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Remedial Investigation Report
Area of Concern (AOC) H

Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Naval Facilities Engineering Command

Prepared for

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Acronyms and Abbreviations

AB	Ambient Blank
ABS_{dermal}	Dermal Absorption Factor
ABS_{GI}	Gastrointestinal Absorption
AD	Average Daily Intake
AOC	Area of Concern
ASTM	American Society for Testing and Materials
atm-m^3/M	Atmosphere-Cubic Meter per Mole
ATSDR	Agency for Toxic Substances and Disease Registry
BAF	Bioaccumulation Factor
BCF	Bioconcentration Factor
BEHP	Bis(2-ethylhexyl)phthalate
BERA	Baseline Ecological Risk Assessment
bls	Below Land Surface
BRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
BW	Body Weight
CCME	Canadian Council of Ministers of the Environment
CDI	Chronic Daily Intake
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cfm	Cubic Feet per Minute
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chemicals of Concern
COPC	Chemical of Potential Concern
CS	Confirmation Study
CSF	Cancer Slope Factors
CSM	Conceptual Site Model
CTC	CERCLA Technical Committee
CWA	Clean Water Act

DAF	Dilution Attenuation Factor
DGPS	Differential Global Positioning System
DOI	Department of the Interior
DQE	Data Quality Evaluation
EBS	Environmental Baseline Survey
ECOPC	Ecological Chemical of Potential Concern
ED	Exposure Duration
EDMS	Environmental Data Management System
EDS	Environmental Data Services
EF	Exposure Frequency
ELCR	Excess Lifetime Cancer Risk
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
ERB	Equipment Rinsate Blank
ERL	Effects Range-Low
°F	Degrees Fahrenheit
FB	Field Blank
FS	Feasibility Study
ft	Feet
ft/day	Feet per Day
ft/year	Feet per Year
gpm	Gallons per Minute
GPS	Global Positioning System
H	Henry's Law Constant
HEAST	Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	Hazard Index
hp	Horsepower
HQ	Hazard Quotient
HRS	Hazardous Rank Scoring

IR	Ingestion Rate
IR	Installation Restoration
IRA	Immediate Response Action
IRIS	Integrated Risk Information System
IRP	Installation Restoration Program
Kp	Permeability Constant
L	Liter
LANTDIV	Atlantic Division
lb	Pound
LCS	Laboratory Control Standard
LCSD	Laboratory Control Standard Duplicate
LNAPL	Light Non-Aqueous Phase Liquid
LOAEL	Lowest Observed Adverse Effect Level
LOEC	Lowest Observed Effect Concentration
MB	Method Blank
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goals
MDL	Method Detection Limit
MEC	Munitions and Explosives of Concern
MEK	Methyl Ethyl Ketone
mg/d	Milligrams per Day
mg/kg	Milligrams per Kilogram
MHSPE	Ministry of Housing, Spatial Planning, and Environment
MNA	Monitored Natural Attenuation
MOU	Memorandum of Understanding
MOV	Municipality of Vieques
MS/MSD	Matrix Spike/Matrix Spike Duplicate
msl	Mean Sea Level
MW	Monitoring Well
NA	Not Applicable
NAPL	Non-Aqueous Phase Liquid
NASD	Naval Ammunition Support Detachment

NAVFACENGCOM	Naval Facilities Engineering Command
NC	Not Collected
NCEA	National Center for Environmental Assessment
ND	Not Detected
NFA	No Further Action
NFG	National Functional Guidelines
NM	Not Measured
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
NPL	National Priorities List
NRHP	National Registry of Historic Places
NSRR	Naval Station Roosevelt Roads
OE	Ordnance and Explosives
ORC	Oxygen-Releasing Chemicals
ORP	Oxidative-Redox Potential
ORS	Ordnance-Related Scrap
OSWER	Office of Solid Waste and Emergency Response (of EPA)
OVM	Organic Vapor Meter
PA/SI	Preliminary Assessment/Site Investigation
PAH	Polynuclear Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCOC	Preliminary Chemical of Concern
PEF	Particulate Emission Factor
PID	Photoionization Detector
PPM	Parts per Million
PQL	Practical Quantitation Limit
PREQB	Puerto Rico Environmental Quality Board
PRG	Preliminary Remediation Goal
PPT	Parts per Thousand
PVC	Polyvinyl Chloride
PWA	Public Works Area

QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
RA	Risk Assessment
RAGS	Risk Assessment Guidance for Superfund
RBC	Risk-Based Concentration
RfC	Reference Concentration Value
RfD	Reference Dose Value
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
RL	Reporting Limit
RME	Reasonable Maximum Exposure
SB	Soil Boring
SC	Site Characterization
SDG	Sample Delivery Group
SDWA	Safe Drinking Water Act
SERA	Screening Ecological Risk Assessment
SMDP	Scientific Management Decision Point
SMP	Site Management Plan
SOP	Standard Operating Procedures
SQG	Soil Quality Guidelines
SSL	Soil Screening Level
SVE	Soil Vapor Extraction
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TAL	Target Analyte List
TB	Trip Blank
TCL	Target Compound List
TDS	Total Dissolved Solids
TEF	Toxicity Equivalent Factor
TOC	Top of Casing
TTAL	Treatment Technique Action Limit
UCL	Upper Confidence Limit

ug/L	Micrograms per Liter
USCS	Unified Soil Classification System
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTL	Upper Tolerance Limit
UXO	Unexploded Ordnance
VOA	Volatile Organic Aromatic
VOC	Volatile Organic Compound

Executive Summary

This report presents the results of the Remedial Investigation (RI) conducted for Area of Concern (AOC) H of the former Naval Ammunition Support Detachment (NASD) in the western portion of Vieques Island, Puerto Rico. AOC H is located approximately 1,000 feet east of the entrance to the NASD Public Works Area (PWA) just north of Highway 200. The access restriction boundary area covers about two acres. The AOC H site is an abandoned concrete building approximately 80 feet long and 25 feet wide. An ephemeral stream is located to the west of the site.

From 1941 to 1943, prior to Navy activities, the AOC H site housed power generation equipment. The building included power generation equipment and large diesel generators to provide electricity to a nearby community. Historically, aboveground storage tanks (ASTs) associated with the generators were reportedly located on the west side of the building and held an estimated 2,000 to 3,000 gallons of diesel fuel storage. These tanks are no longer on site. The building and its surrounding area included for sampling and investigation cover less than a half-acre.

After 1943, the building was vacant until the 1960s, when it was used for fire training operations. The firefighter training included the use of diesel fuel, which was poured over rubber tires inside the building and ignited to simulate structure fires. The fire training activities ceased in the 1980s. The building has remained abandoned and overgrown with vines and tall shrubs. An ecological survey indicated the use of the building by fruit bats as a habitat.

This RI was conducted to supplement the previous investigations to (1) characterize the nature and extent of environmental contamination associated with the site and (2) assess whether site-related contaminants pose an unacceptable risk to human health and the environment.

Remedial Investigation Activities

To meet the RI objectives, a number of tasks were completed, including the following:

- Examination of previous environmental investigations and contaminant-related activities completed at AOC H to understand the physical characteristics, soil profiles, groundwater interfaces, and groundwater quality
- Collection and interpretation of groundwater data in the AOC H study area to establish baseline static groundwater levels
- Collection of 33 surface soil and 31 subsurface soil samples for laboratory analysis and reporting
- Installation of a network of one background and six onsite permanent monitoring wells constructed during an Expanded Preliminary Assessment/Site Investigation (PA/SI) in 2000 and this RI in 2003

- Collection of seven groundwater samples from existing and newly installed monitoring wells for laboratory analysis and reporting
- Analysis of soil, groundwater, surface water, and sediment samples for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), metals, perchlorate, pesticides, polychlorinated biphenyls (PCBs), and munitions and explosives-related chemicals

The RI was completed in accordance with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and followed the Environmental Protection Agency (EPA) interim final *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA, 1988). A work plan for the proposed RI activities was reviewed by the CERCLA Technical Committee (CTC) consisting of representatives from the Navy, Puerto Rico Environmental Quality Board (PREQB), EPA, Department of the Interior (DOI), and others. The work plan was finalized after comments were received from these and the other participating agencies.

RI field program findings, archives data, and previous studies at the site were used to develop and update the conceptual site model (CSM) for AOC H. The CSM identifies and describes potential source areas, environmental media affected by past disposal activities, potential migration pathways for the contaminants across the media, and exposure points for the identified chemicals. The CSM also identifies the potential human and ecological receptors for AOC H and their exposure routes based on current and future land use conditions and flow directions of groundwater.

Nature and Extent of Chemical Distribution at AOC H

All the samples were analyzed for metals, VOCs, SVOCs, pesticides, PCBs, and explosives.

The site soils were sampled in 33 surface soil and 31 subsurface soil locations. The surface soil analytical results indicated the presence of six inorganic chemicals at concentrations above at least one screening criterion and background concentrations. One VOC and six SVOCs were detected in surface soil samples above screening criteria. Three pesticides (DDD, DDT, and DDE) also exceeded screening criteria in surface soil. No explosives, PCBs or perchlorate were detected in the surface soils above the screening criteria. Subsurface soil had one inorganic chemical, arsenic, above screening criteria. All the chemicals above their respective human health and ecological screening protection based screening criteria were included for human health and ecological risk assessment.

Several inorganic chemicals in unfiltered (total) groundwater samples exceeded tap water PRGs. Filtered (dissolved) metals results showed aluminum, iron, manganese, and vanadium above tap-water PRGs. Metals were detected in all wells including the upgradient well, and no distribution patterns indicative of a release from the site were identified. One pesticide (DDD) was detected in groundwater above its PRG. No VOCs, SVOCs, PCBs, explosives, or perchlorate were detected in groundwater above their respective PRGs.

The site surface water was sampled at four locations during the RI. The surface water analytical results indicated the presence of one inorganic chemical (arsenic) at a concentration above ecological screening criterion in one unfiltered sample. One SVOC (caprolactam) was detected in one surface water sample at AOC H. No screening criteria were available for this constituent for comparison. Pesticides, explosives, or perchlorate were not detected in any of the surface water samples.

Site sediment samples were collected at five locations during the RI. The sediment analytical results indicated the presence of 21 inorganic chemicals. Screening criteria were not available for twelve of the detected inorganics. No pesticides were detected above screening criteria in the sediment samples. No SVOCs, explosives, or perchlorate were detected in sediment samples.

All soil and groundwater data were evaluated for their fate and transport properties.

Fate and Transport Evaluation

A fate and transport evaluation was performed for potential contaminants at AOC H. The primary migration pathways for transport of contaminants from the disposal area are rainwater leaching to the subsurface and surface soil runoff into the ephemeral stream.

Metals are ubiquitous at the site in soil and groundwater. The concentrations of inorganics in soil samples collected downgradient of the site were either less than or comparable to background concentrations, suggesting that surface runoff is not transporting metal contamination from the source area.

Arsenic in surface and subsurface soils at selected locations near the former power plant building was detected above health protection-based concentrations and background levels in some of the surface soil samples and subsurface soil samples (see Figures 6-2 and 6-3). One well had total arsenic reported during the 2000 sampling. Subsequent sampling did not detect arsenic in any wells in either the filtered or unfiltered samples (see Figure 6-4). Therefore, arsenic in soil does not appear to be migrating through leaching into the groundwater. Several other metals were detected in wells nearer the ephemeral stream for both total and dissolved metals concentrations (Figure 6-4). Elevated metals concentrations in groundwater samples may be a function of suspended solids, which is indicated by turbidity, or due to natural geochemical processes. The groundwater at the site has reducing conditions in some areas that are generally conducive to the presence of higher dissolved metals.

Arsenic was detected in downgradient sediment sample SD-1 and downgradient surface water sample SW-2 at concentrations that exceeded background levels or screening criteria. Arsenic was also detected at elevated levels in soil samples on the northern side of the building, but it was not detected at elevated levels adjacent to the ephemeral stream or within the ephemeral stream adjacent to this location. Most of the surface soil samples along the ephemeral stream have arsenic levels below background levels. In addition, all of the arsenic concentrations in the ephemeral stream sediment samples are below base-wide background sediment arsenic concentration. Therefore, the presence of arsenic in surface water and sediment at AOC H is most likely not related to site-activities.

To assess whether any constituents pose an unacceptable risk to human health and the environment, a human health risk assessment (HHRA) and an ecological risk assessment (ERA) were completed.

Human Health Risk Assessment

Detected chemicals were screened against criteria to determine the nature and extent of contamination. The chemicals identified as chemicals of potential concern (COPCs) were eight inorganic chemicals, two pesticides, and two SVOCs in surface soils and inorganic chemicals and one pesticide in groundwater based on one low-level detection, and only one inorganic chemical in sediment and surface water. The inorganic chemicals were also present in background samples and are likely part of the natural soil mineralogy and groundwater geochemical conditions. Most metals in soil, with the exception of arsenic in surface and subsurface soil samples in selected locations, were generally found at concentrations similar to those in background soils of the former NASD. Site groundwater metals in general were within the levels of either the upgradient well (NDAHMW01) or facility-wide background wells.

This area is designated by the Puerto Rico Planning Board as a potential low-density residential and tourism area, bordering a coastal conservation zone, with no specific plans for development for the site. However, for a conservative risk assessment based on unrestricted land use, the following potentially exposed populations were evaluated:

- Maintenance workers
- Construction workers
- Industrial workers
- Recreational receptors (adult, youth, and child)
- Residential receptors (adult and child)

The residential scenario represents the most conservative exposure scenario available in a risk assessment. The estimated non-carcinogenic risks from soils were within the EPA's target risk range for maintenance workers, industrial workers, construction workers, and recreational receptors. The Hazard Index (HI) for soils was above the target value of 1.0 for the residential child due to the presence of vanadium. The site soil concentrations of arsenic were also above background concentrations. The vanadium detections in soils were within the range of background concentrations.

The estimated carcinogenic risks for soils were within or below EPA's target risk range for recreational child, industrial adult, residential adult, and child. The HI from groundwater exposure through potable use was above the target limit due to manganese, iron, thallium, vanadium, and arsenic. The detected higher concentrations of metals in site wells were found in wells along the ephemeral stream (e.g., NDAHMW02, NDAHMW05, and NDAHMW07). Observed elevated metals are likely from natural geochemical processes in site groundwater.

The cumulative risks combined from soil and groundwater results in cancer risks and HI above acceptable limits. However, groundwater risks and HIs may not be site-related. Additionally, site groundwater is brackish and not suitable for potable use.

Ecological Risk Assessment

The ERA for AOC H was conducted in accordance with the *Navy Policy for Conducting Ecological Risk Assessments* (CNO, 1999) and the EPA *Ecological Risk Assessment Guidance for Superfund* (EPA, 1997a). The site is relatively undisturbed (except for recently cleared vegetation around the building perimeter to facilitate investigations) and provides suitable terrestrial habitat for plant, invertebrate, reptile, bird, and mammal communities. The adjacent aquatic brackish water/saltwater habitat associated with the ephemeral stream is supportive of fish, invertebrate, aquatic plant (mangroves), and semi-aquatic bird communities.

Based on the results of the ERA, it was concluded that chemicals detected in soil do not pose unacceptable risks to directly exposed organisms. Chemicals in the surface soil do not pose a risk to upper trophic level wildlife feeding on various prey at the site. Many of the metals detected onsite were generally comparable to background. Average concentrations of remaining soil metals and the few detected organic chemicals were either below screening ecotoxicity values or had a low magnitude of exceedance. Although some metals and a few organic chemicals were identified as COPCs, risks to lower trophic level receptors were negligible based on low magnitude of screening value exceedances and comparisons to background/upgradient data. No significant risks were identified for upper trophic level wildlife from potential food web exposures.

Five inorganics (aluminum, arsenic, barium, cobalt, and manganese) were identified as COPCs in surface water due to screening value exceedance (arsenic only) or lack of screening values. Of these, aluminum, arsenic, and cobalt were detected only as total (unfiltered) inorganics. Because these inorganics were not detected in any of the filtered (dissolved) surface water samples, they are likely associated with suspended sediment particulates and not readily bioavailable to directly exposed aquatic organisms. As a result, these inorganics were not considered for further evaluation as COPCs.

Eight inorganics (aluminum, barium, beryllium, cobalt, iron, manganese, thallium, and vanadium) were identified as COPCs in sediment from AOC H. Onsite concentrations of these parameters were compared to concentrations in an upgradient sediment sample. Except for barium, all other inorganics were below background levels. Barium is not widely distributed, exceeded basewide background in only one sample, and does not have a literature screening value available; thus the potential for unacceptable risk is likely to be low, and therefore it was not considered further as a COPC.

The results of the ERA indicate that chemicals detected in surface water and sediment do not pose unacceptable risks to directly exposed organisms. Many of the inorganic concentrations detected in sediment were generally comparable to background (upgradient samples). Average concentrations of the remaining inorganics and the few detected organic chemicals were either below screening ecotoxicity values or had a low magnitude of exceedance. Although some inorganics and a few organic chemicals were identified as COPCs, risks to lower trophic level receptors were negligible based on low magnitude of screening value exceedances and comparisons to background/upgradient data. No unacceptable risks were identified for upper trophic level wildlife from potential food web exposures. Given the low risk estimates for site-related chemicals, no additional ecological studies or sampling are recommended for AOC H based upon the results of this ERA. It was determined from the ERA that sufficient data are available on which to base a conclusion of no unacceptable risk within acceptable uncertainty at AOC H.

Conclusions and Recommendations

Overall human health risks are within the target limits for soils, groundwater, sediment, and surface water individually. However, the cancer risks and HI for soil and groundwater combined are above the target limits. Soils have elevated arsenic concentrations, although the risks from soils alone are within the target risk range. Groundwater is not potable due to the brackish nature of the water.

There are no unacceptable risks to ecological receptors from direct exposure to surface water, sediment, or surface soil. No significant risks were identified for upper trophic level wildlife from potential food web exposures.

The HHRA and the ERA indicated that sufficient data are available on which to base a conclusion of no unacceptable risk within acceptable uncertainty at AOC H. The HHRA is based on the most conservative assumption of unrestricted land use. Given the low risk estimates for site-related chemicals, no additional sampling or remedial actions are recommended for AOC H based upon the results of the RI.

Resumen Ejecutivo

Este reporte presenta los resultados de las actividades de Investigación de Remediación (RI, por sus siglas en ingles) conducidas para el Área de Preocupación (AOC, por sus siglas en ingles) H del Antiguo Destacamento Naval de Apoyo de Municiones (NASD, por sus siglas en ingles) localizado en el oeste de la isla de Vieques, Puerto Rico. El AOC H se encuentra aproximadamente a 1,000 pies al este de la entrada del Área de Trabajos Públicos (PWA, por sus siglas en ingles) del NASD justo al norte de la carretera 200. Los límites del área de con acceso restringido cubren alrededor de dos acres. El sitio AOC H es un edificio de concreto abandonado de aproximadamente 80 pies de largo y 25 pies de ancho. Una corriente efímera se encuentra al oeste del sitio.

Desde el 1941 al 1943, antes de las actividades de la Marina, el sitio AOC H albergaba equipos generadores de energía. El edificio incluía equipos de generación de energía y grandes generadores diesel para proveer electricidad a una comunidad cercana. Históricamente, los tanques de almacenamiento sobre tierra asociados (ASTs, por sus siglas en ingles) con los generadores eran reportados localmente en el oeste del edificio y almacenaban aproximadamente de 2,000 a 3,000 galones de combustible diesel. Estos tanques ya no se encuentran en el sitio. El edificio y las áreas alrededor incluidas para muestreo e investigación cubren menos de medio acre.

Luego del 1943, el edificio estuvo vacante hasta los años 1960s, cuando fue utilizado para operaciones de entrenamiento para combatir incendios. El entrenamiento de bomberos incluía el uso de combustible diesel, el cual era derramado sobre neumáticos de goma dentro del edificio y encendido para simular estructuras de fuegos. Las actividades de entrenamiento de fuego cesaron en los 1980s. El edificio permaneció abandonado y se cubrió rápidamente con enredaderas y arbustos. Un monitoreo ecológico indicó el uso del edificio por murciélagos fruteros como hábitat.

Este RI fue conducido para suplementar investigaciones previas para (1) caracterizar la naturaleza y extensión de la contaminación ambiental asociada al sitio y (2) evaluar si la contaminación relacionada al sitio posee un riesgo inaceptable para la salud humana y el ambiente.

Actividades de Investigación Remediadoras

Para alcanzar los objetivos del RI, se completó un número de tareas, incluyendo lo siguiente:

- Revisión de investigaciones ambientales previas y actividades relacionadas con contaminantes completadas en el AOC H para entender las características físicas, perfiles del suelo, interacción de aguas subterráneas, y calidad de aguas subterráneas.

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- Recolección e interpretación de datos de aguas subterráneas en el área de estudio de AOC H para establecer los niveles estáticos de la línea inicial de aguas subterráneas.
- Recolección de muestras de superficie de suelos y 31 muestras de subsuelos para análisis de laboratorios y reportes.
- Instalación de un pozo de monitoreo de trasfondo y seis pozos de monitoreo permanentes en el sitio construidos durante una Evaluación Preliminar Extendida/Investigación del Sitio (PA/SI, por sus siglas en ingles) en el 2000 y este RI en el 2003.
- Colección de siete muestras subterráneas de pozos de monitoreo existentes y pozos nuevos instalados para análisis de laboratorio y reportes.
- Análisis de suelo, aguas subterráneas, aguas de superficie, y muestras de sedimentos para compuestos orgánicos volátiles, (VOCs, por sus siglas en ingles), compuestos orgánicos semi-volátiles, SVOCs, por sus siglas en ingles), metales, perclorato, pesticidas, bifenilos policlorinados (PCBs, por sus siglas en ingles), y químicos relacionados a municiones y explosivos.

El RI se completó de acuerdo con las regulaciones de la Ley de Respuesta Ambiental, Responsabilidad y Compensación Comprensiva (CERCLA, por sus siglas en ingles) y siguiendo la guía provisoria final de la Agencia de Protección Ambiental *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA, 1988). Un plan de trabajo propuesto para las actividades RI fue revisado por el Comité Técnico de CERCLA (CTC, por sus siglas en ingles) compuesto por representantes de la Marina, Junta de Calidad Ambiental de Puerto Rico (JCA), EPA, El Departamento del Interior (DOI), y otras. El Plan de Trabajo se completó luego de recibirse los comentarios de éstas y otras agencias participantes.

Los hallazgos del programa de campo RI, información de archivos, y estudios previos del sitio fueron usados para desarrollar y actualizar el modelo conceptual del sitio (CSM, por sus siglas en ingles) para el AOC H. El CSM identifica y describe áreas de fuentes potenciales, medios ambientales afectados por actividades de disposición pasadas, rutas potenciales de emigración para los contaminantes a través de los medios, y puntos de exposición para los químicos identificados. El CSM también identifica los potenciales receptores humanos y ecológicos para AOC H y sus rutas de exposición basados en las condiciones de uso actual y futuro y la dirección de flujo de aguas subterráneas.

Naturaleza y Extensión de la Distribución Química en AOC H

Todas las muestras fueron analizadas para metales, VOCs, SVOCs, pesticidas, PCBs, y explosivos.

Se muestrearon los suelos del sitio en 33 localidades superficiales y 31 de subsuelos. Los resultados analíticos de la superficie del suelo indicaron la presencia de seis químicos

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inorgánicos en concentraciones sobre al menos un criterio de clasificación y concentraciones de trasfondo. Un VOC y seis SVOCs fueron detectados en muestras de la superficie del suelo sobre los criterios de clasificación. Tres pesticidas (DDD, DDT, y DDE) también excedieron los criterios de clasificación en la superficie del suelo. No se detectaron explosivos, PCBs o perclorato en la superficie del suelo sobre los criterios de clasificación. Los suelos de bajo la superficie contenían un químico inorgánico, arsénico, sobre los criterios de clasificación. Todos los químicos encontrados sobre sus respectivos niveles de clasificación de protección para la salud humana y protección ecológica fueron incluidos para una evaluación de salud humana y riesgo ecológico.

Varios químicos inorgánicos en muestras de aguas subterráneas sin filtrar (total) excedieron los PRGs para agua de consumo. Los resultados para metales filtrados (disueltos) mostraron aluminio, hierro, manganeso y vanadio sobre los PRGs para agua de consumo. Se detectaron metales en todos los pozos incluyendo un pozo declive arriba, y no se encontraron patrones indicativos de un escape del sitio. Un pesticida (DDD) fue detectado en aguas subterráneas sobre sus PRG. No se detectaron VOCs, SVOCs, PCBs, explosivos, o perclorato en aguas subterráneas sobre sus respectivos PRGs.

El agua de superficie del sitio fue muestreado en cuatro localizaciones durante el RI. Los resultados analíticos de la superficie del agua indicaron la presencia de un químico inorgánico (arsénico) en una concentración sobre los criterios de clasificación ecológicos en una muestra sin filtrar. Un SVOC (caprolactam) fue detectado en una muestra de agua de superficie en el AOC H. No hay criterio de selección disponible para este constituyente para ser comparado. No se detectaron pesticidas, explosivos, o perclorato en ninguna de las muestras de agua de superficie.

Se recolectaron muestras de sedimentos del sitio en cinco localizaciones durante el RI. Los resultados analíticos de sedimentos indicaron la presencia de 21 químicos inorgánicos. Los criterios de clasificación no estaban disponibles para 12 de los inorgánicos detectados. No se detectaron pesticidas sobre los niveles de clasificación en las muestras de sedimentos. No se detectaron SVOCs, explosivos, o perclorato en muestras de sedimentos.

Toda la información de suelos y aguas subterráneas fueron evaluadas para su propiedad de destino y transportación.

Evaluación de Destino y Transportación

Se realizó una evaluación para definir el destino y transportación de contaminantes potenciales en el AOC H. Las rutas primarias de emigración para la transportación de contaminantes desde el área de disposición son agua de lluvia que lixivia al sub suelo y superficie de los suelos en la corriente efímera.

Los metales se encuentran presentes en el suelo del sitio y en aguas subterráneas. Las concentraciones de inorgánicos en las muestras de suelo recolectadas vertiente abajo del sitio se encontraban bajas ó comparables a las concentraciones de trasfondo, lo cual sugiere

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que las escorrentías de superficie no están transportando contaminación de metales desde el área.

El arsénico en suelos de superficie y sub suelos en localizaciones seleccionadas cerca de la antigua planta de energía fue detectado sobre las concentraciones de protección a la salud y niveles de trasfondo en algunas de las muestras de suelos de superficie y sub suelos (ver Figuras 6-2 y 6-3). Un pozo contenía arsénico total reportado durante un muestreo en el 2000. Un muestreo subsiguiente no detectó arsénico en ninguno de los pozos en las muestras filtradas o sin filtrar (Ver Figura 6-4). Por lo tanto, el arsénico en los suelos no parece emigrar a través de lixiviación al agua subterránea. Varios otros metales fueron detectados en pozos cerca de la corriente efímera para concentraciones de metales totales y disueltos (Figura 6-4). Concentraciones elevadas de metales en muestras de aguas subterráneas pueden ser una función de sólidos suspendidos, lo cual es indicado por la turbidez, o debido a procesos geoquímicas naturales. El agua subterránea del sitio tiene condiciones reducidas en algunas áreas que generalmente conducen a una presencia de metales disueltos más altos.

Arsénico fue detectado en muestra de sedimento SD-1 vertiente abajo y muestras de agua SW-2 de superficie vertiente abajo en concentraciones que exceden los niveles de trasfondo o criterios de clasificación. El arsénico también fue detectado en niveles elevados en muestras de suelo en la parte norte del edificio, pero no fue detectado en niveles elevados adyacente a la corriente efímera o dentro de la corriente efímera adyacente a esta localización. La mayoría de las muestras de suelos de superficie a lo largo de la corriente efímera contienen niveles de arsénico bajo los niveles de trasfondo. Además, todas las concentraciones de arsénico en las muestras de sedimento de la corriente efímera se encuentran por debajo de la concentración base para concentraciones de sedimentos de arsénico. Por lo tanto, la presencia de arsénico en aguas de superficie y sedimentos en el AOC H probablemente se deba a actividades no relacionadas con el sitio.

Para evaluar si cualquier constituyente presenta un riesgo a la salud humana y al ambiente, se completó una Evaluación de Riesgo a la Salud Humana (HHRA, por sus siglas en ingles) y una Evaluación de Riesgo Ecológico (ERA, por sus siglas en ingles).

Evaluación de Riesgo a la Salud Humana

Los químicos detectados fueron comparados contra criterios para determinar la naturaleza y extensión de la contaminación. Los químicos identificados como Químicos de Preocupación Potencial (COPCs, por sus siglas en ingles) fueron ocho químicos inorgánicos, dos pesticidas, y dos SVOCs en superficies de suelos y químicos inorgánicos y un pesticida en aguas subterráneas basado en una detección de bajo nivel, y solamente un químico inorgánico en aguas de superficie y sedimento. Los químicos inorgánicos también estuvieron presentes en muestras de trasfondo y posiblemente sean parte de la mineralogía del suelo y las condiciones geoquímicas de las aguas subterráneas. Casi todos los metales en los suelos, con excepción del arsénico en la superficie y muestras de sub suelos en localizaciones seleccionadas, generalmente fueron encontrados en concentraciones similares a aquellas en

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suelos de trasfondo de la Antigua NASD. En general, se encontraron metales en aguas subterráneas del sitio dentro de los niveles del pozo de vertiente arriba (NDAHMW01) ó pozos de trasfondo de amplias facilidades.

Esta área está designada por la Junta de Planificación de Puerto Rico como un área residencial y de turismo de baja densidad potencial, confinando una zona costera de conservación, sin planes específicos para desarrollo para este sitio. Sin embargo, para una evaluación de riesgo conservadora basado en uso de tierras sin restricciones, las siguientes poblaciones potencialmente expuestas fueron evaluadas:

- Trabajadores de mantenimiento
- Trabajadores de Construcción
- Trabajadores Industriales
- Receptores recreativos (adultos, jóvenes y niños)
- Receptores residenciales (adultos y niños)

El panorama residencial representa el más conservador panorama de exposición disponible en una evaluación de riesgo. Los riesgos estimados no-carcinógenos de suelos se encontraban dentro de la gama de riesgos de la EPA para trabajadores de mantenimiento, trabajadores industriales, trabajadores de construcción y receptores recreativos. El Índice de Peligrosidad (HI, por sus siglas en ingles) para suelos estaba sobre el valor de 1.0 para un niño residente debido a la presencia de vanadio. Las concentraciones de arsénico en el suelo también se encontraban sobre las concentraciones de trasfondo. Las detecciones de vanadio en los suelos estaban dentro de la gama de las concentraciones de trasfondo.

Los riesgos estimados de carcinógenos para los suelos estaban dentro o por debajo de la gama de riesgo de la EPA para niño recreativo, adulto industrial, adulto residencial, y niño. El HI de exposición a aguas subterráneas a través de uso potable estaba sobre el límite debido al manganeso, hierro, talio, vanadio y arsénico. Las concentraciones altas de metales detectadas en los pozos del sitio se encontraron en pozos a lo largo de la corriente efímera (ej., NDAHMW02, NDAHMW05, y NDAHMW07). Los metales elevados observados son posiblemente de procesos geoquímicas naturales en el sitio y de aguas subterráneas.

Los riesgos acumulativos combinados de suelos y aguas subterráneas resultan en riesgos de cáncer y HI sobre los niveles limites de aceptación. Sin embargo, los riesgos de aguas subterráneas y HIs podrían ser no relacionadas con el sitio. Además, el agua subterránea del sitio es salobre y no conveniente para uso potable.

Evaluación de Riesgo Ecológico

El ERA para el AOC H fue conducido de acuerdo con el *Navy Policy for Conducting Ecological Risk Assessments* (CNO, 1999) y la EPA *Ecological Risk Assessment Guidance for Superfund* (EPA,

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1997a). El sitio es relativamente imperturbado (excepto por la vegetación limpiada recientemente alrededor de los perímetros del edificio para facilitar las investigaciones) y provee un hábitat terrestre conveniente para plantas, invertebrados, reptiles, pájaros y comunidades de mamíferos. El hábitat salobre/salino acuático adyacente asociado con la corriente efímera es apoyo para pescado, invertebrados, plantas acuáticas (mangles), y comunidades de pájaros semi acuáticos.

Basado en los resultados de la ERA, se concluyó que los químicos detectados en el suelo no poseen un riesgo inaceptable para organismos directamente expuestos. Los químicos en la superficie del suelo no presentan un riesgo para la vida silvestre de nivel trófica alta que se alimenta de varias presas en el sitio. Muchos de los metales detectados en el sitio eran generalmente comparables al trasfondo. El promedio de concentraciones de metales del resto de los suelos y los pocos químicos orgánicos detectados estaban o bajo los valores ecotóxicos de clasificación ó tenían una baja magnitud de exceso. A pesar de que algunos metales y unos pocos químicos orgánicos fueron identificados como COPCs, los riesgos para receptores de nivel trófico bajo eran insignificantes basados en la baja magnitud de los excedentes sobre los valores de clasificación y las comparaciones a trasfondo/información vertiente arriba. No se identificaron riesgos significativos para vida silvestre trófica alta por exposiciones potenciales de la cadena alimenticia.

Cinco inorgánicos (aluminio, arsénico, bario, cobalto, y manganeso) fueron identificados como COPCs en aguas superficiales debido al excedente de los valores de clasificación (arsénico solamente) o falta de valores de clasificación. De estos, aluminio, arsénico, y cobalto fueron detectados solo como inorgánicos totales (sin filtrar). Debido a que estos inorgánicos no se detectaron en ninguna de las aguas de superficie filtradas (disueltas) posiblemente están asociadas con las partículas de alimentos suspendidos y no bio-disponibles para organismos acuáticos directamente expuestos. Como resultado, estos inorgánicos no fueron considerados para más evaluaciones COPCs.

Ocho inorgánicos (aluminio, bario, berilio, cobalto, hierro, manganeso, talio, y vanadio) fueron identificados como COPCs en sedimentos del AOC H. Las concentraciones en el sitio de estos parámetros fueron comparados a las concentraciones en una muestra de sedimento vertiente arriba. Excepto por el bario, todos los demás inorgánicos se encontraron bajo los niveles de trasfondo. El bario no se distribuye extensamente, solamente una muestra excedió el trasfondo ampliamente, y no posee valores de clasificación disponible; por lo tanto, el potencial de riesgo inaceptable es posiblemente bajo, y por lo tanto dejó de considerarse como un COPC.

