly Damp	Dk Brown F-Sand, some Silt
NASB-SKT-XRF-SB03-0312	3-12	7/7/2009	1326	18	23	19	20	Slightly Damp	Dk Brown F-Sand some Silt
NASB-SKT-XRF-SB03-0003	0-3	7/7/2009	1334	34	38	25	32	Slightly Damp	Brown F-Sand, trace coarse Sand, trace Silt
NASB-SKT-XRF-SB05-0312	3-12	7/7/2009	1340	24	24	20	23	Slightly Damp	Brown F-Sand, trace coarse Sand
NASB-SKT-XRF-SB05-0003	0-3	7/7/2009	1346	25	24	24	24	Dry	Brown F-Sand, trace coarse Sand
NASB-SKT-XRF-SB02-0003 (DUP02)	0-3	7/7/2009	1355	219	207	214	213	Dry	Brown F-Sand, some Silt (Clay pigeons found at sample location)
Standardized (QA)	N/A	7/8/2009	1155	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/8/2009	1200	17	10	22	16	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/8/2009	1203	5520	5374	5546	5480	N/A	High Concentration Standard
NASB-MGBR/SKT-XRF-SS07N-0003 (BKG 02)	0-3	7/8/2009	1250	84	103	101	96	Damp	Dk Brown, F-Sand and Silt
NASB-MGBR/SKT-XRF-SS07S-0003 (BKG 03)	0-3	7/8/2009	1256	33	33	32	33	Damp	Dk Brown, F-Sand and Silt
NASB-MGBR/SKT-XRF-SS07E-0003 (BKG 04)	0-3	7/8/2009	1303	34	<24	37	36	Damp	Dk Brown, F-Sand and Silt
NASB-MGBR/SKT-XRF-SS07W-0003 (BKG 05)	0-3	7/8/2009	1310	42	34	29	35	Damp	Dk Brown, F-Sand and Silt, fibrous organics
NASB-SKT-XRF-SS18-0003	0-3	7/8/2009	1320	<22	31	35	33	Damp	Dk Brown, F-Sand and Silt, fibrous organics, 6 Pellets found in sample and removed
NASB-SKT-XRF-SS18-0312	3-12	7/8/2009	1340	33	39	23	32	Slightly Damp	Brown, F-Sand some Silt
NASB-SKT-XRF-SS13-0003	0-3	7/8/2009	1357	38	49	46	44	Slightly Damp	Dk Brown, F-Sand and Silt, fibrous organics, 4 Clay Pigeon fragments found in sample and removed

TABLE 5-3

**XRF LEAD DETECTIONS
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 4**

Sample ID	Depth (in-bgs)	Date	Time	XRF Analysis				Qualitative Moisture Content	Description/Comments
				1st (ppm)	2nd (ppm)	3rd (ppm)	Average (ppm)		
NASB-SKT-XRF-SS13-0312	3-12	7/8/2009	1406	<20	37	33	35	Slightly Damp	Brown, F-Sand trace Silt
NASB-SKT-XRF-SS19-0003	0-3	7/8/2009	1410	489	352	327	389	Damp	Dk Brown, F-Sand and Silt, fibrous organics (4th reading taken, removed result was 112 ppm)
NASB-SKT-XRF-SS19-0312	3-12	7/8/2009	1420	18	<22	25	22	Slightly Damp	Brown, F-Sand, some Silt
Standardized (QA)	N/A	7/8/2009	1430	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/8/2009	1435	19	16	16	17	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/8/2009	1440	5076	5313	5106	5165	N/A	High Concentration Standard
NASB-SKT-XRF-SS21-0003	0-3	7/8/2009	1450	345	479	307	377	Damp	Dk Brown, F-Sand and Silt, fibrous organics (4th reading taken, removed result was 622 ppm)
NASB-SKT-XRF-SS21-0312	3-12	7/8/2009	1500	19	13	15	16	Slightly Damp	Dk Brown, F-Sand, some Silt
Standardized (QA)	N/A	7/8/2009	1855	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/8/2009	1902	17	14	19	17	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/8/2009	1909	5282	4737	5337	5119	N/A	High Concentration Standard
NASB-SKT-XRF-SS20-0003	0-3	7/8/2009	1915	53	62	52	56	Slightly Damp	Dk Brown, F-Sand and Silt
NASB-SKT-XRF-SS15-0003	0-3	7/8/2009	1920	29	83	71	61	Slightly Damp	Dk Brown, F-Sand and Silt (4th reading taken, removed result was 214 ppm)
NASB-SKT-XRF-SS14-0003	0-3	7/8/2009	1930	22	21	16	20	Slightly Damp	Brown, F-Sand, trace Silt
NASB-SKT-XRF-SS17-0003	0-3	7/8/2009	1935	599	631	654	628	Damp	Dk Brown, F-Sand and Silt
NASB-SKT-XRF-SS16-0003	0-3	7/8/2009	1943	60	143	130	111	Damp	Brown, F-Sand some Silt
NASB-SKT-XRF-SS24-0003	0-3	7/8/2009	1947	19	19	12	17	Slightly Damp	Brown, F-Sand trace Silt
NASB-SKT-XRF-SS25-0003	0-3	7/8/2009	1953	22	21	21	21	Slightly Damp	Brown, F-Sand trace Silt
Standardized (QA)	N/A	7/9/2009	828	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/9/2009	830	17	16	25	19	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/9/2009	835	5375	5405	5311	5364	N/A	High Concentration Standard
NASB-SKT-XRF-SS07-0312	3-12	7/9/2009	840	28	30	37	32	Damp	Brown F-Sand, trace Silt
NASB-SKT-XRF-SS07-0312 (DUP03)	3-12	7/9/2009	844	30	17	24	24	Damp	Brown F-Sand, trace Silt
NASB-SKT-XRF-SS06-0312	3-12	7/9/2009	847	27	26	37	30	Slightly Damp	Dk Brown F-Sand, some Silt
NASB-SKT-XRF-SS08-0312	3-12	7/9/2009	854	17	21	21	20	Slightly Damp	Dk Brown F-Sand, some Silt
NASB-SKT-XRF-SS14-0312	3-12	7/9/2009	901	23	26	25	25	Slightly Damp	Dk Brown F-Sand, trace Silt

TABLE 5-3

**XRF LEAD DETECTIONS
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 4 OF 4**

Sample ID	Depth (in-bgs)	Date	Time	XRF Analysis				Qualitative Moisture Content	Description/Comments
				1st (ppm)	2nd (ppm)	3rd (ppm)	Average (ppm)		
NASB-SKT-XRF-SS15-0312	3-12	7/9/2009	908	202	129	269	200	Slightly Damp	Dk Brown F-Sand, trace Silt
NASB-SKT-XRF-SS16-0312	3-12	7/9/2009	917	187	96	124	136	Slightly Damp	Dk Brown, F-Sand, some Silt
NASB-SKT-XRF-SS17-0312	3-12	7/9/2009	923	49	38	37	41	Slightly Damp	Brown/Red, F-Sand, trace Silt
NASB-SKT-XRF-SS20-0312	3-12	7/9/2009	929	22	18	15	18	Slightly Damp	Brown, F-Sand, trace Silt
Standardized (QA)	N/A	7/10/2009	1142	PASSED	N/A	N/A	N/A	N/A	N/A
NIST 2709 -LOW (QA)	N/A	7/10/2009	1155	15	13	19	16	N/A	Low Concentration Standard
NIST 2710 - HIGH (QA)	N/A	7/10/2009	1159	5143	5072	5046	5087	N/A	High Concentration Standard
NASB-SKT-XRF-SS22-0003	0-3	7/10/2009	1205	37	34	35	35	Dry	Brown F-M Sand, some Gravel, clay pigeon fragments in vicinity
NASB-SKT-XRF-SS22-0312	3-12	7/10/2009	1210	31	26	35	31	Slightly Damp	Brown F-M Sand, some Gravel
NASB-SKT-XRF-SS23-0003	0-3	7/10/2009	1214	133	155	184	157	Slightly Damp	Dk Brown, F-Sand, little Silt
NASB-SKT-XRF-SS23-0312	3-12	7/10/2009	1218	17	16	15	16	Slightly Damp	Dk Brown, F-Sand, little Silt

Standard Values:

NIST 2709 = 18.9 ppm

NIST 2710 = 5532 ppm

QA = Quality Assurance

(1) Predicted laboratory concentrations were not calculated for those XRF values greater than 100 mg/kg.

N/A = Not Applicable.

in-bgs = Inches below ground surface.

BKG = Background sample.

PPM = Parts per million.

Bolded - Average soil sample value exceeds 340 ppm (MEDEP Residential Guideline, January 13, 2010).

Pb = Lead.

TABLE 5-4

**FREQUENCY OF DETECTION IN SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 3**

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽³⁾	Maximum Non-Detection ⁽³⁾	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)
METALS (mg/kg)									
ALUMINUM	32/32	2160	13300	NASB-SKT-XRF-SB08	NASB-SKT-SB08-0312	--	--	69000	7700 N
ANTIMONY	12/32	0.392 J	1790 J	NASB-SKT-XRF-SS17	NASB-SKT-SS17-0003	0.263	0.488	14	3.1 N
ARSENIC	32/32	1.83	494	NASB-SKT-XRF-SS17	NASB-SKT-SS17-0003	--	--	9	0.39 C
BARIUM	32/32	8.63	687	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	--	--	6800	1500 N
BERYLLIUM	31/32	0.0959 J	0.605	NASB-SKT-XRF-SB03	NASB-SKT-SB03-0003	0.132	0.139	68	16 N
CADMIUM	27/32	0.0632 J	4.14	NASB-SKT-XRF-SS17	NASB-SKT-SS17-0003	0.0525	0.0756	2.1	7 N
CALCIUM	32/32	185 J	6400	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	--	--	NC	NC
CHROMIUM	32/32	3.47	23.4	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	--	--	100	0.29 C
COBALT	32/32	0.575 J	22.3	NASB-SKT-XRF-SB03	NASB-SKT-SB03-0003	--	--	15	2.3 N
COPPER	32/32	2.24 J	38.4	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	--	--	480	310 N
IRON	32/32	3480	18700	NASB-SKT-XRF-SB03	NASB-SKT-SB03-0003	--	--	31000	5500 N
LEAD	31/32	6.35 J	29300 J	NASB-SKT-XRF-SS17	NASB-SKT-SS17-0003	3.8	3.8	170	400 N
LEAD-CALC	12/19	2.6	287.3	NASB-SKT-XRF-SS15	NASB-SKT-XRF-SS15-0003	0	0	170	400
MAGNESIUM	32/32	174 J	3280 J	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	--	--	NC	NC
MANGANESE	32/32	29.2	2230	NASB-SKT-XRF-SB03	NASB-SKT-SB03-0003	--	--	1100	180 N
MERCURY	32/32	0.015 J	0.321	NASB-SKT-XRF-SS06	NASB-SKT-SS06-0003-D	--	--	10	1 N
NICKEL	32/32	3.49	19.6	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	--	--	100	150 N
POTASSIUM	32/32	134 J	1600 J	NASB-SKT-XRF-SB03	NASB-SKT-SB03-0312	--	--	NC	NC
SELENIUM	24/32	0.292 J	1.51	NASB-SKT-XRF-SS06	NASB-SKT-SS06-0003-D	0.158	0.952	68	39 N
SILVER	2/32	2.68 J	4.44	NASB-SKT-XRF-SS17	NASB-SKT-SS17-0003	0.0635	0.487	170	39 N
SODIUM	8/32	69.7 J	509 J	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	52.5	139	NC	NC
VANADIUM	32/32	12.4	38.1	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	--	--	240	39 N
ZINC	32/32	10.2	224	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	--	--	10000	2300 N
EXPLOSIVES (mg/kg)									
2,4-DINITROTOLUENE	1/8	0.44 J	0.44 J	NASB-SKT-XRF-SS19	NASB-SKT-SS19-0003	0.3	0.3	3.5	1.6 C
2,6-DINITROTOLUENE	1/8	0.37 J	0.37 J	NASB-SKT-XRF-SS01	NASB-SKT-SS01-0003	0.3	0.3	1.6	6.1 N
2-AMINO-4,6-DINITROTOLUENE	1/8	0.37 J	0.37 J	NASB-SKT-XRF-SS01	NASB-SKT-SS01-0003	0.3	0.3	NC	15 N
3-NITROTOLUENE	1/8	0.17 J	0.17 J	NASB-SKT-XRF-SS19	NASB-SKT-SS19-0003	0.3	0.3	NC	0.61 N
4-AMINO-2,6-DINITROTOLUENE	3/8	0.18 J	1.1 J	NASB-SKT-XRF-SS26	NASB-SKT-SS26-0003	0.3	0.3	NC	15 N
4-NITROTOLUENE	1/8	0.72 J	0.72 J	NASB-SKT-XRF-SS19	NASB-SKT-SS19-0003	0.3	0.3	NC	30 C
PAHs (ug/kg)									
1-METHYLNAPHTHALENE	25/32	2.4 J	37 J	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	72	100	NC	22000 C
2-METHYLNAPHTHALENE	27/32	1.8 J	44 J	NASB-SKT-XRF-SS19	NASB-SKT-SS19-0003	72	100	3600	31000 N
ACENAPHTHENE	28/32	2.8 J	440	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	79	120	110000	340000 N
ACENAPHTHYLENE	26/32	2.2 J	140 J	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	79	190	68000	340000 N
ANTHRACENE	28/32	4.8 J	840	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	79	100	430000	1700000 N
BENZO(A)ANTHRACENE	31/32	1.8 J	2200	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	84	84	260	150 C
BENZO(A)PYRENE	29/32	5.4 J	2400	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	16	36	26	15 C
BENZO(B)FLUORANTHENE	30/32	2 J	3300	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	72	84	260	150 C
BENZO(G,H,I)PERYLENE	28/32	3.8 J	1200	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	72	100	750000	170000 N
BENZO(K)FLUORANTHENE	29/32	3.6 J	1100	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	72	84	2600	1500 C

TABLE 5-4

FREQUENCY OF DETECTION IN SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 3

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽³⁾	Maximum Non-Detection ⁽³⁾	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)
CHRYSENE	31/32	2.4 J	2800 J	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	84	84	26000	15000 C
DIBENZO(A,H)ANTHRACENE	16/32	3.1 J	340	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	14	66	26	15 C
FLUORANTHENE	32/32	2.8 J	6000	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	--	--	1000000	230000 N
FLUORENE	27/32	2.6 J	330	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	79	120	120000	230000 N
INDENO(1,2,3-CD)PYRENE	29/32	4.8 J	1600	NASB-SKT-XRF-SS03	NASB-SKT-SS03-0003	79	90	260	150 C
NAPHTHALENE	23/32	5.6 J	160	NASB-SKT-XRF-SS19	NASB-SKT-SS19-0003	72	120	1700	3600 C
PHENANTHRENE	32/32	2.1 J	3400	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	--	--	97000	170000 N
PYRENE	32/32	2.1 J	4900	NASB-SKT-XRF-SS05	NASB-SKT-SS05-0003	--	--	750000	170000 N
XRF (mg/kg)									
LEAD	55/55	16	1839	NASB-SKT-XRF-SS06	NASB-SKT-XRF-SS06-0003	--	--	170	400 N
MISCELLANEOUS PARAMETERS (MEQ/100)									
CATION EXCHANGE CAPACITY	4/4	0.608 J	1.58 J	NASB-SKT-XRF-SS06	NASB-SKT-SS06-0003	--	--	NC	NC
MISCELLANEOUS PARAMETERS (S.U.)									
PH	4/4	3.52	5.28	NASB-SKT-XRF-SS07	NASB-SKT-SS07-0003	--	--	NC	NC
MISCELLANEOUS PARAMETERS (mg/kg)									
TOTAL ORGANIC CARBON	4/4	73800 J	356000 J	NASB-SKT-XRF-SS06	NASB-SKT-SS06-0003	--	--	NC	NC

MEQ/100 = Milliequivalent.
S.U. = Standard Unit.
mg/kg = Milligrams per kilogram.
ug/kg = Micrograms per kilogram.
XRF = X-ray fluorescence.
J = Value is estimated.
NC = No criteria.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

- 1 Maine RAGS, Appendix 3, (Jan, 2010).
 - 2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.
 - 3 Minimum and maximum non-detections are for all samples in the data set.
- Note: Chromium screening levels are for hexavalent chromium.

Note that a sample and its duplicate sample were considered separately when determining the maximum concentration, and the average concentration of a sample and its duplicate were used in determining frequency of detection.

TABLE 5-4
FREQUENCY OF DETECTION IN SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 3

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽³⁾	Maximum Non-Detection ⁽³⁾	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)
Associated Samples:									
NASB-SKT-SB01-0003					NASB-SKT-SB08-0003				
NASB-SKT-SB01-0312					NASB-SKT-SB08-0312				
NASB-SKT-XRF-SB01-0003					NASB-SKT-SS01-0003				
NASB-SKT-XRF-SB01-0312					NASB-SKT-SS01-0003-AVG				
NASB-SKT-XRF-SB02-0003					NASB-SKT-SS01-0003-D				
NASB-SKT-XRF-SB02-0003-AV					NASB-SKT-XRF-SS01-0003				
NASB-SKT-XRF-SB02-0003-D					NASB-SKT-XRF-SS02-0003				
NASB-SKT-XRF-SB02-0312					NASB-SKT-SS02-0003				
NASB-SKT-SB02-0003					NASB-SKT-SS03-0003				
NASB-SKT-SB02-0003-AVG					NASB-SKT-XRF-SS03-0003				
NASB-SKT-SB02-0003-D					NASB-SKT-XRF-SS04-0003				
NASB-SKT-SB02-0312					NASB-SKT-SS04-0003				
NASB-SKT-SB03-0003					NASB-SKT-SS05-0003				
NASB-SKT-SB03-0312					NASB-SKT-XRF-SS05-0003				
NASB-SKT-XRF-SB03-0003					NASB-SKT-XRF-SS06-0003				
NASB-SKT-XRF-SB03-0312					NASB-SKT-XRF-SS06-0312				
NASB-SKT-XRF-SB04-0003					NASB-SKT-SS06-0003				
NASB-SKT-XRF-SB04-0312					NASB-SKT-SS06-0003-AVG				
NASB-SKT-SB04-0003					NASB-SKT-SS06-0003-D				
NASB-SKT-SB04-0312					NASB-SKT-SS07-0003				
NASB-SKT-SB05-0003					NASB-SKT-XRF-SS07-0003				
NASB-SKT-SB05-0312					NASB-SKT-XRF-SS07-0312				
NASB-SKT-XRF-SB05-0003					NASB-SKT-XRF-SS07-0312-AVG				
NASB-SKT-XRF-SB05-0312					NASB-SKT-XRF-SS07-0312-D				
NASB-SKT-XRF-SB06-0003					NASB-SKT-XRF-SS08-0003				
NASB-SKT-XRF-SB06-0312					NASB-SKT-XRF-SS08-0003-AVG				
NASB-SKT-SB06-0003					NASB-SKT-XRF-SS08-0003-D				
NASB-SKT-SB06-0312					NASB-SKT-XRF-SS08-0312				
NASB-SKT-SB07-0003					NASB-SKT-SS08-0003				
NASB-SKT-SB07-0312					NASB-SKT-SS09-0003				
NASB-SKT-XRF-SB07-0003					NASB-SKT-XRF-SS09-0003				
NASB-SKT-XRF-SB07-0312					NASB-SKT-XRF-SS10-0003				
NASB-SKT-XRF-SB08-0003					NASB-SKT-SS10-0003				
NASB-SKT-XRF-SB08-0312					NASB-SKT-SS11-0003				
					NASB-SKT-XRF-SS11-0003				

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SB01-0003	SB01-0312	SB01-0003	SB01-0312	SB02-0003			
			0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs			
			Jul-09		Dec-09		SAMPLE	AVERAGE	DUPLICATE	
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6	C	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ	NA
2,6-DINITROTOLUENE	1.6	6.1	N	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U	NA
3-NITROTOLUENE	NC	0.61	N	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ	NA
4-NITROTOLUENE	NC	30	C	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U	NA
METALS (MG/KG)										
ALUMINUM	69000	7700	N	8850	8370	NA	NA	7620	7405	7190
ANTIMONY	14	3.1	N	0.301 UJ	0.272 UJ	NA	NA	0.529 J	0.49	0.451 J
ARSENIC	9	0.39	C	5.26	6.03	NA	NA	2.73	2.595	2.46
BARIUM	6800	1500	N	33	28.4	NA	NA	34.3	31.75	29.2
BERYLLIUM	68	16	N	0.446	0.383	NA	NA	0.337 J	0.3405	0.344 J
CADMIUM	2.1	7	N	0.835	0.199 J	NA	NA	0.254 J	0.239	0.224 J
CALCIUM	NC	NC		1290	1380	NA	NA	1720	1595	1470
CHROMIUM	100	0.29	C	16.5	13.9	NA	NA	9.09	8.77	8.45
COBALT	15	2.3	N	4.24	4.13	NA	NA	1.35	1.3	1.25
COPPER	480	310	N	18.4	11.9	NA	NA	6.63	6.3	5.97
IRON	31000	5500	N	10700	10100	NA	NA	7780	7900	8020
LEAD	170	400	N	47.5 J	18.8 J	NA	NA	166 J	159	152 J
LEAD-CALC	170	400		NA	NA	NA	NA	NA	NA	NA
MAGNESIUM	NC	NC		2310 J	2140 J	NA	NA	540 J	514.5	489 J
MANGANESE	1100	180	N	179 J	174 J	NA	NA	117 J	108.15	99.3
MERCURY	10	1	N	0.0325 J	0.0284 J	NA	NA	0.121	0.118	0.115
NICKEL	100	150	N	12.8	11.9	NA	NA	5.59	5.31	5.03
POTASSIUM	NC	NC		1220 J	1130 J	NA	NA	320 J	300	280 J
SELENIUM	68	39	N	0.181 UJ	0.163 UJ	NA	NA	0.642 J	0.5685	0.495 J
SILVER	170	39	N	0.241 UJ	0.163 UJ	NA	NA	0.152 UJ	0.1485 U	0.145 UJ
SODIUM	NC	NC		87.4 J	111 J	NA	NA	75.8 U	74.1 U	72.4 U
VANADIUM	240	39	N	31.1	17.7	NA	NA	18	17.55	17.1
ZINC	10000	2300	N	49.7	34.5	NA	NA	26.1	25.05	24
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC		NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000	C	14 J	2.6 J	NA	NA	12 J	10.95	9.9 J
2-METHYLNAPHTHALENE	3600	31000	N	18 J	3.5 J	NA	NA	15 J	13.5	12 J
ACENAPHTHENE	110000	340000	N	30 J	11 J	NA	NA	59 J	60	61 J
ACENAPHTHYLENE	68000	340000	N	65 J	29 J	NA	NA	100 U	35 J	35 J
ANTHRACENE	430000	1700000	N	84 J	26 J	NA	NA	91 J	93	95 J
BENZO(A)ANTHRACENE	260	150	C	380	200	NA	NA	940	935	930 J
BENZO(A)PYRENE	26	15	C	400	230	NA	NA	1200	1200	1200
BENZO(B)FLUORANTHENE	260	150	C	650	330	NA	NA	1600	1450	1300
BENZO(G,H,I)PERYLENE	750000	170000	N	240 J	140	NA	NA	660	620	580
BENZO(K)FLUORANTHENE	2600	1500	C	230 J	100	NA	NA	560	615	670

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SB01-0003	SB01-0312	SB01-0003	SB01-0312	SB02-0003			
			0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs			
			Jul-09		Dec-09		SAMPLE	AVERAGE	DUPLICATE	
CHRYSENE	26000	15000 C	510	280	NA	NA	1100	1150	1200 J	
DIBENZO(A,H)ANTHRACENE	26	15 C	<i>67</i>	<i>39</i>	NA	NA	<i>170 J</i>	<i>90</i>	20 UJ	
FLUORANTHENE	1000000	230000 N	910	310	NA	NA	1400	1400	1400 J	
FLUORENE	120000	230000 N	43 J	8.5 J	NA	NA	48 J	42.5	37 J	
INDENO(1,2,3-CD)PYRENE	260	150 C	<i>270 J</i>	<i>170</i>	NA	NA	<i>740</i>	<i>775</i>	<i>810</i>	
NAPHTHALENE	1700	3600 C	37 J	5.6 J	NA	NA	100 U	33 J	33 J	
PHENANTHRENE	97000	170000 N	510	110	NA	NA	610	555	500	
PYRENE	750000	170000 N	820	300	NA	NA	1300	1250	1200	
XRF (MG/KG)										
LEAD	170	400 N	NA	NA	36	27	NA	NA	NA	

MEQ/100 = Milliequivalent.
NC = No criterion.
J = Value is estimated.
S.U. = Standard Units.
U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

- 1 Maine RAGS, Appendix 3, (Jan, 2010).
2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SB02-0312 0.25 - 1 ft bgs Jul-09	SB02-0003 0 - 0.25 ft bgs			SB02-0312 0.25 - 1 ft bgs Jul-09	SB03-0003 0 - 0.25 ft bgs Jul-09	SB03-0312 0.25 - 1 ft bgs Jul-09	
				SAMPLE	AVERAGE	DUPLICATE				
										Dec-09
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6 C	0.3 UJ	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1 N	0.3 UJ	NA	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15 N	0.3 U	NA	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61 N	0.3 U	NA	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15 N	0.3 UJ	NA	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30 C	0.3 U	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	69000	7700 N	10900	NA	NA	NA	NA	13100	10700	
ANTIMONY	14	3.1 N	0.295 UJ	NA	NA	NA	NA	0.317 UJ	0.275 UJ	
ARSENIC	9	0.39 C	1.93 J	NA	NA	NA	NA	10.6	6.9	
BARIUM	6800	1500 N	17.3	NA	NA	NA	NA	124	36.5	
BERYLLIUM	68	16 N	0.406	NA	NA	NA	NA	0.605	0.449	
CADMIUM	2.1	7 N	0.0591 U	NA	NA	NA	NA	0.25 J	0.0965 J	
CALCIUM	NC	NC	738	NA	NA	NA	NA	1520	1280	
CHROMIUM	100	0.29 C	7.1	NA	NA	NA	NA	19.2	15	
COBALT	15	2.3 N	1.47	NA	NA	NA	NA	22.3	4.6	
COPPER	480	310 N	2.24 J	NA	NA	NA	NA	18.9	9.95	
IRON	31000	5500 N	9390	NA	NA	NA	NA	18700	11600	
LEAD	170	400 N	11.2 J	NA	NA	NA	NA	68.7 J	9.88 J	
LEAD-CALC	170	400	NA	NA	NA	NA	NA	NA	NA	
MAGNESIUM	NC	NC	590 J	NA	NA	NA	NA	2160 J	2810 J	
MANGANESE	1100	180 N	55.5 J	NA	NA	NA	NA	2230	168 J	
MERCURY	10	1 N	0.0418	NA	NA	NA	NA	0.0583	0.0219 J	
NICKEL	100	150 N	3.79 J	NA	NA	NA	NA	14.8	12.9	
POTASSIUM	NC	NC	277 J	NA	NA	NA	NA	1150 J	1600 J	
SELENIUM	68	39 N	0.585 J	NA	NA	NA	NA	0.952 UJ	0.165 UJ	
SILVER	170	39 N	0.177 UJ	NA	NA	NA	NA	0.0635 UJ	0.22 UJ	
SODIUM	NC	NC	59.1 U	NA	NA	NA	NA	104 J	134 J	
VANADIUM	240	39 N	15.8	NA	NA	NA	NA	32.9	20.1	
ZINC	10000	2300 N	17	NA	NA	NA	NA	110	33.2	
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000 C	2.4 J	NA	NA	NA	NA	3.4 J	76 U	
2-METHYLNAPHTHALENE	3600	31000 N	2 J	NA	NA	NA	NA	4.3 J	1.8 J	
ACENAPHTHENE	110000	340000 N	13 J	NA	NA	NA	NA	6.5 J	3.5 J	
ACENAPHTHYLENE	68000	340000 N	82 U	NA	NA	NA	NA	31 J	34 J	
ANTHRACENE	430000	1700000 N	82 U	NA	NA	NA	NA	27 J	18 J	
BENZO(A)ANTHRACENE	260	150 C	520	NA	NA	NA	NA	170	130	
BENZO(A)PYRENE	26	15 C	740	NA	NA	NA	NA	140	110	
BENZO(B)FLUORANTHENE	260	150 C	910	NA	NA	NA	NA	210	140	
BENZO(G,H,I)PERYLENE	750000	170000 N	540	NA	NA	NA	NA	82 J	60 J	
BENZO(K)FLUORANTHENE	2600	1500 C	320	NA	NA	NA	NA	69 J	52 J	

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 4 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SB02-0312	SB02-0003			SB02-0312	SB03-0003	SB03-0312	
				0 - 0.25 ft bgs						
			0.25 - 1 ft bgs	SAMPLE	AVERAGE	DUPLICATE	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	
			Jul-09	Dec-09				Jul-09		
CHRYSENE	26000	15000 C	730	NA	NA	NA	NA	240	160	
DIBENZO(A,H)ANTHRACENE	26	15 C	<i>120</i>	NA	NA	NA	NA	20	17	
FLUORANTHENE	1000000	230000 N	440	NA	NA	NA	NA	360	180	
FLUORENE	120000	230000 N	5 J	NA	NA	NA	NA	11 J	5.4 J	
INDENO(1,2,3-CD)PYRENE	260	150 C	<i>580</i>	NA	NA	NA	NA	87	72 J	
NAPHTHALENE	1700	3600 C	7.5 J	NA	NA	NA	NA	8.3 J	76 U	
PHENANTHRENE	97000	170000 N	57 J	NA	NA	NA	NA	160	45 J	
PYRENE	750000	170000 N	500	NA	NA	NA	NA	340	200	
XRF (MG/KG)										
LEAD	170	400 N	NA	222	217.5	213	21	NA	NA	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 5 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF									
			SB03-0003	SB03-0312	SB04-0003	SB04-0312	SB04-0003	SB04-0312	SB05-0003	SB05-0312	SB05-000	
			0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs
			Dec-09		Jul-09		Dec-09		Jul-09		Dec-09	
EXPLOSIVES (MG/KG)												
2,4-DINITROTOLUENE	3.5	1.6	C	NA								
2,6-DINITROTOLUENE	1.6	6.1	N	NA								
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA								
3-NITROTOLUENE	NC	0.61	N	NA								
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA								
4-NITROTOLUENE	NC	30	C	NA								
METALS (MG/KG)												
ALUMINUM	69000	7700	N	NA	NA	6320	9040	NA	NA	9660	8040	NA
ANTIMONY	14	3.1	N	NA	NA	0.369 UJ	0.294 UJ	NA	NA	0.283 UJ	0.277 UJ	NA
ARSENIC	9	0.39	C	NA	NA	2.27	2.41	NA	NA	3.74	3.02	NA
BARIIUM	6800	1500	N	NA	NA	18.9	15.2	NA	NA	27.5	17	NA
BERYLLIUM	68	16	N	NA	NA	0.289 J	0.445	NA	NA	0.398	0.328	NA
CADMIUM	2.1	7	N	NA	NA	0.183 J	0.0736 J	NA	NA	0.197 J	0.118 J	NA
CALCIUM	NC	NC		NA	NA	799	400	NA	NA	1000	427	NA
CHROMIUM	100	0.29	C	NA	NA	8.11	9.5	NA	NA	10.8	8.15	NA
COBALT	15	2.3	N	NA	NA	2.45	3.4	NA	NA	2.54	1.89	NA
COPPER	480	310	N	NA	NA	5.93	5.7	NA	NA	8.59	5.96	NA
IRON	31000	5500	N	NA	NA	7240	9180	NA	NA	9490	8870	NA
LEAD	170	400	N	NA	NA	23 J	18.4 J	NA	NA	39.3 J	44 J	NA
LEAD-CALC	170	400		NA								
MAGNESIUM	NC	NC		NA	NA	1280 J	1670 J	NA	NA	1490 J	960 J	NA
MANGANESE	1100	180	N	NA	NA	94.3 J	125 J	NA	NA	177 J	140 J	NA
MERCURY	10	1	N	NA	NA	0.0524	0.0294 J	NA	NA	0.0874	0.0553	NA
NICKEL	100	150	N	NA	NA	6.93	8.21	NA	NA	7.47	5.74	NA
POTASSIUM	NC	NC		NA	NA	678 J	811 J	NA	NA	638 J	394 J	NA
SELENIUM	68	39	N	NA	NA	0.401	0.177 UJ	NA	NA	0.323 J	0.332 J	NA
SILVER	170	39	N	NA	NA	0.148 U	0.177 UJ	NA	NA	0.17 UJ	0.166 UJ	NA
SODIUM	NC	NC		NA	NA	73.9 U	58.9 U	NA	NA	69.7 J	55.4 U	NA
VANADIUM	240	39	N	NA	NA	17.5	18.5	NA	NA	18.2	19.4	NA
ZINC	10000	2300	N	NA	NA	27.2	20.3	NA	NA	47.8	25.9	NA
MISCELLANEOUS PARAMETERS (MEQ/100)												
CATION EXCHANGE CAPACITY	NC	NC		NA								
MISCELLANEOUS PARAMETERS (MG/KG)												
TOTAL ORGANIC CARBON	NC	NC		NA								
MISCELLANEOUS PARAMETERS (S.U.)												
pH	NC	NC		NA								
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)												
1-METHYLNAPHTHALENE	NC	22000	C	NA	NA	6.7 J	80 U	NA	NA	5.3 J	4.8 J	NA
2-METHYLNAPHTHALENE	3600	31000	N	NA	NA	8 J	1.8 J	NA	NA	5.4 J	5.6 J	NA
ACENAPHTHENE	110000	340000	N	NA	NA	40 J	3.3 J	NA	NA	49 J	41 J	NA
ACENAPHTHYLENE	68000	340000	N	NA	NA	26 J	7.8 J	NA	NA	27 J	13 J	NA
ANTHRACENE	430000	1700000	N	NA	NA	67 J	8.2 J	NA	NA	100	100	NA
BENZO(A)ANTHRACENE	260	150	C	NA	NA	290	46 J	NA	NA	490	260	NA
BENZO(A)PYRENE	26	15	C	NA	NA	320	40	NA	NA	470	210	NA
BENZO(B)FLUORANTHENE	260	150	C	NA	NA	520	59 J	NA	NA	700	290	NA
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	NA	180	22 J	NA	NA	270	110	NA
BENZO(K)FLUORANTHENE	2600	1500	C	NA	NA	180	23 J	NA	NA	270	100	NA

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 6 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (¹)	USEPA RSL (²)	NASB-SKT-XRF								
			SB03-0003	SB03-0312	SB04-0003	SB04-0312	SB04-0003	SB04-0312	SB05-0003	SB05-0312	SB05-000
			0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs
			Dec-09		Jul-09		Dec-09		Jul-09		Dec-09
CHRYSENE	26000	15000 C	NA	NA	400	60 J	NA	NA	660	270	NA
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	NA	47	5.9 J	NA	NA	66	29	NA
FLUORANTHENE	1000000	230000 N	NA	NA	860	91	NA	NA	1400	610	NA
FLUORENE	120000	230000 N	NA	NA	35 J	3.4 J	NA	NA	50 J	44 J	NA
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	NA	210	25 J	NA	NA	300	130	NA
NAPHTHALENE	1700	3600 C	NA	NA	17 J	80 U	NA	NA	10 J	11 J	NA
PHENANTHRENE	97000	170000 N	NA	NA	470	38 J	NA	NA	760	430	NA
PYRENE	750000	170000 N	NA	NA	690	83	NA	NA	1100	490	NA
XRF (MG/KG)											
LEAD	170	400 N	32	20	NA	NA	29	34	NA	NA	24

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 7 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF								
			3	SB05-0312	SB06-0003	SB06-0312	SB06-0003	SB06-0312	SB07-0003	SB07-0312	SB07-0003
			gs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs
	Dec-09	Jul-09	Jul-09	Dec-09	Dec-09	Jul-09	Jul-09	Dec-09	Dec-09		
EXPLOSIVES (MG/KG)											
2,4-DINITROTOLUENE	3.5	1.6	C	NA							
2,6-DINITROTOLUENE	1.6	6.1	N	NA							
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA							
3-NITROTOLUENE	NC	0.61	N	NA							
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA							
4-NITROTOLUENE	NC	30	C	NA							
METALS (MG/KG)											
ALUMINUM	69000	7700	N	NA	2160	8210	NA	NA	9230	9710	NA
ANTIMONY	14	3.1	N	NA	1.7 J	0.378 UJ	NA	NA	0.283 UJ	0.282 UJ	NA
ARSENIC	9	0.39	C	NA	3.34	1.83	NA	NA	2.09	1.87	NA
BARIIUM	6800	1500	N	NA	28.7	10.6	NA	NA	12.3	8.63	NA
BERYLLIUM	68	16	N	NA	0.114 J	0.461	NA	NA	0.354	0.58	NA
CADMIUM	2.1	7	N	NA	0.349 J	0.0756 U	NA	NA	0.0632 J	0.0563 U	NA
CALCIUM	NC	NC		NA	2170	530	NA	NA	234 J	188 J	NA
CHROMIUM	100	0.29	C	NA	3.7	6.29	NA	NA	8.17	7.04	NA
COBALT	15	2.3	N	NA	1.07	1.14	NA	NA	2.73	1.86	NA
COPPER	480	310	N	NA	6.39	2.97	NA	NA	3.97 J	3.79 J	NA
IRON	31000	5500	N	NA	3780	6760	NA	NA	8880	8400	NA
LEAD	170	400	N	NA	774 J	17.6 J	NA	NA	16.4 J	3.8 UJ	NA
LEAD-CALC	170	400		NA							
MAGNESIUM	NC	NC		NA	308 J	591 J	NA	NA	1210 J	641 J	NA
MANGANESE	1100	180	N	NA	297	61.8	NA	NA	166	106	NA
MERCURY	10	1	N	NA	0.0785	0.0305 J	NA	NA	0.0474	0.0414	NA
NICKEL	100	150	N	NA	3.71	3.49	NA	NA	6.23	3.75 J	NA
POTASSIUM	NC	NC		NA	134 J	176 J	NA	NA	404 J	199 J	NA
SELENIUM	68	39	N	NA	0.411 J	0.292 J	NA	NA	0.35 J	0.514 J	NA
SILVER	170	39	N	NA	0.166 U	0.151 U	NA	NA	0.226 UJ	0.169 UJ	NA
SODIUM	NC	NC		NA	83 U	75.6 U	NA	NA	56.6 U	56.3 U	NA
VANADIUM	240	39	N	NA	15.7	15.5	NA	NA	16.7	12.4	NA
ZINC	10000	2300	N	NA	26.9	12	NA	NA	19.2	15.1	NA
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NC	NC		NA							
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NC	NC		NA							
MISCELLANEOUS PARAMETERS (S.U.)											
pH	NC	NC		NA							
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)											
1-METHYLNAPHTHALENE	NC	22000	C	NA	4.7 J	100 U	NA	NA	79 U	79 U	NA
2-METHYLNAPHTHALENE	3600	31000	N	NA	6.3 J	100 U	NA	NA	79 U	79 U	NA
ACENAPHTHENE	110000	340000	N	NA	7.9 J	100 U	NA	NA	2.8 J	79 U	NA
ACENAPHTHYLENE	68000	340000	N	NA	15 J	100 U	NA	NA	2.2 J	79 U	NA
ANTHRACENE	430000	1700000	N	NA	15 J	100 U	NA	NA	4.8 J	79 U	NA
BENZO(A)ANTHRACENE	260	150	C	NA	91 J	6 J	NA	NA	21 J	1.8 J	NA
BENZO(A)PYRENE	26	15	C	NA	100	5.4 J	NA	NA	19	16 U	NA
BENZO(B)FLUORANTHENE	260	150	C	NA	190	9.7 J	NA	NA	28 J	2 J	NA
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	60 J	3.8 J	NA	NA	12 J	79 U	NA
BENZO(K)FLUORANTHENE	2600	1500	C	NA	60 J	3.6 J	NA	NA	9.9 J	79 U	NA

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (¹)	USEPA RSL (²)	NASB-SKT-XRF								
			3	SB05-0312	SB06-0003	SB06-0312	SB06-0003	SB06-0312	SB07-0003	SB07-0312	SB07-0003
			gs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs
				Dec-09	Jul-09	Jul-09	Dec-09	Dec-09	Jul-09	Jul-09	Dec-09
CHRYSENE	26000	15000 C		NA	160	10 J	NA	NA	27 J	2.4 J	NA
DIBENZO(A,H)ANTHRACENE	26	15 C		NA	<i>17 J</i>	20 U	NA	NA	3.1 J	16 U	NA
FLUORANTHENE	1000000	230000 N		NA	280	15 J	NA	NA	51 J	4.2 J	NA
FLUORENE	120000	230000 N		NA	110 U	100 U	NA	NA	2.6 J	79 U	NA
INDENO(1,2,3-CD)PYRENE	260	150 C		NA	80 J	4.8 J	NA	NA	13 J	79 U	NA
NAPHTHALENE	1700	3600 C		NA	19 J	100 U	NA	NA	79 U	79 U	NA
PHENANTHRENE	97000	170000 N		NA	130	7.9 J	NA	NA	28 J	2.6 J	NA
PYRENE	750000	170000 N		NA	220	13 J	NA	NA	44 J	3.2 J	NA
XRF (MG/KG)											
LEAD	170	400 N		23	NA	NA	69	24	NA	NA	36

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 9 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF								SS01	
			SB07-0312	SB08-0003	SB08-0312	SB08-0003	SB08-0312	SS01-0003	SS01-0003	0 - 0.25 ft bgs	0 - 0.25 ft bgs	
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	SAMPLE	AVERAGE	Dec	
			Dec-09	Jul-09	Jul-09	Dec-09	Dec-09	Jul-09	Dec-09	Dec-09	Dec-09	
EXPLOSIVES (MG/KG)												
2,4-DINITROTOLUENE	3.5	1.6	C	NA	NA	NA	NA	NA	0.3 UJ	0.3 U	0.3 UJ	
2,6-DINITROTOLUENE	1.6	6.1	N	NA	NA	NA	NA	NA	0.37 J	0.26	0.3 UJ	
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	0.37 J	0.26	0.3 U	
3-NITROTOLUENE	NC	0.61	N	NA	NA	NA	NA	NA	0.3 U	0.3 U	0.3 U	
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	0.89 J	0.52	0.3 UJ	
4-NITROTOLUENE	NC	30	C	NA	NA	NA	NA	NA	0.3 U	0.3 U	0.3 U	
METALS (MG/KG)												
ALUMINUM	69000	7700	N	NA	3660	13300	NA	NA	2630	2495	2360	
ANTIMONY	14	3.1	N	NA	0.608 J	0.308 UJ	NA	NA	1.49 J	515.745	1030 J	
ARSENIC	9	0.39	C	NA	4.13	2.09 J	NA	NA	3.5 J	154.75	306 J	
BARIUM	6800	1500	N	NA	36.5	12.3	NA	NA	55.4	53.8	52.2	
BERYLLIUM	68	16	N	NA	0.166 J	0.571	NA	NA	0.167 J	0.163	0.159 J	
CADMIUM	2.1	7	N	NA	0.302 J	0.0617 U	NA	NA	0.407 J	1.6135	2.82 J	
CALCIUM	NC	NC		NA	307 J	185 J	NA	NA	1460	1345	1230	
CHROMIUM	100	0.29	C	NA	5.08	9.38	NA	NA	5.26	4.89	4.52	
COBALT	15	2.3	N	NA	0.682 J	2.01	NA	NA	1.08 J	1.04	1 J	
COPPER	480	310	N	NA	8.14	3 J	NA	NA	10.6	13.65	16.7	
IRON	31000	5500	N	NA	6410	11000	NA	NA	4080	3780	3480	
LEAD	170	400	N	NA	443 J	6.35 J	NA	NA	512 J	9456	18400 J	
LEAD-CALC	170	400		NA	NA	NA	NA	NA	NA	NA	NA	
MAGNESIUM	NC	NC		NA	236 J	857 J	NA	NA	369 J	349	329 J	
MANGANESE	1100	180	N	NA	45.4	83.1	NA	NA	68.6	61.3	54	
MERCURY	10	1	N	NA	0.134	0.0515	NA	NA	0.145	0.152	0.159	
NICKEL	100	150	N	NA	5.33	5.15 J	NA	NA	7.69	7.35	7.01	
POTASSIUM	NC	NC		NA	144 J	243 J	NA	NA	407 J	395.5	384 J	
SELENIUM	68	39	N	NA	0.727	0.609 J	NA	NA	0.868	0.889	0.91	
SILVER	170	39	N	NA	0.232 U	0.185 UJ	NA	NA	0.18 UJ	1.385	2.68 J	
SODIUM	NC	NC		NA	77.3 U	61.7 U	NA	NA	90.1 U	87 U	83.9 U	
VANADIUM	240	39	N	NA	19.7	16.7	NA	NA	15.9	14.95	14	
ZINC	10000	2300	N	NA	10.6	14.9	NA	NA	17.9	17.25	16.6	
MISCELLANEOUS PARAMETERS (MEQ/100)												
CATION EXCHANGE CAPACITY	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA	
MISCELLANEOUS PARAMETERS (MG/KG)												
TOTAL ORGANIC CARBON	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA	
MISCELLANEOUS PARAMETERS (S.U.)												
pH	NC	NC		NA	NA	NA	NA	NA	NA	NA	NA	
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)												
1-METHYLNAPHTHALENE	NC	22000	C	NA	12 J	84 U	NA	NA	16 J	15.5	15 J	
2-METHYLNAPHTHALENE	3600	31000	N	NA	16 J	84 U	NA	NA	20 J	19	18 J	
ACENAPHTHENE	110000	340000	N	NA	100 U	84 U	NA	NA	120 U	36 J	36 J	
ACENAPHTHYLENE	68000	340000	N	NA	100 U	84 U	NA	NA	120 U	56 J	56 J	
ANTHRACENE	430000	1700000	N	NA	26 J	84 U	NA	NA	56 J	65.5	75 J	
BENZO(A)ANTHRACENE	260	150	C	NA	100 J	84 U	NA	NA	260	315	370 J	
BENZO(A)PYRENE	26	15	C	NA	99	17 U	NA	NA	290	360	430	
BENZO(B)FLUORANTHENE	260	150	C	NA	200	84 U	NA	NA	540	560	580	
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	100 U	84 U	NA	NA	150	190	230	
BENZO(K)FLUORANTHENE	2600	1500	C	NA	59 J	84 U	NA	NA	180 J	300	420 J	

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF								SS01	
			SB07-0312	SB08-0003	SB08-0312	SB08-0003	SB08-0312	SS01-0003	SS01-0003		SS01	
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs		
			Dec-09	Jul-09	Jul-09	Dec-09	Dec-09	Jul-09	Dec-09	Dec-09	Dec	
CHRYSENE	26000	15000 C	NA	170	84 U	NA	NA	NA	390	475	560 J	
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	21 U	17 U	NA	NA	<i>43</i>	<i>27.25</i>	23 UJ		
FLUORANTHENE	1000000	230000 N	NA	310	2.8 J	NA	NA	800	870	940 J		
FLUORENE	120000	230000 N	NA	100 U	84 U	NA	NA	120 U	31 J	31 J		
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	80 J	84 U	NA	NA	<i>210</i>	<i>260</i>	<i>310</i>		
NAPHTHALENE	1700	3600 C	NA	100 U	84 U	NA	NA	120 U	43 J	43 J		
PHENANTHRENE	97000	170000 N	NA	200	2.1 J	NA	NA	450	465	480		
PYRENE	750000	170000 N	NA	250	2.1 J	NA	NA	620	700	780		
XRF (MG/KG)												
LEAD	170	400 N	18	NA	NA	102	24	NA	NA	NA		

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF								
			-0003	SS02-0003	SS02-0003	SS03-0003	SS03-0003	SS04-0003	SS04-0003	SS05-0003	
			0 - 0.25 ft bgs								
			DUPLICATE	0 - 0.25 ft bgs							
-09	Jul-09	Dec-09	Jul-09	Dec-09	Jul-09	Dec-09	Jul-09				
EXPLOSIVES (MG/KG)											
2,4-DINITROTOLUENE	3.5	1.6	C	NA	0.3 UJ	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1	N	NA	0.3 UJ	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	0.3 U	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61	N	NA	0.3 U	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	0.3 UJ	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30	C	NA	0.3 U	NA	NA	NA	NA	NA	NA
METALS (MG/KG)											
ALUMINUM	69000	7700	N	NA	8470	NA	9230	NA	6510	NA	8100
ANTIMONY	14	3.1	N	NA	0.315 UJ	NA	0.373 UJ	NA	0.347 UJ	NA	0.302 UJ
ARSENIC	9	0.39	C	NA	4.7	NA	6.54	NA	4.09	NA	3.26
BARIUM	6800	1500	N	NA	30.2	NA	41.3	NA	22.9	NA	687
BERYLLIUM	68	16	N	NA	0.376	NA	0.422	NA	0.297 J	NA	0.322
CADMIUM	2.1	7	N	NA	0.626	NA	1.1	NA	0.285 J	NA	0.246 J
CALCIUM	NC	NC		NA	1240	NA	2470	NA	1920	NA	888
CHROMIUM	100	0.29	C	NA	19.8	NA	23.4	NA	11.8	NA	11
COBALT	15	2.3	N	NA	4.72	NA	6.36	NA	2.27	NA	3.13
COPPER	480	310	N	NA	14.8	NA	38.4	NA	6.74	NA	9.28
IRON	31000	5500	N	NA	12000	NA	14500	NA	8620	NA	9430
LEAD	170	400	N	NA	50.9 J	NA	134 J	NA	68.4 J	NA	17 J
LEAD-CALC	170	400		NA	NA						
MAGNESIUM	NC	NC		NA	2540 J	NA	3280 J	NA	1210 J	NA	1550 J
MANGANESE	1100	180	N	NA	202	NA	213	NA	181	NA	150
MERCURY	10	1	N	NA	0.0351 J	NA	0.0416	NA	0.0679	NA	0.054
NICKEL	100	150	N	NA	12.5	NA	19.6	NA	8.97	NA	7.94
POTASSIUM	NC	NC		NA	1430 J	NA	1250 J	NA	526 J	NA	845 J
SELENIUM	68	39	N	NA	0.189 UJ	NA	0.224 U	NA	0.307 J	NA	0.306 J
SILVER	170	39	N	NA	0.252 UJ	NA	0.299 U	NA	0.277 UJ	NA	0.181 UJ
SODIUM	NC	NC		NA	93.7 J	NA	135 J	NA	69.4 U	NA	60.4 U
VANADIUM	240	39	N	NA	30.1	NA	30.5	NA	30.4	NA	15.8
ZINC	10000	2300	N	NA	44.2	NA	224	NA	26.7	NA	36.2
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NC	NC		NA	NA						
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NC	NC		NA	NA						
MISCELLANEOUS PARAMETERS (S.U.)											
pH	NC	NC		NA	NA						
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)											
1-METHYLNAPHTHALENE	NC	22000	C	NA	12 J	NA	18 J	NA	7.7 J	NA	26 J
2-METHYLNAPHTHALENE	3600	31000	N	NA	18 J	NA	26 J	NA	9.6 J	NA	26 J
ACENAPHTHENE	110000	340000	N	NA	88	NA	110	NA	52 J	NA	440
ACENAPHTHYLENE	68000	340000	N	NA	47 J	NA	98 J	NA	39 J	NA	36 J
ANTHRACENE	430000	1700000	N	NA	130	NA	280	NA	89 J	NA	840
BENZO(A)ANTHRACENE	260	150	C	NA	700	NA	1100	NA	660 J	NA	2200
BENZO(A)PYRENE	26	15	C	NA	1000	NA	1600	NA	520	NA	2400
BENZO(B)FLUORANTHENE	260	150	C	NA	1400	NA	2400	NA	830	NA	3300
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	630	NA	1200	NA	280	NA	1200
BENZO(K)FLUORANTHENE	2600	1500	C	NA	500	NA	790	NA	270 J	NA	1100

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			-0003	SS02-0003	SS02-0003	SS03-0003	SS03-0003	SS04-0003	SS04-0003	SS05-0003
			0 - 0.25 ft bgs							
			DUPLICATE	0 - 0.25 ft bgs						
-09	Jul-09	Dec-09	Jul-09	Dec-09	Jul-09	Dec-09	Jul-09			
CHRYSENE	26000	15000 C	NA	860	NA	1500	NA	910 J	NA	2100
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	<i>160</i>	NA	<i>300</i>	NA	19 UJ	NA	<i>340</i>
FLUORANTHENE	1000000	230000 N	NA	1400	NA	2700	NA	1200 J	NA	6000
FLUORENE	120000	230000 N	NA	69 J	NA	120	NA	50 J	NA	330
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	<i>700</i>	NA	<i>1600</i>	NA	<i>360</i>	NA	<i>1500</i>
NAPHTHALENE	1700	3600 C	NA	38 J	NA	54 J	NA	16 J	NA	54 J
PHENANTHRENE	97000	170000 N	NA	580	NA	1300	NA	500	NA	3400
PYRENE	750000	170000 N	NA	1300	NA	2300	NA	1000	NA	4900
XRF (MG/KG)										
LEAD	170	400 N	<i>210</i>	NA	38	NA	56	NA	<i>173</i>	NA

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level
(June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SS05-0003	SS06-0003	SS06-0312	SS06-0003				
			0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs				
			Dec-09	Jul-09		SAMPLE	AVERAGE	DUPLICATE		
						Dec-09				
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6	C	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1	N	NA	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61	N	NA	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30	C	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	69000	7700	N	NA	4070	3835	3600	NA	NA	NA
ANTIMONY	14	3.1	N	NA	0.968 J	1.379	1.79 J	NA	NA	NA
ARSENIC	9	0.39	C	NA	5.02	4.88	4.74	NA	NA	NA
BARIUM	6800	1500	N	NA	39.4	38.05	36.7	NA	NA	NA
BERYLLIUM	68	16	N	NA	0.139 U	0.1355 U	0.132 U	NA	NA	NA
CADMIUM	2.1	7	N	NA	0.535 J	0.518	0.501 J	NA	NA	NA
CALCIUM	NC	NC		NA	3230	3330	3430	NA	NA	NA
CHROMIUM	100	0.29	C	NA	12	11.55	11.1	NA	NA	NA
COBALT	15	2.3	N	NA	1.91	1.77	1.63 J	NA	NA	NA
COPPER	480	310	N	NA	8.43	8.235	8.04	NA	NA	NA
IRON	31000	5500	N	NA	7340	6885	6430	NA	NA	NA
LEAD	170	400	N	NA	702 J	741.5	781 J	NA	NA	NA
LEAD-CALC	170	400		NA	NA	NA	NA	NA	NA	61
MAGNESIUM	NC	NC		NA	1060 J	980.5	901 J	NA	NA	NA
MANGANESE	1100	180	N	NA	301	279	257	NA	NA	NA
MERCURY	10	1	N	NA	0.274	0.2975	0.321	NA	NA	NA
NICKEL	100	150	N	NA	14	13.6	13.2	NA	NA	NA
POTASSIUM	NC	NC		NA	870 J	800.5	731 J	NA	NA	NA
SELENIUM	68	39	N	NA	1.33	1.42	1.51	NA	NA	NA
SILVER	170	39	N	NA	0.278 U	0.271 U	0.264 U	NA	NA	NA
SODIUM	NC	NC		NA	139 U	135.5 U	132 U	NA	NA	NA
VANADIUM	240	39	N	NA	32.4	30.4	28.4	NA	NA	NA
ZINC	10000	2300	N	NA	53.8	51.15	48.5	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC		NA	1.58 J	1.58 J	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC		NA	356000 J	356000 J	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC		NA	4.02	4.02	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000	C	NA	21 J	22	23 J	NA	NA	NA
2-METHYLNAPHTHALENE	3600	31000	N	NA	30 J	30	30 J	NA	NA	NA
ACENAPHTHENE	110000	340000	N	NA	110 J	104	98 J	NA	NA	NA
ACENAPHTHYLENE	68000	340000	N	NA	190 U	185 U	180 U	NA	NA	NA
ANTHRACENE	430000	1700000	N	NA	160 J	180	200	NA	NA	NA
BENZO(A)ANTHRACENE	260	150	C	NA	1100 J	1025	950 J	NA	NA	NA
BENZO(A)PYRENE	26	15	C	NA	1200 J	609	36 UJ	NA	NA	NA
BENZO(B)FLUORANTHENE	260	150	C	NA	1800	1650	1500	NA	NA	NA
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	600	525	450	NA	NA	NA
BENZO(K)FLUORANTHENE	2600	1500	C	NA	900	880	860	NA	NA	NA

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF						
			SS05-0003	SS06-0003	SS06-0312	SS06-0003			
			0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs			
			Dec-09	Jul-09	Dec-09	SAMPLE	AVERAGE	DUPLICATE	
CHRYSENE	26000	15000 C	NA	1700 J	1500	1300 J	NA	NA	
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	38 UJ	37 U	36 UJ	NA	NA	
FLUORANTHENE	1000000	230000 N	NA	2400 J	2450	2500 J	NA	NA	
FLUORENE	120000	230000 N	NA	74 J	78	82 J	NA	NA	
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	<i>850</i>	<i>740</i>	<i>630</i>	NA	NA	
NAPHTHALENE	1700	3600 C	NA	69 J	64.5	60 J	NA	NA	
PHENANTHRENE	97000	170000 N	NA	1000	1100	1200	NA	NA	
PYRENE	750000	170000 N	NA	2000	2000	2000	NA	NA	
XRF (MG/KG)									
LEAD	170	400 N	22	NA	NA	NA	<i>1839</i>	30	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level
(June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF-SS07-0003							
			SS07-0003	SS07-0312			SS07-0003	SS08-0003		
				0.25 - 1 ft bgs						
				0 - 0.25 ft bgs	SAMPLE	AVERAGE			DUPLICATE	0 - 0.25 ft bgs
Jul-09				Dec-09		Jul-09				
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6	C	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1	N	NA	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61	N	NA	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30	C	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	69000	7700	N	5790	NA	NA	NA	NA	NA	4660
ANTIMONY	14	3.1	N	3.3 J	NA	NA	NA	NA	NA	0.813 J
ARSENIC	9	0.39	C	6.74	NA	NA	NA	NA	NA	4.9
BARIUM	6800	1500	N	102	NA	NA	NA	NA	NA	13.9
BERYLLIUM	68	16	N	0.458 J	NA	NA	NA	NA	NA	0.192 J
CADMIUM	2.1	7	N	0.585 J	NA	NA	NA	NA	NA	0.13 J
CALCIUM	NC	NC		6400	NA	NA	NA	NA	NA	447
CHROMIUM	100	0.29	C	12.1	NA	NA	NA	NA	NA	8.92
COBALT	15	2.3	N	6.38	NA	NA	NA	NA	NA	2.09
COPPER	480	310	N	15.2	NA	NA	NA	NA	NA	5.18
IRON	31000	5500	N	11300	NA	NA	NA	NA	NA	8690
LEAD	170	400	N	2340 J	NA	NA	NA	NA	NA	785 J
LEAD-CALC	170	400		NA	NA	46.4	46.4	NA	NA	NA
MAGNESIUM	NC	NC		1150 J	NA	NA	NA	NA	NA	1080 J
MANGANESE	1100	180	N	171	NA	NA	NA	NA	NA	74.6
MERCURY	10	1	N	0.299	NA	NA	NA	NA	NA	0.0882
NICKEL	100	150	N	10.4	NA	NA	NA	NA	NA	6.77
POTASSIUM	NC	NC		683 J	NA	NA	NA	NA	NA	505 J
SELENIUM	68	39	N	1.48	NA	NA	NA	NA	NA	0.473 J
SILVER	170	39	N	0.487 U	NA	NA	NA	NA	NA	0.143 UJ
SODIUM	NC	NC		509 J	NA	NA	NA	NA	NA	71.5 U
VANADIUM	240	39	N	38.1	NA	NA	NA	NA	NA	24.5
ZINC	10000	2300	N	23.3	NA	NA	NA	NA	NA	19.3
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC		1.02 J	NA	NA	NA	NA	NA	0.608 J
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC		197000 J	NA	NA	NA	NA	NA	73800 J
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC		5.28	NA	NA	NA	NA	NA	3.73
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000	C	37 J	NA	NA	NA	NA	NA	14 J
2-METHYLNAPHTHALENE	3600	31000	N	42 J	NA	NA	NA	NA	NA	17 J
ACENAPHTHENE	110000	340000	N	140 J	NA	NA	NA	NA	NA	64 J
ACENAPHTHYLENE	68000	340000	N	140 J	NA	NA	NA	NA	NA	68 J
ANTHRACENE	430000	1700000	N	240 J	NA	NA	NA	NA	NA	110
BENZO(A)ANTHRACENE	260	150	C	1700 J	NA	NA	NA	NA	NA	600 J
BENZO(A)PYRENE	26	15	C	1400	NA	NA	NA	NA	NA	400
BENZO(B)FLUORANTHENE	260	150	C	2100	NA	NA	NA	NA	NA	540
BENZO(G,H,I)PERYLENE	750000	170000	N	780	NA	NA	NA	NA	NA	210
BENZO(K)FLUORANTHENE	2600	1500	C	830	NA	NA	NA	NA	NA	260

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF-SS07-0003						
			SS07-0003	SS07-0312			SS07-0003	SS08-0003	
				0.25 - 1 ft bgs					
			0 - 0.25 ft bgs	SAMPLE	AVERAGE	DUPLICATE	0 - 0.25 ft bgs	SAMPLE	
Jul-09				Dec-09			Jul-09		
CHRYSENE	26000	15000 C	2800 J	NA	NA	NA	NA	750 J	
DIBENZO(A,H)ANTHRACENE	26	15 C	66 UJ	NA	NA	NA	NA	19 UJ	
FLUORANTHENE	1000000	230000 N	3800 J	NA	NA	NA	NA	1200 J	
FLUORENE	120000	230000 N	110 J	NA	NA	NA	NA	44 J	
INDENO(1,2,3-CD)PYRENE	260	150 C	<i>1100</i>	NA	NA	NA	NA	<i>290</i>	
NAPHTHALENE	1700	3600 C	74 J	NA	NA	NA	NA	33 J	
PHENANTHRENE	97000	170000 N	1600	NA	NA	NA	NA	540	
PYRENE	750000	170000 N	3200	NA	NA	NA	NA	1000	
XRF (MG/KG)									
LEAD	170	400 N	NA	<i>1035</i>	32	28	24	NA	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level
(June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SS08-0003		SS08-0312	SS08-0003	SS09-0003	SS09-0003	SS09-0003	
			0 - 0.25 ft bgs							
			AVERAGE	DUPLICATE	0.25 - 1 ft bgs	0 - 0.25 ft bgs				
Jul-09		Dec-09	Jul-09	Dec-09						
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6	C	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1	N	NA	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61	N	NA	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30	C	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	69000	7700	N	NA	NA	NA	NA	NA	7080	NA
ANTIMONY	14	3.1	N	NA	NA	NA	NA	NA	0.263 UJ	NA
ARSENIC	9	0.39	C	NA	NA	NA	NA	NA	2.29	NA
BARIUM	6800	1500	N	NA	NA	NA	NA	NA	14.3	NA
BERYLLIUM	68	16	N	NA	NA	NA	NA	NA	0.299	NA
CADMIUM	2.1	7	N	NA	NA	NA	NA	NA	0.0525 U	NA
CALCIUM	NC	NC		NA	NA	NA	NA	NA	453	NA
CHROMIUM	100	0.29	C	NA	NA	NA	NA	NA	9.55	NA
COBALT	15	2.3	N	NA	NA	NA	NA	NA	3.3	NA
COPPER	480	310	N	NA	NA	NA	NA	NA	5.87	NA
IRON	31000	5500	N	NA	NA	NA	NA	NA	9300	NA
LEAD	170	400	N	NA	NA	NA	NA	NA	20.3 J	NA
LEAD-CALC	170	400		NA	NA	NA	0 U	NA	NA	NA
MAGNESIUM	NC	NC		NA	NA	NA	NA	NA	2060 J	NA
MANGANESE	1100	180	N	NA	NA	NA	NA	NA	103	NA
MERCURY	10	1	N	NA	NA	NA	NA	NA	0.015 J	NA
NICKEL	100	150	N	NA	NA	NA	NA	NA	8.48	NA
POTASSIUM	NC	NC		NA	NA	NA	NA	NA	1000 J	NA
SELENIUM	68	39	N	NA	NA	NA	NA	NA	0.158 UJ	NA
SILVER	170	39	N	NA	NA	NA	NA	NA	0.21 UJ	NA
SODIUM	NC	NC		NA	NA	NA	NA	NA	52.5 U	NA
VANADIUM	240	39	N	NA	NA	NA	NA	NA	19.4	NA
ZINC	10000	2300	N	NA	NA	NA	NA	NA	19.9	NA
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC		NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000	C	NA	NA	NA	NA	NA	72 U	NA
2-METHYLNAPHTHALENE	3600	31000	N	NA	NA	NA	NA	NA	72 U	NA
ACENAPHTHENE	110000	340000	N	NA	NA	NA	NA	NA	4.9 J	NA
ACENAPHTHYLENE	68000	340000	N	NA	NA	NA	NA	NA	2.6 J	NA
ANTHRACENE	430000	1700000	N	NA	NA	NA	NA	NA	6.4 J	NA
BENZO(A)ANTHRACENE	260	150	C	NA	NA	NA	NA	NA	37 J	NA
BENZO(A)PYRENE	26	15	C	NA	NA	NA	NA	NA	26	NA
BENZO(B)FLUORANTHENE	260	150	C	NA	NA	NA	NA	NA	72 U	NA
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	NA	NA	NA	NA	72 U	NA
BENZO(K)FLUORANTHENE	2600	1500	C	NA	NA	NA	NA	NA	72 U	NA

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF						
			SS08-0003		SS08-0312	SS08-0003	SS09-0003	SS09-0003	
			0 - 0.25 ft bgs						
			AVERAGE	DUPLICATE	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	
			Jul-09		Dec-09		Jul-09		Dec-09
CHRYSENE	26000	15000 C	NA	NA	NA	NA	36 J	NA	
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	NA	NA	NA	14 UJ	NA	
FLUORANTHENE	1000000	230000 N	NA	NA	NA	NA	75 J	NA	
FLUORENE	120000	230000 N	NA	NA	NA	NA	3.8 J	NA	
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	NA	NA	NA	22 J	NA	
NAPHTHALENE	1700	3600 C	NA	NA	NA	NA	72 U	NA	
PHENANTHRENE	97000	170000 N	NA	NA	NA	NA	43 J	NA	
PYRENE	750000	170000 N	NA	NA	NA	NA	65 J	NA	
XRF (MG/KG)									
LEAD	170	400 N	<i>555</i>	<i>553.5</i>	<i>552</i>	20	NA	25	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF								
			SS10-0003	SS10-0003	SS11-0003	SS11-0003	SS12-0003	SS12-0003	SS13-0003		
			0 - 0.25 ft bgs Jul-09	0 - 0.25 ft bgs Dec-09	0 - 0.25 ft bgs Jul-09	0 - 0.25 ft bgs Dec-09	0 - 0.25 ft bgs Jul-09	0 - 0.25 ft bgs Dec-09	0 - 0.25 ft bgs Jul-09		
EXPLOSIVES (MG/KG)											
2,4-DINITROTOLUENE	3.5	1.6 C	NA	NA							
2,6-DINITROTOLUENE	1.6	6.1 N	NA	NA							
2-AMINO-4,6-DINITROTOLUENE	NC	15 N	NA	NA							
3-NITROTOLUENE	NC	0.61 N	NA	NA							
4-AMINO-2,6-DINITROTOLUENE	NC	15 N	NA	NA							
4-NITROTOLUENE	NC	30 C	NA	NA							
METALS (MG/KG)											
ALUMINUM	69000	7700 N	2910	NA	2720	NA	2930	NA	NA	NA	
ANTIMONY	14	3.1 N	0.392 J	NA	0.392 J	NA	0.488 UJ	NA	NA	NA	
ARSENIC	9	0.39 C	3.35	NA	3.77	NA	3.63	NA	NA	NA	
BARIUM	6800	1500 N	24.3	NA	23.3	NA	83.6	NA	NA	NA	
BERYLLIUM	68	16 N	0.116 J	NA	0.0959 J	NA	0.148 J	NA	NA	NA	
CADMIUM	2.1	7 N	0.159 J	NA	0.242 J	NA	0.366 J	NA	NA	NA	
CALCIUM	NC	NC	265 J	NA	598	NA	310 J	NA	NA	NA	
CHROMIUM	100	0.29 C	5.37	NA	4.5	NA	5.21	NA	NA	NA	
COBALT	15	2.3 N	0.737 J	NA	0.575 J	NA	0.838 J	NA	NA	NA	
COPPER	480	310 N	6.18	NA	5.02	NA	9.33	NA	NA	NA	
IRON	31000	5500 N	5950	NA	4440	NA	4070	NA	NA	NA	
LEAD	170	400 N	294 J	NA	265 J	NA	66.7 J	NA	NA	NA	
LEAD-CALC	170	400	NA	163.2							
MAGNESIUM	NC	NC	371 J	NA	279 J	NA	222 J	NA	NA	NA	
MANGANESE	1100	180 N	39.2	NA	86.2	NA	29.2	NA	NA	NA	
MERCURY	10	1 N	0.0852	NA	0.11	NA	0.153	NA	NA	NA	
NICKEL	100	150 N	4.46	NA	6.24	NA	7.94	NA	NA	NA	
POTASSIUM	NC	NC	273 J	NA	230 J	NA	314 J	NA	NA	NA	
SELENIUM	68	39 N	0.635	NA	0.523	NA	1.07	NA	NA	NA	
SILVER	170	39 N	0.272 U	NA	0.228 U	NA	0.195 U	NA	NA	NA	
SODIUM	NC	NC	68.1 U	NA	76.1 U	NA	97.6 U	NA	NA	NA	
VANADIUM	240	39 N	22	NA	20.5	NA	19.1	NA	NA	NA	
ZINC	10000	2300 N	14.1	NA	13.3	NA	15.7	NA	NA	NA	
MISCELLANEOUS PARAMETERS (MEQ/100)											
CATION EXCHANGE CAPACITY	NC	NC	NA	NA							
MISCELLANEOUS PARAMETERS (MG/KG)											
TOTAL ORGANIC CARBON	NC	NC	NA	NA							
MISCELLANEOUS PARAMETERS (S.U.)											
pH	NC	NC	NA	NA							
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)											
1-METHYLNAPHTHALENE	NC	22000 C	7.4 J	NA	16 J	NA	18 J	NA	NA	NA	
2-METHYLNAPHTHALENE	3600	31000 N	7.8 J	NA	20 J	NA	24 J	NA	NA	NA	
ACENAPHTHENE	110000	340000 N	24 J	NA	25 J	NA	19 J	NA	NA	NA	
ACENAPHTHYLENE	68000	340000 N	34 J	NA	80 J	NA	73 J	NA	NA	NA	
ANTHRACENE	430000	1700000 N	48 J	NA	66 J	NA	69 J	NA	NA	NA	
BENZO(A)ANTHRACENE	260	150 C	230 J	NA	320 J	NA	310 J	NA	NA	NA	
BENZO(A)PYRENE	26	15 C	210	NA	240	NA	240	NA	NA	NA	
BENZO(B)FLUORANTHENE	260	150 C	290	NA	360	NA	360	NA	NA	NA	
BENZO(G,H,I)PERYLENE	750000	1700000 N	120	NA	130	NA	120 J	NA	NA	NA	
BENZO(K)FLUORANTHENE	2600	1500 C	140	NA	150	NA	200	NA	NA	NA	