Los resultados del ERA indicaron que los químicos detectados en aguas superficiales y sedimentos no presentan un riesgo inaceptable para organismos directamente expuestos. Muchas de las concentraciones inorgánicas detectadas en el sedimento fueron generalmente comparables al trasfondo (muestras vertiente arriba). El promedio de concentraciones de los inorgánicos restantes y los pocos químicos orgánicos detectados estaban o bajo los niveles de clasificación ecotóxicos o la magnitud de exceso muy bajo. Aunque algunos inorgánicos

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y unos pocos químicos orgánicos fueron identificados como COPCs, los riesgos a los receptores tróficos bajos eran insignificantes basados en la baja magnitud del exceso sobre los valores de clasificación y comparaciones al trasfondo/información vertiente arriba. No se identificaron riesgos inaceptables para la vida silvestre de un nivel trófico alto por exposición potencial a la red alimenticia. Dado el bajo riesgo estimado para sustancias químicas relacionadas al sitio, no se recomiendan estudios ecológicos o muestreos adicionales para el AOC H basado en los resultados de este ERA. Se determinó de ésta ERA que hay suficiente información disponible en la cual basar una conclusión de ningún riesgo inaceptable dentro de la incertidumbre aceptable en el AOC H.

Conclusiones y Recomendaciones

Los riesgos a la salud humana se encuentran dentro de los límites para suelos, aguas subterráneas, sedimentos, y aguas de superficie individual. Sin embargo, los riesgos de cáncer y HI para suelos y aguas subterráneas combinadas se encuentran sobre los límites. Los suelos tienen concentraciones elevadas de arsénico, aunque los riesgos provenientes de los suelos solamente, se encuentran dentro del blanco de alcance de riesgos. El agua subterránea no es potable debido a la naturaleza salobre del agua.

No hay riesgos inaceptables para los receptores ecológicos por exposición directa al agua de la superficie, sedimento, o superficie del suelo. No se identificaron riesgos significantes para la vida Silvestre trófica alta por exposición a la red alimenticia.

El HHRA y el ERA indican que hay suficiente información disponible para basar la conclusión de ningún riesgo inaceptable dentro de la incertidumbre aceptable en el AOC H. El HHRA se basa en la asunción más conservadora de uso de tierra sin restricción. Dado el bajo riesgo estimado para químicos relacionados al sitio, no se recomienda ningún muestreo adicional o acciones remediadoras para AOC H basado en los resultados del RI.

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SECTION 1

Introduction

This Remedial Investigation (RI) report presents the results of the RI completed at Area of Concern (AOC) H of the Former Naval Ammunition Support Detachment (NASD), Vieques, during 2003. This RI report incorporates previous investigations conducted at AOC H. Based on the RI, results of the risk assessment (RA) were used to determine whether a feasibility study (FS) would be needed that would present a range of remedial action alternatives to protect human health and the environment. The results of the RI provide the Navy with a comprehensive understanding of environmental contamination at the site and recommendations for moving forward in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process at the site. The site will be recommended for no further action (NFA) if the results of the RI indicate that site conditions at AOC H are adequately protective of human health and the environment.

This report has been prepared for the Commander of the U.S. Navy's Atlantic Fleet by the Naval Facilities Engineering Command (NAVFACENGCOM) Atlantic Division (LANTDIV) and CH2M HILL under Navy Contract N62470-02-D-3052, Navy Comprehensive Long-Term Environmental Action Navy (CLEAN III), District III, Contract Task Order 007.

1.1 Purpose and Scope

This RI was designed to accumulate sufficient site data to characterize the nature and extent of contamination from the known sources onsite so that recommendations for remedial actions, if any, could be evaluated from site data. To achieve this, two primary objectives were developed for executing this project:

1. Complete a field data collection program to evaluate the type, extent, and magnitude of contamination present in site media (soils, sediments, surface water, and groundwater)
2. Determine the current and potential future risks to human health and the environment from the analytical results from site media and the planned future land use for the site

To meet these two objectives, a number of tasks were implemented at the site to gather information that would help form conclusions on the potential site risks posed by surface and subsurface contamination within the study area. These tasks included:

- Examination of previous environmental investigations and construction activities at AOC H to evaluate and establish baseline conditions concerning the physical characteristics, subsurface soil profiles, groundwater interfaces, and subsurface and groundwater quality in the study area
- Measurement and interpretation of groundwater levels within the main operational compound area and nearby ephemeral stream to establish baseline static groundwater levels in the vicinity of AOC H
- Collection of surface water and sediment samples for laboratory analysis and reporting

- Installation of subsurface soil borings to further classify the geologic profile and to collect environmental samples for laboratory analysis and reporting
- Installation of permanent monitoring wells to supplement the existing monitoring well network constructed during the site characterization (SC) and expanded preliminary assessment/site investigation (PA/SI) completed at AOC H in 2000
- Collection of groundwater samples from existing and newly installed monitoring wells for laboratory for analysis and reporting

The scope for the RI field program was completed in accordance with the provisions of CERCLA and followed the interim final guidance (EPA, 1988).

1.2 Report Organization

This Draft RI report contains 9 sections, presented in Volume I, and 11 appendixes, presented in Volume II. The sections in Volume I are organized as follows:

Section 1. Introduction presents the purpose and scope of the investigation and the organization of this report**.**

Section 2. Physical Setting, Site History, and Previous Investigations presents general background information related to AOC H, a summary of natural and cultural resources in the AOC H area, and a discussion of the regulatory status of the site.

Section 3. Summary of Field Investigation presents descriptions of the various tasks completed as part of the RI for AOC H and the approach, methods, and operational procedures employed to perform these tasks. This section also presents the data management and quality control measures used during collection of AOC H-related data, as well as a data quality evaluation (DQE) of analyzed data.

Section 4. Nature and Extent of Contamination presents results on the nature and extent of contamination at AOC H based on information from Section 3.

Section 5. Contaminant Fate and Transport presents conclusions on the fate and transport of contaminants at the site formulated from results of the previous sections and information on site physical characteristics, contaminant source characteristics, and extent of contamination. The conceptual model (CSM) for the main operational area of the former NASD and AOC H is introduced in this section; the CSM illustrates the primary contaminant sources, release mechanisms, pathways, and potential receptors.

Section 6. Human Health Risk Assessment presents results of the HHRA for AOC H as developed from information summarized in the previous sections.

Section 7. Ecological Risk Assessment presents an ERA for AOC H using information from previous sections.

Section 8. RI Conclusions and Recommendations presents the conclusions and recommendations from the RI program at the site.

Section 9. References presents a list of sources cited in this RI report or used in developing it.

SECTION 2

Physical Setting, Site History, and Previous Investigations

This section presents the site setting, history, and previous environmental investigations conducted at the AOC H area. This section also contains brief descriptions of the natural and cultural resources in the former NASD, results of previous environmental investigations, and discussion of the regulatory status of the site.

2.1 Location

Figure 2-1 illustrates the location of Vieques Island, Puerto Rico, in the Caribbean Sea approximately 7 miles southeast across Vieques Passage from the eastern tip of the main island of Puerto Rico. Vieques is the second-largest island in the Commonwealth of Puerto Rico. It is approximately 20 miles long and 3 miles wide, with an area of 33,088 acres, or 51 square miles.

AOC H is located approximately 1,000 feet east of the entrance to the public works area (PWA) just north of Highway 200 and covers about 2 acres. The site is approximately 200 feet south of Vieques Passage at coordinates of 18° 07′ 36″ N latitude and 65° 31′ 20″ W longitude. The site elevation ranges from sea level to 10 feet above mean sea level (msl). The AOC H site is an abandoned concrete building approximately 80 feet long and 25 feet wide. An ephemeral stream is located to the west of the site and contains tidal water from Vieques Passage. Figure 2-2 shows the location of AOC H within the former NASD property and its present land use.

2.2 Site History

The building at the AOC H site housed power generation equipment and large diesel generators to provide electricity to a nearby community from 1941 to 1943, prior to Navy activities. Aboveground storage tanks (ASTs) associated with the generators were reportedly located on the west side of the building; these stored an estimated 2,000 to 3,000 gallons of diesel fuel. The ASTs are no longer on the site. The building and surrounding area included for sampling and investigation cover an area of less than a half-acre. Figure 2-3 is an aerial photograph of AOC H that shows the power plant building, the adjacent ephemeral stream, and dense vegetation surrounding the site. No historical aerial photographs or diagrams show the location of the former generators, ASTs, or transformers located at the site. There are three exterior doors in the building, one door on each of the north, south, and east sides of the building.

After 1943, the building was vacant until the 1960s, when it was used for fire training operations. The firefighter training included the use of diesel fuel, which was poured over rubber tires inside the building and ignited to simulate structure fires. The fire training activities ceased in the 1980s. The building has remained abandoned and overgrown with vines and tall shrubs. An ecological survey indicated use of the building by fruit bats as a habitat.

The U.S. Navy ceased facility-wide operations on the former NASD on April 30, 2001, in accordance with the January 30, 2000, Presidential Directive to the Secretary of Defense relating to the transfer of lands of the Navy-owned western portion of Vieques. The land transfer was completed on May 1, 2001, and the Navy has had no presence at the main operational area since that date.

The main operational area of the former NASD remained largely undisturbed from May 2001 until early 2003, when the Municipality of Vieques (MOV) began using a small number of existing buildings for public works vehicle storage and maintenance activities. No other activity at AOC H has been reported since the 1980s.

2.3 Physical Setting

2.3.1 Weather and Climate

The climate of Vieques is tropical-marine. Temperatures are nearly constant, with an annual average of about 79°F; August is the warmest month, at 82°F, and February the coolest, at 76°F (Greenleaf/Telesca, 1984). Vieques lies directly in the path of the prevailing easterly trade winds that regulate the climate of Puerto Rico. The trade winds result in a rainfall pattern characterized by a dry season from December through July and a rainy season from August through November. Heavy precipitation may be induced by tropical storms from June to November, which is considered normal for this area of the Caribbean. The western part of the Island, where the site is located, averages approximately 50 inches of rainfall per year, 50 percent of which occurs during the rainy season (U.S. Geological Survey [USGS], 1989).

2.3.2 Topography

The topography of the former NASD is characterized by a series of low hills and small valleys intersected by a series of ephemeral streams. The most elevated areas occur along a west-to-east axis near the center of the former NASD. The highest point is Mount Pirata, approximately 987 feet above sea level. In general, the slope of the former NASD tapers gradually down from the center to the coastal areas, with the exception of steep slopes in the vicinity of Mount Pirata

Topography at AOC H is characterized by relatively flat reworked areas resulting from construction of the former power plant building in the early 1940s (CH2M HILL, 1999). An ephemeral stream flows along the western portion of the site. This ephemeral stream drains northward to Vieques Passage (CH2M HILL, 2000d). The ephemeral stream varies from 20 to 40 feet wide and averages 3 to 6 feet deep. The site is located at elevation between sea level and 10 feet above msl, as shown in Figure 2-4.

2.3.3 Vegetation

Vegetation immediately around the structure was cleared for the installation of monitoring wells prior to the survey. The area to the east consists of dense thorn scrub. West of the building, a mixed thorn scrub and coastal forest transitions to the ephemeral stream that drains to Vieques Passage. Water quality within the ephemeral stream was brackish during the survey. To the north, a densely mixed thorn scrub and coastal forest is present.

Dominant shrubs identified on the site included tantan, Christmas tree, and brisselet. The sandy ground was covered with tantan seedlings. The dominant herbs observed on the site include malva colorada and better man better. Hurricane grass was observed on the southern boundary of the site. AOC H is bordered to the south by the grassy road shoulder, which is maintained frequently.

2.3.4 Geology

2.3.4.1 Regional Geology

The geology of western Vieques is characterized by plutonic rocks generally overlain by alluvial deposits. The plutonic rocks consist of granodiorites that were intruded by a quartz-diorite plutonic complex and are exposed over a large percentage of the island. A gradual change in texture from coarse- to fine-grained quartz-diorite has been observed from the west to the east part of Vieques. A saprolite formation occurs at the surface of the plutonic complex. The alluvial deposits are generally of Quaternary age, consisting of a mixture of sand, silt, and clay that together have an average thickness of 30 feet in western Vieques. The sediments consist of alluvial deposits, beach and dune deposits, and swamp and marsh deposits. The floodplains consist of beach and dune deposits formed by calcite, quartz, plutonic rock fragments, and minor magnetite (USGS, 1989).

2.3.4.2 Local Geology

Geologic profiles for AOC H were developed through the evaluation of soil boring logs and the associated geologic cross-section (Figure 2-5). Soil samples collected during the installation of soil borings and monitoring wells associated with the Expanded PA/SI completed in 2000 and this RI indicate that the soils encountered beneath AOC H consist of a variety of different alluvial deposits such as clay, sand, silty sand, gravel, gravel with sand, and gravelly clay. Soil colors range from a yellowish brown in the clay to a greenish gray sand. The materials in the clay zone generally exhibit low plasticity when moist, are stiff when dry, and are easily crumbled under hand pressure. The materials in the sand and gravel zones also exhibit low plasticity when moist, are generally loose, and can be easily crumbled under hand pressure.

The AOC H area appears to be on the fringes of the Resolución Valley aquifer and contains some of the sands and silty sands described in the USGS 1989 study. The water-bearing sediments (the sands, silty sands, and gravels) are within the upper 30 feet of the alluvium deposits.

2.3.5 Hydrology

2.3.5.1 Surface Water

Surface water on the former NASD consists of several lagoons and intermittent streams. Most of the streams are ephemeral, flowing only for a short period of time after precipitation events. These streams are located throughout the former NASD, generally flowing in a northerly direction.

One surface water body is present at AOC H. An ephemeral stream is located just west of the building and is mostly stagnant. It is possible that during periods of heavy and prolonged rainfall or ocean surge, the mouth of the ephemeral stream opens to the Vieques Passage to the north and at these times the ephemeral stream is subject to tidal influence. However, a tidal study (see Section 3.2) indicated that water levels in the ephemeral stream were not influenced by tides when the mouth of the stream is closed off to the Vieques Passage.

2.3.5.2 Groundwater

The Resolución Valley aquifer, estimated by the USGS to extend across much of the northwest portion of Vieques, is the only known groundwater aquifer on the former NASD property that contains potentially potable water. The Navy installed the only potable wells on the island of Vieques. The Navy plugged and abandoned all potable wells in the summer of 2000 as part of the transfer process. The Resolución Valley slopes from Mount Pirata toward the Vieques Passage and encompasses an area of approximately 8 square miles. Although no perennial streams are present in the valley, this area receives more rainfall than any other part of Vieques. The geology of the Resolución Valley aquifer consists of sedimentary deposits that overlie a saprolite formation derived from plutonic rocks. Geophysical surveys show that the alluvial deposits average approximately 30 feet in thickness (USGS, 1989).

AOC H is underlain by an unconfined groundwater system composed of alluvial deposits made up of sands, silty sands, and gravels. Groundwater was encountered at the site at a depth of approximately 7 feet below land surface (bls). Based on groundwater elevation data collected for this investigation, the groundwater flow direction at AOC H is predominantly to the north toward Vieques Passage. However, at the western part of the site groundwater may flow locally to the west toward the ephemeral stream. (Figure 2-6). The predominant northerly flow is reflected in the steeper gradient to the north of approximately 0.01 ft/ft as compared to the westward gradient of approximately 0.006 ft/ft, as calculated below.

Northern Direction from MW-6 to MW-3

Gradient = (-1.09 ft – (-) 2.12 ft)/100 ft = 1.03 ft/100 ft = 0.01 ft/ft

Western Direction from MW-6 to MW-5

Gradient = (-1.09 ft – (-) 1.42 ft)/60 ft = 0.33 ft/60 ft = 0.006 ft/ft.

2.4 Wildlife

During the wildlife surveys, several species were observed using the abandoned power plant building and adjacent habitat. The exterior of the building provides shade, foraging areas, and cover for an abundant number of lizards such as the garden lizard, common lizard, and spotted lizard. A ground lizard was seen immediately adjacent to the site among thorn scrub. In addition, the building provides a roosting place for a population of approximately 150 West Indian fruit bats. Numerous seeds from bat droppings littered the floor of the building. Fruits collected in the building included the moca tree, quenepa plant, and the Indian almond tree.

Bird species observed near the power plant building included gray kingbird, Adelaide warbler, and common ground doves. No evidence was observed to indicate that AOC H has had an adverse effect on wildlife diversity or habitat. The recent clearing of vegetation may have reduced structural diversity, but recovery of vegetation would be expected to occur.

No endangered or threatened species were observed within the AOC H area.

2.5 Cultural Resources

A number of resources on the former NASD property are of interest from a cultural perspective, including conservation zones and prehistoric and historic sites. U.S. Navy surveys have located more than 100 sites on Vieques with the potential to contain significant cultural resources. Eleven of these sites are listed in the National Registry of Historic Places (NRHP).

The sugarcane industry was the major economic base of Vieques during the late 19th century and early 20th century. Several sugarcane factories operated at or near the former NASD property, including the Arcadia, Playa Grande, Resolución, and Santa Elena factories. Sugarcane operations in Vieques were largely discontinued in the early 1940s when the U.S. Navy purchased large portions of the island; operations were discontinued entirely by the early 1950s.

A total of 17 archeological sites and districts are listed on the NRHP for Vieques, with 12 of these on the western end of the island (Geo-Marine, 1996). This information has been confirmed in the review of other cultural resource maps of Vieques. None of these 12 archeological sites occurs within the AOC H area. No cultural resources are expected to be encountered at AOC H based on its recent history and lack of documented evidence of such resources.

2.6 Summary of Previous Investigations

Several investigations have been conducted onsite to evaluate the presence of contaminants from the historical operations at the former powerhouse building. These investigations included analyses of soil, groundwater, and sediments and ecological surveys of the habitats and wildlife occurrences. Table 2-1 summarizes the previous investigations to date and the findings.

The Expanded PA/SI report (2000) includes details of the previous investigations conducted at this site. This section includes a summary of that report.

An EBS was performed on the site (ERM, 2000). Soil wipe samples were collected from the building's concrete floor to determine if polychlorinated biphenyls (PCBs) were present. The analysis concluded that PCB contamination was not present.

An ecological survey was conducted in August 2000 by Geo-Marine Inc. The survey concluded that no endangered or threatened species were present at the site.

The Expanded PA/SI field investigation was performed by CH2M HILL to determine if contaminants of concern existed on the site (CH2M HILL, 2000d). Sixteen surface/subsurface soil samples were collected at the building perimeter, and four surface soil samples were collected inside the building to characterize the extent of site contamination. One upgradient and three downgradient groundwater samples were collected from site monitoring wells (Figure 3-3).

Groundwater analytical results indicated total inorganic exceedances above the Region IX tap-water preliminary remediation goals (PRGs) (HI at 0.1 for non-carcinogenic chemicals) for aluminum, antimony, arsenic, barium, iron, manganese, vanadium, and thallium. Since these constituents occur naturally in the soil, their presence might have resulted from suspended particles rather than from site-related activities (i.e., dissolved in groundwater). One exceedance of the criterion was recorded for one pesticide, p,p'-DDD.

Surface soil samples contained aluminum, antimony, arsenic, chromium (total), iron, lead, manganese, benzo(a)pyrene, n-nitrosodi-n-propylamine, p,p-DDE, p,p-DDT, and 2,6-dinitrotoluene above the USEPA Region IX residential PRGs, industrial PRGs, or leachability criteria.

The subsurface soil samples showed no constituent above risk-based criteria.

2.7 Regulatory Status

The investigations of AOC H are being conducted in accordance with the CERCLA process. AOC H was originally identified as a potential release location and addressed under the EBS investigation in 2000 and in the PA/SI and Expanded PA/SI (CH2M HILL, 2000d). The Puerto Rico Environmental Quality Board (PREQB) and EPA Region 2 reviewed and provided comments on the Expanded PA/SI report. These comments were incorporated in the RI work plan and included recommendations for additional sampling of soils, groundwater, and sediments.

Based on EPA and PREQB comments, analytical results from the previous investigations indicated a need for further investigation at AOC H. Additional data were collected during 2003 as part of this RI to further characterize the site and define the nature and extent of contamination in site media.

TABLE 2-1
Previous Sampling/Investigations at AOC H as Reported in Expanded PA/SI Report
AOC H, Former NASD, Vieques, Puerto Rico

Event/Activity	Samples	Purpose	Findings
Environmental Baseline Survey (EBS) by ERM (2000)	Wipe samples for PCBs	Determine if hazardous chemicals are present	No PCBs were detected inside the building
Ecological Survey	Plant and animal survey	Characterize ecology, identify any federally protected species present, qualitative impact analysis	No protected species identified, no impacts from AOC H reported. Ephemeral stream adjacent to the site has brackish water.
Expanded PA/SI Sampling	4 new monitoring wells 20 surface soil (4 inside the building) 16 subsurface soil	Determine if RI/FS is required or NFA	Metals, SVOCs, and pesticides in surface soils were above criteria. Groundwater had metals and a pesticide above criteria. No chemical above criteria in subsurface soil.

Notes:

Site is a building approximately 80 feet long x <25 feet that was used for firefighter training in more recent times.
Site and surrounding area combined occupy about 0.3 to 0.5 acre.

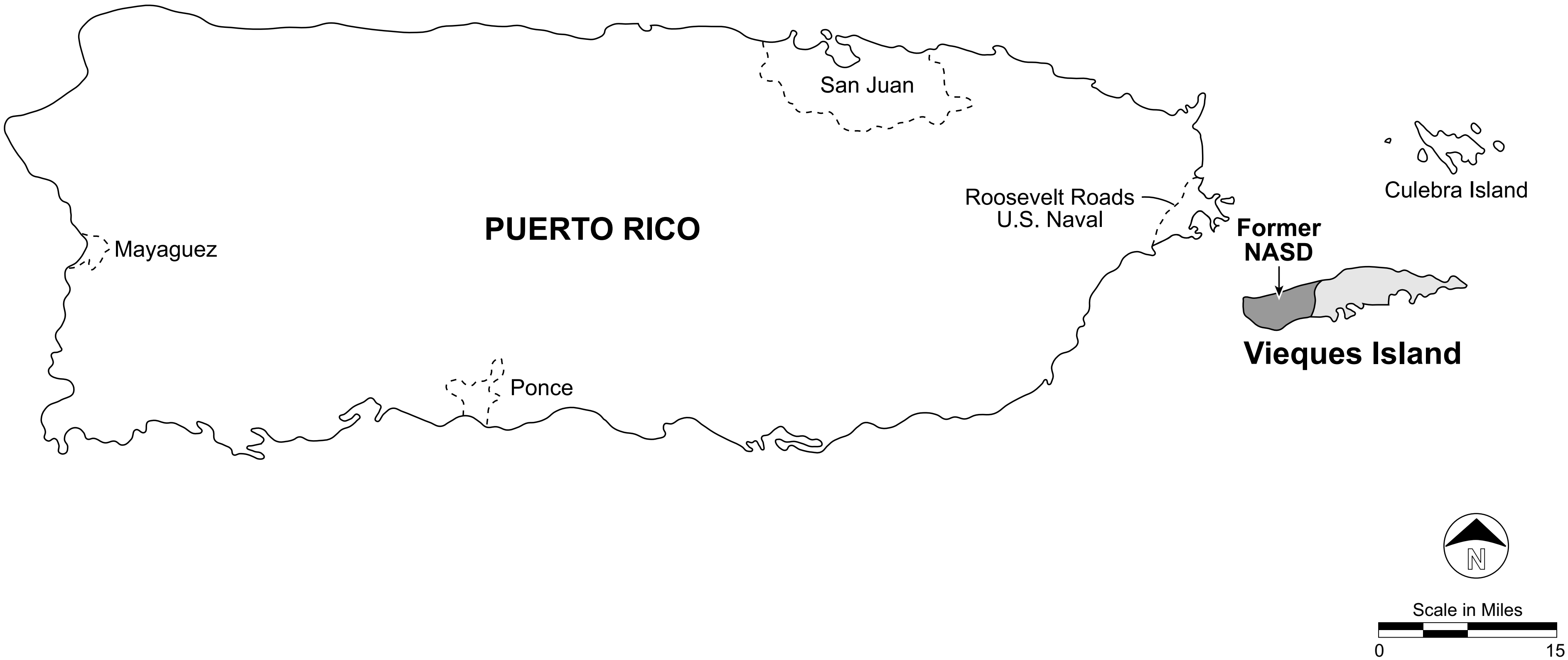
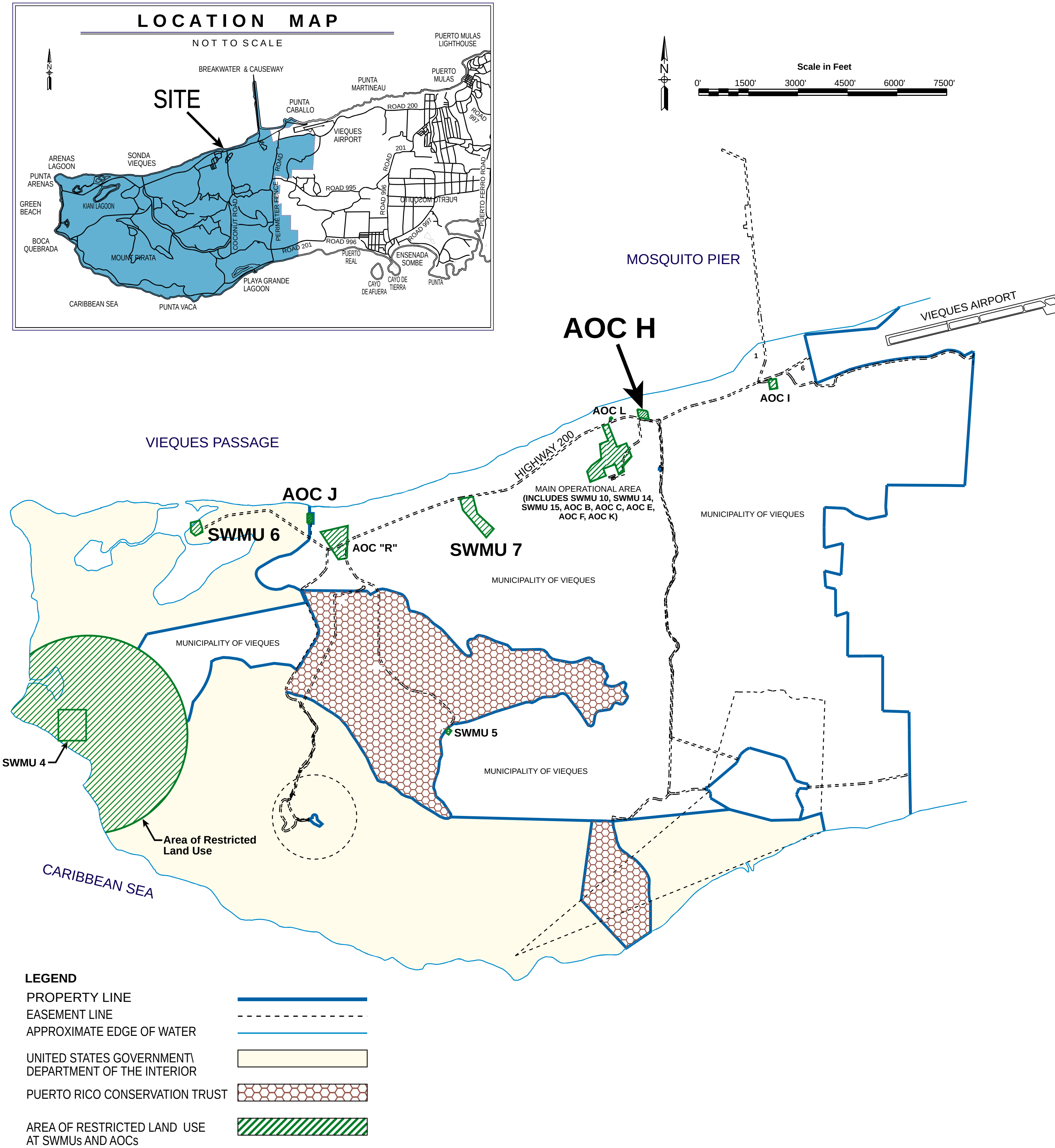


FIGURE 2-1
Regional Location Map
Vieques, Puerto Rico

CH2MHILL



SOURCE:
VIEQUES NASD SURVEY LAND TRANSFER & DISPOSAL OVERALL LOCATION SURVEY
PREPARED BY GLENN & SADLER AND LUIS BERRIOS MONTES & ASSOCIATES

Figure 2-2
AOC H and Other IR Sites Location Map
Former NASD, West Vieques Island, Puerto Rico

CH2MHILL

Legend

Access Restriction Boundary

Source: 1994 Aerial Photograph

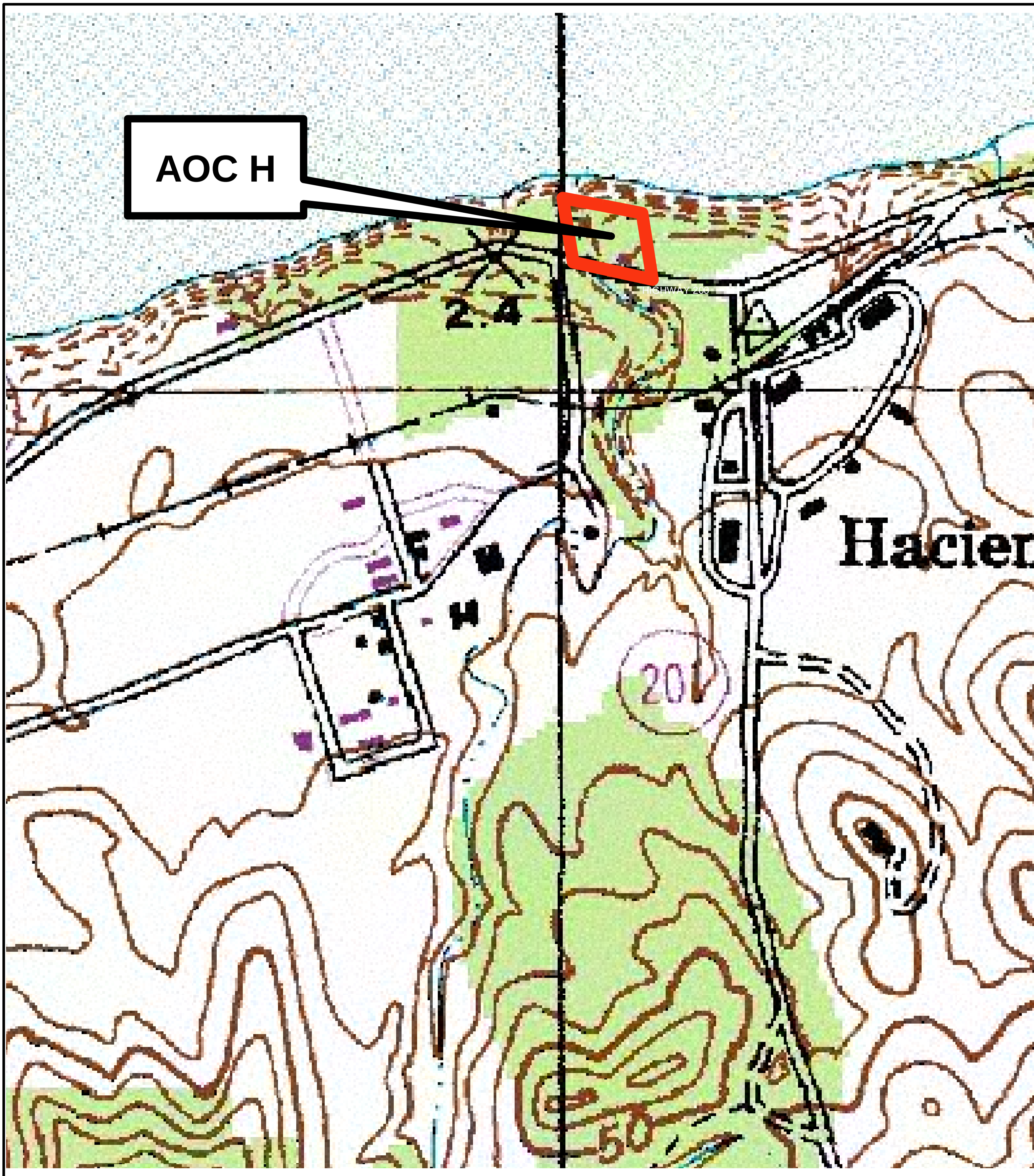
N
W E
S

200 100 0 200
Feet

Figure 2-3
Aerial Photograph
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

File Path: \\tampa\projects\Environmental\Navy CLEAN II_Vieques_ PR\Former NASD\GIS\Site Locations_RIFS.mxd, Date: February 16, 2004, User: JRIVERA1



Legend

Access Restriction Boundary

Note: Dashed lines indicate 1 meter contours.
Solid lines indicate 10 meter contours.

N
W E
S

150 0 150 Feet

Figure 2-4
AOC H Topographic Location Map
Former NASD, Vieques, Puerto Rico

Source: USGS, NOS/NOAA. Isla de Vieques Quadrangle 1941, revised 1982.

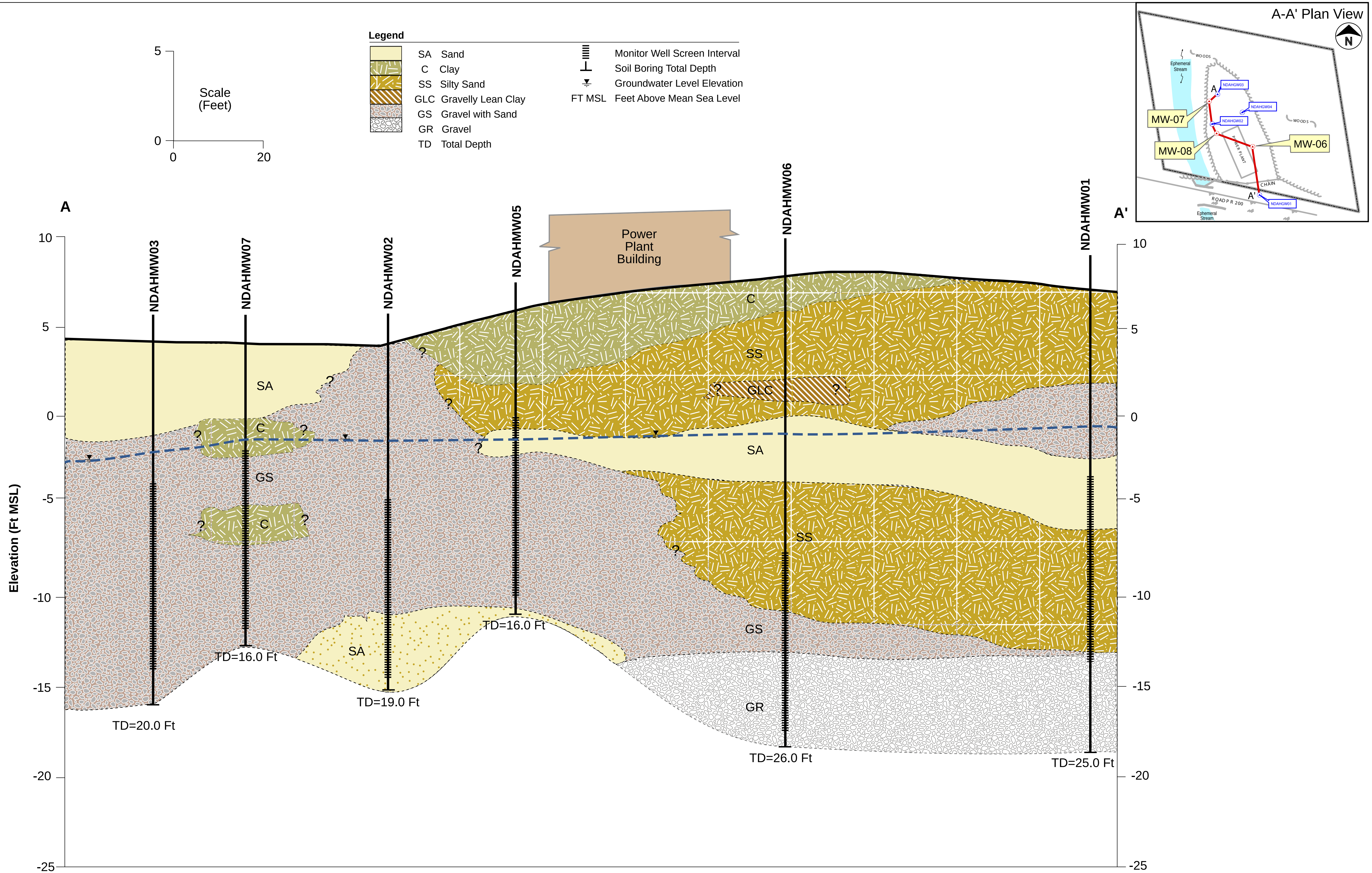


FIGURE 2-5
Geologic Cross-Section A-A'
AOC-H, Former NASD, Vieques, Puerto Rico

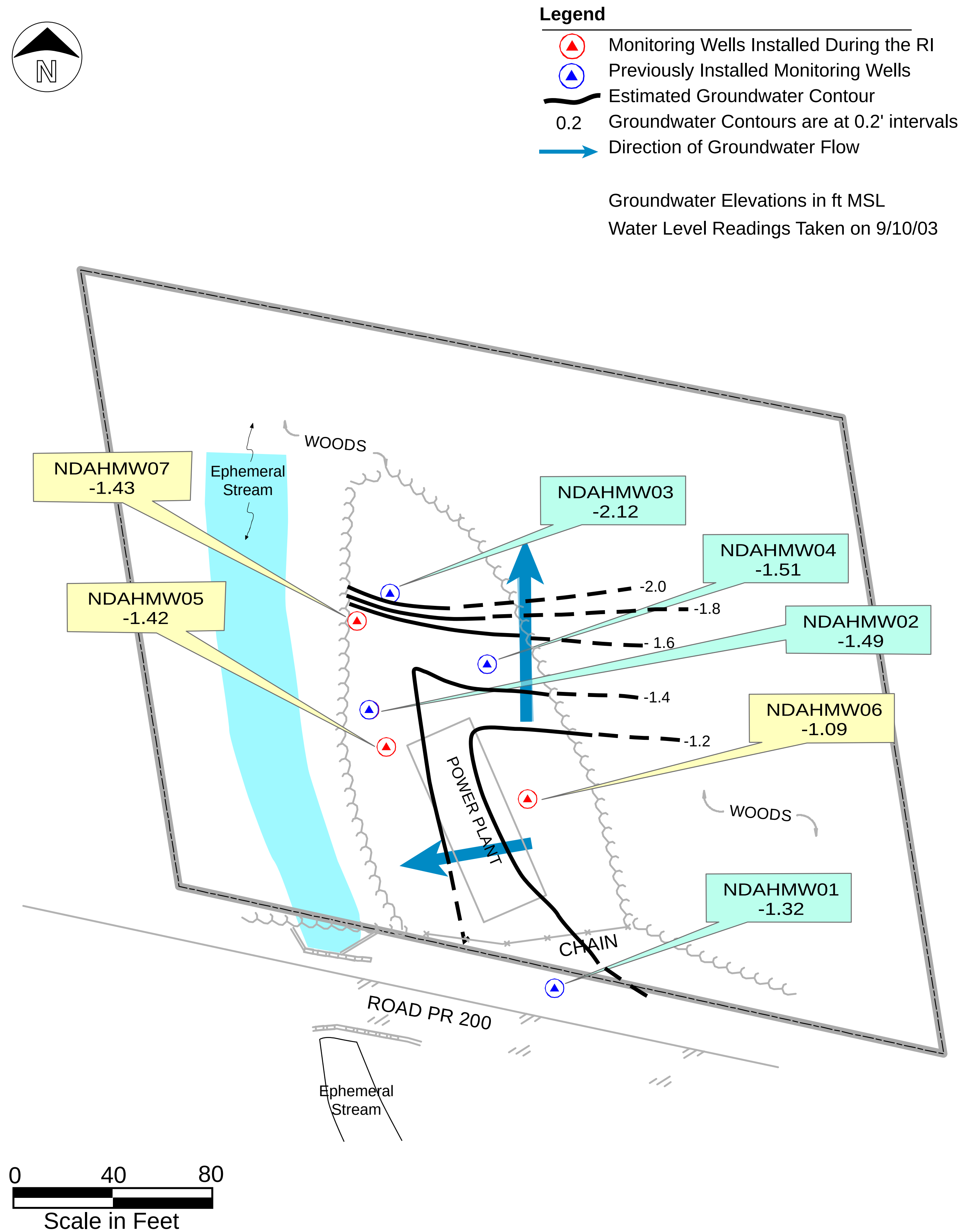


FIGURE 2-6
Groundwater Flow Map
AOC H, Former NASD, Vieques, Puerto Rico

SECTION 3

Summary of Field Investigation

The RI field investigation at AOC H included monitoring well installation and sampling, surface and subsurface soil sampling, surface water and sediment sampling, and groundwater elevation monitoring and surveying. The field investigation was conducted at AOC H from June 10, 2003, through October 2, 2003.

Data collected were in accordance with the standard operating procedures presented in the facility-wide Master Work Plan (CH2M HILL, 2001a) and with the Field Sampling Plan presented in the Final RI/FS Work Plan (CH2M HILL, 2003b); both work plans were reviewed by EPA and PREQB. Brief descriptions of the field procedures used during the RI field investigations are provided in the following subsections.

3.1 Soil Sampling

3.1.1 OVM Soil Screening

Soil samples were collected and screened in accordance with the procedures outlined in the Master Work Plan. The samples were screened in the field with a photoionization detector (PID), also known as an organic vapor meter (OVM). PID readings were recorded on the soil boring logs (Appendix A).

3.1.2 Surface and Subsurface Soil Samples and Analysis

Thirteen surface and subsurface soil samples were collected to define the horizontal and vertical extent of soil contamination in the source area at AOC H. Figures 3-1 and 3-2 present the locations of surface and subsurface soil sampling locations, respectively. Table 3-1 provides a listing of soil sample parameters and methods and includes the number of soil samples collected as part of this evaluation, including QA/QC samples. Because the exact locations of former generators, ASTs, or other potential sources of contamination are not known, surface and subsurface soil sampling was conducted around the perimeter of the building and surface soil sampling was conducted inside the building. The rationale for the selection of specific soil sampling locations is as follows:

- Three surface/subsurface soil samples each were collected at locations NDAHSS/NDAHSB17, NDAHSS18/NDAHSB18, and NDAHSS19/NDAHSB19 to the south of the building to assess the southern extent of metals and explosives previously detected in the soils during the Expanded PA/SI.

- Surface and subsurface soil samples were collected at locations NDAHSS/NDAHSB20, NDAHSS/NDAHSB21, NDAHSS/NDAHSB22, NDAHSS/NDAHSB23, and NDAHSS/NDAHSB 24 to assess the eastern extent of the metals previously detected in the soils.

- Surface and subsurface soil samples were collected at locations NDAHSS/NDAHSB25 and NDAHSS/NDAHSB26 to assess the northern extent of contamination previously detected.
- Surface and subsurface soil samples were collected at locations NDAHSS/NDAHSB27, NDAHSS/NDAHSB28, and NDAHSS/NDAHSB29 to assess the westward extent of the explosives, metals, and SVOCs previously detected at NDAHSB11, NDAHSB12, and NDAHSB13.

Details regarding the required container, preservatives, and holding times for groundwater and soil samples are presented in the field sampling plan in the Final Master Work Plan for the former NASD (CH2M HILL, 2001a).

Surface soil samples were collected from the surface to 6 inches below land surface (bls). Subsurface soil samples were collected at a depth of 4 to 6 feet bls. The top layer of grass and soil (approximately 1 inch) was scraped away before sampling began. Surface soil samples were collected using a stainless steel spoon, a stainless steel hand auger, or both. The soil was placed in a stainless steel bowl. Samples were collected for analysis for SVOCs, metals, pesticides, perchlorate, and explosives. The soil was thoroughly mixed and transferred to appropriate laboratory jars.

Drill rigs and auger flights were decontaminated after every use and between sites by washing with potable water using a high-pressure cleaner. Sampling equipment, including sampling spoons, split-spoons, hand augers, and bowls, was decontaminated between sample locations using the following procedure:

- Rinse with potable water to remove most of the soil
- Wash with scrub brush using potable water and Alconox (nonphosphate soap)
- Rinse with potable water
- Rinse with laboratory-grade deionized water
- Rinse with isopropyl alcohol
- Rinse with laboratory-grade deionized water
- Air dry

3.2 Groundwater Monitoring Well Installation, Development, and Sampling

3.2.1 Monitoring Well Installations

Three new monitoring wells were added to the four existing wells. The rationale for selection of these wells is as follows:

- Monitoring well NDAHMW05 was installed just northwest of soil borings NDAHSB11, NDAHSB12, and NDAHSB13 to assess whether the explosives and SVOCs detected in these soil borings have impacted the groundwater.
- Monitoring well NDAHMW06 was installed approximately 5 feet east of the eastern side of the building wall and 35 feet southeast of the northeast corner of the building to assess whether groundwater contamination is present on the east side of the building.

- Monitoring well NDAHMW07 was installed approximately 50 feet north of NDAHMW02 to assess the downgradient extent of the metals detected at NDAHMW02.

Monitoring well locations are illustrated in Figure 3-3.

The monitoring wells were constructed of 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) well casing and 10 feet of 0.01-inch-slot PVC well screen with flush joint threads. The annular space between the well screen and borehole was filled with a silica sand pack that extends above the well screen. A bentonite seal was installed above the sand pack, and the annular space above the bentonite seal was filled with a cement/bentonite grout. Each monitoring well was equipped with a protective surface casing, concrete pad, and locking cap to minimize unauthorized access to the wells.

The monitoring wells at AOC H were installed at the first encountered groundwater within the alluvial deposits using the hollow-stem auger drilling methods. During the drilling of the boreholes for these monitoring wells, the lithology was characterized by a combination of split spoon sampling and drill cutting observations. All wells were logged in the field during drilling. The soil boring logs and well construction diagrams are included in Appendixes A and B, respectively. Well depths and screen intervals are shown in Table 3-2. Well location and top of casing (TOC) elevations are shown in Table 3-3.

The depth of these wells was based on the water level measurements of the surrounding wells. The existing wells were constructed with 2 feet of screen above the water table. To be consistent, this design was used for the new wells.

Drill cuttings generated during monitoring well installation were collected and stored onsite in 55-gallon drums. The disposal method for these cuttings was determined based on results of the soil and groundwater analyses as specified in the investigation-derived waste management plan (CH2M HILL, 2000a). Composite soil and water samples were collected on July 19 and 20, 2004 for the AOC H IDW. Samples were analyzed for full suite TCLP analysis by PEL Laboratories and results showed the soil and water were both non-hazardous. IDW drums were removed from the staging area on October 22, 2004 and February 3, 2005. All drums were transported by the contractor Caribe Hydroblasting Environmental Division to the BFI Ponce Landfill. Table 3-4 summarizes the analytical results from the IDW sampling.

Drill rigs and auger flights were decontaminated by using a high-pressure cleaner with potable water before use and between borings. Sampling equipment, including sampling spoons, split-spoons, hand augers, and bowls, were decontaminated between sample locations using the following procedure:

- Rinse with potable water to remove most of the soil
- Wash with scrub brush using potable water and Alconox (nonphosphate soap)
- Rinse with potable water
- Rinse with laboratory grade deionized water
- Rinse with isopropyl alcohol
- Rinse with laboratory grade deionized water
- Air dry

3.2.2 Monitoring Well Development and Purging

Well development was performed after the grout that was used in well construction had adequately set for at least 24 hours. The groundwater levels were measured to the nearest 0.01 foot from the top of the PVC casing. Development consisted of removing at least three borehole volumes of water. Development continued until groundwater appeared clear. Well development information is included in Appendix C.

Monitoring well development was performed either by using a Whale centrifugal submersible pump with a combination of pumping and swabbing with the pump or by bailing using a Teflon® bailer and surging the well. Development water was discharged into 55-gallon drums. The submersible Whale pump was used on NDAHMW07 and encountered clogging, which made pumping impossible. Bailing was used for the other three wells.

Bailing continued until clear water (of minimal turbidity) was produced. The bailer was moved up and down (swabbed) through the screened interval to force water in and out of the screen. The turbidity increased when the bailer was moved to a new portion of the screen. Bailing and swabbing continued until clear, sediment-free water was generated. This procedure was used for monitoring wells NDAHMW05, NDAHMW06, and NDAHMW07.

During air lifting, air was forced to the bottom of the well, and all water was evacuated. This procedure was continued until the water was clear. This borehole development procedure was used at monitoring wells NDAHMW04, NDAHMW05, and NDAHMW08.

Pumps and bailers were decontaminated between sample locations using the following procedure:

- Rinse with potable water
- Wash with scrub brush using potable water and Alconox (nonphosphate soap) and run pump in large tub
- Rinse and cycle pump with potable water
- Rinse with laboratory grade deionized water
- Air dry

3.2.3 Groundwater Elevation Measurements

Groundwater elevation measurements were obtained from all monitoring wells at AOC H on September 10, 2003. An electronic water level meter was used to measure the depth to water from the TOC of each monitoring well. Table 3-5 summarizes the results of these measurements. Figure 2-6 illustrates the results of the groundwater measurements taken at AOC H. The general groundwater flow direction is northerly toward Vieques Passage; however, in the southern portion of the site, groundwater flows in a more westerly direction toward the ephemeral stream (Figure 2-6).

3.2.4 Monitoring Well Sampling and Analysis

The three newly installed monitoring wells (NDAHMW05, NDAHMW06, and NDAHMW07) and two existing wells (NDAHMW01 and NDAHMW02) were sampled for total and dissolved metals, SVOCs, explosives, pesticides, and perchlorate to evaluate the potential presence of these constituents. Unfiltered metals samples were used for risk assessment, and the filtered metals samples were used for comparison purposes. Low-flow sampling procedures were used.

Table 3-6 presents the numbers of groundwater samples collected as part of this evaluation, including QA/QC samples. The field sampling plan (CH2M HILL, 2001a) presents details regarding sampling, the required containers, preservatives, and holding times for groundwater and soil samples.

The wells were sampled using a peristaltic pump with Teflon® tubing.

A minimum of three well volumes of water were pumped from each well prior to sampling. The wells were pumped at a rate of approximately 0.06 to 0.22 gallons per minute (gpm). Water quality data, including temperature, specific conductance, oxidation-reduction potential (ORP), dissolved oxygen, turbidity, and pH were monitored during purging and the well was sampled after the parameters stabilized (less than 10 percent fluctuation) as shown in Table 3-7 for the PA/SI and Table 3-8 for the RI. New Teflon® tubing was used at each sampling location. Appendix D includes monitoring well groundwater sampling logs.

3.2.5 Background Groundwater Well Sampling

Monitoring well NDAHMW01 was installed approximately 50 feet southeast of the building during the Expanded PA/SI. This provides an upgradient (background) well to assess whether the metal concentrations detected in the groundwater are associated with the site or are attributable to background conditions. The groundwater flow at AOC H is shown in Figure 2-6. Monitoring well NDAHMW01 was sampled using a peristaltic pump.

3.2.6 Surface Water and Sediment Sampling

Five surface water samples were to be collected and analyzed for total and dissolved metals, SVOCs, explosives, pesticides, and perchlorate. During sampling, one surface water sampling location, NDAHSW05, was found to be dry. Consequently, only four surface water samples were collected. In addition, a stilling well (referred to as Stilling Well 1H) was installed in the ephemeral stream northwest of the building to measure surface water levels. Figure 3-4 illustrates sample locations of the surface water samples.

Samples NDAHSW04, NDAHSW03, NDAHSW02, and NDAHSW01 were collected to assess the downgradient surface water and sediment impacts at distances of 70, 90, 130, and 150 feet, respectively, downgradient from the center of the site. Sample NDAHSW01 was collected approximately 10 feet inside the naturally occurring sand berm that forms at the mouth of the ephemeral stream where it meets the ocean. Table 3-9 presents the location and elevation of each surface water sample collected.

Surface water samples were collected from mid-depth in a pre-cleaned 2-liter glass jar provided by the laboratory. One set of samples was field-filtered and preserved to ascertain the contribution of the dissolved constituents for metals. One liter of the sample was transferred to the total metals container, and the other liter was field-filtered and preserved for dissolved metals. Additional aliquots were collected for the SVOCs, explosives, perchlorate, and pesticides. Table 3-10 presents the number of surface water samples collected at AOC H. Field parameters were collected during the surface water sampling; the results are shown in Table 3-11. The field sampling plan (CH2M HILL, 2001a) presents details regarding sampling, the required containers, preservatives, and holding times for surface water samples. Surface water sample logs are included in Appendix E.

Five sediment samples were collected at the surface water sample locations identified above to assess the horizontal extent of sediment contamination, if present, from the source area. Figure 3-4 illustrates the sediment sampling locations. All samples were collected at a depth of 0 to 6 inches.

The applicable standard operating procedure (SOP) for the collection of sediment samples is presented in the work plan for the former NASD (CH2M HILL, 2001a).

Table 3-12 provides a listing of sediment sample locations and elevations. Sediment samples were analyzed for SVOCs, explosives, perchlorate, total metals, and pesticides. Details regarding the required containers, preservatives, and holding times for groundwater and soil samples are presented in the field sampling plan for the former NASD (CH2M HILL, 2001a).

Table 3-13 provides a listing of sediment sample parameters and methods and also includes the number of sediment samples collected as part of this evaluation, including QA/QC samples. Details regarding the required containers, preservatives, and holding times for groundwater and soil samples are presented in the field sampling plan (CH2M HILL, 2001a). Appendix E includes sediment sampling logs.

Sampling equipment, including hand augers, and bowls, was decontaminated between each sample location using the following procedure:

- Rinse with potable water to remove most of the soil
- Wash with scrub brush using potable water and Alconox (nonphosphate soap)
- Rinse with potable water
- Rinse with laboratory grade deionized water
- Rinse with isopropyl alcohol
- Rinse with laboratory grade deionized water
- Air dry

3.2.7 Background Surface Water and Sediment Sampling

Sample locations NDAHSW05 and NDAHSD05 are south of Highway 200 to provide background surface water and sediment data.

3.2.8 Tidal Fluctuation Study

A hydraulic tidal study was conducted at AOC H from June 9 through June 11, 2003, to determine if there is a tidal influence on groundwater flow at the site. Groundwater level measurements and surface water measurements were recorded from monitoring wells NDAHMW01, NDAHMW02, and NDAHMW04 and the stilling well. Monitoring well NDAHMW01 is the farthest south, just north of Highway 200, and is approximately 80 feet east of the ephemeral stream. Monitoring well NDAHMW02 is located off the northwest corner of the building approximately 30 feet east of the ephemeral stream. Monitoring well NDAHMW04 is located off the northeast corner of the building approximately 70 feet east of the ephemeral stream. The stilling well was placed along the edge of the ephemeral stream approximately 70 feet north of monitoring well NDAHMW02. Monitoring well and stilling well locations within AOC H are presented in Figure 3-3. The northern border of AOC H is approximately 200 feet south of the Vieques Passage.

Water levels were obtained by measuring the depth to water from a marked location on the TOC, which was surveyed in to the nearest 0.01 foot above msl. Time-series water level data were obtained using an in situ data logger that provided continuous water level recordings in the three monitoring wells and one stilling well. The stilling well was installed by pushing slotted PVC pipe into the ephemeral stream. The data logger transducers were then suspended inside the slotted section and secured. Continuous water levels were captured at approximately 10-minute intervals for a 36-hour period.

Figure 2-6 shows water level data, corrected to elevation above msl, for the monitoring wells NDAHMW01, NDAHMW02, and NDAHMW04. Monitoring well NDAHMW02 shows a gradual rise of approximately 0.2 foot during the tidal study. This may be explained by a rain event that took place on the second day (June 10). The surface water elevation of Stilling Well 1H was most affected by the rain event, showing an increase in surface water elevation of 0.3 foot. Monitoring well NDAHMW02 showed a rise in groundwater elevation after the ephemeral stream surface water elevation rose. Monitoring well NDAHMW02 is close to the ephemeral stream, and its groundwater elevation appears to be affected by changes in the water level in the ephemeral stream. The other two monitoring wells (NDAHMW01 and NDAHMW04) did not appear to be influenced by the rain event. For reference, tidal data compiled by the National Oceanic and Atmospheric Administration (NOAA) were obtained from the nearest tide gauge, which is located at the La Puntilla station at San Juan Bay, Puerto Rico. This location indicated a surface water tidal fluctuation of up to 1.8 feet during the same time period, as shown in Figure 3-5.

A comparison of the surface water tidal fluctuations and the groundwater elevation data shown in Figure 3-5 shows that there is no significant tidal influence on the groundwater elevations at the AOC H monitoring wells or the ephemeral stream when the mouth of the ephemeral stream is closed off to the Vieques Passage. Thus, the direction of groundwater flow at the site is not influenced by tidal fluctuations.

3.3 Surveying

The monitoring well locations and sampling locations (surface soil, soil borings, and sediment) were surveyed in the field using differential global positioning system (DGPS) techniques by Transystems Inc. The survey established the latitude and longitude coordinates for each of the locations. In addition, the elevation in feet above msl was established to the nearest 0.01 foot for the TOC of the monitoring wells using traditional surveying techniques and DGPS techniques for remote areas. Tables 3-3, 3-7, 3-9, and 3-14 provide the survey data. These survey data are also found in Appendix F.

All sample locations and well elevations were surveyed in accordance with the civil surveying SOP included in the work plan.

TABLE 3-1
Surface and Subsurface Soil Sample Parameters, Methods, and Quantities
AOC H, Former NASD, Vieques, Puerto Rico

Parameter	Method	No. of Samples	Equipment Blanks	Field Blanks	Field Duplicates	Matrix Spike/ Duplicate	Total Number of Samples
SVOCs	8270C	26	2	1	2	2	33
Metals	6010B	26	2	1	2	2	33
Explosives	8330	26	2	1	2	2	33
Perchlorate	314.0	26	2	1	2	2	33
Pesticides	8081A	26	2	1	2	2	33

Equipment blanks – 1 per matrix per day; blank for filtered samples is a filtration blank
Field Blanks – 1 per lot of ERB source water
Field Duplicates – 1 per every 10 samples per matrix/medium or per batch, whichever is more frequent
Matrix Spike/Matrix Spike Duplicates – 1 per 20 samples per matrix or batch, whichever is more frequent

TABLE 3-2
Summary of Well Construction Details
AOC H, Former NASD, Vieques, Puerto Rico

Well ID	Date Installed	Boring Depth (ft bls)	Well Depth (ft bls)	Screen Interval Depth (ft bls)	Screen Interval Elevation (ft amsl)	Depth to Bentonite (ft bls)	Depth to Sandpack (ft bls)
NDAHMW01	12/6/00	20	20	10 - 20	-1.23 to -11.23	2	8
NDAHMW02	12/6/00	18	18	8 - 18	-5.15 to -15.15	2	6
NDAHMW03	12/7/00	18	18	8 - 18	-6.15 to -16.15	2	6
NDAHMW04	12/7/00	20	20	10 - 20	-5.69 to -15.69	2	8
NDAHMW05	08/15/03	15	15	5 -15	-1.07 to -11.07	2	3
NDAHMW06	08/22/03	26	26	16 – 26	-7.84 to -17.84	4	11
NDAHMW07	08/15/03	16	16	6 – 16	-3.51 to -13.51	2	3

Notes:
Monitoring wells NDAHMW01 through NDAHMW04 were installed during the PA/SI in December 2000.
Monitoring wells NDAHMW05 through NDAHMW07 were installed during the RI in August 2003.

TABLE 3-3
Monitoring Well Locations and TOC Elevation
AOC H, Former NASD, Vieques, Puerto Rico

Well ID	Northing	Easting	Elevation (ft amsl)
NDAHMW05	2006060.9216	233080.0478	7.53
NDAHMW06	2006054.5730	233097.2942	9.96
NDAHMW07	2006076.3062	233076.5103	5.76

Notes: amsl = above mean sea level TOC= top of casing

TABLE 3-4
IDW Results for AOC H Soil and Water
AOC H, Former NASD, Vieques, Puerto Rico

Soil Composite Sample			
Parameter	**Method**	**Result**	**Units**
Flash Point	1010	>160	Fahrenheit
Sulfide	376.1	ND	mg/Kg
Metals	6010 TCLP	ND	mg/L
Mercury	7470	ND	mg/L
VOCs	8260 TCLP	ND	µg/L
SVOCs	8270 TCLP	ND	µg/L
Cyanide	9012	ND	mg/Kg
pH	9045	8.35	pH
TPH	FL-PRO	825	mg/Kg
Water Composite Sample			
Parameter	Method	Result	Units
Flash Point	1010	>160	Fahrenheit
Sulfide	376.1	ND	mg/Kg
Metals	6010 TCLP	ND	mg/L
Mercury	7470	ND	mg/L
VOCs	8260 TCLP	ND	µg/L
SVOCs	8270 TCLP	ND	µg/L
Cyanide	9012	ND	mg/Kg
pH	150.1	8.99	pH
TPH	NA	NA	NA

TABLE 3-5
Summary of Monitoring Wells Water Level Measurements
AOC H, Former NASD, Vieques, Puerto Rico

Well ID	**Date**	**Top of PVC Elevation (ft amsl)**	**Depth to Water (ft)**	**Groundwater Level (ft amsl)**
NDAHMW01	09/10/03	9.08	10.40	-1.32
NDAHMW02	09/10/03	5.81	7.30	-1.49
NDAHMW03	09/10/03	5.75	7.87	-2.12
NDAHMW04	09/10/03	6.41	7.92	-1.51
NDAHMW05	09/10/03	7.53	8.95	-1.42
NDAHMW06	09/10/03	9.96	11.05	-1.09
NDAHMW07	09/10/03	5.76	7.19	-1.43

Notes: amsl = above mean sea level

TABLE 3-6
Groundwater Sample Parameters, Methods, and Quantities
AOC H, Former NASD, Vieques, Puerto Rico

Parameter	Method	No. of Samples	Equipment Blanks	Field Blanks	Field Duplicates	Matrix Spike/ Duplicate	Total Number of Samples
Pesticides	8081A	5	1	1	1	2	10
Total Metals	6010B	5	1	1	1	2	10
Dissolved Metals	6010B	5	1	1	1	2	10
SVOCs	8270C	5	1	1	1	2	10
Explosives	8330	5	1	1	1	2	10
Perchlorate	314.0	5	1	1	1	2	10

Notes:
Equipment blanks – 1 per day
Field Blanks – 1 per lot of ERB source water
Field Duplicates – 1 per every 10 samples per matrix/medium or per batch, whichever is more frequent
Matrix Spike/Matrix Spike Duplicates – 1 per 20 samples per matrix or batch, whichever is more frequent

TABLE 3-7
Summary of Field Parameters Collected During Groundwater Sampling for the PA/SI
AOC H, Former NASD, Vieques, Puerto Rico

Well	Date	pH	ORP (mV)	Temp C	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Conductivity (µmhos/cm)
NDAHMW01	12/19/2000	8.07	141.5	28.9	NA	2.57	110.8	1,549
NDAHMW02	12/19/2000	7.4	27.8	26.26	NA	3.94	15.4	7,105
NDAHMW03	12/19/2000	7.83	250.8	26.52	NA	8.37	1,573	5,284
NDAHMW04	12/19/2000	7.74	258	26.48	NA	8.37	1,575	9,138

TABLE 3-8
Summary of Field Parameters Collected During Groundwater Sampling for the RI
AOC H, Former NASD, Vieques, Puerto Rico

Well	Date	pH	ORP (mV)	Temp C	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Conductivity (µmhos/cm)
NDAHMW01	09/08/2003	7.25	300.5	29.87	NA	NA	19.2	11,800
NDAHMW02	09/08/2003	6.9	-12.2	28.63	NA	NA	16.2	28,500
NDAHMW03	NA	NA	NA	NA	NA	NA	NA	NA
NDAHMW04	NA	NA	NA	NA	NA	NA	NA	NA
NDAHMW05	09/08/2003	6.43	15.6	28.77	NA	1.2	4.05	34,248
NDAHMW06	09/09/2003	7.12	2.9	27.35	NA	0.72	4.62	10,820
NDAHMW07	09/08/2003	6.7	187.7	28.32	NA	8.91	8.05	40,200

TABLE 3-9
Surface Water Locations and Elevations
AOC H, Former NASD, Vieques, Puerto Rico

Station ID	Northing	Easting	Elevation (ft amsl)
NDAHSW01	2006156.5358	233040.5081	-1.06
NDAHSW02	2006105.7829	233060.6586	-1.06
NDAHSW03	2006081.3024	233064.0805	-1.06
NDAHSW04	2006054.6881	233068.8617	-1.06

Note: amsl = above mean sea level

TABLE 3-10
Surface Water Sample Parameters, Methods, and Quantities
AOC H, Former NASD, Vieques, Puerto Rico

Parameter	Method	No. of Samples	Equipment Blanks	Field Blanks	Field Duplicates	Matrix Spike/ Duplicate	Total Number of Samples
SVOCs	8270C	5	1	1	1	2	10
Explosives	8330	5	1	1	1	2	10
Perchlorate	314.0	5	1	1	1	2	10
Total Metals	6010B	5	1	1	1	2	10
Dissolved Metals	6010B	5	1	1	1	2	10
Pesticides	8081A	5	1	1	1	2	10

Notes:
Equipment blanks – 1 per matrix per day; blank for filtered samples is a filtration blank
Field Blanks – 1 per lot of ERB source water
Field Duplicates – 1 per every 10 samples per matrix/medium or per batch, whichever is more frequent
Matrix Spike/Matrix Spike Duplicates – 1 per 20 samples per matrix or batch, whichever is more frequent

TABLE 3-11
Summary of Field Parameters Collected During Surface Water Sampling During the RI
AOC H, Former NASD, Vieques, Puerto Rico

Location	Date	pH	ORP (mV)	Temp C	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Conductivity (µmhos/cm)
NDAHSW01	09/30/2003	7.57	-41	29.46	26.52	2.51	31	41,600
NDAHSW02	09/30/2003	6.95	-325	29.14	32.2	1.6	14.3	49,460
NDAHSW03	09/30/2003	7.49	48.9	28.8	26.04	2.03	17.9	40,990
NDAHSW04	09/30/2003	7.5	-285	27.95	25.75	1.66	34.5	40,310

TABLE 3-12
Sediment Sampling Locations and Elevations
AOC H, Former NASD, Vieques, Puerto Rico

Boring #	Northing	Easting	Elevation (ft amsl)
NDAHSD01	2006156.5358	233040.5081	-1.06
NDAHSD02	2006105.7829	233060.6586	-1.06
NDAHSD03	2006081.3024	233064.0805	-1.06
NDAHSD04	2006054.6881	233068.8617	-1.06
NDAHSD05	2006002.8789	233086.5382	1.40

Notes: amsl = above mean sea level

TABLE 3-13
Sediment Sample Parameters, Methods, and Quantities
AOC H, Former NASD, Vieques, Puerto Rico

Parameter	Method	No. of Samples	Equipment Blanks	Field Blanks	Field Duplicates	Matrix Spike/Duplicate	Total Number of Samples
SVOCs	8270C	5	1	1	1	2	10
Explosives	8330	5	1	1	1	2	10
Perchlorate	314.0	5	1	1	1	2	10
Total Metals	6010B	5	1	1	1	2	10
Pesticides	8081A	5	1	1	1	2	10

Notes:
Equipment blanks – 1 per matrix per day; blank for filtered samples is a filtration blank
Field Blanks – 1 per matrix per day
Field Duplicates – 1 per every 10 samples per matrix/medium
Matrix Spike/Matrix Spike Duplicates – 1 per 20 samples per matrix

TABLE 3-14
Surface Soil and Soil Boring (Subsurface soil) Sampling Locations and Elevations
AOC H, Former NASD, Vieques, Puerto Rico

Station ID	Northing	Easting	Elevation (ft amsl)
NDAHSS17/SB17	2006033.9391	233087.5917	2.676
NDAHSS18/SB18	2006034.3403	233094.5574	2.488
NDAHSS19/SB19	2006032.3892	233104.5813	2.677
NDAHSS20/SB20	2006044.0734	233109.8721	2.617
NDAHSS21/SB21	2006052.4757	233108.0936	2.358
NDAHSS22/SB22	2006057.9443	233102.9168	2.035
NDAHSS23/SB23	2006062.8715	233100.6571	1.797
NDAHSS24/SB24	2006070.3758	233099.0019	1.668
NDAHSS25/SB25	2006074.5020	233089.9264	1.132
NDAHSS26/SB26	2006072.6188	233082.7231	0.958
NDAHSS27/SB27	2006059.6069	233077.6844	1.238
NDAHSS28/SB28	2006044.0516	233082.9703	1.873
NDAHSS29/SB29	2006037.3785	233087.0447	2.342