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 20 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (¹)	USEPA RSL (²)	NASB-SKT-XRF							
			SS10-0003	SS10-0003	SS11-0003	SS11-0003	SS12-0003	SS12-0003	SS13-0003	
			0 - 0.25 ft bgs							
			Jul-09	Dec-09	Jul-09	Dec-09	Jul-09	Dec-09	Jul-09	
CHRYSENE	26000	15000 C	300 J	NA	500 J	NA	490 J	NA	NA	
DIBENZO(A,H)ANTHRACENE	26	15 C	18 UJ	NA	21 UJ	NA	27 UJ	NA	NA	
FLUORANTHENE	1000000	230000 N	490 J	NA	730 J	NA	740 J	NA	NA	
FLUORENE	120000	230000 N	20 J	NA	24 J	NA	27 J	NA	NA	
INDENO(1,2,3-CD)PYRENE	260	150 C	<i>160</i>	NA	<i>170</i>	NA	150	NA	NA	
NAPHTHALENE	1700	3600 C	17 J	NA	51 J	NA	86 J	NA	NA	
PHENANTHRENE	97000	170000 N	260	NA	360	NA	450	NA	NA	
PYRENE	750000	170000 N	420	NA	640	NA	650	NA	NA	
XRF (MG/KG)										
LEAD	170	400 N	NA	301	NA	37	NA	179	44	

MEQ/100 = Milliequivalent.
 NC = No criterion.
 J = Value is estimated.
 S.U. = Standard Units.
 U = Analyte not detected at the
 reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
 Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

- 1 Maine RAGS, Appendix 3, (Jan, 2010).
 2 USEPA residential Regional Screening Level
 (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 21 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SS13-0312	SS14-0003	SS14-0312	SS15-0003	SS15-0312	SS16-0003		
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs		
			Jul-09	Jul-09	Jul-09	Jul-09	Jul-09	Jul-09		
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6	C	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1	N	NA	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61	N	NA	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30	C	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	69000	7700	N	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	14	3.1	N	NA	NA	NA	NA	NA	NA	NA
ARSENIC	9	0.39	C	NA	NA	NA	NA	NA	NA	NA
BARIUM	6800	1500	N	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	68	16	N	NA	NA	NA	NA	NA	NA	NA
CADMIUM	2.1	7	N	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA
CHROMIUM	100	0.29	C	NA	NA	NA	NA	NA	NA	NA
COBALT	15	2.3	N	NA	NA	NA	NA	NA	NA	NA
COPPER	480	310	N	NA	NA	NA	NA	NA	NA	NA
IRON	31000	5500	N	NA	NA	NA	NA	NA	NA	NA
LEAD	170	400	N	NA	NA	NA	NA	NA	NA	NA
LEAD-CALC	170	400		97.5	0 U	24.5	287.3	NA	NA	NA
MAGNESIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA
MANGANESE	1100	180	N	NA	NA	NA	NA	NA	NA	NA
MERCURY	10	1	N	NA	NA	NA	NA	NA	NA	NA
NICKEL	100	150	N	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA
SELENIUM	68	39	N	NA	NA	NA	NA	NA	NA	NA
SILVER	170	39	N	NA	NA	NA	NA	NA	NA	NA
SODIUM	NC	NC		NA	NA	NA	NA	NA	NA	NA
VANADIUM	240	39	N	NA	NA	NA	NA	NA	NA	NA
ZINC	10000	2300	N	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC		NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000	C	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	3600	31000	N	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	110000	340000	N	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	68000	340000	N	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	430000	1700000	N	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	260	150	C	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	26	15	C	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	260	150	C	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	2600	1500	C	NA	NA	NA	NA	NA	NA	NA

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
 SKEET RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF						
			SS13-0312	SS14-0003	SS14-0312	SS15-0003	SS15-0312	SS16-0003	
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	
			Jul-09	Jul-09	Jul-09	Jul-09	Jul-09	Jul-09	
CHRYSENE	26000	15000 C	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	1000000	230000 N	NA	NA	NA	NA	NA	NA	NA
FLUORENE	120000	230000 N	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	1700	3600 C	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	97000	170000 N	NA	NA	NA	NA	NA	NA	NA
PYRENE	750000	170000 N	NA	NA	NA	NA	NA	NA	NA
XRF (MG/KG)									
LEAD	170	400 N	35	20	25	61	200	111	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
 Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 23 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF							
			SS16-0312	SS17-0003	SS17-0312	SS17-0003	SS18-0003	SS18-0312		
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs		
			Jul-09	Jul-09	Jul-09	Dec-09	Jul-09	Jul-09		
EXPLOSIVES (MG/KG)										
2,4-DINITROTOLUENE	3.5	1.6	C	NA	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1	N	NA	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61	N	NA	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15	N	NA	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30	C	NA	NA	NA	NA	NA	NA	NA
METALS (MG/KG)										
ALUMINUM	69000	7700	N	NA	3100	NA	NA	NA	NA	NA
ANTIMONY	14	3.1	N	NA	1790 J	NA	NA	NA	NA	NA
ARSENIC	9	0.39	C	NA	494	NA	NA	NA	NA	NA
BARIUM	6800	1500	N	NA	22.3	NA	NA	NA	NA	NA
BERYLLIUM	68	16	N	NA	0.124 J	NA	NA	NA	NA	NA
CADMIUM	2.1	7	N	NA	4.14	NA	NA	NA	NA	NA
CALCIUM	NC	NC		NA	635	NA	NA	NA	NA	NA
CHROMIUM	100	0.29	C	NA	8.91	NA	NA	NA	NA	NA
COBALT	15	2.3	N	NA	1.05	NA	NA	NA	NA	NA
COPPER	480	310	N	NA	24.5	NA	NA	NA	NA	NA
IRON	31000	5500	N	NA	5510	NA	NA	NA	NA	NA
LEAD	170	400	N	NA	29300 J	NA	NA	NA	NA	NA
LEAD-CALC	170	400		NA	NA	NA	141.3	82.9	75.6	
MAGNESIUM	NC	NC		NA	552 J	NA	NA	NA	NA	NA
MANGANESE	1100	180	N	NA	51.5	NA	NA	NA	NA	NA
MERCURY	10	1	N	NA	0.136	NA	NA	NA	NA	NA
NICKEL	100	150	N	NA	6.55	NA	NA	NA	NA	NA
POTASSIUM	NC	NC		NA	389 J	NA	NA	NA	NA	NA
SELENIUM	68	39	N	NA	1.04	NA	NA	NA	NA	NA
SILVER	170	39	N	NA	4.44	NA	NA	NA	NA	NA
SODIUM	NC	NC		NA	82.3 U	NA	NA	NA	NA	NA
VANADIUM	240	39	N	NA	23.6	NA	NA	NA	NA	NA
ZINC	10000	2300	N	NA	19.2	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)										
CATION EXCHANGE CAPACITY	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)										
TOTAL ORGANIC CARBON	NC	NC		NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)										
pH	NC	NC		NA	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)										
1-METHYLNAPHTHALENE	NC	22000	C	NA	13 J	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	3600	31000	N	NA	14 J	NA	NA	NA	NA	NA
ACENAPHTHENE	110000	340000	N	NA	88 J	NA	NA	NA	NA	NA
ACENAPHTHYLENE	68000	340000	N	NA	51 J	NA	NA	NA	NA	NA
ANTHRACENE	430000	1700000	N	NA	140	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	260	150	C	NA	840 J	NA	NA	NA	NA	NA
BENZO(A)PYRENE	26	15	C	NA	730	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	260	150	C	NA	1300	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	750000	170000	N	NA	390	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	2600	1500	C	NA	500	NA	NA	NA	NA	NA

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF						
			SS16-0312	SS17-0003	SS17-0312	SS17-0003	SS18-0003	SS18-0312	
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	
			Jul-09	Jul-09	Jul-09	Dec-09	Jul-09	Jul-09	
CHRYSENE	26000	15000 C	NA	1000 J	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	22 UJ	NA	NA	NA	NA	NA
FLUORANTHENE	1000000	230000 N	NA	1900 J	NA	NA	NA	NA	NA
FLUORENE	120000	230000 N	NA	65 J	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	570	NA	NA	NA	NA	NA
NAPHTHALENE	1700	3600 C	NA	28 J	NA	NA	NA	NA	NA
PHENANTHRENE	97000	170000 N	NA	940	NA	NA	NA	NA	NA
PYRENE	750000	170000 N	NA	1600	NA	NA	NA	NA	NA
XRF (MG/KG)									
LEAD	170	400 N	136	NA	628	41	33	32	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF						
			SS19-0003	SS19-0312	SS19-0003	SS20-0003	SS20-0312	SS21-0003	
			0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	
			Jul-09	Jul-09	Dec-09	Jul-09	Jul-09	Jul-09	
EXPLOSIVES (MG/KG)									
2,4-DINITROTOLUENE	3.5	1.6 C	0.44 J	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	1.6	6.1 N	0.3 UJ	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NC	15 N	0.3 U	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NC	0.61 N	0.17 J	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NC	15 N	0.18 J	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NC	30 C	0.72 J	NA	NA	NA	NA	NA	NA
METALS (MG/KG)									
ALUMINUM	69000	7700 N	3590	NA	NA	NA	NA	NA	3220
ANTIMONY	14	3.1 N	3.73 J	NA	NA	NA	NA	NA	0.446 UJ
ARSENIC	9	0.39 C	4.56	NA	NA	NA	NA	NA	3.64
BARIUM	6800	1500 N	76.7	NA	NA	NA	NA	NA	48.5
BERYLLIUM	68	16 N	0.214 J	NA	NA	NA	NA	NA	0.131 J
CADMIUM	2.1	7 N	0.51	NA	NA	NA	NA	NA	0.741
CALCIUM	NC	NC	966	NA	NA	NA	NA	NA	1040
CHROMIUM	100	0.29 C	6.73	NA	NA	NA	NA	NA	5.69
COBALT	15	2.3 N	1.24	NA	NA	NA	NA	NA	1.04 J
COPPER	480	310 N	13	NA	NA	NA	NA	NA	10.8
IRON	31000	5500 N	5340	NA	NA	NA	NA	NA	5420
LEAD	170	400 N	513 J	NA	NA	NA	NA	NA	101 J
LEAD-CALC	170	400	NA	NA	2.6	250.8	0 U	NA	NA
MAGNESIUM	NC	NC	343 J	NA	NA	NA	NA	NA	318 J
MANGANESE	1100	180 N	41.8	NA	NA	NA	NA	NA	110
MERCURY	10	1 N	0.201	NA	NA	NA	NA	NA	0.178
NICKEL	100	150 N	11.1	NA	NA	NA	NA	NA	14.3
POTASSIUM	NC	NC	352 J	NA	NA	NA	NA	NA	251 J
SELENIUM	68	39 N	1.28	NA	NA	NA	NA	NA	1.04
SILVER	170	39 N	0.184 U	NA	NA	NA	NA	NA	0.357 U
SODIUM	NC	NC	92 U	NA	NA	NA	NA	NA	89.2 U
VANADIUM	240	39 N	24.7	NA	NA	NA	NA	NA	37.5
ZINC	10000	2300 N	29.1	NA	NA	NA	NA	NA	22.1
MISCELLANEOUS PARAMETERS (MEQ/100)									
CATION EXCHANGE CAPACITY	NC	NC	1.25 J	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)									
TOTAL ORGANIC CARBON	NC	NC	210000 J	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)									
pH	NC	NC	3.52	NA	NA	NA	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)									
1-METHYLNAPHTHALENE	NC	22000 C	33 J	NA	NA	NA	NA	NA	14 J
2-METHYLNAPHTHALENE	3600	31000 N	44 J	NA	NA	NA	NA	NA	18 J
ACENAPHTHENE	110000	340000 N	59 J	NA	NA	NA	NA	NA	27 J
ACENAPHTHYLENE	68000	340000 N	87 J	NA	NA	NA	NA	NA	68 J
ANTHRACENE	430000	1700000 N	140	NA	NA	NA	NA	NA	65 J
BENZO(A)ANTHRACENE	260	150 C	630 J	NA	NA	NA	NA	NA	270 J
BENZO(A)PYRENE	26	15 C	24 U	NA	NA	NA	NA	NA	210
BENZO(B)FLUORANTHENE	260	150 C	840	NA	NA	NA	NA	NA	360
BENZO(G,H,I)PERYLENE	750000	170000 N	250	NA	NA	NA	NA	NA	100 J
BENZO(K)FLUORANTHENE	2600	1500 C	360	NA	NA	NA	NA	NA	170

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF						
			SS19-0003	SS19-0312	SS19-0003	SS20-0003	SS20-0312	SS21-0003	
			0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	
			Jul-09	Jul-09	Dec-09	Jul-09	Jul-09	Jul-09	
CHRYSENE	26000	15000 C	880 J	NA	NA	NA	NA	NA	380 J
DIBENZO(A,H)ANTHRACENE	26	15 C	24 UJ	NA	NA	NA	NA	NA	24 UJ
FLUORANTHENE	1000000	230000 N	1500 J	NA	NA	NA	NA	NA	630 J
FLUORENE	120000	230000 N	58 J	NA	NA	NA	NA	NA	24 J
INDENO(1,2,3-CD)PYRENE	260	150 C	<i>350</i>	NA	NA	NA	NA	NA	150
NAPHTHALENE	1700	3600 C	160	NA	NA	NA	NA	NA	42 J
PHENANTHRENE	97000	170000 N	890	NA	NA	NA	NA	NA	330
PYRENE	750000	170000 N	1300	NA	NA	NA	NA	NA	550
XRF (MG/KG)									
LEAD	170	400 N	NA	389	22	56	18	NA	NA

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF-SS21-0312						
			SS21-0312	SS21-0003	SS22-0003	SS22-0312	SS23-0003	SS23-0312	
			0.25 - 1 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	0 - 0.25 ft bgs	0.25 - 1 ft bgs	
			Jul-09	Dec-09	Jul-09	Jul-09	Jul-09	Jul-09	
CHRYSENE	26000	15000 C	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	1000000	230000 N	NA	NA	NA	NA	NA	NA	NA
FLUORENE	120000	230000 N	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	1700	3600 C	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	97000	170000 N	NA	NA	NA	NA	NA	NA	NA
PYRENE	750000	170000 N	NA	NA	NA	NA	NA	NA	NA
XRF (MG/KG)									
LEAD	170	400 N	377	16	35	31	157	16	

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.
Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level
(June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 29 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF		
			SS24-0003	SS25-0003	SS26-0003
			0 - 0.25 ft bgs Jul-09	0 - 0.25 ft bgs Jul-09	0 - 0.25 ft bgs Dec-09
EXPLOSIVES (MG/KG)					
2,4-DINITROTOLUENE	3.5	1.6 C	NA	NA	0.3 UJ
2,6-DINITROTOLUENE	1.6	6.1 N	NA	NA	0.3 UJ
2-AMINO-4,6-DINITROTOLUENE	NC	15 N	NA	NA	0.3 U
3-NITROTOLUENE	NC	0.61 N	NA	NA	0.3 U
4-AMINO-2,6-DINITROTOLUENE	NC	15 N	NA	NA	1.1 J
4-NITROTOLUENE	NC	30 C	NA	NA	0.3 U
METALS (MG/KG)					
ALUMINUM	69000	7700 N	NA	NA	2230
ANTIMONY	14	3.1 N	NA	NA	1.23 J
ARSENIC	9	0.39 C	NA	NA	3.11
BARIIUM	6800	1500 N	NA	NA	43.7
BERYLLIUM	68	16 N	NA	NA	0.1 J
CADMIUM	2.1	7 N	NA	NA	0.195 J
CALCIUM	NC	NC	NA	NA	578
CHROMIUM	100	0.29 C	NA	NA	3.47
COBALT	15	2.3 N	NA	NA	0.6 J
COPPER	480	310 N	NA	NA	6.68
IRON	31000	5500 N	NA	NA	3840
LEAD	170	400 N	NA	NA	241 J
LEAD-CALC	170	400	0 U	0 U	NA
MAGNESIUM	NC	NC	NA	NA	174 J
MANGANESE	1100	180 N	NA	NA	33.9
MERCURY	10	1 N	NA	NA	0.0668
NICKEL	100	150 N	NA	NA	4.48
POTASSIUM	NC	NC	NA	NA	181 J
SELENIUM	68	39 N	NA	NA	0.553
SILVER	170	39 N	NA	NA	0.135 U
SODIUM	NC	NC	NA	NA	67.6 U
VANADIUM	240	39 N	NA	NA	15.1
ZINC	10000	2300 N	NA	NA	10.2
MISCELLANEOUS PARAMETERS (MEQ/100)					
CATION EXCHANGE CAPACITY	NC	NC	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)					
TOTAL ORGANIC CARBON	NC	NC	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)					
pH	NC	NC	NA	NA	NA
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)					
1-METHYLNAPHTHALENE	NC	22000 C	NA	NA	4.8 J
2-METHYLNAPHTHALENE	3600	31000 N	NA	NA	5.3 J
ACENAPHTHENE	110000	340000 N	NA	NA	12 J
ACENAPHTHYLENE	68000	340000 N	NA	NA	24 J
ANTHRACENE	430000	1700000 N	NA	NA	26 J
BENZO(A)ANTHRACENE	260	150 C	NA	NA	97 J
BENZO(A)PYRENE	26	15 C	NA	NA	92
BENZO(B)FLUORANTHENE	260	150 C	NA	NA	150
BENZO(G,H,I)PERYLENE	750000	170000 N	NA	NA	52 J
BENZO(K)FLUORANTHENE	2600	1500 C	NA	NA	68 J

TABLE 5-5

SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE AND SUBSURFACE SOIL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 30 OF 30

PARAMETER	MAINE RAGS (Appendix 3) (1)	USEPA RSL (2)	NASB-SKT-XRF		
			SS24-0003	SS25-0003	SS26-0003
			0 - 0.25 ft bgs	0 - 0.25 ft bgs	0 - 0.25 ft bgs
			Jul-09	Jul-09	Dec-09
CHRYSENE	26000	15000 C	NA	NA	150 J
DIBENZO(A,H)ANTHRACENE	26	15 C	NA	NA	18 UJ
FLUORANTHENE	1000000	230000 N	NA	NA	260 J
FLUORENE	120000	230000 N	NA	NA	10 J
INDENO(1,2,3-CD)PYRENE	260	150 C	NA	NA	90 U
NAPHTHALENE	1700	3600 C	NA	NA	90 U
PHENANTHRENE	97000	170000 N	NA	NA	140
PYRENE	750000	170000 N	NA	NA	220
XRF (MG/KG)					
LEAD	170	400 N	17	21	NA

MEQ/100 = Milliequivalent.

NC = No criterion.

J = Value is estimated.

S.U. = Standard Units.

U = Analyte not detected at the reported detection limit.

Yellow Shading - concentration greater than Maine RAGs criterion.

Italics - concentration greater than RSL criterion.

Note: Chromium screening levels are for hexavalent chromium.

1 Maine RAGS, Appendix 3, (Jan, 2010).

2 USEPA residential Regional Screening Level (June, 2011). Non-carcinogen values are divided by 10.

TABLE 5-6

FREQUENCY OF DETECTION IN SEDIMENT
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽²⁾	Maximum Non-Detection ⁽²⁾	Project Action Limit ⁽¹⁾
METALS (mg/kg)								
ALUMINUM	4/4	3920	19800	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	2600
ANTIMONY	2/4	1.4 J	1.97 J	NASB-SKT-SWSD03	NASB-SKT-SD03-0006	0.342	6.38	0.16
ARSENIC	4/4	2.01	49.7 J	NASB-SKT-SWSD02	NASB-SKT-SD02-0006	--	--	9.8
BARIUM	4/4	11.6 J	231 J	NASB-SKT-SWSD02	NASB-SKT-SD02-0006	--	--	0.7
BERYLLIUM	4/4	0.262 J	1.39	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	0.55
CADMIUM	4/4	0.0932 J	8.48	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	0.99
CALCIUM	4/4	806 J	4850 J	NASB-SKT-SWSD02	NASB-SKT-SD02-0006	--	--	NC
CHROMIUM	4/4	5.69	59.5	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	43.4
COBALT	4/4	1.92	32.5	NASB-SKT-SWSD03	NASB-SKT-SD03-0006	--	--	10
COPPER	4/4	4.69	116	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	31.6
IRON	4/4	4790	144000	NASB-SKT-SWSD02	NASB-SKT-SD02-0006	--	--	10000
LEAD	4/4	11.5	189	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	35.8
MAGNESIUM	4/4	1090 J	6120 J	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	NC
MANGANESE	4/4	102 J	11000 J	NASB-SKT-SWSD02	NASB-SKT-SD02-0006	--	--	630
MERCURY	3/4	0.0984 J	0.223	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	0.0137	0.0137	0.18
NICKEL	4/4	5.77	44.4	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	22.7
POTASSIUM	4/4	531	3550	NASB-SKT-SWSD04	NASB-SKT-SD04-0006-D	--	--	NC
SELENIUM	2/4	1.72	2.18	NASB-SKT-SWSD03	NASB-SKT-SD03-0006	0.205	3.83	0.29
SODIUM	4/4	71.9 J	428 J	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	NC
VANADIUM	4/4	8.5	92.7	NASB-SKT-SWSD04	NASB-SKT-SD04-0006	--	--	43
ZINC	4/4	19.7	634	NASB-SKT-SWSD03	NASB-SKT-SD03-0006	--	--	121
MISCELLANEOUS PARAMETERS (MG/KG)								
TOTAL ORGANIC CARBON	4/4	4040	102000	NASB-SKT-SWSD02	NASB-SKT-SD02-0006	--	--	NC

1. See Appendix G for supporting documentation.

2. Minimum and maximum non-detections are for all samples in the data set.

mg/kg = Miligram per kilogram.

J = Value is estimated.

Shaded concentrations exceed Project Action Limits.

Associated Samples:

- NASB-SKT-SD01-0006
- NASB-SKT-SD02-0006
- NASB-SKT-SD03-0006
- NASB-SKT-SD04-0006
- NASB-SKT-SD04-0006-AVG
- NASB-SKT-SD04-0006-D

Note that a sample and its duplicate sample were considered separately when determining the maximum concentration, and the average concentration of a sample and its duplicate were used in determining frequency of detection.

TABLE 5-7

SUMMARY OF DETECTED CONCENTRATIONS IN SEDIMENT
 SKEET RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE

PARAMETER	Project Action Limit ⁽¹⁾	NASB-SKT					
		SD01-0006	SD02-0006	SD03-0006	SD04-0006		
					SAMPLE	AVERAGE	DUPLICATE
METALS (MG/KG)							
ALUMINUM	2600	3920	12100	18300	19800	19750	19700
ANTIMONY	0.16	0.342 UJ	6.38 UJ	1.97 J	1.4 J	1.43 J	1.46 J
ARSENIC	9.8	2.01	49.7 J	34.7	28.6	28.65	28.7
BARIUM	0.7	11.6 J	231 J	179 J	129 J	127.5 J	126 J
BERYLLIUM	0.55	0.262 J	0.947 J	1.35	1.39	1.36	1.33
CADMIUM	0.99	0.0932 J	4.76 J	8.04	8.48	7.87	7.26
CALCIUM	NC	806 J	4850 J	3680 J	3330 J	3260 J	3190 J
CHROMIUM	43.4	5.69	32.4	56.1	59.5	57.35	55.2
COBALT	10	1.92	32.3	32.5	21.8	20.75	19.7
COPPER	31.6	4.69	71.6	112	116	114.5	113
IRON	10000	4790	144000	72300	37400	37050	36700
LEAD	35.8	11.5	124	166	189	182	175
MAGNESIUM	NC	1090 J	3430 J	5550 J	6120 J	6060 J	6000 J
MANGANESE	630	102 J	11000 J	3690 J	1010 J	1002 J	994 J
MERCURY	0.18	0.0137 U	0.0984 J	0.138 J	0.223	0.1755	0.128
NICKEL	22.7	5.77	31.1	43.7	44.4	43.5	42.6
POTASSIUM	NC	531	2160	3340	3510	3530	3550
SELENIUM	0.29	0.205 U	3.83 U	2.18	1.9	1.81	1.72
SODIUM	NC	71.9 J	333 J	355 J	428 J	418 J	408 J
VANADIUM	43	8.5	52.6	72.5	92.7	88.5	84.3
ZINC	121	19.7	432	634	583	569.5	556
MISCELLANEOUS PARAMETERS (MG/KG)							
TOTAL ORGANIC CARBON	NC	4040	102000	83500	96600	82250	67900

mg/kg = Milligrams per kilogram.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

Shaded concentrations exceed Project Action Limits.

1. See Appendix G for supporting documentation.

TABLE 5-8

FREQUENCY OF DETECTION IN SURFACE WATER
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Parameter	Frequency of Detection	Minimum Result	Maximum Result	Location of Maximum Detection	Sample with Maximum Detection	Minimum Non-Detection ⁽²⁾	Maximum Non-Detection ⁽²⁾	Project Action Limit ⁽¹⁾
METALS (ug/l)								
ALUMINUM	4/4	78	99.6	NASB-SKT-SWSD03	NASB-SKT-SW03-040910	--	--	87
ARSENIC	2/4	0.877 J	0.892 J	NASB-SKT-SWSD04	NASB-SKT-SW04-040910-D	0.75	0.75	150
BARIUM	4/4	13.5	23.3	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	3.9
CADMIUM	4/4	0.346 J	0.407 J	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	0.08
CALCIUM	4/4	11300	18900	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	NC
COPPER	3/4	1.48 J	1.86 J	NASB-SKT-SWSD04	NASB-SKT-SW04-040910	1.25	1.25	2.36
IRON	4/4	991	1630	NASB-SKT-SWSD02	NASB-SKT-SW02-040910	--	--	1000
LEAD	1/4	0.443 J	0.443 J	NASB-SKT-SWSD03	NASB-SKT-SW03-040910	0.375	0.375	0.41
MAGNESIUM	4/4	1340	2190	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	NC
MANGANESE	4/4	284	582	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	120
NICKEL	4/4	0.964 J	1.79 J	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	13.4
POTASSIUM	4/4	2190	2470	NASB-SKT-SWSD02	NASB-SKT-SW02-040910	--	--	NC
POTASSIUM	4/4	2190	2470	NASB-SKT-SWSD04	NASB-SKT-SW04-040910-D	--	--	NC
SODIUM	4/4	12600	24400	NASB-SKT-SWSD01	NASB-SKT-SW01-040910	--	--	NC
ZINC	4/4	7.18	11.4	NASB-SKT-SWSD04	NASB-SKT-SW04-040910	--	--	30.6

1 See Appendix G for supporting documentation.

2 Minimum and maximum non-detections are for all samples in the data set.

ug/l = Micrograms per liter.

J = Value is estimated.

Shaded concentrations exceed Project Action Limits.

Associated Samples:

- NASB-SKT-SW01-040910
- NASB-SKT-SW02-040910
- NASB-SKT-SW03-040910
- NASB-SKT-SW04-040910
- NASB-SKT-SW04-040910-AVG
- NASB-SKT-SW04-040910-D

Note that a sample and its duplicate sample were considered separately when determining the maximum concentration, and the average concentration of a sample and its duplicate were used in determining frequency of detection.

TABLE 5-9

**SUMMARY OF DETECTED CONCENTRATIONS IN SURFACE WATER
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

PARAMETER	Project Action Limit ⁽¹⁾	NASB-SKT					
		SW01	SW02	SW03	SW04		
		Apr-10	Apr-10	Apr-10	SAMPLE Apr-10	AVERAGE Apr-10	DUPLICATE Apr-10
METALS (UG/L)							
ALUMINUM	87	98.8	82.5	99.6	80.5	79.25	78
ARSENIC	150	0.75 U	0.877 J	0.75 U	0.75 U	0.6335 J	0.892 J
BARIUM	3.9	23.3	15.1	13.5	13.7	13.6	13.5
CADMIUM	0.08	0.407 J	0.377 J	0.346 J	0.368 J	0.3765 J	0.385 J
CALCIUM	NC	18900	12700	11300	11700	11750	11800
COPPER	2.36	1.52 J	1.25 U	1.48 J	1.86 J	1.855 J	1.85 J
IRON	1000	991	1630	1340	1300	1300	1300
LEAD	0.41	0.375 U	0.375 U	0.443 J	0.375 U	0.375 U	0.375 U
MAGNESIUM	NC	2190	1490	1340	1350	1355 J	1360 J
MANGANESE	120	582	386	284	342	342	342
NICKEL	13.4	1.79 J	0.989 J	0.964 J	1.6 J	1.53 J	1.46 J
POTASSIUM	NC	2380	2470	2190	2380	2425	2470
SODIUM	NC	24400	14000	12600	12800	13050	13300
ZINC	30.6	10.5	7.18	8.78	11.4	10.8	10.2

UG/L = Micrograms per liter.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

Shaded concentrations exceed Project Action Limits.

1. See Appendix G for supporting documentation.

TABLE 5-10

**CONCEPTUAL SITE MODEL INFORMATION PROFILE
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK MAINE
PAGE 1 OF 3**

Profile Type	Information Needs	Findings
Range/Site Profile	Installation Name	Former Naval Air Station Brunswick
	Installation Location	Cumberland County, Maine
	Range/Site Name	Skeet Range
	Range/Site Location	Located Approximately 75 meters north and 100 meters east of the current Building 55 and adjacent to the Machine Gun Boresight Range.
	Range/Site History	Shown on installation maps from 1946 and in an aerial photo from 1957.
	Range/Site Area and Layout	The Skeet Range encompasses approximately 73.2 acres. On the map from 1946, the range is shown with the firing towards the north; however, in the 1957 aerial photo and on later maps, the range is shown firing to the east.
	Range/Site Structures	Aerial photos show shot house for skeet; however, structures that existed when the range was active are no longer present at the site.
	Range/Site Boundaries	N: Building 211 S: Forested Area E: Forested Area W: Orion Street
Range/Site Security	No security or access restrictions to the site.	
Munitions/Release Profile	Munitions Types	Shotgun ammunition – 12 Gauge.
	Maximum Probability Penetration Depth	Small arms, one foot or less. Based on the SI results, contamination presenting a concern is located primarily in the top 3 inches (shallow surface soil) of the ground surface.
	MEC Density	Not applicable.
	Munitions Scrap/Fragments/ MDAS	Not applicable.
	Associated MC	Primary MC is lead (associated with bullets), as confirmed by the SI. Other associated MC included: antimony (increases hardness), arsenic (present in lead), and PAHs (associated with skeet clay targets).

TABLE 5-10

**CONCEPTUAL SITE MODEL INFORMATION PROFILE
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK MAINE
PAGE 2 OF 3**

Profile Type	Information Needs	Findings
	Migration Routes/Release Mechanisms	Erosion – The majority of the Skeet Range is level. A drainage is present south of Neptune Drive within the Skeet Range. The drainage is a natural feature and well vegetated, therefore, no significant run-off is anticipated from the Skeet Range. Run-off that does occur will flow into the retention ponds, which retain the majority of the surface water from this area for collection and reduction of suspended sediment. Contamination from runoff is not significant based on acceptable risk evaluation of detention pond sediment and surface water. Moreover, significant migration of contamination from the shallow surface to the deep surface soils is not evident.
Physical Profile (see Section 2)	Climate	Continental climate with three well-defined seasons. Highest temperatures occur in July (79F or higher). Coldest temperatures occur in January (21F or lower).
	Topography	The majority of the Skeet Range is level. A northwest-southeast trending drainage is present south of Neptune Drive within the Skeet Range.
	Geology	Silty Clay with occasional fine sand, trace small fragments, wet soft, very soft, corresponds to the descriptions of the Presumpscot Formation.
	Soil	Soils from the Suffield-Buxton-Hollis Association which consists of deep to shallow, moderately well drained to somewhat poorly drained soils that are characterized by low permeability. The field boring log for monitoring well 078 lists the top soil as dark brown, fine sandy silt with black, silty, fine sand just below the topsoil. From 0.1 to 5 feet bgs the soil is reddish bring to tan moist loose sand.
	Hydrogeology	The yield of bedrock wells in the vicinity of the NASB ranges from less than 10gpm to over 50gpm. Most of the wells in the vicinity are between 101 and 300ft deep.
	Hydrology	Surface water flows towards the retention ponds which are a part of the Merriconeag Stream watershed.
	Vegetation	The majority of the Skeet Range (post 1950) area is open and grassy with carious crops of woodland species of trees (mostly pine). The Skeet Range (pre1950) is highly developed and vegetation consists mainly of urban landscaping and small trees.
Land Use and Exposure Profile	Current Land Use	The area is primarily undeveloped except for the northernmost portion, which contains a baseball field and is intersected by Neptune Drive.
	Current Human Receptors	Current human receptors include: Civilian, visitors, trespassers, and maintenance workers/contractors.
	Current Activities	Grounds crew and pedestrian traffic.

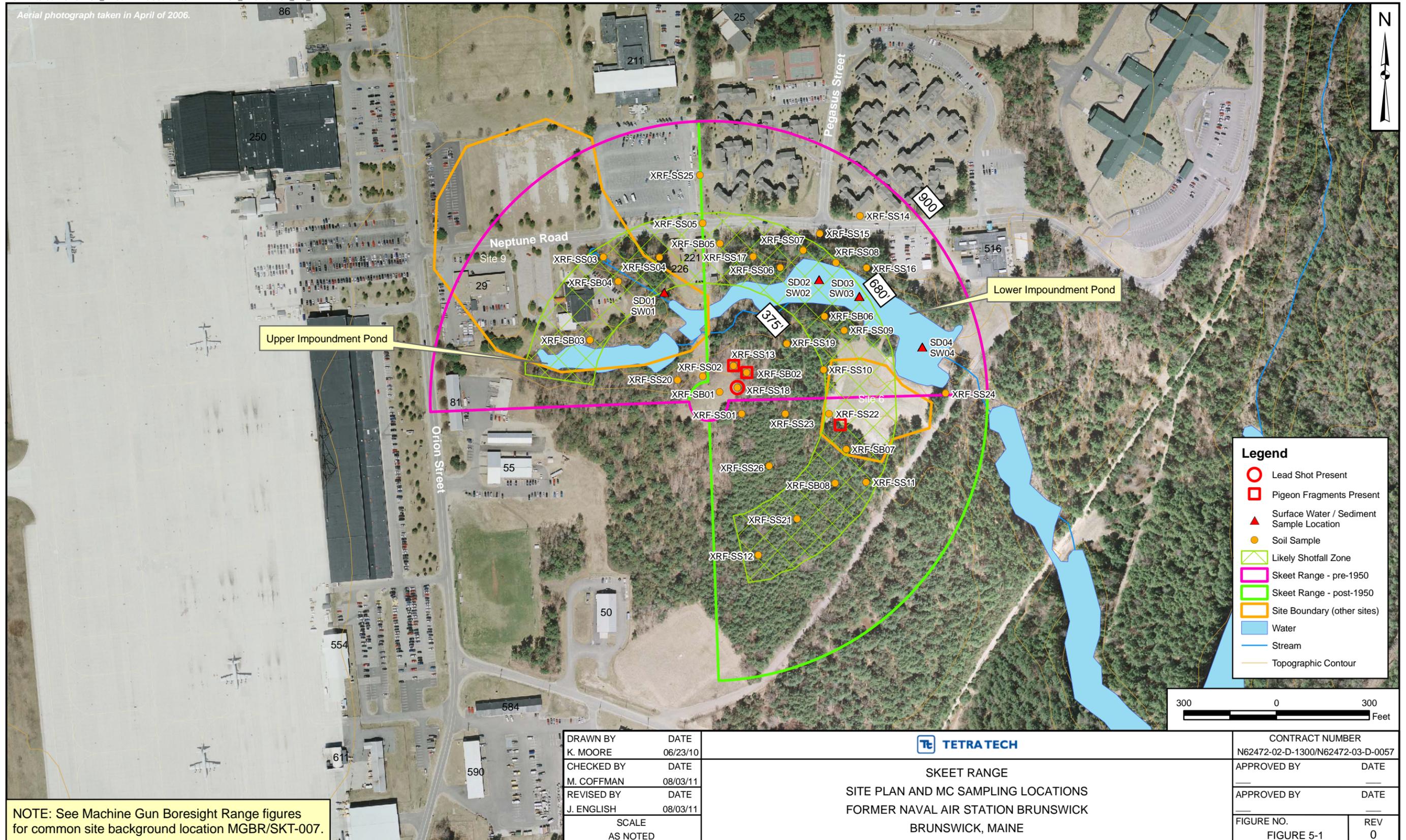
TABLE 5-10

**CONCEPTUAL SITE MODEL INFORMATION PROFILE
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK MAINE
PAGE 3 OF 3**

Profile Type	Information Needs	Findings
	Potential Future Land Use	Potential future land use included Community Mixed Use, Recreation, and Business and Technology.
	Potential Future Human Receptors	Potential future human receptors include residents, workers, visitors, trespassers, maintenance workers, and contractors.
	Potential Future Land Use Related Activities	Potential future land use related activities include business and technology related industry, residential, outdoor recreation, retail, offices, and day care.
	Zoning/Land Use Restrictions	No site specific restrictions or access controls exist for the Skeet Range. However, a portion of Site 9 lies within the Skeet Range site boundary and Site 9 has soil and groundwater restrictions. Additionally, the Eastern Plume, which has groundwater restrictions, extends into the Skeet Range
	Demographics/Zoning	Cumberland County population density is approximately 50,000 persons per square mile.
	Beneficial Resources	Groundwater is the source of the municipal water supply. However, the wells are screened in the deep aquifer (>100 feet below surface).
Ecological Profile	Habitat Type	Scrub/shrub, open field, forested areas, and an open water wetland (retention ponds).
	Degree of Disturbance	Limited to surface activities including grounds maintenance.
	Ecological Receptors and Species of Special Concern	Potential ecological receptors include indigenous species. The state-listed Blanding's turtle and spotted turtle (threatened) may reside in wetlands, vernal pools, or streams on or near the former installation.
General Exposure Profile	Relationship of MC Sources to Habitat and Potential Receptors	MEC not suspected at this site. MC potential migration pathways include infiltration to subsurface soil, infiltration and leaching to groundwater, and to a lesser extent dust emissions and volatilization to ambient air. Future planned land use includes Community Mixed Use, Recreation, and Business and Technology

NASB = Naval Air Station Brunswick.
 MEC = Munitions and explosives of concern.
 MC = Munitions constituent.
 MDAS = Material documented as safe.
 Bgs = Below ground surface.
 SI = Site Investigation.

Aerial photograph taken in April of 2006.



NOTE: See Machine Gun Boresight Range figures for common site background location MGBR/SKT-007.

DRAWN BY	DATE
K. MOORE	06/23/10
CHECKED BY	DATE
M. COFFMAN	08/03/11
REVISED BY	DATE
J. ENGLISH	08/03/11
SCALE	
AS NOTED	

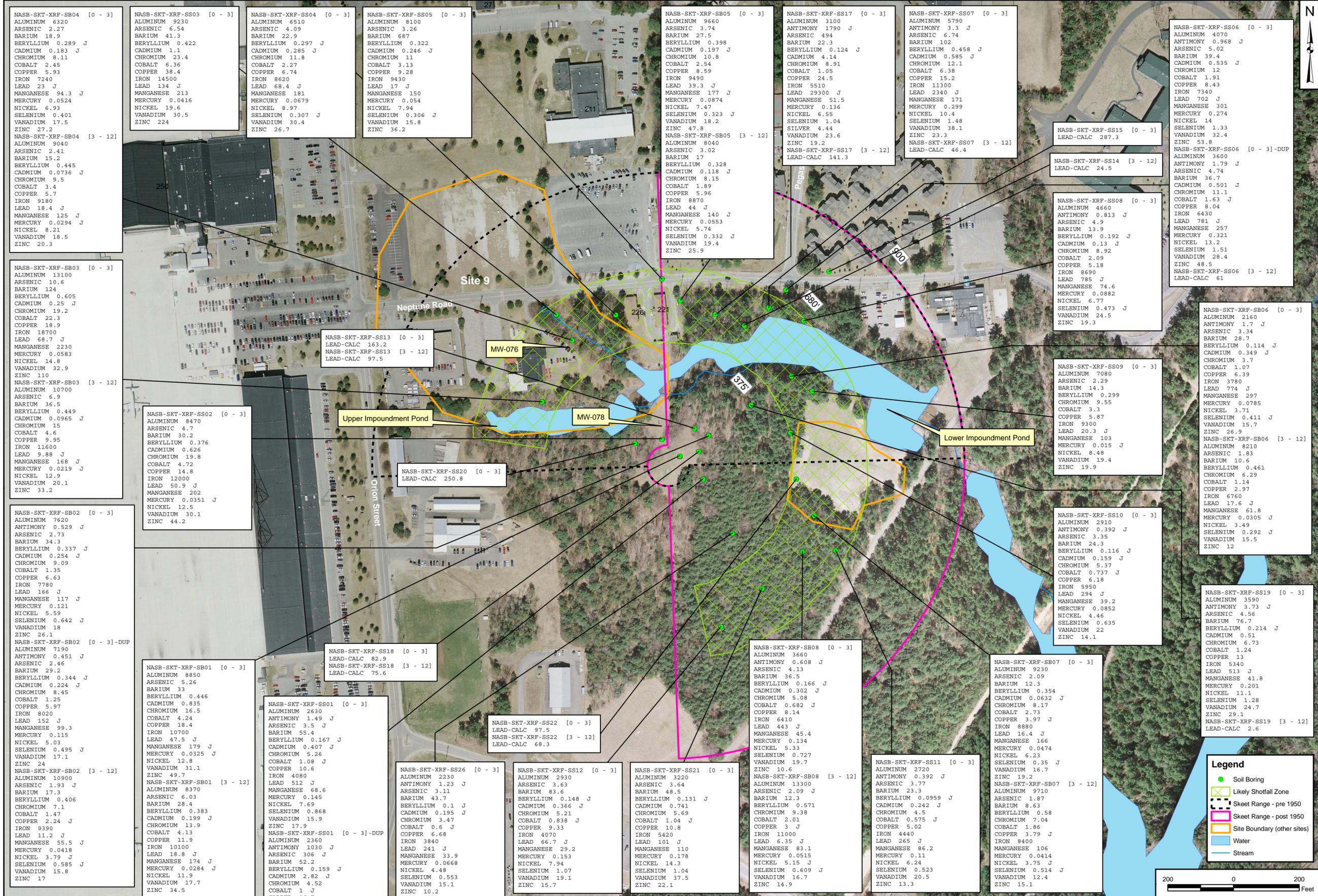


SKEET RANGE
SITE PLAN AND MC SAMPLING LOCATIONS
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

Legend	
	Lead Shot Present
	Pigeon Fragments Present
	Surface Water / Sediment Sample Location
	Soil Sample
	Likely Shotfall Zone
	Skeet Range - pre-1950
	Skeet Range - post-1950
	Site Boundary (other sites)
	Water
	Stream
	Topographic Contour



CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 5-1	0



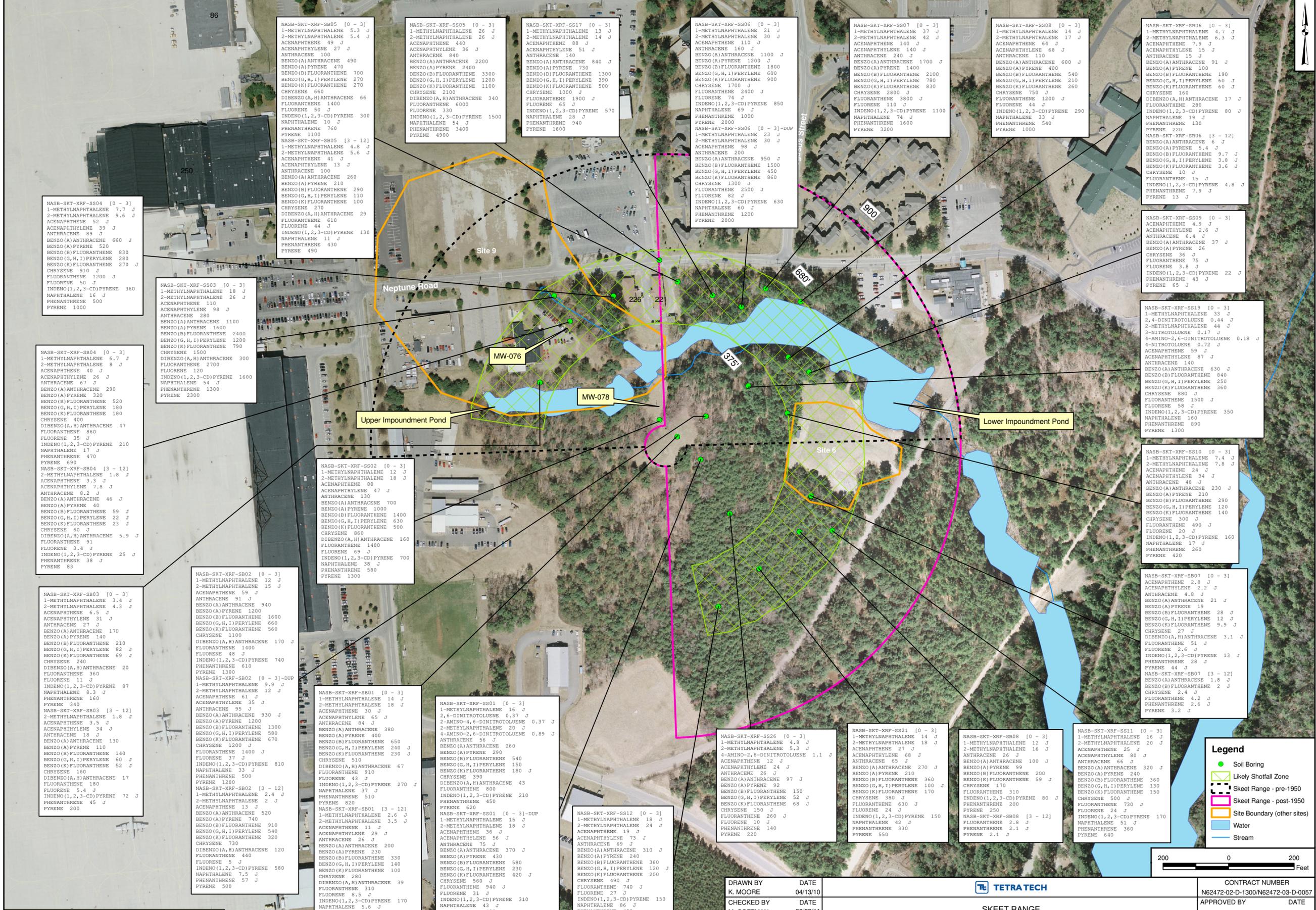
NOTES:
 1.) See Machine Gun Boresight Range figures for common site background location MGBR/SKT-007.
 2.) Units in mg/kg

NASB-SKT-XRF-SB01 [0 - 3]	NASB-SKT-XRF-SB02 [0 - 3]	NASB-SKT-XRF-SB03 [0 - 3]	NASB-SKT-XRF-SB04 [0 - 3]	NASB-SKT-XRF-SB05 [0 - 3]	NASB-SKT-XRF-SB06 [0 - 3]	NASB-SKT-XRF-SB07 [0 - 3]
ALUMINUM 8850 ANTIMONY 0.529 J ARSENIC 2.73 BARIUM 34.3 BERYLLIUM 0.337 J CADMIUM 0.254 J CHROMIUM 9.09 COBALT 1.35 COPPER 6.63 IRON 7780 LEAD 166 J MANGANESE 117 J MERCURY 0.121 NICKEL 5.59 SELENIUM 0.642 J VANADIUM 18 ZINC 26.1	ALUMINUM 7620 ANTIMONY 0.529 J ARSENIC 2.73 BARIUM 34.3 BERYLLIUM 0.337 J CADMIUM 0.254 J CHROMIUM 9.09 COBALT 1.35 COPPER 6.63 IRON 7780 LEAD 166 J MANGANESE 117 J MERCURY 0.121 NICKEL 5.59 SELENIUM 0.642 J VANADIUM 18 ZINC 26.1	ALUMINUM 13100 ANTIMONY 0.529 J ARSENIC 10.6 BARIUM 124 BERYLLIUM 0.605 CADMIUM 0.25 J CHROMIUM 19.2 COBALT 22.3 J COPPER 18.9 IRON 18700 LEAD 68.7 J MANGANESE 2230 MERCURY 0.0583 NICKEL 14.8 SELENIUM 32.9 VANADIUM 11.0	ALUMINUM 6510 ANTIMONY 0.297 J ARSENIC 4.09 BARIUM 22.9 BERYLLIUM 0.297 J CADMIUM 0.285 J CHROMIUM 11.8 COBALT 2.27 COPPER 6.74 IRON 8620 LEAD 68.4 J MANGANESE 181 MERCURY 0.0679 NICKEL 8.97 SELENIUM 0.307 J VANADIUM 30.4 ZINC 26.7	ALUMINUM 8100 ANTIMONY 0.322 ARSENIC 3.26 BARIUM 687 BERYLLIUM 0.322 CADMIUM 0.246 J CHROMIUM 11 COBALT 3.13 COPPER 9.28 IRON 9430 LEAD 17 J MANGANESE 150 MERCURY 0.054 NICKEL 7.94 SELENIUM 0.306 J VANADIUM 15.8 ZINC 36.2	ALUMINUM 9660 ANTIMONY 0.197 J ARSENIC 3.74 BARIUM 27.5 BERYLLIUM 0.398 CADMIUM 0.197 J CHROMIUM 10.8 COBALT 2.54 COPPER 8.59 IRON 9490 LEAD 39.3 J MANGANESE 177 J MERCURY 0.0874 NICKEL 7.47 SELENIUM 0.323 J VANADIUM 18.2 ZINC 47.8	ALUMINUM 5790 ANTIMONY 3.3 J ARSENIC 6.74 BARIUM 102 BERYLLIUM 0.458 J CADMIUM 0.585 J CHROMIUM 12.1 COBALT 6.38 COPPER 15.2 IRON 11300 LEAD 2340 J MANGANESE 171 MERCURY 0.299 NICKEL 10.4 SELENIUM 1.48 VANADIUM 38.1 ZINC 23.3

NASB-SKT-XRF-SB08 [0 - 3]	NASB-SKT-XRF-SB09 [0 - 3]	NASB-SKT-XRF-SB10 [0 - 3]	NASB-SKT-XRF-SB11 [0 - 3]	NASB-SKT-XRF-SB12 [3 - 12]
ALUMINUM 3660 ANTIMONY 0.608 J ARSENIC 4.13 BARIUM 36.5 BERYLLIUM 0.166 J CADMIUM 0.302 J CHROMIUM 5.08 COBALT 0.682 J COPPER 8.14 IRON 6410 LEAD 443 J MANGANESE 45.4 MERCURY 0.134 NICKEL 5.33 SELENIUM 0.727 VANADIUM 19.7 ZINC 10.6	ALUMINUM 7080 ANTIMONY 0.392 J ARSENIC 2.29 BARIUM 14.3 BERYLLIUM 0.299 CHROMIUM 9.55 COBALT 3.3 COPPER 5.87 IRON 9300 LEAD 20.3 J MANGANESE 103 MERCURY 0.015 J NICKEL 8.48 VANADIUM 19.4 ZINC 19.9	ALUMINUM 2910 ANTIMONY 0.392 J ARSENIC 3.35 BARIUM 24.3 BERYLLIUM 0.116 J CADMIUM 0.159 J CHROMIUM 5.37 COBALT 0.737 J COPPER 6.18 IRON 5950 LEAD 294 J MANGANESE 39.2 MERCURY 0.0852 NICKEL 4.46 SELENIUM 0.635 VANADIUM 22 ZINC 14.1	ALUMINUM 2720 ANTIMONY 0.392 J ARSENIC 3.77 BARIUM 23.3 BERYLLIUM 0.0959 J CADMIUM 0.242 J CHROMIUM 4.5 COBALT 0.575 J COPPER 5.02 IRON 11000 LEAD 265 J MANGANESE 86.2 MERCURY 0.11 NICKEL 6.24 SELENIUM 0.523 VANADIUM 20.5 ZINC 13.3	ALUMINUM 9230 ANTIMONY 0.392 J ARSENIC 2.09 BARIUM 12.3 BERYLLIUM 0.354 CADMIUM 0.0632 J CHROMIUM 8.17 COBALT 2.73 COPPER 3.97 J IRON 8880 LEAD 16.4 J MANGANESE 166 MERCURY 0.0474 NICKEL 6.23 SELENIUM 0.35 J VANADIUM 16.7 ZINC 19.2

CONTRACT NUMBER	APPROVED BY	DATE
N62472-02-D-1300/N62472-03-D-0057		
FIGURE NO.	REV	
FIGURE 5-2	0	

Aerial photograph taken in April of 2006.



NOTES:
 1.) See Machine Gun Boresight Range figures for common site background location MGBR/SKT-007.
 2.) Units in ug/kg

DRAWN BY	DATE
K. MOORE	04/13/10
CHECKED BY	DATE
M. COFFMAN	08/03/11
REVISED BY	DATE
J. ENGLISH	08/03/11
SCALE	AS NOTED

TETRA TECH

SKEET RANGE
SOIL POSITIVE DETECTIONS - PAHs AND EXPLOSIVES
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	N62472-02-D-1300/N62472-03-D-0057
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 5-3	0

Legend

- ▲ Surface Water/Sediment Sample
- Likely Shotfall Zone
- Skeet Range - pre 1950
- Skeet Range - post 1950
- Site Boundary (other sites)
- Building
- Water
- Stream

NASB-SKT-SD04-0006 (mg/kg)	
ALUMINUM	19800
ANTIMONY	1.4 J
ARSENIC	28.6
BARIUM	129 J
BERYLLIUM	1.39
CADMIUM	8.48
CHROMIUM	59.5
COBALT	21.8
COPPER	116
IRON	37400
LEAD	189
MANGANESE	1010 J
MERCURY	0.223
NICKEL	44.4
SELENIUM	1.9
VANADIUM	92.7
ZINC	583
NASB-SKT-SD04-0006-DUP (mg/kg)	
ALUMINUM	19700
ANTIMONY	1.46 J
ARSENIC	28.7
BARIUM	126 J
BERYLLIUM	1.33
CADMIUM	7.26
CHROMIUM	55.2
COBALT	19.7
COPPER	113
IRON	36700
LEAD	175
MANGANESE	994 J
MERCURY	0.128
NICKEL	42.6
SELENIUM	1.72
VANADIUM	84.3
ZINC	556
NASB-SKT-SW04-040910 (ug/L)	
ALUMINUM	80.5
BARIUM	13.7
CADMIUM	0.368 J
COPPER	1.86 J
IRON	1300
MANGANESE	342
NICKEL	1.6 J
ZINC	11.4
NASB-SKT-SW04-040910-DUP (ug/L)	
ALUMINUM	78
ARSENIC	0.892 J
BARIUM	13.5
CADMIUM	0.385 J
COPPER	1.85 J
IRON	1300
MANGANESE	342
NICKEL	1.46 J
ZINC	10.2

NASB-SKT-SD01-0006 (mg/kg)	
ALUMINUM	3920
ARSENIC	2.01
BARIUM	11.6 J
BERYLLIUM	0.262 J
CADMIUM	0.0932 J
CHROMIUM	5.69
COBALT	1.92
COPPER	4.69
IRON	4790
LEAD	11.5
MANGANESE	102 J
NICKEL	5.77
VANADIUM	8.5
ZINC	19.7
NASB-SKT-SW01-040910 (ug/L)	
ALUMINUM	98.8
BARIUM	23.3
CADMIUM	0.407 J
COPPER	1.52 J
IRON	991
MANGANESE	582
NICKEL	1.79 J
ZINC	10.5

NASB-SKT-SD02-0006 (mg/kg)	
ALUMINUM	12100
ARSENIC	49.7 J
BARIUM	231 J
BERYLLIUM	0.947 J
CADMIUM	4.76 J
CHROMIUM	32.4
COBALT	32.3
COPPER	71.6
IRON	144000
LEAD	124
MANGANESE	11000 J
MERCURY	0.0984 J
NICKEL	31.1
VANADIUM	52.6
ZINC	432
NASB-SKT-SW02-040910 (ug/L)	
ALUMINUM	82.5
ARSENIC	0.877 J
BARIUM	15.1
CADMIUM	0.377 J
IRON	1630
MANGANESE	386
NICKEL	0.989 J
ZINC	7.18

NASB-SKT-SD03-0006 (mg/kg)	
ALUMINUM	18300
ANTIMONY	1.97 J
ARSENIC	34.7
BARIUM	179 J
BERYLLIUM	1.35
CADMIUM	8.04
CHROMIUM	56.1
COBALT	32.5
COPPER	112
IRON	72300
LEAD	166
MANGANESE	3690 J
MERCURY	0.138 J
NICKEL	43.7
SELENIUM	2.18
VANADIUM	72.5
ZINC	634
NASB-SKT-SW03-040910 (ug/L)	
ALUMINUM	99.6
BARIUM	13.5
CADMIUM	0.346 J
COPPER	1.48 J
IRON	1340
LEAD	0.443 J
MANGANESE	284
NICKEL	0.964 J
ZINC	8.78

Upper Impoundment Pond

Lower Impoundment Pond

MW-076

MW-078

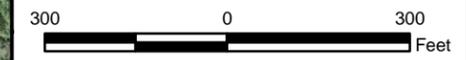
NASB-SKT-SD01

Site 9

Neptune Road

Pegasus Street

Orion Street



DRAWN BY	DATE
K. MOORE	06/29/10
CHECKED BY	DATE
M. COFFMAN	08/03/11
REVISED BY	DATE
J. ENGLISH	08/03/11
SCALE AS NOTED	

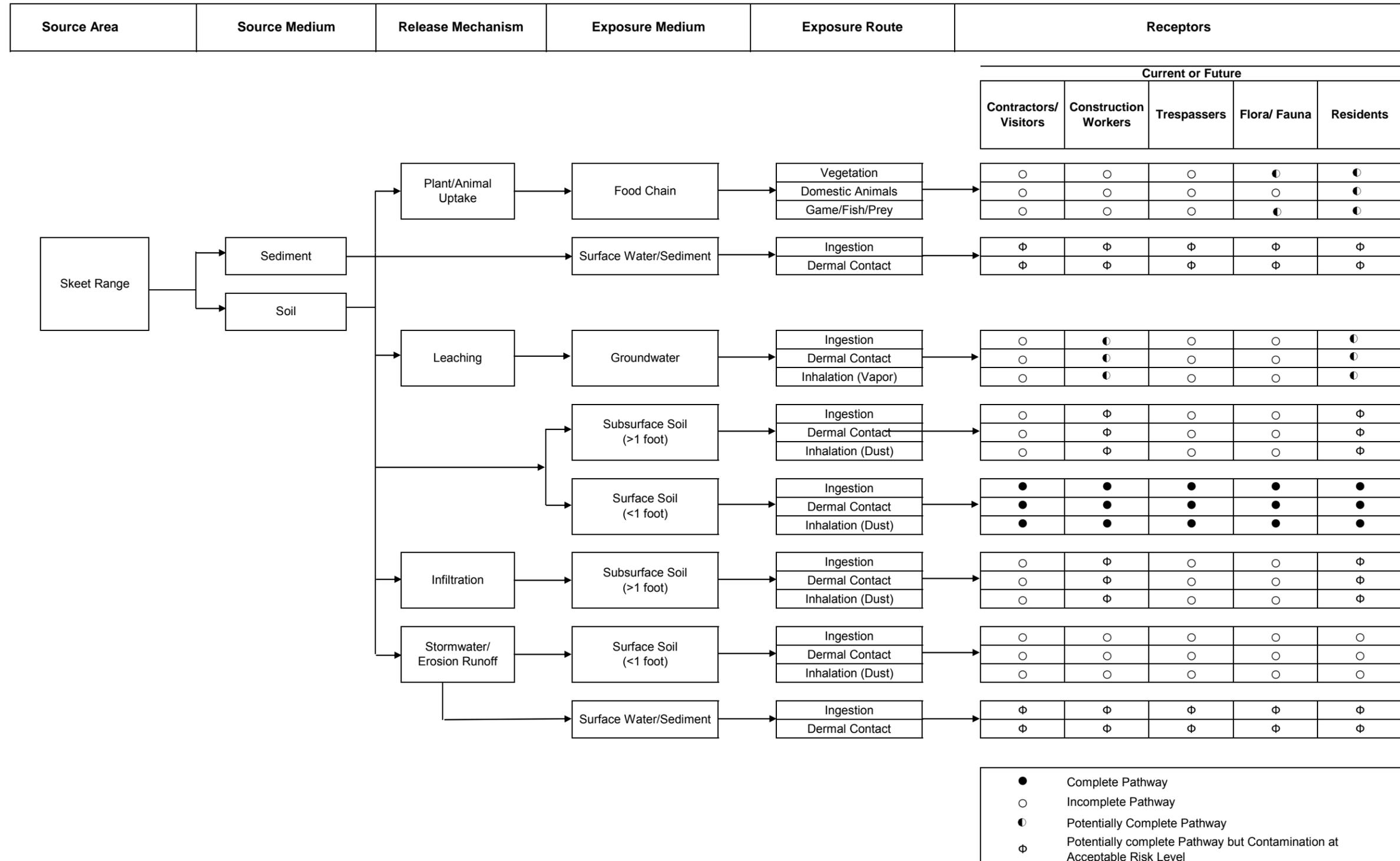


SKEET RANGE
SURFACE WATER AND SEDIMENT POSITIVE DETECTIONS - METALS
FORMER NAVAL SIR STATION BRUNSWICK
BRUNSWICK, MAINE

CONTRACT NUMBER	
N62472-02-D-1300/N62472-03-D-0057	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO.	REV
FIGURE 5-4	0

NOTE: Units in ug/L for surface water and mg/kg for sediment

FIGURE 5-5
MC EXPOSURE PATHWAY ANALYSIS
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE





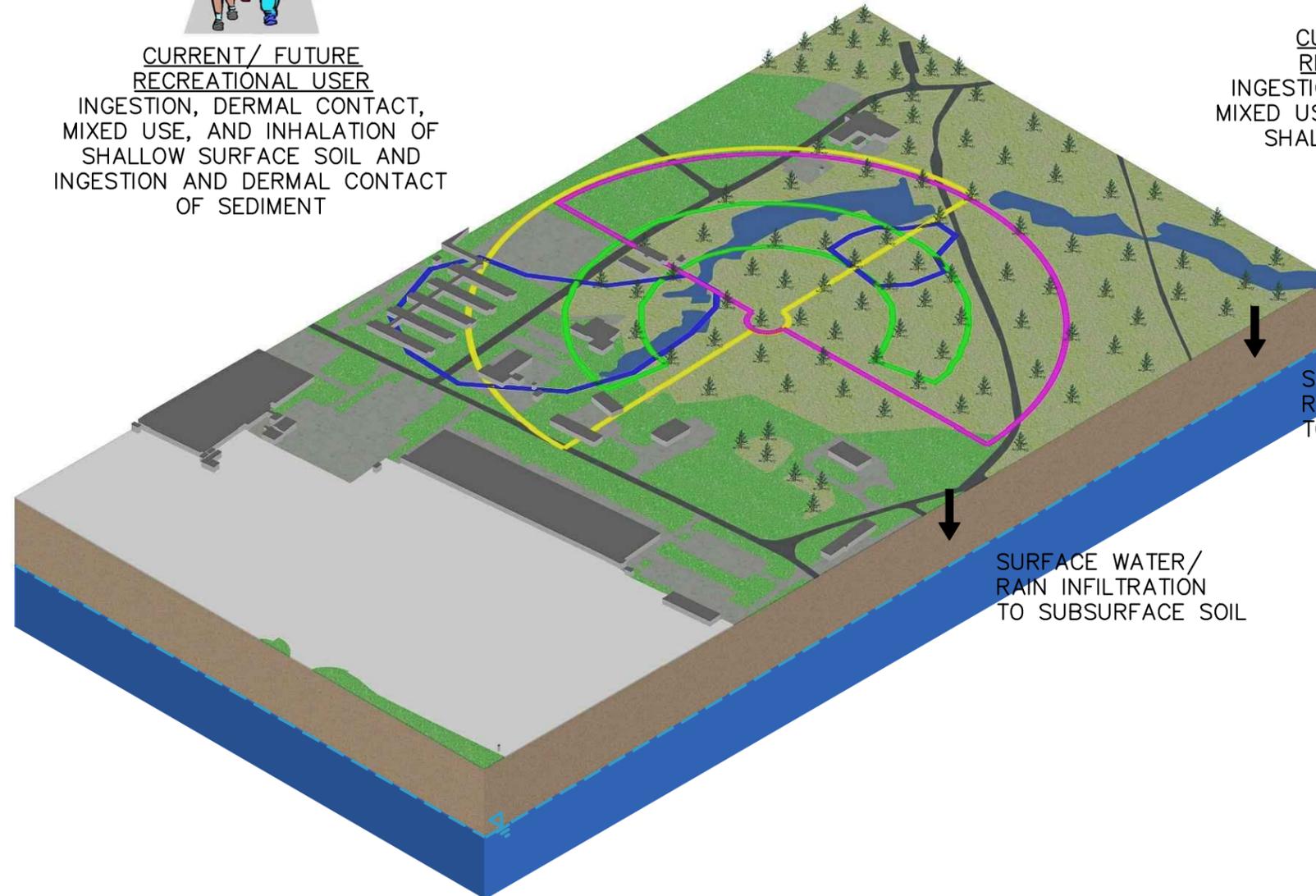
CURRENT/ FUTURE
RECREATIONAL USER
INGESTION, DERMAL CONTACT,
MIXED USE, AND INHALATION OF
SHALLOW SURFACE SOIL AND
INGESTION AND DERMAL CONTACT
OF SEDIMENT



CURRENT/ FUTURE
RESIDENTIAL USER
INGESTION, DERMAL CONTACT,
MIXED USE, AND INHALATION OF
SHALLOW SURFACE SOIL



CURRENT/ FUTURE BUSINESS AND
TECHNOLOGY INDUSTRIES WORKER
INGESTION, DERMAL CONTACT,
MIXED USE, AND INHALATION OF
SHALLOW SURFACE SOIL



SURFACE WATER/
RAIN INFILTRATION
TO SUBSURFACE SOIL

SURFACE WATER/
RAIN INFILTRATION
TO SUBSURFACE SOIL



ECOLOGICAL RECEPTORS
INGESTION, DERMAL
CONTACT, AND INHALATION
OF SHALLOW SURFACE SOIL
AND INGESTION AND
DERMAL CONTACT OF
SEDIMENT

LEGEND

- SKEET RANGE – PRE 1950
- SKEET RANGE – POST 1950
- LIKELY SHOTFALL ZONE
- WATER TABLE (ESTIMATED)

DRAWN BY NN	DATE 9/9/10
CHECKED BY	DATE
REVISED BY	DATE
SCALE NOT TO SCALE	



**CONCEPTUAL SITE MODEL
SKEET RANGE
FORMER NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE**

CONTRACT NO. CTO 069	
OWNER NO. 0645	
APPROVED BY	DATE
DRAWING NO. FIGURE 5-6	REV. 1

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APPENDIX A

PROJECT PERSONNEL SIGN-OFF SHEET

QAPP Worksheet #4 (UFP-QAPP Manual Section 2.3.2)

Have copies of this form signed by key project personnel from each organization to indicate that they have read the applicable sections of the QAPP and will perform the tasks as described. Ask each organization to forward signed sheets to the central project file.

Worksheet Not Applicable (State Reason)

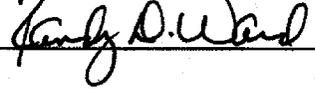
Project Personnel Sign-Off Sheet

Organization: **TINUS**

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
Linda Klink	PM	412-921-8650	See Signature Page	
Charles Race	Maine Certified Geologist	978-474-8437	See Certification Page	
To Be Determined (TBD) Brian Geringer	FOL, lead geologist, site safety officer	TBD 617-474-8406	<i>Brian Geringer</i>	07/02/09
Kelly Carper <i>Lucy Guzman</i>	Project Chemist	412-921-7273 978-474-8466	<i>Lucy Guzman</i>	01/21/10
Matt Soltis	HSM	412-921-8912	See HASP signature page (separate internal Navy document)	
Joseph Samohuck Jennifer Cardinal	DVM DV	412-921-8510 518 695 3092x313	<i>Jennifer Cardinal</i>	1/20/10
Chelsea Fellows-Swain	Site Safety officer	978-474-8411	<i>Chelsea Fellows-Swain</i>	7/2/09

Project Personnel Sign-Off Sheet

Organization: Empirical Laboratory

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
Janice Shilling	Laboratory PM	615-345-1115		7/20/09
Randy Ward	Quality Assurance (QA) Director	615-345-1115		7/20/09

APPENDIX B

PHOTOGRAPHIC LOG

MACHINE GUN BORESIGHT RANGE



Photograph #-1: MGBR, MAI Environmental advancing soil boring associated with monitoring well 03.