Notes: amsl = above mean sea level

Note: Original Figure Created in Color

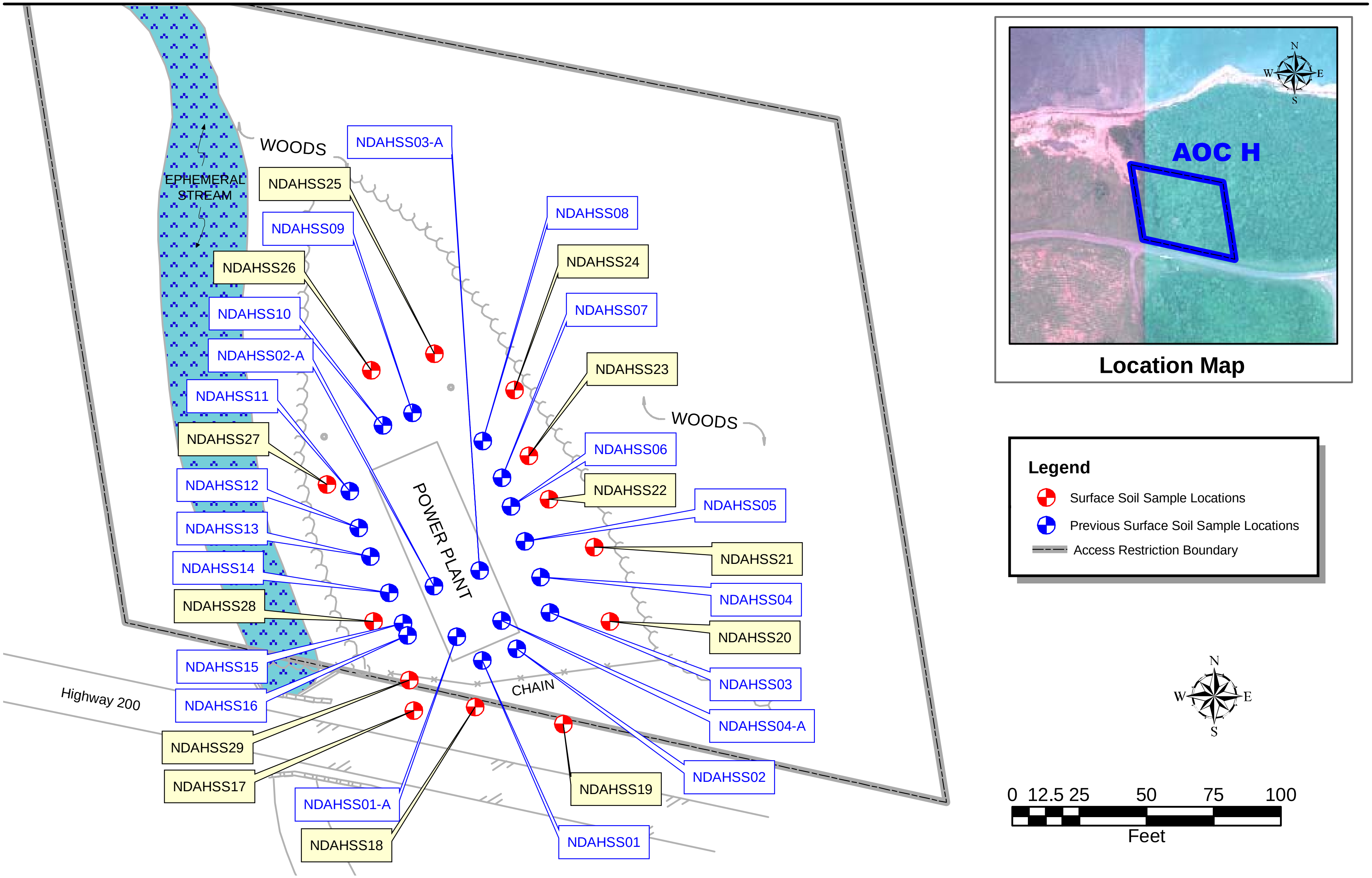


FIGURE 3-1
Remedial Investigation Surface Soil Location Map
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

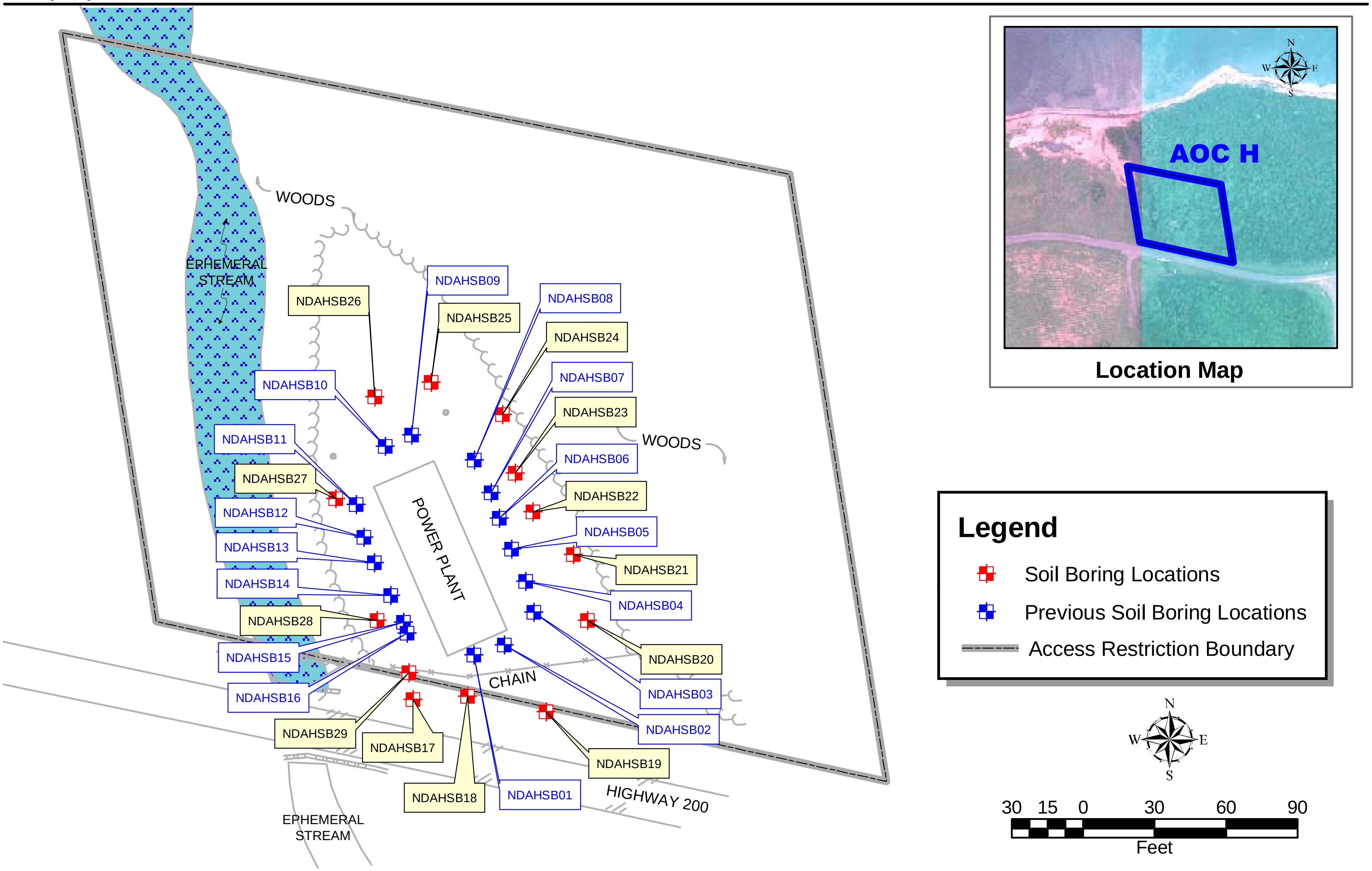


FIGURE 3-2
Remedial Investigation Soil Boring Location Map
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

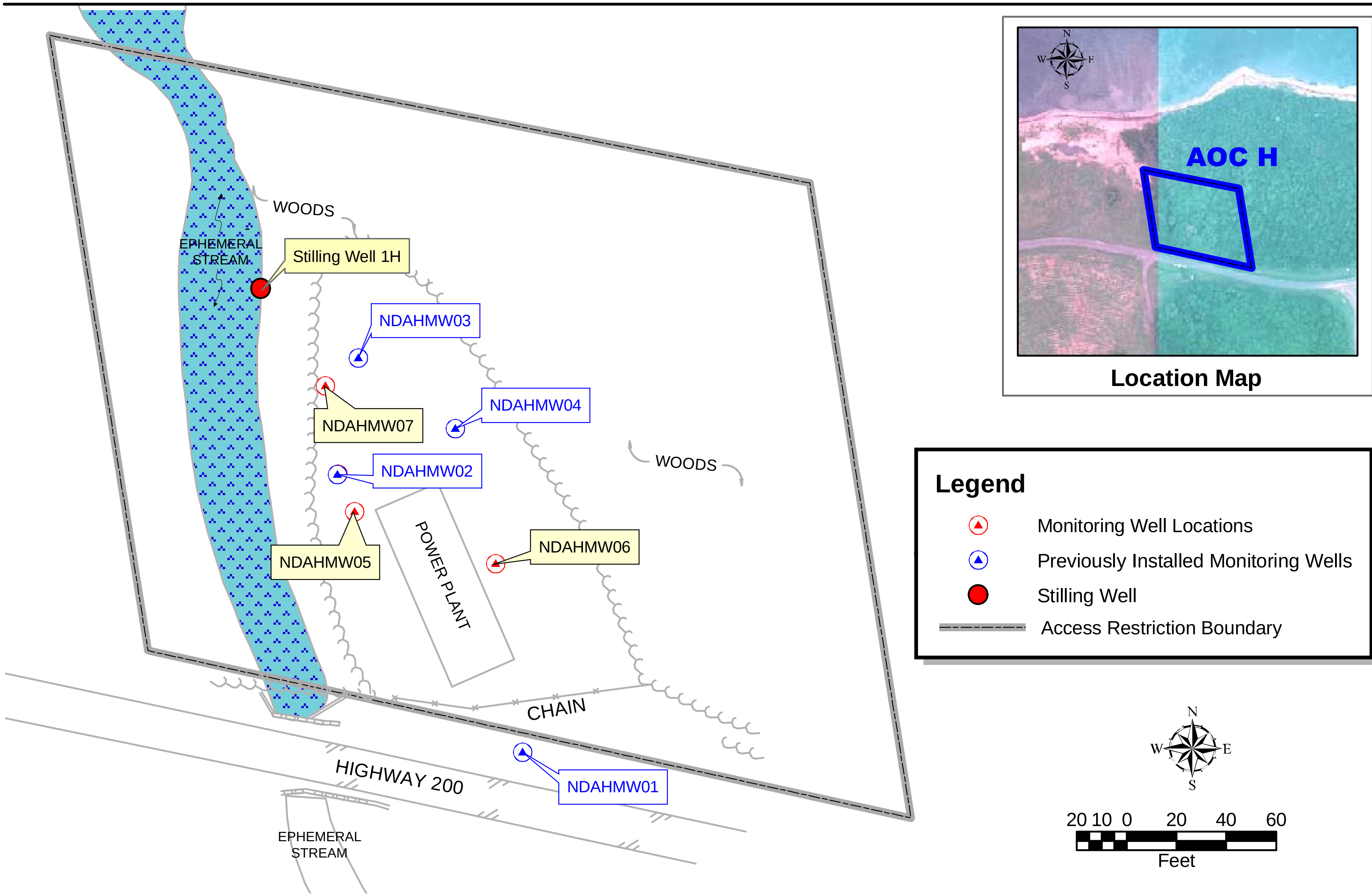
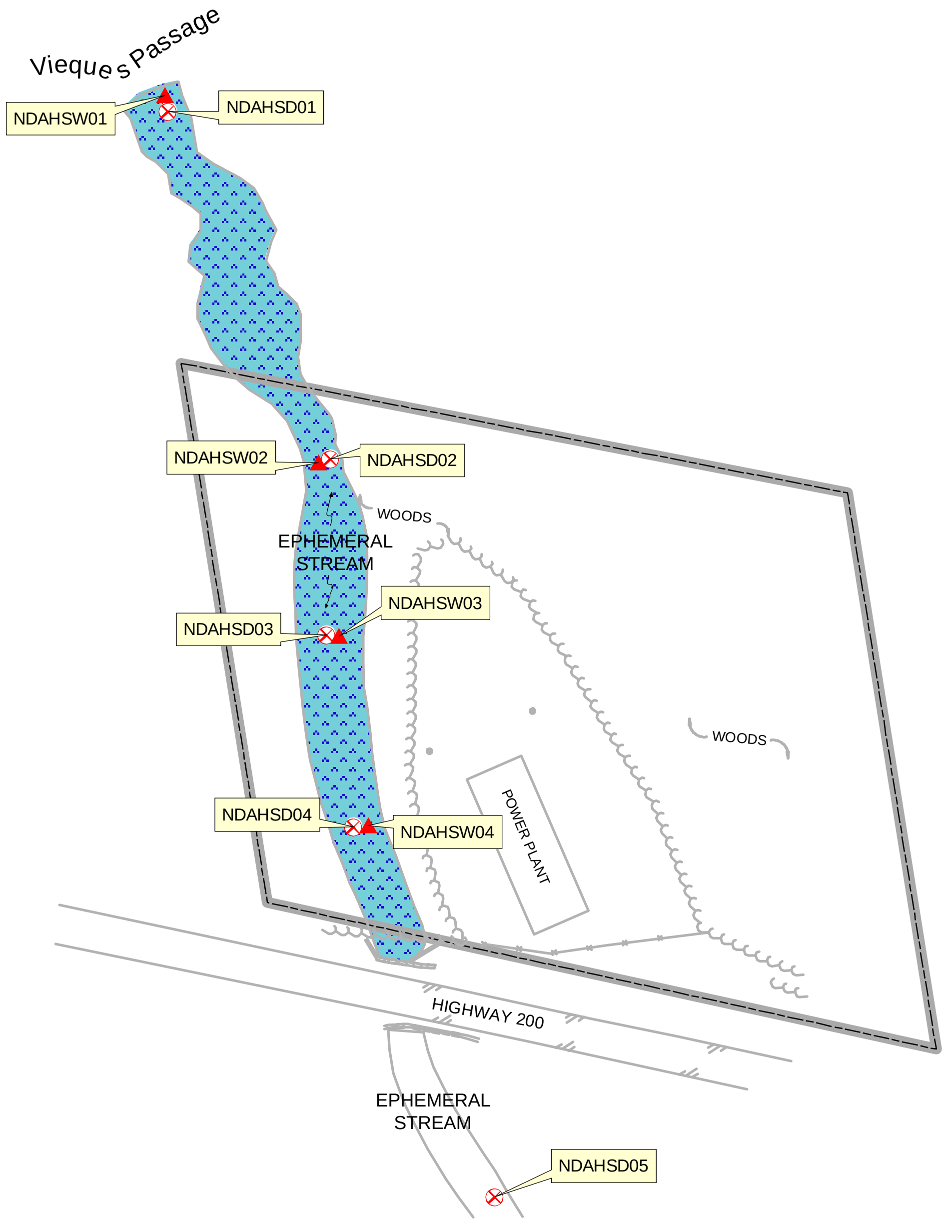


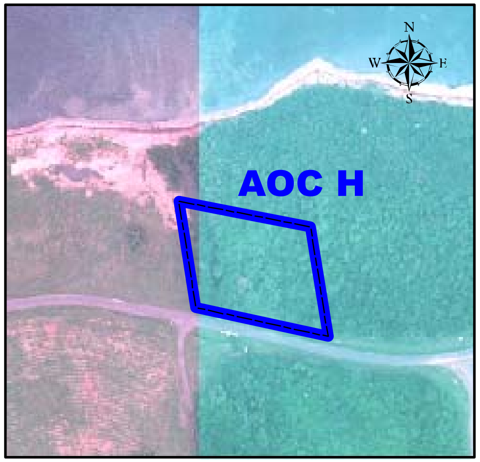
FIGURE 3-3
Remedial Investigation Monitoring Well Location Map
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color





Location Map

Legend

- ▲ Surface Water Sample Locations
- ⊗ Sediment Sample Locations
- Access Restriction Boundary

50 25 0 50 100 150
Feet

FIGURE 3-4
Remedial Investigation Sediment & Surface Water Sample Location Map
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

SECTION 4

Nature and Extent of Contamination

This section presents a discussion of the nature and extent of contamination found in the soil, groundwater, surface water, and sediment at AOC H during the RI. The discussion of AOC H results is divided into two parts. Section 4.1 presents a summary of the management and evaluation of laboratory analytical data for the site and media sampled during the RI. Section 4.2 presents a discussion of the results of the sampling activities for each medium at the site. The discussion of AOC H addresses surface soil, subsurface soil, groundwater, surface water, and sediment. The results of the site-specific background groundwater sample, surface water sample, sediment sample and the soil background results (CH2M HILL, 2002b) are also presented and discussed.

This section presents the nature and extent discussion for the combined data from 2003 RI data and the 2000 Expanded PA/SI (CH2M HILL, 2000d). A detailed discussion of sampling procedures and other RI activities was presented in Section 3.

4.1 Data Management and Evaluation

This subsection presents information on the analytical data collected during the RI and the documentation process used to assure data quality. Data tracking and management, from the collection of data in the field through data validation, is presented. Non-site-related analytical results are discussed in relation to laboratory contaminants and naturally occurring elements. The screening criteria used in the evaluation of the analytical results also are presented and defined.

4.1.1 Data Tracking and Validation

The management and tracking of data is the evidentiary portion of the quality assurance (QA) process. Custody is assured from the time of field collection to receipt of validated electronic analytical results. Field samples and their required analytical methods were recorded on the chain-of-custody documents, which are included with the data validation reports compiled in Appendix H. Chain-of-custody document entries were verified against the work plan (CH2M HILL, 2003b) to determine if all designated samples were collected and submitted for the appropriate analytical methodologies. Upon receipt of the samples by the laboratory, a comparison to the field information was made to determine if each sample was logged in and analyzed for the correct methods and target analytes. Additionally, field-specified quality control samples annotated on the chain-of-custody documentation were logged in as part of the specific sample delivery group (SDG). Field QC samples include field blanks, equipment blanks, trip blanks, field duplicates, and matrix spike/matrix spike duplicate (MS/MSD) samples.

The analytical data for AOC H were collected in two phases. The Expanded PA/SI fieldwork was performed in December 2000, and the report was finalized in February 2001. The RI fieldwork was conducted in August 2003.

The PA/SI and the RI data were validated by independent contractors to the Navy, Heartland Environmental Services Inc. and Environmental Data Services (EDS), respectively. Validation procedures established by the National Functional Guidelines for Organic (EPA, 1999a) and Inorganic Analyses (EPA, 2002), as modified by Region 2, were adhered to during the validation process. Following this guidance, the DQE included evaluation of the laboratory performance and possible impact on the usability of data due to matrix interferences. The DQE focused on the usability of the data to support project data interpretation and the decision-making process.

Data reports were submitted in hard copy and electronic versions. Electronic versions were specifically formatted for the capability of automatically downloading data into the EDMS database.

The qualifying flags are appended to data records during the database query process and are included in the final data summary tables deliverable so that the data will not be used indiscriminately. The following primary flags were used to qualify the data:

- "U" indicates that the analyte was not detected and the associated number indicates the approximate sample concentration necessary to be detected.
- "UJ" indicates that the analyte was not detected and the quantitation limit may be inaccurate or imprecise.
- "J" indicates that the analyte is present. Numerical sample results that are greater than the method detection limit (MDL) but less than the laboratory reporting limit (RL) are qualified with a "J" for estimated.
- "=" indicates that the analyte is present. The reported value is the measured concentration.
- "R" indicates an unusable result. The analyte may or may not be present in the sample. Data can be rejected because of matrix interference, dilution of the sample, and other reasons.

4.1.2 Evaluation of Non-Site-Related Analytical Results

Many of the organic and inorganic constituents detected in soil and groundwater at AOC H may be attributed to non-site-related conditions or activities. Non-site-related results include laboratory contaminants and naturally occurring, or background concentrations of, organic and inorganic analytes. A discussion of non-site-related analytical results is provided in the following subsections.

4.1.2.1 Laboratory and Field Sampling Blank Contamination

Four types of blank samples were used to monitor potential contamination introduced during field sampling, sample handling, shipping activities, as well as sample preparation and analysis in the laboratory. Types of blank samples included:

- **Trip Blank (TB)**: A sample of ASTM Type II water that is prepared in the laboratory prior to the sampling event. The water is stored in VOC sample containers and is not opened in the field, and travels back to the laboratory with the other samples for VOC analysis. This blank is used to monitor the potential for sample contamination during the sample container trip. One trip blank should be included in each sample cooler that contained samples for VOC analysis.

- **Equipment Rinsate Blank (ERB)**: A sample of the target-free water used for the final rinse during the equipment decontamination process. This blank sample is collected by rinsing the sampling equipment after decontamination and is analyzed for the same analytical parameters as the corresponding samples. This blank is used to monitor potential contamination caused by incomplete equipment decontamination. One equipment rinsate blank should be collected per day of sampling, per type of sampling equipment.
- **Field Blank or Ambient Blank (FB or AB)**: The field blank is an aliquot of the source water used for equipment decontamination. This blank monitors contamination that may be introduced from the water used for decontamination. One field blank should be collected from each source of decontamination water and analyzed for the same parameters as the associated samples.
- **Laboratory Method Blank or Method Blank (MB)**: A laboratory method blank is ASTM Type II water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance and contamination introduced during the analytical procedure. One method blank was prepared and analyzed for every 20 samples or per analytical batch, whichever was more frequent.

4.1.3 Analytical Results Data Quality Evaluation Summary and Conclusions

The completeness for these data was calculated to be 97.8 percent based on the total of 13,014 records, of which 12,725 were determined as usable. An explanation of the 289 rejected records is included below:

- Ninety volatile results were rejected for low relative response factors.
- Low recoveries of the LCS resulted in 129 semivolatile records being rejected.
- Seventy records were rejected due to surrogate recoveries less than 10 percent.

Ambient, equipment, and trip blanks were collected during the field efforts. According to the EPA functional guidelines, concentrations of common organic lab contaminants detected in samples at less than 10 times the concentration associated with blanks can be attributed to field sampling and laboratory contamination rather than environmental contamination from site activities. For other inorganic and organic chemicals, five times the concentration detected in the associated blanks is used to qualify results as potential field/laboratory contamination.

Data qualified due to blank contamination consisted of 45 records including acetone, methylene chloride, and toluene. Additionally, the ubiquitous phthalates from the semivolatile fraction were also present in blanks and elicited qualification for diethyl phthalate. Seven zinc results were rejected due to high levels of zinc detected in the equipment blank, following EPA Region 2 guidelines.

Additionally, many results reported in blanks (especially metals) are well below a defined practical quantitation limit (PQL) and may represent Type I errors when associated with a matrix. A Type I (or alpha error) occurs when the value reported is dismissed as a biased high, or false positive.

4.1.3.1 Background Conditions

Environmental media samples were collected and analyzed to evaluate background, or native soil, conditions at the NASD. The data from these samples were evaluated to statistically calculate basewide background concentrations for soil, groundwater, surface water, and sediment. Background concentrations were calculated for inorganic analytes only. The project team agreed to use only the soil data for comparison to site data. Section 4.2.1 presents and discusses the basewide background data for soil.

Site-specific background samples were collected for groundwater and sediment at AOC H from upgradient sample locations. The site-specific background data are also discussed in Section 4.2.1 for each sampled media at AOC H.

4.1.4 Regulatory, Health-Based, and Ecological Screening Levels

Analytical results for all media were compared against common regulatory, human health-based, and ecological standards or criteria. Overall, seven sets of standards or criteria were used. The screening levels are identified below according to each medium.

- Surface soil results were compared to the EPA (2002) Region 9 residential preliminary remediation goals (PRGs) adjusted to a hazard index (HI) of 0.1 for noncarcinogenic chemicals; the EPA (2002d) Region 9 leachability criteria for soil (SSL based on a dilution attenuation factor [DAF] of 1 and 10); and appropriate ecological screening criteria. The ecological screening criteria were the lower of the plant and soil invertebrate ecological soil screening levels (eco-SSLs) from EPA (2005). If eco-SSLs were not available, the ecological screening criteria were the most conservative values derived from either *Toxicological benchmarks for screening contaminants of potential concern for effects on soil and litter invertebrates and heterotrophic process* (Efroymson et al., 1997a) or *Toxicological benchmarks for screening contaminants of potential concern for effects on terrestrial plants* (Efroymson et al., 1997b). In some instances when soil screening values were not available from these primary sources, three other references were consulted comprising the Canadian protocol for deriving environmental soil quality guidelines (SQGs; CCME, 1996), Dutch Soil Quality Standards (MHSPE, 1994), and U.S. Fish and Wildlife Service (USFWS) soil screening values presented by Beyer (1990). The lowest screening value from these three sources was then selected for screening.

  Appendix G, Table G-2 includes the SSL (DAF=1) screening. When the soil data are screened against the SSLs at a DAF=10, the following constituents exhibit exceedances:

  Surface Soil
  - Antimony
  - Arsenic
  - Chromium
  - 2,6-DNT
  - N-nitrosodi-n-propylamine

Subsurface Soil
- Arsenic
- Chromium

When the soil data are screened against the SSLs at a DAF=1, the following additional constituents exhibit exceedances:

Surface Soil
- Barium
- Nickel
- Selenium
- Benzo(a)anthracene
- Isophorone
- p,p′-DDE
- p,p′-DDT

Subsurface Soil
- Antimony
- Barium
- Nickel
- Selenium
- 1,2-dichloroethane (DCA)

Of all the metals whose soil concentrations exceed either the SSL at a DAF=10 and/or the SSL at a DAF=1 (i.e., antimony, arsenic, barium, chromium, nickel, and selenium), only antimony and arsenic were detected at concentrations above background soil concentrations. Antimony was detected in only one surface soil sample (NDAHSS03) at a concentration (6.3 mg/kg) above the background soil concentration (2.3 mg/kg). However, antimony was not detected in the subsurface soil at the same location or any other location above background. The well closest to surface soil sample NDAHSS03 (MW06) contained 2.6 μg/L of antimony, which is below the MCL (6 μg/L) and tap water PRG (15 μg/L). In fact, the highest concentration of antimony detected at the site (5.4 μg/L in well MW04) is below both the MCL and PRG.

Arsenic is the only other metal detected in soil above background. It was detected above background at 10 surface soil locations distributed across the site; however, it was detected at only two subsurface soil locations (NDAHSS01 and NDAHSS03) above background. Arsenic is the only constituent whose maximum site groundwater concentration (detected in only one well [MW02], at 6.3 μg/L) exceeds its tap water PRG (0.04 μg/L). However, the detected concentration is below the MCL (10 μg/L), on which the SSL is likely based. Further, the detected concentration was in the total form; dissolved arsenic was not detected in site groundwater. Additionally, although arsenic was not detected in the site-specific background well, it was detected at a similar concentration in the base-wide background groundwater (5.5 μg/L, dissolved).

Of the remaining seven soil constituents that exceed SSLs at a DAF=1 (which include those that exceed at a DAF=10), five of them (i.e., 2,6-DNT; N-nitrosodi-n-propylamine; benzo(a)anthracene; isophorone; and 1,2-DCA) were not detected in any site groundwater samples. The two remaining constituents, p,p'-DDE and p,p'-DDT, were detected in site groundwater. These two constituents were detected in one surface soil sample (NDAHSS01) above their respective SSLs at a DAF=1 only. p,p'-DDE was detected in only two wells (MW02 and MW05), the highest concentration (0.022 µg/L) in which is an order of magnitude below the tap water PRG of 0.2 µg/L (there is no MCL for p,p'-DDE). Similarly, p,p'-DDT was detected in only one well (MW04), where the detected concentration (0.028 µg/L) is an order of magnitude below the tap water PRG of 0.2 µg/L (there is no MCL for p,p'-DDT). Groundwater at AOC H may discharge to the drainage ditch located along the western site boundary. p,p'-DDE was detected in only one sediment sample (NDAHSD04) collected from the ditch adjacent to the site, but its concentration (0.00012 mg/kg) is more than an order of magnitude below the ecological screening criterion (0.0033 mg/kg). It should be noted that p,p'-DDE was detected at a concentration of 0.00007 mg/kg in sediment sample NDAHSD05, which was collected from the ditch upstream of the site.

The information above suggests that the SSLs at a DAF=1 and DAF=10 are overly conservative for the site (i.e., they underestimate the concentrations that can be present in soil at levels protective of groundwater). Further, the soil constituent concentrations are not uniformly distributed throughout the unsaturated soil column (i.e., the concentrations vary horizontally and generally decline with depth), but are assumed to be so in the generic SSL estimates (EPA 1996c and 2001c).

Leaching of soil constituents has occurred at the site for over 40 years (operations ceased in the 1960s), the groundwater is very shallow (approximately 7 feet), and the soil around the former power plan is clayey and silty (high binding ability). Therefore, the groundwater data collected from the wells are likely representative of any constituent concentrations attributable to leaching, and are a better representation than SSLs.

- Subsurface soil results were compared to the EPA Region 9 leachability criteria for soil (SSL, DAF = 1 and 10). For risk assessment, subsurface soil was compared against industrial PRGs, as discussed in Section 6.
- Groundwater results were screened against EPA Region 9 tap-water PRGs, adjusted to an HI of 0.1. For lead, which does not have a PRG, its risk-based action-level was used as its screening criterion.
- The surface water screening values used were the lower of the values from two sources, the Puerto Rico Water Quality Standards Regulation (EQB, 2003) and the U.S. National Recommended Water Quality Criteria (NRWQC) for the protection of aquatic life (USEPA, 2002). Surface water at AOC H is saline, as shown in Table 3-11, with salinity values from 25.75 ppt to 32.20 ppt. Saltwater has a salinity greater than 10 ppt, thus the chronic NRWQC criteria for saltwater were used. Similarly, the Puerto Rico standards identified for coastal/estuarine waters were used in the assessment.

- Sediment results were primarily compared to screening values presented in *Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments* (Long et al., 1995). The NOAA SQuiRT tables (Buchman, 1999) include a compilation of sediment screening values from several literature sources, including Long et al. (1995). The Long et al. (1995) values were primarily used in this ERA because they are conservative and generally accepted. Other values, such as AETs that are provided in the NOAA SQuiRT tables, are much less conservative, and therefore less appropriate for this screening level ERA.

These are conservative screening values based on human health or ecological risk factors.

Brief descriptions of the screening values follow.

- Region 9 Preliminary Remediation Goals (PRGs) for Residential Surface Soil, Tapwater, and Soil Screening Levels (October 2002) - The criteria presented in the Region 9 PRG table correspond to a systemic hazard quotient of 1.0 or a lifetime cancer risk of 10E-6 (1 additional cancer case per 1 million people). For screening purposes, the PRGs were adjusted to correspond to a systemic hazard quotient of 0.1 to account for an exposure to multiple constituents on the same target organ. The risk-based concentrations are developed using protective default exposure scenarios recommended by EPA (EPA, 1991a) and the best available reference doses and carcinogenic potency slopes. In the absence of Puerto Rico regulatory standards for soil, these criteria are commonly used as a basis of comparison for the nature and extent of soil contamination. They also provide a solely health-based level of comparison for potable water at the point of use. The SSL for protection of groundwater provides soil concentrations that are generally considered to be protective of shallow groundwater. Soil concentrations above the SSL may pose a leaching hazard. However, the size of the affected area and the soil characteristics can have a significant impact on the potential for contaminants to migrate from soil to groundwater.

- The ecological screening criteria were the lower of the plant and soil invertebrate ecological soil screening levels (eco-SSLs) from EPA (2005). If eco-SSLs were not available, ecologically-based toxicological benchmarks for screening contaminants of potential concern for effects to soil invertebrates and microbial processes were taken from Efroymson (1997a) and for terrestrial plants from Efroymson et al. (1997b).

  The Oak Ridge National Laboratory has identified soil screening values specific to soil invertebrates and microbial processes (Efroymson et al., 1997a) and terrestrial plants (Efroymson et al., 1997b). The soil benchmarks for invertebrates were derived using NOAA effects range-low (ERL) approach (Long and Morgan, 1990), supported by information from field and laboratory studies, bibliographic databases, and the published literature. Lowest Observed Effect Concentrations (LOECs) were rank-ordered, and a value was selected that most closely approximated the 10th percentile of the distribution. If fewer than 10 values were available, the lowest No Observed Effect Concentration (NOEC) was used. If 10 or more values were available, the 10th percentile was used. Values for plant benchmarks were derived in the same way as for invertebrates and microbial processes (Efroymson et al., 1997a, b).

  In the absence of eco-SSLs and Oak Ridge National Laboratory soil screening values, alternate screening values were selected from the following references:

  Evaluating soil contamination (Beyer, 1990) -- One of the earliest compilations of soil screening values was presented by Beyer (1990) of the USFWS. Screening levels from the Netherlands were taken from the interim Dutch Soil Cleanup Act values issued in the 1980s, which identified three categories: (1) Category A refers to background concentrations in soil or detection limits; (2) Category B refers to moderate soil contamination that requires additional study; and (3) Category C refers to threshold values that require immediate cleanup.

A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines, Canadian Council of Ministers of the Environment (CCME, 1996) **--** The Canadian protocol for deriving environmental SQGs takes into consideration levels of ecological protection, endpoints, availability of soil toxicity data, receptor arrays, and exposure pathways for four types of land use. In 1997, the CCME issued soil quality guidelines for 20 constituents. The guidelines were derived specifically for the protection of ecological receptors in the environment or for the protection of human health associated with agricultural, residential/parkland, commercial, and industrial land use types. The land use most closely associated with ecological resources was agricultural.

Dutch Soil Quality Standards, (MHSPE, 1994) **--** The Dutch government issued three categories of soil quality values: target values, sum of the target value and intervention value divided by 2, and intervention values. The target values indicate the soil quality required for sustainability or, expressed in terms of remedial policy, the soil quality required for the full restoration of the soil's functionality for human, animal, and plant life. Target values were based on standards for drinking water and surface waters.

4.1.5 Data Presentation

Complete analytical results for all media are presented in Appendix G. All detected compounds are presented in Tables 4-A through 4-E. Data validation reports are included in Appendix H. Within the text, data are summarized within groups of samples that represent the various media (surface soil, subsurface soil, groundwater, surface water, and sediment) at AOC H. The data are presented in two ways. Tables 4-4 to 4-8 present lists of detected chemicals with concentrations exceeding the screening criteria for inorganic chemicals, and for inorganic chemicals, concentrations above background and a screening criteria value for each parameter. Tables 4-9 to 4-13 present summaries of the maximum and minimum concentrations, along with the detection frequency, for parameters that exceed screening criteria. In addition figures are presented that illustrate detected concentrations of only those parameters that exceed their respective screening criteria and their background concentrations.