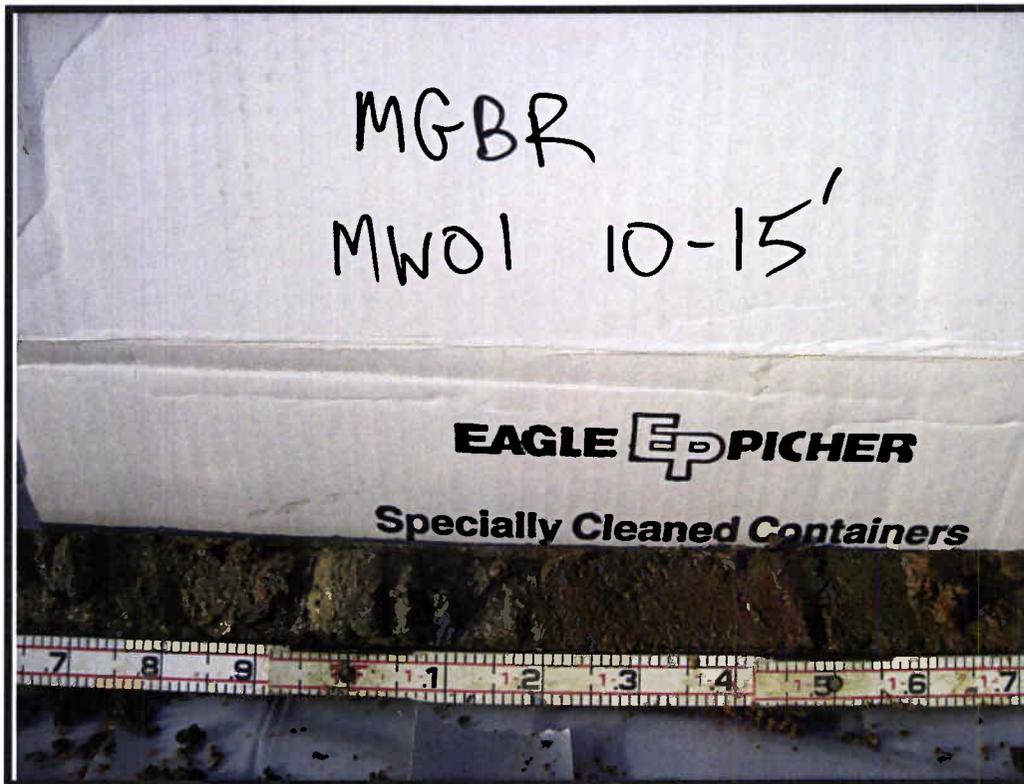
Photograph #-2: MGBR, completed monitoring well 01.



Photograph #3: MGBR from the west.



Photograph #4: MGBR, monitoring well 01 prior to completion.



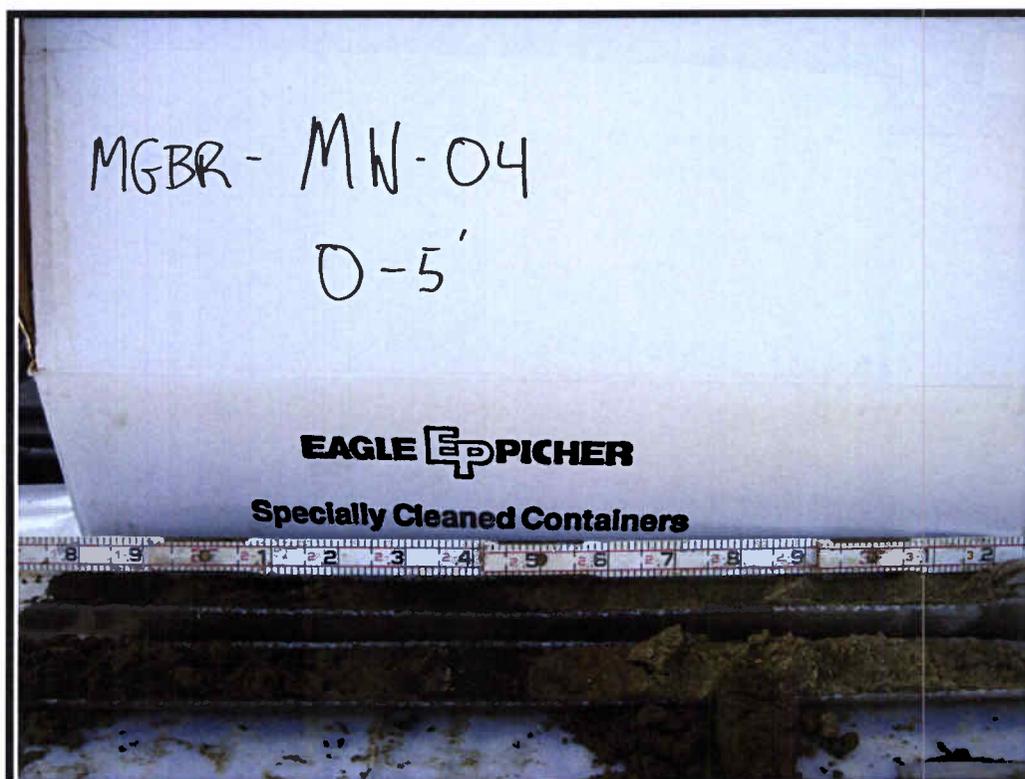
Photograph #5: MGBR, soil from 10-15' bgs, collected from boring associated with monitoring well 01.



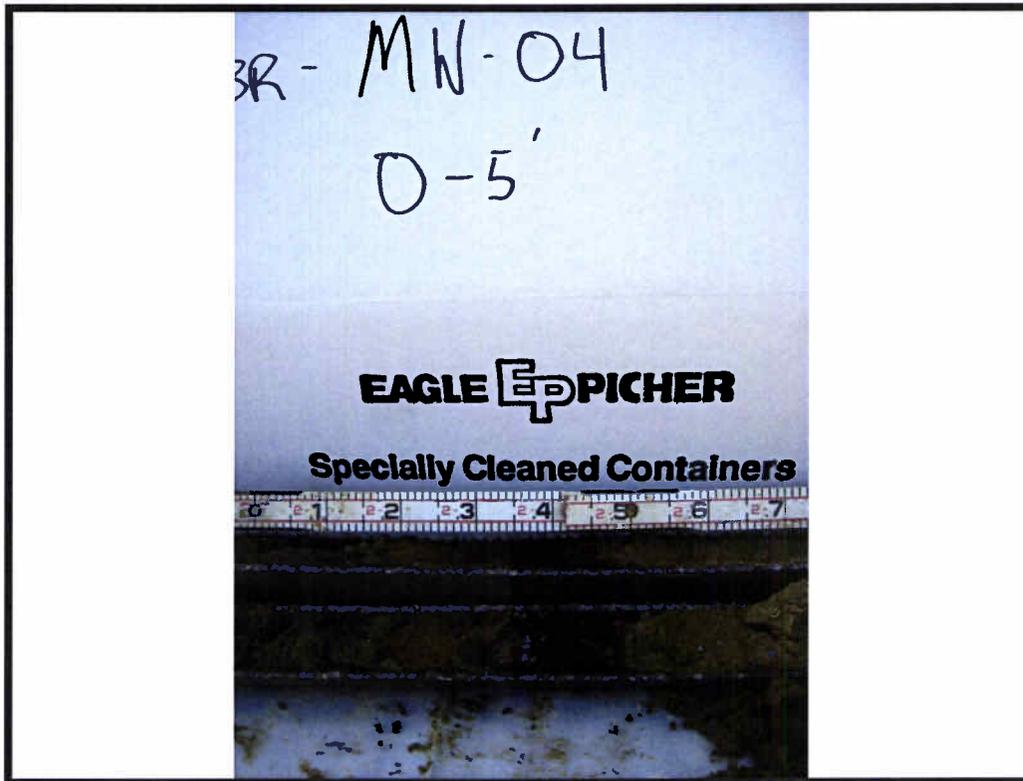
Photograph #6: MGBR, soil from 10-15' bgs, collected from boring associated with monitoring well 01.



Photograph #7: MGBR, monitoring well 02 prior to completion.



Photograph #8: MGBR, soil from 0-5' bgs, collected from boring associated with monitoring well 04.



Photograph #9: MGBR, soil from 0-5' bgs, collected from boring associated with monitoring well 04.



Photograph #10: MGBR, MAI Environmental installing monitoring well 03.



Photograph #11: MGBR, advancing soil boring 02 using stainless steel hand auger.



Photograph #12: MGBR, advancing soil boring 02 using stainless steel hand auger.



Photograph #13: MGBR, developing monitoring well 01 with peristaltic pump.

SKEET RANGE



Photograph #1: SKT, collecting soil sample.



Photograph #2: SKT, transferring XRF data to a spreadsheet.

APPENDIX C

MC FIELD DOCUMENTATION

- C-1 SOIL BORING LOGS**
- C-2 SOIL SAMPLE LOG SHEETS**
- C-3 TEMPORARY WELL CONSTRUCTION LOGS**
- C-4 GROUNDWATER SAMPLE LOG AND PURGE SHEETS**
- C-5 WATER LEVEL MEASUREMENT SHEETS**
- C-6 SURFACE WATER/SEDIMENT SAMPLE LOG SHEETS**
- C-7 QA/QC AND IDW SAMPLE LOG SHEETS**
- C-8 SURVEY DATA**

C-1 SOIL BORING LOGS

MACHINE GUN BORESIGHT RANGE

BORING LOG FOR:
 PROJECT NO.:
 LOGGED BY:
 DRILLED BY (Company/Driller):
 GRD. SURFACE ELEVATION:

NASB-MGBR
112600645
B. Gerings
MAI/S. Brown

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW01
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW01
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6" N/A	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSID. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = (FID, (PPM))
		3.8			M.Dense	Brown	F-M Sand, T-Silt 0.0-0.4 (Top Soil)	SP	Dry - Frozen	
1		5.0	0910		Lt Brown		0.4-1.0 - " "	SW		
					DK Brown		1.0-1.4 - F-M Sand, Some Silt	SW	Dry	Headspace
2					Loose Lt Brown		1.4-3.8 - F-M Sand, T-Silt	SW		PID=00
3										
4										
5										
		4.3			Loose	Lt. Brown	0.0-3.0 F-M Sand, T-C Sand, T-Silt	SW	Moist	
6		5.0	0915							
									Wet	Headspace
7										PID=00
8										

TYPE OF DRILLING RIG: Geoprobe ~~PT-100~~ 6620DT
 METHOD OF ADVANCING BORING: Direct Push
 METHOD OF SOIL SAMPLING: Dual Tube
 METHOD OF ROCK CORING: N/A
 GROUNDWATER LEVELS: _____
 OTHER OBSERVATIONS: _____

Tetra Tech NUS, Inc.

 BORING NO.: MW-01 PAGE: 1 OF 3

BORING LOG FOR:

NASB-MGBR

PROJECT NO.:

112G00645

LOGGED BY:

B. Geringer

DRILLED BY (Company/Driller):

MAI / S. Brown

GRD. SURFACE ELEVATION:

TRANSCRIBED BY: _____

ELEVATION FROM: _____

BORING NO.:

MGBR-MW01

START DATE:

12/14/09

COMPLETION DATE:

12/14/09

MON. WELL NO.:

MGBR-MW01

CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
9		/			M. Dense	Brown	3.0-4.3 - Silty and F-Sand	SM	Wet	
					↓	↓	Some mottling -			
10		4.9	0920		↓	↓	↓			
11		4.9 / 5.0	0920		Loose	Lt Brown	0.0-1.2 F-M Sand, T-Silt	SW	Saturated	
12		/			↓	Brown	1.2-2.5 - SAA	SW		Headspace
					↓	↓	Silt lenses at 1.3 & 2.0			PTD=0.0
13		/			↓	Lt Brown	2.5-4.9 - SAA	SW		
14		/			↓	↓	Silt lense at 4.0			
15		/			↓	↓	↓			
16		4.0 / 5.0	0925		Loose	Lt Brown	0.0-4.0 - SAA	SW	Saturated	

TYPE OF DRILLING RIG:	<u>Geoprobe DR6200 GG20DT</u>	Tetra Tech NUS, Inc. 
METHOD OF ADVANCING BORING:	<u>Direct Push</u>	
METHOD OF SOIL SAMPLING:	<u>Dual Tube</u>	
METHOD OF ROCK CORING:	<u>N/A</u>	
GROUNDWATER LEVELS:	_____	
OTHER OBSERVATIONS:	_____	BORING NO.: <u>MW-01</u> PAGE: <u>2</u> OF <u>3</u>

BORING LOG FOR: MGBR-NA99
 PROJECT NO.: 112G00645
 LOGGED BY: B. Gerstner
 DRILLED BY (Company/Driller): MAI/S. Brown
 GRD. SURFACE ELEVATION: _____

BORING NO.: MGBR-MW01
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW01
 CHECKED BY: _____
 TRANSCRIBED BY: _____
 ELEVATION FROM: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
		/			Loose	Lt Brown	SAA	SW	Saturated	
17		/			↓	↓	↓			Headspace
18		/								PID=0.0
19		/								
20		/	EOB		↓	↓	↓			
		/					Installed Monitoring Well - refer to well construction log			
		/								
		/								
		/								
		/								
		/								
		/								
		/								
		/								
		/								

TYPE OF DRILLING RIG: Geoprobe 6609 DT 0670 DT
 METHOD OF ADVANCING BORING: Direct Push
 METHOD OF SOIL SAMPLING: Dual Tube
 METHOD OF ROCK CORING: N/A
 GROUNDWATER LEVELS: _____
 OTHER OBSERVATIONS: _____

Tetra Tech NUS, Inc.

 BORING NO.: MW-01 PAGE: 3 OF 3

BORING LOG FOR: NASB-MGBR
 PROJECT NO.: 112G00645
 LOGGED BY: B. Geringer
 DRILLED BY (Company/Driller): MAI/S. Brown
 GRD. SURFACE ELEVATION: _____

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW02
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW02
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIG. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
1	2.9 / 5.0	/	1005		M. Dense	Dk. Brown	0.0-0.4 - F-M Sand, T-Silt	SP	Frozen	
					Loose	Lt. Brown	0.4-2.9 - SAA	SW	Dry	
2	/	/			↓	↓				
3	/	/			↓	↓			Moist	Headspace PID=0.0
4	/	/			↓	↓				
5	/	/			↓	↓				
6	3.3 / 5.0	/	1010		Loose	Lt. Brown	0.0-3.3 - F-M Sand, T-Silt	SW	Wet	
							Mottling at 1.7, 2.0 & 2.7			
7	/	/			↓	↓				Headspace PID=0.0
8	/	/			↓	↓				

TYPE OF DRILLING RIG: Geoprobe 574200 6620 DT
 METHOD OF ADVANCING BORING: Direct Push
 METHOD OF SOIL SAMPLING: Dual Tube
 METHOD OF ROCK CORING: N/A
 GROUNDWATER LEVELS: _____
 OTHER OBSERVATIONS: _____

Tetra Tech NUS, Inc.

 BORING NO.: MW-02 PAGE: 1 OF 3

BORING LOG FOR:
 PROJECT NO.:
 LOGGED BY:
 DRILLED BY (Company/Driller):
 GRD. SURFACE ELEVATION:

MGBR-NASB
112600645
B. Geringer
MAI / S. Brown

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW02
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW02
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = (FID, (PPM))
9	/	/			Loose	Lt. Brown	SAA	SW		
10	/	/			↓	↓	↓			
11	46/50	/	1015		Loose	Lt Brown / gray	0.0- 3.5 ^{2.8} - SAA	SW	Saturated	
12	/	/			↓	↓	↓			
13	/	/			Loose	Brown	2.8-3.5 - SAA	SW		
14	/	/			↓	↓	↓			
15	/	/				Lt gray / Brown	3.5-3.7 - F. Sand & Silt	SM		
15	/	/			↓	↓	↓			
15	40/50	/	1020		Loose	Lt gray / Brown	3.7-4.6 - F.M Sand T. Silt	SW		
16	/	/			Loose	Lt gray / Brown	0.0-2.1 - SAA	SW	Saturated	
					↓	↓	↓			

TYPE OF DRILLING RIG: <u>Geoprobe 6620D 6620DT</u>	Tetra Tech NUS, Inc. 	
METHOD OF ADVANCING BORING: <u>Direct Push</u>		
METHOD OF SOIL SAMPLING: <u>Dual Tube</u>		
METHOD OF ROCK CORING: <u>N/A</u>		
GROUNDWATER LEVELS: _____		
OTHER OBSERVATIONS: _____	BORING NO.: <u>MW-02</u>	PAGE: <u>2</u> OF <u>3</u>

BORING LOG FOR:

PROJECT NO.:

LOGGED BY:

DRILLED BY (Company/Driller):

GRD. SURFACE ELEVATION:

NASB-MGBR

112000645

B. Geisinger

MAE/S. Brown

TRANSCRIBED BY: _____

ELEVATION FROM: _____

BORING NO.:

START DATE:

COMPLETION DATE:

MON. WELL NO.:

CHECKED BY:

MGBR-MW02

12/14/09

12/14/09

MGBR-MW02

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MATL CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
17	/	/			Loose	Lt. Gray/Brown	SAA	SW	Saturated	Headspace
18	/	/			M. Dense	Brown	2.1-2.5 - " "	SM	Wet	P-D=0.0
19	/	/								
20	/	/								
				EOB			Installed Monitoring Well - Refer to Well Construction log			

TYPE OF DRILLING RIG:

METHOD OF ADVANCING BORING:

METHOD OF SOIL SAMPLING:

METHOD OF ROCK CORING:

GROUNDWATER LEVELS:

OTHER OBSERVATIONS:

Geoprobe 12/16/09 G620 DT

Direct Push

Dual Tube

N/A

Tetra Tech NUS, Inc.



BORING NO.: MW-02

PAGE: 3 OF 3

TINUS Form 0018

BORING LOG FOR:

PROJECT NO.:

LOGGED BY:

DRILLED BY (Company/Driller):

GRD. SURFACE ELEVATION:

NASB-MGBR

112600645

B. Geringer

MAI / S. Brown

BORING NO.:

START DATE:

COMPLETION DATE:

MON. WELL NO.:

CHECKED BY:

MGBR-MW03

12/14/09

12/14/09

MGBR-MW03

TRANSCRIBED BY: _____

ELEVATION FROM: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
1	/	3.2	1100		Loose	DK Brown	0.0-0.4-F-M Sand, Little Silt & Gravel	SP	Frozen	
		5.0			Brown	0.4-1.6-F-M Sand, T. Silt	SW	Dry		
2	/	/			↓		↓			
		/			Lt. Brown	1.6-3.2- SAA	SW	Dry	Headspace	
3	/	/			↓		↓			PID=0.1
		/								
4	/	/			↓		↓			
		/								
5	/	/			↓		↓			
		/								
6	/	3.2	1105		Loose	Lt. Brown	0.0- 2.0 3.2- SAA	SW	Moist(0-1')	
		5.0				Mottled at 2.0 & 2.4				
7	/	/			↓		↓		wet	Headspace
		/							PID=0.1	
8	/	/			↓		↓			
		/								

TYPE OF DRILLING RIG:	<u>Geoprobe 774200 6620 DT</u>	Tetra Tech NUS, Inc. 
METHOD OF ADVANCING BORING:	<u>Direct Push</u>	
METHOD OF SOIL SAMPLING:	<u>Dual Tube</u>	
METHOD OF ROCK CORING:	<u>N/A</u>	
GROUNDWATER LEVELS:	_____	
OTHER OBSERVATIONS:	_____	BORING NO.: <u>MW-03</u>
		PAGE: <u>1</u> OF <u>3</u>

BORING LOG FOR: NASB - MGBR
 PROJECT NO.: 112600645
 LOGGED BY: B. Geringer
 DRILLED BY (Company/Driller): MAI / S. Brown
 GRD. SURFACE ELEVATION: _____

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW03
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW03
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
9	/	/			Loose	Lt. Brown	SAA	SW		
10	/	/			↓	↓	↓		Wet	
11	4.3 / 5.0		# 1110 / 1150		Loose	Lt. Gray/Brown	0.0-3.4 - F-M Sand, little silt	SW	Saturated	
12	/	/			↓	↓	↓			Headspace P.D.=0.0
13	/	/			↓	↓	↓			
14	/	/			M.D.MZ	Lt. Brown	Fe staining 2.8-3.4 3.4-4.3 - F Sand & Silt (Silty Sand)	SM	Wet	
15	/	/			↓	↓	↓			
16	3.7 / 5.0		1145		Loose	Lt. Brown	0.0-1.4 - F-M Sand, T. Silt	SW	Saturated	

TYPE OF DRILLING RIG: Geoprobe #10200 6620 DT
 METHOD OF ADVANCING BORING: Direct Push
 METHOD OF SOIL SAMPLING: Dual Tube
 METHOD OF ROCK CORING: N/A
 GROUNDWATER LEVELS: _____
 OTHER OBSERVATIONS: _____

Tetra Tech NUS, Inc.

 BORING NO.: MW-03 PAGE: 2 OF 3

* - 1st run liner stuck in casing moved next to boring and collected 10-15' run again

BORING LOG FOR:
 PROJECT NO.:
 LOGGED BY:
 DRILLED BY (Company/Driller):
 GRD. SURFACE ELEVATION:

NASB-MGBR
112600645
B. Gering
MAI / S. Brown

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW03
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW03
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
		/			Loose	Lt. Brown	SAA			
17		/			↓	↓	1.4-3.7 - F-M Sand, little silt	SW	Subsided	
18		/			↓	↓	Fe staining at 2.0' & 3.4'			Headspace PID=0.0
19		/			↓	↓				
20		/			↓	↓				
		/		EOB			Installed monitoring well - Refer to monitoring well installation log			
		/								
		/								
		/								
		/								
		/								
		/								
		/								

TYPE OF DRILLING RIG: <u>Geoprobe 112600645 6620 DT</u>	 Tetra Tech NUS, Inc.
METHOD OF ADVANCING BORING: <u>Direct Push</u>	
METHOD OF SOIL SAMPLING: <u>Dual Tube</u>	
METHOD OF ROCK CORING: <u>N/A</u>	
GROUNDWATER LEVELS: _____	
OTHER OBSERVATIONS: _____	

BORING LOG FOR:
 PROJECT NO.:
 LOGGED BY:
 DRILLED BY (Company/Driller):
 GRD. SURFACE ELEVATION:

AGT NAB-MGBR
11200645
B. Geringer
MAI / S. Brown

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW04
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW04
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
1	3.2 / 5.0	/	1230	↓	M. Dense	DK Brown	F-Sand, f Silt (0.0-0.2) Topsoil	SP	Frozen	
						Brown	0.2-2.5- F-M Sand, T-silt	SW	Dry	
2	/	/		↓			Dark Brown Staining at 1.2 f 2.3			Headspace
										PID=0.0
3	/	/		↓	Loose	Lt. Brown	2.5-3.2 - F-M Sand, T-Silt	SW	moist	
							Some Fe Staining at 2.0-2.6			
4	/	/		↓						
5	/	/		↓						
6	3.6 / 5.0	/	1240	↓	Loose	Lt. Brown	0.0-3.6 - SAA	SW	Wet	
							Some Fe Staining at 2.0-3.6			Headspace
7	/	/		↓						PID=0.0
									Saturated	
8	/	/		↓						

TYPE OF DRILLING RIG: <u>Geoprobe 6620 DT</u>	Tetra Tech NUS, Inc. 
METHOD OF ADVANCING BORING: <u>Direct Push</u>	
METHOD OF SOIL SAMPLING: <u>Dual Tube</u>	
METHOD OF ROCK CORING: <u>N/A</u>	
GROUNDWATER LEVELS: _____	
OTHER OBSERVATIONS: _____	BORING NO.: <u>MW-04</u>
PAGE: 1 OF 2	

BORING LOG FOR: NASS-MGBR
 PROJECT NO.: 112 G00645
 LOGGED BY: B. Geringer
 DRILLED BY (Company/Driller): MAI / S. Brown
 GRD. SURFACE ELEVATION: _____

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW04
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW04
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
9	/	/			Loose	Lt. Brown	SAA	SW	Saturated	
10	/	/					↓			
11	41 / 50		1250		Loose	Brown	0.0-2.7 - SAA Fe Staining	SW	Saturated	
12	/	/					↓			Headpace PID=0.0
13	/	/			M. Dense	Gray	2.7-2.9 - Silty Sand	SM	Wet	
14	/	/			Loose	Lt. Brown	2.9-4.1 - F-M Sand, T-Silt	SW	Saturated	
15	/	/			↓	↓	↓			
				EOB			Installed MW - Refer to MW Construction log for details			

TYPE OF DRILLING RIG: <u>Geoprobe 2742DP G620 DT</u>	Tetra Tech NUS, Inc. 
METHOD OF ADVANCING BORING: <u>Direct Push</u>	
METHOD OF SOIL SAMPLING: <u>Dual Tube</u>	
METHOD OF ROCK CORING: <u>N/A</u>	
GROUNDWATER LEVELS: _____	
OTHER OBSERVATIONS: _____	BORING NO.: <u>MW-04</u>
	PAGE: <u>2</u> OF <u>2</u>

BORING LOG FOR:
 PROJECT NO.:
 LOGGED BY:
 DRILLED BY (Company/Driller):
 GRD. SURFACE ELEVATION:

NASS-MGBR
112600645
B. Geringer
MAI/S. Brown

TRANSCRIBED BY: _____
 ELEVATION FROM: _____

BORING NO.: MGBR-MW05
 START DATE: 12/14/09
 COMPLETION DATE: 12/14/09
 MON. WELL NO.: MGBR-MW05
 CHECKED BY: _____

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MATL CHG./ WELL PROF'L	SOIL DENSITY/ CONSIS. or ROCK HARD.	CLR.	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
1	2.8 / 50	/	1420	↓	Loose	DK. Brown / Brown	0.0-0.2 - F-Sand & Silt (topsoil)	SP	Frozen	
						Brown	0.2-1.0 - F-M Sand, little Silt	SW	Dry	
2	/	/		↓		Lt Brown	1.0-2.8 - F-M Sand, T-Silt	SW		Headspace PID=0.2
3	/	/		↓						
4	/	/		↓					Moist	
5	3.3 / 5.0	/	1424	↓	Loose	Lt Brown	0.0-3.3 - SAA	SW	Wet	
6	/	/		↓						Headspace PID=0.1
7	/	/		↓						
8	/	/		↓						

TYPE OF DRILLING RIG: Geoprobe ~~6620~~ 6620 DT
 METHOD OF ADVANCING BORING: Direct Push
 METHOD OF SOIL SAMPLING: Dual Tube
 METHOD OF ROCK CORING: N/A
 GROUNDWATER LEVELS: _____
 OTHER OBSERVATIONS: _____

Tetra Tech NUS, Inc.



BORING NO.: MW-05

PAGE: 1 OF 2

BORING LOG FOR:

PROJECT NO.:

LOGGED BY:

DRILLED BY (Company/Driller):

GRD. SURFACE ELEVATION:

NASS-MGBR

112600645

B. Geringer

MAI/S. Brown

TRANSCRIBED BY: _____

ELEVATION FROM: _____

BORING NO.:

START DATE:

COMPLETION DATE:

MON. WELL NO.:

CHECKED BY:

MGBR-MW05

12/14/09

12/14/09

MGBR-MW05

DEPTH (FEET)	BLOWS PER 6"	SAMP REC. / SAMP LENG.	SAMPLING TIME & SAMPLE NO. (QA/QC STATUS)	DEPTH MAT'L CHG./ WELL PROF'L	SOIL DENSITY/ CONSIG. or ROCK HARD.	CLR	MATERIAL CLASSIFICATION	USCS or ROCK BRKN	REMARKS (moisture condition; odors; geological classification; rock weathering; etc.)	FIELD SCREENING DATA METHOD = [FID, (PPM)]
9	/	/			Loose	Lt Brown	SAA	SW	Saturated	
10	/	/			↓	↓	↓			
11	4.5 / 5.0		1430		Loose	Lt Brown	0.0-2.5 - SAA 2.5-4.5 - SAA - Some Fe Staining	SW SW	Saturated	
12	/	/			↓	↓	↓			Headspace PID=0.0
13	/	/			↓	↓	↓			
14	/	/			↓	↓	↓			
15	/	/			↓	↓	↓			
	/	/		EOB			Refer to monitoring well construction log -			

TYPE OF DRILLING RIG:

METHOD OF ADVANCING BORING:

METHOD OF SOIL SAMPLING:

METHOD OF ROCK CORING:

GROUNDWATER LEVELS:

OTHER OBSERVATIONS:

Geoprobe 6620 DT

Direct Push

Dual Tube

N/A

Tetra Tech NUS, Inc.



BORING NO.: MW-06

PAGE: 2 OF 2

TINUS Form 0018

C-2 SOIL SAMPLE LOG SHEETS

MACHINE GUN BORESIGHT RANGE



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SS01-0003
Sample Location: SS01
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1125</u>	<u>0-3</u>	<u>Brown</u>	<u>F-M Sand, - Dry</u>
Method: <u>DPT</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-4oz</u>	<u>YES</u>	
<u>Nitroglycerine</u>	<u>1-4oz</u>	<u>YES</u>	

OBSERVATIONS / NOTES:

MAP:

Ground Frozen Solid - MAI available to collect sample - some asphalt pieces

X ~~SS01~~ MU01

X SS01

Parent

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

NASB-MGBR-50-Dup01-121609

B. Geringer / C. Fellows



Project Site Name: MASB - Ma Chue Gea Boreright Bay
Project No.: 117 G-001 GHS

Sample ID No.: MASB-M76-BR-SS02 0003
Sample Location: SS02
Sampled By: CFS BG
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0835</u>	<u>CG-03</u>	<u>Brown</u>	<u>Sand(?) some silt, organics/fibres some asphalt pieces - Dry</u>
Method: <u>SCOOP</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>4oz</u>	<u>✓</u>	
<u>Microglycerine</u>	<u>4oz</u>	<u>✓</u>	

OBSERVATIONS / NOTES:

MAP:

X SS02 X SS03

⊙ M701

Circle if Applicable:

Signature(s):

MS/MSD: _____
Duplicate ID No.: _____

C. F. ... / B. Y. ...



Project Site Name: NASB - Marlin (on Borealis) Road Sample ID No.: NASB-MBGR-SS03-0003
 Project No.: 112600645 Sample Location: SS03
 Sampled By: CFS BG
 C.O.C. No.: _____
 Surface Soil
 Subsurface Soil
 Sediment
 Other: _____
 QA Sample Type: _____
 Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/16/09</u>	<u>00-03</u>	<u>Brown</u>	<u>sand (f) some silt - organics / fibrous piece of asphalt - Dry</u>
Time: <u>0830</u>			
Method: <u>Scrap</u>			
Monitor Reading (ppm): <u>ND</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>4oz</u>	<u>Y</u>	
<u>N-nitrogen</u>	<u>4oz</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

MAP:

X SS03
0 hwa1

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.: _____

C. Kim / Bin Yi



Project Site Name:
Project No.:

MASB - Machup 6 in Base Rd Rwy
112 600645

Sample ID No.: MASB-M6B2-SS04-003
Sample Location: SS04
Sampled By: CFSBA
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/16/09</u>	<u>60-68</u>	<u>Brown</u>	<u>Sand (f) some silt, organics/fibers</u>
Time: <u>0840</u>			<u>Dry</u>
Method: <u>Scop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>4oz</u>	<u>Y</u>	
<u>Nitrolycarbons</u>	<u>4oz</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

MAP:

x SS04
x SS03 x SS02

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

C. Fells / Bin Yi



Project Site Name: M356 Machine (on Bore) Range
Project No.: 12600645

Sample ID No.: M356-MG30-SS05-0003
Sample Location: SS05
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/16/09</u>	<u>00-03</u>	<u>Brown</u>	<u>sand (f) silt, organics / Alkalis</u> <u>Dry</u>
<u>0815</u>			
<u>SC06</u>			
<u>6.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>4oz</u>	<u>X</u>	
<u>Microplastics</u>	<u>4oz</u>	<u>X</u>	

OBSERVATIONS / NOTES:

MAP:

X SS05
@ M303

X SS04

Circle if Applicable:

MS/MSD
Duplicate ID No.:

Signature(s): C. F. M. / Bin Yin



Project Site Name:
Project No.:

NASB - Macao Co. Dues de Rango
12 600 645

Sample ID No.:

NASB-MCDA-SS06

Sample Location:

SS06

Sampled By:

CFS BG

C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:

- Low Concentration
- High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0855</u>	<u>00-03</u>	<u>Brown</u>	<u>sand (f) some silt, organics / fibrous</u> <u>Dry</u>
Method: <u>Scor</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>602</u>	<u>Y</u>	
<u>Inorganic</u>	<u>402</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

MAP:

x SS06
x SS05
o MW03

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

C. P. / B. H.



Project Site Name: AMSIF Madras Gun Barrack Hoag
Project No.: 1126C0645

Sample ID No.: MS-11600-SS07-0003
Sample Location: SS07
Sampled By: CPS BG
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0900</u>	<u>00-03</u>	<u>DARK BROWN</u>	<u>Sand/Silt, organics/fibres/roots</u>
Method: <u>Scrap</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>4oz</u>	<u>✓</u>	
<u>PAHs</u>	<u>4oz</u>	<u>✓</u>	

OBSERVATIONS / NOTES:

MAP:

SS07
Ddy St

Circle if Applicable:

Signature(s):

MS/MSD _____
Duplicate ID No.: _____

CPS / Bri Hui



Project Site Name: MSD-Machin Gun Barrels Range
Project No.: 12625645

Sample ID No.: MSD-MGBR-SS08-0013
Sample Location: SS08
Sampled By: CB DG
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0905</u>	<u>00-03</u>	<u>Brown</u>	<u>sand(f) silt, some organics / fibrous</u>
Method: <u>Scrap</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>Metals</u>	<u>4oz</u>	<u>Y</u>	
<u>Microplastic</u>	<u>4oz</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

MAP:

*SS08 *SS06

*SS05
@ MWS

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

C. P. M. / Bin Yin



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB01-0003/0312

Sample Location: SB01

Sampled By: B. Geringer / C. Fellows

C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>9:30 / 0935</u>	<u>0-3</u>	<u>DK Brown</u>	<u>F-Sand, little silt, roots - dry</u>
Method: <u>Scoop/Auger</u>	<u>3-12</u>	<u>Brown</u>	<u>F-M Sand, little silt - dry</u>
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

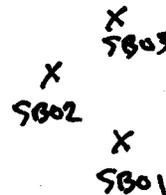
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-402</u>	<u>YES</u>	
<u>Nitrogen</u>	<u>1-402</u>	<u>YES</u>	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground



Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

NASB-MGBR-SB-DUP02-121609

B. Geringer / C. Fellows



Project Site Name: NASB - MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB01-1218
Sample Location: SB01
Sampled By: B. Genger / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/16/09</u>	<u>12-18</u>	<u>Lt. Brown</u>	<u>F-M Sand, T-Silt - dry</u>
<u>0940</u>			
Method: <u>Hand Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-4oz</u>	<u>YES</u>	
<u>Nitrogen</u>	<u>1-4oz</u>	<u>YES</u>	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X SB03
X SB02

X SB01

X SB03

SB02 X

X SB01

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

B. Genger / C. Fellows



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-5802-0312
Sample Location: 5802
Sampled By: B. Gringer / CFellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/16/09</u>	<u>12-18</u>	<u>Lt. Brown</u>	<u>F-M Sand, T-silt - dry</u>
Time: <u>0955</u>			
Method: <u>Hand Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-402</u>	<u>YES</u>	
<u>Nitroglycerine</u>	<u>1-402</u>	<u>YES</u>	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X 5803
 X 5802
 X 5801

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

B. Gringer / P. Hill



Project Site Name: NASB MGBR
Project No.: 112600645

Sample ID No.: NASB-MGBR-SB02-0001/022
Sample Location: SB02
Sampled By: B. Geringer / C. Fellous
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/16/09	0-3	Drk Brown	F-Sand, little silt, roots - dry
Time: 9:45/09:50	3-12	Brown	F-M Sand, little silt - dry
Method: <u>Scoop / Hand Auger</u>			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

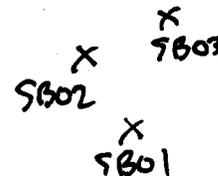
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1 4oz	Yes	
Nitroglycerine	1 4oz	Yes	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

B. Geringer / C. Fellous



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-5803-0009/0312

Sample Location: 5803

Sampled By: B. Geringer / C. Fellows

C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/16/09	0-3	Brown	F-Sand, little silt, roots - dry
Time: 1000/1005			
Method: Scoop/Auger			
Monitor Reading (ppm): 0.0	3-12	Lt Brown	F-M Sand, T-Silt, little roots - dry

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1 4oz	YES	
Nitrolyceriae	1 4oz	YES	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X 5804
 X 5803
 X 5802
 X 5801

Circle if Applicable:

Signature(s):

MS/MSD Duplicate ID No.:

B. Geringer / C. Fellows



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB03-1218
Sample Location: SB03
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/16/09	12-18	Lt. Brown	F-M Sand, T-silt
Time: 1010			
Method: Auger			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1 4oz	Yes	
Nitroglycerine	1 4oz	Yes	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X
SB04

X
SB02

X
SB03

X
SB01

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Brian Geringer / C. Fellows



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB04-003/0312
Sample Location: SB04
Sampled By: B. Geering / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/16/09	0-3	DK Brown	F-Sand, silt, roots - dry
Time: 1015/1020	3-12	Brown	F-M sand, T. silt, dry
Method: <u>Scope/Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

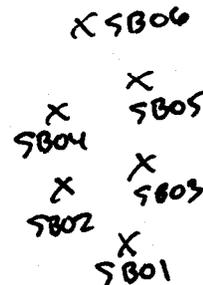
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1 4oz	yes	
Nitroglycerine	1 4oz	yes	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

B. Geering / C. Fellows



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-5B04-1218
Sample Location: 5B04
Sampled By: B. Geringer / C. Fellows
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1025</u>	<u>12-18</u>	<u>Lt. Brown</u>	<u>F-M Sand, T-silt - dry</u>
Method: <u>Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

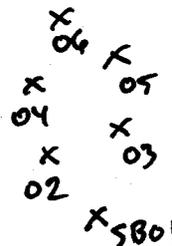
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1 4oz</u>	<u>Yes</u>	
<u>Nitroglycerine</u>	<u>1 4oz</u>	<u>Yes</u>	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground



Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

NASB-MGBR-SO-DP03-121609

B. Geringer / C. Fellows



Project Site Name: NASB-MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-5805-0003/0312
Sample Location: 5805
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/16/09	0-3	Dk. Brown	F-Sand, little silt, roots - dry
Time: 1155 / 1200	3-12	Brown	F-Sand, 7. Silt - dry
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1 402	Yes	
Nitrogen	1 402	Yes	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X 5804
X 5805
X 5806

Circle if Applicable:

Signature(s):

MS/MSD Duplicate ID No.:

B. Geringer



Project Site Name: NASB-MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB05-1218
Sample Location: SB05
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1205</u>	<u>12-18</u>	<u>Lt Brown</u>	<u>F-M Sand, T-silt - dry</u>
Method: <u>DPT</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

TAL metal Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1 - 4oz</u>	<u>Yes</u>	
<u>Nitroglycerine</u>	<u>1 - 4oz</u>	<u>Yes</u>	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X SB04
 X SB05
 X SB06

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-5806-0003 0312
Sample Location: 5806
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/16/09	0-3	DK. Brown	F-Sand, Silt, rock - dry
Time: 1210/1215	3-12	Brown	F-Sand, T-silt dry
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

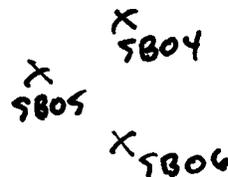
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1-4 oz.	Yes	
Nitroglycerine	1-4 oz.	Yes	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground



Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

03-12

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB-MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB04-1218
Sample Location: SB06
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/16/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1220</u>	<u>12-18</u>	<u>Brown</u>	<u>F-M Sand, little silt - dry</u>
Method: <u>DPT</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-402</u>	<u>Yes</u>	
<u>Nitrolycerine</u>	<u>1-402</u>	<u>Yes</u>	

OBSERVATIONS / NOTES:

MAP:

3" of snow on ground

X SB05
X SB04
X SB06

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.: _____

B. Geringer / C. Fellows



Project Site Name: NASB MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-SB07-1218
Sample Location: SB07
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/16/09</u>	<u>12-18</u>	<u>Brown</u>	<u>F-M Sand, T-Silt, Some Gravel - dry</u>
Time: <u>0925</u>			
Method: <u>Hand Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

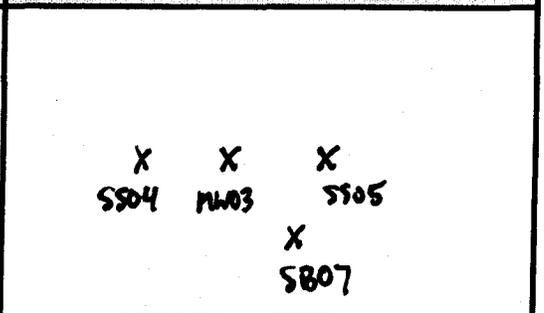
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-4oz</u>	<u>YES</u>	
<u>Nitrogen</u>	<u>1-4oz</u>	<u>YES</u>	

OBSERVATIONS / NOTES:

3" of snow on ground

MAP:



Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

B. Geringer

SKEET RANGE



Project Site Name: NASB - M Base Street
Project No.: 112600645

Sample ID No.: NASB-SKT-SS01-009
Sample Location: SS01
Sampled By: B. Geringer / C. Felton
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0820</u>	<u>0-3"</u>	<u>DK Brown</u>	<u>F-Sand, little silt, roots - moist Dry</u>
Method: <u>Disposable Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

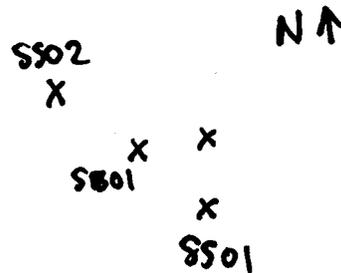
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>14oz</u>	<u>yes</u>	
<u>PAHs</u>	↓	↓	
<u>Dinitrobenz</u>			
<u>Nitrobenz</u>			

OBSERVATIONS / NOTES:

MAP:

6" of snow on ground surface



Circle if Applicable:

MS/MSD

Duplicate ID No.:

NASB-SKT-SS DUPO1-121509

Signature(s):

B. Geringer / C. Felton



Project Site Name: NASB-Sheet Ramp
Project No.: 112G00645

Sample ID No.: NASB-SKT-SS02-0003
Sample Location: SS02
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0850</u>	<u>0-3</u>	<u>Brown</u>	<u>F-Sand, little silt, roots, organic T-Gravel - Dry</u>
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

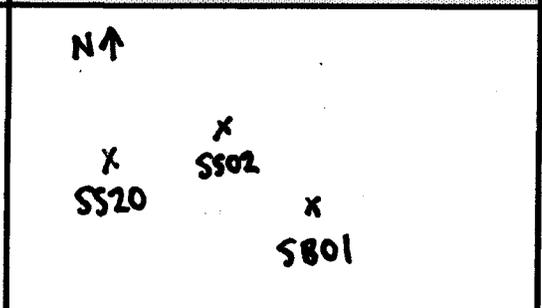
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1 402</u>	<u>YES</u>	
<u>PAHs</u>	↓	↓	
<u>Dinitrotoluene</u>	↓	↓	
<u>Nitroglycerine</u>	↓	↓	

OBSERVATIONS / NOTES:

6" of snow on ground

MAP:



Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

B. Geringer / C. Fellows



Project Site Name: MBSB Street Range
Project No.: 112600645

Sample ID No.: MBSB-SLT-SS03-003
Sample Location: SS03
Sampled By: BG/CFS
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval: <u>00-03</u>	Color: <u>Brown</u>	Description (Sand, Silt, Clay, Moisture, etc.): <u>some (f-m) some coarse sand trace silt, some organics. Moist</u>
Time: <u>1310</u>			
Method: <u>Scrap</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

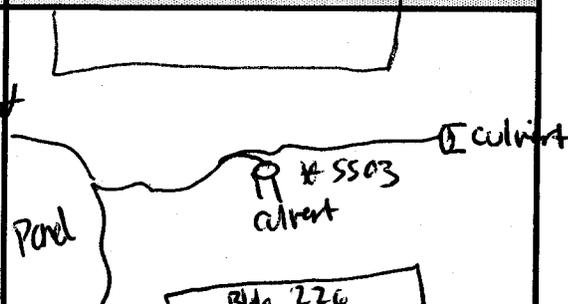
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals			
TAL Metals	4oz	Y	
PAH	4oz	Y	

OBSERVATIONS / NOTES:

- 2" of snow at sample location
 - creek - water flowing, orange pluc on sediment on creek/stream beds
 - organic / sulfur smell at creek

MAP:



Circle If Applicable:

MS/MSD <u> </u>	Duplicate ID No.: <u> </u>
---------------------	--------------------------------

Signature(s):
C. Fabian / Bai Yin



Project Site Name: M5B-SKUT Range
Project No.: 112600645

Sample ID No.: M5B-SKT-SS04-003
Sample Location: SS04
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval: <u>00-03</u>	Color: <u>Brown</u>	Description (Sand, Silt, Clay, Moisture, etc.): <u>Sand (H) and silt - very organic / fibrous - (loam) Dry</u>
Time: <u>1255</u>			
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

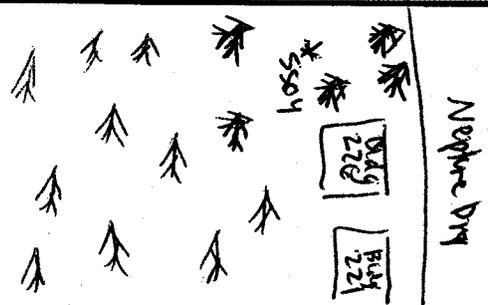
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>402</u>	<u>Y</u>	
<u>PAH</u>	<u>402</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

2 in of snow on ground at sample location

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

C. Kim / Bi Yin



Project Site Name: MAB-SKEET DRIVE
Project No.: 112G00645

Sample ID No.: MAB-SKT-SS05-0003
Sample Location: SS05
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1250</u>	<u>00-03</u>	<u>Brown</u>	<u>Sand (f-m) some gravel - Dry</u>
Method: <u>SCOP</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

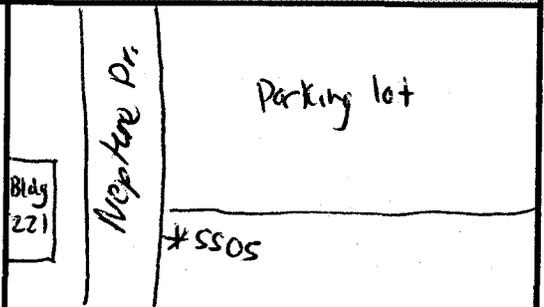
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAM Metals</u>	<u>4oz</u>	<u>Y</u>	
<u>PAH</u>	<u>4oz</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

- NO snow at sample location
- sample location marked in middle of road/
Weptone Dr. - collect sample on corner approx.
10-12 ft from marked location.

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

C. Fan / Bi Yin



Project Site Name: MASB-Skelt Range
Project No.: 112600645

Sample ID No.: MASB-SKT-SS06-0003
Sample Location: SS06
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1210</u>	<u>00-03</u>	<u>Dark Brown</u>	<u>sand and silt - mostly organics, v. fibrous - 10cm. Dry</u>
Method: <u>Grab / Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

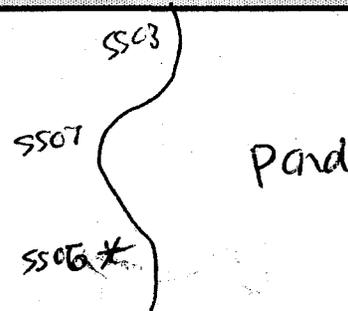
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TDL Metals</u>	<u>402</u>	<u>Y</u>	
<u>PAH</u>	<u>402</u>	<u>Y</u>	
<u>pH</u>	<u>402</u>	<u>Y</u>	
<u>TOC</u>	<u>402</u>	<u>Y</u>	
<u>ECE</u>	<u>402</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

MAP:

2" of snow at sample location



Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.: Metals and PAH Only

MASB-SKT-DUP02-121509

E. Fahn / Bin Yi



Project Site Name: MSB-Skeet Range
Project No.: 112600645

Sample ID No.: MSB-SKT-5507-0003
Sample Location: 3507
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval: <u>00-03</u>	Color: <u>Dark Brown</u>	Description (Sand, Silt, Clay, Moisture, etc.): <u>silt and sand (f) mostly organics / fibrous. Moist to wet</u>
Time: <u>1200</u>			
Method: <u>Grab / Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

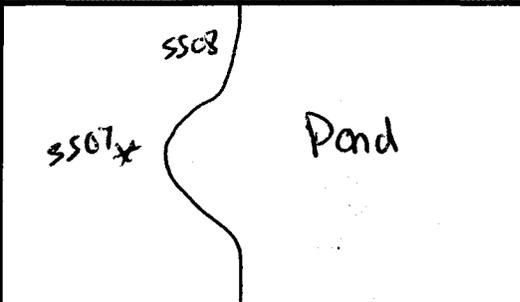
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	Yes	Y	
PAH	↓	Y	
pH	↓	Y	
TOC	↓	Y	
ECE	↓	Y	

OBSERVATIONS / NOTES:

MAP:

- NO SNOW at sample location



Circle if Applicable:

Signature(s):

MS/MSD: _____
Duplicate ID No.: _____

C. Fahn / Bin Hui



Project Site Name: NASB-Sheet Range
Project No.: 112G-00645

Sample ID No.: NASB-SKT-3508-0003
Sample Location: 3508
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1150</u>	<u>00-03</u>	<u>Brown</u>	<u>Sand (f) some silt, organics and fibrous roots - loam. Dry</u>
Method: <u>SCUD</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>402 jar</u>	<u>YES</u>	
<u>PAH</u>	<u>402 jar</u>	<u>YES</u>	
<u>pH</u>	<u>402 jar</u>	<u>YES</u>	
<u>TOC</u>	<u>402 jar</u>	<u>YES</u>	
<u>CEC</u>	<u>402 jar</u>	<u>YES</u>	

OBSERVATIONS / NOTES:

MAP:

No snow at sample location.

3508
*

Pond

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.: _____

Chris Kahr / Ben G...



Project Site Name: NASB-Sheet Range
Project No.: 112600645

Sample ID No.: NASB-SKT-SS09-0003
Sample Location: SS09
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1050</u>	<u>0-3"</u>	<u>Lt. Brown / Tan</u>	<u>F-M Sand, T-Silt - Dry</u>
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

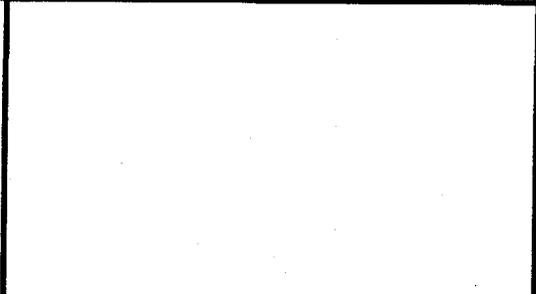
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL metals</u>	<u>1 4oz</u>	<u>Yes</u>	
<u>PAHs</u>	<u>↓</u>	<u>↓</u>	

OBSERVATIONS / NOTES:

← N Clearing 4" of snow on ground
 Blk. → □
 Tree line x-Sample

MAP:



Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB-Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SS10-0003
Sample Location: SS10
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1055</u>	<u>0-3</u>	<u>.Dk. Brown</u>	<u>F-Sand, T-Silt, roots - dry</u>
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

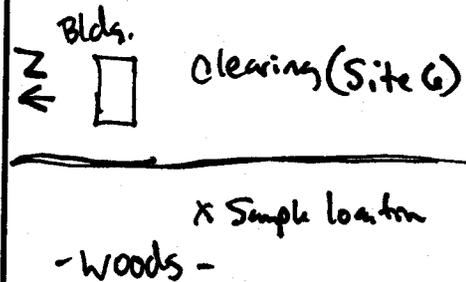
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1-4 oz.</u>	<u>Yes</u>	
<u>PAHs</u>	<u>↓</u>	<u>↓</u>	

OBSERVATIONS / NOTES:

MAP:

4" of snow on ground



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB-Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SS11-0003
Sample Location: SS11
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0950</u>	<u>0-3"</u>	<u>Dr. Brown</u>	<u>F-Sand, T-silt, roots - dry</u>
Method: <u>SCOOP</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

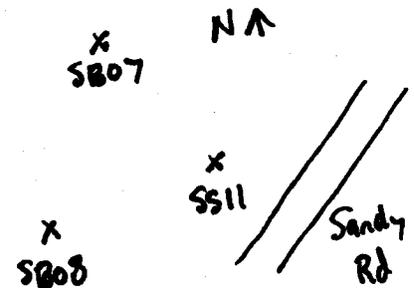
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1402</u>	<u>Yes</u>	
<u>PAHs</u>	↓	↓	

OBSERVATIONS / NOTES:

MAP:

4" of snow on ground



Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

B. Geringer / C. Fellows



Project Site Name: NASB-Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SS12-0003
Sample Location: SS12
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0900</u>	<u>0-3</u>	<u>Dr. Brown</u>	<u>F-Sand, little silt, roots, organic - dry</u>
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1402</u>	<u>Yes</u>	
<u>PAHs</u>	<u>↓</u>	<u>↓</u>	

OBSERVATIONS / NOTES:

MAP:

6" of snow on ground

NA x
 SB08

x
SS21

x
SS12

Circle If Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: MBS-Skeet Range
Project No.: 11260026US

Sample ID No.: MBS-SKT-SS17-0003
Sample Location: SS17
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1230</u>	<u>00-03</u>	<u>Dark Brown</u>	<u>Sand (f) and silt, organics / fibrous (loom)</u> <u>Dry</u>
Method: <u>Grab / SCOOP</u>			
Monitor Reading (ppm): <u>0.1</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

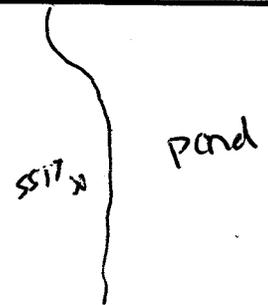
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>402</u>	<u>Y</u>	
<u>PAH</u>	<u>402</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

2" of snow at sample location

MAP:



Circle If Applicable:

MS/MSD: _____
Duplicate ID No.: _____

Signature(s):

C. Fisher / Bin Lin



Project Site Name: NASB - Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SS19-0003
Sample Location: SS19
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1025</u>	<u>0-3"</u>	<u>Brown</u>	<u>F-Sand, little silt, very root-dry</u>
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1402</u>	<u>Yes</u>	
<u>PAHs</u>	↓	↓	
<u>Nitroglycerine</u>	↓	↓	
<u>Dinitrotoluene</u>	↓	↓	
<u>TOC</u>	<u>1402</u>	↓	
<u>PH</u>	↓	↓	
<u>CEC</u>	↓	↓	

OBSERVATIONS / NOTES:

MAP:

4" of snow on ground

NA X 5806

SS19
X

5802
X

woods

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB - Skerit Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SS21-0003
Sample Location: SS21
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0905</u>	<u>0.3"</u>	<u>Dk Brown</u>	<u>F-Sand, roots, wood, T-silt dry</u>
Method: <u>Scoop</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>14oz</u>	<u>Yes</u>	
<u>PAHs</u>	<u>↓</u>	<u>↓</u>	

OBSERVATIONS / NOTES:

MAP:

6" of snow on ground

NA

X
SS03

X
SS21

X
SS12

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Brian Geringer



Project Site Name: NASB-Street Range
Project No.: 112600645

Sample ID No.: NASB-SKT-3526-0003
Sample Location: SS26
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1000</u>	<u>0-3"</u>	<u>DK. BROWN</u>	<u>F-Sand, little silt, roots - dry</u>
Method: <u>SCOOP</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

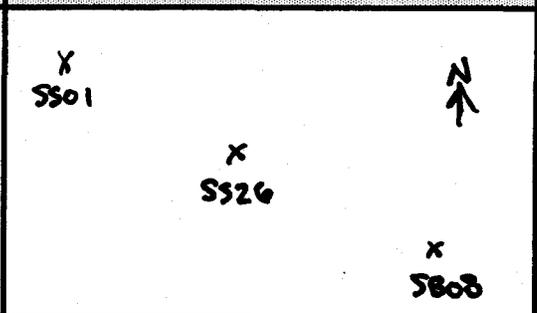
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>1x4oz</u>	<u>yes</u>	
<u>PAHs</u>	↓	↓	
<u>Dinitrotoluene</u>			
<u>Nitrobenzene</u>			

OBSERVATIONS / NOTES:

MAP:

4" of Snow on ground



Circle If Applicable:

Signature(s):

MS/MSD Duplicate ID No.: _____

B. Geringer



Project Site Name: NASB-MGBR
Project No.: 112G00645

Sample ID No.: NASB-S&T-S&D-0003/0312
Sample Location: S&D1
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/15/09	0-3"	DK Brown	F-S&D, little silt - moist
Time: 0808/0813	3-12"	Brown	F-M Sand, T-Silt, little Gravel - moist
Method: Scoop/Auger			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1402	YES	
PAHs	" "	↓	
Dinitrobenzene	↓	↓	
Nitrobenzene			

OBSERVATIONS / NOTES:

MAP:

6" of snow on ground

X
SS02

X
S&D1

X
SS01

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

B. Geringer



Project Site Name: NASB-Sheet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SB02.0009/0312
Sample Location: SB02
Sampled By: B. Geringer
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/15/09	0-3	dk Brown	F-Sand, little silt, roots, organic - Dry
Time: 0830/0835	3-12	Lt Brown	F-M Sand, T-Silt - Dry
Method: Scoop/Auger			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

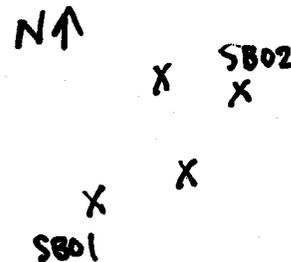
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1402	Yes	
PAHS	↓	↓	
DNITROTOLUENE			
NITROGLYCERINE			

OBSERVATIONS / NOTES:

6" of snow on ground
Several pigeon fragments found in 0-3"

MAP:



Circle If Applicable:

MS/MSD

Duplicate ID No.:

NASB-SKT DUP03-121509

Signature(s):

B. Geringer



Project Site Name: MBS-Skull Range
Project No.: 112600045

Sample ID No.: MBS-SKT-SB03-0003/0312
Sample Location: SB03
Sampled By: CBS BC
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/15/09</u>	<u>00-03</u>	<u>Dark Brown</u>	<u>- sand / some silt, organics - Dry</u>
<u>1340 / 1345</u>	<u>03-12</u>	<u>Brown / Tan</u>	<u>- sand / some organics - Dry</u>
Method: <u>Scoop / Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

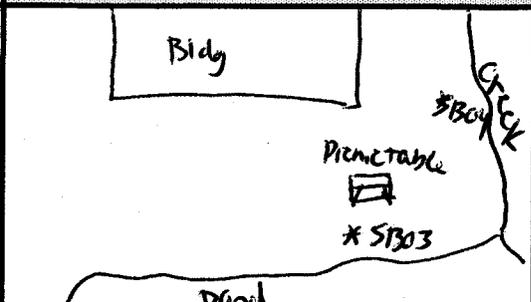
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAC Metals</u>	<u>2x 4oz</u>	<u>✓</u>	
<u>PAH</u>	<u>2x 4oz</u>	<u>✓</u>	

OBSERVATIONS / NOTES:

1 in of snow at sample location

MAP:



Circle If Applicable:

MS/MSD Duplicate ID No.:

Signature(s):

C. M. / Bai Hui



Project Site Name: MAB3-Sheet Range
Project No.: 112600645

Sample ID No.: MAB3-SLT-SB04-0003/031
Sample Location: SB04
Sampled By: BG, CFS
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/15/09	00-03	Brown/Dark Brown	- sand (f) - some silt - organics - Dry
1325 / 1330	03-12	Brown	- sand (f) - some organics - Dry
Method: <u>Scoop / Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

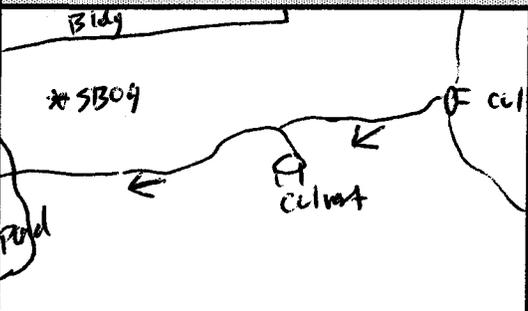
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	2 x 402	<input checked="" type="checkbox"/>	
PAH	2 x 402	<input checked="" type="checkbox"/>	

OBSERVATIONS / NOTES:

- 1/2 in of snow at sample location.
 - sample location on steep bank approx 20 ft from small creek flowing into pond.

MAP:



Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s): C. Farley / B. [unclear]



Project Site Name: MARB-Sheet Range
Project No.: 112600045

Sample ID No.: MARB-SKT-5805-0013/0312
Sample Location: 5805
Sampled By: _____
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>12/15/09</u>	<u>00-03</u>	<u>Brown / tan</u>	<u>Sand (f-m) some organics / fibrous - Dry</u>
<u>12/35/1240</u>	<u>03-12</u>	<u>Brown</u>	<u>Sand (f-m) some organics / roots - Dry</u>
Method: <u>Grab / Scoop / Auger</u>			
Monitor Reading (ppm): <u>G.D.</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

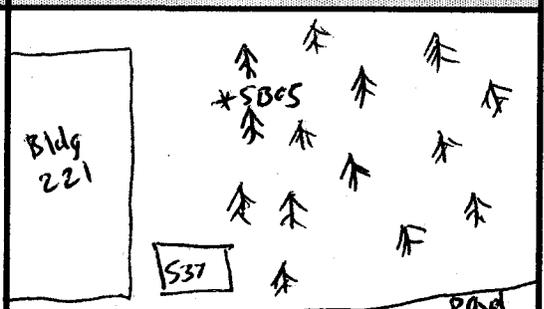
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>PAH</u>	<u>2 x 402</u>	<u>Y</u>	
<u>TAL Metals</u>	<u>2 x 402</u>	<u>Y</u>	

OBSERVATIONS / NOTES:

- 1/2" of snow at sample location
 - Small piece of Syro foam in 03-12" sample

MAP:



Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s):

[Signature]



Project Site Name: NASB-Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-3306-0003/0312
Sample Location: SB06
Sampled By: B. Geringer / C. Follows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/15/09	0-3"	DK. Brown	silty sand, organic, wood-wet
Time: 1035/1040	3-12"	Brown	F-Sand, little silt - wet
Method: <u>Scoop / Auger</u>			
Monitor Reading (ppm): <u>0.0</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

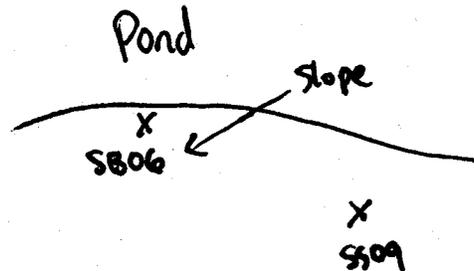
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	2x4oz	YES	
PAHs	↓	↓	

OBSERVATIONS / NOTES:

4" of snow on ground
Sample location 2' from retention pond,
Water at bottom of Auger hole.