4.2 Analytical Results

4.2.1 Basewide Background

This section presents basewide background data and discussion of the data for western Vieques Island that are being used to evaluate background conditions in the various media at AOC H. Two sources for background are basewide background concentrations for western Vieques developed on a regional basis and the results from site-specific background samples. Basewide background concentrations were evaluated for soil, groundwater, surface water, and sediment (CH2M HILL, 2002b) for the western portion of the former NASD. The Navy and regulatory agencies concurred upon the use of the basewide soil background concentrations for site soil comparisons because evaluation of the background soil inorganic concentrations demonstrated statistical comparability among the various soil types on west Vieques. Site-specific background samples were to be collected in the work plan for surface water (NDAHSW05) and sediment (NDAHSD05) at AOC H. However, the ephemeral stream was dry during sampling, and only the sediment sample was collected. One upgradient well was installed to serve as the background well (NDAHMW01). The results from this site-specific groundwater and sediment background samples were also presented in this subsection.

4.2.1.1 Background Surface Soil

The *Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report* (CH2M HILL, 2002b) evaluated 26 surface and 11 subsurface soil samples collected from the western portion of Vieques Island to determine background levels of inorganic constituents to be used for comparing site data. Inorganic background concentrations can be used as reliable indicators of the commonly occurring inorganic constituents at the former NASD and can be used to evaluate whether constituents detected during investigations are the result of natural conditions or activities related to past military operations. If the site inorganic data are below the background concentrations, it can be assumed that these constituents are not related to historical site activities but are more likely from background conditions. The upper tolerance limit (UTL) values for the combined soil data were selected as appropriate screening criteria for single point comparisons. The EPA Region 2 risk assessment process requires that all chemicals detected above risk-based screening criteria be carried through the risk assessment. Therefore, all inorganics detected above screening criteria were retained as COPCs and carried through the risk assessment process even if the detected concentrations were consistent with background concentrations. For presentation, only chemicals exceeding screening criteria and background levels are presented in figures for inorganics.

4.2.1.2 Groundwater

Background groundwater concentrations were determined on a site-specific basis. At AOC H, monitoring well NDAHGW01 was determined to be hydraulically upgradient of the site and was therefore designated as the site-specific background monitoring point. Two rounds of sampling have been collected from this monitoring well. The maximum detected concentration was used as the background concentration. A summary of the analytical results from the site-specific background sampling is provided in Table 4-1.

Toluene and caprolactam were detected in the site-specific background well (MW01), but the concentrations are below risk-based levels and the well is immediately adjacent to Route 200. Although toluene and caprolactam were detected in MW01, its use for background comparisons with site groundwater samples is likely appropriate and, at a minimum, inconsequential to the findings and conclusions of the RI. All inorganic constituent concentrations in MW01 are lower than the base-wide background concentrations except for:

- aluminum (total and dissolved)
- chromium (total)
- copper (total and dissolved)
- iron (total)

- nickel (total)
- silver (total)
- selenium (dissolved)

However, for all "totals" results (and dissolved aluminum), the maximum detected site groundwater concentrations were greater than site-specific background, so they would not have been attributed to background concentrations. Further, dissolved copper was not detected in site groundwater. Therefore, the only one of these constituents detected at a lower concentration in site groundwater (3.6 μg/L) than in the site-specific background well (3.7 μg/L) is dissolved selenium, but the maximum detected concentration is more than an order of magnitude less than the MCL (50 μg/L) and tap water PRG (182 μg/L).

4.2.1.3 Surface Water

Background surface water concentrations were to be determined on a site-specific basis at AOC H. However, the ephemeral stream at the location of the proposed background surface water sampling location was dry at the time of sampling, and a sample could not be obtained. Therefore, no site-specific background surface water data are available for AOC H. Therefore, base-wide background surface water data were used for comparison with the down-gradient surface water data from the adjacent ephemeral stream to the AOC H.

4.2.1.4 Sediment

Background sediment concentrations from one sediment sample (NDAHSD05) was collected to represent site-specific background levels at AOC H. The detected concentrations from this sample were used as background concentrations. A summary of the analytical results from the site-specific background sample is provided in Table 4-2.

4.2.1.5 Essential Human Nutrients

In accordance with EPA guidance, the presence of several essential human nutrients was evaluated to determine if they should be further evaluated. *Risk Assessment Guidance for Superfund: Part A* (EPA, 1989) specifies that essential human nutrients that are present at concentrations that marginally exceed background concentrations and are toxic only at very high doses can be eliminated from further consideration during the initial screening process. To meet these requirements, the percentage of the recommended daily intake was calculated for each essential human nutrient based on soil consumption and the maximum detected concentration in surface soil. Table 4-3 presents the data used in the calculation and the results of the evaluation. This method is considered conservative because the calculation is based on the maximum detected concentration of the essential nutrient and the recommended daily intake rather than a level where adverse effects are observed. The recommended daily intake is the median value (where a range is presented) from the *Recommended Dietary Allowances* (NAS, 1989).

As Table 4-3 indicates, daily intake of the essential nutrients calcium, magnesium, potassium, and sodium from soil consumption (based on the maximum soil concentration) represents less than 2 percent of the recommended daily intake of these essential nutrients. Therefore, the maximum concentrations of these essential nutrients are well below toxic levels and will not be considered further in this report.

4.2.2 AOC H – Power Plant

The sampling activities conducted at AOC H during the Expanded PA/SI and RI fieldwork in 2000 and 2003 consisted of surface and subsurface soil sampling, groundwater sampling from permanent wells, and surface water and sediment samples from the adjacent ephemeral stream. The results of these sampling activities and the nature and extent of contamination in the soil and groundwater are discussed in this subsection.

Tables 4-4 through 4-8 present the detected chemicals above screening criteria and, for inorganics, above background values, in surface soil, subsurface soil, groundwater, surface water, and sediment, respectively. Figures 4-1 through 4-9 present the chemicals detected above the respective screening criteria and background levels for inorganic chemicals for soil, groundwater, sediment, and surface water.

4.2.2.1 Surface Soil

Results from surface soil samples collected during both the 2000 Expanded PA/SI sampling and the 2003 RI sampling are presented and evaluated in this subsection. Twenty surface soil samples were collected during the Expanded PA/SI. The soil samples were analyzed for inorganics, VOCs, SVOCs, pesticides, PCBs, and explosives.

Thirteen additional surface soil samples were collected at AOC H during the RI. Surface soil samples were analyzed for inorganics, SVOCs, pesticides, PCBs, explosives, and perchlorate. Table 4-9 presents the statistical summaries of chemicals that exceed their respective screening criteria and background. Figures 4-1 through 4-3 illustrate the detected concentrations of those parameters that exceed screening criteria (i.e., human health protection-based PRGs and ecological protection-based values) and background concentrations for inorganic chemicals in one or more surface soil samples collected at AOC H.

Inorganic Analytes

A total of 23 inorganic analytes were detected in surface soil samples collected at AOC H. Twelve inorganic analytes were detected above screening criteria in at least one surface soil sample. Eight metals (aluminum, antimony, arsenic, iron, lead, manganese, thallium, and vanadium) exceeded their respective EPA Region 9 residential PRGs (HI = 0.1). Human health-based screening criteria were not available for calcium, magnesium, potassium, and sodium. As previously discussed, these essential human nutrients were not identified as human health COPCs in accordance with EPA guidance RAGS Part A (EPA, 1989).

Twelve metals (aluminum, antimony, arsenic, chromium, copper, iron, lead, manganese, selenium, thallium, vanadium, and zinc) exceeded their respective ecological screening criteria in at least one surface soil sample.

Three inorganic chemicals (antimony, arsenic, and chromium) were detected above their respective leachability criteria in surface soil. Leaching criteria were not available for 12 metals (aluminum, calcium, cobalt, copper, iron, lead, magnesium, manganese, mercury, potassium, sodium, and thallium).

Each of the chemicals that exceeded available screening criteria and inorganic chemicals detected above background levels are discussed below. Figure 4-1 shows concentrations of inorganic analytes that were found above screening criteria and background concentrations.

Arsenic was detected in all 33 surface soil samples collected at AOC H. Ten sample concentrations were above the background concentration of 2.2 mg/kg (CH2M HILL, 2002b), and one was equal to the background concentration. All 33 samples contained arsenic at concentrations that exceeded its residential PRG. Two samples contained arsenic above its ecological screening criterion and its SSL.

Copper was detected in all 33 surface soil samples collected at AOC H. Copper was detected above its background concentration of 68 mg/kg (CH2M HILL, 2002b) in two samples. It was not detected above its residential PRG. Two samples contained copper above its ecological screening criterion. An SSL was not available for copper.

Iron was detected in all 33 surface soil samples collected at AOC H. One sample contained iron above its background concentration of 37,531 mg/kg (CH2M HILL, 2002b). All 33 samples contained iron at concentrations that exceed its residential PRG and its ecological screening criterion. An SSL was not available for iron.

Lead was detected in all 33 surface soil samples collected at AOC H. Thirty-two samples contained lead above its background concentration of 6.9 mg/kg (CH2M HILL, 2002b). Lead was not detected above its residential PRG. Four samples contained lead above its ecological screening criterion. An SSL was not available for lead.

Thallium was detected in 13 of 33 surface soil samples collected at AOC H. Eight samples contained thallium above its background concentration of 0.67 mg/kg (CH2M HILL, 2002b). Ten samples contained thallium above its residential PRG, and one sample exceeded the ecological screening criterion. An SSL was not available for thallium.

Zinc was detected in all 33 surface soil samples collected at AOC H. Twenty-four samples contained zinc above its background concentration of 65 mg/kg (CH2M HILL, 2002b). Zinc was not detected above its residential PRG or its SSL in any sample collected at AOC H. Zinc was detected above its ecological screening criterion in 29 samples.

Volatile Organic Compounds

Xylenes and 1,1-dichloroethene were detected in the surface soil samples collected at AOC H). 1,1-Dichloroethene was detected in one sample at a concentration below available screening criteria. An ecological screening criterion was not available for 1,1-dichloroethene. Xylenes were detected in 1 of 20 samples, above its ecological screening criterion. Xylene concentrations were below residential PRGs and SSLs.

Semivolatile Organic Compounds

Nineteen SVOCs were detected in surface soil samples collected at AOC H. Two of the detected SVOCs, benzo(a)pyrene and n-nitrosodi-n-propylamine, were above their respective residential PRGs. PRGs were not available for three other SVOCs. Three of the detected SVOCs were above their respective ecological screening criteria, and 13 others did not have ecological screening criteria. N-nitroso-n-propylamine and 2,6-dinitrotoluene were detected above their respective SSLs.

SVOCs that exceeded available screening criteria are discussed below.

Benzo(a)pyrene was detected in 15 of 33 surface soil samples collected at AOC H. It was detected above its residential PRG in four samples and its ecological screening criterion in one sample. The detected benzo(a)pyrene concentrations did not exceed the SSL value of 4 mg/kg.

2,6-Dinitrotoluene was detected in 2 of 33 surface soil samples collected at AOC H. It was not detected above its residential PRG. 2,6-Dinitrotoluene was detected above its SSL in two samples. An ecological screening criterion was not available for 2,6-dinitrotoluene.

Fluoranthene was detected in 16 of 33 surface soil samples collected at AOC H. It was not detected above its residential PRG or SSL. It was detected above its ecological screening criterion in two samples.

N-nitroso-n-propylamine was detected in 3 of 33 surface soil samples collected at AOC H. All three detected concentrations exceeded the residential PRG and SSL. An ecological screening criterion was not available for n-nitroso-n-propylamine.

Phenanthrene was detected in eight of 33 surface soil samples collected at AOC H. A human health screening criterion and SSL were not available for phenanthrene. One sample contained phenanthrene above its ecological screening criterion.

Pyrene was detected in 17 of 33 surface soil samples collected at AOC H. It was not detected above its residential PRG or SSL. It was detected above its ecological screening criterion in three samples.

Pesticides

Four pesticides were detected in surface soil samples collected at AOC H. DDD, DDE, and DDT were detected above available screening criteria in at least one surface soil sample. Methoxychlor was also detected, but concentrations were below available screening criteria. An ecological screening criterion was not available for methoxychlor.

DDD was detected in 12 of 31 surface soil samples collected at AOC H. It was not detected above its residential PRG or SSL. It was detected above its ecological screening criterion in five samples.

DDE was detected in 22 of 32 surface soil samples collected at AOC H. It was detected above its residential PRG in two samples. DDE was not detected above its SSL. It was detected above its ecological screening criterion in 19 samples.

DDT was detected in 19 of 32 surface soil samples collected at AOC H. It was detected above its residential PRG in one sample. DDE was not detected above its SSL. It was detected above its ecological screening criterion in 18 samples.

Polychlorinated Biphenyls

PCBs were not detected in surface soil samples collected at AOC H.

Explosives

The explosive 2,6-dinitrotoluene was detected above its SSL in 2 of 33 surface soil samples as part of the SVOC analytical parameter group (8270C); however it was not detected in any soil sample by the explosives analytical method (8330). Neither detection is above its residential PRG. An ecological screening criterion is not available for 2,6-dinitrotoluene. No other explosives related chemicals were detected in surface soils at AOC H.

Perchlorate
Perchlorate was not detected in surface soil samples collected at AOC H.

4.2.2.2 Subsurface Soil
Results from subsurface soil samples collected during both the 2000 Expanded PA/SI sampling and the 2003 RI sampling are presented and evaluated in this subsection. Eighteen subsurface soil samples were collected at 16 locations during the Expanded PA/SI. The soil samples were analyzed for metals, VOCs, SVOCs, pesticides, PCBs, and explosives.

Thirteen additional subsurface soil samples were collected at AOC H during the RI. Table 4-10 presents the statistical summaries of chemicals that exceed their respective screening criteria and background. Figure 4-4 presents the detected concentrations of chemicals that exceed screening criteria and background concentrations.

Inorganic Analytes
A total of 23 inorganic analytes were detected in subsurface soil samples collected at AOC H. Arsenic and chromium were each detected above their respective SSLs in subsurface soil. Leaching criteria were not available for 12 metals (aluminum, calcium, cobalt, copper, iron, lead, magnesium, manganese, mercury, potassium, sodium, and thallium).

Arsenic was detected in 21 of 31 subsurface soil samples. It was detected above its background concentration of 2.3 mg/kg (CH2M HILL, 2002b) in two subsurface soil samples and its SSL in one subsurface soil sample.

Chromium was detected in all 31 subsurface soil samples. Two samples contained chromium at concentrations above its SSL but below its background concentration of 74 mg/kg (CH2M HILL, 2002b).

Volatile Organic Compounds
Six VOCs (1,1-dichloroethene, 1,2-dichloroethene, methylene chloride, tetrachloroethene [PCE], toluene, and trichloroethene [TCE]) were detected in subsurface soil samples collected at AOC H. None of the detected VOCs exceeded its respective SSL.

Semivolatile Organic Compounds
SVOCs were not detected in subsurface soil at AOC H.

Explosives
Explosives were not detected in subsurface soil at AOC H.

Perchlorate
Perchlorate was not detected in subsurface soil at AOC H.

Pesticides
DDD, DDE, and DDT were detected in subsurface soil at AOC H but at concentrations below the respective SSLs.

Polychlorinated Biphenyls
PCBs were not detected in subsurface soil samples collected at AOC H.

4.2.2.3 Groundwater

Four monitoring wells were installed and sampled as part of the Expanded PA/SI. The samples were analyzed for total and dissolved metals, VOCs, SVOCs, PCBs, and pesticides.

During the RI, samples were collected from two of the existing monitoring wells (NDAHMW01 and NDAHMW02). Three new monitoring wells were installed and sampled. Groundwater samples were analyzed for total and dissolved metals, SVOCs, pesticides, explosives, and perchlorate. One of the monitoring wells, NDAHMW01, was installed upgradient of the site and is used as a site-specific background well. The details of this sampling are presented in Section 3. Table 4-6 presents the detected concentrations, screening criteria, and exceedances of each chemical in AOC H groundwater samples. Table 4-11 presents the statistical summaries of chemicals that exceed their respective screening criteria and background. Figures 4-5 and 4-6 illustrate the detected concentrations of those parameters that exceed background and applicable screening criteria.

Inorganic Analytes

A total of 21 inorganic analytes were detected in unfiltered groundwater samples, and 20 were detected in filtered samples. Ten metals (aluminum, antimony, arsenic, barium, cadmium, chromium, iron, manganese, thallium, and vanadium) were detected above screening criteria in unfiltered samples. Six metals (antimony, barium, cadmium, iron, manganese, and thallium) were detected above their respective EPA Region 9 tap-water PRGs in filtered samples. Screening criteria were not available for calcium, chromium, lead, magnesium, potassium, and sodium.

Antimony was detected in two of seven unfiltered and one of seven filtered groundwater samples collected at AOC H. All detections (filtered and unfiltered) exceeded the EPA Region 9 PRG. Because antimony was not detected in the upgradient background well, the detected concentrations were also above the background concentrations.

Arsenic was detected in one of seven unfiltered groundwater samples collected at AOC H. It was not detected in any of the filtered samples. The detected concentration was above the tap water PRG for arsenic. Because arsenic was not detected in the upgradient background well, the detected concentration was also above the background concentrations.

Cadmium was detected in two of seven unfiltered and three of seven filtered groundwater samples collected at AOC H. One unfiltered and three filtered sample concentrations were above the tap-water PRG. Cadmium was detected above its unfiltered background concentration (0.435 μg/L, unfiltered) in one sample. A second unfiltered sample contained cadmium at a concentration equal to its unfiltered background concentration. Because cadmium was not detected in the filtered background sample, filtered concentrations were all above the background concentrations.

Chromium was detected in three of seven unfiltered and two of seven filtered groundwater samples collected at AOC H. One unfiltered sample contained chromium above its tap water PRG and its unfiltered background concentration of 11 μg/L. Chromium was not detected above its tap-water PRG in any filtered sample. Because chromium was not detected in the filtered background sample, both filtered samples exceeded the background concentration. As a conservative measure, the PRG used for comparison of site chromium concentrations is the tap water PRG for hexavalent chromium.

Iron was detected in five of seven unfiltered and two of seven filtered groundwater samples collected at AOC H. Six unfiltered samples and two filtered samples were above the tap-water PRG. One unfiltered sample contained iron above its unfiltered background concentration, and one unfiltered sample contained iron at a concentration equal to the background concentration of 8,200 µg/L, unfiltered. Two filtered samples contained iron above its filtered background concentration, and two filtered samples contained iron at concentrations equal to the background concentration of 120 µg/L, filtered.

Thallium was not detected in four of seven unfiltered and one of seven filtered samples collected from AOC H. Detected concentrations were all above its tap-water PRG. Two unfiltered samples and one filtered sample contained thallium at concentrations that exceeded the site-specific background concentrations of 10 µg/L unfiltered and 9 µg/L filtered. Two unfiltered samples and one filtered sample contained thallium at concentrations equal to their respective background concentrations.

Volatile Organic Compounds

Toluene was detected in all four groundwater samples collected in 2000 from AOC H. Detected concentrations were all below the Region 9 tap-water PRG.

Semivolatile Organic Compounds

Two SVOCs were detected in groundwater samples collected from AOC H. Neither was detected above its tap-water PRG.

Pesticides

DDD, DDE, and DDT were detected in groundwater samples collected from AOC H. DDD was detected above its tap-water PRG in three samples.

Polychlorinated Biphenyls

PCBs were not detected in any of the groundwater samples collected from AOC H.

Explosives

Explosives were not detected in any of the groundwater samples collected from AOC H.

Perchlorate

Perchlorate was not detected in any of the groundwater samples collected from AOC H.

4.2.2.4 Surface Water

During the Expanded PA/SI, surface water samples were not collected. During the RI, five surface water samples were to be collected, including one background surface water sample. The location of the site-specific background was dry during sampling, so the background sample could not be collected. The other four surface water samples were collected as proposed and were analyzed for total and dissolved (filtered) metals, SVOCs, pesticides, explosives, and perchlorate. The details of this sampling are presented in Section 3. Table 4-7 presents the detected concentrations, screening criteria, and exceedances of each chemical in AOC H surface water samples. Table 4-12 presents the statistical summaries of chemicals that exceed their respective screening criteria. Figure 4-7 illustrates the detected concentrations of those parameters that exceed available screening criteria in surface water.

The site surface water was sampled at four locations during the RI. The surface water analytical results indicated the presence of one inorganic chemical (arsenic) at a concentration above ecological screening criterion in one unfiltered sample. One SVOC (caprolactam) was detected in one surface water sample at AOC H. No screening criteria were available for this constituent for comparison. Pesticides, explosives, or perchlorate were not detected in any of the surface water samples.

Analytical results from the surface water samples were compared to appropriate ecological screening criteria. The results of the comparison are presented below.

Inorganic Analytes

Thirteen inorganic chemicals were detected in site surface water samples. One inorganic chemical, arsenic, exceeded its ecological screening criterion in one unfiltered sample. Screening criteria were not available for eight other inorganic chemicals.

Arsenic was detected in one of four unfiltered surface water samples collected at AOC H. It was not detected in any of the four filtered samples. The detected concentration exceeded ecological screening criterion. A site-specific background concentration was not available for comparison.

Semivolatile Organic Compounds

One SVOC, caprolactam, was detected in one of the four surface water sample collected at AOC H. No screening criteria were available for this constituent for comparison.

Pesticides

Pesticides were not detected in any surface water samples collected at AOC H.

Explosives

Explosive compounds were not detected in any surface water samples collected at AOC H.

Perchlorate

Perchlorate was not detected in any surface water samples collected at AOC H.

4.2.2.5 Sediment

During the Expanded PA/SI, sediment samples were not collected at AOC H. During the RI, five sediment samples were collected and analyzed for metals, SVOCs, pesticides, explosives, and perchlorate. One of the RI sediment samples (NDAHSD05) was collected as a site-specific background sample. The details of this sampling are presented in Section 3. Table 4-8 presents the detected concentrations, screening criteria, and exceedances of each chemical in AOC H sediment samples. Table 4-13 presents the statistical summaries of chemicals that exceeded their respective screening criteria. Figures 4-8 and 4-9 illustrate the detected concentrations of those parameters that exceeded available screening criteria and their background concentration.

Site sediment samples were collected at five locations during the RI. The sediment analytical results indicated the presence of 21 inorganic chemicals. Screening criteria were not available for twelve of the detected inorganics. No pesticides were detected above screening criteria in the sediment samples. No SVOCs, explosives, or perchlorate were detected in sediment samples.

Analytical results from the sediment samples were compared to appropriate ecological screening criteria. The results of the comparison are presented below.

Inorganic Analytes

Twenty-one inorganic chemicals were detected in site sediment samples. Barium exceeded its ecological screening criterion. Screening criteria were not available for 11 of the other detected inorganic chemicals.

Barium was detected in all four sediment samples collected at AOC H. One sample contained barium at a concentration that exceeded its ecological screening criterion and its site-specific background concentration (22.5 mg/kg).

Semivolatile Organic Compounds

SVOCs were not detected in any sediment samples collected at AOC H.

Pesticides

DDE was detected in one of four sediment samples collected at AOC H. The detected concentration was below its ecological screening criterion.

Explosives

Explosive compounds were not detected in any sediment samples collected at AOC H.

Perchlorate

Perchlorate was not detected in any sediment samples collected at AOC H.

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
				Total Metals (mg/kg)				
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Aluminum	9000	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Antimony	1.5	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Arsenic	1.5	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Barium	51	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Calcium	7400	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Chromium, Total	20	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Cobalt	8.1	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Copper	28	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Iron	17000	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Lead	19	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Magnesium	4200	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Manganese	410	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Mercury	0.026	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Nickel	8.1	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Potassium	1300	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Selenium	0.86	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Sodium	180	J	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Vanadium	49	=	mg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Zinc	76	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Aluminum	9700	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Antimony	1.6	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Arsenic	1.4	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Barium	60	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Beryllium	0.11	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Calcium	8800	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Chromium, Total	20	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Cobalt	9	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Copper	31	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Iron	18000	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Lead	20	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Magnesium	4300	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Manganese	490	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Mercury	0.027	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Nickel	8.4	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Potassium	1400	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Selenium	1	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Sodium	230	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Vanadium	52	=	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Zinc	81	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Aluminum	7700	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Arsenic	43	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Barium	63	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Beryllium	0.17	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Calcium	11000	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Chromium, Total	8.1	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Cobalt	6.9	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Copper	110	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Iron	17000	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Lead	24	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Magnesium	2100	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Manganese	360	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Mercury	0.033	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Nickel	4.4	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Potassium	1500	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Sodium	230	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Vanadium	46	=	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Zinc	88	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Aluminum	11000	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Antimony	1	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Arsenic	0.86	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Barium	59	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Beryllium	0.15	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Cadmium	0.21	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Calcium	31000	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Chromium, Total	50	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Cobalt	9.1	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Copper	34	=	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS01A	NDE176	12/05/2000	SS	N	Iron	19000	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Lead	27	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Magnesium	5800	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Manganese	350	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Mercury	0.02	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Nickel	15	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Potassium	2000	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Sodium	460	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Vanadium	63	=	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Zinc	170	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Aluminum	9900	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Antimony	0.86	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Arsenic	2.3	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Barium	54	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Calcium	12000	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Chromium, Total	20	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Cobalt	8.3	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Copper	29	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Iron	17000	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Lead	22	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Magnesium	4900	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Manganese	440	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Mercury	0.04	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Nickel	9.7	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Potassium	1400	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Selenium	0.83	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Sodium	210	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Vanadium	45	=	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Zinc	93	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Aluminum	5600	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Arsenic	0.89	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Barium	42	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Beryllium	0.12	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Calcium	30000	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Chromium, Total	18	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Cobalt	5.3	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Copper	21	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Iron	14000	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Lead	13	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Magnesium	2800	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Manganese	290	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Mercury	0.052	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Nickel	5.9	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Potassium	1400	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Sodium	340	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Vanadium	33	=	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Zinc	170	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Aluminum	5600	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Antimony	0.68	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Arsenic	33	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Barium	130	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Calcium	32000	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Chromium, Total	10	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Cobalt	4	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Copper	100	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Iron	12000	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Lead	45	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Magnesium	8400	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Manganese	510	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Mercury	0.024	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Nickel	4.7	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Potassium	3400	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Selenium	0.65	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Sodium	590	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Vanadium	29	=	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	Zinc	110	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Aluminum	4600	J	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Antimony	6.3	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS03A	NDE178	12/05/2000	SS	N	Arsenic	2	J	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Barium	69	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Calcium	30000	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Chromium, Total	46	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Cobalt	6.3	J	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Copper	48	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Iron	39000	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Lead	18	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Magnesium	2600	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Manganese	390	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Mercury	0.014	J	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Nickel	26	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Potassium	1100	J	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Sodium	310	J	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Vanadium	27	=	mg/kg
NDAHSS03A	NDE178	12/05/2000	SS	N	Zinc	260	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Aluminum	8400	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Antimony	0.77	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Arsenic	2.4	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Barium	130	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Calcium	21000	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Chromium, Total	18	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Cobalt	8.2	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Copper	41	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Iron	19000	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Lead	52	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Magnesium	5000	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Manganese	580	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Mercury	0.032	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Nickel	9.3	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Potassium	1900	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Selenium	0.8	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Sodium	460	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Vanadium	45	=	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Zinc	140	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Aluminum	3400	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Antimony	0.61	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Arsenic	0.54	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Barium	23	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Calcium	34000	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Chromium, Total	12	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Cobalt	3.2	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Copper	12	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Iron	7700	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Lead	8.3	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Magnesium	2000	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Manganese	140	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Mercury	0.0049	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Nickel	3.9	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Potassium	860	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Sodium	360	J	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Vanadium	21	=	mg/kg
NDAHSS04A	NDE179	12/05/2000	SS	N	Zinc	100	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Aluminum	9900	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Antimony	1.2	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Arsenic	3.5	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Barium	140	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Beryllium	0.12	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Calcium	16000	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Chromium, Total	14	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Cobalt	8.6	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Copper	28	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Iron	23000	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Lead	21	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Magnesium	5900	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Manganese	560	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Mercury	0.037	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Nickel	7.4	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS05	NDE013	12/05/2000	SS	N	Potassium	1500	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Selenium	1.4	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Sodium	260	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Vanadium	55	=	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	Zinc	97	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Aluminum	11000	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Antimony	2	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Arsenic	2.2	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Barium	50	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Calcium	33000	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Chromium, Total	36	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Cobalt	9.1	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Copper	34	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Iron	19000	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Lead	43	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Magnesium	7700	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Manganese	390	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Mercury	0.021	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Nickel	16	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Potassium	1200	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Selenium	0.98	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Sodium	300	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Vanadium	54	=	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Zinc	130	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Aluminum	9300	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Antimony	1.2	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Arsenic	1.9	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Barium	110	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Calcium	17000	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Chromium, Total	20	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Cobalt	7.2	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Copper	42	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Iron	17000	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Lead	47	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Magnesium	5600	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Manganese	390	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Mercury	0.025	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Nickel	10	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Potassium	1200	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Selenium	1.1	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Silver	0.17	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Sodium	270	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Vanadium	41	=	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Zinc	130	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Aluminum	5300	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Antimony	0.36	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Arsenic	1.4	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Barium	110	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Beryllium	0.15	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Calcium	34000	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Chromium, Total	7.9	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Cobalt	4.2	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Copper	50	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Iron	12000	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Lead	48	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Magnesium	3600	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Manganese	390	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Mercury	0.041	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Nickel	4	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Potassium	2600	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Sodium	420	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Vanadium	29	=	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Zinc	130	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Aluminum	6600	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Antimony	0.77	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Arsenic	6.2	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Barium	76	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Beryllium	0.18	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS09	NDE021	12/05/2000	SS	N	Calcium	15000	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Chromium, Total	17	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Cobalt	6.7	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Copper	36	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Iron	17000	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Lead	63	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Magnesium	2900	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Manganese	370	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Mercury	0.051	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Nickel	8.4	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Potassium	1600	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Selenium	0.62	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Sodium	260	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Vanadium	36	=	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Zinc	140	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Aluminum	7100	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Antimony	0.47	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Arsenic	67	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Barium	290	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Beryllium	0.26	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Calcium	9000	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Chromium, Total	16	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Cobalt	9	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Copper	87	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Iron	21000	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Lead	29	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Magnesium	2800	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Manganese	720	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Mercury	0.035	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Nickel	7.2	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Potassium	1600	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Selenium	0.82	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Sodium	130	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Vanadium	62	=	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Zinc	95	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Aluminum	8100	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Arsenic	1.3	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Barium	57	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Beryllium	0.11	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Calcium	7300	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Chromium, Total	13	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Cobalt	7.6	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Copper	26	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Iron	18000	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Lead	11	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Magnesium	3800	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Manganese	410	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Mercury	0.043	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Nickel	6.2	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Potassium	1500	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Sodium	110	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Vanadium	49	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Zinc	50	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Aluminum	7100	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Arsenic	1.7	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Barium	52	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Calcium	8100	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Chromium, Total	12	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Cobalt	7.1	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Copper	19	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Iron	17000	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Lead	12	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Magnesium	3600	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Manganese	370	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Mercury	0.041	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Nickel	6.1	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Potassium	1200	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Sodium	140	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS12	NDE028	12/05/2000	SS	N	Vanadium	46	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Zinc	51	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Aluminum	6700	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Arsenic	1.5	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Barium	52	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Calcium	8200	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Chromium, Total	11	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Cobalt	6.8	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Copper	19	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Iron	16000	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Lead	11	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Magnesium	3300	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Manganese	360	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Mercury	0.05	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Nickel	5.5	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Potassium	1200	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Sodium	130	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Vanadium	44	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Zinc	49	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Aluminum	5900	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Arsenic	1.1	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Barium	51	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Calcium	8900	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Chromium, Total	13	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Cobalt	5.9	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Copper	20	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Iron	20000	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Lead	15	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Magnesium	2700	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Manganese	340	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Mercury	0.029	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Nickel	5.5	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Potassium	1200	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Sodium	110	J	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Vanadium	48	=	mg/kg
NDAHSS14	NDE032	12/05/2000	SS	N	Zinc	68	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Aluminum	6200	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Arsenic	1	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Barium	50	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Calcium	20000	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Chromium, Total	13	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Cobalt	6.3	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Copper	19	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Iron	17000	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Lead	13	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Magnesium	2900	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Manganese	340	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Mercury	0.019	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Nickel	4.8	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Potassium	1300	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Sodium	220	J	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Vanadium	51	=	mg/kg
NDAHSS15	NDE034	12/05/2000	SS	N	Zinc	88	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Aluminum	7300	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Arsenic	4.7	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Barium	66	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Beryllium	0.11	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Calcium	13000	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Chromium, Total	14	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Cobalt	7.1	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Copper	23	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Iron	15000	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Lead	16	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Magnesium	3800	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Manganese	410	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Mercury	0.04	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Nickel	7	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Potassium	1300	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS16	NDE037	12/05/2000	SS	N	Sodium	200	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Vanadium	43	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Zinc	62	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Aluminum	9300	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Antimony	0.394	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Arsenic	1.18	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Barium	60.4	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Beryllium	0.143	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Cadmium	0.0466	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Calcium	4460	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Chromium, Total	15.4	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Cobalt	7.72	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Copper	25.6	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Iron	18100	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Lead	16.4	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Magnesium	3460	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Manganese	441	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Mercury	0.0308	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Nickel	7.56	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Potassium	1550	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Selenium	0.47	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Silver	0.0709	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Sodium	187	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Thallium	0.944	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Vanadium	51.6	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Zinc	61.8	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Aluminum	10400	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Antimony	0.882	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Arsenic	1.12	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Barium	36.7	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Beryllium	0.101	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Cadmium	0.0742	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Calcium	6830	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Chromium, Total	23.9	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Cobalt	8.42	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Copper	26.4	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Iron	22400	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Lead	16.6	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Magnesium	7220	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Manganese	368	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Mercury	0.00904	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Nickel	13.8	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Potassium	1100	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Selenium	0.382	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Silver	0.0702	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Sodium	252	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Thallium	1.16	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Vanadium	51.3	=	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Zinc	59.1	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Aluminum	9760	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Antimony	1.17	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Arsenic	0.715	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Barium	76.5	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Beryllium	0.133	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Cadmium	0.11	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Calcium	4840	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Chromium, Total	23.7	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Cobalt	10.2	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Copper	30.9	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Iron	20600	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Lead	26.9	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Magnesium	4750	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Manganese	636	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Mercury	0.0227	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Nickel	10.3	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Potassium	1330	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Selenium	0.677	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Silver	0.0346	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Sodium	268	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Thallium	0.867	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Vanadium	61	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Zinc	86.3	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Aluminum	8710	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Aluminum	9140	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Antimony	0.492	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Antimony	0.393	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Arsenic	1.1	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Arsenic	1.58	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Barium	40.7	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Barium	41.5	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Beryllium	0.084	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Beryllium	0.0904	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Cadmium	0.069	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Cadmium	0.0873	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Calcium	11200	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Calcium	13100	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Chromium, Total	22.4	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Chromium, Total	17	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Cobalt	6.42	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Cobalt	7.99	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Copper	19.6	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Copper	22.2	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Iron	14100	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Iron	17100	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Lead	20.8	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Lead	52.4	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Magnesium	4680	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Magnesium	6130	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Manganese	336	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Manganese	369	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Mercury	0.0221	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Mercury	0.0231	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Nickel	9.31	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Nickel	12.3	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Potassium	1230	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Potassium	1310	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Selenium	0.369	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Selenium	0.657	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Silver	0.0491	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Sodium	371	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Sodium	262	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Thallium	0.62	J	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Thallium	0.611	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Vanadium	40.8	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Vanadium	48.9	=	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Zinc	60.3	=	mg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Zinc	65.1	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Aluminum	5720	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Antimony	0.362	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Arsenic	1.92	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Barium	61.7	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Beryllium	0.1	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Cadmium	0.116	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Calcium	20300	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Chromium, Total	7.83	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Cobalt	5.16	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Copper	22.2	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Iron	14600	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Lead	27	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Magnesium	2330	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Manganese	313	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Mercury	0.0367	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Nickel	3.55	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Potassium	1500	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Selenium	0.449	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Sodium	244	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Thallium	0.671	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Vanadium	40.4	=	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Zinc	87.3	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Aluminum	6990	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Antimony	0.585	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Arsenic	1.79	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Barium	56.1	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Beryllium	0.114	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Cadmium	0.135	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Calcium	29600	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Chromium, Total	10.9	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Cobalt	5.58	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Copper	23	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Iron	14400	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Lead	23.7	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Magnesium	3320	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Manganese	325	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Mercury	0.0303	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Nickel	4.81	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Potassium	1950	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Selenium	0.38	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Silver	0.0511	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Sodium	349	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Thallium	0.429	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Vanadium	43.2	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Zinc	71.1	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Aluminum	6850	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Antimony	0.393	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Arsenic	1.13	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Barium	52.1	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Beryllium	0.112	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Cadmium	0.0699	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Calcium	21700	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Chromium, Total	9.51	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Cobalt	5.7	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Copper	20.3	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Iron	13400	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Lead	18.3	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Magnesium	2670	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Manganese	352	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Mercury	0.0383	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Nickel	4.1	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Potassium	1380	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Selenium	0.3	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Silver	0.0579	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Sodium	261	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Thallium	0.488	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Vanadium	40.1	=	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Zinc	56.7	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Aluminum	7030	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Antimony	0.422	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Arsenic	1.49	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Barium	55.5	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Beryllium	0.115	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Cadmium	0.102	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Calcium	14800	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Chromium, Total	10.1	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Cobalt	6.07	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Copper	24.6	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Iron	14800	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Lead	25.4	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Magnesium	2690	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Manganese	375	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Mercury	0.0351	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Nickel	4.92	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Potassium	1360	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Selenium	0.285	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Silver	0.0608	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Sodium	211	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Thallium	0.68	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Vanadium	43.2	=	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Zinc	81.4	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Aluminum	6380	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Antimony	0.381	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Arsenic	2.59	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Barium	85.7	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Beryllium	0.13	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Cadmium	0.152	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Calcium	18600	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Chromium, Total	8.84	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Cobalt	5.11	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Copper	37.4	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Iron	15100	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Lead	58.9	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Magnesium	2330	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Manganese	309	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Mercury	0.0625	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Nickel	4.49	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Potassium	1730	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Selenium	0.234	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Silver	0.0651	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Sodium	282	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Thallium	0.693	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Vanadium	36.1	=	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Zinc	126	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Aluminum	10300	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Antimony	0.661	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Arsenic	6.74	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Barium	77	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Beryllium	0.128	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Cadmium	0.291	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Calcium	22200	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Chromium, Total	17.4	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Cobalt	7.81	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Copper	36.5	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Iron	17200	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Lead	44	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Magnesium	5500	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Manganese	404	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Mercury	0.053	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Nickel	10.4	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Potassium	1810	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Selenium	0.597	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Silver	0.0583	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Sodium	347	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Thallium	0.287	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Vanadium	44.5	=	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Zinc	125	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Aluminum	7530	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Aluminum	7690	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Antimony	0.64	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Antimony	0.457	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Arsenic	2.48	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Arsenic	2.79	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Barium	54.9	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Barium	62.7	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Beryllium	0.118	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Beryllium	0.126	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Cadmium	0.147	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Cadmium	0.159	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Calcium	29700	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Calcium	10900	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Chromium, Total	11.9	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Chromium, Total	10.2	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Cobalt	6	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Cobalt	6.99	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Copper	22	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Copper	24.6	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Iron	15000	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Iron	16800	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Lead	13.5	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Lead	14.6	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Magnesium	2580	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Magnesium	3280	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Manganese	325	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Manganese	359	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Mercury	0.0286	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Mercury	0.0291	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Nickel	4.46	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Nickel	5.87	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Potassium	1560	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Potassium	1420	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Selenium	0.367	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Selenium	0.357	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Silver	0.0332	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Silver	0.0383	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Sodium	328	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Sodium	221	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Thallium	0.45	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Thallium	0.732	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Vanadium	44.3	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Vanadium	48	=	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	Zinc	65.2	=	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	Zinc	72.4	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Aluminum	3840	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Antimony	0.34	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Arsenic	0.435	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Barium	27.9	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Beryllium	0.0799	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Calcium	5400	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Chromium, Total	7.98	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Cobalt	3.26	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Copper	11.1	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Iron	11200	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Lead	4.43	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Magnesium	1630	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Manganese	182	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Mercury	0.0168	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Nickel	3.26	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Potassium	721	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Selenium	0.353	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Silver	0.0356	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Sodium	142	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Thallium	0.863	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Vanadium	35.9	=	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	Zinc	31.5	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Aluminum	7920	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Antimony	0.534	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Arsenic	0.701	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Barium	54.4	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Beryllium	0.12	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Cadmium	0.0454	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Calcium	5980	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Chromium, Total	13.8	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Cobalt	8.39	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Copper	24.8	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Iron	16300	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Lead	8.68	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Magnesium	3250	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Manganese	384	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Mercury	0.0194	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Nickel	6.24	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Potassium	1330	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Selenium	0.616	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Silver	0.0611	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Sodium	213	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Thallium	0.613	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Vanadium	48	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Zinc	44.7	=	mg/kg
					Volatile Organic Compounds (µg/kg)			
NDAHSS01A	NDE176	12/05/2000	SS	N	m+p Xylene	0.058	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	o-Xylene	0.024	J	mg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Xylenes, Total	0.082	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	1,1-Dichloroethene	0.00078	J	mg/kg
					Semivolatile Organic Compounds (µg/kg)			
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Benzo(a)anthracene	30	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Benzo(a)pyrene	41	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Benzo(b)fluoranthene	84	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Benzo(k)fluoranthene	72	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Chrysene	83	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	DI-n-butyl phthalate	49	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Fluoranthene	111	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Phenanthrene	36	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	Pyrene	92	J	µg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Benzo(a)anthracene	0.032	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Benzo(a)pyrene	0.043	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Benzo(b)fluoranthene	0.072	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Benzo(k)fluoranthene	0.054	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Chrysene	0.057	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Fluoranthene	0.056	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Indeno(1,2,3-c,d)pyrene	0.026	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	Pyrene	0.057	J	mg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	2,6-Dinitrotoluene	1220	=	µg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	4-Bromophenyl Phenyl Ether	228	J	µg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	Isophorone	108	J	µg/kg
NDAHSS010	NDE024FD1	12/05/2000	SS	FD	N-Nitrosodi-n-propylamine	595	=	µg/kg
NDAHSS01A	NDE176	12/05/2000	SS	N	Pyrene	1.9	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	Chrysene	0.029	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Benzo(a)pyrene	0.074	J	mg/kg
NDAHSS02A	NDE177	12/05/2000	SS	N	Benzo(g,h,i)perylene	0.06	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	2-Methylnaphthalene	0.055	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Benzo(a)anthracene	0.112	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Benzo(a)pyrene	0.12	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Benzo(b)fluoranthene	0.133	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Benzo(k)fluoranthene	0.124	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Chrysene	0.155	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Fluoranthene	0.187	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Indeno(1,2,3-c,d)pyrene	0.054	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Phenanthrene	0.083	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	Pyrene	0.168	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	2-Methylnaphthalene	0.028	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Benzo(a)anthracene	0.049	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Benzo(a)pyrene	0.053	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Benzo(b)fluoranthene	0.065	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Benzo(k)fluoranthene	0.066	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Chrysene	0.068	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Fluoranthene	0.082	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Phenanthrene	0.032	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	Pyrene	0.076	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Benzo(b)fluoranthene	0.062	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Benzo(k)fluoranthene	0.044	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Chrysene	0.05	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Fluoranthene	0.069	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Phenanthrene	0.034	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	Pyrene	0.066	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	2-Methylnaphthalene	0.176	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Benzo(a)anthracene	0.068	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Benzo(a)pyrene	0.071	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Benzo(b)fluoranthene	0.104	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Benzo(k)fluoranthene	0.088	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Chrysene	0.121	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Dibenzofuran	0.051	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS08	NDE019	12/05/2000	SS	N	Fluoranthene	0.089	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Naphthalene	0.09	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Phenanthrene	0.144	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	Pyrene	0.097	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	2-Methylnaphthalene	0.19	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Benzo(a)pyrene	0.037	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Benzo(b)fluoranthene	0.05	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Benzo(k)fluoranthene	0.044	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Chrysene	0.059	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Dibenzofuran	0.038	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Fluoranthene	0.04	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Naphthalene	0.069	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Phenanthrene	0.092	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	Pyrene	0.049	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	2-Methylnaphthalene	0.036	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Benzo(a)anthracene	0.029	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Fluoranthene	0.033	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Phenanthrene	0.037	J	mg/kg
NDAHSS10	NDE023	12/05/2000	SS	N	Pyrene	0.032	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	2,6-Dinitrotoluene	1.21	=	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	4-Bromophenyl Phenyl Ether	0.238	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	Isophorone	0.106	J	mg/kg
NDAHSS11	NDE026	12/05/2000	SS	N	N-Nitrosodi-n-propylamine	0.658	=	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	4-Bromophenyl Phenyl Ether	0.217	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	Isophorone	0.112	J	mg/kg
NDAHSS12	NDE028	12/05/2000	SS	N	N-Nitrosodi-n-propylamine	0.562	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	2,6-Dinitrotoluene	1.23	=	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	3-Nitroaniline	0.048	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	4-Bromophenyl Phenyl Ether	0.267	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Benzo(b)fluoranthene	0.04	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	Indeno(1,2,3-c,d)pyrene	0.037	J	mg/kg
NDAHSS13	NDE030	12/05/2000	SS	N	N-Nitrosodi-n-propylamine	0.717	=	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Benzo(a)anthracene	0.029	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Benzo(a)pyrene	0.05	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Benzo(b)fluoranthene	0.058	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Benzo(k)fluoranthene	0.053	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Chrysene	0.054	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Fluoranthene	0.053	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	Pyrene	0.058	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Benzo(a)anthracene	0.036	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.042	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0595	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0465	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0421	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Chrysene	0.044	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Fluoranthene	0.0369	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Indeno(1,2,3-c,d)pyrene	0.0567	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	Pyrene	0.0432	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Benzo(a)anthracene	0.0299	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0502	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.092	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0495	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.07	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Chrysene	0.0699	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Fluoranthene	0.0291	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Indeno(1,2,3-c,d)pyrene	0.0636	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	Pyrene	0.045	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0323	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0608	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0328	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0394	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Chrysene	0.0416	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Indeno(1,2,3-c,d)pyrene	0.0442	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Benzo(a)anthracene	32.5	J	µg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0283	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Benzo(a)pyrene	31.1	J	µg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0502	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Benzo(b)fluoranthene	52.4	J	µg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0249	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Benzo(g,h,i)perylene	24.5	J	µg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0359	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Benzo(k)fluoranthene	38.8	J	µg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	bis(2-Ethylhexyl) Phthalate	76.6	J	µg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Chrysene	0.0471	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Chrysene	49.8	J	µg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Fluoranthene	0.0385	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Fluoranthene	42.6	J	µg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Indeno(1,2,3-c,d)pyrene	36.8	J	µg/kg
NDAHSS20	NDAHSS20-R01	08/26/2003	SS	N	Pyrene	0.0435	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	Pyrene	48	J	µg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0267	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0279	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0274	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.022	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Chrysene	0.0254	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Fluoranthene	0.0246	J	mg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	Pyrene	0.0296	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0271	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0217	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0196	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.08530001	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Chrysene	0.0247	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Fluoranthene	0.0258	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	Pyrene	0.029	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.025	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.0827	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Chrysene	0.0225	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Fluoranthene	0.0272	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	Pyrene	0.0282	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Benzo(a)anthracene	0.0946	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0969	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0935	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0589	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0763	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.117	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Chrysene	0.0972	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Fluoranthene	0.112	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Indeno(1,2,3-c,d)pyrene	0.0848	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Phenanthrene	0.0211	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	Pyrene	0.125	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	2-Methylnaphthalene	0.0956	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Benzo(a)anthracene	0.0451	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0426	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0544	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0422	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0339	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.0831	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Chrysene	0.0671	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Dibenzofuran	0.0294	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Fluoranthene	0.0522	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Indeno(1,2,3-c,d)pyrene	0.0489	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Naphthalene	0.0424	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Phenanthrene	0.0816	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	Pyrene	0.0548	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0187	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.0729	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.0766	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	bis(2-Ethylhexyl) Phthalate	81.8	J	ug/Kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.0905	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Benzo(a)pyrene	0.0257	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Benzo(b)fluoranthene	0.0449	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Benzo(g,h,i)perylene	0.0244	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Benzo(k)fluoranthene	0.0283	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	bis(2-Ethylhexyl) Phthalate	0.0819	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	Chrysene	0.0241	J	mg/kg

TABLE 4-A
Surface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
				Pesticides (mg/kg)				
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	p,p'-DDE	3440	J	µg/kg
NDAHSS001	NDE005FD1	12/05/2000	SS	FD	p,p'-DDT	2190	J	µg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	p,p'-DDE	3.99	J	mg/kg
NDAHSS01	NDE004	12/05/2000	SS	N	p,p'-DDT	1.94	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	p,p'-DDE	2.66	J	mg/kg
NDAHSS02	NDE007	12/05/2000	SS	N	p,p'-DDT	1.09	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	p,p'-DDD	0.0024	J	mg/kg
NDAHSS03	NDE009	12/05/2000	SS	N	p,p'-DDE	0.05	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	p,p'-DDD	0.0029	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	p,p'-DDE	0.041	J	mg/kg
NDAHSS04	NDE011	12/05/2000	SS	N	p,p'-DDT	0.017	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	p,p'-DDE	0.014	J	mg/kg
NDAHSS05	NDE013	12/05/2000	SS	N	p,p'-DDT	0.01	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	p,p'-DDE	0.01	J	mg/kg
NDAHSS06	NDE015	12/05/2000	SS	N	p,p'-DDT	0.011	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	p,p'-DDE	0.126	J	mg/kg
NDAHSS07	NDE017	12/05/2000	SS	N	p,p'-DDT	0.075	J	mg/kg
NDAHSS08	NDE019	12/05/2000	SS	N	p,p'-DDE	0.0016	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	p,p'-DDE	0.0078	J	mg/kg
NDAHSS09	NDE021	12/05/2000	SS	N	p,p'-DDT	0.0067	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	p,p'-DDD	0.0048	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	p,p'-DDE	0.041	J	mg/kg
NDAHSS16	NDE037	12/05/2000	SS	N	p,p'-DDT	0.029	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	p,p'-DDD	0.00052	J	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	p,p'-DDE	0.04	=	mg/kg
NDAHSS17	NDAHSS17-R01	08/26/2003	SS	N	p,p'-DDT	0.018	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	p,p'-DDD	0.0021	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	p,p'-DDE	0.095	J	mg/kg
NDAHSS18	NDAHSS18-R01	08/26/2003	SS	N	p,p'-DDT	0.025	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	Methoxychlor	0.00074	J	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	p,p'-DDE	0.023	=	mg/kg
NDAHSS19	NDAHSS19-R01	08/26/2003	SS	N	p,p'-DDT	0.0086	J	mg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	p,p'-DDD	6.6	J	µg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	p,p'-DDE	69	J	µg/kg
NDAHSS20	NDAHFD04P-R01	08/26/2003	SS	FD	p,p'-DDT	4.6	=	µg/kg
NDAHSS21	NDAHSS21-R01	08/26/2003	SS	N	p,p'-DDE	0.0014	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	p,p'-DDD	0.01	J	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	p,p'-DDE	0.19	=	mg/kg
NDAHSS22	NDAHSS22-R01	08/26/2003	SS	N	p,p'-DDT	0.0092	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	p,p'-DDD	0.0036	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	p,p'-DDE	0.016	J	mg/kg
NDAHSS23	NDAHSS23-R01	08/26/2003	SS	N	p,p'-DDT	0.0083	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	p,p'-DDE	0.005	J	mg/kg
NDAHSS24	NDAHSS24-R01	08/26/2003	SS	N	p,p'-DDT	0.0055	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	p,p'-DDD	0.00062	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	p,p'-DDE	0.0025	J	mg/kg
NDAHSS25	NDAHSS25-R01	08/26/2003	SS	N	p,p'-DDT	0.0013	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	p,p'-DDD	0.0023	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	p,p'-DDE	0.016	J	mg/kg
NDAHSS26	NDAHSS26-R01	08/26/2003	SS	N	p,p'-DDT	0.01	J	mg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	p,p'-DDD	0.0019	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	p,p'-DDD	3	J	µg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	p,p'-DDE	0.0088	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	p,p'-DDE	7.5	=	µg/kg
NDAHSS27	NDAHSS27-R01	08/26/2003	SS	N	p,p'-DDT	0.011	J	mg/kg
NDAHSS27	NDAHFD06P-R01	08/26/2003	SS	FD	p,p'-DDT	2.2	J	µg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	p,p'-DDD	0.0011	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	p,p'-DDE	0.092	J	mg/kg
NDAHSS28	NDAHSS28-R01	08/26/2003	SS	N	p,p'-DDT	0.16	J	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	p,p'-DDD	0.0044	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	p,p'-DDE	0.035	=	mg/kg
NDAHSS29	NDAHSS29-R01	08/26/2003	SS	N	p,p'-DDT	0.0077	J	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
				Total Metals (mg/kg)				
NDAHSB01	NDE006	12/05/2000	SB	N	Aluminum	5900	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Antimony	0.9	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Arsenic	24	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Barium	44	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Calcium	4800	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Chromium, Total	16	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Cobalt	5.9	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Copper	17	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Iron	16000	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Lead	7.5	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Magnesium	2300	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Manganese	310	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Mercury	0.013	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Nickel	5.5	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Potassium	1100	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Selenium	0.91	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Sodium	140	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Vanadium	44	=	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	Zinc	33	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Aluminum	8500	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Barium	84	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Beryllium	0.23	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Calcium	5200	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Chromium, Total	9.5	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Cobalt	8.5	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Copper	24	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Iron	19000	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Lead	2.1	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Magnesium	2700	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Manganese	500	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Mercury	0.011	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Nickel	3.9	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Potassium	1500	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Selenium	0.9	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Sodium	130	J	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Vanadium	54	=	mg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Zinc	27	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Aluminum	8900	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Antimony	0.55	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Arsenic	2.4	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Barium	75	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Beryllium	0.24	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Calcium	2900	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Chromium, Total	10	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Cobalt	9.2	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Copper	25	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Iron	23000	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Lead	1.5	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Magnesium	3100	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Manganese	400	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Mercury	0.0093	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Nickel	4	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Potassium	1800	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Selenium	1	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Sodium	210	J	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Vanadium	68	=	mg/kg
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Zinc	27	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Aluminum	2500	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Arsenic	0.78	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Barium	26	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Calcium	1400	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Chromium, Total	3.6	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Cobalt	2.2	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Copper	7	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Iron	6900	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Lead	1.8	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Magnesium	840	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Manganese	160	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Nickel	1.2	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Potassium	440	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Sodium	43	J	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB02	NDE008	12/05/2000	SB	N	Vanadium	20	=	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	Zinc	8.8	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Aluminum	6900	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Antimony	0.59	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Arsenic	10	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Barium	87	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Calcium	5200	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Chromium, Total	10	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Cobalt	6.9	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Copper	31	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Iron	19000	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Lead	8.6	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Magnesium	3600	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Manganese	370	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Mercury	0.011	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Nickel	4.2	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Potassium	2700	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Selenium	1.3	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Sodium	200	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Vanadium	52	=	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Zinc	41	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Aluminum	4200	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Antimony	0.44	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Arsenic	0.69	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Barium	160	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Calcium	2100	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Chromium, Total	5.3	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Cobalt	7.9	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Copper	15	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Iron	12000	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Lead	2.5	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Magnesium	1600	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Manganese	680	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Mercury	0.0038	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Nickel	2.7	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Potassium	980	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Selenium	0.84	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Sodium	48	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Vanadium	36	=	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	Zinc	16	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Aluminum	2900	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Barium	23	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Calcium	1900	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Chromium, Total	3.6	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Cobalt	2.4	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Copper	7.7	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Iron	7800	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Lead	2	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Magnesium	980	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Manganese	110	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Mercury	0.0032	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Nickel	1.2	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Potassium	650	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Selenium	0.55	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Sodium	60	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Vanadium	22	=	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Zinc	13	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Aluminum	3100	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Antimony	0.38	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Barium	20	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Calcium	2700	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Chromium, Total	6.4	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Cobalt	3.1	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Copper	10	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Iron	9300	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Lead	5.7	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Magnesium	1400	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Manganese	150	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Nickel	3.1	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Potassium	560	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Selenium	0.79	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Sodium	59	J	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB06	NDE016	12/06/2000	SB	N	Vanadium	27	=	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Zinc	20	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Aluminum	4300	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Antimony	0.44	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Barium	200	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Beryllium	0.15	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Calcium	2700	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Chromium, Total	13	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Cobalt	16	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Copper	16	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Iron	15000	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Lead	4.4	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Magnesium	3100	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Manganese	1000	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Nickel	3.4	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Potassium	970	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Selenium	0.57	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Sodium	46	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Vanadium	40	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	Zinc	26	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Aluminum	4200	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Arsenic	0.64	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Barium	86	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Beryllium	0.15	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Calcium	8400	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Chromium, Total	8.9	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Cobalt	4.2	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Copper	16	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Iron	11000	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Lead	5.9	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Magnesium	2500	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Manganese	520	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Nickel	7.5	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Potassium	1300	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Sodium	240	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Vanadium	31	=	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	Zinc	27	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Aluminum	9700	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Aluminum	11000	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Aluminum	5200	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Antimony	0.49	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Antimony	0.44	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Arsenic	0.76	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Barium	63	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Barium	69	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Barium	120	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Beryllium	0.22	J	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Beryllium	0.42	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Beryllium	0.48	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Calcium	1800	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Calcium	3000	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Calcium	1800	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Chromium, Total	27	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Chromium, Total	23	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Chromium, Total	5.7	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Cobalt	15	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Cobalt	8.4	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Cobalt	5.1	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Copper	23	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Copper	30	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Copper	14	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Iron	28000	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Iron	22000	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Iron	15000	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Lead	1.2	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Lead	2.1	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Lead	2.2	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Magnesium	3000	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Magnesium	2000	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Magnesium	4200	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Manganese	420	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Manganese	600	=	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB09	NDE204	12/06/2000	SB	N	Manganese	850	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Mercury	0.0034	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Nickel	6.9	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Nickel	2.9	J	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Nickel	9.2	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Potassium	1000	J	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Potassium	840	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Potassium	630	J	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Selenium	0.89	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Selenium	0.9	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Selenium	0.76	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Sodium	170	J	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Sodium	850	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Sodium	590	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Thallium	0.43	J	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Vanadium	75	=	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Vanadium	79	=	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Vanadium	36	=	mg/kg
NDAHSB09	NDE204	12/06/2000	SB	N	Zinc	28	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	Zinc	20	J	mg/kg
NDAHSB09	NDE022	12/06/2000	SB	N	Zinc	17	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Aluminum	5200	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Arsenic	1.1	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Barium	74	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Beryllium	0.18	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Calcium	2000	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Chromium, Total	6.7	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Cobalt	5.8	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Copper	16	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Iron	18000	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Lead	1.1	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Magnesium	2000	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Manganese	960	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Nickel	2.5	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Potassium	1000	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Selenium	1.2	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Sodium	290	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Vanadium	46	=	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	Zinc	16	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Aluminum	4000	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Barium	60	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Beryllium	0.16	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Calcium	2900	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Chromium, Total	6.4	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Cobalt	5.5	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Copper	10	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Iron	13000	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Lead	1.2	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Magnesium	1600	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Manganese	290	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Mercury	0.0041	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Nickel	2.3	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Potassium	830	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Selenium	0.61	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Sodium	130	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Vanadium	34	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Zinc	15	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Aluminum	5000	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Barium	57	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Beryllium	0.19	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Calcium	3900	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Chromium, Total	8.1	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Cobalt	6.1	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Copper	15	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Iron	17000	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Lead	1.1	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Magnesium	2000	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Manganese	300	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Mercury	0.0094	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Nickel	2.7	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Potassium	1100	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Selenium	0.65	J	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB12	NDE029	12/06/2000	SB	N	Sodium	310	J	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Vanadium	54	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	Zinc	18	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Aluminum	3200	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Barium	29	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Beryllium	0.17	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Calcium	1700	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Chromium, Total	3.3	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Cobalt	4.1	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Copper	17	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Iron	11000	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Lead	0.92	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Magnesium	1400	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Manganese	160	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Nickel	1.7	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Potassium	700	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Sodium	180	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Vanadium	37	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	Zinc	15	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Aluminum	7000	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Barium	85	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Beryllium	0.21	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Calcium	6200	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Chromium, Total	8.9	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Cobalt	7	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Copper	23	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Iron	19000	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Lead	12	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Magnesium	2500	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Manganese	350	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Mercury	0.015	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Nickel	3.7	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Potassium	1300	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Selenium	1.2	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Sodium	230	J	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Vanadium	51	=	mg/kg
NDAHSB14	NDE033	12/07/2000	SB	N	Zinc	48	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Aluminum	8900	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Barium	98	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Beryllium	0.24	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Calcium	4100	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Chromium, Total	11	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Cobalt	9	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Copper	28	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Iron	20000	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Lead	1.7	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Magnesium	2800	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Manganese	560	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Mercury	0.014	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Nickel	4.3	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Potassium	1600	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Selenium	0.99	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Sodium	110	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Vanadium	61	=	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	Zinc	30	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Aluminum	9400	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Antimony	0.44	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Arsenic	0.88	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Barium	81	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Beryllium	0.26	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Calcium	3300	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Chromium, Total	10	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Cobalt	9	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Copper	25	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Iron	22000	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Lead	1.9	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Magnesium	3000	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Manganese	420	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Mercury	0.0088	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Nickel	4.2	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Potassium	1800	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Selenium	1	J	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB16	NDE038	12/07/2000	SB	N	Sodium	190	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Vanadium	65	=	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	Zinc	28	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Aluminum	6550	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Antimony	0.218	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Arsenic	1.71	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Barium	61.3	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Beryllium	0.112	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Cadmium	0.0442	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Calcium	9420	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Chromium, Total	7.61	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Cobalt	5.79	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Copper	20.6	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Iron	13900	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Lead	18.9	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Magnesium	2130	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Manganese	316	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Mercury	0.0706	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Nickel	3.48	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Potassium	1330	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Selenium	0.383	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Silver	0.0437	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Sodium	190	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Thallium	0.708	J	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Vanadium	38.5	=	mg/kg
NDAHSB17	NDAHSB17-R01	08/26/2003	SB	N	Zinc	59.8	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Aluminum	6880	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Antimony	0.253	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Arsenic	1.29	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Barium	81.4	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Beryllium	0.122	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Cadmium	0.219	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Calcium	15100	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Chromium, Total	9.05	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Cobalt	5.74	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Copper	27.2	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Iron	15400	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Lead	29.1	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Magnesium	2660	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Manganese	345	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Mercury	0.0719	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Nickel	4.17	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Potassium	1820	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Selenium	0.278	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Sodium	297	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Thallium	0.538	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Vanadium	41.8	=	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	Zinc	155	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Aluminum	2930	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Antimony	0.14	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Arsenic	0.161	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Barium	25.4	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Beryllium	0.0591	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Calcium	1540	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Chromium, Total	3.51	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Cobalt	3.24	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Copper	8.56	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Iron	9420	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Lead	1.25	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Magnesium	1060	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Manganese	177	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Mercury	0.00506	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Nickel	1.25	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Potassium	709	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Sodium	85.1	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Thallium	0.476	J	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Vanadium	26.5	=	mg/kg
NDAHSB19	NDAHSB19-R01	08/26/2003	SB	N	Zinc	13.3	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Aluminum	5050	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Aluminum	4980	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Antimony	0.199	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Antimony	0.332	J	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Arsenic	0.372	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Arsenic	0.62	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Barium	40.9	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Barium	45.6	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Beryllium	0.0933	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Beryllium	0.0952	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Cadmium	0.0367	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Calcium	6560	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Calcium	9130	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Chromium, Total	6.98	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Chromium, Total	6.04	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Cobalt	4.81	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Cobalt	4.49	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Copper	21.3	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Copper	21.5	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Iron	12100	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Iron	12400	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Lead	5.2	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Lead	6.75	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Magnesium	1680	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Magnesium	1690	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Manganese	286	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Manganese	283	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Mercury	0.0165	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Mercury	0.0146	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Nickel	2.36	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Nickel	2.25	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Potassium	1390	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Potassium	1400	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Selenium	0.351	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Selenium	0.5	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Silver	0.0424	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Sodium	179	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Sodium	196	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Thallium	0.622	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Thallium	0.583	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Vanadium	34.3	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Vanadium	36.2	=	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	Zinc	49.4	=	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	Zinc	54.1	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Aluminum	2620	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Arsenic	0.203	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Barium	32.4	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Beryllium	0.0532	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Calcium	1070	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Chromium, Total	5.15	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Cobalt	2.93	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Copper	7.04	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Iron	7810	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Lead	0.75	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Magnesium	895	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Manganese	161	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Mercury	0.00429	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Nickel	1.26	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Potassium	665	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Selenium	0.268	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Sodium	77.3	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Thallium	0.407	J	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Vanadium	22.8	=	mg/kg
NDAHSB21	NDAHSB21-R01	08/26/2003	SB	N	Zinc	10.2	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Aluminum	3760	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Antimony	0.25	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Arsenic	1.94	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Barium	31	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Beryllium	0.0805	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Calcium	1420	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Chromium, Total	4.32	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Cobalt	2.48	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Copper	46.4	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Iron	8700	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Lead	2.29	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Magnesium	1380	=	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Manganese	80.4	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Mercury	0.009	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Nickel	1.35	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Potassium	1050	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Selenium	0.199	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Sodium	95.9	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Thallium	0.522	J	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Vanadium	25.5	=	mg/kg
NDAHSB22	NDAHSB22-R01	08/26/2003	SB	N	Zinc	17.5	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Aluminum	2630	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Arsenic	1.24	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Barium	29.2	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Beryllium	0.0479	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Calcium	1180	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Chromium, Total	4.4	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Cobalt	2.58	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Copper	8.18	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Iron	8360	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Lead	1.11	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Magnesium	975	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Manganese	117	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Mercury	0.00644	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Nickel	1.21	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Potassium	739	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Selenium	0.29	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Sodium	78.8	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Thallium	0.355	J	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Vanadium	25.3	=	mg/kg
NDAHSB23	NDAHSB23-R01	08/26/2003	SB	N	Zinc	12.3	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Aluminum	3020	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Arsenic	1.09	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Barium	37.3	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Beryllium	0.0735	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Calcium	2900	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Chromium, Total	4.54	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Cobalt	3.87	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Copper	9.45	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Iron	9070	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Lead	1.04	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Magnesium	1100	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Manganese	277	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Mercury	0.00318	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Nickel	1.58	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Potassium	809	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Sodium	114	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Thallium	0.553	J	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Vanadium	27.8	=	mg/kg
NDAHSB24	NDAHSB24-R01	08/26/2003	SB	N	Zinc	15	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Aluminum	2110	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Arsenic	0.223	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Barium	32.6	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Beryllium	0.0547	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Calcium	1300	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Chromium, Total	3.28	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Cobalt	3.14	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Copper	7.49	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Iron	6660	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Lead	0.91	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Magnesium	748	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Manganese	271	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Mercury	0.00476	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Nickel	1.13	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Potassium	591	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Sodium	91.6	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Thallium	0.24	J	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Vanadium	19	=	mg/kg
NDAHSB25	NDAHSB25-R01	08/26/2003	SB	N	Zinc	9.07	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Aluminum	4440	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Arsenic	1.18	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Barium	44	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Beryllium	0.103	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Calcium	3220	=	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Chromium, Total	6.75	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Cobalt	5.08	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Copper	14.8	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Iron	14000	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Lead	1.42	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Magnesium	1760	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Manganese	427	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Mercury	0.0061	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Nickel	3.17	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Potassium	1020	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Selenium	0.411	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Silver	0.0405	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Sodium	363	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Thallium	0.661	J	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Vanadium	36.4	=	mg/kg
NDAHSB26	NDAHSB26-R01	08/26/2003	SB	N	Zinc	18.8	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Aluminum	5790	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Antimony	0.168	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Arsenic	0.631	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Barium	43.7	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Beryllium	0.112	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Calcium	4240	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Chromium, Total	7.03	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Cobalt	5.65	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Copper	16.5	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Iron	15400	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Lead	3.23	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Magnesium	2340	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Manganese	199	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Mercury	0.0218	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Nickel	2.71	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Potassium	1240	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Selenium	0.384	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Silver	0.0242	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Sodium	737	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Thallium	0.712	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Vanadium	46.8	=	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	Zinc	31	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Aluminum	5360	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Antimony	0.222	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Arsenic	0.917	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Barium	68.5	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Beryllium	0.134	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Calcium	2780	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Chromium, Total	6.78	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Cobalt	6.25	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Copper	15.4	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Iron	13200	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Lead	1.86	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Magnesium	2030	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Manganese	544	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Mercury	0.0109	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Nickel	2.86	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Potassium	1170	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Selenium	0.572	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Silver	0.0293	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Sodium	205	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Thallium	0.789	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Vanadium	40.3	=	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	Zinc	22.2	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Aluminum	6450	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Antimony	0.412	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Arsenic	0.545	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Barium	69.1	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Beryllium	0.118	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Calcium	6060	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Chromium, Total	8.81	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Cobalt	6.8	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Copper	18.8	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Iron	15800	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Lead	3.02	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Magnesium	2520	=	mg/kg