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

B. Geringer / C. Follows



Project Site Name: NASB-Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SB07-0005/0312
Sample Location: SB07
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>12/15/09</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>0930/0935</u>	<u>0-3"</u>	<u>Lt. Brown /</u>	<u>F-Sand, some M-Sand, T-Silt-dry</u>
Method: <u>Scoop / Auger</u>	<u>3-12"</u>		
Monitor Reading (ppm): <u>0.0</u>			" "

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

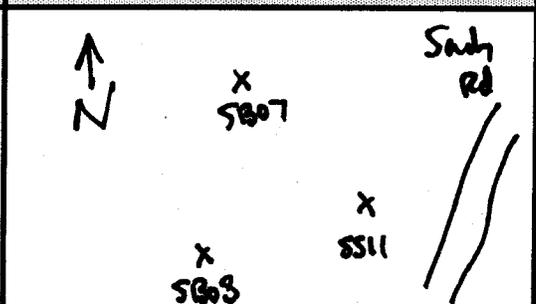
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
<u>TAL Metals</u>	<u>4 oz</u>	<u>Yes</u>	
<u>PAHs</u>	<u>↓</u>	<u>↓</u>	

OBSERVATIONS / NOTES:

MAP:

4" of snow on ground



Circle if Applicable:

Signature(s):

MS/MSD Duplicate ID No.: _____

B. Geringer



Project Site Name: NASB-Skeet Range
Project No.: 112G00645

Sample ID No.: NASB-SKT-SB08-0008 0312
Sample Location: SB08
Sampled By: B. Geringer / C. Fellows
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
12/15/09	0-3"	Dk. Brown	F-Sand, T-Silt, roots - Dry
Time: 0940 / 0945	3-12	Brown / Lt. Brown	F-Sand, T-Silt - Dry
Method: Scoop / Auger			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)

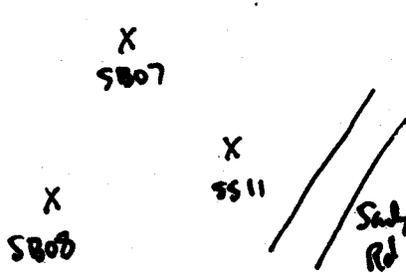
SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL Metals	1 402	Yes	
PAHs	↓	↓	

OBSERVATIONS / NOTES:

4" of snow on ground

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

B. Geringer / C. Fellows

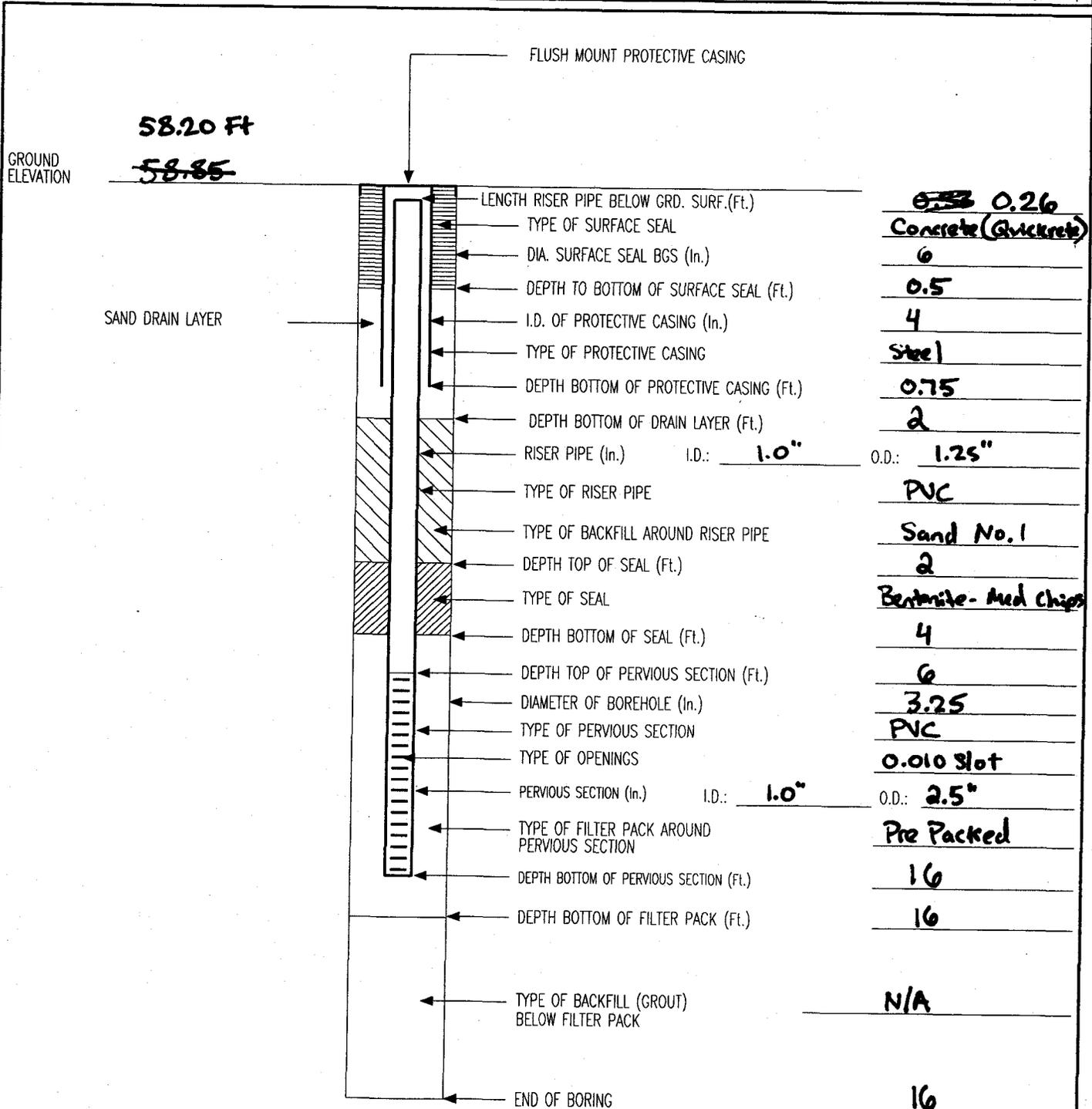
C-3 TEMPORARY WELL CONSTRUCTION LOGS

MACHINE GUN BORESIGHT RANGE

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME: NASB-MGBR	PROJECT NO: 112G00645
PROJECT LOCATION: Brunswick, Maine	WELL NO: NASB-MGBR-MW01
CLIENT: Navy	BORING NO: NASB-MGBR-MW01
CONTRACTOR: MAI Environmental	BORING LOCATION: 385272.12 (Y)
LOGGED BY: B. Geringer	3015689.45 (X)
CHECKED BY: _____	DATE: _____
DRILLER: S. Brown	DATE: 12/14/09



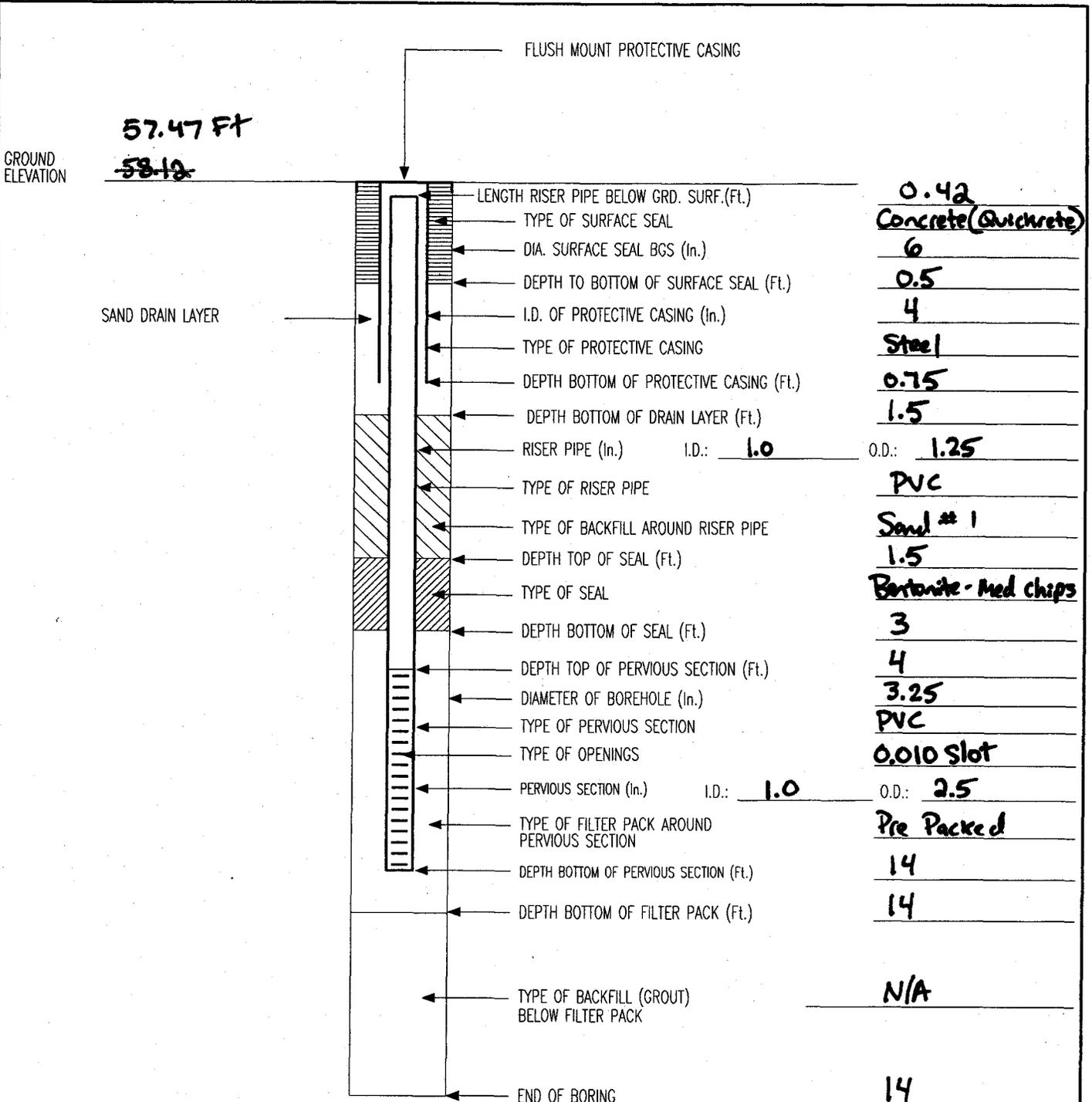
GENERAL NOTE:

1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME: NASB-MGBR	PROJECT NO: 112G00645
PROJECT LOCATION: Brunswick, Maine	WELL NO: NASB-MGBR-MW02
CLIENT: Navy	BORING NO: NASB-MGBR-MW02
CONTRACTOR: MAI Environmental	DRILLER: S. Brown
LOGGED BY: B. Geringer	BORING LOCATION: 385342.20 (Y)
CHECKED BY: _____	DATE: 12/14/09
	DATE: _____
	3015778.60 (X)
	PAGE: 1 OF 1

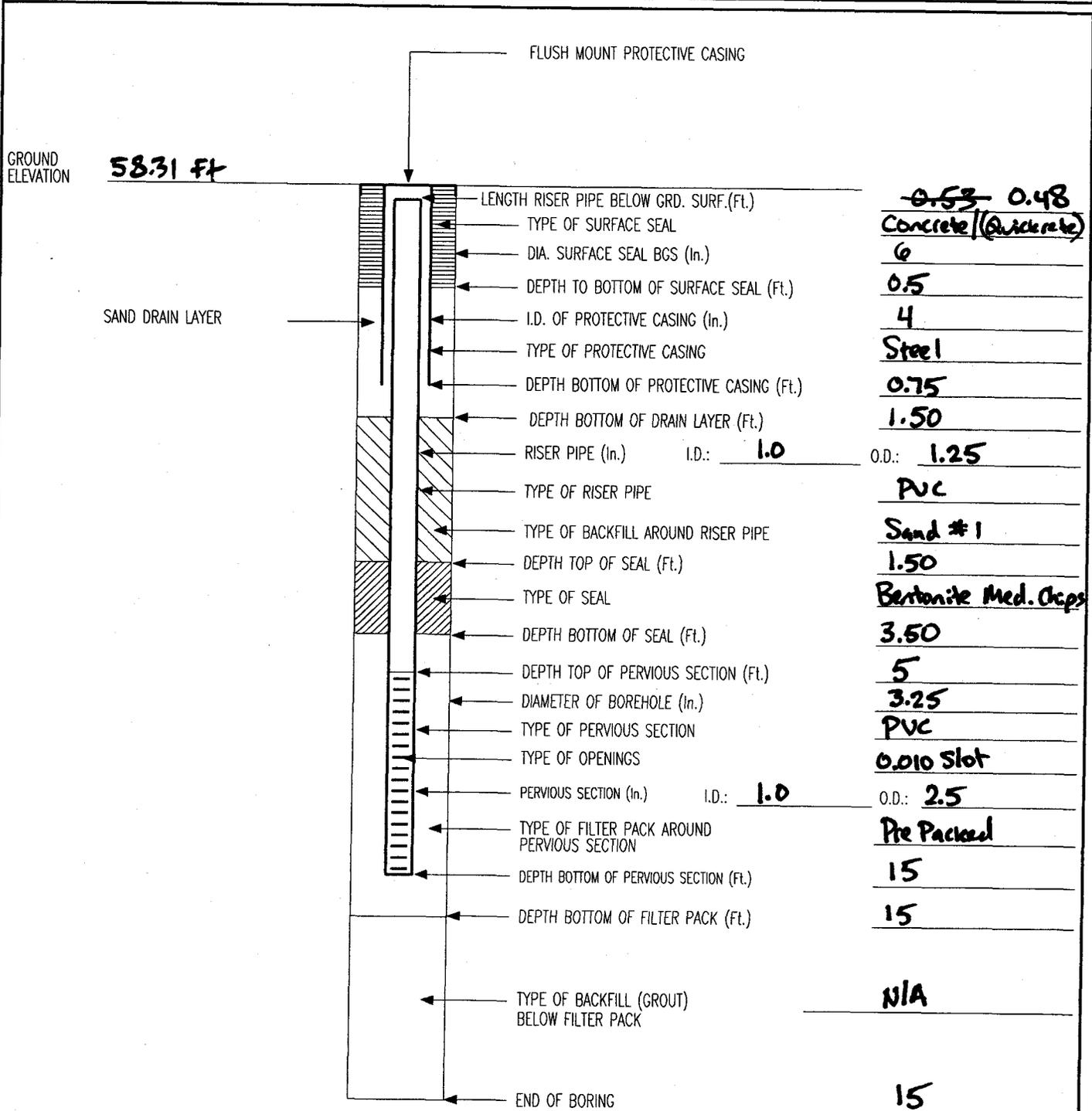


GENERAL NOTE:
 1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME: NASB-MGBR	PROJECT NO: 112G00645
PROJECT LOCATION: Brunswick, Maine	WELL NO: NASB-MGBR-MW03
CLIENT: Navy	BORING NO: NASB-MGBR-MW03
CONTRACTOR: MAE Environmental	DRILLER: S. Brown
LOGGED BY: B. Geringer	DATE: 12/14/09
CHECKED BY: _____	DATE: _____
	BORING LOCATION: 385273.94 (Y) 3015784.35 (X)
	PAGE: 1 OF 1

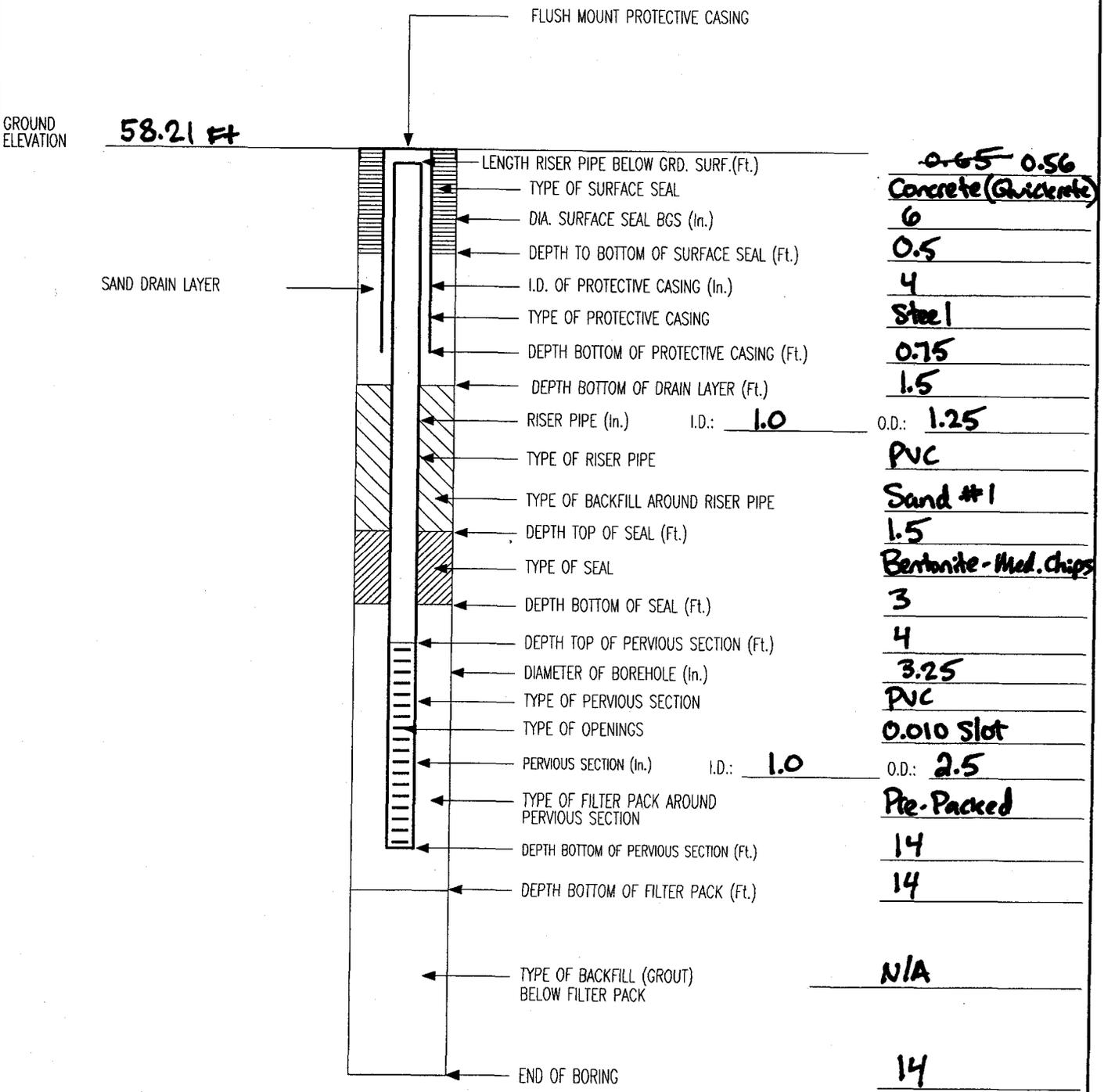


GENERAL NOTE:
1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.

FLUSH MOUNT MONITORING WELL CONSTRUCTION LOG

TETRA TECH NUS INC.

PROJECT NAME: NASB-MGBR	PROJECT NO: 112G00645
PROJECT LOCATION: Brunswick, Maine	WELL NO: NASB-MGBR-MW04
CLIENT: NAVY	BORING NO: NASB-MGBR-MW04
CONTRACTOR: MAI Environmental	DRILLER: S. Brown
LOGGED BY: B. Geringer	DATE: 12/14/09
CHECKED BY: _____	DATE: _____
	BORING LOCATION: 385205.20 (T) 3015768.92 (X)
	PAGE: 1 OF 1



GENERAL NOTE:
1. Entry of 0.00 for Ground Elevation Indicates that Surveyed Ground Elevation is NOT Available.



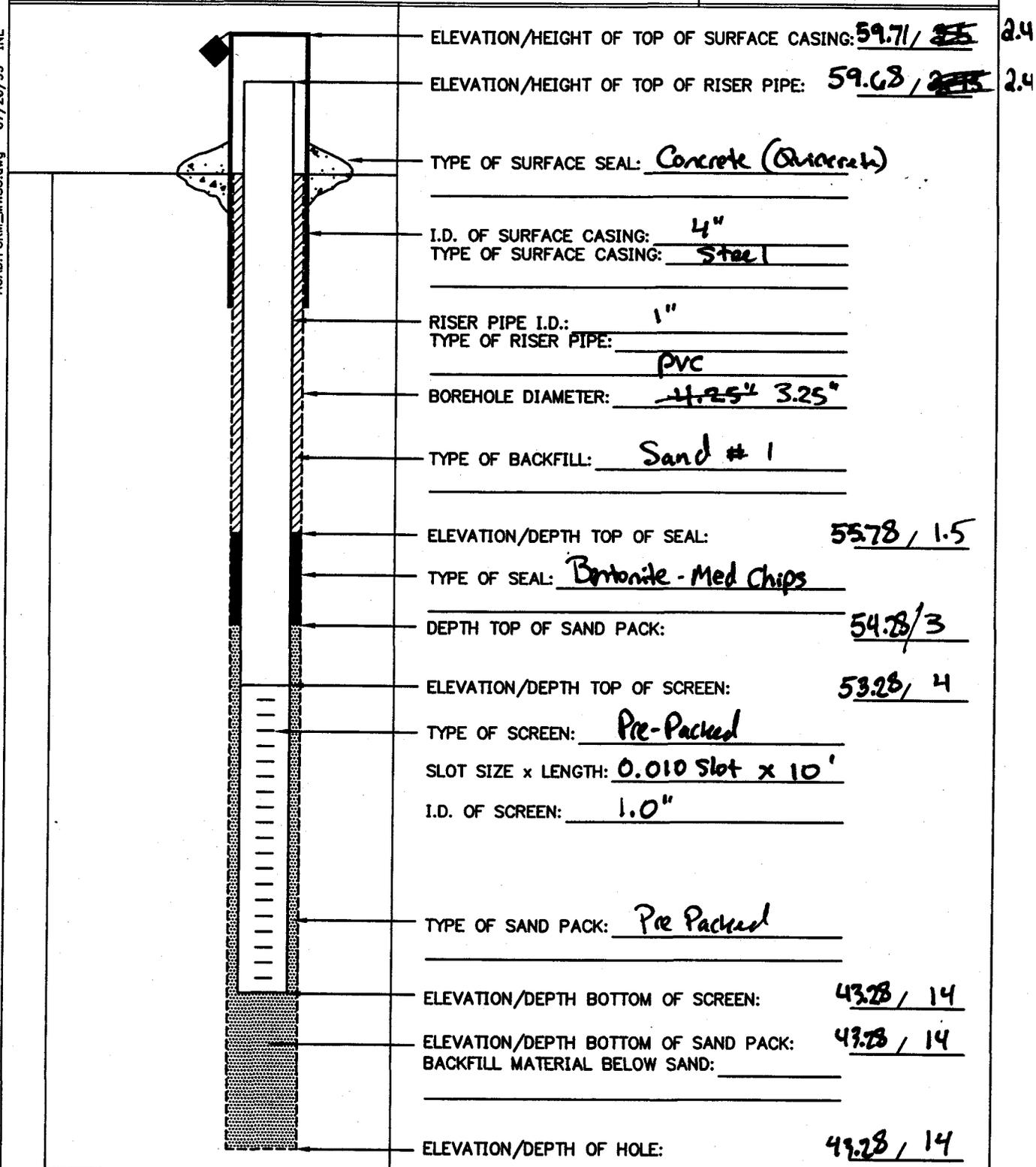
Tetra Tech NUS, Inc.

OVERBURDEN MONITORING WELL SHEET STICK-UP

WELL NO.: MGBR-MW05

PROJECT <u>MGBR</u>	LOCATION <u>385269.12(1)3015902.76</u>	DRILLER <u>MAI</u>
PROJECT NO. <u>112600645</u>	BORING <u>MW05</u>	DRILLING METHOD <u>Direct Push</u>
DATE BEGUN <u>12/14/09</u>	DATE COMPLETED <u>12/14/09</u>	DEVELOPMENT METHOD <u>Peristaltic</u>
FIELD GEOLOGIST <u>B. Geringer</u>	DATUM <u>NAVD88</u>	
GROUND ELEVATION <u>57.28</u>		

ACAD:FORM_MWSU.dwg 07/20/99 INL



ELEVATION/HEIGHT OF TOP OF SURFACE CASING: 59.71 / ~~55~~ 2.4

ELEVATION/HEIGHT OF TOP OF RISER PIPE: 59.68 / ~~235~~ 2.4

TYPE OF SURFACE SEAL: Concrete (Overcast)

I.D. OF SURFACE CASING: 4"
TYPE OF SURFACE CASING: Steel

RISER PIPE I.D.: 1"
TYPE OF RISER PIPE: PVC

BOREHOLE DIAMETER: 4.25" 3.25"

TYPE OF BACKFILL: Sand # 1

ELEVATION/DEPTH TOP OF SEAL: 55.78 / 1.5

TYPE OF SEAL: Bentonite - Med Chips

DEPTH TOP OF SAND PACK: 54.28 / 3

ELEVATION/DEPTH TOP OF SCREEN: 53.28 / 4

TYPE OF SCREEN: Pre-Packed
SLOT SIZE x LENGTH: 0.010 Slot x 10'
I.D. OF SCREEN: 1.0"

TYPE OF SAND PACK: Pre Packed

ELEVATION/DEPTH BOTTOM OF SCREEN: 43.28 / 14

ELEVATION/DEPTH BOTTOM OF SAND PACK: 43.28 / 14
BACKFILL MATERIAL BELOW SAND: _____

ELEVATION/DEPTH OF HOLE: 43.28 / 14

C-4 GROUNDWATER SAMPLE LOG AND PURGE SHEETS

MACHINE GUN BORESIGHT RANGE



Project Site Name: MAB3-Machine Gun Core sight Range
Project No.: 1126-030645

Sample ID No.: MAB3-MGBR-MW01-120909

Sample Location: MW01

Sampled By: CS BG

C.O.C. No.: _____

Type of Sample: _____

- Low Concentration
- High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
<u>12/29/09</u>	<u>Clear colorless</u>	<u>5.43</u>	<u>111</u>	<u>8.69</u>	<u>0.56</u>	<u>9.32</u>	<u>NA</u>	
Time: <u>0943</u>								
Method: <u>Low Flow</u>								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: <u>1" PVC</u>								
Total Well Depth (TD):	} * See low flow purge data sheet							
Static Water Level (WL):								
One Casing Volume (gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>TAL Metals</u>	<u>HNO3</u>	<u>1x 250ml poly</u>	<u>Y</u>
<u>Perchlorate</u>	<u>4°C</u>	<u>1x 250ml poly</u>	<u>Y</u>
<u>Nitroglycerine</u>	<u>4°C</u>	<u>2x 1 liter Amber</u>	<u>Y</u>

OBSERVATIONS / NOTES:

No Sheers

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

C. Fuller



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NASB-MGBR
Project No.: 112G00645

Sample ID No.: NASB-MGBR-MW02-122909

Sample Location: MW-02

Sampled By: B. Geringer

C.O.C. No.: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
<u>12/29/09</u>	<u>Clear</u>	<u>6.06</u>	<u>35</u>	<u>7.80</u>	<u>2.10</u>	<u>9.47</u>	<u>—</u>	
Time: <u>0950</u>								
Method: <u>Ferrihite</u>								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: <u>See Sample log Sheet</u>								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: <u>1" PVC</u>								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume (gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>TAL Metals</u>	<u>HNO₃/Cold</u>	<u>1-250 ml</u>	<u>YES</u>
<u>Nitrobenzene</u>	<u>Cold</u>	<u>2-1 liter</u>	<u>YES</u>
<u>Perchlorate</u>	<u>Cold</u>	<u>1-250 ml</u>	<u>YES</u>

OBSERVATIONS / NOTES:

No Shear / odor

Circle if Applicable:

MS/MSD

Duplicate ID No.:

NASB-MGBR-GW-DUP-122909

Signature(s):

B. Geringer



Project Site Name: MBB-Machin Gun Disposal Range Sample ID No.: MBB-NGDR-MW03-22A04
 Project No.: 12G-00645 Sample Location: MW03
 Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____
 Sampled By: DG, LIS
 C.O.C. No.: _____
 Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>12/24/09</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>1105</u>	<u>clear/colorless</u>	<u>9.4</u>	<u>168</u>	<u>8.37</u>	<u>320</u>	<u>9.30</u>	<u>NA</u>	
Method: <u>Low Flow</u>								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: <u>1" PVC</u>								
Total Well Depth (TD):	see low flow purge data sheet							
Static Water Level (WL):								
One Casing Volume (gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>TAL Metals</u>	<u>HNO3</u>	<u>1 x 250 ml poly</u>	<u>X</u>
<u>Perchlorate</u>	<u>40</u>	<u>1 x 250 ml poly</u>	<u>X</u>
<u>Nitroglycerine</u>	<u>40</u>	<u>2 x 1 liter Amber</u>	<u>X</u>

OBSERVATIONS / NOTES:

NO Sheens

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Bi Jus
[Signature]



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NASS-MGBR Sample ID No.: NASS-MGBR-MW04-122909
 Project No.: 112600645 Sample Location: MW-04
 Sampled By: C. Fellows
 Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____
 C.O.C. No.: _____
 Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time:	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	
<u>12/29/09</u>	<u>clear</u>	<u>5.68</u>	<u>185</u>	<u>8.67</u>	<u>0.03</u>	<u>5.24</u>	<u>—</u>	
<u>1037</u>								
Method: <u>Peristaltic</u>								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: <u>1" PVC</u>								
Total Well Depth (TD):	- See purge data sheet							
Static Water Level (WL):								
One Casing Volume (gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>TAL Metals</u>	<u>HNO3/CAD</u>	<u>1-250 ml</u>	<u>YES</u>
<u>Nitroglycerine</u>	<u>COLD</u>	<u>2-1 liter Ambers</u>	<u>YES</u>
<u>Perchlorate</u>	<u>COLD</u>	<u>1-250 ml</u>	<u>YES</u>

OBSERVATIONS / NOTES:

No shen / odor

Circle if Applicable: MS/MSD Duplicate ID No.: _____ Signature(s): C. Fellows



Project Site Name: MAB3-Machine Gun Boreste Range
Project No.: _____

Sample ID No.: MAB3-MGBR-MW05 122909

Sample Location: MW05

Sampled By: CJB BG

C.O.C. No.: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
- Low Concentration
 - High Concentration

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
<u>12/22/09</u>								
Time: <u>1200</u>								
Method: <u>Low Flow</u>	<u>Colorless</u>	<u>5.43</u>	<u>61</u>	<u>7.07</u>	<u>233</u>	<u>6.27</u>	<u>NA</u>	

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material Type: <u>1" PVC</u>								
Total Well Depth (TD):	<u>See low flow purge data sheet</u>							
Static Water Level (WL):								
One Casing Volume (gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>Trace Metals</u>	<u>HNO3</u>	<u>1x 250ml poly</u>	<u>Y</u>
<u>Perchlorate</u>	<u>40</u>	<u>1x 250ml poly</u>	<u>Y</u>
<u>Nitroglycerine</u>	<u>40</u>	<u>2x 1 liter Amber</u>	<u>Y</u>

OBSERVATIONS / NOTES:

no trends

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

C. Full



TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NASB - Machine Gun Boresight Range
 Sample ID: NASB-MGBR-MW02-122909

Tetra Tech NUS Charge No. 112G00645 0000.0505
 QC: NASB-MGBR-GW-DP01-122909 (If applicable)

Sample Method: Low Flow (stress) with Peristaltic Pump
 Depth Sampled: 9 Feet Screened Interval Depth 4-14 feet
 Sample Date & Time: 12/29/2009 0950 hours Yes /Dup
 Sampler(s): B. Geringer / C. Fellows
 Data Recorded By: B. Geringer Signature: B. Geringer
 Notes: WL measuring pt = top of riser (TOR) yes
 LNAPL signal at start (YES/NO) No
 Weather: Cloudy / cold / very Windy

H&S Survey Meter 0.0 PPM Field Instrument Group A B/C/D
 Pre-pump insertion WL - ft Post - pump insertion WL 4.07 ft

Analysis (LAB)

TAL Metals
Nitroglycerine
Perchlorate

(Also see separate logsheet for gw)

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 uS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
<u>START: 920</u>											
<u>0930</u>	<u>4.07</u>	<u>3/8</u>	<u>200</u>	<u>2.0</u>	<u>7.47</u>	<u>37</u>	<u>6.16</u>	<u>225.5</u>	<u>9.52</u>	<u>9.48</u>	<u>clear/colorless</u>
<u>0935</u>	<u>4.07</u>		<u>200</u>	<u>2.5</u>	<u>7.83</u>	<u>35</u>	<u>6.08</u>	<u>229.6</u>	<u>9.55</u>	<u>9.35</u>	" "
<u>0940</u>	<u>4.07</u>		<u>200</u>	<u>3.0</u>	<u>7.79</u>	<u>36</u>	<u>6.07</u>	<u>230.2</u>	<u>9.65</u>	<u>3.42</u>	
<u>0945</u>	<u>4.07</u>	✓	<u>200</u>	<u>3.5</u>	<u>7.80</u>	<u>35</u>	<u>6.06</u>	<u>228.8</u>	<u>9.47</u>	<u>2.10</u>	✓
	<u>Reached Stabilization - started to collect samples</u>										

TINUS Form 0009

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).



TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NASB - Machine Gun Boresight Range

Sample ID: NASB-MG BR-MW03-122909

Tetra Tech NUS Charge No. 112G00645 0000.0505

QC: N/A (If applicable)

Sample Method: Low Flow (stress) with Peristaltic Pump

Depth Sampled: 10 Feet Screened Interval Depth 5-15 feet

Sample Date & Time: 2/29/2009 1105 hours N/A /Dup

Sampler(s): B. Geringer / C. Fellows

Data Recorded By: B. Geringer Signature: B. Geringer

Notes: WL measuring pt = top of riser (TOR)

LNAPL signal at start (YES/NO) No

Weather: Cloudy / Cdd / Very Windy

H&S Survey Meter 0.0 PPM

Pre-pump insertion WL - ft

Field Instrument Group A/B/C/D
Post - pump insertion WL 4.98 ft 5.03

Analysis (LAB)

TAL Metals

Nitrogen

Perchlorate

(Also see separate logsheet for gw)

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 uS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
Start: 1035											
1035	5.08	3/4	400	4.0	8.30	190	9.87	49.0	9.16	32.9	little cloudy
1040	5.08	↓	400	6.0	8.15	191	9.72	14.3	9.40	20.0	Clear/cloudless
1045	5.08	↓	400	8.0	8.14	186	9.62	9.9	9.39	11.8	" "
1050	5.08	↓	400	10.0	8.33	175	9.47	8.3	9.29	5.23	↓
1055	5.08	↓	400	12.0	8.35	172	9.45	9.4	9.35	4.61	↓
1100	5.08	↓	400	14	8.37	168	9.41	9.8	9.30	3.20	↓
	Reached Stabilization - Started to collect samples										

TINUS Form 0009

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).



TETRA TECH NUS, INC.

SAMPLE LOG SHEET - "LOW FLOW" GROUNDWATER

Site Name: NASB - Machine Gun Boresight Range
 Sample ID: MAB3-MGBR-NW05-12290A

Tetra Tech NUS Charge No. 112G00645 0000.0505
 QC: NA (If applicable)

Sample Method: Low Flow (stress) with Peristaltic Pump
 Depth Sampled: 9 1/4 Feet ~~to~~ Screened Interval Depth 4-14 feet
 Sample Date & Time: 12/29/2009 1200 hours NA /Dup
 Sampler(s): CFS BG
 Data Recorded By: CFS Signature: C. Miller
 Notes: WL measuring pt = top of riser (TOR) _____
 LNAPL signal at start (YES/NO) _____
 Weather: Cloudy, Windy 10's

H&S Survey Meter 6.0 PPM Field Instrument Group A/B/C/D
 Pre-pump insertion WL — ft Post - pump insertion WL 6.88 ft
Dedicated tubing
 Analysis (LAB)

Ta Metals _____
Nitrosyls _____
Perchlorate _____

(Also see separate logsheet for gw)

Clock Time 24hr	Water Depth below MP ft	Pump Dial 1 Post-pump	Purge Rate ml/min	Cumm. Volume Purged liters	Temp °C	Spec. Cond. 2 uS/cm	pH	ORP/Eh3 mv	DO mg/L	Turbidity NTU	Comments
<u>1125</u>	<u>* Begin purging, measuring groundwater, and filling flow through cell</u>										
<u>1135</u>	<u>6.92</u>	<u>3 o'clock</u>	<u>500</u>	<u>1</u>	<u>6.62</u>	<u>73</u>	<u>5.50</u>	<u>192.5</u>	<u>5.70</u>	<u>6.48</u>	<u>sl. dirty / colorless</u>
<u>1145</u>	<u>6.93</u>	<u>"</u>	<u>"</u>	<u>3</u>	<u>7.06</u>	<u>64</u>	<u>5.44</u>	<u>191.5</u>	<u>6.23</u>	<u>4.01</u>	<u>Clear</u>
<u>1150</u>	<u>6.93</u>	<u>"</u>	<u>"</u>	<u>4</u>	<u>6.87</u>	<u>64</u>	<u>5.44</u>	<u>192.5</u>	<u>6.19</u>	<u>3.74</u>	<u>"</u>
<u>1155</u>	<u>6.94</u>	<u>"</u>	<u>"</u>	<u>5</u>	<u>7.07</u>	<u>61</u>	<u>5.43</u>	<u>194.5</u>	<u>6.27</u>	<u>3.33</u>	<u>"</u>
<u>1200</u>	<u>* End purges Begin Sampling.</u>										

TINUS Form 0009

1. Pump dial setting (for example: hertz, cycle/min, etc.)
2. Siemens per cm (same as umhos/cm) at 25 °C.
3. Oxidation reduction potential (stand in for Eh).

C-5 WATER LEVEL MEASUREMENT SHEETS

MACHINE GUN BORESIGHT RANGE



TETRA TECH NUS, INC.

GROUNDWATER LEVEL MEASUREMENT

SITE INFORMATION

Site Name: NASB-MGBR Municipality: NIA
 Project Number: 112G00645 County: Cumberland
 Personnel: B. Geringer / C. Fellows State: ME
 Date: 12/29/09 Street or Map Location: Orion St.
 (If Off-Site): _____

WEATHER CONDITIONS AND EQUIPMENT

Temperature Range: Cloudy 20's Equipment No.: Solinst WL Meter
 Precipitation: Flurries Equipment Number: _____
 Barometric Pressure: 744 mmHg Latest Calibration Date: _____
 Tidally-Influenced Yes No

Well or Piezometer Number	Date/Time	Elevation of Reference Point (Feet)*	Water Level Indicator Reading (Feet)*	Adjusted Depth (Feet)*	Groundwater Elevation (Feet)*
MGBR-MW01	12/29/09 / 0835		5.31		
MGBR-MW02	↓ / 0840		4.08		
MGBR-MW03	↓ / 0845		5.03		
MGBR-MW04	↓ / 0850		4.70		
MGBR-MW05	↓ / 0855		6.86		

TtNUS Form 0010

* measured made to 0.00 feet



TETRA TECH NUS, INC.

GROUNDWATER LEVEL MEASUREMENT

SITE INFORMATION

Site Name: NASB - Machine Gun Boresight Range Municipality: Brunswick
 Project Number: 112G00645 0000.0505 County: Cumberland
 Personnel: B. Geringer State: Maine
 Date: 07/22/10 Street or Map Location: Orion Street
 (If Off-Site): _____

WEATHER CONDITIONS AND EQUIPMENT

Temperature Range: 65 - 70° F Equipment No.: _____
 Precipitation: 1" (In Past 24 hours) Equipment Number: _____
 Barometric Pressure: _____ Latest Calibration Date: _____
 Tidally-Influenced Yes No

Well or Piezometer Number	Date/Time	Elevation of Reference Point (Feet)*	Water Level Indicator Reading (Feet)*	Adjusted Depth (Feet)*	Groundwater Elevation (Feet)*
MGBR-MW01	07/22/10 0705		7.08		
" - MW02	" " 0709		6.10		
" - MW03	" " 0713		7.10		
" - MW04	" " 0716		6.65		
↓ - MW05	↓ " 0720		9.23		

TtNUS Form 0010

* measured made to 0.00 feet

C-6 SURFACE WATER/SEDIMENT SAMPLE LOG SHEETS

SKEET RANGE



Project Site Name: NASB Skeet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SW01-040910
Sample Location: SW 01
Sampled By: CFS/BG
C.O.C. No.: _____

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>04/09/10</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (ppm) <u>BS</u>	ORP (mV)
Time: <u>1020</u>	<u>Clear</u>	<u>6.46</u>	<u>255</u>	<u>9.00</u>	<u>1.64</u>	<u>10.70</u>	<u>0.12</u>	<u>170.2</u>
Depth: <u>N/A</u>								
Method: <u>Direct Dip/Grab</u>								

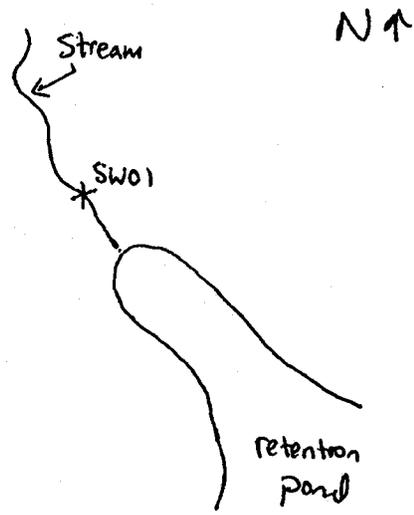
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL METALS	HNO3	2 - 500mL poly	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
PAHS	4° C	2 - 1L Ambers	Yes <input checked="" type="checkbox"/> No

OBSERVATIONS / NOTES:

Depth to bottom = 3.5"
Stream channel 2.5' wide

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Bi Yi



Project Site Name: NASB Skaet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SW02-040910
Sample Location: SW-02
Sampled By: BG/CFS
C.O.C. No.: _____

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>04/09/10</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (PPM) (µg) <u>µS</u>	ORP (mV)
Time: <u>0900</u>	<u>Clear</u>	<u>4.62</u>	<u>184</u>	<u>9.06</u>	<u>4.31</u>	<u>9.20</u>	<u>0.09</u>	<u>210.1</u>
Depth: <u>3' / 1.75'</u>								
Method: <u>Kemmer</u>								

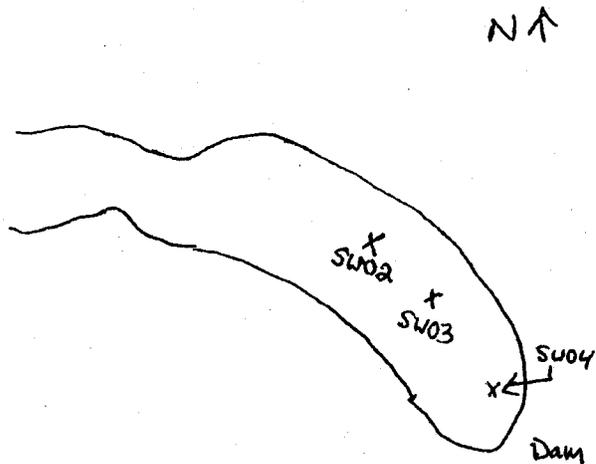
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL METALS	HNO3	1 - 500mL poly	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No
PAHS	4° C	2 - 1L Ambers	Yes <input checked="" type="checkbox"/> No

OBSERVATIONS / NOTES:

Depth to Bottom: 3.5'
Collected Composite Sample From 3'
below Water Surface & 1.75' below Water
Surface
Organic odor

MAP:



Circle if Applicable:

MS/MSD Duplicate ID No.: _____

Signature(s):

B. G. CFS



Project Site Name: NASB Skeet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SW03-040910
Sample Location: SW-03
Sampled By: BG/CFS
C.O.C. No.: _____

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date: <u>04/09/10</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (PPM) (%) <u>DG</u>	ORP (mV)
Time: <u>0840</u>	Clear	5.72	154	10.26	4.66	9.03	0.07	226.0
Depth: <u>Surface to 1.25</u>								
Method: <u>Direct Dip / Grab</u>								

seemlar

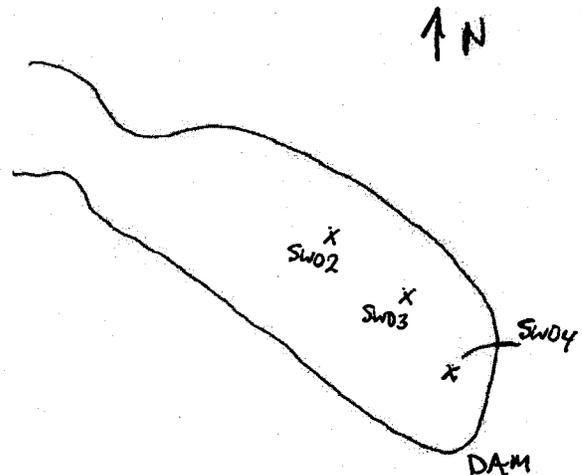
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL METALS	HNO3	1 - 500mL poly	Yes/No
PAHS	4° C	2 - 1L Ambers	Yes (No)

OBSERVATIONS / NOTES:

Total Depth : 2.5'
Too shallow to collect Composite Sample
Collected Sample at 1.25'
Organic odor

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
--------	-------------------

Signature(s):

B. C. Fisher



Project Site Name: NASB Skeet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SW04-040910

Sample Location: SW-04

Sampled By: BG/CFS

C.O.C. No.: _____

- Stream
- Spring
- Pond
- Lake
- Other: _____
- QA Sample Type: _____

Type of Sample:

- Low Concentration
- High Concentration

SAMPLING DATA:

Date: <u>04/09/10</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity PPM (mg/l) <u>B6</u>	ORP (mV)
Time: <u>0815</u>	<u>Clear</u>	<u>5.69</u>	<u>169</u>	<u>10.44</u>	<u>4.93</u>	<u>8.76</u>	<u>0.08</u>	<u>240.4</u>
Depth: <u>4' / 2.5'</u>								
Method: <u>Kemmer / Composite</u>								

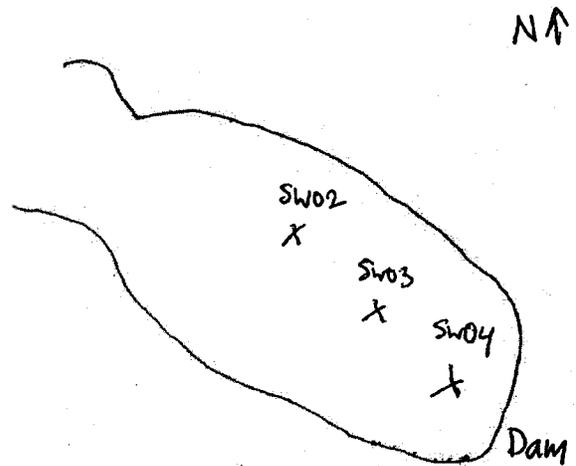
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected (Yes/No)
TAL METALS	HNO3	2 - 500mL poly	(Yes) No
PAHS	4° C	2 - 1L Ambers	Yes / No

OBSERVATIONS / NOTES:

Depth to Bottom = 5'
 Collected Composite Sample from 4'
 and 2.5' below water surface
 organic odor

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.: <u>NASB-SKT-SW-DUP01-040910</u>
--------	--

Signature(s):

B-G



SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NASB Skeet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SD01-0006
Sample Location: SD-01
Sampled By: BG/CFS
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: <u>04/09/10</u>	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: <u>1030</u>	<u>0-6"</u>	<u>Brown / Dk. Brown</u>	<u>Sand(F-M), Trace Silt, Some organic Material, Wood, Pine needles</u>
Method: <u>Auger / Grab</u>			
Monitor Reading (ppm): <u>-</u>			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL METALS	1 - 4 OZ. GLASS X3	<u>YES / NO</u>	
PAHS	1 - 4 OZ. GLASS	<u>YES / NO</u>	
NITROGLYCERINE/DINITROTOLUENE	1 - 4 OZ. GLASS	<u>YES / NO</u>	
PH	1 - 4 OZ. GLASS	<u>YES / NO</u>	
CEC	1 - 4 OZ. GLASS	<u>YES / NO</u>	
TOC	1 - 4 OZ. GLASS X3	<u>YES / NO</u>	

OBSERVATIONS / NOTES:

Some organic odor

MAP:

Refer to SW01 log.

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Bai Yi



Project Site Name: NASB Skeet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SD02-0006
Sample Location: SD-02
Sampled By: BG/CFS
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>04/09/10</u>	<u>0910</u>	<u>0-6"</u>	<u>Dark Brown/Black</u>	<u>Muck/Organic Material - iron floc, Some silt, leaves, roots, Saturated</u>
Method: <u>Ponar Dredge</u>				
Monitor Readings (Range in ppm): <u>—</u>				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL METALS	1 - 4 OZ. GLASS x3	(YES) NO	
PAHS	1 - 4 OZ. GLASS	YES / (NO)	
NITROGLYCERINE/DINITROTOLUENE	1 - 4 OZ. GLASS	YES / (NO)	
PH	1 - 4 OZ. GLASS	YES / (NO)	
CEC	1 - 4 OZ. GLASS	YES / (NO)	
TOC	1 - 4 OZ. GLASS x3	(YES) / NO	

OBSERVATIONS / NOTES:

MAP:

Organic odor; very soupy/saturated
Composite of two locations

Refer to SWO2 log

Circle if Applicable:

MS/MSD

Duplicate ID No.: _____

Signature(s):

Brian



Project Site Name: NASB Skeet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SD03-0006
Sample Location: SD-03
Sampled By: BG/CFS
C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>04/09/10</u>	<u>0850</u>	<u>0-6"</u>	<u>Dk. Brown/Black</u>	<u>Muck/Organic Material, iron Floe, Some silt, leaves, Saturated</u>
Method:				
<u>Ponar Dredge</u>				
Monitor Readings (Range in ppm):				
<u>-</u>				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL METALS	1 - 4 OZ. GLASS <u>x3</u>	<u>YES/NO</u>	
PAHS	1 - 4 OZ. GLASS	<u>YES/NO</u>	
NITROGLYCERINE/DINITROTOLUENE	1 - 4 OZ. GLASS	<u>YES/NO</u>	
PH	1 - 4 OZ. GLASS	<u>YES/NO</u>	
CEC	1 - 4 OZ. GLASS	<u>YES/NO</u>	
TOC	1 - 4 OZ. GLASS <u>x3</u>	<u>YES/NO</u>	

OBSERVATIONS / NOTES:

MAP:

Organic odor; very soupy/saturated
Composite of two locations

Refer to SW03 log.

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Brian



Project Site Name: NASB Sreet Range
Project No.: 112G00645 0000.0505

Sample ID No.: NASB-SKT-SD04-0006

Sample Location: SD-04

Sampled By: BG/CFS

C.O.C. No.: _____

- Surface Soil
- Subsurface Soil
- Sediment
- Other: _____
- QA Sample Type: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
<u>04/09/10</u>	<u>0830</u>	<u>0-6"</u>	<u>DK. Brown/Black</u>	<u>Muck/Organic Material, little iron Floc, Some silt, leaves, saturated</u>
Method:				
<u>Ponar Dredge</u>				
Monitor Readings (Range in ppm):				
<u>—</u>				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
TAL METALS	1-4 OZ. GLASS X6	YES/NO	
PAHS	1-4 OZ. GLASS	YES/NO	
NITROGLYCERINE/DINITROTOLUENE	1-4 OZ. GLASS	YES/NO	
PH	1-4 OZ. GLASS	YES/NO	
CEC	1-4 OZ. GLASS	YES/NO	
TOC	1-4 OZ. GLASS X6	YES/NO	

OBSERVATIONS / NOTES:

MAP:

Organic odor, very soupy/saturated
Composite of two locations

Refer to SW04 log

Circle if Applicable:

Signature(s):

MS/MSD Duplicate ID No.:
NASB-SKT-SD-DWP01-040910

B. C. F.

C-7 QA/QC AND IDW SAMPLE LOG SHEETS

MACHINE GUN BORESIGHT RANGE



Project Site Name: NASB MGBR Sample ID Number: NASB-MGBR-SO-RB01-121609
 Project Number: 112600645 Sampled By: B. Geringer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

- Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:

Date: 12/16/09
 Time: 1520
 Method: Direct Pour

WATER SOURCE:

- Laboratory Prepared Tap
 Purchased Fire Hydrant
 Other _____

PURCHASED WATER INFORMATION
(If Applicable as Source or Rinsate Water):

Product Name: Reagent Grade Water
 Supplier: VWR
 Manufacturer: NERL
 Order Number: _____
 Lot Number: 0911099
 Expiration Date: 09/2010

RINSATE INFORMATION
(If Applicable):

Media Type: Soil
 Equipment Used: Aluminum Pans / Plastic Scoop
 Equipment Type: Stainless Steel Hand Auger
 Dedicated
 Reusable (Hand Auger)

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool 4°C & HNO ₃	1-250 ml plastic	<input checked="" type="checkbox"/> YES / NO
PAHs	Cool 4°C	1-1 Liter Amber	<input checked="" type="checkbox"/> YES / NO
Nitroglycerine	Cool 4°C	1-1 Liter Amber	<input checked="" type="checkbox"/> YES / NO

OBSERVATIONS / NOTES:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB-MGBR Sample ID Number: NASB-MGBR-30-R602-12609
 Project Number: 112600645 Sampled By: B. Geringer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

- Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:

Date: 12/16/09
 Time: 1530
 Method: Direct Pour

WATER SOURCE:

- Laboratory Prepared Tap
 Purchased Fire Hydrant
 Other _____

PURCHASED WATER INFORMATION
(If Applicable as Source or Rinsate Water):

Product Name: Reagent Grade Water
 Supplier: VWR
 Manufacturer: NERL
 Order Number: —
 Lot Number: 0911099
 Expiration Date: 09/2010

RINSATE INFORMATION
(If Applicable):

Media Type: Soil
 Equipment Used: Aluminum Pans, Plastic Scoop
 Equipment Type: Stainless Steel Hand Auger, acetate sleeve
 Dedicated
 Reusable (Hand Auger)

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool 4°C & HNO ₃	1-250 ml plastic	<input checked="" type="checkbox"/> YES / NO
PAHs	Cool 4°C	1-1 Liter Amber	YES / NO
Nitroglycerine	Cool 4°C	1-1 Liter Amber	<input checked="" type="checkbox"/> YES / NO

OBSERVATIONS / NOTES:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB-MGBR- Sample ID Number: NASB-MGBR-GW-R01-122909
 Project Number: 112G00645 Sampled By: B. Geringer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____
 Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:	WATER SOURCE:
Date: <u>12/29/09</u>	<input type="checkbox"/> Laboratory Prepared <input type="checkbox"/> Tap
Time: <u>1345</u>	<input checked="" type="checkbox"/> Purchased <input type="checkbox"/> Fire Hydrant
Method: <u>Peristaltic</u>	<input type="checkbox"/> Other _____

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):	RINSATE INFORMATION (If Applicable):
Product Name: <u>Reagent Grade Water</u>	Media Type: <u>Teflon / Sealtic Tubing</u>
Supplier: <u>VWR</u>	Equipment Used: <u>Grandmaster</u>
Manufacturer: <u>NERL</u>	Equipment Type: <input checked="" type="checkbox"/> Dedicated
Order Number: <u>—</u>	<input type="checkbox"/> Reusable
Lot Number: <u>0911099</u>	
Expiration Date: <u>09/10</u>	

SAMPLE COLLECTION INFORMATION:			
Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool/HNO3	1 - 250 ml plastic	<input checked="" type="checkbox"/> YES / NO
Nitroglycerine	Cool	2 - 1 liter glass amber	<input checked="" type="checkbox"/> YES / NO
Perchlorate	Cool	1 - 425 250 ml plastic	<input checked="" type="checkbox"/> YES / NO

OBSERVATIONS / NOTES:

Signature(s):



Project Site Name: NASB-MGBR Sample ID Number: NASB-MGBR-GW-R802-122909
 Project Number: 112G00645 Sampled By: B. Geryer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

- Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:

Date: 12/29/09
 Time: 1350
 Method: Potshak Ramp

WATER SOURCE:

- Laboratory Prepared Tap
 Purchased Fire Hydrant
 Other _____

PURCHASED WATER INFORMATION
(If Applicable as Source or Rinsate Water):

Product Name: Reagent Grade Water
 Supplier: VWR
 Manufacturer: NERL
 Order Number: —
 Lot Number: 0911099
 Expiration Date: 09/10

RINSATE INFORMATION
(If Applicable):

Media Type: Granular
 Equipment Used: Teflon/Silastic Tubing
 Equipment Type: Dedicated
 Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool/HNO3	1 - 250 ml plastic	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Nitroglycerine	Cool	2 - 1 liter glass amber	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
Perchlorate	Cool	1 - 25 250 ml plastic	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO

OBSERVATIONS / NOTES:

Signature(s):
B. Geryer / C. Fellows



Project Site Name: NASB-MGBR Sample ID Number: NASB-MGBR-GW-FB-122909
 Project Number: 112600645 Sampled By: B. Germyr / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

- Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:	WATER SOURCE:
Date: <u>12/29/09</u> Time: <u>1400</u> Method: <u>Direct Pour</u>	<input type="checkbox"/> Laboratory Prepared <input type="checkbox"/> Tap <input checked="" type="checkbox"/> Purchased <input type="checkbox"/> Fire Hydrant <input type="checkbox"/> Other _____

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):	RINSATE INFORMATION (If Applicable):
Product Name: <u>Reagent Grade Water</u> Supplier: <u>VWR</u> Manufacturer: <u>NEGL</u> Order Number: <u>-</u> Lot Number: <u>091109</u> Expiration Date: <u>09/10</u>	Media Type: <u>N/A</u> Equipment Used: _____ Equipment Type: <input type="checkbox"/> Dedicated <input type="checkbox"/> Reusable

SAMPLE COLLECTION INFORMATION:			
Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool/HNO3	1 - 250 ml plastic	<input checked="" type="checkbox"/> YES / NO
Nitroglycerine	Cool	2 - 1 liter glass amber	<input checked="" type="checkbox"/> YES / NO
Perchlorate	Cool	1 - 125 250 ml plastic	<input checked="" type="checkbox"/> YES / NO

OBSERVATIONS / NOTES:

Signature(s): B. Germyr / C. Fellows

SKEET RANGE



Project Site Name: NASB Street Range Sample ID Number: NASB-SAT-30-R601-121509
 Project Number: 112G00G45 Sampled By: B. Geringer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

- Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:	WATER SOURCE:
Date: <u>12/15/09</u>	<input type="checkbox"/> Laboratory Prepared <input type="checkbox"/> Tap
Time: <u>1620</u>	<input checked="" type="checkbox"/> Purchased <input type="checkbox"/> Fire Hydrant
Method: <u>Direct Pour</u>	<input type="checkbox"/> Other _____

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):	RINSATE INFORMATION (If Applicable):
Product Name: <u>Reagent Grade Water</u>	Media Type: <u>Soil</u>
Supplier: <u>VWR</u>	Equipment Used: <u>Aluminum Pan / Plastic Scoop</u>
Manufacturer: <u>NERL</u>	Equipment Type: <u>Stainless Steel Hand Auger</u>
Order Number: <u>—</u>	<input checked="" type="checkbox"/> Dedicated
Lot Number: <u>0911099</u>	<input checked="" type="checkbox"/> Reusable (Auger only)
Expiration Date: <u>09/2010</u>	

SAMPLE COLLECTION INFORMATION:			
Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool 4°C & HNO ₃	1-250 ml plastic	<input checked="" type="checkbox"/> YES / NO
PAHs	Cool 4°C	1-1 Liter Amber	<input checked="" type="checkbox"/> YES / NO
Nitroglycerine/Dinitrotoluene	Cool 4°C	1-1 Liter Amber	<input checked="" type="checkbox"/> YES / NO

OBSERVATIONS / NOTES:

Signature(s):
B. Geringer / C. Fellows



Project Site Name: NASB Skeet Range Sample ID Number: NASB-SKT-R302-121509
 Project Number: 112600645 Sampled By: B. Geringer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:

Date: 12/15/09
 Time: 8:57:00 1640
 Method: Direct Pour

WATER SOURCE:

Laboratory Prepared Tap
 Purchased Fire Hydrant
 Other _____

PURCHASED WATER INFORMATION
(If Applicable as Source or Rinsate Water):

Product Name: Reagent Grade Water
 Supplier: VWR
 Manufacturer: NERL
 Order Number: _____
 Lot Number: 0911099
 Expiration Date: 09/2010

RINSATE INFORMATION
(If Applicable):

Media Type: Soil
 Equipment Used: Aluminum Pan / Plastic Scoop
 Equipment Type: Stainless Steel Hand Auger
 Dedicated
 Reusable (Auger only)

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool 4°C & HNO ₃	1-250 ml plastic	<u>YES</u> / NO
PAHs	Cool 4°C	1-1 Liter Amber	<u>YES</u> / NO
Nitroglycerine/Dinitrotoluene	Cool 4°C	1-1 Liter Amber	YES / <u>NO</u>

OBSERVATIONS / NOTES:

Signature(s):

B. Geringer / C. Fellows



Project Site Name: NASB Sreet Range Sample ID Number: NASB-SKT-RE03-121509
 Project Number: 112G00645 Sampled By: B. Geringer / C. Fellows
 Sample Location: _____ C.O.C. Number: _____
 QA Sample Type: _____

- Trip Blank Rinsate Blank
 Source Water Blank Other Blank _____

SAMPLING DATA:

WATER SOURCE:

Date: 12/15/09
 Time: 1700
 Method: Direct Pour

- Laboratory Prepared Tap
 Purchased Fire Hydrant
 Other _____

**PURCHASED WATER INFORMATION
(If Applicable as Source or Rinsate Water):**

**RINSATE INFORMATION
(If Applicable):**

Product Name: Reagent Grade Water
 Supplier: VWR
 Manufacturer: NEGL
 Order Number: _____
 Lot Number: 0911099
 Expiration Date: 09/2010

Media Type: Soil
 Equipment Used: Aluminum Pan, Plastic Scoop
 Equipment Type: Stainless Steel Hand Auger
 Dedicated
 Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
TAL Metals	Cool 4°C & HNO ₃	1-250 ml plastic	<input checked="" type="checkbox"/> YES / NO
PAHs	Cool 4°C	1-1 Liter Amber	<input checked="" type="checkbox"/> YES / NO
Nitroglycerine/Dinitrotoluene	Cool 4°C	1-1 Liter Amber	YES / NO

OBSERVATIONS / NOTES:

Signature(s):
B. Geringer / C. Fellows

C-8 SURVEY DATA

APPENDIX C-8

**SURVEY COORDINATES
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 1 OF 3**

Location ID	Easting	Northing
MGBR/SKT-XRF-SS07	3015963.32	385037.6
MGBR/SKT-XRF-SS07E	3016013.32	385037.6
MGBR/SKT-XRF-SS07N	3015963.32	385087.6
MGBR/SKT-XRF-SS07S	3015963.32	384987.6
MGBR/SKT-XRF-SS07W	3015913.32	385037.6
NASB-SKT-SWSD01	3016018.589	385895.66
NASB-SKT-SWSD02	3016518.994	385935.957
NASB-SKT-SWSD03	3016649.555	385882.166
NASB-SKT-SWSD04	3016852.724	385719.655
NASB-SKT-XRF-SB01	3016198.281	385575.266
NASB-SKT-XRF-SB02	3016285.395	385638.33
NASB-SKT-XRF-SB03	3015779.042	385742.287
NASB-SKT-XRF-SB04	3015870.75	385931.236
NASB-SKT-XRF-SB05	3016199.444	386052.944
NASB-SKT-XRF-SB06	3016537.224	385820.042
NASB-SKT-XRF-SB07	3016606.851	385391.661
NASB-SKT-XRF-SB08	3016570.935	385281.88
NASB-SKT-XRF-SS01	3016269.362	385505.254
NASB-SKT-XRF-SS02	3016143.234	385626.573
NASB-SKT-XRF-SS03	3015822.524	386009.504
NASB-SKT-XRF-SS04	3016003.568	386008.713
NASB-SKT-XRF-SS05	3016143.202	386119.358
NASB-SKT-XRF-SS06	3016394.178	385975.647
NASB-SKT-XRF-SS07	3016467.814	386032.05
NASB-SKT-XRF-SS08	3016573.83	385991.315
NASB-SKT-XRF-SS09	3016600.454	385774.411
NASB-SKT-XRF-SS10	3016533.965	385647.951
NASB-SKT-XRF-SS11	3016671.229	385285.607
NASB-SKT-XRF-SS12	3016323.592	385051.383
NASB-SKT-XRF-SS13	3016242.91	385660.29
NASB-SKT-XRF-SS14	3016651.27	386142.05
NASB-SKT-XRF-SS15	3016521.28	386085.38
NASB-SKT-XRF-SS16	3016673.24	385975.08
NASB-SKT-XRF-SS17	3016306.3	386010.9
NASB-SKT-XRF-SS18	3016255.38	385589.47
NASB-SKT-XRF-SS19	3016414.98	385731.4
NASB-SKT-XRF-SS20	3016061.89	385614.06
NASB-SKT-XRF-SS21	3016448.46	385167.58
NASB-SKT-XRF-SS22	3016551.71	385505.14
NASB-SKT-XRF-SS23	3016410.73	385505.04
NASB-SKT-XRF-SS24	3016927.76	385572.06
NASB-SKT-XRF-SS25	3016134.23	386273.13
NASB-SKT-XRF-SS26	3016358.24	385337.94
NASB-MGBR-MW01	3015688.709	385272.0749
NASB-MGBR-MW02	3015777.606	385342.9268
NASB-MGBR-MW03	3015783.369	385273.0542
NASB-MGBR-MW04	3015769.892	385204.3634
NASB-MGBR-MW05	3015903.652	385268.1059
NASB-MGBR-SB01	3015882.753	385297.3781
NASB-MGBR-SB02	3015892.62	385287.6984

APPENDIX C-8

**SURVEY COORDINATES
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 2 OF 3**

Location ID	Easting	Northing
NASB-MGBR-SB03	3015882.945	385277.6477
NASB-MGBR-SB04	3015891.723	385257.9727
NASB-MGBR-SB05	3015883.359	385247.7584
NASB-MGBR-SB06	3015892.955	385239.2175
NASB-MGBR-SB07	3015795.084	385260.925
NASB-MGBR-SS01	3015661.096	385271.9272
NASB-MGBR-SS02	3015743.382	385284.2019
NASB-MGBR-SS03	3015743.594	385264.7257
NASB-MGBR-SS04	3015773.378	385273.1157
NASB-MGBR-SS05	3015793.641	385272.9863
NASB-MGBR-SS06	3015813.396	385272.6752
NASB-MGBR-SS08	3015804.744	385340.4442
NASB-MGBR-XRF-SB01	3015797.73	385261.7
NASB-MGBR-XRF-SB02	3015817.33	385322.63
NASB-MGBR-XRF-SB03	3015844.69	385340.57
NASB-MGBR-XRF-SB04	3015863.62	385358.49
NASB-MGBR-XRF-SB05	3015886.02	385363.66
NASB-MGBR-XRF-SB06	3015826.61	385302.98
NASB-MGBR-XRF-SB07	3015854.52	385317.27
NASB-MGBR-XRF-SB08	3015877.16	385328.27
NASB-MGBR-XRF-SB09	3015895.57	385341.45
NASB-MGBR-XRF-SB10	3015832.75	385276.75
NASB-MGBR-XRF-SB11	3015859.11	385276.82
NASB-MGBR-XRF-SB12	3015879.92	385285.63
NASB-MGBR-XRF-SB13	3015899.97	385277.31
NASB-MGBR-XRF-SB14	3015833.62	385250.87
NASB-MGBR-XRF-SB15	3015859.98	385252.4
NASB-MGBR-XRF-SB16	3015885.29	385250.29
NASB-MGBR-XRF-SB17	3015913.77	385246.73
NASB-MGBR-XRF-SB18	3015828.15	385226.07
NASB-MGBR-XRF-SB19	3015861.36	385230.9
NASB-MGBR-XRF-SB20	3015882.2	385224.76
NASB-MGBR-XRF-SB21	3015909.89	385221.56
NASB-MGBR-XRF-SB22	3015808.57	385343.39
NASB-MGBR-XRF-SB23	3015798.09	385321.48
NASB-MGBR-XRF-SB24	3015803.7	385294.89
NASB-MGBR-XRF-SB25	3015807.98	385275.22
NASB-MGBR-XRF-SB26	3015809.89	385252.26
NASB-MGBR-XRF-SB27	3015807.59	385227.1
NASB-MGBR-XRF-SB28	3015773.83	385322.51
NASB-MGBR-XRF-SB29	3015780.76	385298.1
NASB-MGBR-XRF-SB30	3015783.74	385271.14
NASB-MGBR-XRF-SB31	3015786.43	385250.73
NASB-MGBR-XRF-SB32	3015784.92	385224.48
NASB-MGBR-XRF-SB33	3015757.05	385293.3
NASB-MGBR-XRF-SB34	3015759.23	385267.79
NASB-MGBR-XRF-SB35	3015762.2	385244.1
NASB-MGBR-XRF-SB36	3015765.17	385217.86
NASB-MGBR-XRF-SB37	3015733.07	385287.4
NASB-MGBR-XRF-SB38	3015735.78	385263.34

APPENDIX C-8

SURVEY COORDINATES
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 3

Location ID	Easting	Northing
NASB-MGBR-XRF-SB39	3015740.07	385238.93

APPENDIX D

VALIDATED ANALYTICAL RESULTS

- D-1 MACHINE GUN BORESIGHT RANGE, SOIL**
- D-2 MACHINE GUN BORESIGHT RANGE, GROUNDWATER**
- D-3 SKEET RANGE, SOIL**
- D-4 SKEET RANGE, SEDIMENT**
- D-5 SKEET RANGE, SURFACE WATER**
- D-6 BACKGROUND SAMPLES, MACHINE GUN BORESIGHT
RANGE/SKEET RANGE**
- D-7 CHAIN-OF-CUSTODY FORMS**

D-1 MACHINE GUN BORESIGHT RANGE, SOIL

APPENDIX D-1

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
 PAGE 1 OF 20

LOCATION SAMPLE ID	NASB-MGBR-SB01				
	NASB-MGBR-SB01-0003	NASB-MGBR-SB01-0312	NASB-MGBR-SB01-0312-AVG	NASB-MGBR-SB01-0312-D	NASB-MGBR-SB01-1218
SAMPLE DATE	20091216	20091216	20091216	20091216	20091216
SAMPLE CODE	NORMAL	ORIGINAL	AVERAGE	DUPLICATE	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SB	SB	SB	SB
TOP DEPTH	0	3	3	3	12
BOTTOM DEPTH	3	12	12	12	18
METALS (MG/KG)					
ALUMINUM	4480	13400	13400	13400	10900
ANTIMONY	0.319 UJ	0.294 UJ	0.3015 UJ	0.309 UJ	0.274 UJ
ARSENIC	2.33	2.41 J	2.385 J	2.36 J	2.29
BARIIUM	19.6	13.2	12.75 J	12.3 J	13.5
BERYLLIUM	0.193 J	0.459	0.4575	0.456	0.427
CADMIUM	0.149 J	0.0588 U	0.0603 U	0.0618 U	0.0549 U
CALCIUM	182 J	225 J	219 J	213 J	281 J
CHROMIUM	5.72	9.74	9.68	9.62	10.3
COBALT	0.9	2.31	2.185	2.06	3.24
COPPER	9.62	3.58 J	3.39 J	3.2 J	4.17 J
IRON	8810	12200	12550	12900	10200
LEAD	63.9 J	9.9 J	9.425 J	8.95 J	4.61 UJ
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	427 J	886 J	852.5 J	819 J	1450 J
MANGANESE	43.2 J	102 J	106.5 J	111 J	108 J
MERCURY	0.0926	0.0336 J	0.0319 J	0.0302 J	0.0208 J
NICKEL	4.74 J	5.18 J	4.99 J	4.8 J	7.61
POTASSIUM	222 J	294 J	289.5 J	285 J	456 J
SELENIUM	0.425 J	0.407 J	0.421 J	0.435 J	0.165 UJ
SILVER	0.191 UJ	0.235 UJ	0.21 UJ	0.185 UJ	0.165 UJ
SODIUM	63.8 U	58.8 U	60.3 U	61.8 U	54.9 U
THALLIUM	0.191 U	0.176 U	0.1805 U	0.185 U	0.165 U
VANADIUM	18.5	18.8	19.55	20.3	16
ZINC	11.3	15.3	14.6	13.9	17.5
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA

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 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-SB02			NASB-MGBR-SB03	
	NASB-MGBR-SB02-0003	NASB-MGBR-SB02-0312	NASB-MGBR-SB02-1218	NASB-MGBR-SB03-0003	NASB-MGBR-SB03-0312
SAMPLE DATE	20091216	20091216	20091216	20091216	20091216
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SB	SB	SS	SB
TOP DEPTH	0	3	12	0	3
BOTTOM DEPTH	3	12	18	3	12
METALS (MG/KG)					
ALUMINIUM	5240	9920	13500	8250	20800
ANTIMONY	0.326 UJ	0.307 UJ	0.306 UJ	0.358 UJ	0.315 UJ
ARSENIC	2.25	1.78 J	2.4 J	2.6 J	3.24 J
BARIUM	20.3	11.2	14.9	25.8	24
BERYLLIUM	0.221 J	0.358	0.485	0.276 J	0.604
CADMIUM	0.0932 J	0.0614 U	0.0612 U	0.137 J	0.0629 U
CALCIUM	227 J	137 J	181 J	244 J	226 J
CHROMIUM	5.83	7.59	11.2	8.45	15.8
COBALT	0.858	0.945	2.63	1.17	2.52
COPPER	5.11	1.89 J	2.65 J	7.36	4.61 J
IRON	9050	12500	13500	12700	17600
LEAD	26.7 J	5.47 UJ	5.55 UJ	27.6 J	7.69 J
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	446 J	475 J	935 J	594 J	1110 J
MANGANESE	57.6 J	63.4 J	108 J	101 J	162 J
MERCURY	0.0544	0.0325 J	0.0622	0.0656	0.0383 J
NICKEL	3.76 J	2.84 J	5.88 J	5.34 J	7.37 J
POTASSIUM	247 J	207 J	325 J	278 J	366 J
SELENIUM	0.364 J	0.518 J	0.384 J	0.555 J	0.856 J
SILVER	0.195 UJ	0.245 UJ	0.245 UJ	0.286 UJ	0.252 UJ
SODIUM	65.1 U	61.4 U	61.2 U	71.5 U	62.9 U
THALLIUM	0.195 U	0.184 U	0.184 U	0.215 U	0.189 U
VANADIUM	20.1	20.7	21.9	24.3	27.3
ZINC	9.47	10.2	17	17.4	19.8
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	1.5 U				
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-SB03	NASB-MGBR-SB04			
	NASB-MGBR-SB03-1218	NASB-MGBR-SB04-0003	NASB-MGBR-SB04-0312	NASB-MGBR-SB04-1218	NASB-MGBR-SB04-1218-AVG
SAMPLE DATE	20091216	20091216	20091216	20091216	20091216
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIGINAL	AVERAGE
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SB	SS	SB	SB	SB
TOP DEPTH	12	0	3	12	12
BOTTOM DEPTH	18	3	12	18	18
METALS (MG/KG)					
ALUMINIUM	17200	7110	12200	15800	14950
ANTIMONY	0.314 UJ	0.359 UJ	0.294 UJ	0.295 UJ	0.295 UJ
ARSENIC	3.36 J	3.53 J	3.16	3.42 J	3.29 J
BARIIUM	26	45.5	23.8	26.7	25.05 J
BERYLLIUM	0.583	0.297 J	0.462	0.568	0.5385
CADMIUM	0.0628 U	0.246 J	0.0587 U	0.0591 U	0.0591 U
CALCIUM	234 J	1530 J	276 J	270 J	271.5 J
CHROMIUM	18	11.9	14.1	16.1	15.4
COBALT	4.2	2.78	3.56	5.57	4.635
COPPER	7.45	25.6	6.94	7.7	7.8
IRON	15800	11500	14100	15900	15100
LEAD	6.7 J	106 J	7.58 J	8.13 J	8.1 J
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	2100 J	1550 J	1850 J	2170 J	2055 J
MANGANESE	130 J	309 J	168 J	345 J	243 J
MERCURY	0.0444	0.0875	0.0364 J	0.0307 J	0.0307 J
NICKEL	12	9.72	9.78	12.5	11.4
POTASSIUM	588 J	614 J	512 J	673 J	645 J
SELENIUM	0.678 J	0.538 J	0.261 J	0.411 J	0.4355 J
SILVER	0.314 UJ	0.215 UJ	0.235 UJ	0.236 UJ	0.236 UJ
SODIUM	62.8 U	71.7 U	58.7 U	59.1 U	59.1 U
THALLIUM	0.188 U	0.287 U	0.176 U	0.177 U	0.177 U
VANADIUM	26.4	27.1	22.8	24.9	24.1
ZINC	23.6	30.2	18.7	21.5	20.35
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	1.5 U				
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	NASB-MGBR-SB04	NASB-MGBR-SB05			NASB-MGBR-SB06
SAMPLE ID	NASB-MGBR-SB04-1218-D	NASB-MGBR-SB05-0003	NASB-MGBR-SB05-0312	NASB-MGBR-SB05-1218	NASB-MGBR-SB06-0003
SAMPLE DATE	20091216	20091216	20091216	20091216	20091216
SAMPLE CODE	DUPLICATE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SB	SS	SB	SB	SS
TOP DEPTH	12	0	3	12	0
BOTTOM DEPTH	18	3	12	18	3
METALS (MG/KG)					
ALUMINIUM	14100	6410	19500	23000	5700
ANTIMONY	0.295 UJ	0.43 UJ	0.336 UJ	0.323 UJ	0.317 UJ
ARSENIC	3.16	5.38	4.14 J	4.96 J	2.14
BARIIUM	23.4 J	35.7	29.5	66.3	19.1
BERYLLIUM	0.509	0.257 J	0.644	0.933	0.226 J
CADMIUM	0.0591 U	0.157 J	0.0672 U	0.129 U	0.0634 U
CALCIUM	273 J	1070 J	302 J	367 J	236 J
CHROMIUM	14.7	10.9	18.8	28.4	6.17
COBALT	3.7	1.74	4.06	9.37	1
COPPER	7.9	18.5	6.9 J	18.2	6.75
IRON	14300	9790	20600	24600	7880
LEAD	8.07 J	218 J	12.6 J	8.74 J	29.1 J
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	1940 J	991 J	2160 J	5260 J	413 J
MANGANESE	141 J	165 J	162 J	258 J	51.1 J
MERCURY	0.0307 J	0.119	0.0345 J	0.0291 J	0.0452
NICKEL	10.3	7.21	13.1	26	3.72 J
POTASSIUM	617 J	575 J	649 J	1820 J	242 J
SELENIUM	0.46 J	0.653 J	0.482 J	0.194 UJ	0.472 J
SILVER	0.236 UJ	0.344 UJ	0.269 UJ	0.387 UJ	0.19 UJ
SODIUM	59.1 U	86.1 U	67.2 U	64.5 U	63.4 U
THALLIUM	0.177 U	0.258 U	0.202 U	0.194 U	0.19 U
VANADIUM	23.3	32.8	31.6	38.8	17
ZINC	19.2	19.2	25.7	41.7	7.78
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-SB06		NASB-MGBR-SB07		
	NASB-MGBR-SB06-0312	NASB-MGBR-SB06-1218	NASB-MGBR-SB07-0003	NASB-MGBR-SB07-0312	NASB-MGBR-SB07-1218
SAMPLE DATE	20091216	20091216	20091216	20091216	20091216
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SB	SB	SS	SB	SB
TOP DEPTH	3	12	0	3	12
BOTTOM DEPTH	12	18	3	12	18
METALS (MG/KG)					
ALUMINIUM	13500	13900	6980	6420	6820
ANTIMONY	0.305 UJ	0.286 UJ	0.286 UJ	0.278 UJ	0.271 UJ
ARSENIC	2.23 J	2.57 J	2.69	2.98	3.2
BARIIUM	13.5	15.6 J	27.9 J	21.3 J	32.8 J
BERYLLIUM	0.484	0.529	0.318	0.31	0.339
CADMIUM	0.0609 U	0.0573 U	6.29 J	0.591 J	0.794 J
CALCIUM	195 J	214 J	1360 J	1210 J	1380 J
CHROMIUM	9.77	12.1	102	52.3	39.4
COBALT	1.96	3.32	3.29	3.31	3.13
COPPER	2.53 J	4.06 J	12	10	19
IRON	12300	12300	10000	9330	8620
LEAD	5.21 UJ	4.69 UJ	142 J	45.9 J	63 J
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	758 J	1350 J	1550 J	1810 J	1620 J
MANGANESE	74.6 J	97.5 J	150 J	156 J	147 J
MERCURY	0.0289 J	0.0336 J	0.0267 J	0.0255 J	0.0429
NICKEL	5.67 J	9.35	8.35	8.66	8.84
POTASSIUM	280 J	443 J	688 J	759 J	838 J
SELENIUM	0.365 J	0.269 J	0.172 UJ	0.167 UJ	0.163 UJ
SILVER	0.244 UJ	0.229 UJ	0.172 UJ	0.111 UJ	0.352 J
SODIUM	60.9 U	57.3 U	70.4 J	63.1 J	54.5 J
THALLIUM	0.183 U	0.172 U	0.343 U	0.167 U	0.163 U
VANADIUM	20.3	20	14.5	15.2	14.8
ZINC	12.1	16.2	49.2	35.5	41.8
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	1.5 U				
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
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LOCATION SAMPLE ID	NASB-MGBR-SS01			NASB-MGBR-SS02	NASB-MGBR-SS03
	NASB-MGBR-SS01-0003	NASB-MGBR-SS01-0003-AVG	NASB-MGBR-SS01-0003-D	NASB-MGBR-SS02-0003	NASB-MGBR-SS03-0003
SAMPLE DATE	20091216	20091216	20091216	20091216	20091216
SAMPLE CODE	ORIGINAL	AVERAGE	DUPLICATE	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINIUM	9910	9315	8720	7190	8570
ANTIMONY	0.275 J	0.2035 J	0.264 UJ	0.286 UJ	0.3 UJ
ARSENIC	8.89	8.805	8.72	2.44	2.53
BARIIUM	41.7	37.55 J	33.4 J	18.9	127
BERYLLIUM	0.355	0.3475	0.34	0.338	0.41
CADMIUM	0.231 J	0.2225 J	0.214 J	0.255 J	0.599 J
CALCIUM	5600 J	5470 J	5340 J	854 J	2980 J
CHROMIUM	32.3	30.55	28.8	9.69	17.4
COBALT	6.35	6.415	6.48	3.2	3.26
COPPER	22	19.4	16.8	15.1	13.7
IRON	15200	15200	15200	8600	10700
LEAD	67.6 J	72.35 J	77.1 J	86.9 J	44.6 J
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	5490 J	5710 J	5930 J	1420 J	1630 J
MANGANESE	250 J	256 J	262 J	174 J	138 J
MERCURY	0.0156 U	0.0139 U	0.0122 U	0.0199 J	0.0164 U
NICKEL	26.5	26.9	27.3	7.55	8.49
POTASSIUM	2340 J	2385 J	2430 J	645 J	838 J
SELENIUM	0.213 UJ	0.265 UJ	0.317 UJ	0.172 UJ	0.18 UJ
SILVER	0.107 UJ	0.212 UJ	0.317 UJ	0.115 UJ	0.169 J
SODIUM	218 J	178.5 J	139 J	57.3 U	214 J
THALLIUM	0.213 U	0.1855 U	0.158 U	0.229 U	0.18 U
VANADIUM	37.2	40.6	44	13.7	15.6
ZINC	56.9	55.75	54.6	22.7	32.7
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	0.83 J	1.015 J	1.2 J	1.5 U	1.5 U
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA

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 MACHINE GUN BORESIGHT RANGE
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LOCATION	NASB-MGBR-SS04	NASB-MGBR-SS05	NASB-MGBR-SS06	NASB-MGBR-SS08	NASB-MGBR-XRF-SB01
SAMPLE ID	NASB-MGBR-SS04-0003	NASB-MGBR-SS05-0003	NASB-MGBR-SS06-0003	NASB-MGBR-SS08-0003	NASB-MGBR-XRF-SB01-0003
SAMPLE DATE	20091216	20091216	20091216	20091216	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINIUM	9840	6620	6210	6650	5800
ANTIMONY	0.296 UJ	0.282 UJ	0.274 UJ	0.277 UJ	9.6 U
ARSENIC	3.73	2.07	2.05	1.92	19 U
BARIIUM	28.9	16	16	13.1	26
BERYLLIUM	0.382	0.282 J	0.281	0.307	0.96 U
CADMIUM	0.771 J	0.85 J	0.168 J	0.0618 J	4.9
CALCIUM	600 J	489 J	727 J	464 J	2600
CHROMIUM	14.9	13.4	7.67	6.57	320
COBALT	3.78	2.68	2.68	2.61	3.3
COPPER	8.46	7.6	6.69	6.36	14
IRON	11900	7380	7020	6960	17000
LEAD	29.7 J	38.8 J	13.6 J	8.01 J	1000
LEAD-CALC	NA	NA	NA	NA	NA
MAGNESIUM	1910 J	1270 J	1330 J	1120 J	1800
MANGANESE	223 J	143 J	150 J	155 J	170
MERCURY	0.0326 J	0.0208 J	0.0163 J	0.02 J	NA
NICKEL	9.44	6.56	6.95	6.19	5.8 U
POTASSIUM	765 J	545 J	652 J	538 J	NA
SELENIUM	0.28 J	0.237 J	0.168 J	0.166 UJ	19 U
SILVER	0.178 UJ	0.169 UJ	0.11 UJ	0.166 UJ	2.9 UJ
SODIUM	59.2 U	56.5 U	54.9 U	55.4 U	NA
THALLIUM	0.178 U	0.169 U	0.219 U	0.166 U	19 U
VANADIUM	19.5	11.8	11.4	11.1	14
ZINC	35.5	24	21	15.5	52
ZINC-CALC	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	1.5 U	1.5 U	1.5 U	0.55 J	NA
XRF (MG/KG)					
COPPER	NA	NA	NA	NA	204
LEAD	NA	NA	NA	NA	1640
NICKEL	NA	NA	NA	NA	430
ZINC	NA	NA	NA	NA	245

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 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB01		NASB-MGBR-XRF-SB02		
	NASB-MGBR-XRF-SB01-0612	NASB-MGBR-XRF-SB01-1216	NASB-MGBR-XRF-SB02-0003	NASB-MGBR-XRF-SB02-0003-AVG	NASB-MGBR-XRF-SB02-0003-D
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	ORIGINAL	AVERAGE	DUPLICATE
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SB	SB	SS	SS	SS
TOP DEPTH	6	12	0	0	0
BOTTOM DEPTH	12	16	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	240.56	455.6	NA	124.64	NA
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	51.92	39.8	NA	26.39	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	62	74 U	43 U	43 U	43 U
LEAD	226	610	17	19	21
NICKEL	53 U	130 U	51 U	51.5 U	52 U
ZINC	226	125	26 U	26.5 U	27 U

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 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB03	NASB-MGBR-XRF-SB04			NASB-MGBR-XRF-SB05
	NASB-MGBR-XRF-SB03-0003	NASB-MGBR-XRF-SB04-0003	NASB-MGBR-XRF-SB04-0003-AVG	NASB-MGBR-XRF-SB04-0003-D	NASB-MGBR-XRF-SB05-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	ORIGINAL	AVERAGE	DUPLICATE	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	162.16	NA	158.24	NA	157.12
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	27.68	NA	26.15	NA	26.06
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	45	58	38.25	37 U	40
LEAD	86	76	79	82	77
NICKEL	39 U	40 U	41 U	42 U	36 U
ZINC	24	22 U	22.5 U	23 U	21 U

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	NASB-MGBR-XRF-SB06	NASB-MGBR-XRF-SB07	NASB-MGBR-XRF-SB08	NASB-MGBR-XRF-SB09	NASB-MGBR-XRF-SB10
SAMPLE ID	NASB-MGBR-XRF-SB06-0003	NASB-MGBR-XRF-SB07-0003	NASB-MGBR-XRF-SB08-0003	NASB-MGBR-XRF-SB09-0003	NASB-MGBR-XRF-SB10-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	123.52	148.16	160.48	138.08	128
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	26.24	26.24	25.88	26.18	26.42
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	39 U	39 U	31 U	53	43 U
LEAD	17	61	83	43	25
NICKEL	46 U	45 U	37 U	45 U	51 U
ZINC	24 U	24 U	18 U	23 U	27 U

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB10			NASB-MGBR-XRF-SB11	NASB-MGBR-XRF-SB12
	NASB-MGBR-XRF-SB10-0612	NASB-MGBR-XRF-SB10-1218	NASB-MGBR-XRF-SB10-1824	NASB-MGBR-XRF-SB11-0003	NASB-MGBR-XRF-SB12-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SB	SB	SB	SS	SS
TOP DEPTH	6	12	18	0	0
BOTTOM DEPTH	12	18	24	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	5700
ANTIMONY	NA	NA	NA	NA	9.7 U
ARSENIC	NA	NA	NA	NA	19 U
BARIIUM	NA	NA	NA	NA	30
BERYLLIUM	NA	NA	NA	NA	0.97 U
CADMIUM	NA	NA	NA	NA	2.9 U
CALCIUM	NA	NA	NA	NA	340
CHROMIUM	NA	NA	NA	NA	8.3
COBALT	NA	NA	NA	NA	2.9 U
COPPER	NA	NA	NA	NA	9.3
IRON	NA	NA	NA	NA	8300
LEAD	NA	NA	NA	NA	57
LEAD-CALC	124.64	117.92	118.48	128.56	NA
MAGNESIUM	NA	NA	NA	NA	740
MANGANESE	NA	NA	NA	NA	64
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	5.8 U
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	19 U
SILVER	NA	NA	NA	NA	2.9 UJ
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	19 U
VANADIUM	NA	NA	NA	NA	22
ZINC	NA	NA	NA	NA	20
ZINC-CALC	26.42	26.54	26.6	28.4	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	44 U	46 U	48 U	43 U	33 U
LEAD	19	14 U	16 U	26	49
NICKEL	52 U	54 U	60 U	50 U	39 U
ZINC	27 U	29 U	30 U	30	21 U

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 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	NASB-MGBR-XRF-SB13	NASB-MGBR-XRF-SB14	NASB-MGBR-XRF-SB15	NASB-MGBR-XRF-SB16	NASB-MGBR-XRF-SB17
SAMPLE ID	NASB-MGBR-XRF-SB13-0003	NASB-MGBR-XRF-SB14-0003	NASB-MGBR-XRF-SB15-0003	NASB-MGBR-XRF-SB16-0003	NASB-MGBR-XRF-SB17-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	140.88	168.88	137.52	158.24	133.04
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	28.04	28.16	26.6	26.18	26.3
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	33	43 U	50 U	43	40 U
LEAD	48	98	42	79	34
NICKEL	34 U	51 U	58 U	44 U	46 U
ZINC	27	28	30 U	23 U	25 U

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB18			NASB-MGBR-XRF-SB19	NASB-MGBR-XRF-SB20
	NASB-MGBR-XRF-SB18-0003	NASB-MGBR-XRF-SB18-0003-AVG	NASB-MGBR-XRF-SB18-0003-D	NASB-MGBR-XRF-SB19-0003	NASB-MGBR-XRF-SB20-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	ORIGINAL	AVERAGE	DUPLICATE	NORMAL	ORIGINAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	NA	132.2	NA	128	NA
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	NA	26.51	NA	26.12	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	49 U	46 U	43 U	35 U	32 U
LEAD	28	32.5	37	25	33
NICKEL	61 U	58.5 U	56 U	42 U	39 U
ZINC	30 U	28.5 U	27 U	22 U	20 U

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 MACHINE GUN BORESIGHT RANGE
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB20		NASB-MGBR-XRF-SB21
	NASB-MGBR-XRF-SB20-0003-AVG	NASB-MGBR-XRF-SB20-0003-D	NASB-MGBR-XRF-SB21-0003
SAMPLE DATE	20080501	20080501	20080501
SAMPLE CODE	AVERAGE	DUPLICATE	NORMAL
MATRIX	SO	SO	SO
SUBMATRIX	SS	SS	SS
TOP DEPTH	0	0	0
BOTTOM DEPTH	3	3	3
METALS (MG/KG)			
ALUMINUM	NA	NA	NA
ANTIMONY	NA	NA	NA
ARSENIC	NA	NA	NA
BARIUM	NA	NA	NA
BERYLLIUM	NA	NA	NA
CADMIUM	NA	NA	NA
CALCIUM	NA	NA	NA
CHROMIUM	NA	NA	NA
COBALT	NA	NA	NA
COPPER	NA	NA	NA
IRON	NA	NA	NA
LEAD	NA	NA	NA
LEAD-CALC	131.08	NA	156.56
MAGNESIUM	NA	NA	NA
MANGANESE	NA	NA	NA
MERCURY	NA	NA	NA
NICKEL	NA	NA	NA
POTASSIUM	NA	NA	NA
SELENIUM	NA	NA	NA
SILVER	NA	NA	NA
SODIUM	NA	NA	NA
THALLIUM	NA	NA	NA
VANADIUM	NA	NA	NA
ZINC	NA	NA	NA
ZINC-CALC	26.06	NA	25.82
EXPLOSIVES (MG/KG)			
NITROGLYCERIN	NA	NA	NA
XRF (MG/KG)			
COPPER	33.5 U	35 U	33
LEAD	30.5	28	76
NICKEL	40 U	41 U	33 U
ZINC	21 U	22 U	17 U

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 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB22				NASB-MGBR-XRF-SB23
	NASB-MGBR-XRF-SB22-0003	NASB-MGBR-XRF-SB22-0612	NASB-MGBR-XRF-SB22-1218	NASB-MGBR-XRF-SB22-1824	NASB-MGBR-XRF-SB23-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SB	SB	SB	SS
TOP DEPTH	0	6	12	18	0
BOTTOM DEPTH	3	12	18	24	3
METALS (MG/KG)					
ALUMINIUM	6400	NA	NA	NA	NA
ANTIMONY	9.5 UJ	NA	NA	NA	NA
ARSENIC	19 U	NA	NA	NA	NA
BARIIUM	55	NA	NA	NA	NA
BERYLLIUM	0.95 U	NA	NA	NA	NA
CADMIUM	22	NA	NA	NA	NA
CALCIUM	1900	NA	NA	NA	NA
CHROMIUM	170	NA	NA	NA	NA
COBALT	3.5	NA	NA	NA	NA
COPPER	11	NA	NA	NA	NA
IRON	14000	NA	NA	NA	NA
LEAD	490	NA	NA	NA	NA
LEAD-CALC	NA	176.72	138.64	163.28	128.56
MAGNESIUM	1700	NA	NA	NA	NA
MANGANESE	160	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	5.7 U	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	19 U	NA	NA	NA	NA
SILVER	2.8 UJ	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	19 U	NA	NA	NA	NA
VANADIUM	14	NA	NA	NA	NA
ZINC	46	NA	NA	NA	NA
ZINC-CALC	NA	26.9	26.48	26.36	26.42
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	100 U	57 U	44 U	42 U	43 U
LEAD	401	112	44	88	26
NICKEL	210 U	85 U	55 U	52 U	53 U
ZINC	109	35 U	28 U	26 U	27 U

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 MACHINE GUN BORESIGHT RANGE
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LOCATION	NASB-MGBR-XRF-SB24	NASB-MGBR-XRF-SB25	NASB-MGBR-XRF-SB26	NASB-MGBR-XRF-SB27	NASB-MGBR-XRF-SB28
SAMPLE ID	NASB-MGBR-XRF-SB24-0003	NASB-MGBR-XRF-SB25-0003	NASB-MGBR-XRF-SB26-0003	NASB-MGBR-XRF-SB27-0003	NASB-MGBR-XRF-SB28-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	126.88	135.28	166.64	130.8	127.44
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	29.36	26.42	27.92	26.42	27.68
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	39 U	45 U	41 U	44 U	40 U
LEAD	23	38	94	30	24
NICKEL	48 U	54 U	50 U	50 U	47 U
ZINC	38	27 U	26	27 U	24

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 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB29	NASB-MGBR-XRF-SB30			
	NASB-MGBR-XRF-SB29-0003	NASB-MGBR-XRF-SB30-0003	NASB-MGBR-XRF-SB30-0003-AVG	NASB-MGBR-XRF-SB30-0003-D	NASB-MGBR-XRF-SB30-0612
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	ORIGINAL	AVERAGE	DUPLICATE	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SB
TOP DEPTH	0	0	0	0	6
BOTTOM DEPTH	3	3	3	3	12
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	117.64	NA	240.56	NA	143.12
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	26.36	NA	33.8	NA	26.36
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	42 U	58 U	58 U	58 U	42 U
LEAD	13 U	226	226	226	52
NICKEL	50 U	74 U	73 U	72 U	51 U
ZINC	26 U	56	75	94	26 U

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 MACHINE GUN BORESIGHT RANGE
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LOCATION SAMPLE ID	NASB-MGBR-XRF-SB30		NASB-MGBR-XRF-SB31	NASB-MGBR-XRF-SB32	NASB-MGBR-XRF-SB33
	NASB-MGBR-XRF-SB30-1218	NASB-MGBR-XRF-SB30-1824	NASB-MGBR-XRF-SB31-0003	NASB-MGBR-XRF-SB32-0003	NASB-MGBR-XRF-SB33-0003
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SB	SB	SS	SS	SS
TOP DEPTH	12	18	0	0	0
BOTTOM DEPTH	18	24	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA
BARIIUM	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA
LEAD-CALC	139.76	134.16	130.8	153.76	145.92
MAGNESIUM	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA
ZINC-CALC	26.42	26.12	27.92	26.54	30.92
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	44 U	38 U	39 U	48 U	54 U
LEAD	46	36	30	71	57
NICKEL	50 U	44 U	46 U	55 U	61 U
ZINC	27 U	22 U	26	29 U	51

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 MACHINE GUN BORESIGHT RANGE
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LOCATION	NASB-MGBR-XRF-SB34	NASB-MGBR-XRF-SB35	NASB-MGBR-XRF-SB36	NASB-MGBR-XRF-SB37	
SAMPLE ID	NASB-MGBR-XRF-SB34-0003	NASB-MGBR-XRF-SB35-0003	NASB-MGBR-XRF-SB36-0003	NASB-MGBR-XRF-SB37-0003	NASB-MGBR-XRF-SB37-0003-AVG
SAMPLE DATE	20080501	20080501	20080501	20080501	20080501
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIGINAL	AVERAGE
MATRIX	SO	SO	SO	SO	SO
SUBMATRIX	SS	SS	SS	SS	SS
TOP DEPTH	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3
METALS (MG/KG)					
ALUMINUM	NA	8200	NA	8100	8150
ANTIMONY	NA	9.6 U	NA	9.8 U	9.75 U
ARSENIC	NA	19 U	NA	20 U	19.5 U
BARIIUM	NA	33	NA	28	27.5
BERYLLIUM	NA	0.96 U	NA	0.98 U	0.975 U
CADMIUM	NA	2.9 U	NA	2.9 U	2.9 U
CALCIUM	NA	1200	NA	1100	1100
CHROMIUM	NA	17	NA	12	12.5
COBALT	NA	3.7	NA	4.3	4.4
COPPER	NA	53	NA	30	31
IRON	NA	8600	NA	9300	9550
LEAD	NA	160	NA	230	235
LEAD-CALC	156.56	NA	152.08	NA	NA
MAGNESIUM	NA	1300	NA	1700	1750
MANGANESE	NA	110	NA	160	160
MERCURY	NA	NA	NA	NA	NA
NICKEL	NA	7.1	NA	8.3	8.05
POTASSIUM	NA	NA	NA	NA	NA
SELENIUM	NA	19 U	NA	20 U	19.5 U
SILVER	NA	2.9 UJ	NA	2.9 UJ	2.9 UJ
SODIUM	NA	NA	NA	NA	NA
THALLIUM	NA	19 U	NA	20 U	19.5 U
VANADIUM	NA	14	NA	16	16.5
ZINC	NA	26	NA	28	29.5
ZINC-CALC	26.48	NA	28.88	NA	NA
EXPLOSIVES (MG/KG)					
NITROGLYCERIN	NA	NA	NA	NA	NA
XRF (MG/KG)					
COPPER	45 U	84	53 U	49 U	45.75
LEAD	76	160	68	208	203.5
NICKEL	54 U	64 U	60 U	59 U	63.5 U
ZINC	28 U	33 U	34	29 U	33 U

APPENDIX D-1

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-MGBR-XRF-SB37	NASB-MGBR-XRF-SB38	NASB-MGBR-XRF-SB39
SAMPLE ID	NASB-MGBR-XRF-SB37-0003-D	NASB-MGBR-XRF-SB38-0003	NASB-MGBR-XRF-SB39-0003
SAMPLE DATE	20080501	20080501	20080501
SAMPLE CODE	DUPLICATE	NORMAL	NORMAL
MATRIX	SO	SO	SO
SUBMATRIX	SS	SS	SS
TOP DEPTH	0	0	0
BOTTOM DEPTH	3	3	3
METALS (MG/KG)			
ALUMINUM	8200	NA	NA
ANTIMONY	9.7 U	NA	NA
ARSENIC	19 U	NA	NA
BARIUM	27	NA	NA
BERYLLIUM	0.97 U	NA	NA
CADMIUM	2.9 U	NA	NA
CALCIUM	1100	NA	NA
CHROMIUM	13	NA	NA
COBALT	4.5	NA	NA
COPPER	32	NA	NA
IRON	9800	NA	NA
LEAD	240	NA	NA
LEAD-CALC	NA	137.52	167.76
MAGNESIUM	1800	NA	NA
MANGANESE	160	NA	NA
MERCURY	NA	NA	NA
NICKEL	7.8	NA	NA
POTASSIUM	NA	NA	NA
SELENIUM	19 U	NA	NA
SILVER	2.9 UJ	NA	NA
SODIUM	NA	NA	NA
THALLIUM	19 U	NA	NA
VANADIUM	17	NA	NA
ZINC	31	NA	NA
ZINC-CALC	NA	28.52	26.6
EXPLOSIVES (MG/KG)			
NITROGLYCERIN	NA	NA	NA
XRF (MG/KG)			
COPPER	67	54	51 U
LEAD	199	42	96
NICKEL	68 U	53 U	63 U
ZINC	37 U	31	30 U

mg/kg = Milligrams per kilogram.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

D-2 MACHINE GUN BORESIGHT, GROUNDWATER

APPENDIX D-2

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
 PAGE 1 OF 2

LOCATION	NASB-MGBR-MW01		NASB-MGBR-MW02		NASB-MGBR-MW02		NASB-MGBR-MW02		NASB-MGBR-MW03	
SAMPLE ID	NASB-MGBR-MW01-122909		NASB-MGBR-MW02-122909		NASB-MGBR-MW02-122909-AVG		NASB-MGBR-MW02-122909-D		NASB-MGBR-MW03-122909	
SAMPLE DATE	20091229		20091229		20091229		20091229		20091229	
SAMPLE CODE	NORMAL		NORMAL		NORMAL		NORMAL		NORMAL	
MATRIX	GW		GW		GW		GW		GW	
SUBMATRIX	GW		GW		GW		GW		GW	
TOP DEPTH	NA		NA		NA		NA		NA	
BOTTOM DEPTH	NA		NA		NA		NA		NA	
INORGANICS (UG/L)										
ALUMINUM	84.7	J	113	J	80.05	J	47.1	J	418	J
ANTIMONY	1.25	U	1.25	U	1.25	U	1.25	U	1.63	J
ARSENIC	0.75	U	0.75	U	0.75	U	0.75	U	0.822	J
BARIUM	38.6		9.52	J	9.47	J	9.42	J	4.7	J
BERYLLIUM	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
CADMIUM	0.298	J	0.25	U	0.25	U	0.25	U	0.282	J
CALCIUM	9510	J	3960	J	3970	J	3980	J	6550	J
CHROMIUM	0.5	U	0.5	U	0.5	U	0.5	U	35.1	
COBALT	1.88	J	1.25	U	1.25	U	1.25	U	1.25	U
COPPER	1.33	J	1.25	U	1.25	U	1.25	U	2.29	J
IRON	63.1	J	95.6	J	63.1	J	30.6	J	127	J
LEAD	0.375	U	0.375	U	0.375	U	0.375	U	0.375	U
MAGNESIUM	744	J	420	J	414	J	408	J	283	J
MANGANESE	151		180		180		180		17.9	
MERCURY	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U
NICKEL	2.14	J	1.63	J	1.635	J	1.64	J	0.75	U
POTASSIUM	1400		698	J	698	J	698	J	23600	
SELENIUM	0.75	U	0.75	U	0.75	U	0.75	U	1.1	J
SILVER	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
SODIUM	8100	J	1490	J	1490	J	1490	J	9920	J
THALLIUM	0.75	U	0.75	U	0.75	U	0.75	U	0.75	U
VANADIUM	1.25	U	1.25	U	1.25	U	1.25	U	1.25	U
ZINC	7.87		1.79	J	1.875	J	1.96	J	1.25	U
EXPLOSIVES (UG/L)										
NITROGLYCERIN	1.1	U	1.1	U	1.1	U	1.1	U	1.1	U
MISCELLANEOUS PARAMETERS (UG/L)										
PERCHLORATE	0.066	U	0.066	U	0.066	U	0.066	U	0.0737	J

APPENDIX D-2

SUMMARY OF ANALYTICAL RESULTS FOR GROUNDWATER
 MACHINE GUN BORESIGHT RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
 PAGE 2 OF 2

LOCATION	NASB-MGBR-MW04		NASB-MGBR-MW05	
SAMPLE ID	NASB-MGBR-MW04-122909		NASB-MGBR-MW05-122909	
SAMPLE DATE	20091229		20091229	
SAMPLE CODE	NORMAL		NORMAL	
MATRIX	GW		GW	
SUBMATRIX	GW		GW	
TOP DEPTH	NA		NA	
BOTTOM DEPTH	NA		NA	
INORGANICS (UG/L)				
ALUMINUM	51.1	J	251	J
ANTIMONY	1.25	U	1.25	U
ARSENIC	0.75	U	0.75	U
BARIUM	38.1		56.6	
BERYLLIUM	0.25	U	0.25	U
CADMIUM	0.301	J	0.307	J
CALCIUM	20000	J	5210	J
CHROMIUM	0.5	U	0.858	J
COBALT	1.25	U	1.88	J
COPPER	1.34	J	1.37	J
IRON	44.5	J	322	J
LEAD	0.375	U	0.375	U
MAGNESIUM	2050		750	J
MANGANESE	63.2		551	
MERCURY	0.08	U	0.08	U
NICKEL	1.03	J	2.93	
POTASSIUM	4880		2730	
SELENIUM	0.75	U	0.75	U
SILVER	0.25	U	0.25	U
SODIUM	9200	J	2750	J
THALLIUM	0.75	U	0.75	U
VANADIUM	1.25	U	1.25	U
ZINC	1.25	U	4.37	J
EXPLOSIVES (UG/L)				
NITROGLYCERIN	1.1	UJ	1.1	U
MISCELLANEOUS PARAMETERS (UG/L)				
PERCHLORATE	0.165	J	0.066	U

UG/L = Micrograms per liter.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reporting limit left of the letter.

UJ = Numerical detection limit for the undetected result is estimated.

D-3 SKEET RANGE, SOIL

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SB01				NASB-SKT-XRF-SB02	
	NASB-SKT-SB01-0003 20091215 NORMAL SO 0 3	NASB-SKT-SB01-0312 20091215 NORMAL SO 3 12	NASB-SKT-XRF-SB01-0003 20090706 NORMAL SO 0 3	NASB-SKT-XRF-SB01-0312 20090707 NORMAL SO 3 12	NASB-SKT-SB02-0003 20091215 ORIGINAL SO 0 3	NASB-SKT-SB02-0003-AVG 20091215 AVERAGE SO 0 3
METALS (MG/KG)						
ALUMINUM	8850	8370	NA	NA	7620	7405
ANTIMONY	0.301 UJ	0.272 UJ	NA	NA	0.529 J	0.49 J
ARSENIC	5.26	6.03	NA	NA	2.73	2.595
BARIUM	33	28.4	NA	NA	34.3	31.75
BERYLLIUM	0.446	0.383	NA	NA	0.337 J	0.3405 J
CADMIUM	0.835	0.199 J	NA	NA	0.254 J	0.239 J
CALCIUM	1290	1380	NA	NA	1720	1595
CHROMIUM	16.5	13.9	NA	NA	9.09	8.77
COBALT	4.24	4.13	NA	NA	1.35	1.3
COPPER	18.4	11.9	NA	NA	6.63	6.3
IRON	10700	10100	NA	NA	7780	7900
LEAD	47.5 J	18.8 J	NA	NA	166 J	159 J
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	2310 J	2140 J	NA	NA	540 J	514.5 J
MANGANESE	179 J	174 J	NA	NA	117 J	108.15 J
MERCURY	0.0325 J	0.0284 J	NA	NA	0.121	0.118
NICKEL	12.8	11.9	NA	NA	5.59	5.31
POTASSIUM	1220 J	1130 J	NA	NA	320 J	300 J
SELENIUM	0.181 UJ	0.163 UJ	NA	NA	0.642 J	0.5685 J
SILVER	0.241 UJ	0.163 UJ	NA	NA	0.152 UJ	0.1485 UJ
SODIUM	87.4 J	111 J	NA	NA	75.8 U	74.1 U
THALLIUM	0.181 U	0.163 U	NA	NA	0.227 U	0.222 U
VANADIUM	31.1	17.7	NA	NA	18	17.55
ZINC	49.7	34.5	NA	NA	26.1	25.05
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ
2,4-DINITROTOLUENE	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ
2,6-DINITROTOLUENE	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ
2-AMINO-4,6-DINITROTOLUENE	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U
2-NITROTOLUENE	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U
3-NITROTOLUENE	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U
4-AMINO-2,6-DINITROTOLUENE	0.3 UJ	0.3 UJ	NA	NA	0.3 UJ	0.3 UJ
4-NITROTOLUENE	0.3 U	0.3 U	NA	NA	0.3 U	0.3 U
NITROGLYCERIN	1.5 U	1.5 U	NA	NA	1.5 U	1.5 U
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	14 J	2.6 J	NA	NA	12 J	10.95 J
2-METHYLNAPHTHALENE	18 J	3.5 J	NA	NA	15 J	13.5 J
ACENAPHTHENE	30 J	11 J	NA	NA	59 J	60 J
ACENAPHTHYLENE	65 J	29 J	NA	NA	100 U	35 J
ANTHRACENE	84 J	26 J	NA	NA	91 J	93 J
BENZO(A)ANTHRACENE	380	200	NA	NA	940	935 J
BENZO(A)PYRENE	400	230	NA	NA	1200	1200
BENZO(B)FLUORANTHENE	650	330	NA	NA	1600	1450
BENZO(G,H,I)PERYLENE	240 J	140	NA	NA	660	620
BENZO(K)FLUORANTHENE	230 J	100	NA	NA	560	615
CHRYSENE	510	280	NA	NA	1100	1150 J
DIBENZO(A,H)ANTHRACENE	67	39	NA	NA	170 J	90 J
FLUORANTHENE	910	310	NA	NA	1400	1400 J
FLUORENE	43 J	8.5 J	NA	NA	48 J	42.5 J
INDENO(1,2,3-CD)PYRENE	270 J	170	NA	NA	740	775
NAPHTHALENE	37 J	5.6 J	NA	NA	100 U	33 J
PHENANTHRENE	510	110	NA	NA	610	555
PYRENE	820	300	NA	NA	1300	1250
XRF (MG/KG)						
LEAD	NA	NA	36	27	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)						

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SB01				NASB-SKT-XRF-SB02	
	NASB-SKT-SB01-0003	NASB-SKT-SB01-0312	NASB-SKT-XRF-SB01-0003	NASB-SKT-XRF-SB01-0312	NASB-SKT-SB02-0003	NASB-SKT-SB02-0003-AVG
SAMPLE ID	20091215	20091215	20090706	20090707	20091215	20091215
SAMPLE DATE	20091215	20091215	20090706	20090707	20091215	20091215
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	ORIGINAL	AVERAGE
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	3	0	3	0	0
BOTTOM DEPTH	3	12	3	12	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 3 OF 34

LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SB02				NASB-SKT-XRF-SB02	
	NASB-SKT-SB02-0003-D 20091215 DUPLICATE SO 0 3	NASB-SKT-SB02-0312 20091215 NORMAL SO 3 12	NASB-SKT-XRF-SB02-0003 20090707 ORIGINAL SO 0 3	NASB-SKT-XRF-SB02-0003-AVG 20090707 AVERAGE SO 0 3	NASB-SKT-XRF-SB02-0003-D 20090707 DUPLICATE SO 0 3	NASB-SKT-XRF-SB02-0312 20090707 NORMAL SO 3 12
METALS (MG/KG)						
ALUMINUM	7190	10900	NA	NA	NA	NA
ANTIMONY	0.451 J	0.295 UJ	NA	NA	NA	NA
ARSENIC	2.46	1.93 J	NA	NA	NA	NA
BARIUM	29.2	17.3	NA	NA	NA	NA
BERYLLIUM	0.344 J	0.406	NA	NA	NA	NA
CADMIUM	0.224 J	0.0591 U	NA	NA	NA	NA
CALCIUM	1470	738	NA	NA	NA	NA
CHROMIUM	8.45	7.1	NA	NA	NA	NA
COBALT	1.25	1.47	NA	NA	NA	NA
COPPER	5.97	2.24 J	NA	NA	NA	NA
IRON	8020	9390	NA	NA	NA	NA
LEAD	152 J	11.2 J	NA	NA	NA	NA
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	489 J	590 J	NA	NA	NA	NA
MANGANESE	99.3	55.5 J	NA	NA	NA	NA
MERCURY	0.115	0.0418	NA	NA	NA	NA
NICKEL	5.03	3.79 J	NA	NA	NA	NA
POTASSIUM	280 J	277 J	NA	NA	NA	NA
SELENIUM	0.495 J	0.585 J	NA	NA	NA	NA
SILVER	0.145 UJ	0.177 UJ	NA	NA	NA	NA
SODIUM	72.4 U	59.1 U	NA	NA	NA	NA
THALLIUM	0.217 U	0.177 U	NA	NA	NA	NA
VANADIUM	17.1	15.8	NA	NA	NA	NA
ZINC	24	17	NA	NA	NA	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	0.3 UJ	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	0.3 UJ	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	0.3 UJ	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	0.3 U	NA	NA	NA	NA
2-NITROTOLUENE	NA	0.3 U	NA	NA	NA	NA
3-NITROTOLUENE	NA	0.3 U	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	0.3 UJ	NA	NA	NA	NA
4-NITROTOLUENE	NA	0.3 U	NA	NA	NA	NA
NITROGLYCERIN	NA	1.5 U	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	9.9 J	2.4 J	NA	NA	NA	NA
2-METHYLNAPHTHALENE	12 J	2 J	NA	NA	NA	NA
ACENAPHTHENE	61 J	13 J	NA	NA	NA	NA
ACENAPHTHYLENE	35 J	82 U	NA	NA	NA	NA
ANTHRACENE	95 J	82 U	NA	NA	NA	NA
BENZO(A)ANTHRACENE	930 J	520	NA	NA	NA	NA
BENZO(A)PYRENE	1200	740	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	1300	910	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	580	540	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	670	320	NA	NA	NA	NA
CHRYSENE	1200 J	730	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	20 UJ	120	NA	NA	NA	NA
FLUORANTHENE	1400 J	440	NA	NA	NA	NA
FLUORENE	37 J	5 J	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	810	580	NA	NA	NA	NA
NAPHTHALENE	33 J	7.5 J	NA	NA	NA	NA
PHENANTHRENE	500	57 J	NA	NA	NA	NA
PYRENE	1200	500	NA	NA	NA	NA
XRF (MG/KG)						
LEAD	NA	NA	222	217.5	213	21
MISCELLANEOUS PARAMETERS (MEQ/100)						

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SB02				NASB-SKT-XRF-SB02	
	NASB-SKT-SB02-0003-D	NASB-SKT-SB02-0312	NASB-SKT-XRF-SB02-0003	NASB-SKT-XRF-SB02-0003-AVG	NASB-SKT-XRF-SB02-0003-D	NASB-SKT-XRF-SB02-0312
SAMPLE ID	20091215	20091215	20090707	20090707	20090707	20090707
SAMPLE DATE	20091215	20091215	20090707	20090707	20090707	20090707
SAMPLE CODE	DUPLICATE	NORMAL	ORIGINAL	AVERAGE	DUPLICATE	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	3	0	0	0	3
BOTTOM DEPTH	3	12	3	3	3	12
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
PAGE 5 OF 34

LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SB03			NASB-SKT-XRF-SB03		NASB-SKT	
	NASB-SKT-SB03-0003 20091215 NORMAL SO 0 3	NASB-SKT-SB03-0312 20091215 NORMAL SO 3 12	NASB-SKT-XRF-SB03-0003 20090707 NORMAL SO 0 3	NASB-SKT-XRF-SB03-0312 20090707 NORMAL SO 3 12	NASB-SKT-SB04-0003 20091215 NORMAL SO 0 3	NASB-SKT-SB04-0312 20091215 NORMAL SO 3 12	
METALS (MG/KG)							
ALUMINUM	13100	10700	NA	NA	6320	9040	
ANTIMONY	0.317 UJ	0.275 UJ	NA	NA	0.369 UJ	0.294 UJ	
ARSENIC	10.6	6.9	NA	NA	2.27	2.41	
BARIUM	124	36.5	NA	NA	18.9	15.2	
BERYLLIUM	0.605	0.449	NA	NA	0.289 J	0.445	
CADMIUM	0.25 J	0.0965 J	NA	NA	0.183 J	0.0736 J	
CALCIUM	1520	1280	NA	NA	799	400	
CHROMIUM	19.2	15	NA	NA	8.11	9.5	
COBALT	22.3	4.6	NA	NA	2.45	3.4	
COPPER	18.9	9.95	NA	NA	5.93	5.7	
IRON	18700	11600	NA	NA	7240	9180	
LEAD	68.7 J	9.88 J	NA	NA	23 J	18.4 J	
LEAD-CALC	NA	NA	NA	NA	NA	NA	
MAGNESIUM	2160 J	2810 J	NA	NA	1280 J	1670 J	
MANGANESE	2230	168 J	NA	NA	94.3 J	125 J	
MERCURY	0.0583	0.0219 J	NA	NA	0.0524	0.0294 J	
NICKEL	14.8	12.9	NA	NA	6.93	8.21	
POTASSIUM	1150 J	1600 J	NA	NA	678 J	811 J	
SELENIUM	0.952 UJ	0.165 UJ	NA	NA	0.401	0.177 UJ	
SILVER	0.0635 UJ	0.22 UJ	NA	NA	0.148 U	0.177 UJ	
SODIUM	104 J	134 J	NA	NA	73.9 U	58.9 U	
THALLIUM	1.59 U	0.165 U	NA	NA	0.222 U	0.177 U	
VANADIUM	32.9	20.1	NA	NA	17.5	18.5	
ZINC	110	33.2	NA	NA	27.2	20.3	
EXPLOSIVES (MG/KG)							
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
NITROGLYCERIN	NA	NA	NA	NA	NA	NA	
PAHs (UG/KG)							
1-METHYLNAPHTHALENE	3.4 J	76 U	NA	NA	6.7 J	80 U	
2-METHYLNAPHTHALENE	4.3 J	1.8 J	NA	NA	8 J	1.8 J	
ACENAPHTHENE	6.5 J	3.5 J	NA	NA	40 J	3.3 J	
ACENAPHTHYLENE	31 J	34 J	NA	NA	26 J	7.8 J	
ANTHRACENE	27 J	18 J	NA	NA	67 J	8.2 J	
BENZO(A)ANTHRACENE	170	130	NA	NA	290	46 J	
BENZO(A)PYRENE	140	110	NA	NA	320	40	
BENZO(B)FLUORANTHENE	210	140	NA	NA	520	59 J	
BENZO(G,H,I)PERYLENE	82 J	60 J	NA	NA	180	22 J	
BENZO(K)FLUORANTHENE	69 J	52 J	NA	NA	180	23 J	
CHRYSENE	240	160	NA	NA	400	60 J	
DIBENZO(A,H)ANTHRACENE	20	17	NA	NA	47	5.9 J	
FLUORANTHENE	360	180	NA	NA	860	91	
FLUORENE	11 J	5.4 J	NA	NA	35 J	3.4 J	
INDENO(1,2,3-CD)PYRENE	87	72 J	NA	NA	210	25 J	
NAPHTHALENE	8.3 J	76 U	NA	NA	17 J	80 U	
PHENANTHRENE	160	45 J	NA	NA	470	38 J	
PYRENE	340	200	NA	NA	690	83	
XRF (MG/KG)							
LEAD	NA	NA	32	20	NA	NA	
MISCELLANEOUS PARAMETERS (MEQ/100)							

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	NASB-SKT-XRF-SB03			NASB-SKT-XRF-SB03		NASB-SKT	
	NASB-SKT-SB03-0003	NASB-SKT-SB03-0312	NASB-SKT-XRF-SB03-0003	NASB-SKT-XRF-SB03-0312	NASB-SKT-SB04-0003	NASB-SKT-SB04-0312	
SAMPLE ID	20091215	20091215	20090707	20090707	20091215	20091215	
SAMPLE DATE	20091215	20091215	20090707	20090707	20091215	20091215	
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
MATRIX	SO	SO	SO	SO	SO	SO	
TOP DEPTH	0	3	0	3	0	3	
BOTTOM DEPTH	3	12	3	12	3	12	
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	XRF-SB04		NASB-SKT-XRF-SB05			
	NASB-SKT-XRF-SB04-0003 20090707 NORMAL SO 0 3	NASB-SKT-XRF-SB04-0312 20090707 NORMAL SO 3 12	NASB-SKT-SB05-0003 20091215 NORMAL SO 3 12	NASB-SKT-SB05-0312 20091215 NORMAL SO 3 12	NASB-SKT-XRF-SB05-0003 20090707 NORMAL SO 0 3	NASB-SKT-XRF-SB05-0312 20090707 NORMAL SO 3 12
METALS (MG/KG)						
ALUMINUM	NA	NA	9660	8040	NA	NA
ANTIMONY	NA	NA	0.283 UJ	0.277 UJ	NA	NA
ARSENIC	NA	NA	3.74	3.02	NA	NA
BARIUM	NA	NA	27.5	17	NA	NA
BERYLLIUM	NA	NA	0.398	0.328	NA	NA
CADMIUM	NA	NA	0.197 J	0.118 J	NA	NA
CALCIUM	NA	NA	1000	427	NA	NA
CHROMIUM	NA	NA	10.8	8.15	NA	NA
COBALT	NA	NA	2.54	1.89	NA	NA
COPPER	NA	NA	8.59	5.96	NA	NA
IRON	NA	NA	9490	8870	NA	NA
LEAD	NA	NA	39.3 J	44 J	NA	NA
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	1490 J	960 J	NA	NA
MANGANESE	NA	NA	177 J	140 J	NA	NA
MERCURY	NA	NA	0.0874	0.0553	NA	NA
NICKEL	NA	NA	7.47	5.74	NA	NA
POTASSIUM	NA	NA	638 J	394 J	NA	NA
SELENIUM	NA	NA	0.323 J	0.332 J	NA	NA
SILVER	NA	NA	0.17 UJ	0.166 UJ	NA	NA
SODIUM	NA	NA	69.7 J	55.4 U	NA	NA
THALLIUM	NA	NA	0.17 U	0.166 U	NA	NA
VANADIUM	NA	NA	18.2	19.4	NA	NA
ZINC	NA	NA	47.8	25.9	NA	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	NA	NA	5.3 J	4.8 J	NA	NA
2-METHYLNAPHTHALENE	NA	NA	5.4 J	5.6 J	NA	NA
ACENAPHTHENE	NA	NA	49 J	41 J	NA	NA
ACENAPHTHYLENE	NA	NA	27 J	13 J	NA	NA
ANTHRACENE	NA	NA	100	100	NA	NA
BENZO(A)ANTHRACENE	NA	NA	490	260	NA	NA
BENZO(A)PYRENE	NA	NA	470	210	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	700	290	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	270	110	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	270	100	NA	NA
CHRYSENE	NA	NA	660	270	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	66	29	NA	NA
FLUORANTHENE	NA	NA	1400	610	NA	NA
FLUORENE	NA	NA	50 J	44 J	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	300	130	NA	NA
NAPHTHALENE	NA	NA	10 J	11 J	NA	NA
PHENANTHRENE	NA	NA	760	430	NA	NA
PYRENE	NA	NA	1100	490	NA	NA
XRF (MG/KG)						
LEAD	29	34	NA	NA	24	23
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	-XRF-SB04		NASB-SKT-XRF-SB05			
	NASB-SKT-XRF-SB04-0003	NASB-SKT-XRF-SB04-0312	NASB-SKT-SB05-0003	NASB-SKT-SB05-0312	NASB-SKT-XRF-SB05-0003	NASB-SKT-XRF-SB05-0312
SAMPLE ID	20090707	20090707	20091215	20091215	20090707	20090707
SAMPLE DATE	20090707	20090707	20091215	20091215	20090707	20090707
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	3	3	3	0	3
BOTTOM DEPTH	3	12	12	12	3	12
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SB06		NASB-SKT-XRF-SB06		NASB-SKT-XRF-SB07	
	NASB-SKT-SB06-0003 20091215 NORMAL SO 0 3	NASB-SKT-SB06-0312 20091215 NORMAL SO 3 12	NASB-SKT-XRF-SB06-0003 20090707 NORMAL SO 0 3	NASB-SKT-XRF-SB06-0312 20090707 NORMAL SO 3 12	NASB-SKT-SB07-0003 20091215 NORMAL SO 0 3	NASB-SKT-SB07-0312 20091215 NORMAL SO 3 12
METALS (MG/KG)						
ALUMINUM	2160	8210	NA	NA	9230	9710
ANTIMONY	1.7 J	0.378 UJ	NA	NA	0.283 UJ	0.282 UJ
ARSENIC	3.34	1.83	NA	NA	2.09	1.87
BARIUM	28.7	10.6	NA	NA	12.3	8.63
BERYLLIUM	0.114 J	0.461	NA	NA	0.354	0.58
CADMIUM	0.349 J	0.0756 U	NA	NA	0.0632 J	0.0563 U
CALCIUM	2170	530	NA	NA	234 J	188 J
CHROMIUM	3.7	6.29	NA	NA	8.17	7.04
COBALT	1.07	1.14	NA	NA	2.73	1.86
COPPER	6.39	2.97	NA	NA	3.97 J	3.79 J
IRON	3780	6760	NA	NA	8880	8400
LEAD	774 J	17.6 J	NA	NA	16.4 J	3.8 UJ
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	308 J	591 J	NA	NA	1210 J	641 J
MANGANESE	297	61.8	NA	NA	166	106
MERCURY	0.0785	0.0305 J	NA	NA	0.0474	0.0414
NICKEL	3.71	3.49	NA	NA	6.23	3.75 J
POTASSIUM	134 J	176 J	NA	NA	404 J	199 J
SELENIUM	0.411 J	0.292 J	NA	NA	0.35 J	0.514 J
SILVER	0.166 U	0.151 U	NA	NA	0.226 UJ	0.169 UJ
SODIUM	83 U	75.6 U	NA	NA	56.6 U	56.3 U
THALLIUM	0.332 U	0.227 U	NA	NA	0.17 U	0.169 U
VANADIUM	15.7	15.5	NA	NA	16.7	12.4
ZINC	26.9	12	NA	NA	19.2	15.1
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	4.7 J	100 U	NA	NA	79 U	79 U
2-METHYLNAPHTHALENE	6.3 J	100 U	NA	NA	79 U	79 U
ACENAPHTHENE	7.9 J	100 U	NA	NA	2.8 J	79 U
ACENAPHTHYLENE	15 J	100 U	NA	NA	2.2 J	79 U
ANTHRACENE	15 J	100 U	NA	NA	4.8 J	79 U
BENZO(A)ANTHRACENE	91 J	6 J	NA	NA	21 J	1.8 J
BENZO(A)PYRENE	100	5.4 J	NA	NA	19	16 U
BENZO(B)FLUORANTHENE	190	9.7 J	NA	NA	28 J	2 J
BENZO(G,H,I)PERYLENE	60 J	3.8 J	NA	NA	12 J	79 U
BENZO(K)FLUORANTHENE	60 J	3.6 J	NA	NA	9.9 J	79 U
CHRYSENE	160	10 J	NA	NA	27 J	2.4 J
DIBENZO(A,H)ANTHRACENE	17 J	20 U	NA	NA	3.1 J	16 U
FLUORANTHENE	280	15 J	NA	NA	51 J	4.2 J
FLUORENE	110 U	100 U	NA	NA	2.6 J	79 U
INDENO(1,2,3-CD)PYRENE	80 J	4.8 J	NA	NA	13 J	79 U
NAPHTHALENE	19 J	100 U	NA	NA	79 U	79 U
PHENANTHRENE	130	7.9 J	NA	NA	28 J	2.6 J
PYRENE	220	13 J	NA	NA	44 J	3.2 J
XRF (MG/KG)						
LEAD	NA	NA	69	24	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)						

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 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SB06	NASB-SKT-XRF-SB06				NASB-SKT-XRF-SB07	
SAMPLE ID	NASB-SKT-SB06-0003	NASB-SKT-SB06-0312	NASB-SKT-XRF-SB06-0003	NASB-SKT-XRF-SB06-0312	NASB-SKT-SB07-0003	NASB-SKT-SB07-0312	
SAMPLE DATE	20091215	20091215	20090707	20090707	20091215	20091215	
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
MATRIX	SO	SO	SO	SO	SO	SO	
TOP DEPTH	0	3	0	3	0	3	
BOTTOM DEPTH	3	12	3	12	3	12	
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	
MISCELLANEOUS PARAMETERS (MG/KG)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	NA	NA	NA	NA	

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SB07		NASB-SKT-XRF-SB08			NASB-SKT-XRF-SB08
	NASB-SKT-XRF-SB07-0003 20090707 NORMAL SO 0 3	NASB-SKT-XRF-SB07-0312 20090707 NORMAL SO 3 12	NASB-SKT-SB08-0003 20091215 NORMAL SO 0 3	NASB-SKT-SB08-0312 20091215 NORMAL SO 3 12	NASB-SKT-XRF-SB08-0003 20090707 NORMAL SO 0 3	NASB-SKT-XRF-SB08-0312 20090707 NORMAL SO 3 12
METALS (MG/KG)						
ALUMINUM	NA	NA	3660	13300	NA	NA
ANTIMONY	NA	NA	0.608 J	0.308 UJ	NA	NA
ARSENIC	NA	NA	4.13	2.09 J	NA	NA
BARIUM	NA	NA	36.5	12.3	NA	NA
BERYLLIUM	NA	NA	0.166 J	0.571	NA	NA
CADMIUM	NA	NA	0.302 J	0.0617 U	NA	NA
CALCIUM	NA	NA	307 J	185 J	NA	NA
CHROMIUM	NA	NA	5.08	9.38	NA	NA
COBALT	NA	NA	0.682 J	2.01	NA	NA
COPPER	NA	NA	8.14	3 J	NA	NA
IRON	NA	NA	6410	11000	NA	NA
LEAD	NA	NA	443 J	6.35 J	NA	NA
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	NA	NA	236 J	857 J	NA	NA
MANGANESE	NA	NA	45.4	83.1	NA	NA
MERCURY	NA	NA	0.134	0.0515	NA	NA
NICKEL	NA	NA	5.33	5.15 J	NA	NA
POTASSIUM	NA	NA	144 J	243 J	NA	NA
SELENIUM	NA	NA	0.727	0.609 J	NA	NA
SILVER	NA	NA	0.232 U	0.185 UJ	NA	NA
SODIUM	NA	NA	77.3 U	61.7 U	NA	NA
THALLIUM	NA	NA	0.232 U	0.185 U	NA	NA
VANADIUM	NA	NA	19.7	16.7	NA	NA
ZINC	NA	NA	10.6	14.9	NA	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	NA	NA	12 J	84 U	NA	NA
2-METHYLNAPHTHALENE	NA	NA	16 J	84 U	NA	NA
ACENAPHTHENE	NA	NA	100 U	84 U	NA	NA
ACENAPHTHYLENE	NA	NA	100 U	84 U	NA	NA
ANTHRACENE	NA	NA	26 J	84 U	NA	NA
BENZO(A)ANTHRACENE	NA	NA	100 J	84 U	NA	NA
BENZO(A)PYRENE	NA	NA	99	17 U	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	200	84 U	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	100 U	84 U	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	59 J	84 U	NA	NA
CHRYSENE	NA	NA	170	84 U	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	21 U	17 U	NA	NA
FLUORANTHENE	NA	NA	310	2.8 J	NA	NA
FLUORENE	NA	NA	100 U	84 U	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	80 J	84 U	NA	NA
NAPHTHALENE	NA	NA	100 U	84 U	NA	NA
PHENANTHRENE	NA	NA	200	2.1 J	NA	NA
PYRENE	NA	NA	250	2.1 J	NA	NA
XRF (MG/KG)						
LEAD	36	18	NA	NA	102	24
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SB07		NASB-SKT-XRF-SB08			NASB-SKT-XRF-SB08
	NASB-SKT-XRF-SB07-0003	NASB-SKT-XRF-SB07-0312	NASB-SKT-SB08-0003	NASB-SKT-SB08-0312	NASB-SKT-XRF-SB08-0003	NASB-SKT-XRF-SB08-0312
SAMPLE ID	20090707	20090707	20091215	20091215	20090707	20090707
SAMPLE DATE	20090707	20090707	20091215	20091215	20090707	20090707
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	3	0	3	0	3
BOTTOM DEPTH	3	12	3	12	3	12
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SS01				NASB-SKT-XRF-SS02	
	NASB-SKT-SS01-0003 20091215 ORIGINAL SO 0 3	NASB-SKT-SS01-0003-AVG 20091215 AVERAGE SO 0 3	NASB-SKT-SS01-0003-D 20091215 DUPLICATE SO 0 3	NASB-SKT-XRF-SS01-0003 20090706 NORMAL SO 0 3	NASB-SKT-SS02-0003 20091215 NORMAL SO 0 3	NASB-SKT-XRF-SS02-0003 20090706 NORMAL SO 0 3
METALS (MG/KG)						
ALUMINUM	2630	2495	2360	NA	8470	NA
ANTIMONY	1.49 J	515.745 J	1030 J	NA	0.315 UJ	NA
ARSENIC	3.5 J	154.75 J	306 J	NA	4.7	NA
BARIUM	55.4	53.8	52.2	NA	30.2	NA
BERYLLIUM	0.167 J	0.163 J	0.159 J	NA	0.376	NA
CADMIUM	0.407 J	1.6135 J	2.82 J	NA	0.626	NA
CALCIUM	1460	1345	1230	NA	1240	NA
CHROMIUM	5.26	4.89	4.52	NA	19.8	NA
COBALT	1.08 J	1.04 J	1 J	NA	4.72	NA
COPPER	10.6	13.65	16.7	NA	14.8	NA
IRON	4080	3780	3480	NA	12000	NA
LEAD	512 J	9456 J	18400 J	NA	50.9 J	NA
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	369 J	349 J	329 J	NA	2540 J	NA
MANGANESE	68.6	61.3	54	NA	202	NA
MERCURY	0.145	0.152	0.159	NA	0.0351 J	NA
NICKEL	7.69	7.35	7.01	NA	12.5	NA
POTASSIUM	407 J	395.5 J	384 J	NA	1430 J	NA
SELENIUM	0.868	0.889	0.91	NA	0.189 UJ	NA
SILVER	0.18 UJ	1.385 J	2.68 J	NA	0.252 UJ	NA
SODIUM	90.1 U	87 U	83.9 U	NA	93.7 J	NA
THALLIUM	0.27 U	0.4705 U	0.671 U	NA	0.252 U	NA
VANADIUM	15.9	14.95	14	NA	30.1	NA
ZINC	17.9	17.25	16.6	NA	44.2	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	0.3 UJ	0.3 UJ	0.3 UJ	NA	0.3 UJ	NA
2,4-DINITROTOLUENE	0.3 UJ	0.3 UJ	0.3 UJ	NA	0.3 UJ	NA
2,6-DINITROTOLUENE	0.37 J	0.26 J	0.3 UJ	NA	0.3 UJ	NA
2-AMINO-4,6-DINITROTOLUENE	0.37 J	0.26 J	0.3 U	NA	0.3 U	NA
2-NITROTOLUENE	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA
3-NITROTOLUENE	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA
4-AMINO-2,6-DINITROTOLUENE	0.89 J	0.52 J	0.3 UJ	NA	0.3 UJ	NA
4-NITROTOLUENE	0.3 U	0.3 U	0.3 U	NA	0.3 U	NA
NITROGLYCERIN	1.5 U	1.5 U	1.5 U	NA	1.5 U	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	16 J	15.5 J	15 J	NA	12 J	NA
2-METHYLNAPHTHALENE	20 J	19 J	18 J	NA	18 J	NA
ACENAPHTHENE	120 U	36 J	36 J	NA	88	NA
ACENAPHTHYLENE	120 U	56 J	56 J	NA	47 J	NA
ANTHRACENE	56 J	65.5 J	75 J	NA	130	NA
BENZO(A)ANTHRACENE	260	315 J	370 J	NA	700	NA
BENZO(A)PYRENE	290	360	430	NA	1000	NA
BENZO(B)FLUORANTHENE	540	560	580	NA	1400	NA
BENZO(G,H,I)PERYLENE	150	190	230	NA	630	NA
BENZO(K)FLUORANTHENE	180 J	300 J	420 J	NA	500	NA
CHRYSENE	390	475 J	560 J	NA	860	NA
DIBENZO(A,H)ANTHRACENE	43	27.25 J	23 UJ	NA	160	NA
FLUORANTHENE	800	870 J	940 J	NA	1400	NA
FLUORENE	120 U	31 J	31 J	NA	69 J	NA
INDENO(1,2,3-CD)PYRENE	210	260	310	NA	700	NA
NAPHTHALENE	120 U	43 J	43 J	NA	38 J	NA
PHENANTHRENE	450	465	480	NA	580	NA
PYRENE	620	700	780	NA	1300	NA
XRF (MG/KG)						
LEAD	NA	NA	NA	210	NA	38
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS01				NASB-SKT-XRF-SS02	
	NASB-SKT-SS01-0003	NASB-SKT-SS01-0003-AVG	NASB-SKT-SS01-0003-D	NASB-SKT-XRF-SS01-0003	NASB-SKT-SS02-0003	NASB-SKT-XRF-SS02-0003
SAMPLE ID	20091215	20091215	20091215	20090706	20091215	20090706
SAMPLE DATE	20091215	20091215	20091215	20090706	20091215	20090706
SAMPLE CODE	ORIGINAL	AVERAGE	DUPLICATE	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SS03		NASB-SKT-XRF-SS04		NASB-SKT-XRF-SS05	
	NASB-SKT-SS03-0003 20091215 NORMAL SO 0 3	NASB-SKT-XRF-SS03-0003 20090706 NORMAL SO 0 3	NASB-SKT-SS04-0003 20091215 NORMAL SO 0 3	NASB-SKT-XRF-SS04-0003 20090706 NORMAL SO 0 3	NASB-SKT-SS05-0003 20091215 NORMAL SO 0 3	NASB-SKT-XRF-SS05-0003 20090706 NORMAL SO 0 3
METALS (MG/KG)						
ALUMINUM	9230	NA	6510	NA	8100	NA
ANTIMONY	0.373 UJ	NA	0.347 UJ	NA	0.302 UJ	NA
ARSENIC	6.54	NA	4.09	NA	3.26	NA
BARIUM	41.3	NA	22.9	NA	687	NA
BERYLLIUM	0.422	NA	0.297 J	NA	0.322	NA
CADMIUM	1.1	NA	0.285 J	NA	0.246 J	NA
CALCIUM	2470	NA	1920	NA	888	NA
CHROMIUM	23.4	NA	11.8	NA	11	NA
COBALT	6.36	NA	2.27	NA	3.13	NA
COPPER	38.4	NA	6.74	NA	9.28	NA
IRON	14500	NA	8620	NA	9430	NA
LEAD	134 J	NA	68.4 J	NA	17 J	NA
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	3280 J	NA	1210 J	NA	1550 J	NA
MANGANESE	213	NA	181	NA	150	NA
MERCURY	0.0416	NA	0.0679	NA	0.054	NA
NICKEL	19.6	NA	8.97	NA	7.94	NA
POTASSIUM	1250 J	NA	526 J	NA	845 J	NA
SELENIUM	0.224 U	NA	0.307 J	NA	0.306 J	NA
SILVER	0.299 U	NA	0.277 UJ	NA	0.181 UJ	NA
SODIUM	135 J	NA	69.4 U	NA	60.4 U	NA
THALLIUM	0.299 U	NA	0.208 U	NA	0.181 U	NA
VANADIUM	30.5	NA	30.4	NA	15.8	NA
ZINC	224	NA	26.7	NA	36.2	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	18 J	NA	7.7 J	NA	26 J	NA
2-METHYLNAPHTHALENE	26 J	NA	9.6 J	NA	26 J	NA
ACENAPHTHENE	110	NA	52 J	NA	440	NA
ACENAPHTHYLENE	98 J	NA	39 J	NA	36 J	NA
ANTHRACENE	280	NA	89 J	NA	840	NA
BENZO(A)ANTHRACENE	1100	NA	660 J	NA	2200	NA
BENZO(A)PYRENE	1600	NA	520	NA	2400	NA
BENZO(B)FLUORANTHENE	2400	NA	830	NA	3300	NA
BENZO(G,H,I)PERYLENE	1200	NA	280	NA	1200	NA
BENZO(K)FLUORANTHENE	790	NA	270 J	NA	1100	NA
CHRYSENE	1500	NA	910 J	NA	2100	NA
DIBENZO(A,H)ANTHRACENE	300	NA	19 UJ	NA	340	NA
FLUORANTHENE	2700	NA	1200 J	NA	6000	NA
FLUORENE	120	NA	50 J	NA	330	NA
INDENO(1,2,3-CD)PYRENE	1600	NA	360	NA	1500	NA
NAPHTHALENE	54 J	NA	16 J	NA	54 J	NA
PHENANTHRENE	1300	NA	500	NA	3400	NA
PYRENE	2300	NA	1000	NA	4900	NA
XRF (MG/KG)						
LEAD	NA	56	NA	173	NA	22
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS03		NASB-SKT-XRF-SS04	NASB-SKT-XRF-SS04	NASB-SKT-XRF-SS05	
SAMPLE ID	NASB-SKT-SS03-0003	NASB-SKT-XRF-SS03-0003	NASB-SKT-SS04-0003	NASB-SKT-XRF-SS04-0003	NASB-SKT-SS05-0003	NASB-SKT-XRF-SS05-0003
SAMPLE DATE	20091215	20090706	20091215	20090706	20091215	20090706
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SS06		NASB-SKT-XRF-SS06			NASB-SKT
	NASB-SKT-SS06-0003 20091215 ORIGINAL SO 0 3	NASB-SKT-SS06-0003-AVG 20091215 AVERAGE SO 0 3	NASB-SKT-SS06-0003-D 20091215 DUPLICATE SO 0 3	NASB-SKT-XRF-SS06-0003 20090706 NORMAL SO 0 3	NASB-SKT-XRF-SS06-0312 20090709 NORMAL SO 3 12	NASB-SKT-SS07-0003 20091215 NORMAL SO 0 3
METALS (MG/KG)						
ALUMINUM	4070	3835	3600	NA	NA	5790
ANTIMONY	0.968 J	1.379 J	1.79 J	NA	NA	3.3 J
ARSENIC	5.02	4.88	4.74	NA	NA	6.74
BARIUM	39.4	38.05	36.7	NA	NA	102
BERYLLIUM	0.139 U	0.1355 U	0.132 U	NA	NA	0.458 J
CADMIUM	0.535 J	0.518 J	0.501 J	NA	NA	0.585 J
CALCIUM	3230	3330	3430	NA	NA	6400
CHROMIUM	12	11.55	11.1	NA	NA	12.1
COBALT	1.91	1.77 J	1.63 J	NA	NA	6.38
COPPER	8.43	8.235	8.04	NA	NA	15.2
IRON	7340	6885	6430	NA	NA	11300
LEAD	702 J	741.5 J	781 J	NA	NA	2340 J
LEAD-CALC	NA	NA	NA	NA	61	NA
MAGNESIUM	1060 J	980.5 J	901 J	NA	NA	1150 J
MANGANESE	301	279	257	NA	NA	171
MERCURY	0.274	0.2975	0.321	NA	NA	0.299
NICKEL	14	13.6	13.2	NA	NA	10.4
POTASSIUM	870 J	800.5 J	731 J	NA	NA	683 J
SELENIUM	1.33	1.42	1.51	NA	NA	1.48
SILVER	0.278 U	0.271 U	0.264 U	NA	NA	0.487 U
SODIUM	139 U	135.5 U	132 U	NA	NA	509 J
THALLIUM	0.417 U	0.4725 U	0.528 U	NA	NA	0.73 UJ
VANADIUM	32.4	30.4	28.4	NA	NA	38.1
ZINC	53.8	51.15	48.5	NA	NA	23.3
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	21 J	22 J	23 J	NA	NA	37 J
2-METHYLNAPHTHALENE	30 J	30 J	30 J	NA	NA	42 J
ACENAPHTHENE	110 J	104 J	98 J	NA	NA	140 J
ACENAPHTHYLENE	190 U	185 U	180 U	NA	NA	140 J
ANTHRACENE	160 J	180 J	200	NA	NA	240 J
BENZO(A)ANTHRACENE	1100 J	1025 J	950 J	NA	NA	1700 J
BENZO(A)PYRENE	1200 J	609 J	36 UJ	NA	NA	1400
BENZO(B)FLUORANTHENE	1800	1650	1500	NA	NA	2100
BENZO(G,H,I)PERYLENE	600	525	450	NA	NA	780
BENZO(K)FLUORANTHENE	900	880	860	NA	NA	830
CHRYSENE	1700 J	1500 J	1300 J	NA	NA	2800 J
DIBENZO(A,H)ANTHRACENE	38 UJ	37 UJ	36 UJ	NA	NA	66 UJ
FLUORANTHENE	2400 J	2450 J	2500 J	NA	NA	3800 J
FLUORENE	74 J	78 J	82 J	NA	NA	110 J
INDENO(1,2,3-CD)PYRENE	850	740	630	NA	NA	1100
NAPHTHALENE	69 J	64.5 J	60 J	NA	NA	74 J
PHENANTHRENE	1000	1100	1200	NA	NA	1600
PYRENE	2000	2000	2000	NA	NA	3200
XRF (MG/KG)						
LEAD	NA	NA	NA	1839	30	NA
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	NASB-SKT-XRF-SS06		NASB-SKT-XRF-SS06			NASB-SKT
	NASB-SKT-SS06-0003	NASB-SKT-SS06-0003-AVG	NASB-SKT-SS06-0003-D	NASB-SKT-XRF-SS06-0003	NASB-SKT-XRF-SS06-0312	NASB-SKT-SS07-0003
SAMPLE ID	20091215	20091215	20091215	20090706	20090709	20091215
SAMPLE DATE	20091215	20091215	20091215	20090706	20090709	20091215
SAMPLE CODE	ORIGINAL	AVERAGE	DUPLICATE	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	0	0	0	3	0
BOTTOM DEPTH	3	3	3	3	12	3
CATION EXCHANGE CAPACITY	1.58 J	1.58 J	NA	NA	NA	1.02 J
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	356000 J	356000 J	NA	NA	NA	197000 J
MISCELLANEOUS PARAMETERS (S.U.)						
PH	4.02	4.02	NA	NA	NA	5.28