TABLE 4-B
Subsurface Soil Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Manganese	372	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Mercury	0.0195	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Nickel	3.24	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Potassium	1510	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Selenium	0.362	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Sodium	361	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Thallium	0.954	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Vanadium	48.9	=	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	Zinc	26.8	J	mg/kg
				Volatiles (mg/kg)				
NDAHSB016	NDE039FD1	12/07/2000	SB	FD	Carbon disulfide	0.91	J	µg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	Tetrachloroethylene	0.0016	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	Tetrachloroethylene	0.00031	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	1,1-Dichloroethene	0.00045	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	Methylene chloride	0.00058	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	1,1-Dichloroethene	0.00055	J	mg/kg
NDAHSB08	NDE020	12/06/2000	SB	N	1,1-Dichloroethene	0.00052	J	mg/kg
NDAHSB09	NDE203	12/06/2000	SB	N	1,1-Dichloroethene	0.00078	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	1,1-Dichloroethene	0.00059	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Toluene	0.0004	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	Trichloroethylene	0.00034	J	mg/kg
NDAHSB15	NDE035	12/07/2000	SB	N	1,2-Dichloroethane	0.002	J	mg/kg
				Semivolatile Organic Compounds (µg/kg)				
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	4-Bromophenyl Phenyl Ether	236	J	µg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Fluorene	76	J	µg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	Isophorone	90	J	µg/kg
NDAHSB015	NDE036FD1	12/07/2000	SB	FD	N-Nitrosodi-n-propylamine	603	=	µg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	bis(2-Ethylhexyl) Phthalate	79.9	J	µg/kg
				Pesticides (mg/kg)				
NDAHSB01	NDE006	12/05/2000	SB	N	p,p'-DDE	0.764	J	mg/kg
NDAHSB01	NDE006	12/05/2000	SB	N	p,p'-DDT	0.928	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	p,p'-DDE	0.124	J	mg/kg
NDAHSB02	NDE008	12/05/2000	SB	N	p,p'-DDT	0.022	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	p,p'-DDD	0.0035	J	mg/kg
NDAHSB03	NDE010	12/05/2000	SB	N	p,p'-DDE	0.0039	J	mg/kg
NDAHSB04	NDE012	12/05/2000	SB	N	p,p'-DDE	0.0016	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	p,p'-DDE	0.0087	J	mg/kg
NDAHSB05	NDE014	12/05/2000	SB	N	p,p'-DDT	0.0076	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	p,p'-DDE	0.002	J	mg/kg
NDAHSB06	NDE016	12/06/2000	SB	N	p,p'-DDT	0.0015	J	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	p,p'-DDE	0.0045	=	mg/kg
NDAHSB07	NDE018	12/06/2000	SB	N	p,p'-DDT	0.0025	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	p,p'-DDE	0.0015	J	mg/kg
NDAHSB10	NDE025	12/06/2000	SB	N	p,p'-DDT	0.0009	J	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	p,p'-DDD	0.0049	=	mg/kg
NDAHSB11	NDE027	12/06/2000	SB	N	p,p'-DDE	0.419	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	p,p'-DDD	0.013	=	mg/kg
NDAHSB12	NDE029	12/06/2000	SB	N	p,p'-DDE	0.024	=	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	p,p'-DDD	0.0025	J	mg/kg
NDAHSB13	NDE031	12/06/2000	SB	N	p,p'-DDE	0.0017	J	mg/kg
NDAHSB16	NDE038	12/07/2000	SB	N	p,p'-DDE	0.0038	J	mg/kg
NDAHSB18	NDAHSB18-R01	08/26/2003	SB	N	p,p'-DDE	0.0002	J	mg/kg
NDAHSB20	NDAHSB20-R01	08/26/2003	SB	N	p,p'-DDE	0.00014	J	mg/kg
NDAHSB20	NDAHFD05P-R01	08/26/2003	SB	FD	p,p'-DDE	0.1	J	µg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	p,p'-DDD	0.01	J	mg/kg
NDAHSB27	NDAHSB27-R01	08/26/2003	SB	N	p,p'-DDE	0.0027	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	p,p'-DDD	0.00019	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	p,p'-DDE	0.00061	J	mg/kg
NDAHSB28	NDAHSB28-R01	08/26/2003	SB	N	p,p'-DDT	0.00048	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	p,p'-DDE	0.0032	J	mg/kg
NDAHSB29	NDAHSB29-R01	08/26/2003	SB	N	p,p'-DDT	0.00082	J	mg/kg

TABLE 4-C
Groundwater Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
				Dissolved Metals (µg/L)				
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Aluminum, dissolved	47.7	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Barium, dissolved	62.2	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Barium, dissolved	63	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Barium, dissolved	51	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Calcium, dissolved	15100	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Calcium, dissolved	24000	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Calcium, dissolved	15100	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Chromium, dissolved	0.81	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Copper, dissolved	4.58	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Copper, dissolved	1.21	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Iron, dissolved	16.9	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Iron, dissolved	120	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Lead, dissolved	1.78	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Magnesium, dissolved	10300	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Magnesium, dissolved	13000	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Magnesium, dissolved	10300	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Manganese, dissolved	41.1	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Manganese, dissolved	150	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Manganese, dissolved	39.5	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Nickel, dissolved	7.7	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Potassium, dissolved	4430	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Potassium, dissolved	4100	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Potassium, dissolved	4430	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Selenium, dissolved	3.73	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Selenium, dissolved	2.21	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Sodium, dissolved	272000	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Sodium, dissolved	273000	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Sodium, dissolved	280000	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Thallium, dissolved	9	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Vanadium, dissolved	10.6	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Vanadium, dissolved	10.2	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Vanadium, dissolved	20	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Zinc, dissolved	1.58	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Zinc, dissolved	1.66	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Barium, dissolved	285	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Barium, dissolved	460	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Cadmium, dissolved	4.99	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Calcium, dissolved	554000	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Calcium, dissolved	270000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Chromium, dissolved	7.91	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Cobalt, dissolved	30.3	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Iron, dissolved	3290	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Magnesium, dissolved	220000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Magnesium, dissolved	891000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Manganese, dissolved	14600	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Manganese, dissolved	5800	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Nickel, dissolved	17.6	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Potassium, dissolved	56000	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Potassium, dissolved	203000	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Sodium, dissolved	5870000	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Sodium, dissolved	980000	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Vanadium, dissolved	2.8	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Aluminum, dissolved	100	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Barium, dissolved	210	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Barium, dissolved	190	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Calcium, dissolved	180000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Calcium, dissolved	180000	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Magnesium, dissolved	100000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Magnesium, dissolved	97000	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Manganese, dissolved	110	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Manganese, dissolved	92	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Potassium, dissolved	12000	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Potassium, dissolved	12000	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Sodium, dissolved	890000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Sodium, dissolved	830000	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Vanadium, dissolved	10	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Vanadium, dissolved	9.6	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Aluminum, dissolved	130	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Antimony, dissolved	5.4	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Barium, dissolved	400	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Calcium, dissolved	340000	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Magnesium, dissolved	280000	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Manganese, dissolved	1800	=	µg/L

TABLE 4-C
Groundwater Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHMW04	NDE217	12/19/2000	GW	N	Potassium, dissolved	12000	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Sodium, dissolved	1200000	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Vanadium, dissolved	6	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Barium, dissolved	320	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Cadmium, dissolved	6.3	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Calcium, dissolved	712000	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Chromium, dissolved	5.71	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Cobalt, dissolved	24.2	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Iron, dissolved	4180	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Magnesium, dissolved	958000	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Manganese, dissolved	15400	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Potassium, dissolved	183000	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Sodium, dissolved	5950000	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Thallium, dissolved	26.2	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Barium, dissolved	58.1	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Calcium, dissolved	35900	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Cobalt, dissolved	0.626	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Magnesium, dissolved	25100	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Manganese, dissolved	590	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Potassium, dissolved	2170	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Selenium, dissolved	3.56	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Sodium, dissolved	163000	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Vanadium, dissolved	12.7	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Zinc, dissolved	0.489	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Aluminum, dissolved	438	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Barium, dissolved	274	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Cadmium, dissolved	5.78	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Calcium, dissolved	631000	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Cobalt, dissolved	40.4	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Magnesium, dissolved	1020000	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Manganese, dissolved	13300	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Mercury, dissolved	0.0194	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Nickel, dissolved	10.4	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Potassium, dissolved	294000	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Silver, dissolved	7.15	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Sodium, dissolved	7200000	=	µg/L
				Total Metals (µg/L)				
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Aluminum	7050	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Aluminum	6430	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Aluminum	6000	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Barium	127	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Barium	86	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Barium	123	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Cadmium	0.527	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Cadmium	0.435	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Calcium	16800	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Calcium	16500	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Calcium	35000	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Chromium, Total	10.9	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Chromium, Total	11	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Chromium, Total	11.6	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Cobalt	5.1	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Cobalt	4.68	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Cobalt	5.1	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Copper	14.1	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Copper	12.6	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Copper	17	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Iron	8160	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Iron	7560	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Iron	8200	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Magnesium	12900	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Magnesium	19000	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Magnesium	12700	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Manganese	1150	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Manganese	250	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Manganese	1100	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Nickel	6.6	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Nickel	7.55	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Nickel	22	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Potassium	4320	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Potassium	4300	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Potassium	4600	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Silver	0.527	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Sodium	272000	=	µg/L

TABLE 4-C
Groundwater Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Sodium	266000	=	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Sodium	290000	=	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Thallium	3.26	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Thallium	10	=	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Thallium	3.28	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Vanadium	40.5	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Vanadium	43	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Vanadium	38.5	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Zinc	14.2	J	µg/L
NDAHMW01	NDE213	12/19/2000	GW	N	Zinc	19	J	µg/L
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Zinc	12.8	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Aluminum	399	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Aluminum	9100	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Arsenic	6.3	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Barium	490	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Barium	279	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Calcium	320000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Calcium	556000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Chromium, Total	9.86	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Chromium, Total	15	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Cobalt	29.9	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Cobalt	22	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Copper	25	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Iron	11000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Iron	4580	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Magnesium	220000	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Magnesium	860000	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Manganese	8300	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Manganese	14100	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Mercury	0.0165	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Nickel	59	=	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Nickel	10.4	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Potassium	54000	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Potassium	240000	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Sodium	5860000	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Sodium	940000	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Thallium	6.6	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	Thallium	28.7	J	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Vanadium	70	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Zinc	33	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Aluminum	100	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Aluminum	3800	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Barium	210	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Barium	300	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Calcium	170000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Calcium	200000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Chromium, Total	5.2	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Chromium, Total	3.2	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Cobalt	9.3	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Cobalt	12	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Copper	10	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Copper	16	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Iron	2900	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Iron	4500	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Magnesium	98000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Magnesium	110000	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Manganese	1100	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Manganese	1100	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Nickel	7.6	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Nickel	9	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Potassium	12000	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Potassium	13000	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Sodium	850000	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Sodium	890000	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Thallium	8	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Thallium	10	=	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Vanadium	24	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Vanadium	28	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Zinc	11	J	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Zinc	19	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Aluminum	130	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Antimony	5.4	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Barium	400	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Calcium	340000	=	µg/L

TABLE 4-C
Groundwater Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHMW04	NDE217	12/19/2000	GW	N	Magnesium	280000	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Manganese	1800	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Potassium	12000	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Sodium	1200000	=	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Vanadium	6	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Aluminum	481	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Barium	319	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Calcium	719000	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Cobalt	24.5	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Iron	5170	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Magnesium	937000	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Manganese	14800	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Nickel	11.4	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Potassium	221000	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Sodium	6030000	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Aluminum	112	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Antimony	2.62	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Barium	63.1	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Cadmium	0.408	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Calcium	34900	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Iron	83	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Magnesium	24900	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Manganese	620	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Nickel	1.47	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Potassium	1870	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Sodium	163000	=	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Vanadium	13.7	J	µg/L
NDAHMW06	NDAHGW06-R01	09/09/2003	GW	N	Zinc	0.808	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Aluminum	475	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Barium	264	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Cadmium	4.46	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Calcium	606000	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Cobalt	33.3	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Magnesium	963000	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Manganese	12700	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Mercury	0.024	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Nickel	19.4	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Potassium	283000	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Silver	4.9	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Sodium	6950000	=	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Thallium	44.2	J	µg/L
NDAHMW07	NDAHGW07-R01	09/07/2003	GW	N	Vanadium	9.87	J	µg/L
Volatile Organic Compounds (µg/L)								
NDAHMW01	NDE213	12/19/2000	GW	N	Toluene	1.3	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	Toluene	1.3	=	µg/L
NDAHMW03	NDE215	12/19/2000	GW	N	Toluene	0.43	J	µg/L
NDAHMW03	NDE216FD1	12/19/2000	GW	FD	Toluene	1	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	Toluene	1	=	µg/L
Semivolatile Organic Compounds (µg/L)								
NDAHMW01	NDAHGW01-R01	09/08/2003	GW	N	Caprolactam	3	J	µg/L
NDAHMW01	NDAHGWFD01	09/08/2003	GW	FD	Caprolactam	6.2	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	4-Chloroaniline	9.9	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	Caprolactam	6	J	µg/L
Pesticides (µg/L)								
NDAHMW02	NDE214	12/19/2000	GW	N	p,p'-DDD	0.42	J	µg/L
NDAHMW02	NDAHGW02-R01	09/08/2003	GW	N	p,p'-DDD	0.4	=	µg/L
NDAHMW02	NDE214	12/19/2000	GW	N	p,p'-DDE	0.022	J	µg/L
NDAHMW04	NDE217	12/19/2000	GW	N	p,p'-DDT	0.028	J	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	p,p'-DDD	0.39	=	µg/L
NDAHMW05	NDAHGW05-R01	09/08/2003	GW	N	p,p'-DDE	0.018	J	µg/L

TABLE 4-D
Surface Water Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
				Dissolved Metals (µg/L)				
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Barium, dissolved	142	J	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Calcium, dissolved	346000	=	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Magnesium, dissolved	939000	=	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Manganese, dissolved	91.7	J	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Potassium, dissolved	486000	=	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Selenium, dissolved	67.9	J	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Sodium, dissolved	7750000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Barium, dissolved	163	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Calcium, dissolved	342000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Magnesium, dissolved	924000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Manganese, dissolved	70	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Potassium, dissolved	479000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Sodium, dissolved	7660000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Barium, dissolved	147	J	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Barium, dissolved	150	J	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Calcium, dissolved	342000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Calcium, dissolved	343000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Magnesium, dissolved	928000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Magnesium, dissolved	925000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Manganese, dissolved	268	J	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Manganese, dissolved	234	J	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Mercury, dissolved	0.0239	J	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Mercury, dissolved	0.0303	J	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Potassium, dissolved	479000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Potassium, dissolved	476000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Sodium, dissolved	7670000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Sodium, dissolved	7630000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Barium, dissolved	149	J	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Calcium, dissolved	335000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Magnesium, dissolved	902000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Manganese, dissolved	419	J	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Mercury, dissolved	0.0224	J	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Potassium, dissolved	460000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Sodium, dissolved	7400000	=	µg/L
				Total Metals (µg/L)				
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Barium	146	J	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Calcium	355000	=	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Magnesium	961000	=	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Manganese	450	=	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Mercury	0.0259	J	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Potassium	481000	J	µg/L
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Sodium	7680000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Aluminum	1740	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Arsenic	47.1	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Barium	162	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Cadmium	7.7	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Calcium	371000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Chromium, Total	16.2	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Cobalt	19.6	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Magnesium	1010000	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Manganese	385	=	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Mercury	0.0225	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Potassium	473000	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Selenium	63.9	J	µg/L
NDAHSW02	NDAHSW02-R01	09/30/2003	SW	N	Sodium	7480000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Barium	151	J	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Barium	151	J	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Calcium	374000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Calcium	383000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Magnesium	1020000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Magnesium	1050000	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Manganese	590	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Manganese	654	=	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Mercury	0.043	J	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Mercury	0.0339	J	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Potassium	482000	J	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Potassium	482000	J	µg/L
NDAHSW03	NDAHFD02P-R01	09/30/2003	SW	FD	Sodium	7740000	=	µg/L
NDAHSW03	NDAHSW03-R01	09/30/2003	SW	N	Sodium	7660000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Barium	155	J	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Calcium	371000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Magnesium	1020000	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Manganese	633	=	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Mercury	0.0351	J	µg/L
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Potassium	470000	J	µg/L
				Semivolatile Organic Compounds (µg/L)				
NDAHSW04	NDAHSW04-R01	09/30/2003	SW	N	Sodium	7510000	=	µg/L
				SVOC (µg/L)				
NDAHSW01	NDAHSW01-R01	09/30/2003	SW	N	Caprolactam	0.52	J	µg/L

TABLE 4-E
Sediment Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
				Total Metals (mg/kg)				
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Aluminum	1610	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Aluminum	3320	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Antimony	0.369	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Antimony	0.333	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Arsenic	0.649	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Arsenic	0.882	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Barium	6.16	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Barium	6	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Beryllium	0.0308	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Beryllium	0.0486	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Calcium	76200	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Calcium	2590	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Chromium, Total	13.4	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Chromium, Total	2.84	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Cobalt	1.42	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Cobalt	3.56	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Copper	3.73	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Copper	7.1	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Iron	2950	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Iron	7990	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Lead	0.446	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Lead	0.853	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Magnesium	1780	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Magnesium	3430	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Manganese	33.6	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Manganese	87.6	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Nickel	1.02	J	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Nickel	4.39	J	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Potassium	774	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Potassium	1040	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Sodium	4000	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Sodium	3290	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Vanadium	9.59	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Vanadium	25.8	=	mg/kg
NDAHSD01	NDAHFD03P-R01	09/29/2003	SD	FD	Zinc	4.58	=	mg/kg
NDAHSD01	NDAHSD01-R01	09/29/2003	SD	N	Zinc	11.3	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Aluminum	3080	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Arsenic	0.249	J	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Barium	57.2	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Beryllium	0.0647	J	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Calcium	2660	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Chromium, Total	4.16	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Cobalt	3.85	J	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Copper	9.76	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Iron	8440	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Lead	1.49	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Magnesium	1530	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Manganese	109	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Mercury	0.0127	J	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Nickel	1.93	J	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Potassium	970	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Sodium	2340	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Thallium	0.494	J	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Vanadium	26.9	=	mg/kg
NDAHSD02	NDAHSD02-R01	09/29/2003	SD	N	Zinc	12.5	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Aluminum	1880	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Antimony	0.107	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Barium	13	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Beryllium	0.0379	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Calcium	890	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Chromium, Total	3.11	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Cobalt	2.31	J	mg/kg

TABLE 4-E
Sediment Analytical Detections
AOC H, Former NASD, Vieques, Puerto Rico

Station	Sample	Collection Date	Matrix	Sample Type	Chemical Name	Result	Qualifier	Unit
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Copper	6.15	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Iron	6040	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Lead	0.964	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Magnesium	1140	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Manganese	62.1	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Mercury	0.00363	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Nickel	1.28	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Potassium	716	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Sodium	2800	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Thallium	0.432	J	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Vanadium	17.3	=	mg/kg
NDAHSD03	NDAHSD03-R01	09/29/2003	SD	N	Zinc	7.31	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Aluminum	3180	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Arsenic	0.202	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Barium	13.2	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Beryllium	0.0503	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Calcium	1130	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Chromium, Total	7.75	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Cobalt	4.27	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Copper	9.43	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Iron	8620	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Lead	1.43	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Magnesium	2140	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Manganese	73.6	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Mercury	0.00181	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Nickel	4.25	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Potassium	1090	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Silver	0.0268	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Sodium	2720	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Thallium	0.422	J	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Vanadium	21.9	=	mg/kg
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	Zinc	13.6	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Aluminum	3030	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Antimony	0.183	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Arsenic	0.271	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Barium	22.5	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Beryllium	0.0634	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Calcium	1230	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Chromium, Total	7.36	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Cobalt	4.12	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Copper	10.3	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Iron	15500	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Lead	1.99	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Magnesium	1400	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Manganese	126	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Mercury	0.00181	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Nickel	2.39	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Potassium	673	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Silver	0.0406	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Sodium	90.6	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Thallium	1.12	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Vanadium	50.4	=	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	Zinc	12.1	=	mg/kg
				Pesticides (mg/kg)				
NDAHSD04	NDAHSD04-R01	09/29/2003	SD	N	p,p'-DDE	0.00012	J	mg/kg
NDAHSD05	NDAHSD05-R01	09/30/2003	SD	N	p,p'-DDE	0.00007	J	mg/kg

TABLE 4-1
Analytical Results From Background Groundwater Sample (NDAHGW01)
AOC H, Former NASD, Vieques, Puerto Rico

Chemical		Concentration			
		Total	Qualifer	Dissolved	Qualifer
Metals (ug/L)					
ALUMINUM	09/08/03	6430	=	35	U
ALUMINUM	12/19/00	6000	=	95	U
ANTIMONY	09/08/03	2.5	U	2.5	U
ANTIMONY	12/19/00	2.4	U	2.4	U
ARSENIC	09/08/03	2.04	U	2.04	U
ARSENIC	12/19/00	2.9	U	2.9	U
BARIUM	09/08/03	123	J	63	J
BARIUM	12/19/00	86	J	51	J
BERYLLIUM	09/08/03	0.0945	U	0.0945	U
BERYLLIUM	12/19/00	0.33	U	0.33	U
CADMIUM	09/08/03	0.435	J	0.356	U
CADMIUM	12/19/00	0.27	U	0.27	U
CALCIUM	09/08/03	16500	=	15100	=
CALCIUM	12/19/00	35000	=	24000	=
CHROMIUM, TOTAL	09/08/03	10.9	=	0.57	U
CHROMIUM, TOTAL	12/19/00	11	=	0.87	U
COBALT	09/08/03	4.68	J	0.569	U
COBALT	12/19/00	5.1	J	0.43	U
COPPER	09/08/03	12.6	J	1.21	J
COPPER	12/19/00	17	J	0.8	U
IRON	09/08/03	7560	=	16.7	U
IRON	12/19/00	8200	=	120	=
LEAD	09/08/03	1.76	U	1.76	U
LEAD	12/19/00	1.6	U	1.6	U
MAGNESIUM	09/08/03	12700	=	10300	=
MAGNESIUM	12/19/00	19000	=	13000	=
MANGANESE	09/08/03	1100	=	39.5	=
MANGANESE	12/19/00	250	=	150	=
MERCURY	09/08/03	0.0162	U	0.0162	U
MERCURY	12/19/00	0.025	U	0.025	U
NICKEL	09/08/03	7.55	J	0.997	U
NICKEL	12/19/00	22	J	7.7	J
POTASSIUM	09/08/03	4300	J	4430	J
POTASSIUM	12/19/00	4600	J	4100	J
SELENIUM	09/08/03	2.1	U	2.21	J
SELENIUM	12/19/00	4.6	U	4.6	U
SILVER	09/08/03	0.472	U	0.472	U
SILVER	12/19/00	0.57	U	0.57	U
SODIUM	09/08/03	266000	=	273000	=
SODIUM	12/19/00	290000	=	280000	=
THALLIUM	09/08/03	3.28	J	2.54	U
THALLIUM	12/19/00	10	=	9	J
VANADIUM	09/08/03	38.5	J	10.2	J
VANADIUM	12/19/00	43	J	20	J
ZINC	09/08/03	12.8	J	1.66	J
ZINC	12/19/00	19	J	5	U
Volatile Organic Compounds (ug/L)					
1,1,1-TRICHLOROETHANE	12/19/00	1	U	-	
1,1,2,2-TETRACHLOROETHANE	12/19/00	1	U	-	
1,1,2-TRICHLOROETHANE	12/19/00	1	U	-	
1,1-DICHLOROETHANE	12/19/00	1	U	-	
1,1-DICHLOROETHENE	12/19/00	1	U	-	
1,2,4-TRICHLOROBENZENE	12/19/00	1	U	-	
1,2-DIBROMO-3-CHLOROPROPANE	12/19/00	1	U	-	
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	12/19/00	1	U	-	
1,2-DICHLOROBENZENE	12/19/00	1	U	-	
1,2-DICHLOROETHANE	12/19/00	1	U	-	

TABLE 4-1
Analytical Results From Background Groundwater Sample (NDAHGW01)
AOC H, Former NASD, Vieques, Puerto Rico

		Concentration			
Chemical		**Total**	**Qualifer**	**Dissolved**	**Qualifer**
1,2-DICHLOROPROPANE	12/19/00	1	U	-	
1,3-DICHLOROBENZENE	12/19/00	1	U	-	
1,4-DICHLOROBENZENE	12/19/00	1	U	-	
2-HEXANONE	12/19/00	5	U	-	
BENZENE	12/19/00	1	U	-	
BROMOCHLOROMETHANE	12/19/00	1	U	-	
BROMODICHLOROMETHANE	12/19/00	1	U	-	
BROMOFORM	12/19/00	1	U	-	
BROMOMETHANE	12/19/00	1	U	-	
CARBON DISULFIDE	12/19/00	1	U	-	
CARBON TETRACHLORIDE	12/19/00	1	U	-	
CHLOROBENZENE	12/19/00	1	U	-	
CHLOROETHANE	12/19/00	1	U	-	
CHLOROFORM	12/19/00	1	U	-	
CHLOROMETHANE	12/19/00	1	U	-	
cis-1,2-DICHLOROETHYLENE	12/19/00	1	U	-	
cis-1,3-DICHLOROPROPENE	12/19/00	1	U	-	
DIBROMOCHLOROMETHANE	12/19/00	1	U	-	
ETHYLBENZENE	12/19/00	1	U	-	
M,P-XYLENE (SUM OF ISOMERS)	12/19/00	1	U	-	
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	12/19/00	5	U	-	
METHYLENE CHLORIDE	12/19/00	2	U	-	
O-XYLENE (1,2-DIMETHYLBENZENE)	12/19/00	1	U	-	
STYRENE	12/19/00	1	U	-	
TETRACHLOROETHYLENE(PCE)	12/19/00	1	U	-	
TOLUENE	12/19/00	1.3	=	-	
trans-1,2-DICHLOROETHENE	12/19/00	1	U	-	
trans-1,3-DICHLOROPROPENE	12/19/00	1	U	-	
TRICHLOROETHYLENE (TCE)	12/19/00	1	U	-	
VINYL CHLORIDE	12/19/00	1	U	-	
XYLENES, TOTAL	12/19/00	1	U	-	
Semivolatile Organic Compounds (ug/L)					
1,2,4,5-TETRACHLOROBENZENE	09/08/03	5.1	U	-	
2,4,5-TRICHLOROPHENOL	09/08/03	20.4	U	-	
2,4,5-TRICHLOROPHENOL	12/19/00	22	U	-	
2,4,6-TRICHLOROPHENOL	09/08/03	5.1	U	-	
2,4,6-TRICHLOROPHENOL	12/19/00	5.4	U	-	
2,4-DICHLOROPHENOL	09/08/03	5.1	U	-	
2,4-DICHLOROPHENOL	12/19/00	5.4	U	-	
2,4-DIMETHYLPHENOL	09/08/03	5.1	U	-	
2,4-DIMETHYLPHENOL	12/19/00	5.4	U	-	
2,4-DINITROPHENOL	09/08/03	20.4	U	-	
2,4-DINITROPHENOL	12/19/00	22	U	-	
2,4-DINITROTOLUENE	09/08/03	5.1	U	-	
2,4-DINITROTOLUENE	12/19/00	5.4	U	-	
2,6-DINITROTOLUENE	09/08/03	5.1	U	-	
2,6-DINITROTOLUENE	12/19/00	5.4	U	-	
2-CHLORONAPHTHALENE	09/08/03	5.1	U	-	
2-CHLORONAPHTHALENE	12/19/00	5.4	U	-	
2-CHLOROPHENOL	09/08/03	5.1	U	-	
2-CHLOROPHENOL	12/19/00	5.4	U	-	
2-METHYLNAPHTHALENE	09/08/03	5.1	U	-	
2-METHYLNAPHTHALENE	12/19/00	5.4	U	-	
2-METHYLPHENOL (o-CRESOL)	09/08/03	5.1	U	-	
2-METHYLPHENOL (o-CRESOL)	12/19/00	5.4	U	-	
2-NITROANILINE	09/08/03	20.4	U	-	
2-NITROANILINE	12/19/00	22	U	-	
2-NITROPHENOL	09/08/03	5.1	U	-	

TABLE 4-1
Analytical Results From Background Groundwater Sample (NDAHGW01)
AOC H, Former NASD, Vieques, Puerto Rico

Chemical		Concentration Total	Qualifer	Dissolved	Qualifer
2-NITROPHENOL	12/19/00	5.4	U	-	
3,3'-DICHLOROBENZIDINE	09/08/03	5.1	U	-	
3,3'-DICHLOROBENZIDINE	12/19/00	5.4	U	-	
3-NITROANILINE	09/08/03	20.4	U	-	
3-NITROANILINE	12/19/00	22	U	-	
4,6-DINITRO-2-METHYLPHENOL	09/08/03	20.4	U	-	
4,6-DINITRO-2-METHYLPHENOL	12/19/00	22	U	-	
4-BROMOPHENYL PHENYL ETHER	09/08/03	5.1	U	-	
4-BROMOPHENYL PHENYL ETHER	12/19/00	5.4	U	-	
4-CHLORO-3-METHYLPHENOL	09/08/03	5.1	U	-	
4-CHLORO-3-METHYLPHENOL	12/19/00	5.4	U	-	
4-CHLOROANILINE	09/08/03	5.1	U	-	
4-CHLOROANILINE	12/19/00	5.4	U	-	
4-CHLOROPHENYL PHENYL ETHER	09/08/03	5.1	U	-	
4-CHLOROPHENYL PHENYL ETHER	12/19/00	5.4	U	-	
4-METHYLPHENOL (p-CRESOL)	09/08/03	5.1	U	-	
4-NITROANILINE	09/08/03	20.4	U	-	
4-NITROANILINE	12/19/00	22	U	-	
4-NITROPHENOL	09/08/03	20.4	U	-	
4-NITROPHENOL	12/19/00	22	U	-	
ACENAPHTHENE	09/08/03	5.1	U	-	
ACENAPHTHENE	12/19/00	5.4	U	-	
ACENAPHTHYLENE	09/08/03	5.1	U	-	
ACENAPHTHYLENE	12/19/00	5.4	U	-	
ACETOPHENONE	09/08/03	5.1	U	-	
ANTHRACENE	09/08/03	5.1	U	-	
ANTHRACENE	12/19/00	5.4	U	-	
ATRAZINE	09/08/03	5.1	U	-	
Benzaldehyde	09/08/03	5.1	U	-	
BENZO(a)ANTHRACENE	09/08/03	5.1	U	-	
BENZO(a)ANTHRACENE	12/19/00	5.4	U	-	
BENZO(a)PYRENE	09/08/03	5.1	U	-	
BENZO(a)PYRENE	12/19/00	5.4	U	-	
BENZO(b)FLUORANTHENE	09/08/03	5.1	U	-	
BENZO(b)FLUORANTHENE	12/19/00	5.4	U	-	
BENZO(g,h,i)PERYLENE	09/08/03	5.1	U	-	
BENZO(g,h,i)PERYLENE	12/19/00	5.4	U	-	
BENZO(k)FLUORANTHENE	09/08/03	5.1	U	-	
BENZO(k)FLUORANTHENE	12/19/00	5.4	U	-	
BENZYL BUTYL PHTHALATE	09/08/03	5.1	U	-	
BENZYL BUTYL PHTHALATE	12/19/00	5.4	U	-	
BIPHENYL (DIPHENYL)	09/08/03	5.1	U	-	
bis(2-CHLOROETHOXY) METHANE	09/08/03	5.1	U	-	
bis(2-CHLOROETHOXY) METHANE	12/19/00	5.4	U	-	
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	09/08/03	5.1	U	-	
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	12/19/00	5.4	U	-	
bis(2-CHLOROISOPROPYL) ETHER	09/08/03	5.1	U	-	
bis(2-CHLOROISOPROPYL) ETHER	12/19/00	5.4	U	-	
bis(2-ETHYLHEXYL) PHTHALATE	09/08/03	10.2	U	-	
bis(2-ETHYLHEXYL) PHTHALATE	12/19/00	5.4	U	-	
CAPROLACTAM	09/08/03	3	J	-	
CARBAZOLE	09/08/03	10.2	U	-	
CHRYSENE	09/08/03	5.1	U	-	
CHRYSENE	12/19/00	5.4	U	-	
CRESOLS, m & p	12/19/00	5.4	U	-	
DIBENZ(a,h)ANTHRACENE	09/08/03	5.1	U	-	
DIBENZ(a,h)ANTHRACENE	12/19/00	5.4	U	-	
DIBENZOFURAN	09/08/03	5.1	U	-	

TABLE 4-1
Analytical Results From Background Groundwater Sample (NDAHGW01)
AOC H, Former NASD, Vieques, Puerto Rico

		Concentration			
Chemical		**Total**	**Qualifer**	**Dissolved**	**Qualifer**
DIBENZOFURAN	12/19/00	5.4	U	-	
DIETHYL PHTHALATE	09/08/03	5.1	U	-	
DIETHYL PHTHALATE	12/19/00	5.4	U	-	
DIMETHYL PHTHALATE	09/08/03	5.1	U	-	
DIMETHYL PHTHALATE	12/19/00	5.4	U	-	
DI-n-BUTYL PHTHALATE	09/08/03	5.1	U	-	
DI-n-BUTYL PHTHALATE	12/19/00	5.4	U	-	
DI-n-OCTYLPHTHALATE	09/08/03	5.1	U	-	
DI-n-OCTYLPHTHALATE	12/19/00	5.4	U	-	
FLUORANTHENE	09/08/03	5.1	U	-	
FLUORANTHENE	12/19/00	5.4	U	-	
FLUORENE	09/08/03	5.1	U	-	
FLUORENE	12/19/00	5.4	U	-	
HEXACHLOROBENZENE	09/08/03	5.1	U	-	
HEXACHLOROBENZENE	12/19/00	5.4	U	-	
HEXACHLOROBUTADIENE	09/08/03	5.1	U	-	
HEXACHLOROBUTADIENE	12/19/00	5.4	U	-	
HEXACHLOROCYCLOPENTADIENE	09/08/03	5.1	U	-	
HEXACHLOROCYCLOPENTADIENE	12/19/00	5.4	U	-	
HEXACHLOROETHANE	09/08/03	5.1	U	-	
HEXACHLOROETHANE	12/19/00	5.4	U	-	
INDENO(1,2,3-c,d)PYRENE	09/08/03	5.1	U	-	
INDENO(1,2,3-c,d)PYRENE	12/19/00	5.4	U	-	
ISOPHORONE	09/08/03	5.1	U	-	
ISOPHORONE	12/19/00	5.4	U	-	
NAPHTHALENE	09/08/03	5.1	U	-	
NAPHTHALENE	12/19/00	5.4	U	-	
NITROBENZENE	09/08/03	5.1	U	-	
NITROBENZENE	12/19/00	5.4	U	-	
N-NITROSODI-n-PROPYLAMINE	09/08/03	5.1	U	-	
N-NITROSODI-n-PROPYLAMINE	12/19/00	5.4	U	-	
N-NITROSODIPHENYLAMINE	09/08/03	5.1	U	-	
N-NITROSODIPHENYLAMINE	12/19/00	5.4	U	-	
PENTACHLOROPHENOL	09/08/03	20.4	U	-	
PENTACHLOROPHENOL	12/19/00	22	U	-	
PHENANTHRENE	09/08/03	5.1	U	-	
PHENANTHRENE	12/19/00	5.4	U	-	
PHENOL	09/08/03	5.1	U	-	
PHENOL	12/19/00	5.4	U	-	
PYRENE	09/08/03	5.1	U	-	
PYRENE	12/19/00	5.4	U	-	
Explosives (ug/L)					
1,3,5-TRINITROBENZENE	09/08/03	2.5	U	-	
1,3-DINITROBENZENE	09/08/03	2.5	U	-	
2,4,6-TRINITROTOLUENE	09/08/03	2.5	U	-	
2,4-DINITROTOLUENE	09/08/03	2.5	U	-	
2,6-DINITROTOLUENE	09/08/03	2.5	U	-	
2-NITROTOLUENE	09/08/03	2.5	U	-	
3-NITROTOLUENE	09/08/03	2.5	U	-	
4-NITROTOLUENE	09/08/03	2.5	U	-	
HEXAHYDRO-1,3,5-TRINITRO-1,3,5,7-TETRAZOCINE	09/08/03	2.5	U	-	
NITROBENZENE	09/08/03	2.5	U	-	
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	09/08/03	2.5	U	-	
TETRYL	09/08/03	2.5	U	-	
Perchlorate (ug/L)					
Perchlorate	09/08/03	20	U	-	
Pesticides (ug/L)					
ALDRIN	09/08/03	0.01	U	-	