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	-XRF-SS07	NASB-SKT-XRF-SS07				NASB-SKT-XRF-SS08	
	NASB-SKT-XRF-SS07-0003 20090706 NORMAL SO 0 3	NASB-SKT-XRF-SS07-0312 20090709 ORIGINAL SO 3 12	NASB-SKT-XRF-SS07-0312-AVG 20090709 AVERAGE SO 3 12	NASB-SKT-XRF-SS07-0312-D 20090709 DUPLICATE SO 3 12	NASB-SKT-SS08-0003 20091215 NORMAL SO 0 3	NASB-SKT-XRF-SS08-0003 20090706 ORIGINAL SO 0 3	
METALS (MG/KG)							
ALUMINUM	NA	NA	NA	NA	4660	NA	
ANTIMONY	NA	NA	NA	NA	0.813 J	NA	
ARSENIC	NA	NA	NA	NA	4.9	NA	
BARIUM	NA	NA	NA	NA	13.9	NA	
BERYLLIUM	NA	NA	NA	NA	0.192 J	NA	
CADMIUM	NA	NA	NA	NA	0.13 J	NA	
CALCIUM	NA	NA	NA	NA	447	NA	
CHROMIUM	NA	NA	NA	NA	8.92	NA	
COBALT	NA	NA	NA	NA	2.09	NA	
COPPER	NA	NA	NA	NA	5.18	NA	
IRON	NA	NA	NA	NA	8690	NA	
LEAD	NA	NA	NA	NA	785 J	NA	
LEAD-CALC	NA	46.4	NA	NA	NA	NA	
MAGNESIUM	NA	NA	NA	NA	1080 J	NA	
MANGANESE	NA	NA	NA	NA	74.6	NA	
MERCURY	NA	NA	NA	NA	0.0882	NA	
NICKEL	NA	NA	NA	NA	6.77	NA	
POTASSIUM	NA	NA	NA	NA	505 J	NA	
SELENIUM	NA	NA	NA	NA	0.473 J	NA	
SILVER	NA	NA	NA	NA	0.143 UJ	NA	
SODIUM	NA	NA	NA	NA	71.5 U	NA	
THALLIUM	NA	NA	NA	NA	0.214 U	NA	
VANADIUM	NA	NA	NA	NA	24.5	NA	
ZINC	NA	NA	NA	NA	19.3	NA	
EXPLOSIVES (MG/KG)							
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
NITROGLYCERIN	NA	NA	NA	NA	NA	NA	
PAHs (UG/KG)							
1-METHYLNAPHTHALENE	NA	NA	NA	NA	14 J	NA	
2-METHYLNAPHTHALENE	NA	NA	NA	NA	17 J	NA	
ACENAPHTHENE	NA	NA	NA	NA	64 J	NA	
ACENAPHTHYLENE	NA	NA	NA	NA	68 J	NA	
ANTHRACENE	NA	NA	NA	NA	110	NA	
BENZO(A)ANTHRACENE	NA	NA	NA	NA	600 J	NA	
BENZO(A)PYRENE	NA	NA	NA	NA	400	NA	
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	540	NA	
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	210	NA	
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	260	NA	
CHRYSENE	NA	NA	NA	NA	750 J	NA	
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	19 UJ	NA	
FLUORANTHENE	NA	NA	NA	NA	1200 J	NA	
FLUORENE	NA	NA	NA	NA	44 J	NA	
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	290	NA	
NAPHTHALENE	NA	NA	NA	NA	33 J	NA	
PHENANTHRENE	NA	NA	NA	NA	540	NA	
PYRENE	NA	NA	NA	NA	1000	NA	
XRF (MG/KG)							
LEAD	1035	32	28	24	NA	555	
MISCELLANEOUS PARAMETERS (MEQ/100)							

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	-XRF-SS07	NASB-SKT-XRF-SS07			NASB-SKT-XRF-SS08	
SAMPLE ID	NASB-SKT-XRF-SS07-0003	NASB-SKT-XRF-SS07-0312	NASB-SKT-XRF-SS07-0312-AVG	NASB-SKT-XRF-SS07-0312-D	NASB-SKT-SS08-0003	NASB-SKT-XRF-SS08-0003
SAMPLE DATE	20090706	20090709	20090709	20090709	20091215	20090706
SAMPLE CODE	NORMAL	ORIGINAL	AVERAGE	DUPLICATE	NORMAL	ORIGINAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	3	3	3	0	0
BOTTOM DEPTH	3	12	12	12	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	0.608 J	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	73800 J	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	3.73	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SS08			NASB-SKT-XRF-SS09		NASB-SKT
	NASB-SKT-XRF-SS08-0003-AVG 20090706 AVERAGE	NASB-SKT-XRF-SS08-0003-D 20090706 DUPLICATE	NASB-SKT-XRF-SS08-0312 20090709 NORMAL	NASB-SKT-SS09-0003 20091215 NORMAL	NASB-SKT-XRF-SS09-0003 20090706 NORMAL	NASB-SKT-SS10-0003 20091215 NORMAL
	SO	SO	SO	SO	SO	SO
	0	0	3	0	0	0
	3	3	12	3	3	3
METALS (MG/KG)						
ALUMINUM	NA	NA	NA	7080	NA	2910
ANTIMONY	NA	NA	NA	0.263 UJ	NA	0.392 J
ARSENIC	NA	NA	NA	2.29	NA	3.35
BARIUM	NA	NA	NA	14.3	NA	24.3
BERYLLIUM	NA	NA	NA	0.299	NA	0.116 J
CADMIUM	NA	NA	NA	0.0525 U	NA	0.159 J
CALCIUM	NA	NA	NA	453	NA	265 J
CHROMIUM	NA	NA	NA	9.55	NA	5.37
COBALT	NA	NA	NA	3.3	NA	0.737 J
COPPER	NA	NA	NA	5.87	NA	6.18
IRON	NA	NA	NA	9300	NA	5950
LEAD	NA	NA	NA	20.3 J	NA	294 J
LEAD-CALC	NA	NA	0 U	NA	NA	NA
MAGNESIUM	NA	NA	NA	2060 J	NA	371 J
MANGANESE	NA	NA	NA	103	NA	39.2
MERCURY	NA	NA	NA	0.015 J	NA	0.0852
NICKEL	NA	NA	NA	8.48	NA	4.46
POTASSIUM	NA	NA	NA	1000 J	NA	273 J
SELENIUM	NA	NA	NA	0.158 UJ	NA	0.635
SILVER	NA	NA	NA	0.21 UJ	NA	0.272 U
SODIUM	NA	NA	NA	52.5 U	NA	68.1 U
THALLIUM	NA	NA	NA	0.158 U	NA	0.204 U
VANADIUM	NA	NA	NA	19.4	NA	22
ZINC	NA	NA	NA	19.9	NA	14.1
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	NA	NA	NA	72 U	NA	7.4 J
2-METHYLNAPHTHALENE	NA	NA	NA	72 U	NA	7.8 J
ACENAPHTHENE	NA	NA	NA	4.9 J	NA	24 J
ACENAPHTHYLENE	NA	NA	NA	2.6 J	NA	34 J
ANTHRACENE	NA	NA	NA	6.4 J	NA	48 J
BENZO(A)ANTHRACENE	NA	NA	NA	37 J	NA	230 J
BENZO(A)PYRENE	NA	NA	NA	26	NA	210
BENZO(B)FLUORANTHENE	NA	NA	NA	72 U	NA	290
BENZO(G,H,I)PERYLENE	NA	NA	NA	72 U	NA	120
BENZO(K)FLUORANTHENE	NA	NA	NA	72 U	NA	140
CHRYSENE	NA	NA	NA	36 J	NA	300 J
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	14 UJ	NA	18 UJ
FLUORANTHENE	NA	NA	NA	75 J	NA	490 J
FLUORENE	NA	NA	NA	3.8 J	NA	20 J
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	22 J	NA	160
NAPHTHALENE	NA	NA	NA	72 U	NA	17 J
PHENANTHRENE	NA	NA	NA	43 J	NA	260
PYRENE	NA	NA	NA	65 J	NA	420
XRF (MG/KG)						
LEAD	553.5	552	20	NA	25	NA
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS08			NASB-SKT-XRF-SS09		NASB-SKT
	NASB-SKT-XRF-SS08-0003-AVG	NASB-SKT-XRF-SS08-0003-D	NASB-SKT-XRF-SS08-0312	NASB-SKT-SS09-0003	NASB-SKT-XRF-SS09-0003	NASB-SKT-SS10-0003
SAMPLE ID	20090706	20090706	20090709	20091215	20090706	20091215
SAMPLE DATE	20090706	20090706	20090709	20091215	20090706	20091215
SAMPLE CODE	AVERAGE	DUPLICATE	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	0	3	0	0	0
BOTTOM DEPTH	3	3	12	3	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
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LOCATION	XRF-SS10	NASB-SKT-XRF-SS11			NASB-SKT-XRF-SS12	NASB-SKT-XRF-SS12	NASB-SKT
SAMPLE ID	NASB-SKT-XRF-SS10-0003	NASB-SKT-SS11-0003	NASB-SKT-XRF-SS11-0003	NASB-SKT-SS12-0003	NASB-SKT-XRF-SS12-0003	NASB-SKT-XRF-SS13-0003	
SAMPLE DATE	20090706	20091215	20090706	20091215	20090706	20090708	
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
MATRIX	SO	SO	SO	SO	SO	SO	
TOP DEPTH	0	0	0	0	0	0	
BOTTOM DEPTH	3	3	3	3	3	3	
METALS (MG/KG)							
ALUMINUM	NA	2720	NA	2930	NA	NA	
ANTIMONY	NA	0.392 J	NA	0.488 UJ	NA	NA	
ARSENIC	NA	3.77	NA	3.63	NA	NA	
BARIUM	NA	23.3	NA	83.6	NA	NA	
BERYLLIUM	NA	0.0959 J	NA	0.148 J	NA	NA	
CADMIUM	NA	0.242 J	NA	0.366 J	NA	NA	
CALCIUM	NA	598	NA	310 J	NA	NA	
CHROMIUM	NA	4.5	NA	5.21	NA	NA	
COBALT	NA	0.575 J	NA	0.838 J	NA	NA	
COPPER	NA	5.02	NA	9.33	NA	NA	
IRON	NA	4440	NA	4070	NA	NA	
LEAD	NA	265 J	NA	66.7 J	NA	NA	
LEAD-CALC	NA	NA	NA	NA	NA	163.2	
MAGNESIUM	NA	279 J	NA	222 J	NA	NA	
MANGANESE	NA	86.2	NA	29.2	NA	NA	
MERCURY	NA	0.11	NA	0.153	NA	NA	
NICKEL	NA	6.24	NA	7.94	NA	NA	
POTASSIUM	NA	230 J	NA	314 J	NA	NA	
SELENIUM	NA	0.523	NA	1.07	NA	NA	
SILVER	NA	0.228 U	NA	0.195 U	NA	NA	
SODIUM	NA	76.1 U	NA	97.6 U	NA	NA	
THALLIUM	NA	0.228 U	NA	0.293 U	NA	NA	
VANADIUM	NA	20.5	NA	19.1	NA	NA	
ZINC	NA	13.3	NA	15.7	NA	NA	
EXPLOSIVES (MG/KG)							
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA	
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA	
NITROGLYCERIN	NA	NA	NA	NA	NA	NA	
PAHs (UG/KG)							
1-METHYLNAPHTHALENE	NA	16 J	NA	18 J	NA	NA	
2-METHYLNAPHTHALENE	NA	20 J	NA	24 J	NA	NA	
ACENAPHTHENE	NA	25 J	NA	19 J	NA	NA	
ACENAPHTHYLENE	NA	80 J	NA	73 J	NA	NA	
ANTHRACENE	NA	66 J	NA	69 J	NA	NA	
BENZO(A)ANTHRACENE	NA	320 J	NA	310 J	NA	NA	
BENZO(A)PYRENE	NA	240	NA	240	NA	NA	
BENZO(B)FLUORANTHENE	NA	360	NA	360	NA	NA	
BENZO(G,H,I)PERYLENE	NA	130	NA	120 J	NA	NA	
BENZO(K)FLUORANTHENE	NA	150	NA	200	NA	NA	
CHRYSENE	NA	500 J	NA	490 J	NA	NA	
DIBENZO(A,H)ANTHRACENE	NA	21 UJ	NA	27 UJ	NA	NA	
FLUORANTHENE	NA	730 J	NA	740 J	NA	NA	
FLUORENE	NA	24 J	NA	27 J	NA	NA	
INDENO(1,2,3-CD)PYRENE	NA	170	NA	150	NA	NA	
NAPHTHALENE	NA	51 J	NA	86 J	NA	NA	
PHENANTHRENE	NA	360	NA	450	NA	NA	
PYRENE	NA	640	NA	650	NA	NA	
XRF (MG/KG)							
LEAD	301	NA	37	NA	179	44	
MISCELLANEOUS PARAMETERS (MEQ/100)							

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	-XRF-SS10	NASB-SKT-XRF-SS11		NASB-SKT-XRF-SS12	NASB-SKT-XRF-SS12	NASB-SKT
SAMPLE ID	NASB-SKT-XRF-SS10-0003	NASB-SKT-SS11-0003	NASB-SKT-XRF-SS11-0003	NASB-SKT-SS12-0003	NASB-SKT-XRF-SS12-0003	NASB-SKT-XRF-SS13-0003
SAMPLE DATE	20090706	20091215	20090706	20091215	20090706	20090708
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	3	3	3	3	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION	XRF-SS13	NASB-SKT-XRF-SS14			NASB-SKT-XRF-SS15		NASB-SKT
SAMPLE ID	NASB-SKT-XRF-SS13-0312	NASB-SKT-XRF-SS14-0003	NASB-SKT-XRF-SS14-0312	NASB-SKT-XRF-SS15-0003	NASB-SKT-XRF-SS15-0312	NASB-SKT-XRF-SS16-0003	
SAMPLE DATE	20090708	20090708	20090709	20090708	20090709	20090708	
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
MATRIX	SO	SO	SO	SO	SO	SO	
TOP DEPTH	3	0	3	0	3	0	
BOTTOM DEPTH	12	3	12	3	12	3	
METALS (MG/KG)							
ALUMINUM	NA	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA	NA
CALCIUM	NA	NA	NA	NA	NA	NA	NA
CHROMIUM	NA	NA	NA	NA	NA	NA	NA
COBALT	NA	NA	NA	NA	NA	NA	NA
COPPER	NA	NA	NA	NA	NA	NA	NA
IRON	NA	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA	NA
LEAD-CALC	97.5	0 U	24.5	287.3	NA	NA	NA
MAGNESIUM	NA	NA	NA	NA	NA	NA	NA
MANGANESE	NA	NA	NA	NA	NA	NA	NA
MERCURY	NA	NA	NA	NA	NA	NA	NA
NICKEL	NA	NA	NA	NA	NA	NA	NA
POTASSIUM	NA	NA	NA	NA	NA	NA	NA
SELENIUM	NA	NA	NA	NA	NA	NA	NA
SILVER	NA	NA	NA	NA	NA	NA	NA
SODIUM	NA	NA	NA	NA	NA	NA	NA
THALLIUM	NA	NA	NA	NA	NA	NA	NA
VANADIUM	NA	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)							
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
NITROGLYCERIN	NA	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)							
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA	NA
XRF (MG/KG)							
LEAD	35	20	25	61	200	111	
MISCELLANEOUS PARAMETERS (MEQ/100)							

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
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LOCATION	-XRF-SS13	NASB-SKT-XRF-SS14			NASB-SKT-XRF-SS15		NASB-SKT
SAMPLE ID	NASB-SKT-XRF-SS13-0312	NASB-SKT-XRF-SS14-0003	NASB-SKT-XRF-SS14-0312	NASB-SKT-XRF-SS15-0003	NASB-SKT-XRF-SS15-0312	NASB-SKT-XRF-SS16-0003	
SAMPLE DATE	20090708	20090708	20090709	20090708	20090709	20090708	
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	
MATRIX	SO	SO	SO	SO	SO	SO	
TOP DEPTH	3	0	3	0	3	0	
BOTTOM DEPTH	12	3	12	3	12	3	
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA	
MISCELLANEOUS PARAMETERS (MG/KG)							
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA	
MISCELLANEOUS PARAMETERS (S.U.)							
PH	NA	NA	NA	NA	NA	NA	

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	-XRF-SS16	NASB-SKT-XRF-SS17	NASB-SKT-XRF-SS17		NASB-SKT-XRF-SS18	
	NASB-SKT-XRF-SS16-0312	NASB-SKT-SS17-0003	NASB-SKT-XRF-SS17-0003	NASB-SKT-XRF-SS17-0312	NASB-SKT-XRF-SS18-0003	NASB-SKT-XRF-SS18-0312
	20090709	20091215	20090708	20090709	20090708	20090708
	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
	SO	SO	SO	SO	SO	SO
	3	0	0	3	0	3
	12	3	3	12	3	12
METALS (MG/KG)						
ALUMINUM	NA	3100	NA	NA	NA	NA
ANTIMONY	NA	1790 J	NA	NA	NA	NA
ARSENIC	NA	494	NA	NA	NA	NA
BARIUM	NA	22.3	NA	NA	NA	NA
BERYLLIUM	NA	0.124 J	NA	NA	NA	NA
CADMIUM	NA	4.14	NA	NA	NA	NA
CALCIUM	NA	635	NA	NA	NA	NA
CHROMIUM	NA	8.91	NA	NA	NA	NA
COBALT	NA	1.05	NA	NA	NA	NA
COPPER	NA	24.5	NA	NA	NA	NA
IRON	NA	5510	NA	NA	NA	NA
LEAD	NA	29300 J	NA	NA	NA	NA
LEAD-CALC	NA	NA	NA	141.3	82.9	75.6
MAGNESIUM	NA	552 J	NA	NA	NA	NA
MANGANESE	NA	51.5	NA	NA	NA	NA
MERCURY	NA	0.136	NA	NA	NA	NA
NICKEL	NA	6.55	NA	NA	NA	NA
POTASSIUM	NA	389 J	NA	NA	NA	NA
SELENIUM	NA	1.04	NA	NA	NA	NA
SILVER	NA	4.44	NA	NA	NA	NA
SODIUM	NA	82.3 U	NA	NA	NA	NA
THALLIUM	NA	0.494 U	NA	NA	NA	NA
VANADIUM	NA	23.6	NA	NA	NA	NA
ZINC	NA	19.2	NA	NA	NA	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	NA	13 J	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	14 J	NA	NA	NA	NA
ACENAPHTHENE	NA	88 J	NA	NA	NA	NA
ACENAPHTHYLENE	NA	51 J	NA	NA	NA	NA
ANTHRACENE	NA	140	NA	NA	NA	NA
BENZO(A)ANTHRACENE	NA	840 J	NA	NA	NA	NA
BENZO(A)PYRENE	NA	730	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	NA	1300	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	NA	390	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	NA	500	NA	NA	NA	NA
CHRYSENE	NA	1000 J	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	22 UJ	NA	NA	NA	NA
FLUORANTHENE	NA	1900 J	NA	NA	NA	NA
FLUORENE	NA	65 J	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	570	NA	NA	NA	NA
NAPHTHALENE	NA	28 J	NA	NA	NA	NA
PHENANTHRENE	NA	940	NA	NA	NA	NA
PYRENE	NA	1600	NA	NA	NA	NA
XRF (MG/KG)						
LEAD	136	NA	628	41	33	32
MISCELLANEOUS PARAMETERS (MEQ/100)						

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
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LOCATION	-XRF-SS16	NASB-SKT-XRF-SS17	NASB-SKT-XRF-SS17		NASB-SKT-XRF-SS18	
SAMPLE ID	NASB-SKT-XRF-SS16-0312	NASB-SKT-SS17-0003	NASB-SKT-XRF-SS17-0003	NASB-SKT-XRF-SS17-0312	NASB-SKT-XRF-SS18-0003	NASB-SKT-XRF-SS18-0312
SAMPLE DATE	20090709	20091215	20090708	20090709	20090708	20090708
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	3	0	0	3	0	3
BOTTOM DEPTH	12	3	3	12	3	12
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

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SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SS19		NASB-SKT-XRF-SS19		NASB-SKT-XRF-SS20		NASB-SKT-XRF-SS21
	NASB-SKT-SS19-0003 20091215 NORMAL SO 0 3	NASB-SKT-XRF-SS19-0003 20090708 NORMAL SO 0 3	NASB-SKT-XRF-SS19-0312 20090708 NORMAL SO 3 12	NASB-SKT-XRF-SS20-0003 20090708 NORMAL SO 0 3	NASB-SKT-XRF-SS20-0312 20090709 NORMAL SO 3 12	NASB-SKT-SS21-0003 20091215 NORMAL SO 0 3	
METALS (MG/KG)							
ALUMINUM	3590	NA	NA	NA	NA	NA	3220
ANTIMONY	3.73 J	NA	NA	NA	NA	NA	0.446 UJ
ARSENIC	4.56	NA	NA	NA	NA	NA	3.64
BARIUM	76.7	NA	NA	NA	NA	NA	48.5
BERYLLIUM	0.214 J	NA	NA	NA	NA	NA	0.131 J
CADMIUM	0.51	NA	NA	NA	NA	NA	0.741
CALCIUM	966	NA	NA	NA	NA	NA	1040
CHROMIUM	6.73	NA	NA	NA	NA	NA	5.69
COBALT	1.24	NA	NA	NA	NA	NA	1.04 J
COPPER	13	NA	NA	NA	NA	NA	10.8
IRON	5340	NA	NA	NA	NA	NA	5420
LEAD	513 J	NA	NA	NA	NA	NA	101 J
LEAD-CALC	NA	NA	2.6	250.8	0 U	NA	NA
MAGNESIUM	343 J	NA	NA	NA	NA	NA	318 J
MANGANESE	41.8	NA	NA	NA	NA	NA	110
MERCURY	0.201	NA	NA	NA	NA	NA	0.178
NICKEL	11.1	NA	NA	NA	NA	NA	14.3
POTASSIUM	352 J	NA	NA	NA	NA	NA	251 J
SELENIUM	1.28	NA	NA	NA	NA	NA	1.04
SILVER	0.184 U	NA	NA	NA	NA	NA	0.357 U
SODIUM	92 U	NA	NA	NA	NA	NA	89.2 U
THALLIUM	0.276 U	NA	NA	NA	NA	NA	0.267 U
VANADIUM	24.7	NA	NA	NA	NA	NA	37.5
ZINC	29.1	NA	NA	NA	NA	NA	22.1
EXPLOSIVES (MG/KG)							
2,4,6-TRINITROTOLUENE	0.3 UJ	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	0.44 J	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	0.3 UJ	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	0.3 U	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	0.3 U	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	0.17 J	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	0.18 J	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	0.72 J	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	1.5 U	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)							
1-METHYLNAPHTHALENE	33 J	NA	NA	NA	NA	NA	14 J
2-METHYLNAPHTHALENE	44 J	NA	NA	NA	NA	NA	18 J
ACENAPHTHENE	59 J	NA	NA	NA	NA	NA	27 J
ACENAPHTHYLENE	87 J	NA	NA	NA	NA	NA	68 J
ANTHRACENE	140	NA	NA	NA	NA	NA	65 J
BENZO(A)ANTHRACENE	630 J	NA	NA	NA	NA	NA	270 J
BENZO(A)PYRENE	24 U	NA	NA	NA	NA	NA	210
BENZO(B)FLUORANTHENE	840	NA	NA	NA	NA	NA	360
BENZO(G,H,I)PERYLENE	250	NA	NA	NA	NA	NA	100 J
BENZO(K)FLUORANTHENE	360	NA	NA	NA	NA	NA	170
CHRYSENE	880 J	NA	NA	NA	NA	NA	380 J
DIBENZO(A,H)ANTHRACENE	24 UJ	NA	NA	NA	NA	NA	24 UJ
FLUORANTHENE	1500 J	NA	NA	NA	NA	NA	630 J
FLUORENE	58 J	NA	NA	NA	NA	NA	24 J
INDENO(1,2,3-CD)PYRENE	350	NA	NA	NA	NA	NA	150
NAPHTHALENE	160	NA	NA	NA	NA	NA	42 J
PHENANTHRENE	890	NA	NA	NA	NA	NA	330
PYRENE	1300	NA	NA	NA	NA	NA	550
XRF (MG/KG)							
LEAD	NA	389	22	56	18	NA	NA
MISCELLANEOUS PARAMETERS (MEQ/100)							

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS19	NASB-SKT-XRF-SS19		NASB-SKT-XRF-SS20		NASB-SKT-XRF-SS21
SAMPLE ID	NASB-SKT-SS19-0003	NASB-SKT-XRF-SS19-0003	NASB-SKT-XRF-SS19-0312	NASB-SKT-XRF-SS20-0003	NASB-SKT-XRF-SS20-0312	NASB-SKT-SS21-0003
SAMPLE DATE	20091215	20090708	20090708	20090708	20090709	20091215
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	0	3	0	3	0
BOTTOM DEPTH	3	3	12	3	12	3
CATION EXCHANGE CAPACITY	1.25 J	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	210000 J	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	3.52	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION SAMPLE ID SAMPLE DATE SAMPLE CODE MATRIX TOP DEPTH BOTTOM DEPTH	NASB-SKT-XRF-SS21		NASB-SKT-XRF-SS22		NASB-SKT-XRF-SS23	NASB-SKT-XRF-SS23
	NASB-SKT-XRF-SS21-0003 20090708 NORMAL SO 0 3	NASB-SKT-XRF-SS21-0312 20090708 NORMAL SO 3 12	NASB-SKT-XRF-SS22-0003 20090710 NORMAL SO 0 3	NASB-SKT-XRF-SS22-0312 20090710 NORMAL SO 3 12	NASB-SKT-XRF-SS23-0003 20090710 NORMAL SO 0 3	NASB-SKT-XRF-SS23-0312 20090710 NORMAL SO 3 12
METALS (MG/KG)						
ALUMINUM	NA	NA	NA	NA	NA	NA
ANTIMONY	NA	NA	NA	NA	NA	NA
ARSENIC	NA	NA	NA	NA	NA	NA
BARIUM	NA	NA	NA	NA	NA	NA
BERYLLIUM	NA	NA	NA	NA	NA	NA
CADMIUM	NA	NA	NA	NA	NA	NA
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
IRON	NA	NA	NA	NA	NA	NA
LEAD	NA	NA	NA	NA	NA	NA
LEAD-CALC	NA	0 U	97.5	68.3	NA	0 U
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
VANADIUM	NA	NA	NA	NA	NA	NA
ZINC	NA	NA	NA	NA	NA	NA
EXPLOSIVES (MG/KG)						
2,4,6-TRINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,4-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-AMINO-4,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
2-NITROTOLUENE	NA	NA	NA	NA	NA	NA
3-NITROTOLUENE	NA	NA	NA	NA	NA	NA
4-AMINO-2,6-DINITROTOLUENE	NA	NA	NA	NA	NA	NA
4-NITROTOLUENE	NA	NA	NA	NA	NA	NA
NITROGLYCERIN	NA	NA	NA	NA	NA	NA
PAHs (UG/KG)						
1-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	NA	NA	NA	NA	NA	NA
ACENAPHTHENE	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	NA	NA	NA	NA	NA	NA
ANTHRACENE	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
CHRYSENE	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	NA	NA	NA	NA	NA	NA
FLUORANTHENE	NA	NA	NA	NA	NA	NA
FLUORENE	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA	NA
NAPHTHALENE	NA	NA	NA	NA	NA	NA
PHENANTHRENE	NA	NA	NA	NA	NA	NA
PYRENE	NA	NA	NA	NA	NA	NA
XRF (MG/KG)						
LEAD	377	16	35	31	157	16
MISCELLANEOUS PARAMETERS (MEQ/100)						

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS21		NASB-SKT-XRF-SS22		NASB-SKT-XRF-SS23	NASB-SKT-XRF-SS23
SAMPLE ID	NASB-SKT-XRF-SS21-0003	NASB-SKT-XRF-SS21-0312	NASB-SKT-XRF-SS22-0003	NASB-SKT-XRF-SS22-0312	NASB-SKT-XRF-SS23-0003	NASB-SKT-XRF-SS23-0312
SAMPLE DATE	20090708	20090708	20090710	20090710	20090710	20090710
SAMPLE CODE	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO	SO	SO	SO
TOP DEPTH	0	3	0	3	0	3
BOTTOM DEPTH	3	12	3	12	3	12
CATION EXCHANGE CAPACITY	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)						
TOTAL ORGANIC CARBON	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)						
PH	NA	NA	NA	NA	NA	NA

mg/kg = Milligrams per kilogram.

meq/100 = Milliequivalents.

S.U. = Standard unit.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported
detection limit.

UJ = Numerical detection limit for the undetected
result is estimated.

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS24	NASB-SKT-XRF-SS25	NASB-SKT-XRF-SS26
SAMPLE ID	NASB-SKT-XRF-SS24-0003	NASB-SKT-XRF-SS25-0003	NASB-SKT-SS26-0003
SAMPLE DATE	20090708	20090708	20091215
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO
TOP DEPTH	0	0	0
BOTTOM DEPTH	3	3	3
METALS (MG/KG)			
ALUMINUM	NA	NA	2230
ANTIMONY	NA	NA	1.23 J
ARSENIC	NA	NA	3.11
BARIUM	NA	NA	43.7
BERYLLIUM	NA	NA	0.1 J
CADMIUM	NA	NA	0.195 J
CALCIUM	NA	NA	578
CHROMIUM	NA	NA	3.47
COBALT	NA	NA	0.6 J
COPPER	NA	NA	6.68
IRON	NA	NA	3840
LEAD	NA	NA	241 J
LEAD-CALC	0 U	0 U	NA
MAGNESIUM	NA	NA	174 J
MANGANESE	NA	NA	33.9
MERCURY	NA	NA	0.0668
NICKEL	NA	NA	4.48
POTASSIUM	NA	NA	181 J
SELENIUM	NA	NA	0.553
SILVER	NA	NA	0.135 U
SODIUM	NA	NA	67.6 U
THALLIUM	NA	NA	0.203 U
VANADIUM	NA	NA	15.1
ZINC	NA	NA	10.2
EXPLOSIVES (MG/KG)			
2,4,6-TRINITROTOLUENE	NA	NA	0.3 UJ
2,4-DINITROTOLUENE	NA	NA	0.3 UJ
2,6-DINITROTOLUENE	NA	NA	0.3 UJ
2-AMINO-4,6-DINITROTOLUENE	NA	NA	0.3 U
2-NITROTOLUENE	NA	NA	0.3 U
3-NITROTOLUENE	NA	NA	0.3 U
4-AMINO-2,6-DINITROTOLUENE	NA	NA	1.1 J
4-NITROTOLUENE	NA	NA	0.3 U
NITROGLYCERIN	NA	NA	1.5 U
PAHs (UG/KG)			
1-METHYLNAPHTHALENE	NA	NA	4.8 J
2-METHYLNAPHTHALENE	NA	NA	5.3 J
ACENAPHTHENE	NA	NA	12 J
ACENAPHTHYLENE	NA	NA	24 J
ANTHRACENE	NA	NA	26 J
BENZO(A)ANTHRACENE	NA	NA	97 J
BENZO(A)PYRENE	NA	NA	92
BENZO(B)FLUORANTHENE	NA	NA	150
BENZO(G,H,I)PERYLENE	NA	NA	52 J
BENZO(K)FLUORANTHENE	NA	NA	68 J
CHRYSENE	NA	NA	150 J
DIBENZO(A,H)ANTHRACENE	NA	NA	18 UJ
FLUORANTHENE	NA	NA	260 J
FLUORENE	NA	NA	10 J
INDENO(1,2,3-CD)PYRENE	NA	NA	90 U
NAPHTHALENE	NA	NA	90 U
PHENANTHRENE	NA	NA	140
PYRENE	NA	NA	220
XRF (MG/KG)			
LEAD	17	21	NA
MISCELLANEOUS PARAMETERS (MEQ/100)			

APPENDIX D-3

SUMMARY OF ANALYTICAL RESULTS FOR SOIL
 SKEET RANGE
 NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
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LOCATION	NASB-SKT-XRF-SS24	NASB-SKT-XRF-SS25	NASB-SKT-XRF-SS26
SAMPLE ID	NASB-SKT-XRF-SS24-0003	NASB-SKT-XRF-SS25-0003	NASB-SKT-SS26-0003
SAMPLE DATE	20090708	20090708	20091215
SAMPLE CODE	NORMAL	NORMAL	NORMAL
MATRIX	SO	SO	SO
TOP DEPTH	0	0	0
BOTTOM DEPTH	3	3	3
CATION EXCHANGE CAPACITY	NA	NA	NA
MISCELLANEOUS PARAMETERS (MG/KG)			
TOTAL ORGANIC CARBON	NA	NA	NA
MISCELLANEOUS PARAMETERS (S.U.)			
PH	NA	NA	NA

mg/kg = Milligrams per kilogram.
 meq/100 = Milliequivalents.
 S.U. = Standard unit.
 NA = Not applicable.
 J = Value is estimated.
 U = Analyte not detected at the reported
 detection limit.
 UJ = Numerical detection limit for the undetected
 result is estimated.

D-4 SKEET RANGE, SEDIMENT

APPENDIX D-4

SUMMARY OF ANALYTICAL RESULTS FOR SEDIMENT
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

LOCATION	NASB-SKT-SWSD01	NASB-SKT-SWSD02	NASB-SKT-SWSD03	NASB-SKT-SWSD04		
SAMPLE ID	NASB-SKT-SD01-0006	NASB-SKT-SD02-0006	NASB-SKT-SD03-0006	NASB-SKT-SD04-0006	NASB-SKT-SD04-0006-AVG	NASB-SKT-SD04-0006-D
SAMPLE DATE	20100409	20100409	20100409	20100409	20100409	20100409
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIGINAL	AVERAGE	DUPLICATE
MATRIX	SD	SD	SD	SD	SD	SD
SUBMATRIX	NA	NA	NA	NA	NA	NA
TOP DEPTH	0	0	0	0	0	0
BOTTOM DEPTH	6	6	6	6	6	6
METALS (mg/kg)						
ALUMINUM	3920	12100	18300	19800	19750	19700
ANTIMONY	0.342 UJ	6.38 UJ	1.97 J	1.4 J	1.43 J	1.46 J
ARSENIC	2.01	49.7 J	34.7	28.6	28.65	28.7
BARIUM	11.6 J	231 J	179 J	129 J	127.5 J	126 J
BERYLLIUM	0.262 J	0.947 J	1.35	1.39	1.36	1.33
CADMIUM	0.0932 J	4.76 J	8.04	8.48	7.87	7.26
CALCIUM	806 J	4850 J	3680 J	3330 J	3260 J	3190 J
CHROMIUM	5.69	32.4	56.1	59.5	57.35	55.2
COBALT	1.92	32.3	32.5	21.8	20.75	19.7
COPPER	4.69	71.6	112	116	114.5	113
IRON	4790	144000	72300	37400	37050	36700
LEAD	11.5	124	166	189	182	175
MAGNESIUM	1090 J	3430 J	5550 J	6120 J	6060 J	6000 J
MANGANESE	102 J	11000 J	3690 J	1010 J	1002 J	994 J
MERCURY	0.0137 U	0.0984 J	0.138 J	0.223	0.1755	0.128
NICKEL	5.77	31.1	43.7	44.4	43.5	42.6
POTASSIUM	531	2160	3340	3510	3530	3550
SELENIUM	0.205 U	3.83 U	2.18	1.9	1.81	1.72
SILVER	0.137 U	1.28 U	0.418 U	0.715 U	0.7835 U	0.852 U
SODIUM	71.9 J	333 J	355 J	428 J	418 J	408 J
THALLIUM	0.205 U	3.83 U	0.627 U	0.715 U	0.677 U	0.639 U
VANADIUM	8.5	52.6	72.5	92.7	88.5	84.3
ZINC	19.7	432	634	583	569.5	556
MISCELLANEOUS PARAMETERS (mg/kg)						
TOTAL ORGANIC CARBON	4040	102000	83500	96600	82250	67900

mg/kg = Milligrams per kilogram.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

D-5 SKEET RANGE, SURFACE WATER

APPENDIX D-5

SUMMARY OF ANALYTICAL RESULTS FOR SURFACE WATER
SKEET RANGE
NAVAL AIR STATION BRUNSWICK
BRUNSWICK, MAINE

LOCATION	NASB-SKT-SWSD01	NASB-SKT-SWSD02	NASB-SKT-SWSD03	NASB-SKT-SWSD04		
SAMPLE ID	NASB-SKT-SW01-040910	NASB-SKT-SW02-040910	NASB-SKT-SW03-040910	NASB-SKT-SW04-040910	NASB-SKT-SW04-040910-AVG	NASB-SKT-SW04-040910-D
SAMPLE DATE	20100409	20100409	20100409	20100409	20100409	20100409
SAMPLE CODE	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP
METALS (UG/L)						
ALUMINUM	98.8	82.5	99.6	80.5	79.25	78
ANTIMONY	1.25 U	1.25 U				
ARSENIC	0.75 U	0.877 J	0.75 U	0.75 U	0.6335 J	0.892 J
BARIUM	23.3	15.1	13.5	13.7	13.6	13.5
BERYLLIUM	0.25 U	0.25 U				
CADMIUM	0.407 J	0.377 J	0.346 J	0.368 J	0.3765 J	0.385 J
CALCIUM	18900	12700	11300	11700	11750	11800
CHROMIUM	0.5 U	0.5 U				
COBALT	1.25 U	1.25 U				
COPPER	1.52 J	1.25 U	1.48 J	1.86 J	1.855 J	1.85 J
IRON	991	1630	1340	1300	1300	1300
LEAD	0.375 U	0.375 U	0.443 J	0.375 U	0.375 U	0.375 U
MAGNESIUM	2190	1490	1340	1350	1355 J	1360 J
MANGANESE	582	386	284	342	342	342
MERCURY	0.08 U	0.08 U				
NICKEL	1.79 J	0.989 J	0.964 J	1.6 J	1.53 J	1.46 J
POTASSIUM	2380	2470	2190	2380	2425	2470
SELENIUM	0.75 U	0.75 U				
SILVER	0.25 U	0.25 U				
SODIUM	24400	14000	12600	12800	13050	13300
THALLIUM	0.75 U	0.75 U				
VANADIUM	1.25 U	1.25 U				
ZINC	10.5	7.18	8.78	11.4	10.8	10.2

UG/L = Micrograms per liter.

NA = Not applicable.

J = Value is estimated.

U = Analyte not detected at the reported detection limit.

UJ = Numerical detection limit for the undetected result is estimated.

**D-6 BACKGROUND SAMPLE, MACHINE GUN BORESIGHT RANGE/SKEET
RANGE**

APPENDIX D-6

SUMMARY OF DETECTED CONCENTRATIONS IN BACKGROUND
 MACHINE GUN BORESIGHT RANGE/SKEET RANGE
 FORMER NAVAL AIR STATION BRUNSWICK
 BRUNSWICK, MAINE
 PAGE 1 OF 1

PARAMETER	MGBR-XRF					
	SS07-0003					
			E	N	S	W
	0 - 0.25 ft bgs					
Dec-09	Jun-09	Jun-09	Jun-09	Jun-09	Jun-09	
Inorganics (mg/kg)						
ALUMINUM	5330	NA	NA	NA	NA	NA
ANTIMONY	0.458 J	NA	NA	NA	NA	NA
ARSENIC	4.47	NA	NA	NA	NA	NA
BARIUM	37.2	NA	NA	NA	NA	NA
BERYLLIUM	0.24 J	NA	NA	NA	NA	NA
CADMIUM	0.231 J	NA	NA	NA	NA	NA
CALCIUM	806 J	NA	NA	NA	NA	NA
CHROMIUM	11.9	NA	NA	NA	NA	NA
COBALT	1.72	NA	NA	NA	NA	NA
COPPER	18.8	NA	NA	NA	NA	NA
IRON	9040	NA	NA	NA	NA	NA
LEAD	110 J	NA	NA	NA	NA	NA
LEAD-CALC	NA	NA	NA	NA	NA	NA
MAGNESIUM	1100 J	NA	NA	NA	NA	NA
MANGANESE	126 J	NA	NA	NA	NA	NA
MERCURY	0.158	NA	NA	NA	NA	NA
NICKEL	7.75	NA	NA	NA	NA	NA
POTASSIUM	521 J	NA	NA	NA	NA	NA
SELENIUM	0.588 J	NA	NA	NA	NA	NA
ZINC	25.8	NA	NA	NA	NA	NA
ZINC-CALC	19.8	NA	NA	NA	NA	NA
Field XRF⁽³⁾ (mg/kg)						
LEAD	NA	73	36	96	33	35
Polynuclear Aromatic Hydrocarbons (ug/kg)						
1-METHYLNAPHTHALENE	15 J	NA	NA	NA	NA	NA
2-METHYLNAPHTHALENE	19 J	NA	NA	NA	NA	NA
ACENAPHTHENE	26 J	NA	NA	NA	NA	NA
ACENAPHTHYLENE	110	NA	NA	NA	NA	NA
ANTHRACENE	92 J	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	350 J	NA	NA	NA	NA	NA
BENZO(A)PYRENE	340	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	560	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	160	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	270	NA	NA	NA	NA	NA
CHRYSENE	570 J	NA	NA	NA	NA	NA
FLUORANTHENE	990 J	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	220	NA	NA	NA	NA	NA
NAPHTHALENE	52 J	NA	NA	NA	NA	NA
PHENANTHRENE	460	NA	NA	NA	NA	NA
PYRENE	860	NA	NA	NA	NA	NA

J = Value is estimated.

D-7 CHAIN-OF-CUSTODY FORMS

MACHINE GUN BORESIGHT RANGE

Foster Plaza 7

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD
 SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

8627

Send Results to: Name <u>Linda Klink</u> Company <u>Tetra Tech NYS</u> Address <u>661 Anderson Dr.</u> City <u>Pittsburgh</u> State, Zip <u>PA 15220-2745</u> Phone <u>412-921-8650</u> Fax <u>412-921-4040</u> E-mail <u>Linda.Klink@tetratech.com</u>		Send Invoice to: Name <u>Same</u> Company _____ Address _____ City _____ State, Zip _____ Phone _____ Fax _____ E-mail _____		Analysis Requirements:						Lab Use Only:		
				TAL Metals	Nitrolycarine	PAHS	VOA Headspace Y N <u>NA</u> Field Filtered X N <u>NA</u> Correct Containers <u>Y</u> N <u>NA</u> Discrepancies <u>Y</u> N <u>NA</u> Cust. Seals Intact <u>Y</u> N <u>NA</u> Containers Intact <u>Y</u> N <u>NA</u> Airbill #: <u>4236</u> CAR #: _____					
Project No./Name: <u>NASB-M6BR/112600645</u>		Sampler's (Signature): <u>Bai Yi</u>										

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix							Comments	No. of Bottles	Lab Use Only Containers/Pres.
<u>0912200-01</u>	<u>12/16/09/1125</u>	<u>NASB-M6BR-SS01-0003</u>	<u>Soil</u>	<u>X</u>	<u>X</u>						<u>2</u>	<u>AM</u>
<u>-02</u>	<u>1/0835</u>	<u>" " -SS02-0003</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-03</u>	<u>1/0830</u>	<u>-SS03-0003</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-04</u>	<u>1/0840</u>	<u>-SS04-0003</u>		<u>X</u>	<u>X</u>				<u>LAB QC</u>		<u>2</u>	
<u>-05</u>	<u>1/0845</u>	<u>-SS05-0003</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-06</u>	<u>1/0855</u>	<u>-SS06-0003</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-07</u>	<u>1/0900</u>	<u>5KT-SS07-0003</u>		<u>X</u>		<u>X</u>					<u>2</u>	
<u>-08</u>	<u>1/0905</u>	<u>-SS08-0003</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-09</u>	<u>1/0930</u>	<u>-SB01-0003</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-10</u>	<u>1/0935</u>	<u>-SB01-0312</u>		<u>X</u>	<u>X</u>						<u>2</u>	
<u>-11</u>	<u>1/0940</u>	<u>✓ -SB01-1218</u>	<u>✓</u>	<u>X</u>	<u>X</u>						<u>2</u>	<u>✓</u>

Sample Kit Prep'd by: (Signature) <u>Bai Yi</u>		Date/Time <u>12/17/09/1500</u>	Received By: (Signature)		REMARKS: <u>Sample # NASB-M6BR-SS04-0003 is LAB QC</u>	Details:		
Relinquished By: (Signature)		Date/Time	Received By: (Signature)			Page <u>1</u> of <u>3</u>	Cooler No. _____ of _____	
Relinquished by: (Signature)		Date/Time	Received By: (Signature)			Date Shipped <u>12/17/09</u>	Shipped By <u>BG</u>	
Received for Laboratory by: (Signature) <u>[Signature]</u>		Date/Time <u>12/18/09 08:15</u>	Temperature <u>34c</u>			Turnaround <u>Standard</u>		

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

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8629

Send Results to:		Send Invoice to:				Analysis Requirements:						Lab Use Only:						
Name <u>Refer to page 1</u>		Name <u>Refer to page 1</u>				TAL Metals Nitrogen PAHs									VOA Headspace	Y	N	NA
Company _____		Company _____													Field Filtered	Y	N	NA
Address _____		Address _____													Correct Containers	Y	N	NA
City _____		City _____													Discrepancies	Y	N	NA
State, Zip _____		State, Zip _____													Cust. Seals Intact	X	N	NA
Phone _____		Phone _____													Containers Intact	Y	N	NA
Fax _____		Fax _____													Airbill #: _____	4236		
E-mail _____		E-mail _____				CAR #: _____	-											
Project No./Name: <u>NASB-MGBR/112600645</u>		Sampler's (Signature): <u>[Signature]</u>																

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix											Comments	No. of Bottles	Lab Use Only Containers/Pres.
0912200-24	12/16/09/120	NASB-MGBR-SB06-0003	Soil	X	X										2	2M
-25	12/15	" " -SB06-0312	↓	X	X									LAB QC	2	
-26	1220	↓ -SB06-1218	↓	X	X										2	
-27	-	NASB-MGBR-SO-DUP01-121609	↓	X	X										2	
-28	-	NASB-MGBR-SO-DUP02-121609	↓	X	X										2	
-29	-	NASB-MGBR-SO-DUP08-121609	↓	X	X								Matrix=Soil		2	
-30	1520	NASB-MGBR-SO-RB01-121609	AQ	X	X	X									5	4H, 10-Mi
-31	1530	NASB-MGBR-SO-RB02-121609	AQ	X	X										5	2H, 10-Mi
-32	12/16/09/0915	NASB-MGBR-SO-SB07-0003	Soil	X	X										2	2M
-33	10920	" " SB07-0312	↓	X	X										2	
-34	0925	↓ SB07-1218	↓	X	X										2	

Sample Kit Prep'd by: (Signature) <u>[Signature]</u>	Date/Time 12/17/09/1500	Received By: (Signature)	REMARKS: Sample # <u>NASB-MGBR-SB06-0312</u> is lab QC	Details:
Relinquished by: (Signature)	Date/Time	Received By: (Signature)		Page <u>3</u> of <u>3</u>
Relinquished by: (Signature)	Date/Time	Received By: (Signature)		Cooler No. _____ of _____
Received for Laboratory by: (Signature) <u>[Signature]</u>	Date/Time 12/18/09 08:15	Temperature 3.40C		Date Shipped <u>12/17/09</u>
				Shipped By <u>BG</u>
				Turnaround <u>Standard</u>

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

SKEET RANGE

Lab Copy

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9835

Send Results to:		Send Invoice to:		Analysis Requirements:						Lab Use Only:																										
Name <u>Linda Klink</u>		Name _____		<table border="1"> <tr><td>TAL Metals</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>TOC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>						TAL Metals												TOC												VOA Headspace <u>Y</u> <u>N</u> <u>NA</u>		
TAL Metals																																				
TOC																																				
Company <u>Tetra Tech MS</u>		Company _____								Field Filtered <u>Y</u> <u>N</u> <u>NA</u>																										
Address <u>621 Anderson Dr.</u>		Address <u>SAME</u>								Correct Containers <u>Y</u> <u>N</u> <u>NA</u>																										
City <u>Pittsburg</u>		City _____		Discrepancies <u>Y</u> <u>N</u> <u>NA</u>																																
State, Zip <u>PA 15220</u>		State, Zip _____		Cust. Seals Intact <u>Y</u> <u>N</u> <u>NA</u>																																
Phone <u>412-921-7090</u>		Phone _____		Containers Intact <u>Y</u> <u>N</u> <u>NA</u>																																
Fax <u>412-921-4040</u>		Fax _____		Airbill #: <u>4291</u>																																
E-mail <u>linda.klink@tetratech.com</u>		E-mail _____		CAR #: _____																																
Project No./Name: <u>112G00645/NASB SRECT</u>		Sampler's (Signature): <u>[Signature]</u>																																		
Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix								Comments	No. of Bottles	Lab Use Only Containers/Pres.																							
<u>1004072-01</u>	<u>04/09/10/1020</u>	<u>NASB-SKT-SW01-040910</u>	<u>SW</u>	<u>X</u>							<u>MS/MSD</u>	<u>2</u>	<u>1B-Ni</u>																							
<u>-02</u>	<u>" / 0900</u>	<u>" -SW02-040910</u>	<u>SW</u>	<u>X</u>								<u>1</u>	<u>1B-Ni</u>																							
<u>-03</u>	<u>/0840</u>	<u>" -SW03-040910</u>	<u>SW</u>	<u>X</u>								<u>1</u>	<u>1B-Ni</u>																							
<u>-04</u>	<u>/0815</u>	<u>" -SW04-040910</u>	<u>SW</u>	<u>X</u>								<u>1</u>	<u>1B-Ni</u>																							
<u>-05</u>	<u>/</u>	<u>NASB-SKT-SW-DATA-040910</u>	<u>SW</u>	<u>X</u>								<u>1</u>	<u>1B-Ni</u>																							
<u>-06</u>	<u>/1030</u>	<u>NASB-SKT-SD01-0006</u>	<u>SD</u>	<u>X</u>	<u>X</u>						<u>MS/MSD</u>	<u>6</u>	<u>6M</u>																							
<u>-07</u>	<u>/0910</u>	<u>" -SD02-0006</u>	<u>SD</u>	<u>X</u>	<u>X</u>							<u>6</u>	<u>6M</u>																							
<u>-08</u>	<u>/0850</u>	<u>" -SD03-0006</u>	<u>SD</u>	<u>X</u>	<u>X</u>							<u>6</u>	<u>6M</u>																							
<u>-09</u>	<u>/0830</u>	<u>" -SD04-0006</u>	<u>SD</u>	<u>X</u>	<u>X</u>							<u>6</u>	<u>6M</u>																							
<u>-10</u>	<u>✓ /</u>	<u>NASB-SKT-SD-DATA-040910</u>	<u>SD</u>	<u>X</u>	<u>X</u>							<u>6</u>	<u>6M</u>																							
Sample Kit Prep'd by: (Signature) <u>[Signature]</u>		Date/Time _____	Received By: (Signature) _____		REMARKS: SW = Surface Water SD = Sediment MS/MSD = Lab QC Sample Sediment Samples very wet; Gave extra volume						Details:																									
Relinquished by: (Signature) <u>[Signature]</u>		Date/Time <u>4/9/10 1400</u>	Received By: (Signature) _____								Page <u>1</u> of <u>1</u>																									
Relinquished by: (Signature) _____		Date/Time _____	Received By: (Signature) _____								Cooler No. <u>1</u> of <u>1</u>																									
Received for Laboratory by: (Signature) <u>[Signature]</u>		Date/Time <u>4/10/10 10:30</u>	Temperature <u>2.9°C</u>								Date Shipped <u>4/09/10</u>																									
					Shipped By <u>BG</u>																															
					Turnaround <u>Standard</u>																															

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

CT0069B.004

Foster Plaza 7

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8633

Send Results to:		Send Invoice to:		Analysis Requirements:								Lab Use Only:		
Name <u>Linda Klink</u>		Name <u>← Same</u>		TAL Metals	PAHS	Dinitrotoluene	Nitrobenzene	TOC	PH	CEC	VOA Headspace Y <input type="checkbox"/> N <input type="checkbox"/>			
Company <u>Tetra Tech NUS</u>		Company _____									Field Filtered Y <input type="checkbox"/> N <input type="checkbox"/>			
Address <u>661 Anderson Drive</u>		Address _____									Correct Containers Y <input type="checkbox"/> N <input type="checkbox"/>			
City <u>P. Htsburgh</u>		City _____									Discrepancies Y <input type="checkbox"/> N <input type="checkbox"/>			
State, Zip <u>PA 15220-2745</u>		State, Zip _____									Cust. Seals Intact Y <input type="checkbox"/> N <input type="checkbox"/>			
Phone <u>412-921-8650</u>		Phone _____									Containers Intact Y <input type="checkbox"/> N <input type="checkbox"/>			
Fax <u>412-921-4040</u>		Fax _____		Airbill #: <u>4280</u>										
E-mail <u>linda.klink@tetratech.com</u>		E-mail _____		CAR #: _____										
Project No./Name: <u>112600645</u> <u>NASB-Skeet Range</u>		Sampler's (Signature): <u>Ben Yin</u>												
Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix									Comments	No. of Bottles	Lab Use Only Containers/Pres.
<u>09/2192-01</u>	<u>12/15/09/0808</u>	<u>NASB-SKT-SB01-0003</u>	<u>Soil</u>	X	X	X	X					<u>LAB QC</u>	<u>4</u>	<u>4M</u>
<u>-02</u>	<u>1/0813</u>	<u>" " -0312</u>		X	X	X	X					<u>Sample Tim 0813</u>	<u>4</u>	
<u>-03</u>	<u>1/0813</u>	<u>NASB-SKT-SB02-0003</u>		X	X	X	X					<u>0830</u>	<u>4</u>	
<u>-04</u>	<u>1/0813</u>	<u>" " -0312</u>		X	X	X	X					<u>0835</u>	<u>4</u>	<u>↓</u>
<u>-05</u>	<u>1/1340</u>	<u>NASB-SKT-SB03-0003</u>		X	X							<u>1340</u>	<u>2</u>	<u>2M</u>
<u>-06</u>	<u>1/1340</u>	<u>" " -0312</u>		X	X							<u>1345</u>	<u>2</u>	
<u>-07</u>	<u>1/1345</u>	<u>NASB-SKT-SB04-0003</u>		X	X							<u>1325</u>	<u>2</u>	
<u>-08</u>	<u>1/1345</u>	<u>" " -0312</u>		X	X							<u>1330</u>	<u>2</u>	
<u>-09</u>	<u>1/1235</u>	<u>NASB-SKT-SB05-0003</u>		X	X									
<u>-10</u>	<u>1/1240</u>	<u>" " -0312</u>		X	X									
<u>-11</u>	<u>1/1035</u>	<u>NASB-SKT-SB06-0003</u>		X	X									
<u>-12</u>	<u>1/1040</u>	<u>" " -0312</u>		X	X									
Sample Kit Prep'd by: (Signature) <u>Ben Yin</u>		Date/Time <u>12/16/09 1600</u>	Received By: (Signature)		REMARKS: <u>LAB QC FOR: NASB-SKT-SB01-0003</u>								Details:	
Relinquished by: (Signature)		Date/Time	Received By: (Signature)										Page <u>1</u> of <u>4</u>	
Relinquished by: (Signature)		Date/Time	Received By: (Signature)										Cooler No. ____ of ____	
Received for Laboratory by: (Signature) <u>[Signature]</u>		Date/Time <u>12/16/09 0900</u>	Temperature <u>2.90C</u>										Date Shipped <u>12/16/09</u>	
					Shipped By <u>BG</u>									
					Turnaround <u>Standard</u>									

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1211209 20115

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Foster Plaza 7

8624

Send Results to:		Send Invoice to:		Analysis Requirements:								Lab Use Only:			
Name <u>Linda Kline</u>		Name <u>Shane</u>		TAL Metals PAHs Dinitrotoluene Nitrolycaine TOC PH CEC								VOA Headspace Y N NA			
Company <u>Tetra Tech NUS</u>		Company _____										Field Filtered Y N NA			
Address <u>661 Anderson Drive</u>		Address _____		Correct Containers Y N NA											
City <u>Pittsburgh</u>		City _____		Discrepancies Y N NA											
State, Zip <u>PA 15220-2745</u>		State, Zip _____		Cust. Seals Intact Y N NA											
Phone <u>412-921-8650</u>		Phone _____		Containers Intact Y N NA											
Fax <u>412-921-4040</u>		Fax _____		Airbill #: _____											
E-mail <u>linda.kline@tetratech.com</u>		E-mail _____		CAR #: _____											
Project No./Name: <u>NASB Sket Range / 112600645</u>				Sampler's (Signature): <u>[Signature]</u>											
Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix									Comments	No. of Bottles	Lab Use Only Containers/Pres.	
	12/15/09 / 0930	NASB-SKT-5807-0003	Soil	X	X									2	
	/ 0935	" " -0312		X	X									2	
	/ 0940	NASB-SKT-5808-0003		X	X									2	
	/ 0945	" " -0312		X	X									2	
	/ 0820	NASB-SKT-5501-0003		X	X	X	X						DUP01	4	
	/ 0850	" " -5502-0003		X	X	X	X							4	
	/ 1310	-5503-0003		X	X									2	
	/ 1255	-5504-0003		X	X								LAB QC	2	
	/ 1250	-5505-0003		X	X									2	
	/ 1210	-5506-0003		X	X			X	X	X			DUP02	5	
	/ 1200	-5507-0003		X	X			X	X	X				5	
	✓ 1150	✓ -5508-0003	✓	X	X			X	X	X				5	
Sample Kit Prep'd by: (Signature) <u>[Signature]</u>		Date/Time 12/16/09 1600	Received By: (Signature) _____		REMARKS: LAB QC FOR: NASB-SKT-5504-0003								Details:		
Relinquished by: (Signature) _____		Date/Time	Received By: (Signature) _____										Page <u>2</u> of <u>4</u>		
Relinquished by: (Signature) _____		Date/Time	Received By: (Signature) _____										Cooler No. ____ of ____		
Received for Laboratory by: (Signature) _____		Date/Time	Temperature										Date Shipped <u>12/16/09</u>		
					Shipped By <u>BE</u>										
					Turnaround <u>Standard</u>										

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

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8625

Send Results to:		Send Invoice to:		Analysis Requirements:								Lab Use Only:				
Name <u>Refer to Page 1</u>		Name _____		TAL Metals PAHS Dinitobenzene Nitrohydrocarbons TOC PH CEC									VOA Headspace	Y	N	(NA)
Company _____		Company _____											Field Filtered	Y	N	(NA)
Address _____		Address _____											Correct Containers	(Y)	N	NA
City _____		City _____											Discrepancies	Y	(N)	NA
State, Zip _____		State, Zip _____											Cust. Seals Intact	(Y)	N	NA
Phone _____		Phone _____											Containers Intact	(Y)	N	NA
Fax _____		Fax _____											Airbill #:	4700		
E-mail _____		E-mail _____											CAR #:	-		
Project No./Name: <u>NASB Sweet Range / 112600645</u>				Sampler's (Signature): <u>[Signature]</u>												

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix										Comments	No. of Bottles	Lab Use Only Containers/Pres.
0912192-25	12/15/09/1050	NASB-SKT-SS09-0003	Soil	X	X									2	2M
-26	/1055	" " -SS10-0003		X	X									2	
-27	/0950	-SS11-0003		X	X									2	
-28	/0900	-SS12-0003		X	X									2	
-29	/1230	-SS17-0003		X	X									2	
-30	/1025	-SS19-0003		X	X	X	X	X	X	X	X			7	+5M
-31	/0905	-SS21-0003		X	X									2	
-32	✓/1000	✓ -SS26-0003		X	X	X	X							4	+2M
-33	12/15/09	NASB-SKT-DUP01-121509		X	X	X	X							4	↓
-34	12/15/09	NASB-SKT-DUP02-121509		X	X									2	
-35	12/15/09	NASB-SKT-SB-DUP03-121509	✓	X	X									2	✓

Sample Kit Prep'd by: (Signature) <u>[Signature]</u>	Date/Time 12/16/09 1600	Received By: (Signature) _____	REMARKS:	Details:		
Relinquished by: (Signature)	Date/Time	Received By: (Signature)		Page <u>3</u> of <u>4</u>	Cooler No. ___ of ___	
Relinquished by: (Signature)	Date/Time	Received By: (Signature)		Date Shipped <u>12/16/09</u>	Shipped By <u>BG</u>	
Received for Laboratory by: (Signature) <u>[Signature]</u>	Date/Time 12/17/09 0845	Temperature 2.9°C		Turnaround <u>Standard</u>		

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

APPENDIX E

MC DATA USABILITY ASSESSMENT

APPENDIX E
ANALYTICAL DATA QUALITY REVIEW
SITE INSPECTION
MUNITION CONSTITUENTS AT TWO MUNITIONS RESPONSE SITES
NAS BRUNSWICK, BRUNSWICK, MAINE

A description of the data review processes used to determine whether analytical laboratory data were of acceptable technical quality for use in decision making is presented in this data quality review (DQR). The review began with data verification and validation. Verification is a process used to ensure that contractual requirements were satisfied. Validation is a comparison of data quality indicators (DQIs) against prescribed acceptance criteria to assess analytical method performance. The DQIs used are measures to assess the bias and precision of the analytical calibrations and sample analyses. Together, verification and validation are the first steps in evaluating data completeness, accuracy, sensitivity, comparability, and representativeness. The data review process culminates with a data usability assessment during which the final usability of the data is established relative to the intended data use.

1.0 DATA VALIDATION PROCESS

All of the results from analytical laboratory samples were validated according to several specifications. Assignment of data qualification flags conformed to rules established in USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses – Part II (December 1996), USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (November 2008), and Department of Defense (DoD) document entitled Quality Systems Manual (QSM) for Environmental Laboratories (April 2009) to the greatest extent practicable for non-contract laboratory program data. Numerical criteria used in conjunction with these rules were specified in the Quality Assurance Project Plan for Site Inspection of Munitions Constituents, Three Munitions Response Site, NAS Brunswick, Brunswick, Maine which is Attachment 1 of Appendix 1 within the document titled Site Inspection Work Plan, Munitions Constituents at Three Munitions Response Sites, NAS Brunswick, Brunswick, Maine (Tetra Tech, June 2009).

If no qualifier is assigned to a result that has been validated, the data user is assured that no analytical performance deficiencies were identified during validation. The qualification flags used are defined below:

U – Indicates that the chemical was not detected at the numerical detection limit noted. Non-detected results are reported with a “U” qualifier when received from the laboratory. Additionally, a “U” qualifier is added to a result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – Indicates that the chemical was not detected. However, the detection limit (sample-specific quantitation limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate.

J – Indicates that the chemical was detected. However, the associated numerical result is not an accurate representation of the amount that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.

UR – Indicates that the chemical may or may not be present. The non-detected analytical result reported by the laboratory is considered to be unreliable and unusable. The “UR” qualifier is applied in cases of gross technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration noncompliances, and extremely low quality control [QC] recoveries).

R – Indicates that the chemical may or may not be present. The analytical result reported by the laboratory is considered to be unreliable and unusable. The “R” qualifier is applied in cases of gross technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration noncompliances, and extremely low QC recoveries).

The preceding data qualifiers may be categorized as indicative of major or minor problems. Major problems are defined as issues that result in the rejection of data and qualification with “UR” or “R” data validation qualifiers. Rejected data are considered invalid and are not used for decision making purposes unless used in a qualitative way and the use is justified and documented. Less severe deficiencies, associated with “U”, “J”, and “UJ” data validation qualifiers, are defined as issues resulting in the estimation of data. Estimated analytical results are considered to be suitable for decision-making purposes unless the data use requirements are very stringent and the qualifier indicates a deficiency that is incompatible with the intended data use. Also, a “U” qualifier does not necessarily indicate that a data deficiency exists because all non-detect values are flagged with the “U” qualifier regardless of whether a quality deficiency has been detected.

No data collected for the site inspection (SI) of munitions constituents at the two munitions response sites and evaluated during this DQR was qualified as rejected. Qualified data and the reason for qualification are presented in Tables E.1 to E.7. Any data impacts based on the results of the data evaluation are discussed in the remainder of this review.

2.0 DATA VALIDATION OUTPUTS

After laboratory data were validated, a list was developed of non-conformities requiring data qualifier flags that were used to alert the data user to inaccurate or imprecise data. For situations in which several QC criteria were out of specification, the data validator made professional judgments and or comments on the validity of the overall data package. The reviewer then prepared a technical memorandum presenting qualification of the data, if necessary, and the rationale for making such qualifications. The net result was a data package that had been carefully reviewed for its adherence to prescribed technical requirements. Data validators incorporated data qualifiers into the electronic database and submitted the information to the Tetra Tech NUS, Inc. (Tetra Tech) data management group. A complete printout of the data results with validation flags is presented in Appendix D of the SI Report. Pertinent quality estimates are summarized in a more quantitative format in the following sections.

3.0 GENERAL DATA QUALITY REVIEW

The DQR provided herein is designed to provide an overall quantitative measure of analytical performance not provided by data validation. The analytical performance quantitative evaluations are frequently analyte-specific and reflect deficiencies such as biases associated with the quantification of particular analytes in a particular sample matrix. The data user must be aware that different chemicals in the same analytical fraction (e.g. lead and copper in the metals fraction) may exhibit different degrees of quality.

3.1 Completeness

Completeness is a measure of the number of valid samples or measurements that are available relative to the number of samples or measurements that were intended to be generated. For this project, completeness was measured on two different bases: samples collected and laboratory measurements.

- Sample completeness was a measure of the usable samples collected as compared to those intended to be collected.
- Laboratory measurement completeness was a measure of the amount of usable, valid laboratory measurements per matrix obtained for each target analyte.

Usable, valid samples (or results) were those judged, after data assessment, to represent the sampling populations and to have not been disqualified for use through data validation or additional data review. Completeness was determined using the following equation:

$$\%C = \frac{V}{T} \times 100$$

where %C = percent completeness
V = number of samples (or results) determined to be valid
T = total number of planned samples (or results)

Completeness evaluations for the Machine Gun Boresight Range and the NAS Brunswick Skeet Range are tabulated in Tables E.8 and E.9. All completeness evaluations meet the completeness goal of 95 percent listed in the Quality Assurance Project Plan for Site Inspection of Munitions Constituents, Three Munitions Response Site, NAS Brunswick, Brunswick, Maine (Appendix A, Attachment 1, QAPP Worksheet #12).

3.2 Sensitivity

The detection limits (DLs) reported by the laboratory were generally less than the screening limits listed in Appendix G. Tables E.10 through E.14 list parameters per site and per matrix (aluminum, arsenic, beryllium, copper, and lead) for which the detection limit exceeded the corresponding project action limit (PAL) for one or more sample results. PALs consist of site background limits (as applicable), EPA limits, and Maine state limits. Those tables also display two different percentages: the percentage of non-detected results that exceeded the corresponding PAL when compared to the total number of non-detected results and the percentage of non-detected results that exceeded PALs when compared to the total number of results analyzed (positive and non-detected results). The percentage of non-detected results that exceeded PALs when comparing to the total number of non-detected results is used to evaluate the overall success of the laboratory achieving detection limits equal to or less than PALs. The percentage of non-detected results that exceeded PALs when comparing to the total number of results analyzed (positive and non-detected results) is used to evaluate the effect of sensitivity exceedances on the complete corresponding data set. Lists of parameters per site and matrix for which sensitivity issues were identified and corresponding effects on data usability are described below. For additional information on those sensitivity issues please refer to Table E.10 through E.14.

NAS Brunswick Skeet Range

Sediment – antimony, selenium, silver

Soil – nitroglycerin, benzo(a)pyrene, dibenzo(a,h)anthracene, thallium

Surface water – silver

Sediment

The PAL used to evaluate the sediment results was a facility background limit. One hundred percent (2 of 2) of the non-detected sediment antimony results were reported at a concentration greater than the corresponding facility background limit. The antimony DL was greater than the facility background limit which resulted in the exceedances. Fifty percent (1 of 2) of the non-detected sediment selenium results were reported at a concentration greater than the corresponding facility background limit. The selenium DL was elevated due to dilution which resulted in the exceedance of facility background limits. Sixty percent (3 of 5) of the non-detected sediment silver results were reported at a concentration greater than the corresponding facility background limit. The silver DL was elevated due to dilution or low percent solids resulting in the exceedance of the facility background limit.

Soil

The PALs used to evaluate the soil results were USEPA Residential RSL and Maine RAGS Appendix C. One hundred percent (9 of 9) of non-detected soil nitroglycerin results, one hundred percent (4 of 4) of non-detected soil benzo(a)pyrene results, ninety five percent (18 of 19) of non-detected soil dibenzo(a,h)anthracene, and one hundred percent (35 of 35) of the non-detected soil thallium results exceeded the USEPA Residential RSL. The nitroglycerin, benzo(a)pyrene, dibenzo(a,h)anthracene, and thallium MDLs were greater than the Residential RSL. Twenty five percent (1 of 4) of non-detected soil benzo(a)pyrene results and twenty one percent (18 of 19) of non-detected soil dibenzo(a,h)anthracene exceeded the Maine RAGS Appendix C. The benzo(a)pyrene and dibenzo(a,h)anthracene MDLs were elevated due to low percent solids resulting in the exceedance of the Maine RAGS.

Surface Water

The PAL used to evaluate the surface water results was a facility background limit. Sixty (3 of 5) percent of the non-detected surface water silver results were reported at a concentration greater than the corresponding facility background limit. The silver DL was greater than the facility background limit resulting in the exceedance.

Machine Gun Boresight Range

Soil –arsenic, cadmium, thallium, nitroglycerin, antimony, cobalt

Groundwater –Thallium, nitroglycerin, arsenic, chromium, cobalt

Soil

The PALs used to evaluate the soil results were USEPA Residential RSL and Maine RAGS Appendix C. One hundred percent (9 of 9) of non-detected soil arsenic results, twenty one percent (4 of 19) of non-detected soil cadmium results, and sixteen percent (6 of 37) of the non-detected soil thallium results

exceeded the Maine RAGS Appendix 3 limits. The arsenic, cadmium, and thallium DL was greater than the Maine RAGS limit resulting in the exceedance. One hundred percent (28 of 28) of non-detected soil nitroglycerin results, sixteen percent (6 of 36) non-detected soil antimony results, one hundred percent (6 of 6) of non-detected soil arsenic results, one hundred percent (1 of 1) of non-detected cobalt results, and one hundred percent (37 of 37) of the non-detected soil thallium results exceeded the USEPA Residential RSL. The nitroglycerin, antimony, arsenic, cobalt, and thallium DL was greater than the USEPA Residential RSL.

Groundwater

The PALs used to evaluate the groundwater results were USEPA Tapwater RSL and Maine MEG. One hundred percent (9 of 9) of non-detected groundwater thallium results exceeded the Maine MEG limits. The thallium DL was greater than the Maine MEG limit resulting in the exceedance. One hundred percent (6 of 6) of non-detected groundwater nitroglycerin results, one hundred percent (5 of 5) non-detected groundwater arsenic results, one hundred percent (4 of 4) of non-detected groundwater chromium results, one hundred percent (4 of 4) of non-detected cobalt results, and one hundred percent (6 of 6) of the non-detected groundwater thallium results exceeded the USEPA Tapwater RSL. The nitroglycerin, antimony, arsenic, cobalt, and thallium DL was greater than the USEPA Tapwater RSL.

3.3 Laboratory Accuracy

Accuracy in the laboratory was measured through the comparison of a spiked sample or Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) result to a known or calculated value and is expressed as a percent recovery (%R). Accuracy was also assessed by monitoring the analytical recovery of select surrogate compounds and internal standard compounds added to samples that are analyzed by organic chromatographic methods, and the analytical recovery of calibration standards for all analyses. LCSs were used to assess the accuracy of laboratory operations with minimal sample matrix effects. Matrix spike/matrix spike duplicate (MS/MSD) and surrogate compound analyses measure the combined accuracy effects of the sample matrix, sample preparation, and sample measurement. LCS and MS analyses were performed at a frequency of one per 20 associated samples of like matrix. Laboratory accuracy was assessed by comparing calculated percent recovery (%R) values to accuracy control limits specified by the laboratory using the appropriate SW-846 Method.

Percent recovery is calculated using the following equation:

$$\%R = \frac{S_s - S_o}{S} \times 100$$

where %R = percent recovery

Ss	=	result of spiked sample
So	=	result of non-spiked sample
S	=	concentration of spiked amount.

The inductively coupled plasma (ICP) Interference Check Sample (ICS) is evaluated to verify the laboratory's interelement and background correction factors, and to account for potential spectral overlaps and stray light interferences caused by the interfering analytes aluminum, calcium, iron, and magnesium. ICP ICS interference can affect the accuracy of analyte results and is therefore also evaluated in this section.

Following is an evaluation of qualified data (per site and per matrix) associated to accuracy data quality.

3.3.1 NAS Brunswick Skeet Range

Sediment: Antimony, barium, calcium, magnesium, and manganese results were qualified as estimated, (J), due to MS noncompliance. The MS/MSD analysis of sample NASB-SKT-SD01-0006 yielded a %R less than the lower QC limit for antimony and it also yielded %Rs greater than the upper QC limit for barium, calcium, magnesium, and manganese. Therefore the MS/MSD analysis of sample NASB-SKT-SD01-0006 indicates that antimony results qualified due to MS/MSD noncompliance are biased low and that barium, calcium, magnesium, and manganese results qualified due to MS/MSD noncompliance are biased high. Sediment data non-compliances associated with accuracy were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, sediment data accuracy is considered acceptable. For more detailed information concerning qualified sediment data for the NAS Brunswick Skeet Range refer to Table E.1.

Soil: Acenaphthylene, anthracene, benzo(g,h,i)perylene, benzo(k)perylene, fluorene, indeno(1,2,3-CD)perylene, cation exchange capacity (CEC), lead, sodium results were qualified due to MS/MSD noncompliances that indicated those qualified data points are biased high. Antimony, magnesium, and potassium results were qualified due to MS/MSD noncompliances that indicated those qualified data points are biased low; however, no directional bias can be associated with those antimony results also qualified due to ICP noncompliance. Benzo(a)pyene, chrysene, dibenzo(a,h)anthracene, fluoranthene, 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene results were qualified due to calibration noncompliance and no directional bias is associated with those noncompliances. Manganese and total organic carbon (TOC) results were qualified due to calibration noncompliances that indicated the corresponding qualified results were biased high and low, respectively. Arsenic data points were qualified due to ICP noncompliances that indicated the associated data points are biased high. Cobalt, nickely, selenium, and silver were qualified due to ICP noncompliances that indicated the associated

data points are biased low. Several antimony and cadmium data points were also qualified due to ICP noncompliance; however, no directional bias can be associated with those data points because those points were also qualified due to MS noncompliance. Soil data non-compliances associated with accuracy were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, soil data accuracy is considered acceptable. For more detailed information concerning qualified soil data for the NAS Brunswick Skeet Range refer to Table E.2.

Surface Water: One magnesium result was qualified due to a calibration noncompliance that indicated the qualified data point in biased low. The magnesium surface water data non-compliance associated with accuracy was not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, surface water data accuracy is considered acceptable. For more detailed information concerning qualified surface water data for the NAS Brunswick Skeet Range refer to Table E.3.

3.3.2 Machine Gun Boresight Range

Soil: Silver results were qualified as estimated to due to blank spike contamination which indicated that those results were biased low. Calcium, magnesium, manganese, potassium, and sodium results were qualified due to MS noncompliances that indicated those qualified results were biased high. Antimony and lead results were qualified due to MS noncompliances that indicated those qualified results were biased low. Barium, selenium, manganese, and silver results were qualified due to calibration noncompliance. QC data indicated that the barium and selenium, and manganese and silver results were biased low and high, respectively. Antimony, arsenic, copper, nickel, selenium, and silver were qualified due to ICP interference noncompliance that indicated qualified arsenic results were biased high, and qualified copper, nickel, selenium, and silver results were biased low. No directional bias can be associated with the qualified antimony result because it was also qualified due to other QC noncompliances. The soil data non-compliances associated with accuracy were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, soil data accuracy is considered acceptable. For more detailed information concerning qualified soil data for the Machine Gun Boresight Range refer to Table E.4.

Groundwater: Sodium results were qualified due to calibration noncompliance that indicated those qualified results were biased high and calcium results were qualified due to ICP serial dilution for which direction bias was indeterminate. The groundwater data non-compliances associated with accuracy were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, groundwater data accuracy is considered acceptable. For more detailed

information concerning qualified groundwater data for the Machine Gun Boresight Range refer to Table E.5.

3.3.3 Background Samples

Soil: Antimony, calcium, lead, magnesium, and potassium were qualified due to MS noncompliance and QC data indicated that the qualified antimony and lead results were biased low and the qualified calcium, magnesium, and potassium results were biased high. Manganese, benzo(a)anthracene, chrysene, dibenzo(a,h)anthracene, and fluoranthene results were qualified due to calibration noncompliance. QC data indicated that the manganese background result qualified due to calibration noncompliance was biased high and direction bias of the organic compounds was indeterminate. One selenium and one silver background soil result were qualified due to ICP interferences which indicated that those results were biased low. A cadmium result was qualified due to ICP serial dilution compliance and the direction bias of that estimated result is indeterminate. The background soil data non-compliances associated with accuracy were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, background soil data accuracy is considered acceptable. For more detailed information concerning qualified background soil data refer to Table E.6.

3.3.4 QC Samples

Rinsate blanks and Field Blanks: Nitroglycerin was qualified due to LCS noncompliance which indicated that the associated qualified results were biased low. Several organic compounds including 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, and indeno(1,2,3-CD)pyrene were qualified due to calibration noncompliance for which direction bias was indeterminate. Chromium results were also qualified due to calibration noncompliance that indicated those qualified results were biased low. The QC data non-compliances associated with accuracy were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, QC data accuracy is considered acceptable. For more detailed information concerning qualified QC data refer to Table E.7.

3.4 Laboratory Precision

Precision is a measure of the degree to which two or more measurements are in agreement and describes the reproducibility of measurements of the same parameter for samples analyzed under similar conditions.

Precision for chemical parameters is expressed as a Relative Percent Difference (RPD), which is defined as the ratio of the difference to the mean for the two values being evaluated. RPDs, typically expressed as percentages, are used to evaluate both field and laboratory duplicate precision and are calculated as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where RPD = relative percent difference
V1, V2 = two results obtained by analyzing duplicate samples

The precision estimates obtained from duplicate field samples encompass the combined uncertainty associated with sample collection, homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis. In contrast, precision estimates obtained from analyzing duplicate laboratory samples incorporate only homogenization, sub sampling, preparation for analysis, laboratory storage (if applicable), and analysis uncertainties.

3.4.1 NAS Brunswick Skeet Range

Sediment: Beryllium, cadmium, mercury, and sodium results were qualified due to uncertainty near the detection limit. Positive results qualified due to uncertainty near the detection limit are considered imprecise; therefore qualified as estimated, because relative error increases as analyte concentrations approach corresponding IDLs. However, such non-compliances are not egregious enough to quality the affected data as rejected according to data validation guidelines used for this project; therefore, data precision is not considered unacceptable due to those data points qualified because of uncertainty near the detection limit. For more detailed information concerning qualified sediment data for the NAS Brunswick Skeet Range refer to Table E.1.

Soil: Two explosives (4-nitrotoluene and 2-amino-4,6-dinitrotolue) results were qualified due to percent difference (%D) noncompliance between gas chromatography (GC) columns indicating result imprecision. Arsenic, cadmium, silver, benzo(a)pyrene, benzo(k)fluoranthene, and dibenzo(a,h)anthracene results were qualified due to field duplicate imprecision. A thallium result was qualified due to percent solids less than 30% and many analytes (see Table E.2.) were qualified due to uncertainty near the detection limit. The soil data non-compliances associated with precision were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, soil data accuracy is considered acceptable. For more detailed information concerning qualified soil data for the NAS Brunswick Skeet Range refer to Table E.2.

Surface Water: Arsenic, cadmium, copper, lead, and nickel results were qualified due to uncertainty near the detection limit. Such non-compliances are not egregious enough to qualify the affected data as rejected according to data validation guidelines used for this project; therefore, data precision is not considered unacceptable due to those data points qualified because of uncertainty near the detection limit. For more detailed information concerning qualified surface water data for the NAS Brunswick Skeet Range refer to Table E.3.

3.4.2 Machine Gun Boresight Range

Soil: Beryllium, mercury, and nitroglycerin results were qualified as estimated due to uncertainty near the detection limit. Such non-compliances are not egregious enough to qualify the affected data as rejected according to data validation guidelines used for this project; therefore, data precision is not considered unacceptable due to those data points qualified because of uncertainty near the detection limit. For more detailed information concerning qualified soil data for the Machine Gun Boresight Range refer to Table E.4.

Groundwater: Aluminum and iron results were qualified due to field duplicate imprecision. Thirteen inorganic analytes (see Table E.5) were qualified due to uncertainty near the detection limit. The groundwater data non-compliances associated with precision were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, groundwater data accuracy is considered acceptable. For more detailed information concerning qualified groundwater data for the Machine Gun Boresight Range refer to Table E.5.

3.4.3 Background Samples

Soil: A arsenic and a lead result were qualified due to field duplicate imprecision, and eight analytes (see Table E.6) had results qualified due to uncertainty near the detection limit. The soil data non-compliances associated with precision were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, soil data accuracy is considered acceptable. For more detailed information concerning qualified background soil data refer Table E.6.

3.4.4 QC Samples

Rinsate blanks and Field Blanks: The 3-nitrotoluene and 4-nitrotoluene results for sample NASB-SKT-SO-RB01-121509 were qualified as estimated due to %D noncompliance between GC columns indicating result imprecision. Many organic and inorganic analyte results (see Table E.7) were qualified due to uncertainty near the detection limit. The QC data non-compliances associated with precision were not egregious enough to qualify the affected data as rejected according to the data validation guidelines used for this project; therefore, QC data accuracy is considered acceptable. For more detailed information concerning qualified QC data refer to Table E.7.

3.5 Comparability

Comparability is defined as the confidence with which one data set can be compared with another (e.g., among sampling points and among sampling events). Comparability was achieved by using standardized sampling and analysis methods, as well as standardized data reporting formats. Comparability of laboratory measurements was achieved primarily through the use and documentation of standard sampling and analytical methods. Results were reported in units that ensured comparability with previous data and with current state and federal standards and guidelines. Comparability of laboratory measurements was assessed primarily through the use of QC samples and through adherence to the quality assurance (QA) plan.

3.6 Representativeness

Representativeness is an expression of the degree to which data accurately and precisely depict the actual characteristics of a population or environmental condition existing at the site. By compiling with the Quality Assurance Project Plan for Site Inspection of Munitions Constituents, Three Munitions Response Site, NAS Brunswick, Brunswick, Maine which is Attachment 1 of Appendix 1 within the document titled Site Inspection Work Plan, Munitions Constituents at Three Munitions Response Sites, NAS Brunswick, Brunswick, Maine (Tetra Tech, June 2009), and the use of standardized sampling, sample handling, sample analysis, and data reporting procedures were designed so that the final data would be accurate representations of actual site conditions. The DQR found the data collected to be representative of targeted populations.

4.0 DATA USEABILITY

All data collected for this project is considered useable for the purposes of this project.

Table E.10

NAS Brunswick Skeet Range
Sediment Sensitivity Evaluation
Naval Air Station Brunswick
Brunswick, Maine

Parameter	PAL	Number of Non-Detected Results	Number of Non-Detected Results Exceeding PAL	Percentage of Non-Detected Results Exceeding PAL	Number of Analyses	Percentage of Non-Detected Results Exceeding PAL for Entire Data Set
Inorganics (mg/kg)						
ANTIMONY	0.16	2	2	100.0%	5	40.0%
SELENIUM	0.29	2	1	50.0%	5	20.0%
SILVER	0.5	5	3	60.0%	5	60.0%

Table E.11

NAS Brunswick Skeet Range
Soil Sensitivity Evaluation
Naval Air Station Brunswick
Brunswick, Maine

Parameter	USEPA Residential RSL (mg/kg)	Number of Non-Detected Results	Number of Non-Detected Results Exceeding EPA RSL	Percentage of Non-Detected Results Exceeding EPA RSL	Number of Analyses	Percentage of Non-Detected Results Exceeding EPA RSL for Entire Data Set
Explosives (mg/kg)						
NITROGLYCERIN	0.61	9	9	100%	9	100%
PAHs (ug/kg)						
BENZO(A)PYRENE	15	4	4	100%	35	11%
DIBENZO(A,H)ANTHRACENE	15	19	18	95%	35	51%
Inorganics (mg/kg)						
THALLIUM	0.078	35	35	100.0%	35	100.0%

Parameter	Maine RAGS Appendix 3 (mg/kg)	Number of Non-Detected Results	Number of Non-Detected Results Exceeding MD RAGS	Percentage of Non-Detected Results Exceeding MD RAGS	Number of Analyses	Percentage of Non-Detected Results Exceeding MD RAGS for Entire Data Set
PAHs (ug/kg)						
BENZO(A)PYRENE	26	4	1	25.0%	35	2.9%
DIBENZO(A,H)ANTHRACENE	26	19	4	21.1%	35	11.4%

Table E.12

NAS Brunswick Skeet Range
Surface Water Sensitivity Evaluation
Naval Air Station Brunswick
Brunswick, Maine

Parameter	PAL	Number of Non-Detected Results	Number of Non-Detected Results Exceeding EPA RSL	Percentage of Non-Detected Results Exceeding EPA RSL	Number of Analyses	Percentage of Non-Detected Results Exceeding EPA RSL for Entire Data Set
Inorganics (ug/L)						
SILVER	0.23	5	5	100%	5	100%

Table E.13
Machine Gun Boresight Range
Soil Sensitivity Evaluation
Naval Air Station Brunswick
Brunswick, Maine

Parameter	Maine RAGS Appendix 3 (mg/kg)	Number of Non-Detected Results	Number of Non-Detected Results Exceeding MD RAGS	Percentage of Non-Detected Results Exceeding MD RAGS	Number of Analyses	Percentage of Non-Detected Results Exceeding MD RAGS for Entire Data Set
Inorganics (mg/kg)						
ARSENIC	9	6	6	100.0%	37	16.2%
CADMIUM	2.1	19	4	21.1%	37	10.8%
THALLIUM	2.7	37	6	16.2%	37	16.2%

Parameter	USEPA Residential RSL (mg/kg)	Number of Non-Detected Results	Number of Non-Detected Results Exceeding PAL	Percentage of Non-Detected Results Exceeding PAL	Number of Analyses	Percentage of Non-Detected Results Exceeding PAL for Entire Data Set
Explosives (mg/kg)						
NITROGLYCERIN	0.61	28	28	100%	31	90%
Inorganics (mg/kg)						
ANTIMONY	3.1	36	6	16.7%	37	16.2%
ARSENIC	0.39	6	6	100.0%	37	16.2%
COBALT	2.3	1	1	100.0%	37	2.7%
THALLIUM	0.078	37	37	100.0%	37	100.0%

Table E.14
Machine Gun Boresight Range
Groundwater Sensitivity Evaluation
Naval Air Station Brunswick
Brunswick, Maine

Parameter	Maine MEG (ug/L)	Number of Non-Detected Results	Number of Non-Detected Results Exceeding RSL	Percentage of Non-Detected Results Exceeding MD MEG	Number of Analyses	Percentage of Non-Detected Results Exceeding MD MEG for Entire Data Set
Inorganics (ug/L)						
THALLIUM	0.6	6	6	100.0%	6	100.0%

Parameter	USEPA Tapwater RSL (ug/L)	Number of Non-Detected Results	Number of Non-Detected Results Exceeding RSL	Percentage of Non-Detected Results Exceeding RSL	Number of Analyses	Percentage of Non-Detected Results Exceeding RSL for Entire Data Set
Explosives (ug/l)						
NITROGLYCERIN	0.37	6	6	100%	6	100%
Inorganics (ug/L)						
ARSENIC	0.045	5	5	100.0%	6	83.3%
CHROMIUM	0.043	4	4	100.0%	6	66.7%
COBALT	1.1	4	4	100.0%	6	66.7%
THALLIUM	0.037	6	6	100.0%	6	100.0%

APPENDIX F

XRF/FBL CORRELATION STATISTICAL EVALUATION

F-1 MACHINE GUN BORESIGHT RANGE

F-2 SKEET RANGE

F-1 MACHINE GUN BORESIGHT RANGE

MGBR
Correlation of Fixed Based Laboratory and XRF Concentrations
Naval Air Station Brunswick, Maine

Five collocated XRF and fixed based laboratory concentrations were collected at MGBR Brunswick for lead, copper, nickel and zinc. To determine if the XRF concentrations can be used to predict the Fixed Based Laboratory concentrations a statistical correlation analysis was conducted. Due to the small sample size the correlation analysis will be strongly affected by any outliers and/or influential points. For the statistical analyses $\frac{1}{2}$ the detection limit was used for non-detected concentrations and for duplicate samples the average of the original and duplicate sample was used.

If the correlation between the XRF and Fixed Based Laboratory concentrations is greater than or equal to 0.65 then the XRF concentrations can be used to predict the fixed based laboratory concentrations. The correlation always falls between -1 and 1. Values of r near 0 indicate a very weak linear relationship. The strength of the linear relationship increases as r moves away from 0 toward either -1 or 1. Values of r close to -1 and 1 indicate that the points lie close to a straight line. The extreme values -1 and 1 occur only in the case of a perfect linear relationship. So the correlation indicates a strong linear trend. The R-squared value represents the percent of variation in laboratory concentrations that can be explained by the XRF concentration. An R-squared value greater than about 80 percent is considered to indicate a very strong relationship between the two measurement methods. The maximum possible value is 100 percent.

Figure 1 is a scatterplot of the XRF lead concentrations and the Laboratory lead concentrations for each sample. From the scatterplot, a linear trend is evident. The correlation is 0.97 indicating that there is a strong linear relationship between the XRF and laboratory concentrations. However, there is a wide range of concentrations with the XRF concentrations ranging from 49 mg/kg to 1640 mg/kg and the laboratory concentrations ranging from 57 mg/kg to 1000 mg/kg. However the maximum concentration appears to be a potential outlier. Figure 2 is a scatterplot of the XRF lead concentrations and the Laboratory lead concentrations with the potential outlier removed. From the scatterplot, a linear trend is evident. The correlation is 1 indicating that there is a strong linear relationship between the XRF and laboratory concentration. Table 1 presents the predicted laboratory concentrations for the XRF concentrations where no laboratory concentrations are available based on the regression equation with the potential outlier removed. For concentrations where the predicted laboratory concentration was negative, zero was used as the concentration.

Figure 3 is a scatterplot of the XRF copper concentrations and the Laboratory copper concentrations for each sample. From the scatterplot, there appears to be a linear trend for the four XRF concentrations less than 100 mg/kg. Note that the sample with an XRF concentration of 204 mg/kg is causing the regression line to have a slope close to zero. The correlation is -0.0074 indicating that there is a very weak linear relationship between the XRF and laboratory concentrations. Therefore, the XRF concentrations

will not be used to predict laboratory concentrations. Table 2 presents the XRF concentrations where no laboratory concentrations are available.

Figure 4 is a scatterplot of the XRF nickel concentrations and Laboratory nickel concentrations for each sample. From the scatterplot, there appears to be a linear trend for the XRF concentrations less than 100mg/kg. The two samples with XRF concentrations greater than 100 mg/kg are causing the regression line to have a slope close to zero. The correlation is -0.47, therefore the XRF concentrations will not be used to predict laboratory concentrations. Table 3 presents the XRF concentrations where no laboratory concentrations are available.

Figure 4 is a scatterplot of the XRF zinc concentrations and the Laboratory zinc concentrations for each sample. . From the scatterplot, a linear trend is evident. The correlation is 0.92 indicating that there is a strong linear relationship between the XRF and laboratory concentrations. However, there is a wide range of concentrations with the XRF concentrations ranging from 21U mg/kg to 245 mg/kg and the laboratory concentrations ranging from 20 mg/kg to 52 mg/kg. Table 4 presents the predicted laboratory concentrations for the XRF concentrations where no laboratory concentrations are available.

Table 1
MGBR
Predicted Lead Laboratory Concentrations
At Locations Where Laboratory Concentrations Not Available

Sample	XRF Concentration (mg/kg)	Predicted Laboratory Concentration(mg/kg)
NASB-MGBR-XRF-SB01-0612	226	274.6
NASB-MGBR-XRF-SB01-1216	610	773.8
NASB-MGBR-XRF-SB02-0003-AVG	19	5.5
NASB-MGBR-XRF-SB03-0003	86	92.6
NASB-MGBR-XRF-SB04-0003-AVG	79	83.5
NASB-MGBR-XRF-SB05-0003	77	80.9
NASB-MGBR-XRF-SB06-0003	17	2.9
NASB-MGBR-XRF-SB07-0003	61	60.1
NASB-MGBR-XRF-SB08-0003	83	88.7
NASB-MGBR-XRF-SB09-0003	43	36.7
NASB-MGBR-XRF-SB10-0003	25	13.3
NASB-MGBR-XRF-SB10-0612	19	5.5
NASB-MGBR-XRF-SB10-1218	7	01
NASB-MGBR-XRF-SB10-1824	8	0
NASB-MGBR-XRF-SB11-0003	26	0
NASB-MGBR-XRF-SB13-0003	48	43.2
NASB-MGBR-XRF-SB14-0003	98	108.2
NASB-MGBR-XRF-SB15-0003	42	35.4
NASB-MGBR-XRF-SB16-0003	79	83.5
NASB-MGBR-XRF-SB17-0003	34	25
NASB-MGBR-XRF-SB18-0003-AVG	32.5	23.05
NASB-MGBR-XRF-SB19-0003	25	13.3
NASB-MGBR-XRF-SB20-0003-AVG	30.5	20.45
NASB-MGBR-XRF-SB21-0003	76	79.6
NASB-MGBR-XRF-SB22-0612	112	126.4
NASB-MGBR-XRF-SB22-1218	44	38
NASB-MGBR-XRF-SB22-1824	88	95.2
NASB-MGBR-XRF-SB23-0003	26	14.6
NASB-MGBR-XRF-SB24-0003	23	10.7
NASB-MGBR-XRF-SB25-0003	38	30.2
NASB-MGBR-XRF-SB26-0003	94	103
NASB-MGBR-XRF-SB27-0003	30	19.8
NASB-MGBR-XRF-SB28-0003	24	12
NASB-MGBR-XRF-SB29-0003	6.5	0
NASB-MGBR-XRF-SB30-0003-AVG	226	274.6

Table 1 MGBR Predicted Lead Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available		
NASB-MGBR-XRF-SB30-0612	52	48.4
NASB-MGBR-XRF-SB30-1218	46	40.6
NASB-MGBR-XRF-SB30-1824	36	27.6
NASB-MGBR-XRF-SB31-0003	30	19.8
NASB-MGBR-XRF-SB32-0003	71	73.1
NASB-MGBR-XRF-SB33-0003	57	54.9
NASB-MGBR-XRF-SB34-0003	76	79.6
NASB-MGBR-XRF-SB36-0003	68	69.2
NASB-MGBR-XRF-SB38-0003	42	35.4
NASB-MGBR-XRF-SB39-0003	96	105.6

Table 2 MGBR Copper Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available	
Sample	XRF Concentration (mg/kg)
NASB-MGBR-XRF-SB01-0612	62
NASB-MGBR-XRF-SB01-1216	37
NASB-MGBR-XRF-SB02-0003-AVG	21.5
NASB-MGBR-XRF-SB03-0003	45
NASB-MGBR-XRF-SB04-0003-AVG	38.25
NASB-MGBR-XRF-SB05-0003	40
NASB-MGBR-XRF-SB06-0003	19.5
NASB-MGBR-XRF-SB07-0003	19.5
NASB-MGBR-XRF-SB08-0003	15.5
NASB-MGBR-XRF-SB09-0003	53
NASB-MGBR-XRF-SB10-0003	21.5
NASB-MGBR-XRF-SB10-0612	22
NASB-MGBR-XRF-SB10-1218	23
NASB-MGBR-XRF-SB10-1824	24
NASB-MGBR-XRF-SB11-0003	21.5
NASB-MGBR-XRF-SB13-0003	33
NASB-MGBR-XRF-SB14-0003	21.5
NASB-MGBR-XRF-SB15-0003	25
NASB-MGBR-XRF-SB16-0003	43
NASB-MGBR-XRF-SB17-0003	20
NASB-MGBR-XRF-SB18-0003-AVG	23

Table 2 MGBR Copper Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available	
NASB-MGBR-XRF-SB19-0003	17.5
NASB-MGBR-XRF-SB20-0003-AVG	16.75
NASB-MGBR-XRF-SB21-0003	33
NASB-MGBR-XRF-SB22-0612	28.5
NASB-MGBR-XRF-SB22-1218	22
NASB-MGBR-XRF-SB22-1824	21
NASB-MGBR-XRF-SB23-0003	21.5
NASB-MGBR-XRF-SB24-0003	19.5
NASB-MGBR-XRF-SB25-0003	22.5
NASB-MGBR-XRF-SB26-0003	20.5
NASB-MGBR-XRF-SB27-0003	22
NASB-MGBR-XRF-SB28-0003	20
NASB-MGBR-XRF-SB29-0003	21
NASB-MGBR-XRF-SB30-0003-AVG	29
NASB-MGBR-XRF-SB30-0612	21
NASB-MGBR-XRF-SB30-1218	22
NASB-MGBR-XRF-SB30-1824	19
NASB-MGBR-XRF-SB31-0003	19.5
NASB-MGBR-XRF-SB32-0003	24
NASB-MGBR-XRF-SB33-0003	27
NASB-MGBR-XRF-SB34-0003	22.5
NASB-MGBR-XRF-SB36-0003	26.5
NASB-MGBR-XRF-SB38-0003	54
NASB-MGBR-XRF-SB39-0003	25.5

Table 3 MGBR Nickel Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available	
Sample	XRF Concentration (mg/kg)
NASB-MGBR-XRF-SB01-0612	26.5
NASB-MGBR-XRF-SB01-1216	65
NASB-MGBR-XRF-SB02-0003-AVG	25.75
NASB-MGBR-XRF-SB03-0003	19.5
NASB-MGBR-XRF-SB04-0003-AVG	20.5
NASB-MGBR-XRF-SB05-0003	18
NASB-MGBR-XRF-SB06-0003	23

Table 3 MGBR Nickel Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available	
NASB-MGBR-XRF-SB07-0003	22.5
NASB-MGBR-XRF-SB08-0003	18.5
NASB-MGBR-XRF-SB09-0003	22.5
NASB-MGBR-XRF-SB10-0003	25.5
NASB-MGBR-XRF-SB10-0612	26
NASB-MGBR-XRF-SB10-1218	27
NASB-MGBR-XRF-SB10-1824	30
NASB-MGBR-XRF-SB11-0003	25
NASB-MGBR-XRF-SB13-0003	17
NASB-MGBR-XRF-SB14-0003	25.5
NASB-MGBR-XRF-SB15-0003	29
NASB-MGBR-XRF-SB16-0003	22
NASB-MGBR-XRF-SB17-0003	23
NASB-MGBR-XRF-SB18-0003-AVG	29.25
NASB-MGBR-XRF-SB19-0003	21
NASB-MGBR-XRF-SB20-0003-AVG	20
NASB-MGBR-XRF-SB21-0003	16.5
NASB-MGBR-XRF-SB22-0612	42.5
NASB-MGBR-XRF-SB22-1218	27.5
NASB-MGBR-XRF-SB22-1824	26
NASB-MGBR-XRF-SB23-0003	26.5
NASB-MGBR-XRF-SB24-0003	24
NASB-MGBR-XRF-SB25-0003	27
NASB-MGBR-XRF-SB26-0003	25
NASB-MGBR-XRF-SB27-0003	25
NASB-MGBR-XRF-SB28-0003	23.5
NASB-MGBR-XRF-SB29-0003	25
NASB-MGBR-XRF-SB30-0003-AVG	36.5
NASB-MGBR-XRF-SB30-0612	25.5
NASB-MGBR-XRF-SB30-1218	25
NASB-MGBR-XRF-SB30-1824	22
NASB-MGBR-XRF-SB31-0003	23
NASB-MGBR-XRF-SB32-0003	27.5
NASB-MGBR-XRF-SB33-0003	30.5
NASB-MGBR-XRF-SB34-0003	27
NASB-MGBR-XRF-SB36-0003	30
NASB-MGBR-XRF-SB38-0003	26.5

Table 3 MGBR Nickel Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available	
NASB-MGBR-XRF-SB39-0003	31.5

Table 4 MGBR Predicted Zinc Laboratory Concentrations At Locations Where Laboratory Concentrations Not Available		
Sample	XRF Concentration (mg/kg)	Predicted Laboratory Concentration(mg/kg)
NASB-MGBR-XRF-SB01-0612	226	51.92
NASB-MGBR-XRF-SB01-1216	125	39.8
NASB-MGBR-XRF-SB02-0003-AVG	13.25	26.39
NASB-MGBR-XRF-SB03-0003	24	27.68
NASB-MGBR-XRF-SB04-0003-AVG	11.25	26.15
NASB-MGBR-XRF-SB05-0003	10.5	26.06
NASB-MGBR-XRF-SB06-0003	12	26.24
NASB-MGBR-XRF-SB07-0003	12	26.24
NASB-MGBR-XRF-SB08-0003	9	25.88
NASB-MGBR-XRF-SB09-0003	11.5	26.18
NASB-MGBR-XRF-SB10-0003	13.5	26.42
NASB-MGBR-XRF-SB10-0612	13.5	26.42
NASB-MGBR-XRF-SB10-1218	14.5	26.54
NASB-MGBR-XRF-SB10-1824	15	26.6
NASB-MGBR-XRF-SB11-0003	30	28.4
NASB-MGBR-XRF-SB13-0003	27	28.04
NASB-MGBR-XRF-SB14-0003	28	28.16
NASB-MGBR-XRF-SB15-0003	15	26.6
NASB-MGBR-XRF-SB16-0003	11.5	26.18
NASB-MGBR-XRF-SB17-0003	12.5	26.3
NASB-MGBR-XRF-SB18-0003-AVG	14.25	26.51
NASB-MGBR-XRF-SB19-0003	11	26.12
NASB-MGBR-XRF-SB20-0003-AVG	10.5	26.06
NASB-MGBR-XRF-SB21-0003	8.5	25.82
NASB-MGBR-XRF-SB22-0612	17.5	26.9
NASB-MGBR-XRF-SB22-1218	14	26.48
NASB-MGBR-XRF-SB22-1824	13	26.36
NASB-MGBR-XRF-SB23-0003	13.5	26.42
NASB-MGBR-XRF-SB24-0003	38	29.36
NASB-MGBR-XRF-SB25-0003	13.5	26.42
NASB-MGBR-XRF-SB26-0003	26	27.92

Table 4
MGBR
Predicted Zinc Laboratory Concentrations
At Locations Where Laboratory Concentrations Not Available

NASB-MGBR-XRF-SB27-0003	13.5	26.42
NASB-MGBR-XRF-SB28-0003	24	27.68
NASB-MGBR-XRF-SB29-0003	13	26.36
NASB-MGBR-XRF-SB30-0003-AVG	75	33.8
NASB-MGBR-XRF-SB30-0612	13	26.36
NASB-MGBR-XRF-SB30-1218	13.5	26.42
NASB-MGBR-XRF-SB30-1824	11	26.12
NASB-MGBR-XRF-SB31-0003	26	27.92
NASB-MGBR-XRF-SB32-0003	14.5	26.54
NASB-MGBR-XRF-SB33-0003	51	30.92
NASB-MGBR-XRF-SB34-0003	14	26.48
NASB-MGBR-XRF-SB36-0003	34	28.88
NASB-MGBR-XRF-SB38-0003	31	28.52
NASB-MGBR-XRF-SB39-0003	15	26.6

Figure 1
MGBR
Correlation Analysis
Lead

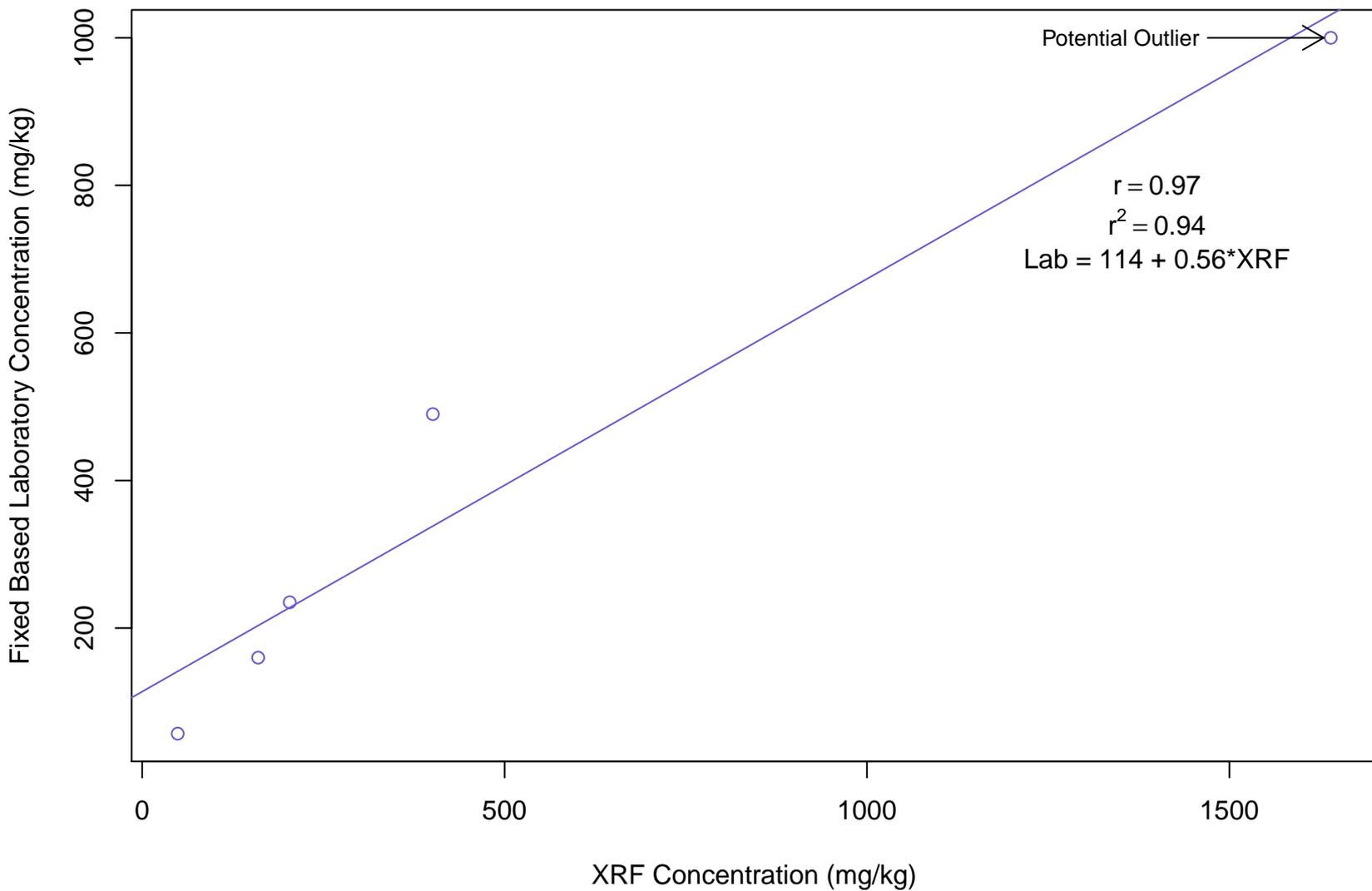


Figure 2
MGBR
Correlation Analysis
Lead with Outlier Removed

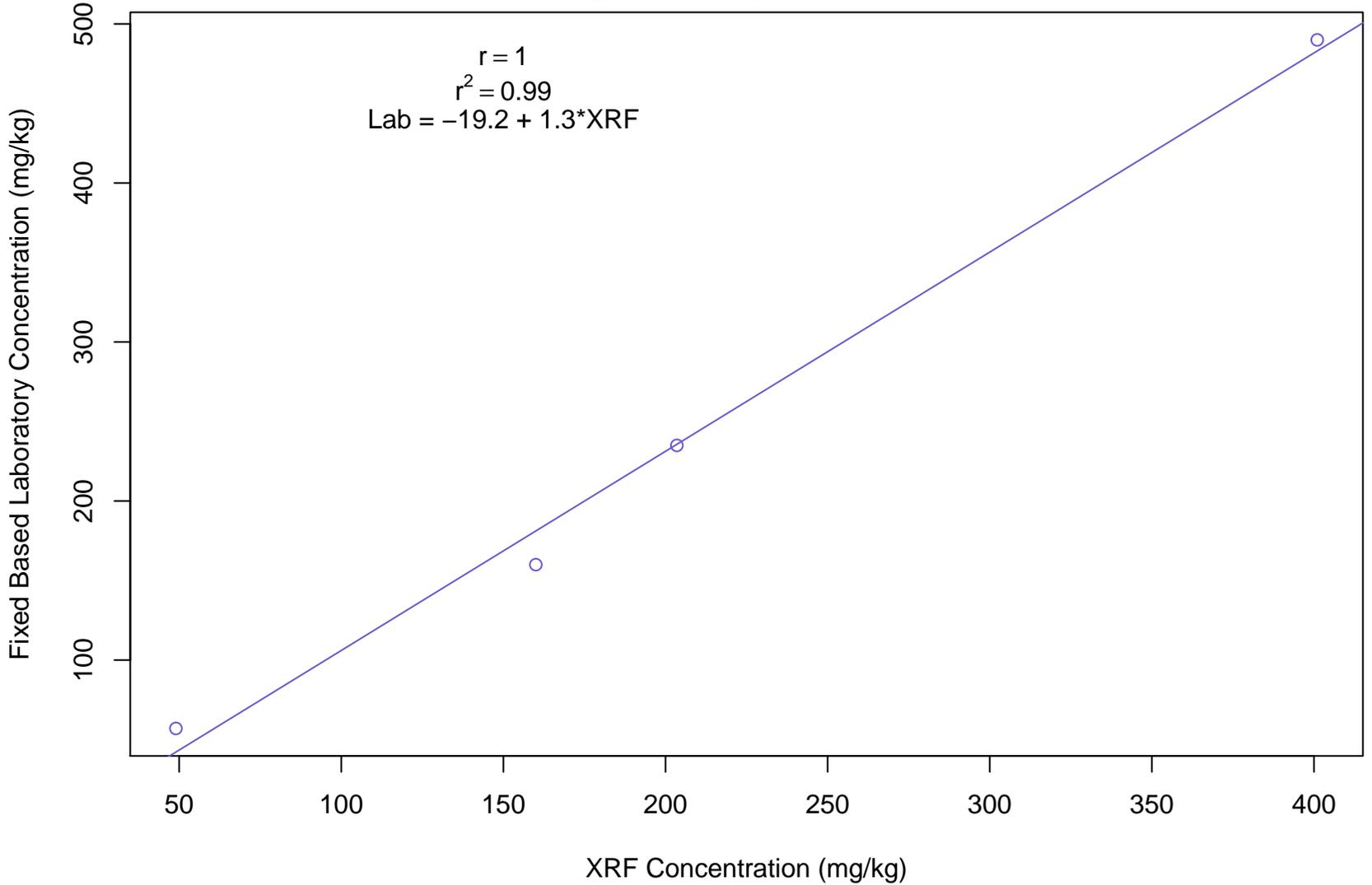


Figure 3
MGBR
Correlation Analysis
Copper

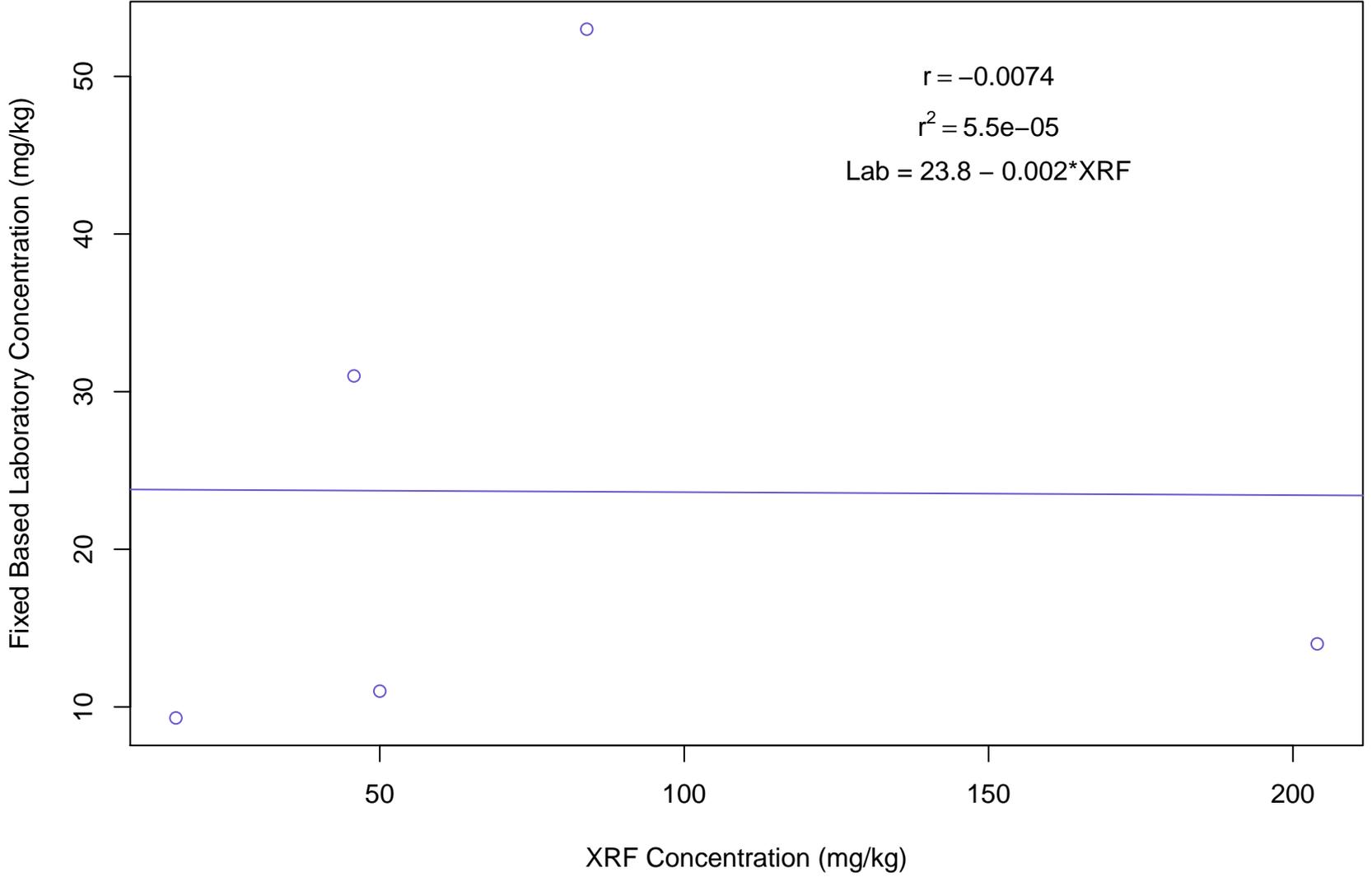


Figure 4
MGBR
Correlation Analysis
Nickel

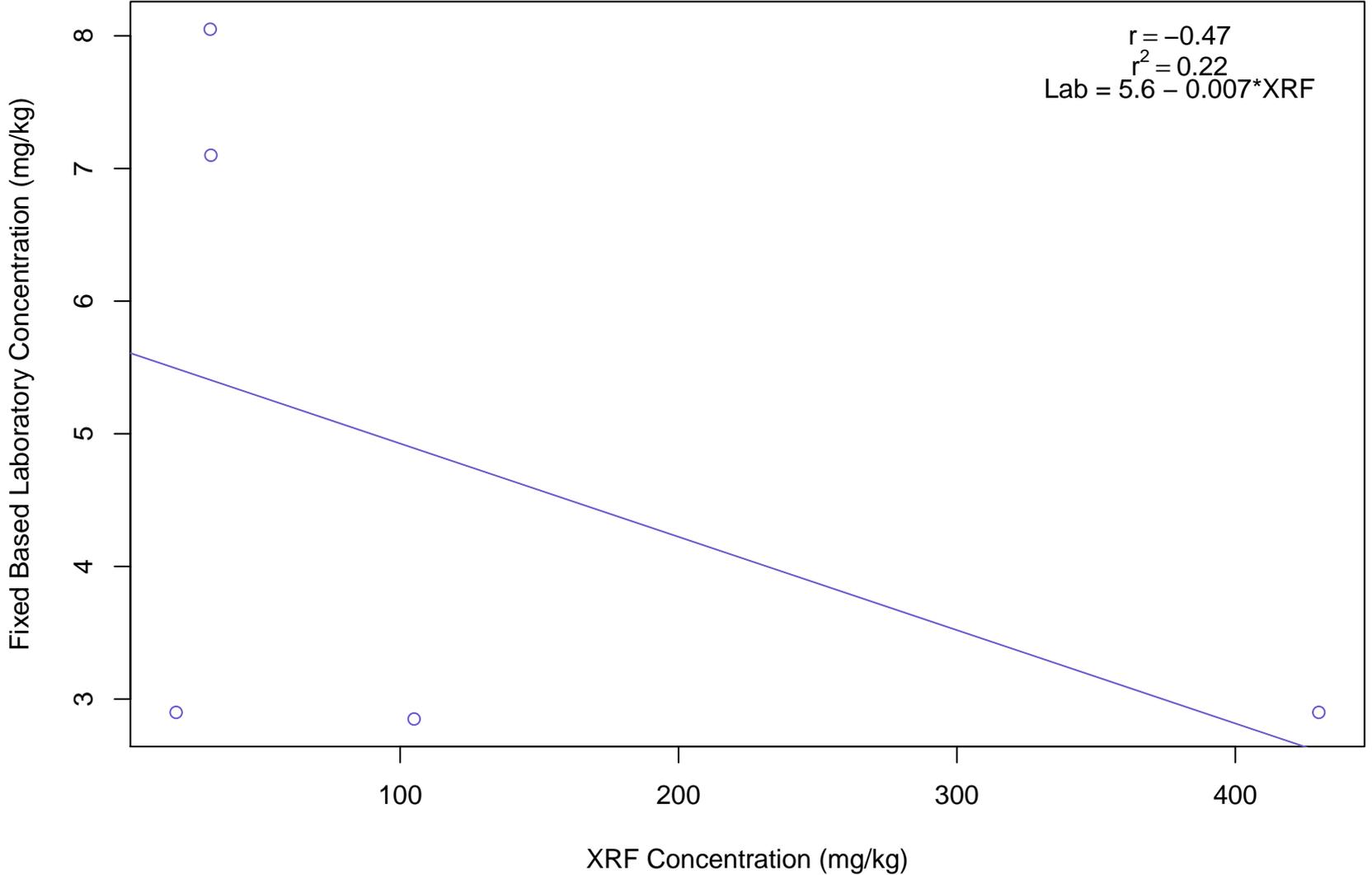
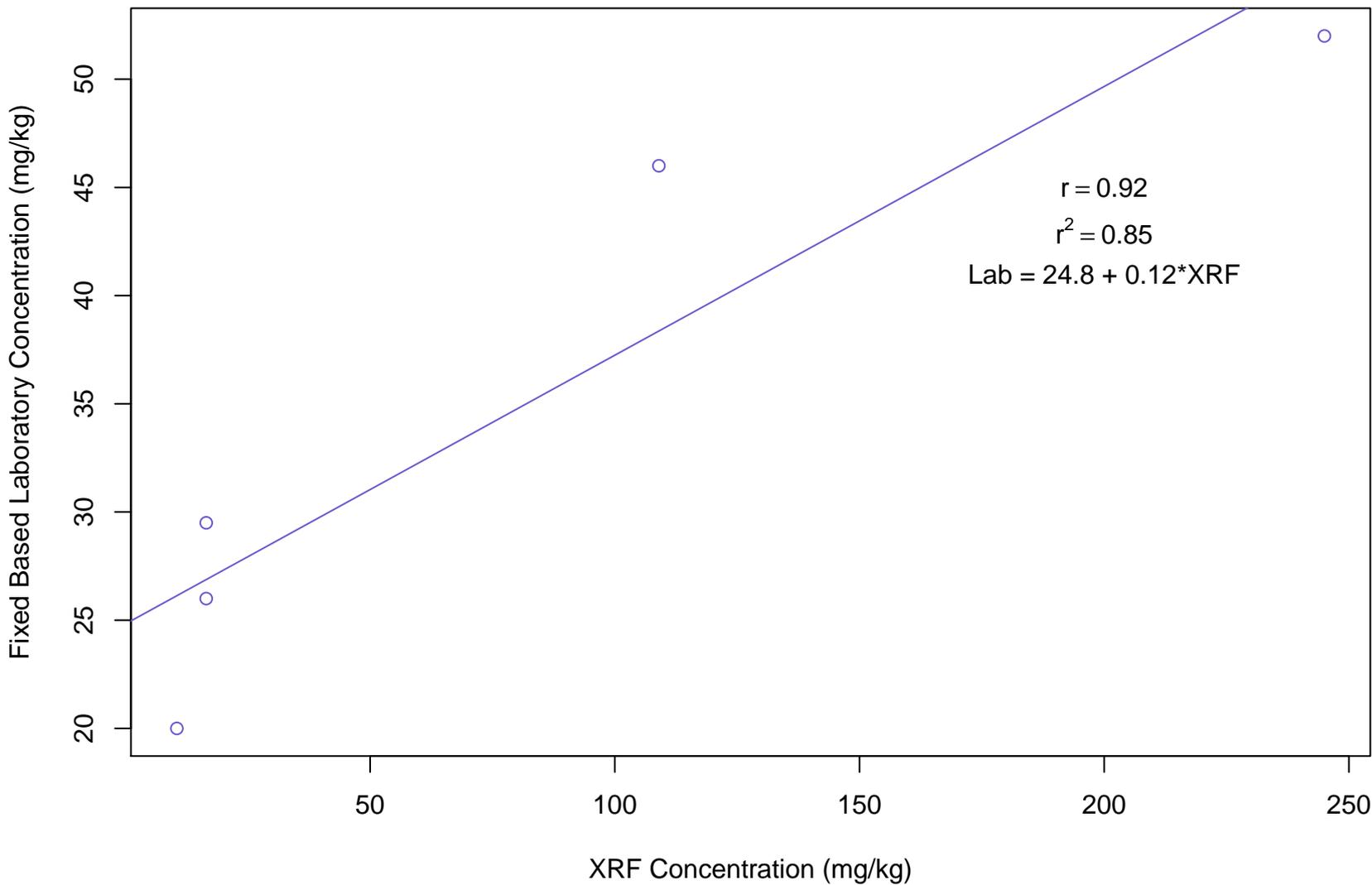


Figure 5
MGBR
Correlation Analysis
Zinc



Klink, Linda

From: Daly.Mike@epamail.epa.gov
Sent: Tuesday, July 01, 2008 1:21 PM
To: paul.burgio@navy.mil; todd.bober@navy.mil; Klink, Linda; claudia.b.sait@maine.gov; gordon.c.evans@maine.gov
Cc: Keefe.Jerry@epamail.epa.gov
Subject: NAS Brunswick: Revised EPA data from EPA XRF Sampling @ Boresight Range
Attachments: Machine Gun Boresight Range XRF Pb Results.1 May 08.xls; 08050003metmsrev.pdf; Brunswick_Soil_Sampling_05012008.pdf

Hi Folks,

I'm forwarding to you a more complete set of data from EPA's XRF sampling effort at the Boresight Range SI site on 1 May. I asked our field and fixed lab folks to go back and provide me data for other metals that were analyzed besides lead. This data give a more complete picture of metals concentrations for the area that was sampled. I assume we will all delve back into MMRP SI MC (gotta love these acronyms) issues in the near future as a BCT.

Have a Happy 4th!

Mike

(See attached file: Machine Gun Boresight Range XRF Pb Results.1 May 08.xls)(See attached file: 08050003metmsrev.pdf)(See attached file: Brunswick_Soil_Sampling_05012008.pdf)

USEPA X-Ray Fluorescence Pb Soil Sampling Results - Former Machine Gun Boresight Range NAS Brunswick - May 1, 2008

Soil Sample	Pb Concentration (ppm)	Zn Concentration (ppm)	Cu Concentration (ppm)	Ni Concentration (ppm)	Longitude	Latitude
MBR-SB-01	1640	245	204	430	69.927505	43.890079
MBR-SB-01 (6-12")	226	226	62	<53		
MBR-SB-01 (12-18")	610	125	<74	<130		
MBR-SB-02	17	<26	<43	<51	69.927430	43.890245
MBR-SB-02 DUP	21	<27	<43	<52		
MBR-SB-03	86	24	45	<39	69.927326	43.890294
MBR-SB-04	76	<22	58	<40	69.927254	43.890343
MBR-SB-04 DUP	82	<23	<37	<42		
MBR-SB-05	77	<21	40	<36	69.927169	43.890357
MBR-SB-06	17	<24	<39	<46	69.927395	43.890191
MBR-SB-07	61	<24	<39	<45	69.927289	43.890230
MBR-SB-08	83	<18	<31	<37	69.927203	43.890260
MBR-SB-09	43	<23	53	<45	69.927133	43.890296
MBR-SB-10	25	<27	<43	<51	69.927372	43.890119
MBR-SB-10 (6-12")	19	<27	<44	<52		
MBR-SB-10 (12-18")	<14	<29	<46	<54		
MBR-SB-10 (18-24")	<16	<30	<48	<60		
MBR-SB-11	26	30	<43	<50	69.927272	43.890119
MBR-SB-12	49	<21	<33	<39	69.927193	43.890143
MBR-SB-13	48	27	33	<34	69.927117	43.890120
MBR-SB-14	98	28	<43	<51	69.927369	43.890048
MBR-SB-15	42	<30	<50	<58	69.927269	43.890052
MBR-SB-16	79	<23	43	<44	69.927173	43.890046
MBR-SB-17	34	<25	<40	<46	69.927065	43.890036
MBR-SB-18	28	<30	<49	<61	69.927390	43.889980
MBR-SB-18 DUP	37	<27	<43	<56		
MBR-SB-19	25	<22	<35	<42	69.927264	43.889993
MBR-SB-20	33	<20	<32	<39	69.927185	43.889976
MBR-SB-20 DUP	28	<22	<35	<41		
MBR-SB-21	76	<17	33	<33	69.927080	43.889967
MBR-SB-22	401	109	<100	<210	69.927463	43.890302
MBR-SB-22 (6-12")	112	<35	<57	<85		
MBR-SB-22 (12-18")	44	<28	<44	<55		
MBR-SB-22 (18-24")	88	<26	<42	<52		
MBR-SB-23	26	<27	<43	<53	69.927503	43.890242
MBR-SB-24	23	38	<39	<48	69.927482	43.890169
MBR-SB-25	38	<27	<45	<54	69.927466	43.890115
MBR-SB-26	94	26	<41	<50	69.927459	43.890052
MBR-SB-27	30	<27	<44	<50	69.927468	43.889983
MBR-SB-28	24	24	<40	<47	69.927595	43.890245
MBR-SB-29	<13	<26	<42	<50	69.927569	43.890173
MBR-SB-30	226	56	<58	<74	69.927558	43.890104
MBR-SB-30 DUP	226	94	<58	<72		
MBR-SB-30 (6-12")	52	<26	<42	<51		
MBR-SB-30 (12-18")	46	<27	<44	<50		
MBR-SB-30 (18-24")	36	<22	<38	<44		
MBR-SB-31	30	26	<39	<46	69.927548	43.890048
MBR-SB-32	71	<29	<48	<55	69.927554	43.889976
MBR-SB-33	57	51	<54	<61	69.927659	43.890165
MBR-SB-34	76	<28	<45	<54	69.927651	43.890095
MBR-SB-35	160	<33	84	<64	69.927640	43.890030
MBR-SB-36	68	34	<53	<60	69.927629	43.889958
MBR-SB-37	208	<29	<49	<59	69.927750	43.890149
MBR-SB-37 DUP	199	<37	67	<68		
MBR-SB-38	42	31	54	<53	69.927740	43.890083
MBR-SB-39	96	<30	<51	<63	69.927724	43.890016



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

June 26, 2008

Michael Daly - HBT
US EPA New England, Region I
One Congress Street
Boston, MA 02114 - 2023

Project Number: 08050003
Project: Brunswick Naval Air Station - Brunswick, ME
Analysis: Metals in Soil Medium Level by ICP
EPA Chemist: Michael Dowling

MD 6/26/08

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Samples were analyzed following the EPA Region I SOP, EIASOP-INGICP7.

Sample preparation was done following the EPA Region I SOP, INGMETALSPREP6.SOP.

Samples were analyzed by inductively coupled plasma - atomic emission spectrometry using pneumatic nebulization. Preparation and analysis SOP's are based on "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition, Revision 2, Final Update III, Methods 3050B and 6010B," respectively.

Date Samples Received by the Laboratory: 5/2/08

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Report may contain multiple sections and each section will be numbered independently.

If you have any questions please call me at 617-918-8340

Sincerely,

Daniel N. Boudreau 6/30/08
Daniel N. Boudreau
Chemistry Team Leader

Qualifiers:

- RL** Reporting limit
- ND** Not Detected above reporting limit
- NA** Not Applicable
- NC** Not calculated since analyte concentration is ND
- J1** Estimated value due to MS recovery outside acceptance criteria
- J2** Estimated value due to LFB result outside acceptance criteria
- J3** Estimated value due to RPD result outside acceptance criteria
- J4** Estimated value due to LCS result outside acceptance criteria
- B** Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.
- R** No recovery was calculated since the analyte concentration is greater than four times the spike level.

Comments:

The samples were prepared and analyzed by ESAT contractors.

Sample results are in mg/Kg, dry weight.

Only lead results were originally reported. The results for additional metals are included on this report as per Mike Daly's request.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Metals in Soil Medium Level by ICP

Client Sample ID: MBR-SB01
Date of Collection: 5/1/2008
Date of Digestion: 5/13/2008
Date of Analysis: 05/16/2008
Volume Digested: N/A

Lab Sample ID: AA82438
Matrix: Soil
Final Volume: 50 mL
Digestate Dilution: 1
pH: N/A

CAS Number	Parameter	Concentration mg/Kg	RL mg/Kg	Qualifier
7429-90-5	Aluminum	5800	19	
7440-36-0	Antimony	ND	9.6	
7440-38-2	Arsenic	ND	19	
7440-39-3	Barium	26	2.9	
7440-41-7	Beryllium	ND	0.96	
7440-43-9	Cadmium	4.9	2.9	
7440-70-2	Calcium	2600	19	
7440-47-3	Chromium	320	2.9	
7440-48-4	Cobalt	3.3	2.9	
7440-50-8	Copper	14	2.9	
7439-89-6	Iron	17000	9.6	
7439-92-1	Lead	1000	9.6	
7439-95-4	Magnesium	1800	19	
7439-96-5	Manganese	170	1.9	
7440-02-0	Nickel	ND	5.8	
7782-49-2	Selenium	ND	19	
7440-22-4	Silver	ND	2.9	J2
7440-28-0	Thallium	ND	19	
7440-62-2	Vanadium	14	2.9	
7440-66-6	Zinc	52	2.9	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Metals in Soil Medium Level by ICP

Client Sample ID: MBR-SB12
Date of Collection: 5/1/2008
Date of Digestion: 5/13/2008
Date of Analysis: 05/16/2008
Volume Digested: N/A

Lab Sample ID: AA82439
Matrix: Soil
Final Volume: 50 mL
Digestate Dilution: 1
pH: N/A

CAS Number	Parameter	Concentration mg/Kg	RL mg/Kg	Qualifier
7429-90-5	Aluminum	5700	19	
7440-36-0	Antimony	ND	9.7	
7440-38-2	Arsenic	ND	19	
7440-39-3	Barium	30	2.9	
7440-41-7	Beryllium	ND	0.97	
7440-43-9	Cadmium	ND	2.9	
7440-70-2	Calcium	340	19	
7440-47-3	Chromium	8.3	2.9	
7440-48-4	Cobalt	ND	2.9	
7440-50-8	Copper	9.3	2.9	
7439-89-6	Iron	8300	9.7	
7439-92-1	Lead	57	9.7	
7439-95-4	Magnesium	740	19	
7439-96-5	Manganese	64	1.9	
7440-02-0	Nickel	ND	5.8	
7782-49-2	Selenium	ND	19	
7440-22-4	Silver	ND	2.9	J2
7440-28-0	Thallium	ND	19	
7440-62-2	Vanadium	22	2.9	
7440-66-6	Zinc	20	2.9	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Metals in Soil Medium Level by ICP

Client Sample ID: MBR-SB22
Date of Collection: 5/1/2008
Date of Digestion: 5/13/2008
Date of Analysis: 05/16/2008
Volume Digested: N/A

Lab Sample ID: AA82440
Matrix: Soil
Final Volume: 50 mL
Digestate Dilution: 1
pH: N/A

CAS Number	Parameter	Concentration mg/Kg	RL mg/Kg	Qualifier
7429-90-5	Aluminum	6400	19	
7440-36-0	Antimony	ND	9.5	J1
7440-38-2	Arsenic	ND	19	
7440-39-3	Barium	55	2.8	
7440-41-7	Beryllium	ND	0.95	
7440-43-9	Cadmium	22	2.8	
7440-70-2	Calcium	1900	19	
7440-47-3	Chromium	170	2.8	
7440-48-4	Cobalt	3.5	2.8	
7440-50-8	Copper	11	2.8	
7439-89-6	Iron	14000	9.5	
7439-92-1	Lead	490	9.5	
7439-95-4	Magnesium	1700	19	
7439-96-5	Manganese	160	1.9	
7440-02-0	Nickel	ND	5.7	
7782-49-2	Selenium	ND	19	
7440-22-4	Silver	ND	2.8	J2
7440-28-0	Thallium	ND	19	
7440-62-2	Vanadium	14	2.8	
7440-66-6	Zinc	46	2.8	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Metals in Soil Medium Level by ICP

Client Sample ID:	MBR-SB35	Lab Sample ID:	AA82441
Date of Collection:	5/1/2008	Matrix:	Soil
Date of Digestion:	5/13/2008	Final Volume:	50 mL
Date of Analysis:	05/16/2008	Digestate Dilution:	1
Volume Digested:	N/A	pH:	N/A

CAS Number	Parameter	Concentration mg/Kg	RL mg/Kg	Qualifier
7429-90-5	Aluminum	8200	19	
7440-36-0	Antimony	ND	9.6	
7440-38-2	Arsenic	ND	19	
7440-39-3	Barium	33	2.9	
7440-41-7	Beryllium	ND	0.96	
7440-43-9	Cadmium	ND	2.9	
7440-70-2	Calcium	1200	19	
7440-47-3	Chromium	17	2.9	
7440-48-4	Cobalt	3.7	2.9	
7440-50-8	Copper	53	2.9	
7439-89-6	Iron	8600	9.6	
7439-92-1	Lead	160	9.6	
7439-95-4	Magnesium	1300	19	
7439-96-5	Manganese	110	1.9	
7440-02-0	Nickel	7.1	5.8	
7782-49-2	Selenium	ND	19	
7440-22-4	Silver	ND	2.9	J2
7440-28-0	Thallium	ND	19	
7440-62-2	Vanadium	14	2.9	
7440-66-6	Zinc	26	2.9	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Metals in Soil Medium Level by ICP

Client Sample ID: MBR-SB37
Date of Collection: 5/1/2008
Date of Digestion: 5/13/2008
Date of Analysis: 05/16/2008
Volume Digested: N/A

Lab Sample ID: AA82442
Matrix: Soil
Final Volume: 50 mL
Digestate Dilution: 1
pH: N/A

CAS Number	Parameter	Concentration mg/Kg	RL mg/Kg	Qualifier
7429-90-5	Aluminum	8100	20	
7440-36-0	Antimony	ND	9.8	
7440-38-2	Arsenic	ND	20	
7440-39-3	Barium	28	2.9	
7440-41-7	Beryllium	ND	0.98	
7440-43-9	Cadmium	ND	2.9	
7440-70-2	Calcium	1100	20	
7440-47-3	Chromium	12	2.9	
7440-48-4	Cobalt	4.3	2.9	
7440-50-8	Copper	30	2.9	
7439-89-6	Iron	9300	9.8	
7439-92-1	Lead	230	9.8	
7439-95-4	Magnesium	1700	20	
7439-96-5	Manganese	160	2.0	
7440-02-0	Nickel	8.3	5.9	
7782-49-2	Selenium	ND	20	
7440-22-4	Silver	ND	2.9	J2
7440-28-0	Thallium	ND	20	
7440-62-2	Vanadium	16	2.9	
7440-66-6	Zinc	28	2.9	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Metals in Soil Medium Level by ICP

Client Sample ID: MBR-SB37 D
Date of Collection: 5/1/2008
Date of Digestion: 5/13/2008
Date of Analysis: 05/16/2008
Volume Digested: N/A

Lab Sample ID: AA82443
Matrix: Soil
Final Volume: 50 mL
Digestate Dilution: 1
pH: N/A

CAS Number	Parameter	Concentration mg/Kg	RL mg/Kg	Qualifier
7429-90-5	Aluminum	8200	19	
7440-36-0	Antimony	ND	9.7	
7440-38-2	Arsenic	ND	19	
7440-39-3	Barium	27	2.9	
7440-41-7	Beryllium	ND	0.97	
7440-43-9	Cadmium	ND	2.9	
7440-70-2	Calcium	1100	19	
7440-47-3	Chromium	13	2.9	
7440-48-4	Cobalt	4.5	2.9	
7440-50-8	Copper	32	2.9	
7439-89-6	Iron	9800	9.7	
7439-92-1	Lead	240	9.7	
7439-95-4	Magnesium	1800	19	
7439-96-5	Manganese	160	1.9	
7440-02-0	Nickel	7.8	5.8	
7782-49-2	Selenium	ND	19	
7440-22-4	Silver	ND	2.9	J2
7440-28-0	Thallium	ND	19	
7440-62-2	Vanadium	17	2.9	
7440-66-6	Zinc	31	2.9	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Brunswick Naval Air Station - Brunswick, ME

Laboratory Reagent Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Digestion: 5/13/2008
Date of Analysis: 05/16/2008
Volume Digested: 50 mL

Lab Sample ID: N/A
Matrix: Water
Final Volume: 50 mL
Digestate Dilution: 1
pH: N/A

CAS Number	Parameter	Concentration ug/L	RL ug/L	Qualifier
7429-90-5	Aluminum	ND	200	
7440-36-0	Antimony	ND	100	
7440-38-2	Arsenic	ND	200	
7440-39-3	Barium	ND	30	
7440-41-7	Beryllium	ND	10	
7440-43-9	Cadmium	ND	30	
7440-70-2	Calcium	ND	200	
7440-47-3	Chromium	ND	30	
7440-48-4	Cobalt	ND	30	
7440-50-8	Copper	ND	30	
7439-89-6	Iron	ND	100	
7439-92-1	Lead	ND	100	
7439-95-4	Magnesium	ND	200	
7439-96-5	Manganese	ND	20	
7440-02-0	Nickel	ND	60	
7782-49-2	Selenium	ND	200	
7440-22-4	Silver	ND	30	
7440-28-0	Thallium	ND	200	
7440-62-2	Vanadium	ND	30	
7440-66-6	Zinc	ND	30	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

METALS MATRIX SPIKE (MS) RESULTS

Sample ID: AA82440

PARAMETER	SPIKE ADDED mg/Kg	SAMPLE CONCENTRATION mg/Kg	MS CONCENTRATION mg/Kg	MS % REC	QC LIMITS (% REC)
Antimony	96.0	ND	52.7	55	75 - 125
Arsenic	96.0	ND	87.8	92	75 - 125
Barium	96.0	55	144	93	75 - 125
Beryllium	38.4	ND	36.8	96	75 - 125
Cadmium	48.0	22	61.1	82	75 - 125
Chromium	96.0	170	261	95	75 - 125
Cobalt	96.0	3.5	92.6	93	75 - 125
Copper	96.0	11	102	95	75 - 125
Lead	96.0	490	580	R	75 - 125
Manganese	96.0	160	261	105	75 - 125
Nickel	96.0	ND	93.6	98	75 - 125
Selenium	96.0	ND	85.6	89	75 - 125
Silver	19.2	ND	14.6	76	75 - 125
Thallium	96.0	ND	90.8	95	75 - 125
Vanadium	96.0	14	103	93	75 - 125
Zinc	96.0	46	128	85	75 - 125

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Laboratory Duplicate Results

Sample ID: AA82438

PARAMETER	SAMPLE RESULT mg/Kg	SAMPLE DUPLICATE RESULT mg/Kg	PRECISION RPD %	QC LIMITS
Aluminum	5800	5400	7	30
Antimony	ND	ND	NC	30
Arsenic	ND	ND	NC	30
Barium	26	21	21	30
Beryllium	ND	ND	NC	30
Cadmium	4.9	ND	NC	30
Calcium	2600	2500	4	30
Chromium	320	260	21	30
Cobalt	3.3	3.1	6	30
Copper	14	13	7	30
Iron	17000	16000	6	30
Lead	1000	790	23	30
Magnesium	1800	1700	6	30
Manganese	170	150	12	30
Nickel	ND	ND	NC	30
Selenium	ND	ND	NC	30
Silver	ND	ND	NC	30
Thallium	ND	ND	NC	30
Vanadium	14	14	0	30
Zinc	52	49	6	30

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/L	LFB RESULT ug/L	LFB RECOVERY %	QC LIMITS %
Aluminum	1000	973	97	85 - 115
Antimony	1000	920	92	85 - 115
Arsenic	1000	982	98	85 - 115
Barium	1000	1060	106	85 - 115
Beryllium	400	403	101	85 - 115
Cadmium	500	474	95	85 - 115
Calcium	10000	9510	95	85 - 115
Chromium	1000	1000	100	85 - 115
Cobalt	1000	1010	101	85 - 115
Copper	1000	1030	103	85 - 115
Iron	1000	992	99	85 - 115
Lead	1000	945	95	85 - 115
Magnesium	10000	9820	98	85 - 115
Manganese	1000	1020	102	85 - 115
Nickel	1000	1010	101	85 - 115
Selenium	1000	952	95	85 - 115
Silver	200	166	83	85 - 115
Thallium	1000	1010	101	85 - 115
Vanadium	1000	1010	101	85 - 115
Zinc	1000	947	95	85 - 115

Comments:

Samples in Batch: AA82438, AA82439, AA82440, AA82441, AA82442, AA82443

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Solid Laboratory Control Sample (LCS) Results

PARAMETER	LCS RESULTS mg/Kg	CONTROL LIMITS mg/Kg
Aluminum	7630	4820 - 13400
Antimony	98.9	0 - 238
Arsenic	144	116 - 186
Barium	277	223 - 321
Beryllium	102	83.7 - 121
Cadmium	87.1	76.3 - 114
Calcium	6030	5530 - 8170
Chromium	119	96.6 - 143
Cobalt	65.9	54.7 - 79.9
Copper	83.8	64.9 - 101
Iron	14400	8880 - 24400
Lead	112	94.1 - 145
Magnesium	2350	2020 - 3160
Manganese	375	313 - 455
Nickel	99.6	81.0 - 123
Selenium	134	107 - 169
Silver	92.2	64.2 - 129
Thallium	164	132 - 208
Vanadium	125	99.5 - 159
Zinc	106	92.5 - 142

Comments:



ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME					NO. OF CONTAINERS	REMARKS				
78050003		Brunswick Naval Air Station Brunswick, ME										
SAMPLERS: (Signature) Dan Granz Jerry Keefe JR for												
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION							
	5/1/08	11:00		✓	MBR-SB01		1	X				
		12:18		✓	MBR-SB12		1	X				
		11:40		✓	MBR-SB22		1	X				
		1500		✓	MBR-SB35		1	X				
		1520		✓	MBR-SB37		1	X				
	↓	1520		✓	MBR-SB37D		1	X				

ICP Metals (Pb only)

Relinquished by: (Signature) <i>[Signature]</i>	Date / Time 5/2/08 0925	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date / Time 05/02/08 09:25	Remarks Mike Daly RPM
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Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

F-2 SKEET RANGE

**NASB SKEET RANGE
CORRELATION OF FIXED BASED LABORATORY AND XRF LEAD
CONCENTRATIONS
NAVAL AIR STATION BRUNSWICK, MAINE**

To determine if the XRF lead concentrations can be used to predict fixed based laboratory concentrations a statistical correlation analysis was conducted. If the correlation between the XRF and fixed based laboratory concentrations is greater than or equal to 0.65 then the XRF concentrations can be used to predict fixed based laboratory concentrations. The correlation always falls between -1 and 1. Values of r near 0 indicate a very weak linear relationship. The strength of the linear relationship increases as r moves away from 0 toward either -1 or 1. Values of r close to -1 and 1 indicate that the points lie close to a straight line. The extreme values -1 and 1 occur only in the case of a perfect linear relationship. So the correlation indicates a strong linear trend. The R squared value represents the percent of variation in laboratory concentrations that can be explained by the XRF concentration. An R-squared value greater than approximately 80 percent is considered to indicate a very strong relationship between the two measurement methods. The maximum possible value is 100 percent. Recall that the XRF samples and fixed based data were not collected from the same sample as typical. The primary purpose of the XRF for this project was to confirm the location and boundaries of the skeet range; first XRF samples were collected and, at a later date, fixed based data were collected. Therefore, correlations for lead were expected to be somewhat lower than typical.

Figure 1 is a scatterplot of the XRF lead concentrations and the corresponding fixed based laboratory lead concentrations for each sample where both XRF and fixed based data are available. From the scatterplot, a linear trend is evident. The correlation is 0.25 indicating a weak linear relationship between the XRF and laboratory concentrations. However, there is a wide range of concentrations; XRF concentrations range from 18 to 1,839 mg/kg and fixed based laboratory concentrations range from 3.8 to 29,300 mg/kg. There appear to be two groups of data concentrations; one grouping with XRF concentrations less than 100 mg/kg and another grouping with XRF concentrations greater than 100 mg/kg that warranted further evaluation.

Figure 2 is a scatterplot of the XRF lead concentrations and the corresponding fixed based laboratory lead concentrations for those samples with XRF concentrations less than 100 mg/kg. From the scatterplot, a linear trend is evident. The correlation is 0.78 indicating a good correlation. The correlation is greater than 0.65, as stipulated in the SAP; therefore, the XRF concentrations can be used to predict laboratory concentrations where XRF concentrations are less than 100 mg/kg. Table 1 presents the predicted laboratory concentrations for the XRF concentrations that are less than 100 mg/kg where no laboratory concentrations are available. (For concentrations where the predicted laboratory concentration was negative, zero was used as the concentration).

Figure 3 is a scatterplot of the XRF lead concentrations and the corresponding laboratory lead concentrations for those samples with XRF concentrations greater than 100 mg/kg. From the scatterplot a linear trend is evident. The correlation is 0.062 indicating a very weak correlation; therefore, the XRF concentrations cannot be used to predict laboratory concentrations where XRF concentrations are greater than 100 mg/kg. However, for every sample where the XRF concentration was greater than 100 mg/kg in the scatterplot, the corresponding laboratory concentration was greater than the project action limit (PAL) of 40 mg/kg. Therefore, although XRF data with concentrations greater than 100 mg/kg were unable to be statistically correlated,

the XRF data is all usable, although with qualification. Table 2 presents the predicted laboratory concentrations for the XRF concentrations that are greater than 100 mg/kg where no laboratory concentrations are available; all predicted concentrations are qualified as "greater than the PAL of 40 mg/kg."

TABLE 1
NASB Skeet Range
Predicted Lead Laboratory Concentrations for XRF Concentrations < 100 mg/kg
At Locations Where Laboratory Concentrations Not Available

Sample	XRF Concentration (mg/kg)	Predicted Laboratory Concentration(mg/kg)
NASB-SKT-XRF-SS06-0312	30	61
NASB-SKT-XRF-SS07-0312	28	46.4
NASB-SKT-XRF-SS08-0312	20	0
NASB-SKT-XRF-SS13-0003	44	163.2
NASB-SKT-XRF-SS13-0312	35	97.5
NASB-SKT-XRF-SS14-0003	20	0
NASB-SKT-XRF-SS14-0312	25	24.5
NASB-SKT-XRF-SS15-0003	61	287.3
NASB-SKT-XRF-SS17-0312	41	141.3
NASB-SKT-XRF-SS18-0003	33	82.9
NASB-SKT-XRF-SS18-0312	32	75.6
NASB-SKT-XRF-SS19-0312	22	2.6
NASB-SKT-XRF-SS20-0003	56	250.8
NASB-SKT-XRF-SS20-0312	18	0
NASB-SKT-XRF-SS21-0312	16	0
NASB-SKT-XRF-SS22-0003	35	97.5
NASB-SKT-XRF-SS22-0312	31	68.3
NASB-SKT-XRF-SS23-0312	16	0
NASB-SKT-XRF-SS24-0003	17	0
NASB-SKT-XRF-SS25-0003	21	0

TABLE 2
NASB Skeet Range
Predicted Lead Laboratory Concentrations for XRF Concentrations >100 mg/kg
At Locations Where Laboratory Concentrations Not Available

Sample	XRF Concentration (mg/kg)	Predicted Laboratory Concentration(mg/kg)
NASB-SKT-XRF-SS15-0312	200	Greater than PAL of 40
NASB-SKT-XRF-SS23-0003	157	Greater than PAL of 40
NASB-SKT-XRF-SS16-0312	136	Greater than PAL of 40
NASB-SKT-XRF-SS16-0003	111	Greater than PAL of 40

Figure 1
NASB Skeet Range
Correlation Analysis

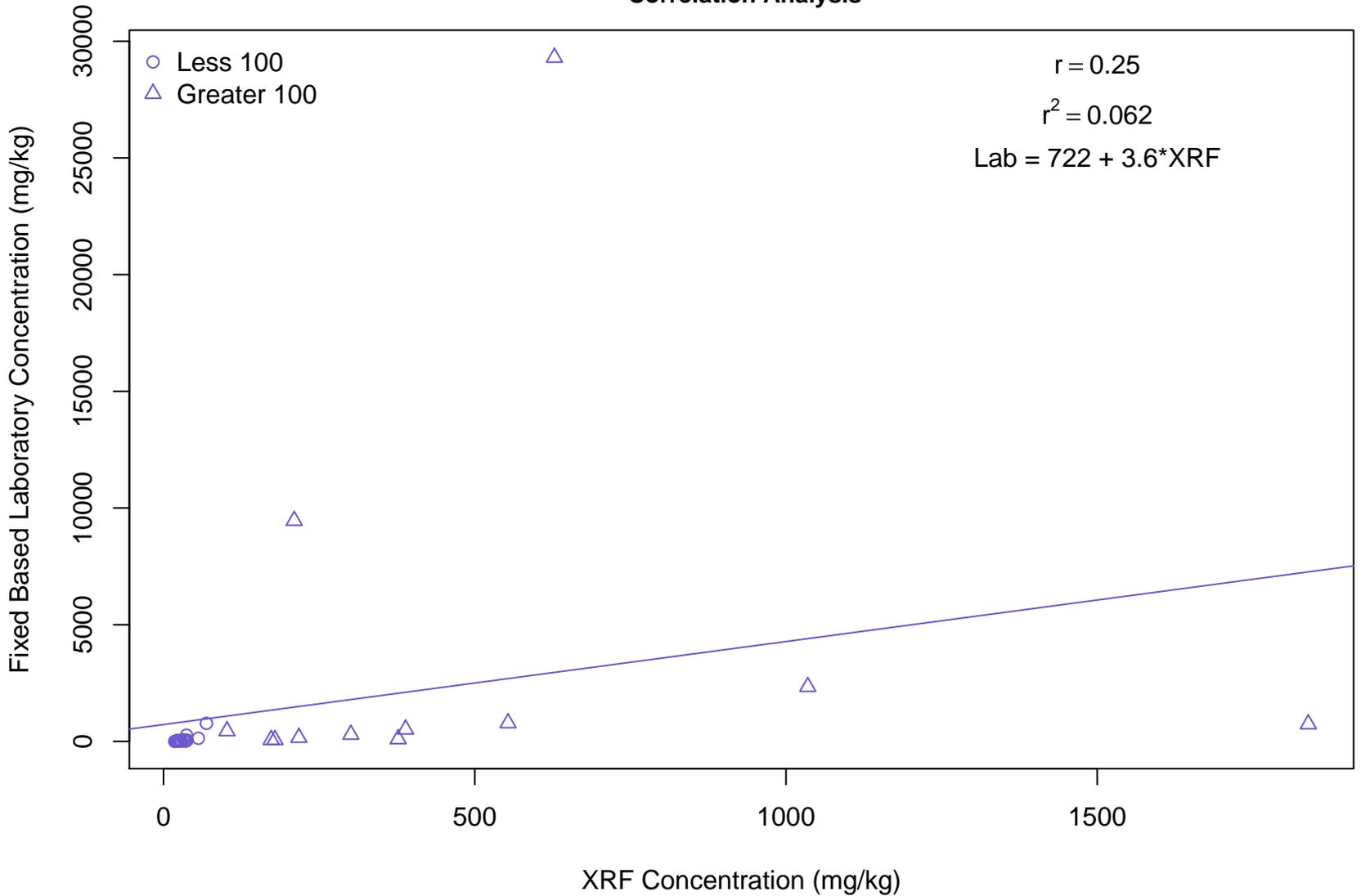


Figure 2
NASB Skeet Range
Correlation Analysis with XRF Concentrations less 100 mg/kg

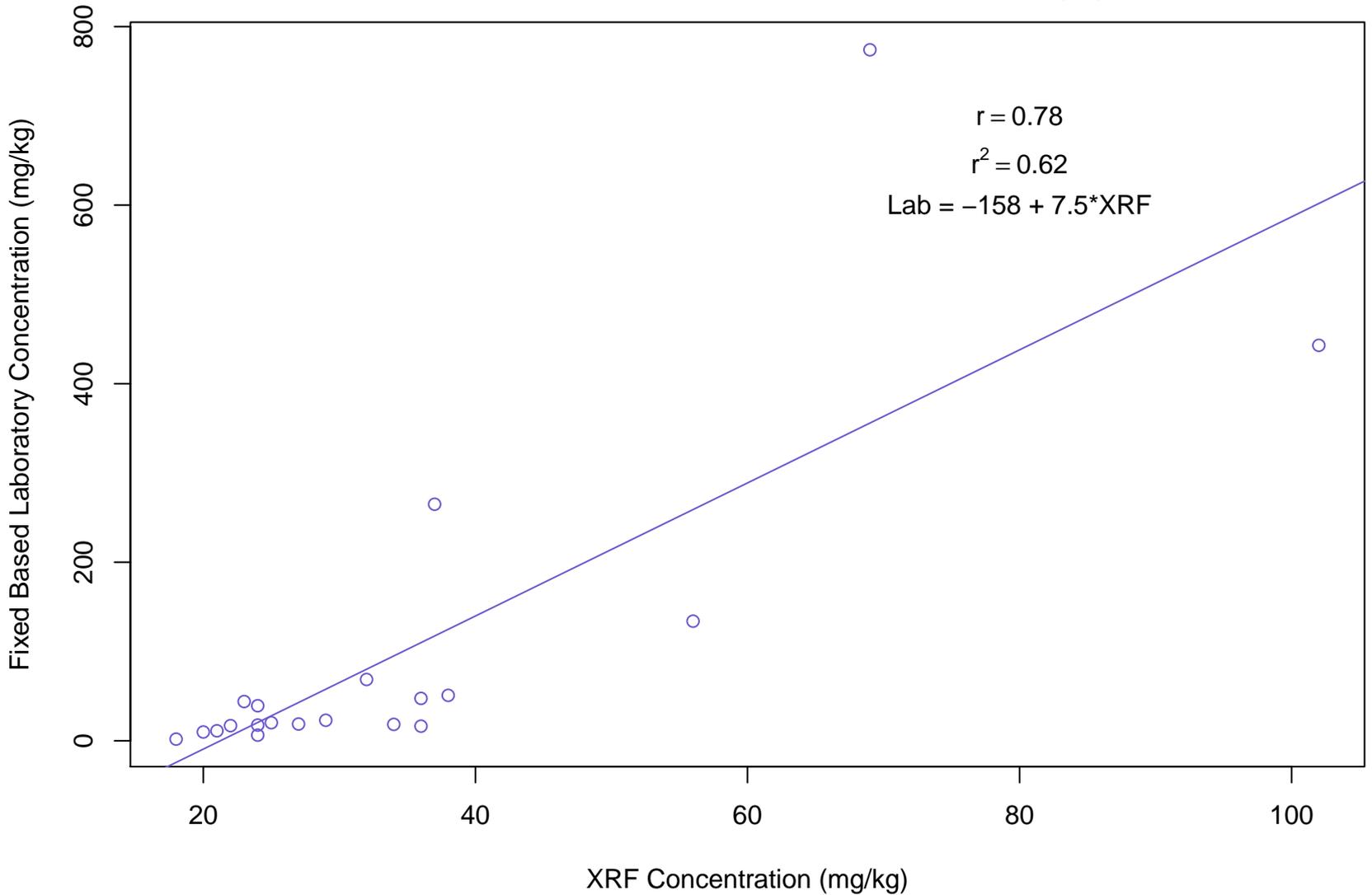
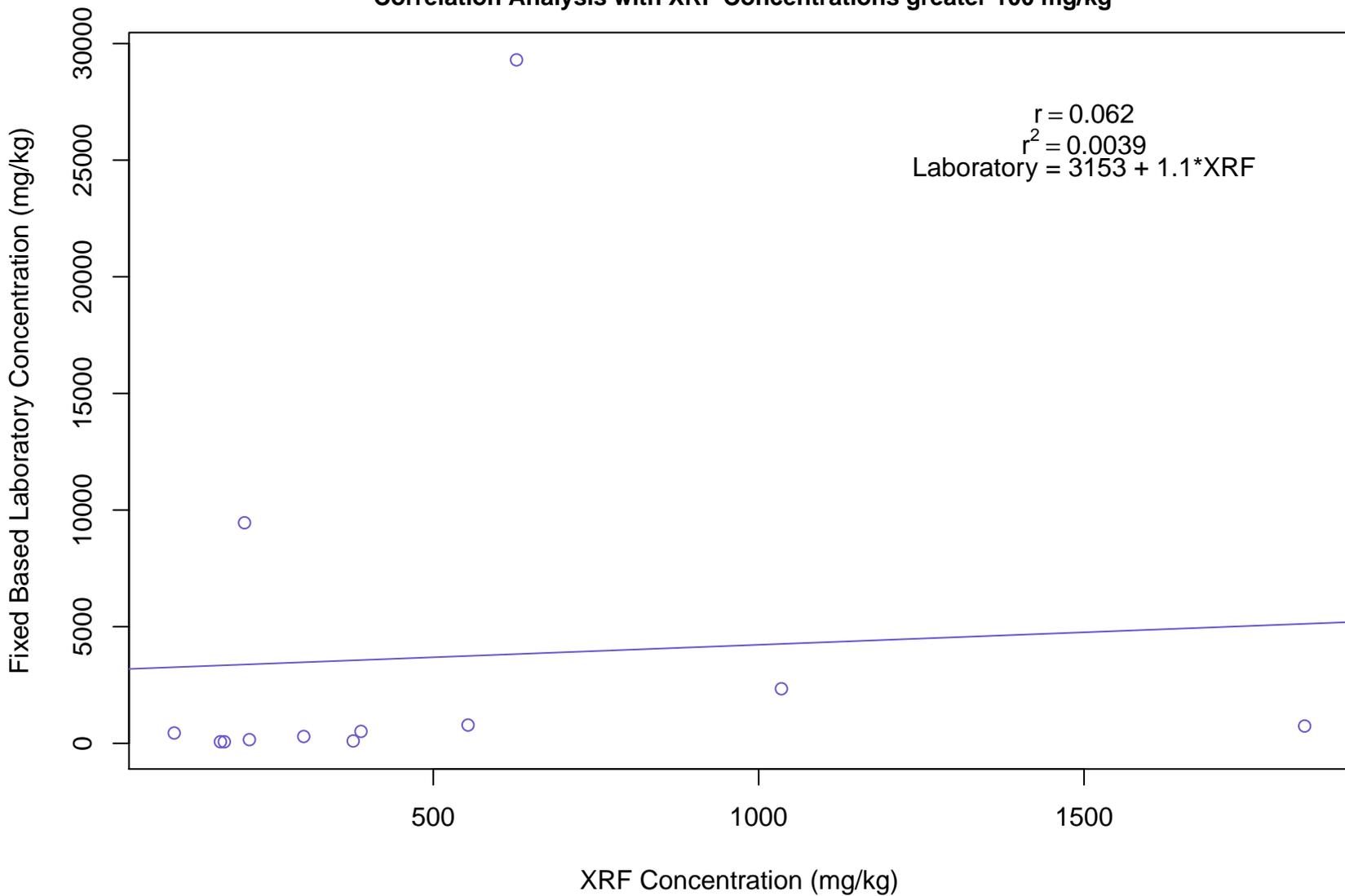


Figure 3
NASB Skeet Range
Correlation Analysis with XRF Concentrations greater 100 mg/kg





Tetra Tech NUS, Inc.

XRF MULTIPLE SAMPLE LOG SHEET

- SURFACE SOIL
- SUBSURFACE SOIL
- OTHER _____

SAMPLERS:

B. Geringer / C. Fellows

PROJECT NAME: NASB Skeet Range Topsham Annex
 PROJECT NUMBER: CTO 69 - T12G00645/0505
 YEAR: 2009 SN: 10105 Model - 41000

LOCATION: NASB - Skeet Range

SAMPLE NO.	DEPTH (INCHES)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	RESULTS				% Moisture	Comments
					XRF READING 1 (PPM)	XRF READING 2 (PPM)	XRF READING 3 (PPM)	AVERAGE OF XRF READINGS (PPM)		
Drax US6235X SN: US7275X										
NIST 2709 (Low)	—	07/06/09	1037	Low	18±3	15±3	17±3	16.67	—	Brown FM BG
NIST 2710 (High)	—		1042	High	5465±76	5503±76	5489±76	5485.67	—	
SKT-SS02	0-3		1047		41±4	36±3	36±3	37.67	Slightly Damp	Bran FM SAND, silt Same silt
SKT-SS01	0-3		1053		38±4	35±4	34±4	35.67	Slightly Damp	" "
SKT-SS01	0-3		1121		165±6	231±7	233±7	209.67	Slightly Damp	DK Brown FM SAND, some silt
SKT-SS09	0-3		1205		27±3	27±3	21±3	25	Sl Damp	Brown F-Sand
SKT-SS10	0-3		1215		332±8	310±8	260±7	300.67	Sl. Damp	DK Brown F-Sand, some silt
SKT-SS11	0-3		1220		35±3	38±3	37±3	36.67	Dry	DK Brown F-Sand, some silt
SKT-SS12	0-3		1226		217±6	170±5	149±5	178.67	Sl. Damp	DK Brown, F-Sand, some silt, so
SKT-SS03	0-3		1334		49±4	60±4	60±4	56.33	Damp	DK Brown, F-Sand and silt
Standardize	—		1350		PASSED	—	—	PASSED		
SKT-SS07	0-3		1355		979±14	1124±15	1001±14	1034.67	^(CB) Dry Damp	DK Brown, F-Sand, and some silt
SKT-SS06	0-3		1402		1000±22 1000±22	1856±23	1923±23	1839	Dry	DK Brown, F-Sand, some silt
SKT-SS04	0-3		1412		184±6	159±5	177±6	173.33	Dry	DK Brown, F-Sand, some silt
Standardize	—		1420		PASSED	—	—	PASSED		
NIST 2709	—		1424	Low	11±3	20±4	20±4	17	—	
NIST 2710	—		1428	High	5307±73	5382±74	5336±74	5341.67	—	
SKT-SS08	0-3		1433		508±10	506±11	502±11	505.33	Dry	DK Brown, F-Sand, some silt
SKT-SS08 (Depol)	0-3		1438		550±10	544±11	503±11	552.33	Dry	DK Brown, F-Sand, some silt

* Standardize DATE 07/06/09 TIME 1030 PASSED



Tetra Tech NUS, Inc.

XRF MULTIPLE SAMPLE LOG SHEET

SURFACE SOIL
 SUBSURFACE SOIL
 OTHER _____

SAMPLERS: B. Geringer / C. Fellows

PROJECT NAME: NASB Skeet Range Topsham Annex
 PROJECT NUMBER: CTO 69 - 112G00645/0505
 YEAR: 2009

LOCATION: NASB - Skeet Range

SAMPLE NO.	DEPTH (INCHES)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	RESULTS				% Moisture	Comments
					XRF READING 1 (PPM)	XRF READING 2 (PPM)	XRF READING 3 (PPM)	AVERAGE OF XRF READINGS (PPM)		
SKT-SS05	0-3	7/6/09	1442		25±3	22±3	20±3	22.33	Dry	DK Brown F-Sand, some silt
Standardization	—	7/7/09	0940	—	PASSED	—	—	PASSED		
NIST 2709	—		0945	Low	21±4	21±4	17±3	19.67		
NIST 2710	—		0955	High	5441±76	5358±74	5155±71	5318		
NASB-SKT-XRF-SB01	3-12		1005		33±4	21±3	26±3	27.33	Sl. Damp	Brown, F-Sand, traces silt
NASB-MG-BR-XRF-SS07	0-3		1010		36±4	65±4	69±4	26.67	Damp	DK Brown, F-Sand, some silt ^{thin} fibrous mat
NASB-SKT-XRF-SB06	3-12		1108		21±3	31±3	21±3	24.33	Damp	Brown F-Sand, silt
NASB-SKT-XRF-SB06	0-3		1120		87±5	54±4	66±4	69	Damp	DK Brown F-Sand and silt (some)
NASB-SKT-XRF-SB08	3-12		1130		19±3	21±3	31±3	23.67	Sl. Damp	Brown F-Sand and silt
NASB-SKT-XRF-SB08	0-3		1140		91±4	117±5	99±5	102.33	Dry	DK Brown F-Sand and silt
NASB-SKT-XRF-SB07	3-12		1200		23±3	15±3	17±3	18.33	Sl. Damp	Lt Brown F-Sand, some silt
NASB-SKT-XRF-SB07	0-3		1208		29±3	39±4	39±4	35.67	Sl. Damp	Brown F-Sand, little silt
NASB-SKT-XRF-SB02	3-12		1214		27±3	16±3	20±3	21	Sl. Damp	Brown F-Sand, some silt
NASB-SKT-XRF-SB02	0-3		1220		225±7	210±6	231±7	222	Dry	Brown F-Sand, some silt ^{clay particles found in sample} intensity
Standardize	—		1255		PASSED	—	—	PASSED		
NIST 2709	—		1258	Low	19	110±3	15±3	15.5		Low Range Std.
NIST 2710	—		1302	High	5568±77	5496±76	5649±78	5571		High Range Std.
NASB-SKT-XRF-SB04	3-12		1312		22±3	34±3	45±4	33.67	Sl. Damp	Brown F-Sand, little silt



Tetra Tech NUS, Inc.

XRF MULTIPLE SAMPLE LOG SHEET

[X] SURFACE SOIL
[X] SUBSURFACE SOIL
[] OTHER _____

SAMPLERS:

B. Geringer / C. Fellows

PROJECT NAME: NASB Skeet Range Topsham Annex
PROJECT NUMBER: CTO 69 - 112G00645/0505
YEAR: 2009

LOCATION: NASB-Skeet Range

SAMPLE NO.	DEPTH (INCHES)	DATE	TIME	CONCENTRATION (L) LOW (H) HIGH	RESULTS				% Moisture	Comments
					XRF READING 1 (PPM)	XRF READING 2 (PPM)	XRF READING 3 (PPM)	AVERAGE OF XRF READINGS (PPM)		
NASB-SKT-XRF-SB04	0-3	7/7/09	1320		27±3	26±3	34±3	29	Sl. Damp	Dr. Brown - F-Sand, some silt
NASB-SKT-XRF-SB03	3-12	7/7/09	1326		18±3	23±3	19±3	20	Sl. Damp	Brown F-Sand - little silt
NASB-SKT-XRF-SB03	0-3	7/7/09	1334		34±4	38±4	25±3	32.33	Sl. Damp	Brown F-Sand, T-C sand, little silt
NASB-SKT-XRF-SB05	3-12	7/7/09	1340		24±3	24±3	20±3	22.67	Sl. Damp	Brown F-Sand, F-C sand
NASB-SKT-XRF-SB05	0-3	7/7/09	1346		25±3	24±3	24±3	24	Dry	Brown F-Sand, T-C sand
D2 NASB-SKT-XRF-SB02 (dup)	0-3	7/7/04	1355		219±7	207±7	214±6	213.33	Dry	Brown F-Sand some silt Clay pigments found at sample location
Standardize	—	7/8/09	1155		PASSED	—	—	—	—	—
MST 2704	—		1200	Low	17±3	10±3	22±4	16.33	—	
MST 2710	—		1203	High	5520±77	5371±73	5546±76	5480	—	
NASB-MGBR-SKT-XRF-SS07N	0-3		1250		84±4	103±4	101±4	96	Damp	DK Brown, F-sand and silt
NASB-MGBR-SKT-XRF-SS07S	0-3		1256		33±3	33±6	32±4	32.67	Damp	DK Brown, F-sand and silt
NASB-MGBR-SKT-XRF-SS07E	0-3		1303		34±3	ND < 24	37±4	35.5	Damp	DK Brown, F-sand and silt
NASB-MGBR-SKT-XRF-SS07W	0-3		1310		42±10	34±9	29±7	35	Damp	DK Brown, F-sand and silt, fibrous
* NASB-SKT-XRF-SS18-0003	0-3		1320		ND < 22	31±8	35±11	33	Damp	6 pellets found in sample, organic DK Brown, F-sand and silt, fibrous
NASB-SKT-XRF-SS18-0312	3-12		1340		33±10	39±5	23±5	31.67	Sl. Damp	Brown F-sand some silt
* NASB-SKT-XRF-SS13-0003	0-3		1357		38±4	49±6	46±7	44.33	Sl. Damp	4 fragments of clay pigments found in sample DK Brown, F-sand and silt, fibrous, organic
NASB-SKT-XRF-SS13-0312	3-12		1406		ND < 20	37±10	33±10	35	Sl. Damp	Brown F-sand some silt
NASB-SKT-XRF-SS19-0003	0-3		1410		489±21	352±14	ND < 8	321±8	Damp	DK Brown - F-sand and silt, fibrous, organic



Tetra Tech NUS, Inc.

XRF MULTIPLE SAMPLE LOG SHEET

SURFACE SOIL
 SUBSURFACE SOIL
 OTHER _____

SAMPLERS: B. Geringer / C. Fellows

PROJECT NAME: NASB - Skeet Range / Topsham Annex
 PROJECT NUMBER: CTO 69 - 112G00645/0505
 YEAR: 2009

LOCATION: NASB - Skeet Range

RESULTS

SAMPLE NO.	DEPTH (INCHES)	DATE	TIME	CONCENTRATION (L)LOW (H)HIGH	XRF READING 1 (PPM)	XRF READING 2 (PPM)	XRF READING 3 (PPM)	AVERAGE OF XRF READINGS (PPM)	% Moisture	Comments
Standardize	—	7/9/09	0828		PASSED	—	—	PASSED	NA	
NIST 2709 (low)	—		0830	Low	17±4	16±3	25±4	19.33	NA	
NIST 2710 (high)	—		0835	High	5375±74	5405±74	5311±73	5363.67	NA	
D3 NASB-SKT-XRF-SS07-0312	3-12		0840		28±3	30±3	37±3	31.67	Damp	Brown, F-Sand trace silt
D3 NASB-SKT-XRF-SS07-0312 (Dup)	3-12		0844		30±3	17±3	24±3	23.67	Damp	Brown, F-Sand, trace silt
NASB-SKT-XRF-SS06-0312	3-12		0847		27±3 26±3	26±3	37±3	30	Sl. Damp	DK Brown F-Sand some silt
NASB-SKT-XRF-SS08-0312	3-12		0854		17±3	21±3	21±3	19.67	Sl. Damp	DK Brown F-Sand some silt
NASB-SKT-XRF-SS14-0312	3-12		0901		23±3	20±3	25±3	24.67	Sl. Damp	DK Brown F-Sand trace silt
NASB-SKT-XRF-SS16-0312	3-12		0908		202±6	129±5	269±7	200	Sl. Damp	DK Brown F-Sand some silt
NASB-SKT-XRF-SS16-0312	3-12		0917		187±6	96±5	124±5	135.67	Sl. Damp	DK Brown F-Sand some silt
NASB-SKT-XRF-SS17-0312	3-12		0923		49±4	38±3	37±3	41.33	Sl. Damp	Brown/Red F-Sand trace silt
NASB-SKT-XRF-SS20-0312	3-12	↓	0929		22±3	18±3	15±3	18.33	Sl. Damp	Brown F-Sand trace silt
Standardized	N/A	7/10/09	1142		PASSED			N/A	N/A	
NIST 2709 - Low	↓		1155	Low	15±3	13±3	19±4	15.67	↓	
NIST 2710 - High	↓		1159	High	5143±72	5072±69	5046±69	5007	↓	
NASB-SKT-XRF-SS22-0003	0-3	1205	1155		37±4	34±4	35±4	35.33	Dry	F-M Sand, some gravel
NASB-SKT-XRF-SS22-0312	3-12		1210		31±4	26±3	35±4	30.67	Sl. Damp	Brown, F-M Sand, some gravel
NASB-SKT-XRF-SS23-0003	0-3		1214		133±5	155±5	184±6	157.33	Sl. Damp	DK Brown F-Sand, little silt
NASB-SKT-XRF-SS23-0312	3-12		1218		17±3	16±3	15±3	16	Sl. Damp	Brown F-Sand, little silt

Clay appears in vicinity
 →

APPENDIX G

PROJECT ACTION LIMITS SCREENING SUPPORTING DOCUMENTATION

Reference Limits and Evaluation Table

Matrix: Soil

Analytical Group: TAL Metals

Analyte	CAS Number	Maine RAGS Appendix 3 (mg/kg) ⁽¹⁾	USEPA Residential RSL (mg/kg) ⁽²⁾
Aluminum	7429-90-5	69,000	7,700N
Antimony	7440-36-0	14	3.1N
Arsenic	7440-38-2	9	0.39C
Barium	7440-39-3	6,800	1,500N
Beryllium	7440-41-7	68	16N
Cadmium	7440-43-9	2.1	7.0N
Calcium	7440-70-2	NC	NC
Chromium	7440-47-3	100	0.29C
Cobalt	7440-48-4	15	2.3N
Copper	7440-50-8	480	310N
Iron	7439-89-6	31,000	5,500N
Lead	7439-92-1	170	400N
Mercury	7439-97-6	10	1N
Magnesium	7439-95-4	NC	NC
Manganese	7439-96-5	1,100	180N
Nickel	7440-02-0	100	150N
Potassium	7440-09-7	NC	NC
Selenium	7782-49-2	68	39N
Silver	7440-22-4	170	39N
Sodium	7440-23-5	NC	NC
Thallium	7440-28-0	2.7	0.078N
Vanadium	7440-62-2	240	39N
Zinc	7440-66-6	10,000	2,300N

Matrix: Soil
Analytical Group: PAHs

Analyte	CAS Number	Maine RAGS Appendix 3 (mg/kg) ⁽¹⁾	USEPA Residential RSL (mg/kg) ⁽²⁾
1-Methylnaphthalene	90-12-0	NC	22C
2-Methylnaphthalene	91-57-6	3.6	31N
Acenaphthene	83-32-9	110	340N
Acenaphthylene	208-96-8	68	340N
Anthracene	120-12-7	430	1700N
Benzo(a)anthracene	56-55-3	0.26	0.15C
Benzo(a)pyrene	50-32-8	0.026	0.015C
Benzo(b)fluoranthene	205-99-2	0.26	0.15C
Benzo(g,h,i)perylene	191-24-2	750	170N
Benzo(k)fluoranthene	207-08-9	2.6	1.5C
Chrysene	218-01-9	26	15C
Dibenzo(a,h)anthracene	53-70-3	0.026	0.015C
Fluoranthene	206-44-0	1,000	230N
Fluorene	86-73-7	120	230N
Indeno(1,2,3-cd)pyrene	193-39-5	0.26	0.15C
Naphthalene	91-20-3	1.7	3.6C
Phenanthrene	85-01-8	97	170N
Pyrene	129-00-0	750	170N

Matrix: Soil
Analytical Group: Explosives

Analyte	CAS Number	Maine RAGS Appendix 3 (mg/kg) ⁽¹⁾	USEPA Residential RSL (mg/kg) ⁽²⁾
2,4-Dinitrotoluene	121-14-2	3.5	1.6C
2,6-Dinitrotoluene	606-20-2	1.6	6.1N
2,4,6-Trinitrotoluene	118-96-7	NC	3.6N
2-Amino-4,6-Dinitrotoluene	35572-78-2	NC	15N
2-Nitrotoluene	88-72-2	NC	2.9C
3-Nitrotoluene	99-08-1	NC	0.61N
4-Amino-2,6-Dinitrotoluene	19406-51-0	NC	15N
4-Nitrotoluene	99-99-0	NC	30C
Nitroglycerin	55-63-0	NC	0.61N

References

1. Maine Remedial Action Guidelines for Soil (RAGS) for Multiple Contaminants, all Scenarios and all Pathways (January, 2010),
2. Residential Soil Regional Screening Level (RSL) (June, 2011). The reference value provided for noncarcinogenic RSLs is the RSL value divided by ten.

NC – No Criteria.

Note: Chromium value in soil is for hexavalent chromium.

Matrix: Groundwater**Analytical Group: TAL Metals**

Analyte	CAS Number	Maine MEG (µg/L) ⁽¹⁾	USEPA Tapwater RSL (µg/L) ⁽¹⁾	MCL (µg/L) ⁽¹⁾
Aluminum	7429-90-5	7000	3700N	NC
Antimony	7440-36-0	3	1.5N	6
Arsenic	7440-38-2	10	0.045C	10
Barium	7440-39-3	1000	730N	2000
Beryllium	7440-41-7	10	7.3N	4
Cadmium	7440-43-9	1	1.8N	5
Calcium	7440-70-2	NC	NC	NC
Chromium	7440-47-3	20 (total)	0.043C (hexavalent)	100 (total)
Cobalt	7440-48-4	10	1.1N	NC
Copper	7440-50-8	500	150N	1300
Iron	7439-89-6	5000	2600N	NC
Lead	7439-92-1	10	NC	15
Mercury	7439-97-6	2	1.1N	2
Magnesium	7439-95-4	NC	NC	NC
Manganese	7439-96-5	500	88N	NC
Nickel	7440-02-0	20	73N	NC
Potassium	7440-09-7	NC	NC	NC
Selenium	7782-49-2	40	18N	50
Silver	7440-22-4	40	18N	NC
Sodium	7440-23-5	2000	NC	NC
Thallium	7440-28-0	0.6	0.037N	2
Vanadium	7440-62-2	200	18N	NC
Zinc	7440-66-6	2000	1100N	NC

Matrix: Groundwater**Analytical Group: Explosives**

Analyte	CAS Number	Maine MEG (µg/L) ⁽¹⁾	USEPA Tapwater RSL (µg/L) ⁽¹⁾	MCL (µg/L) ⁽¹⁾
2,4-Dinitrotoluene	121-14-2	1	0.22C	NC
2,6-Dinitrotoluene	606-20-2	0.5	3.7N	NC
2,4,6-Trinitrotoluene	118-96-7	4	2.2C	NC
2-Amino-4,6-Dinitrotoluene	35572-78-2	NC	7.3N	NC
2-Nitrotoluene	88-72-2	NC	0.31N	NC
3-Nitrotoluene	99-08-1	NC	0.37N	NC
4-Amino-2,6-Dinitrotoluene	1946-51-0	NC	7.3N	NC
4-Nitrotoluene	99-99-0	NC	4.2C	NC
Nitroglycerin	55-63-0	NC	0.37N	NC

Matrix: Groundwater
Analytical Group: Perchlorate

Analyte	CAS Number	Maine MEG (µg/L) ⁽¹⁾	USEPA Tapwater RSL (µg/L) ⁽¹⁾	MCL (µg/L) ⁽¹⁾
Perchlorate	14797-73-0	1	2.6N	NC

PAL References

1. Project Action Limits (PALs) are the lower of the Tapwater Regional Screening Level (RSL) (June, 2011), the Federal Maximum Contaminant Level (MCL) (January, 2011), or the Maine CDC Maximum Exposure Guidelines (MEG) for Drinking Water (February, 2011). The reference value provided noncarcinogenic Tapwater RSLs is the Tapwater RSL value divided by ten.

NC – No Criteria.

Matrix: Sediment

Analytical Group: TAL Metals

Analyte	CAS Number	PAL^(1,2) (mg/kg)	PAL Reference
Aluminum	7429-90-5	2600	Facility EA Background
Antimony	7440-36-0	0.16	Facility EA Background
Arsenic	7440-38-2	9.8	Facility EA Background
Barium	7440-39-3	0.7	Facility EA Background
Beryllium	7440-41-7	0.55	Facility EA Background
Cadmium	7440-43-9	0.99	Facility EA Background
Calcium	7440-70-2	NC	NC
Chromium	7440-47-3	43.4	Facility EA Background
Cobalt	7440-48-4	10	Facility EA Background
Copper	7440-50-8	31.6	Facility EA Background
Iron	7439-89-6	10000	Facility EA Background
Lead	7439-92-1	35.8	Facility EA Background
Mercury	7439-97-6	0.18	Facility EA Background
Magnesium	7439-95-4	NC	NC
Manganese	7439-96-5	630	Facility EA Background
Nickel	7440-02-0	22.7	Facility EA Background
Potassium	7440-09-7	NC	NC
Selenium	7782-49-2	0.29	Facility EA Background
Silver	7440-22-4	0.5	Facility EA Background
Sodium	7440-23-5	NC	NC
Thallium	7440-28-0	NC	NC
Vanadium	7440-62-2	43	Facility EA Background
Zinc	7440-66-6	121	Facility EA Background

Matrix: Sediment
Analytical Group: PAHs

Analyte	CAS Number	PAL ^(1,2) (µg/kg)	Project Action Limit Reference
1-Methylnaphthalene	90-12-0	20.2	NOAA
2-Methylnaphthalene	91-57-6	20.2	NOAA
Acenaphthene	83-32-9	290	NOAA
Acenaphthylene	208-96-8	160	NOAA
Anthracene	120-12-7	57.2	TEC
Benzo(a)anthracene	56-55-3	108	TEC
Benzo(a)pyrene	50-32-8	150	TEC
Benzo(b)fluoranthene	205-99-2	1800	NOAA
Benzo(g,h,i)perylene	191-24-2	170	OMOE
Benzo(k)fluoranthene	207-08-9	240	OMOE
Chrysene	218-01-9	166	TEC
Dibenzo(a,h)anthracene	53-70-3	33	TEC
Fluoranthene	206-44-0	423	TEC
Fluorene	86-73-7	77.4	TEC
Indeno(1,2,3-cd)pyrene	193-39-5	200	OMOE
Naphthalene	91-20-3	176	TEC
Phenanthrene	85-01-8	204	TEC
Pyrene	129-00-0	195	TEC

PAL References

1. Where available, sediment project action limits reflect facility-specific background values, EA Engineering calculated values (EA January 31, 2006).
2. Where facility-specific project action limits are not available for sediment, a variety of other sources were used and is noted as such.
 - NOAA – National Oceanographic and Atmospheric Administration sediment benchmarks lowest observed effects level (Buchman, 1999) (ecological risk based value).
 - TEC – Threshold Effects Concentrations (MacDonald, et al., 2000) (ecological risk based values).

NC – No Criteria.

Matrix: Surface Water
Analytical Group: TAL Metals

Analyte	CAS Number	PAL ^(1,2) (µg/L)	PAL Reference
Aluminum	7429-90-5	87	Facility EA Background
Antimony	7440-36-0	5.5	SWQC
Arsenic	7440-38-2	150	Facility EA Background
Barium	7440-39-3	3.9	Facility EA Background
Beryllium	7440-41-7	0.66	Facility EA Background
Cadmium	7440-43-9	0.08	Facility EA Background
Calcium	7440-70-2	NC	NC
Chromium	7440-47-3	11	Facility EA Background
Cobalt	7440-48-4	23	Facility EA Background
Copper	7440-50-8	2.36	Facility EA Background
Iron	7439-89-6	1000	Facility EA Background
Lead	7439-92-1	0.41	Facility EA Background
Mercury	7439-97-6	0.91	Facility EA Background
Magnesium	7439-95-4	NC	NC
Manganese	7439-96-5	120	Facility EA Background
Nickel	7440-02-0	13.4	Facility EA Background
Potassium	7440-09-7	NC	NC
Selenium	7782-49-2	5	Facility EA Background
Silver	7440-22-4	0.23	Facility EA Background
Sodium	7440-23-5	NC	NC
Thallium	7440-28-0	12	Facility Background/Facility EA
Vanadium	7440-62-2	20	Facility EA Background
Zinc	7440-66-6	30.6	Facility EA Background

Matrix: Surface Water
Analytical Group: PAHs

Analyte	CAS Number	PAL ^(1,2) (µg/L)	PAL Reference
1-methylnaphthalene	90-12-0	72.16	FCV
2-Methylnaphthalene	91-57-6	72.16	FCV
Acenaphthene	83-32-9	55.85	FCV
Acenaphthylene	208-96-8	306.9	FCV
Anthracene	120-12-7	20.73	FCV
Benzo(a)anthracene	56-55-3	0.003	SWQC
Benzo(a)pyrene	50-32-8	0.003	SWQC
Benzo(b)fluoranthene	205-99-2	0.003	SWQC
Benzo(g,h,i)perylene	191-24-2	0.003	SWQC
Benzo(k)fluoranthene	207-08-9	0.003	SWQC
Chrysene	218-01-9	0.003	SWQC
Dibenzo(a,h)anthracene	53-70-3	0.003	SWQC
Fluoranthene	206-44-0	7.109	FCV
Fluorene	86-73-7	39.3	FCV
Indeno(1,2,3-cd)pyrene	193-39-5	0.003	SWQC
Naphthalene	91-20-3	193.5	FCV
Phenanthrene	85-01-8	19.13	FCV
Pyrene	129-00-0	10.11	FCV

PAL References

1. Where available, surface water project action limits reflect facility-specific background values, EA Engineering calculated values (EA January 31, 2006).
2. Where facility-specific project action limits are not available for surface water a variety of other sources were used and is noted as such. FCV – Final chronic values (USEPA, 2003) (ecological risk based value), SWQC – State water quality criteria based on consumption for protection of human health.

NC – No Criteria.

APPENDIX H

**RESPONSES TO STAKEHOLDER COMMENTS OF
DRAFT VERSION OF SI REPORT**

**RESPONSE TO MEDEP COMMENTS DATED OCTOBER 11, 2011
SITE INSPECTION REPORT FOR MUNITIONS RESPONSE PROGRAM SITES
MACHINE GUN BORESIGHT RANGE AND SKEET RANGE, DATED AUGUST 2011
FORMER NAVAL AIR STATION, BRUNSWICK
BRUNSWICK, MAINE**

Note that where the comment response provides revised text, text additions are shown in bold italics and deleted text is shown as strikethrough.

General Comments:

1. **Comment:** MEDEP finds it difficult to read the numbers in the various tables that have been highlighted in red. If it is not too much effort, please use yellow highlighting in the final report.

Response: The red highlighting has been changed to yellow highlighting on all frequency of detection and positive detection tables (Tables 4-4, 4-5, 4-6, 4-7, 5-4, and 5-5).

2. **Comment:** MEDEP appreciates that all the detections are shown on the tag maps but it would be helpful to highlight (in yellow) the detections exceeding their screening criteria.

Response: Because some analytes exceeded multiple criteria, multiple formatting would make the tag figures very hard to read; therefore, the highlighting and other formatting have been presented on the frequency of detection and positive detection tables, but not on the positive detection figures. Note the screening criteria presented in the report are those criteria in place when SI Report was compiled and include, the USEPA Regional Screening Levels (RSLs) (June 2011), Federal Maximum Contaminant Levels (MCLs) (January 2011), Maine CDC Maximum Exposure Guidelines (MEG) for Drinking Water (February, 2011), and Maine RAGS, Appendix 3, (January 2010).

3. **Comment:** The Background Study should be finalized and then referenced for comparison in addition to the site-specific location chosen for sampling. This was proposed in response to comment (RTC) #15 in Appendix D in the Sampling and Analysis Plan (SAP).

Response: The Background Study was not finalized until March 2012, after the Draft SI Report was issued in August 2011. (It was incorrectly assumed during the SAP that facility background concentrations would be available for the report). Therefore, it is not recommended that the report be rewritten, considering that conclusions and results of the SI Report would remain the same.

Moreover, the Base Skeet Range SI has been superseded by the RI and the RI combines the SI and RI data sets for evaluation purposes, and does consider the final Background Study, as well as updated criteria, for evaluation purposes.

For the Machine Gun Boresight Range, the SI has been superseded by a successful removal action for the two soil hot spots identified during the SI. Now that final facility background values are available, additional evaluation is provided as follows:

For soil at the Machine Gun Boresight Range, the recommendations of Section 4.7 currently state:

“There are two “hot spots” of lead and other metals contamination in surface soil (SB22 and SB01), although the locations are infrequent and sporadic (not adjacent to each other). While it appears that metals contamination is present in soil at and near the former source berm location, the berm material has been removed and the remaining contamination is residual and limited to a small area.”

Table 4-4 of the SI Report indicates that cadmium, chromium, lead, and nickel exceed the Maine RAGS (Appendix 3, January 2010), which is the most recent version of the RAGS. Facility background concentrations for each of these metals are less than Maine RAGS.

Parameter	Maximum Result, mg/kg	Maine RAGS, mg/kg January 2010	Final Facility Background, mg/kg (Upper Sand)
Cadmium	22	2.1	0.048
Chromium	320	100	16.2
Lead	1640	170	18 (surface soil) 3.4 (subsurface soil)
Nickel	430	100	9.8

For groundwater at the Machine Gun Boresight Range, the recommendations of Section 4.7 currently state:

“For groundwater, lead concentrations were not of concern, and only chromium and manganese were detected at concentrations greater than both Maine MEGs and USEPA tapwater RSLs. However, chromium was only a potential concern at one location (MW03); moreover, the concentration of chromium at this location was 35.1 micrograms per liter (µg/L), only slightly exceeding the Maine MEG value of 20 µg/L, while the maximum concentration of manganese, 551 µg/L, was only slightly greater than the Maine MEG of 500 µg/L. There were no analytes detected at concentrations greater than MCLs.”

For reference purposes, the facility background concentration (Upper Sand) for chromium is nondetect. The facility background concentration for manganese is 173 and 432 µg/L total and dissolved, respectively. Of note, the updated Maine MEG values of October 19, 2012 remain the same for chromium and manganese.

4. **Comment:** The statements regarding the impacts to groundwater when soil is only contaminated near the surface need to be qualified based on data from areas such as Site 7 where fairly low soil impacts near the surface can result in persistent groundwater contamination. The Machine Gun Boresight Range (MGBR) cadmium detection may need to be verified if groundwater will not be restricted near the MGBR.

Response: Several investigations were performed at Site 7 in an attempt to identify and remove a potential soil source of continuing elevated cadmium concentrations in

groundwater; however, no obvious source area for the elevated cadmium concentrations in groundwater was identified. At Site 7, it was determined that cadmium levels of 2.5 mg/kg or higher could result in groundwater concentrations above the MEG of 1 ug/l (the EPA health advisory number is 5 ug/l); moreover, cadmium was present in groundwater up to 40 ug/L. For groundwater at MGBR, the maximum cadmium concentration of 0.307 J ug/L is less than the MEG for drinking water (1 ug/L). For soil at MGBR, the maximum concentration of cadmium in soil was 22 mg/kg; cadmium was detected in 17 of 33 samples but only three of the locations exceeded 2.5 mg/kg. Of these three locations, two were co-located with the two identified hot spots for lead at locations since removed for remediation purposes, SB22 and SB01 surface soil samples, with cadmium concentrations of 22 and 4.9 mg/kg, respectively; the remaining location SB07 surface soil had a cadmium concentration of 6.29 J mg/kg, compared to the Maine RAGS of 2.1 mg/kg and USEPA RSL of 7 mg/kg). Therefore, considering MGBR post-remediation conditions for soil in combination with the low concentration of in groundwater, cadmium in groundwater does not appear to be impacted by cadmium in soil at MGBR.

It is noted that cadmium detections in groundwater at MGBR may need to be verified if groundwater use is not restricted near MGBR.

Specific Comments:

5. **Comment:** Executive Summary Table ES-1, Skeet Range, Surface Water and Sediment: The subheadings and the following sentences are switched.

Response: The sentences have been revised in both ES-1 and Section 5.7:

Surface Water: Metals were detected at elevated concentrations in **surface water sediment**.

Sediment: Metals were detected at elevated concentrations in **sediment surface water**.”

6. **Comment:** Section 1.1, Purpose of Report: Please add the title of the workplan to the introduction.

Response: The first sentence of the second paragraph in Section 1.1 has been revised, “Field activities included MC sampling and analysis of surface soil, subsurface soil, sediment, and surface water samples, and well installation and groundwater samples at MGBR **which were conducted in accordance with the Site Inspection (SI) Work Plan, Munitions Constituents at Three Munitions Response Sites (Tetra Tech, 2009).**”

7. **Comment:** Section 1.3, Objectives: Please add the workplan objectives, verbatim, to this section.

Response: The first sentence of Section 1.3 has been revised (largely verbatim from the SI workplan although the workplan was referring to all three small arms ranges so objectives were tweaked a bit from the original): “**The objective of the SI described was to conduct**

an on-site investigation and gather sufficient data to determine the presence or absence of MC that may remain from activities conducted by the DoD during site operation and that may subsequently pose a threat to human health and/or the environment (Tetra Tech, 2009). Under the MRP, the primary goal of the SI is to collect the appropriate amount of information necessary to make one of the following decisions: 1) whether a Remedial Investigation (RI) is required at a site; 2) whether an immediate response is needed; or 3) whether the site qualifies for no further action (NFA). The main objective of the SI was to build on the PA information by gathering initial field data to determine whether MC (e.g., metals, explosives, propellants, and PAHs) that may have originated from previous site operations are present and potentially contributing to environmental impacts in surface soil, subsurface soil, surface water, groundwater, and sediment. Based on the results of the SI, recommendations establishing the path forward considering MC concerns for each MRS were developed, as applicable.

8. Section 2.2.5, Hydrology:

a.) **Comment:** It is important to the Conceptual Site Model to mention Merriconeag Stream and its unnamed tributaries of which the impoundment ponds are a part.

Response: Subsection 2.2.5, Hydrology of Section 2.2, General Facility Physical/Environmental Characteristics, mentions Merriconeag Stream and its unnamed tributaries, "Merriconeag Stream and a number of other very small intermittent streams flow into Mere Brook, which flows into Harpswell Cove at the head of the cove."

The Hydrology section of Table 5-10, Conceptual Site Model Information Profile, Skeet Range, has been revised to include mention of Merriconeag Stream and its unnamed tributaries, "Surface water flows towards the retention ponds, **which are a part of the Merriconeag Stream watershed.**"

b.) **Comment:** para. 1: There appears to be text missing on page 2-8 for the Mere Brook description. It should read "Mere Brook enters as a natural stream and is culverted under the runways to an outfall to the southeast" or something similar. Please revise the text.

Response: The fifth sentence of the first paragraph of Section 2.2.5 has been revised, "Mere Brook enters former NASB at the northwestern boundary ~~and flows in its~~ **as a** natural streambed **and is culverted** for approximately 0.5 mile under the runways **to an outfall to the southeast** and **then** through the southern end of former NASB."

9. **Comment:** Section 3.1.9, Investigation Derived Waste: The RCRA number for the main base does not include the Topsham facility, so a temporary number will be needed for any waste shipped from that location.

Response: The comment has been noted for future work at the Topsham facility.

10. **Comment:** Section 4.1.3, Current Land Use and Anticipated Future Land Use: Please check this section for clarity.

Response: This section, as well as the CSM table, will be revised as follows:

“Currently, the site is not in use, ***except for Building 55 that is leased***, but in the future ***anticipated land use will include*** ~~will have~~ redeveloped buildings for business and technology industry use.”

11. **Comment:** Section 4.2.3.1, Surface and Subsurface Soil Sampling: Since this investigation the Navy has completed the Background Study therefore in addition to the one location selected for this investigation the data from the Background Study must also be considered.

Response: Please see the Navy’s response to your General Comment 3.

12. Section 4.3, Hydrogeology:

- a.) **Comment:** Para 3 & 4 and Figures 4-4 and 4-5: The proximity of the wells and the flat water table are contributing to some unrealistic flow maps, particularly Figure 4-4, as it is very unlikely that groundwater is flowing west or “converging” as depicted. The area is too small to accurately depict groundwater flow therefore this uncertainty must be discussed and flow lines should be dashed on the figures to indicate that uncertainty. If groundwater becomes an issue it may be necessary to install additional wells or piezometers to determine groundwater flow at the MGBR.

Response: Flow lines have been revised as dashed on Figure 4-4, but not Figure 4-5. In addition, the following text revisions have been made:

Section 4.3, 3rd paragraph, 2nd sentence has been revised as follows: “The additional round of water levels on July 22, 2010, was collected to confirm conditions at the site, ***based on the groundwater flow directions observed in December 2009. Given the small size of the area under investigation and low hydraulic gradient, some uncertainty may exist for the groundwater flow, specifically for the December 9, 2009 measurements.***”

Section 4.3, 4th paragraph, last sentence has been revised as follows: “Regardless ***of the potential uncertainties of groundwater flow, specifically December 2009***, the overall groundwater flow...”

- b.) **Comment:** Para 3: “Regardless, the overall groundwater flow for the areas is expected to be to the southeast toward Mere Brook based on topography and previous groundwater investigation at Site 1...”

Do you mean Site 11 or Site 13? Site 1 is too far south and on the edge of Mere Brook to be useful to determine groundwater flow for the MGBR area. It is more likely that shallow groundwater flow is to the impoundment ponds or Picnic Pond which is part of the Merriconeag Stream watershed. Please correct.

Response: The sentence has been revised as follows: “Regardless ***of the potential uncertainties of groundwater flow, specifically December 2009***, the overall

groundwater flow for the area is expected to be to the **east-southeast** toward ~~More~~ **the retention ponds and/or Picnic Pond** based on topography and previous groundwater investigations **in the area of MGBR** at (Sites 411 and 13, south of the MGBR, and Site 9, north of the MGBR).”

- 13. Comment:** Section 4.4.1 and Appendix F.1, Figure 1: The plot suggests that the data have a split correlation. The data from 0 – 500 ppm (XRF) should be correlated separately from the higher values. Calculated values for XRF data < 500 ppm should be recalculated with the new correlation equation. Data points above 500 ppm XRF can use the correlation as presented. Please revise the tables and figures, and provide the new correlation plot.

Response: There is only one sample concentration greater than 500 ppm (NASB-MGBR-XRF-SB01-1216 XRF lead concentration = 610 ppm). One sample concentration is not enough data to compute a correlation analysis. However, the sample concentration greater than 500 ppm (NASB-MGBR-XRF-SB01-1216) has been marked as a potential outlier and an additional plot has been added to Appendix F-1 showing the correlation analysis with this sample concentration removed. With the potential outlier removed the correlation is 1 and therefore predicted laboratory concentrations can be predicted for concentrations less than 500 ppm. Table 1 in Appendix F-1 has been updated to display predicted laboratory concentrations based on the regression equation without the potential outlier.

- 14. Comment:** Section 4.4.2.1, last sentence: Nitroglycerin was detected in SS-08 also according to MEDEP’s data and Table 4-5, please revise the text.

Response: Section 4.4.2.1 presents a discussion of analytes that exceeded screening criteria. Nitroglycerin was only detected at concentrations greater than screening criteria in sample NASB-MGBR-SS01-0003 and its duplicate. Nitroglycerin was detected in sample NASB-MGBR-SS08-0003; at a concentration of 0.55J mg/kg which is less than the USEPA RSL of 0.61 mg/kg. Therefore, no revision has been made to Section 4.4.2.1.

- 15. Comment:** Section 4.4.2.2, Groundwater: Chromium was slightly elevated at MW-03, which also had an unusually high pH (around 9). It is possible this is a residual effect of the berm construction materials.

Response: The pH values measured in groundwater at MW-03 were elevated, ranging from 9.87 – 9.41, chromium may tend to precipitate at these elevated pH levels. It is unknown if this is a residual effect of the berm construction materials.

- 16. Comment:** Section 4.7, Recommendations: This section is conclusions not recommendations, please correct and add the recommendations.

Response: Section 4.7 text has been revised to include recommendations as follows (Note that the remediation of the two soil hot spots has since been completed):

Soil: There are two “hot spots” of lead and other metals contamination in surface soil (SB22 and SB01), although the locations are infrequent and sporadic (not adjacent to each other).

While it appears that metals contamination is present in soil at and near the former source berm location, the berm material has been removed and the remaining contamination is residual and limited to **these two** small areas. **The two hot spots warrant remediation via excavation and proper disposal.**

Groundwater: For groundwater, lead concentrations were not of concern, and only chromium and manganese were detected at concentrations greater than both Maine MEGs and USEPA tapwater RSLs. However, chromium was only a potential concern at one location (MW03); moreover, the concentration of chromium at this location was 35.1 micrograms per liter (µg/L), only slightly exceeding the Maine MEG value of 20 µg/L., ~~W~~while the maximum concentration of manganese, 551 µg/L, was only slightly greater than the Maine MEG of 500 µg/L. There were no analytes detected at concentrations greater than MCLs. **The low levels of inorganics found in groundwater do warrant groundwater use restrictions."**

These revisions have also been made to the Executive Summary.

- 17. Comment:** Table 4-4, Frequency of Detections in Soil, page 1 of 2: Why are some of the Maine RAGs highlighted? Please remove if it serves no purpose. If there is a rationale, please include in the footnotes or in a legend.

Response: Per the footnotes on Table 4-4, page 2, these values were highlighted red to indicate that concentrations were greater than Maine RAGS criterion; values were italicized if concentrations exceeded USEPA RSL. Per General Comment #1, the red highlighting has been changed to yellow highlighting. Additionally, per Specific Comment #26, maximum concentration, rather than the associated Maine RAG or USEPA RSL, has been highlighted.

- 18. Comment:** Table 4-5, Summary of Detected Concentrations in Surface and Subsurface Soil: Please highlight the nitroglycerin exceedance of EPA's Residential Screening Limits (RSLs).

Response: Per footnotes on page 15 of Table 4-5, concentrations greater than USEPA RSLs have been italicized. The nitroglycerin concentration for sample NASB-MGBR-SS01-0003, its duplicate concentration, and the average concentration of these sample results have been italicized. The nitroglycerin concentration for sample NASB-MGBR-SS08-0003 did not exceed the USEPA RSL and, therefore, is not italicized.

- 19. Comment:** Table 4-6, Frequency of Detection in Groundwater: There are columns for the Minimum and Maximum Non-Detections. Is this correct? If it is, please provide some explanation in a footnote.

Response: Correct, the seventh and eighth columns present the minimum non-detections and maximum non-detections, respectively. A footnote 4 has been added to Table 4-6, **"Minimum and maximum non-detections are for all samples in the data set."** A similar footnote has been added to Tables 4-4, 5-4, 5-6, and 5-8.

- 20. Comment:** Conceptual Site Model, Machine Gun Bore Sight Range, Figure 4-10: The

figure shows a line (purple) for the pre 1950 skeet range. Please check to see if this is correct.

Response: The purple line on Figure 4-10 represents the portion of the post-1950 skeet range boundary that crosses the Machine Gun Bore Sight Range. The blue line on Figure 4-10 has been revised to indicate that it represents the tree line and not the pre-1950 skeet range.

21. Table 4-8:

a.) **Comment:** It is possible the chromium is related to material in the berm or perhaps some steel projectile used when operational. Greater support is needed to discount the MGBR as the source, such as a possible source for the high pH related to a later use. Chromium did not appear in the shallow groundwater background samples.

Response: Please see the response to your Comment 15. For Table 4-8, Munitions/Release Profile, Associated MC, the following has been revised: “Note that chromium present in both soil and groundwater is not perceived to be related to MGBR operations, **although MGBR should not be discounted as the source, such as a possible source for the elevated pH related to a later use.**”

b.) **Comment:** The hydrology section should at least note the ponds to the north.

Response: A sentence has been added to the hydrology section of Table 4-8, “**The Upper and Lower Impoundment ponds are located on the north of the site.**”

22. **Comment:** Section 5.1.2, Munitions Constituents: Please clarify the phrase “PAH treatment of runway runoff” used in the last sentence.

Response: The subject phrase has been revised as follows: “Of note, assessment of the contributory effects from PAHs from the SKT at the impoundment ponds is difficult due to other significant sources of potential PAH contamination including stormwater runoff and PAH treatment of runway runoff **that potentially contains PAHs.**”

23. **Comment:** Section 5.3, Geology Evaluation: Please check the first sentence for clarity.

Response: The first sentence of Section 5.3 has been revised, “The site is relatively level in the area of the former ~~shooting stations~~ **skeet range high house and low house**”.

24. **Comment:** Section 5.3 Geology, para. 3: The description of the hydrogeology should refer to Site 13 or 11 (See comment 12.b above.) rather than Site 1, and MEDEP suggests clarifying that generally groundwater flows to the southeast toward Merriconeag Stream, but adjacent the ponds and stream shallow flow is toward those surface waters.

Response: Paragraph three of Section 5.3 has been revised, “Note that hydrogeology was not investigated based on previous groundwater investigations north (Site 9) and south

(Sites 411 and 13) of the SKT. Groundwater is expected to flow to the east-southeast north toward *the impoundment ponds and/or Picnic Pond* Merriconeag Stream.

25. **Comment:** Section 5.4.1 and Appendix F.2: The methods used are okay for establishing approximate bounds, but the lack of split samples for the data limits its applicability. Also please add trend lines to the plots in the appendix.

Response: The regression lines have been added to the Figures in Appendix F.2.

26. **Comment:** Table 5-4: The table needs to be revised to highlight the max results rather than the associated RAG.

Response: Table 5-4 has been revised, the maximum concentrations that exceed Maine RAGs are highlighted yellow rather than the associated Maine RAG criterion. Table 5-4 has also been revised so that maximum concentrations that exceed the USEPA RSL are italicized rather than the corresponding USEPA RSL criterion. Similar revisions have been made to Tables 4-4 and 4-6.

27. **Comment:** Section 5.5.2, Sediment: "Several metals." Rather than several MEDEP suggests that the Navy provide actual number of metals (17) (e.g. Seventeen metals...).

Response: The first sentence of Section 5.5.2 has been revised, "~~Several~~ **Seventeen** metals (aluminum, antimony, arsenic, barium, beryllium, chromium, cadmium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium, and zinc) were detected in sediment samples at concentrations exceeding PALs."

28. **Section 5.7: Recommendations:**

a.) **Comment:** The section lacks recommendations. Please include.

Response: Section 5.7 text has been revised to include recommendations as follows (Note that the Remedial Investigation (RI) field work has since been completed and the RI Report is pending):

"Further characterization of shallow surface soil is recommended for the SKT.

Soil: Shallow surface soil (0 to 3 inches bgs) is contaminated with metals and PAHs (primarily antimony, arsenic, lead, and benzo(a)pyrene) at unacceptable concentrations. The contamination appears to be located within the combined middle area of the pre-1950 and post-1950 range fans overlap. Contamination is present from the firing points extending outward to encompass the shotfall zones in this central area. Additional shallow surface soil sampling to refine the area is recommended.

Analytes for further sampling should include antimony, arsenic, lead, and select PAHs.

Groundwater: Groundwater was not investigated, pending evaluation of soil results. Because only shallow surface soils (0 to 3 inches bgs) are of primary concern, it does not appear that contamination has migrated to deeper soils at concentrations of concern and, therefore, the migration pathway from soil to groundwater is not complete. **Therefore, for groundwater no investigation is warranted.**

Surface Water: Metals were detected at elevated concentrations in **surface water** sediment. **Further assessment is recommended for the site pond.**

Sediment: Metals were detected at elevated concentrations in **sediment** ~~surface water~~. **Further assessment is recommended for the site pond."**

These revisions have also been made to the Executive Summary.

b.) **Comment:** The surface water and sediment information are switched. Please correct.

Response: See response to Specific Comment #5.

29. Table 5-10, Conceptual Site Model Information Profile:

a) **Comment:** Munitions/Release Profile, Migration Routes/Release Mechanisms, Findings: The finding is that the area is level but in actuality it is transected by a deeply incised drainage way so erosion of the embankment exists. It also overlooks that the retention pond is not self contained but is part of a drainage system that flows to Picnic Pond, Merriconeag Stream and Mere Brook. Please revise.

Response: The first two sentences have been revised, "The **majority of the Skeet Range** area is level, so. **A drainage is present south of Neptune Drive within the Skeet Range. The drainage is a natural feature and well vegetated, therefore, no significant run-off is anticipated from the Skeet Range.** Run-off that does occur will flow into **the retention ponds, which retain the majority of the surface water from this area for collection and reduction of suspended sediment."**

b) **Comment:** Physical Profile, Topography: The Skeet Range is not flat but is transected by a deeply incised drainage way. The description needs to include the slopes around the ponds and streams. Please correct.

Response: The topography section has been revised, "The **majority of the Skeet Range is mainly flat is level. A northwest-southeast trending drainage is present south of Neptune Drive within the Skeet Range."**

c) **Comment:** Land Use and Exposure Profile, Current Land Use: The information provided is for future land use, please correct.

Response: The current land use information has been revised, "**The area is primarily undeveloped except for the northernmost portion, which contains a**

baseball field and is intersected by Neptune Drive. ~~In the future, most of the site will be used for business and technology industries, while the eastern portion will be used for outdoor recreation.~~

- d) **Comment:** Land Use and Exposure Profile, Potential Future land Use: Planned future uses include Community Mixed Use, Recreation, and Business and Technology. Please revise.

Response: The potential future land use information has been revised, "**Potential future land use includes Community Mixed Use, Recreation, and Business and Technology.** ~~Potential future land use is assumed to be the same as planned land use.~~"

The last sentence of Section 5.1.3, Current Land Use and Anticipated Future Land Use has also been revised, "~~In the future, most of the SKT will be slated for business and technology industries use, while the eastern portion will be used for outdoor recreation~~**Planned future land uses include Community Mixed Use, Recreation, and Business and Technology.**"

- e) **Comment:** Land Use and Exposure Profile, Potential Future Human Receptors: Please list: residents, workers, visitors, trespassers, maintenance workers, and contractors.

Response: The potential future resident information has been revised, "**Potential future human receptors include residents, workers, visitors, trespassers, maintenance workers, and contractors.** ~~Same as currently planned.~~"

- f) **Comment:** Land Use and Exposure Profile, Potential Future Land Use Related Activities: Please specify: business and technology related industry, residential, outdoor recreation, retail, offices, and day care.

Response: The potential future land use related activities information has been revised, "**Potential future land use related activities include business and technology related industry, residential, outdoor recreation, retail, offices, and day care.** ~~Same as currently planned.~~"

- g) **Comment:** Land Use and Exposure Profile, Zoning/Land Use Restriction: Site 9 falls within the former skeet range and has soil and groundwater restrictions and restrictions on groundwater for the Eastern Plume extend into this area also. Please correct.

Response: The land use and exposure profile, zoning/land use restriction information has been revised, "**No site specific restrictions or access controls exist for the Skeet Range. However, a portion of Site 9 lies within the Skeet Range site boundary and Site 9 has soil and groundwater restrictions. Additionally, the Eastern Plume, which has groundwater restrictions, extends into the Skeet**"

Range.”

- h) **Comment:** Ecological Profile, Habitat Type: There are a number of habitat types within skeet range including an open water wetland (retention ponds), scrub shrub, open field and forested areas. Please revise.

Response: The habitat type information has been revised, “Scrub/shrub, in open field, **forested areas, and an open water** wetland area nearby along with (retention ponds).

- i) **Comment:** Ecological Profile, Ecological Receptors and Species of Special Concern: In Section 2.3.1 it states “The state-listed Blanding’s turtle and spotted turtle (threatened) may reside in wetlands, vernal pools, or streams on or near the former installation.” Please correct.

Response: The ecological receptors and species of special concern information has been revised, “Potential ecological receptors include indigenous species. **The state-listed Blanding’s turtle and spotted turtle (threatened) may reside in wetlands, vernal pools, or streams on or near the former installation.** ~~No species of special concern are known to be present at the site. Most of the site is planned for industrial use, and remediation of contaminated soil is being recommended.”~~

- j) **Comment:** General Exposure Profile: While the statement is correct is does not consider the recreational area and the Mixed Community Use area within the site. Please correct.

Response: The following has been added as the last sentence of the General Exposure Profile section, “**Future planned land use includes Community Mixed Use, Recreation, and Business and Technology.**”

30. **Comment:** Figure 5-6, Conceptual Site Model: Please add sediment to the current/future recreational user and to ecological receptors. Residential users must also be added as there are residences already along the northern boundary of the site.

Response: Ingestion and dermal contact of sediment have been added to the description for both the current/future recreational user and ecological receptors. Ingestion, dermal contact, mixed use, and inhalation of surface soil for current/future residential users have been added to Figure 5-6.