TABLE 4-1
Analytical Results From Background Groundwater Sample (NDAHGW01)
AOC H, Former NASD, Vieques, Puerto Rico

Chemical		Concentration			
		Total	**Qualifer**	**Dissolved**	**Qualifer**
ALDRIN	12/19/00	0.014	U	-	
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	09/08/03	0.01	U	-	
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	12/19/00	0.028	U	-	
ALPHA ENDOSULFAN	09/08/03	0.01	U	-	
ALPHA ENDOSULFAN	12/19/00	0.028	U	-	
ALPHA-CHLORDANE	09/08/03	0.01	U	-	
ALPHA-CHLORDANE	12/19/00	0.014	U	-	
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	09/08/03	0.01	U	-	
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	12/19/00	0.014	U	-	
BETA ENDOSULFAN	09/08/03	0.02	U	-	
BETA ENDOSULFAN	12/19/00	0.028	U	-	
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	09/08/03	0.01	U	-	
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	12/19/00	0.014	U	-	
DIELDRIN	09/08/03	0.02	U	-	
DIELDRIN	12/19/00	0.028	U	-	
ENDOSULFAN SULFATE	09/08/03	0.02	U	-	
ENDOSULFAN SULFATE	12/19/00	0.028	U	-	
ENDRIN	09/08/03	0.02	U	-	
ENDRIN	12/19/00	0.028	U	-	
ENDRIN ALDEHYDE	09/08/03	0.02	U	-	
ENDRIN ALDEHYDE	12/19/00	0.028	U	-	
ENDRIN KETONE	09/08/03	0.02	U	-	
ENDRIN KETONE	12/19/00	0.028	U	-	
GAMMA BHC (LINDANE)	09/08/03	0.01	U	-	
GAMMA BHC (LINDANE)	12/19/00	0.028	U	-	
GAMMA-CHLORDANE	09/08/03	0.01	U	-	
GAMMA-CHLORDANE	12/19/00	0.014	U	-	
HEPTACHLOR	09/08/03	0.01	U	-	
HEPTACHLOR	12/19/00	0.014	U	-	
HEPTACHLOR EPOXIDE	09/08/03	0.01	U	-	
HEPTACHLOR EPOXIDE	12/19/00	0.014	U	-	
METHOXYCHLOR	09/08/03	0.1	U	-	
METHOXYCHLOR	12/19/00	0.141	U	-	
p,p'-DDD	09/08/03	0.02	U	-	
p,p'-DDD	12/19/00	0.028	U	-	
p,p'-DDE	09/08/03	0.02	U	-	
p,p'-DDE	12/19/00	0.028	U	-	
p,p'-DDT	09/08/03	0.02	U	-	
p,p'-DDT	12/19/00	0.028	U	-	
TOXAPHENE	09/08/03	0.05	U	-	
TOXAPHENE	12/19/00	1.4	U	-	
Polychlorinated Biphenyls (ug/L)					
PCB-1016 (AROCLOR 1016)	12/19/00	0.282	U	-	
PCB-1221 (AROCLOR 1221)	12/19/00	0.563	U	-	
PCB-1232 (AROCLOR 1232)	12/19/00	0.282	U	-	
PCB-1242 (AROCLOR 1242)	12/19/00	0.282	U	-	
PCB-1248 (AROCLOR 1248)	12/19/00	0.282	U	-	
PCB-1254 (AROCLOR 1254)	12/19/00	0.282	U	-	
PCB-1260 (AROCLOR 1260)	12/19/00	0.282	U	-	

U indicates that the chemical was not detected. The reported value is the minimum detection limit (MDL, inorganics) or the reporting limit (RL, organics).
UJ indicates that the chemical was not detected and the quantitation limit may be inaccurate or imprecise.
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.
- indicates that the chemical was not sampled or analyzed for in the dissolved sample.

TABLE 4-2
Analytical Results From Background Sediment Sample (NDAHSD05)
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Concentration	Qualifer
Metals (mg/Kg)		
ALUMINUM	3030	=
ANTIMONY	0.183	J
ARSENIC	0.271	J
BARIUM	22.5	J
BERYLLIUM	0.0634	J
CADMIUM	0.00969	U
CALCIUM	1230	=
CHROMIUM, TOTAL	7.36	=
COBALT	4.12	J
COPPER	10.3	=
IRON	15500	=
LEAD	1.99	=
MAGNESIUM	1400	=
MANGANESE	126	=
MERCURY	0.00181	J
NICKEL	2.39	J
POTASSIUM	673	=
SELENIUM	0.152	U
SILVER	0.0406	J
SODIUM	90.6	J
THALLIUM	1.12	J
VANADIUM	50.4	=
ZINC	12.1	=
Semivolatile Organic Compounds (mg/Kg)		
2,4,5-TRICHLOROPHENOL	1.01	U
2,4,6-TRICHLOROPHENOL	0.337	U
2,4-DICHLOROPHENOL	0.337	U
2,4-DIMETHYLPHENOL	0.337	U
2,4-DINITROPHENOL	1.01	UJ
2,4-DINITROTOLUENE	0.337	U
2,6-DINITROTOLUENE	0.337	U
2-CHLORONAPHTHALENE	0.337	U
2-CHLOROPHENOL	0.337	U
2-METHYLNAPHTHALENE	0.337	U
2-METHYLPHENOL (o-CRESOL)	0.337	U
2-NITROANILINE	1.01	U
2-NITROPHENOL	0.337	U
3,3'-DICHLOROBENZIDINE	0.685	U
3-NITROANILINE	1.01	U
4,6-DINITRO-2-METHYLPHENOL	1.01	U
4-BROMOPHENYL PHENYL ETHER	0.337	U
4-CHLORO-3-METHYLPHENOL	0.337	U
4-CHLOROPHENYL PHENYL ETHER	0.337	U
4-METHYLPHENOL (p-CRESOL)	0.337	U
4-NITROANILINE	1.01	U
4-NITROPHENOL	1.01	U

TABLE 4-2
Analytical Results From Background Sediment Sample (NDAHSD05)
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Concentration	Qualifer
ACENAPHTHENE	0.337	U
ACENAPHTHYLENE	0.337	U
ACETOPHENONE	0.337	U
ANTHRACENE	0.337	U
ATRAZINE	0.337	U
Benzaldehyde	0.337	U
BENZO(a)ANTHRACENE	0.337	U
BENZO(a)PYRENE	0.337	U
BENZO(b)FLUORANTHENE	0.337	U
BENZO(g,h,i)PERYLENE	0.337	U
BENZO(k)FLUORANTHENE	0.337	U
BENZYL BUTYL PHTHALATE	0.337	U
BIPHENYL (DIPHENYL)	0.337	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETHER)	0.337	U
bis(2-CHLOROISOPROPYL) ETHER	0.337	U
bis(2-ETHYLHEXYL) PHTHALATE	0.337	U
CAPROLACTAM	0.337	U
CARBAZOLE	0.337	U
CHRYSENE	0.337	U
DI-n-BUTYL PHTHALATE	0.337	U
DI-n-OCTYLPHTHALATE	0.337	U
DIBENZ(a,h)ANTHRACENE	0.337	U
DIBENZOFURAN	0.337	U
DIETHYL PHTHALATE	0.337	U
DIMETHYL PHTHALATE	0.337	U
FLUORANTHENE	0.337	U
FLUORENE	0.337	U
HEXACHLOROBENZENE	0.337	U
HEXACHLOROCYCLOPENTADIENE	0.337	U
INDENO(1,2,3-c,d)PYRENE	0.337	U
ISOPHORONE	0.337	U
N-NITROSODI-n-PROPYLAMINE	0.337	U
N-NITROSODIPHENYLAMINE	0.337	U
NITROBENZENE	0.337	U
PENTACHLOROPHENOL	1.01	U
PHENANTHRENE	0.337	U
PHENOL	0.337	U
PYRENE	0.337	U
Explosives (mg/Kg)		
1,3,5-TRINITROBENZENE	0.13	U
1,3-DINITROBENZENE	0.13	U
2,4,6-TRINITROTOLUENE	0.13	U
2,4-DINITROTOLUENE	0.13	U
2,6-DINITROTOLUENE	0.13	U
2-NITROTOLUENE	0.13	U
3-NITROTOLUENE	0.13	U
4-NITROTOLUENE	0.13	U

TABLE 4-2
Analytical Results From Background Sediment Sample (NDAHSD05)
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Concentration	Qualifer
HEXAHYDRO-1,3,5-TRINITRO-1,3,5,7-TETRAZOCINE	0.13	U
NITROBENZENE	0.13	U
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE	0.13	U
TETRYL	0.13	UJ
Perchlorate (mg/Kg)		
Perchlorate	0.104	U
Pesticides (mg/Kg)		
ALDRIN	0.0018	U
ALPHA BHC (ALPHA HEXACHLOROCYCLOHEXANE)	0.0018	UJ
ALPHA ENDOSULFAN	0.0018	U
ALPHA-CHLORDANE	0.0018	U
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)	0.0018	U
BETA ENDOSULFAN	0.0034	U
DELTA BHC (DELTA HEXACHLOROCYCLOHEXANE)	0.0018	U
DIELDRIN	0.0034	U
ENDOSULFAN SULFATE	0.0034	U
ENDRIN	0.0034	U
ENDRIN ALDEHYDE	0.0034	U
ENDRIN KETONE	0.0034	U
GAMMA BHC (LINDANE)	0.0018	UJ
GAMMA-CHLORDANE	0.0018	U
HEPTACHLOR	0.0018	U
HEPTACHLOR EPOXIDE	0.0018	U
METHOXYCHLOR	0.018	U
p,p'-DDD	0.0034	U
p,p'-DDE	0.00007	J
p,p'-DDT	0.0034	U
TOXAPHENE	0.18	U

U indicates that the chemical was not detected. The reported value is the minimum detection limit (MD
UJ indicates that the chemical was not detected and the quantitation limit may be inaccurate or impre
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.

TABLE 4-3
Essential Nutrients in Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Maximum Concentration in Surface Soil (mg/Kg)	Background Concentration [1] (mg/Kg)	Daily Soil Intake [2] (kg/day)		Daily Nutrient Intake from Soil [3] (mg/day)		Recommended Daily Nutrient Intake [4] (mg/day)		Percent of Recommended Daily Nutrient Intake from Soil Consumption	
			Child	Adult	Child	Adult	Child	Adult	Child	Adult
Calcium	34000	210,000	0.0002	0.0001	6.80	3.40	600	1000	1.1%	0.34%
Magnesium	8400	12,834	0.0002	0.0001	1.68	0.84	105	300	1.6%	0.28%
Potassium	3400	1,700	0.0002	0.0001	0.68	0.34	1,050	2,000	0.06%	0.02%
Sodium	590	6,300	0.0002	0.0001	0.118	0.06	260	500	0.05%	0.01%

[1] Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M Hill, 2002).
[2] Soil intake is 200 mg/day for a child and 100 mg/day for an adult.
[3] Calculated value.
[4] Median value from the Recommended Dietary Allowances, 10th Edition, National Academy of Sciences, National Research Council, Food and Nutrition Board, 1989.

TABLE 4-4
Detected Chemicals Above Criteria and Background in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances			
									PRG	Ecological	SSL [3]	SSL [4]
					Metals (mg/Kg)							
ARSENIC	NDAHSS10	12/05/2000	67	=	0.39	10	14.5	1.45	yes	yes	yes	yes
	NDAHSS03	12/05/2000	33	=					yes	yes	yes	yes
	NDAHSS26	08/26/2003	6.74	=					yes	no	no	yes
	NDAHSS09	12/05/2000	6.2	=					yes	no	no	yes
	NDAHSS16	12/05/2000	4.7	=					yes	no	no	yes
	NDAHSS05	12/05/2000	3.5	=					yes	no	no	yes
	NDAHSS27	08/26/2003	2.79	J					yes	no	no	yes
	NDAHSS25	08/26/2003	2.59	=					yes	no	no	yes
	NDAHSS04	12/05/2000	2.4	=					yes	no	no	yes
	NDAHSS02	12/05/2000	2.3	=					yes	no	no	yes
COPPER	NDAHSS03	12/05/2000	100	=	313	50	NA	NA	no	yes	na	na
	NDAHSS10	12/05/2000	87	=					no	yes	na	na
IRON	NDAHSS03	12/05/2000	39000	=	2350	200	NA	NA	yes	yes	na	na
LEAD	NDAHSS09	12/05/2000	63	=	400	50	NA	NA	no	yes	na	na
	NDAHSS25	08/26/2003	58.9	J					no	yes	na	na
	NDAHSS20	08/26/2003	52.4	=					no	yes	na	na
	NDAHSS04	12/05/2000	52	=					no	yes	na	na
THALLIUM	NDAHSS18	08/26/2003	1.16	J	0.516	1	NA	NA	yes	yes	na	na
	NDAHSS17	08/26/2003	0.944	J					yes	no	na	na
	NDAHSS19	08/26/2003	0.867	J					yes	no	na	na
	NDAHSS28	08/26/2003	0.863	J					yes	no	na	na
	NDAHSS27	08/26/2003	0.732	J					yes	no	na	na
	NDAHSS25	08/26/2003	0.693	J					yes	no	na	na
	NDAHSS24	08/26/2003	0.68	J					yes	no	na	na
	NDAHSS21	08/26/2003	0.671	J					yes	no	na	na
ZINC	NDAHSS03A	12/05/2000	260	=	2350	50	6000	600	no	yes	no	no
	NDAHSS01A	12/05/2000	170	=					no	yes	no	no
	NDAHSS02A	12/05/2000	170	=					no	yes	no	no
	NDAHSS04	12/05/2000	140	=					no	yes	no	no
	NDAHSS09	12/05/2000	140	=					no	yes	no	no
	NDAHSS06	12/05/2000	130	=					no	yes	no	no
	NDAHSS07	12/05/2000	130	=					no	yes	no	no
	NDAHSS08	12/05/2000	130	=					no	yes	no	no
	NDAHSS25	08/26/2003	126	=					no	yes	no	no
	NDAHSS26	08/26/2003	125	=					no	yes	no	no
	NDAHSS03	12/05/2000	110	=					no	yes	no	no
	NDAHSS04A	12/05/2000	100	=					no	yes	no	no
	NDAHSS05	12/05/2000	97	=					no	yes	no	no
	NDAHSS10	12/05/2000	95	=					no	yes	no	no
	NDAHSS02	12/05/2000	93	=					no	yes	no	no
	NDAHSS15	12/05/2000	88	=					no	yes	no	no
	NDAHSS21	08/26/2003	87.3	J					no	yes	no	no
	NDAHSS19	08/26/2003	86.3	J					no	yes	no	no
	NDAHSS24	08/26/2003	81.4	=					no	yes	no	no
	NDAHSS01	12/05/2000	81	=					no	yes	no	no
	NDAHSS27	08/26/2003	72.4	=					no	yes	no	no
	NDAHSS22	08/26/2003	71.1	=					no	yes	no	no
	NDAHSS14	12/05/2000	68	=					no	yes	no	no
	NDAHSS20	08/26/2003	65.1	J					no	yes	no	no
					Volatile Organic Compounds (mg/Kg)							
XYLENES, TOTAL	NDAHSS01	12/05/2000	0.082	J	27.5	0.05	105	10.5	no	yes	no	no
1,1-DICHLOROETHENE	NDAHSS09	12/05/2000	0.078	J	12.3	NA	0.03	0.003	No	na	yes	yes

TABLE 4-4
Detected Chemicals Above Criteria and Background in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL [3]	SSL [4]
Semivolatile Organic Compounds (mg/Kg)												
2,6-DINITROTOLUENE	NDAHSS13	12/05/2000	1.23	=	6.11	NA	0.00035	0.000035	no	na	yes	yes
	NDAHSS11	12/05/2000	1.21	=					no	na	yes	ys
BENZO(a)PYRENE	NDAHSS04	12/05/2000	0.12	J	0.0621	0.1	4	0.4	yes	yes	no	no
	NDAHSS24	08/26/2003	0.0969	J					yes	no	no	no
	NDAHSS02	12/05/2000	0.074	J					yes	no	no	no
	NDAHSS08	12/05/2000	0.071	J					yes	no	no	no
FLUORANTHENE	NDAHSS04	12/05/2000	0.187	J	229	0.1	2150	215	no	yes	no	no
	NDAHSS24	08/26/2003	0.112	J					no	yes	no	no
N-NITROSODI-n-PROPYLAMINE	NDAHSS13	12/05/2000	0.717	=	0.0695	NA	0.000025	0.0000025	yes	na	yes	yes
	NDAHSS11	12/05/2000	0.658	=					yes	na	yes	yes
	NDAHSS12	12/05/2000	0.562	J					yes	na	yes	yes
PHENANTHRENE	NDAHSS08	12/05/2000	0.144	J	NA	0.1	NA	NA	na	yes	na	na
PYRENE	NDAHSS01	12/05/2000	1.9	J	232	0.1	2100	210	no	yes	no	no
	NDAHSS04	12/05/2000	0.168	J					no	yes	no	no
	NDAHSS24	08/26/2003	0.125	J					no	yes	no	no
Pesticides (mg/Kg)												
p,p'-DDD	NDAHSS22	08/26/2003	0.01	J	2.44	0.0025	8	0.8	no	yes	no	no
	NDAHSS16	12/05/2000	0.0048	J					no	yes	no	no
	NDAHSS29	08/26/2003	0.0044	=					no	yes	no	no
	NDAHSS23	08/26/2003	0.0036	J					no	yes	no	no
	NDAHSS04	12/05/2000	0.0029	J					no	yes	no	no
p,p'-DDE	NDAHSS01	12/05/2000	3.99	J	1.72	0.0025	27	2.7	yes	yes	no	yes
	NDAHSS02	12/05/2000	2.66	J					yes	yes	no	no
	NDAHSS22	08/26/2003	0.19	=					no	yes	no	no
	NDAHSS07	12/05/2000	0.126	J					no	yes	no	no
	NDAHSS18	08/26/2003	0.095	J					no	yes	no	no
	NDAHSS28	08/26/2003	0.092	J					no	yes	no	no
	NDAHSS03	12/05/2000	0.05	J					no	yes	no	no
	NDAHSS04	12/05/2000	0.041	J					no	yes	no	no
	NDAHSS16	12/05/2000	0.041	J					no	yes	no	no
	NDAHSS17	08/26/2003	0.04	=					no	yes	no	no
	NDAHSS29	08/26/2003	0.035	=					no	yes	no	no
	NDAHSS19	08/26/2003	0.023	=					no	yes	no	no
	NDAHSS23	08/26/2003	0.016	J					no	yes	no	no
	NDAHSS26	08/26/2003	0.016	J					no	yes	no	no
	NDAHSS05	12/05/2000	0.014	J					no	yes	no	no
	NDAHSS06	12/05/2000	0.01	J					no	yes	no	no
	NDAHSS27	08/26/2003	0.0088	J					no	yes	no	no
	NDAHSS09	12/05/2000	0.0078	J					no	yes	no	no
	NDAHSS24	08/26/2003	0.005	J					no	yes	no	no
p,p'-DDT	NDAHSS01	12/05/2000	1.94	J	1.72	0.0025	16	1.6	yes	yes	no	yes
	NDAHSS02	12/05/2000	1.09	J					no	yes	no	no
	NDAHSS28	08/26/2003	0.16	J					no	yes	no	no
	NDAHSS07	12/05/2000	0.075	J					no	yes	no	no
	NDAHSS16	12/05/2000	0.029	J					no	yes	no	no
	NDAHSS18	08/26/2003	0.025	J					no	yes	no	no
	NDAHSS17	08/26/2003	0.018	J					no	yes	no	no
	NDAHSS04	12/05/2000	0.017	J					no	yes	no	no
	NDAHSS06	12/05/2000	0.011	J					no	yes	no	no
	NDAHSS27	08/26/2003	0.011	J					no	yes	no	no
	NDAHSS05	12/05/2000	0.01	J					no	yes	no	no
	NDAHSS26	08/26/2003	0.01	J					no	yes	no	no
	NDAHSS22	08/26/2003	0.0092	J					no	yes	no	no
	NDAHSS19	08/26/2003	0.0086	J					no	yes	no	no
	NDAHSS23	08/26/2003	0.0083	J					no	yes	no	no
	NDAHSS29	08/26/2003	0.0077	J					no	yes	no	no
	NDAHSS09	12/05/2000	0.0067	J					no	yes	no	no
	NDAHSS24	08/26/2003	0.0055	J					no	yes	no	no

[1] USEPA Region IX PRG (2002) based on a hazard index (HI) of 0.1 for non-carcinogens.
[2] The lower of the toxicological benchmarks terrestrial plants, (Efroymson, 1997a) or invertebrates and heterotrophs (Efroymson, 1997b).
[3] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 10.
[4] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 1.
ND indicates that the chemical was not detected.
NA indicates that the information is not available or not applicable.
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.

TABLE 4-5
Detected Chemicals Above Criteria and Background in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	PRG residential	SSL [1] (DAF=10)	SSL [2] (DAF=1)	Exceedances of PRG	Exceedances of SSL [1]	Exceedances of SSL [2]
Metals (mg/Kg)										
ARSENIC	NDAHSB01	12/05/2000	24	=	1.6	14.5	1.45	yes	yes	yes
CHROMIUM, TOTAL	NDAHSB09	12/06/2000	27	=	64	19	1.9	no	yes	yes
	NDAHSB09	12/06/2000	23	=				no	yes	yes
Volatile Organic Compounds (mg/Kg)										
Pesticides (mg/Kg)										

[1] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 10.
[2] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 1.
ND indicates that the chemical was not detected.
NA indicates that the information is not available or not applicable.
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.

TABLE 4-6
Detected Chemicals Above Criteria and Background in Groundwater
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Concentration Total	Qualifer	Dissolved	Qualifer	Region IX PRG [1]	PRG Exceedances Total	Dissolved
				Metals (µg/L)					
ANTIMONY	NDAHMW04	12/19/2000	5.4	J	5.4	J	1.46	yes	yes
ARSENIC	NDAHMW02	12/19/2000	6.3	J	ND		0.0448	yes	no
CADMIUM	NDAHMW07	09/07/2003	4.46	J	5.78	J	1.82	yes	yes
	NDAHMW02	09/08/2003	ND		4.99	J		no	yes
	NDAHMW05	09/08/2003	ND		6.3	J		no	yes
CHROMIUM, TOTAL	NDAHMW02	12/19/2000	15	=	ND		11	yes	no
IRON	NDAHMW02	12/19/2000	11000	=	ND		1090	yes	no
	NDAHMW05	09/08/2003	5170	=	4180	=		yes	yes
THALLIUM	NDAHMW07	09/07/2003	44.2	J	ND		0.241	yes	no
	NDAHMW02	09/08/2003	28.7	J	ND			yes	no
				Volatile Organic Compounds (µg/L)					
				Semivolatile Organic Compounds (µg/L)					
				Pesticides (µg/L)					
p,p'-DDD	NDAHMW02	12/19/2000	0.42	J	-		0.28	yes	na
	NDAHMW02	09/08/2003	0.4	=	-			yes	na
	NDAHMW05	09/08/2003	0.39	=	-			yes	na

[1] USEPA Region IX tap water PRG (2002) based on a hazard index (HI) of 0.1 for non-carcinogens.
na - indicates that the information is not available or not applicable.
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.

TABLE 4-7
Detected Chemicals Above Criteria and Background in Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Concentration Total	Qualifer	Dissolved	Qualifer	Ecological Criteria [1]	ECO Exceedances Total	Dissolved
Metals (ug/L)									
ARSENIC	NDAHSW02	09/30/2003	47.1	J	ND		1.4	yes	no
Semivolatile Organic Compounds (ug/L)									

[1] The lower of the USEPA National Recommended Water Quality Criteria (USEPA, 2002) and the Puerto Rico Environmental Quality Board (EQB) Water Quality Standards.
ND indicates that the chemical was not detected.
NA indicates that the information is not available or not applicable.
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.

TABLE 4-8
Detected Chemicals Above Criteria and Background in Sediment
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Ecological Criteria [1]	Exceedances of ECO
Metals (mg/Kg)						
BARIUM	NDAHSD02	09/29/03	57.2	=	48	yes
Pesticides (mg/Kg)						

[1] NOAA SQUIRT (Buchman 1999).

ND indicates that the chemical was not detected.

NA indicates that the information is not available or not applicable.

J indicates that the chemical was detected. The reported value is estimated.

= indicates that the chemical was detected. The reported value is the measured concentration.

TABLE 4-9
Summary of Surface Soil COPCs
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (mg/Kg)	Minimum Detect (mg/Kg)	Mean Concentration [1] (mg/Kg)	Residential PRG [2]	Ecologic Screening Value [3]	Leaching Screening Value [4]	Leaching Screening Value[6]	Background Concentration [5] (mg/Kg)
METALS										
ALUMINUM	33	33	11000	3400	7580	**7610**	**50**	na	na	29000
ARSENIC	33	33	67	0.435	4.88	**0.39**	**18**	**14.5**	**1.45**	**2.2**
CHROMIUM, TOTAL	33	33	50	7.83	17.1	211	**0.4**	**19**	**1.9**	74
COPPER	33	33	100	11.1	31.8	313	**50**	na	na	**68**
IRON	33	33	39000	7700	17300	**2350**	**200**	na	na	**37531**
MANGANESE	33	33	720	140	396	**176**	**100**	na	na	1167
LEAD	33	33	63	4.43	26.4	**40**	**120**	na	na	**6.9**
ANTIMONY	33	26	6.3	0.34	0.78	**3.13**	**78**	**2.5**	**0.25**	**2.3**
SELENIUM	33	22	1.4	0.234	0.507	39.1	**1**	2.5	**0.25**	2
THALLIUM	33	13	1.16	0.287	0.387	**0.516**	**1**	na	na	**0.67**
VANADIUM	33	33	63	21	44.4	**54.7**	**2**	3000	300	130
ZINC	33	33	260	31.5	96.4	2350	**50**	6000	600	**65**
VOCs										
XYLENES, TOTAL	20	1	0.082	0.082	0.0092	27.5	**0.05**	105	10.5	NA
M,P-XYLENE (SUM OF ISOMERS)	20	1	0.058	0.058	0.008	27.5	na	105	10.5	NA
O-XYLENE (1,2-DIMETHYLBENZENI	20	1	0.024	0.024	0.0063	27.5	na	105	10.5	NA
SVOCs										
BENZO(a)PYRENE	33	15	0.12	0.0257	0.747	**0.0621**	**0.1**	4	0.4	NA
2,6-DINITROTOLUENE	33	2	1.23	1.21	0.876	6.11	na	**0.00035**	**0.000035**	NA
FLUORANTHENE	33	16	0.187	0.0246	0.745	229	**0.1**	2150	215	NA
N-NITROSODI-n-PROPYLAMINE	33	3	0.717	0.562	0.852	**0.0695**	na	**0.000025**	**0.0000025**	NA
PHENANTHRENE	33	8	0.144	0.0211	0.78	na	**0.1**	na	na	NA
PYRENE	33	17	1.9	0.0282	0.377	232	**0.1**	2100	210	NA
PESTICIDES										
p,p'-DDD	31	12	0.01	0.00052	0.00228	2.44	**0.0025**	8	0.8	NA
p,p'-DDE	32	22	3.99	0.0014	0.234	**1.72**	**0.0025**	27	**2.7**	NA
p,p'-DDT	32	19	1.94	0.0013	0.109	**1.72**	**0.0025**	16	**1.6**	NA

[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] USEPA Region IX PRG (2002) based on a hazard index (HI) of 0.1 for non-carcinogens.
[3] Numerical eco-SSL, if available, then the lower of the toxicological benchmarks for terrestrial plants, (Efroymson, 1997a) or invertebrates and heterotrophs (Efroymson, 1997b), then the lowest value reported in Friday (1998).
[4] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 10.
[5] Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M Hill, 2002).
[6] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 1.
NA indicates that the information is not available or not applicable.
Shading indicates the screening criteria was exceeded by the maximum detected concentration.

TABLE 4-10
Summary of Subsurface Soil COPCs
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (mg/Kg)	Minimum Detect (mg/Kg)	Mean Concentration [1] (mg/Kg)	Leaching Screening Value [2]	Leaching Screening Value [4]	Background Concentration [3] (mg/Kg)
METALS								
ARSENIC	31	21	24	0.161	1.68	**14.5**	**1.45**	**2.5**
CHROMIUM, TOTAL	31	31	27	3.28	8.23	**19**	**1.9**	74

[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 10.
[3] Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M Hill, 2002).
[4] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factor (DAF) of 1.
NA indicates that the information is not available or not applicable.
Shading indicates the screening criteria was exceeded by the maximum detected concentration.

TABLE 4-11
Summary of Groundwater COPCs
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (µg/L)	Minimum Detect (µg/L)	Mean Concentration [1] (µg/L)	Tap Water PRG [2]	Background Concentrations Site-Specific [3] (µg/L)	Background Concentrations Base-Wide [4] (µg/L)
METALS								
ALUMINUM	7	7	9100	112	2070	**3650**	**6430**	**3500**
ALUMINUM, DISSOLVED	7	2	438	130	147	3650	**95**	NA
ANTIMONY	7	2	5.4	2.62	6.85	**1.46**	**ND**	**5.2**
ANTIMONY, DISSOLVED	7	1	5.4	5.4	6.65	**1.46**	**ND**	9
ARSENIC	7	1	6.3	6.3	5.83	**0.0448**	**ND**	NA
ARSENIC, DISSOLVED	7	0	0	0	5.14	0.0448	ND	5.5
BARIUM	7	7	490	63.1	302	**255**	**123**	960
BARIUM, DISSOLVED	7	7	460	58.1	284	**255**	**63**	870
CADMIUM	7	2	4.46	0.408	1.26	**1.82**	**0.435**	**1**
CADMIUM, DISSOLVED	7	3	6.3	4.99	2.52	**1.82**	**ND**	**1**
CHROMIUM, TOTAL	7	3	15	5.2	5.21	**11**	**11**	**6.8**
CHROMIUM, DISSOLVED	7	2	7.91	5.71	2.58	11	**0.87**	**5**
IRON	7	5	11000	83	3630	**1090**	**8200**	**4800**
IRON, DISSOLVED	7	2	4180	3290	1090	**1090**	**120**	**490**
MANGANESE	7	7	14800	620	7630	**87.6**	**1100**	17000
MANGANESE, DISSOLVED	7	7	15400	92	7370	**87.6**	**150**	18000
THALLIUM	7	4	44.2	6.6	15	**0.241**	**10**	**18**
THALLIUM, DISSOLVED	7	1	26.2	26.2	8.28	**0.241**	**9**	**16**
VANADIUM	7	5	70	6	18.9	**25.5**	**43**	75
VANADIUM, DISSOLVED	7	4	12.7	2.8	5.4	25.5	20	32
PESTICIDES								
p,p'-DDD	7	3	0.42	0.39	0.179	**0.28**	NA	NA

[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] USEPA Region 9 tap-water PRG (2002) based on a hazard index (HI) of 0.1 for noncarcinogens.
[3] Site-specific background sample from well NDAHGW01.
[4] Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M Hill, 2002).
NA indicates that the information is not available or not applicable.
Shading indicates the screening criteria was exceeded by the maximum detected concentration.

TABLE 4-12
Summary of Surface Water COPCs
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (µg/L)	Minimum Detect (µg/L)	Mean Concentration [1] (µg/L)	Ecological Screening Criteria [2]	Background Concentration [3] (µg/L)
METALS							
ARSENIC	4	1	47.1	47.1	27.1	**1.4**	NA
ARSENIC, DISSOLVED	4	0	0	0	20.4	1.4	NA

[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] The lower of the USEPA National Recommended Water Quality Criteria (USEPA, 2002) and the Puerto Rico Environmental Quality Board (EQB) Water Quality Standards.
[3] Site-specific background sample from sample location NDAHSW05 was not collected (dry).
ND indicates that the chemical was not detected.
NA indicates that the information is not available or not applicable.
J indicates that the chemical was detected. The reported value is estimated.
= indicates that the chemical was detected. The reported value is the measured concentration.
Shading indicates the screening criteria was exceeded by the maximum detected concentration.

TABLE 4-13
Summary of Sediment COPCs
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (mg/Kg)	Minimum Detect (mg/Kg)	Mean Concentration [1] (mg/Kg)	Ecologic Screening Value [2]	Background Concentrations Site-Specific [3] (mg/Kg)	Background Concentrations Base-Wide [4] (mg/Kg)
METALS								
BARIUM	4	4	57.2	6	22.4	**48**	**22.5**	69

[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] NOAA SQUIRT (Buchman 1999).
[3] Site-specific background sample from sediment sample NDAHSD05.
[4] Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M Hill, 2002).
NA indicates that the information is not available or not applicable.
Shading indicates the screening criteria was exceeded by the maximum detected concentration.

Note: Original Figure Created in Color

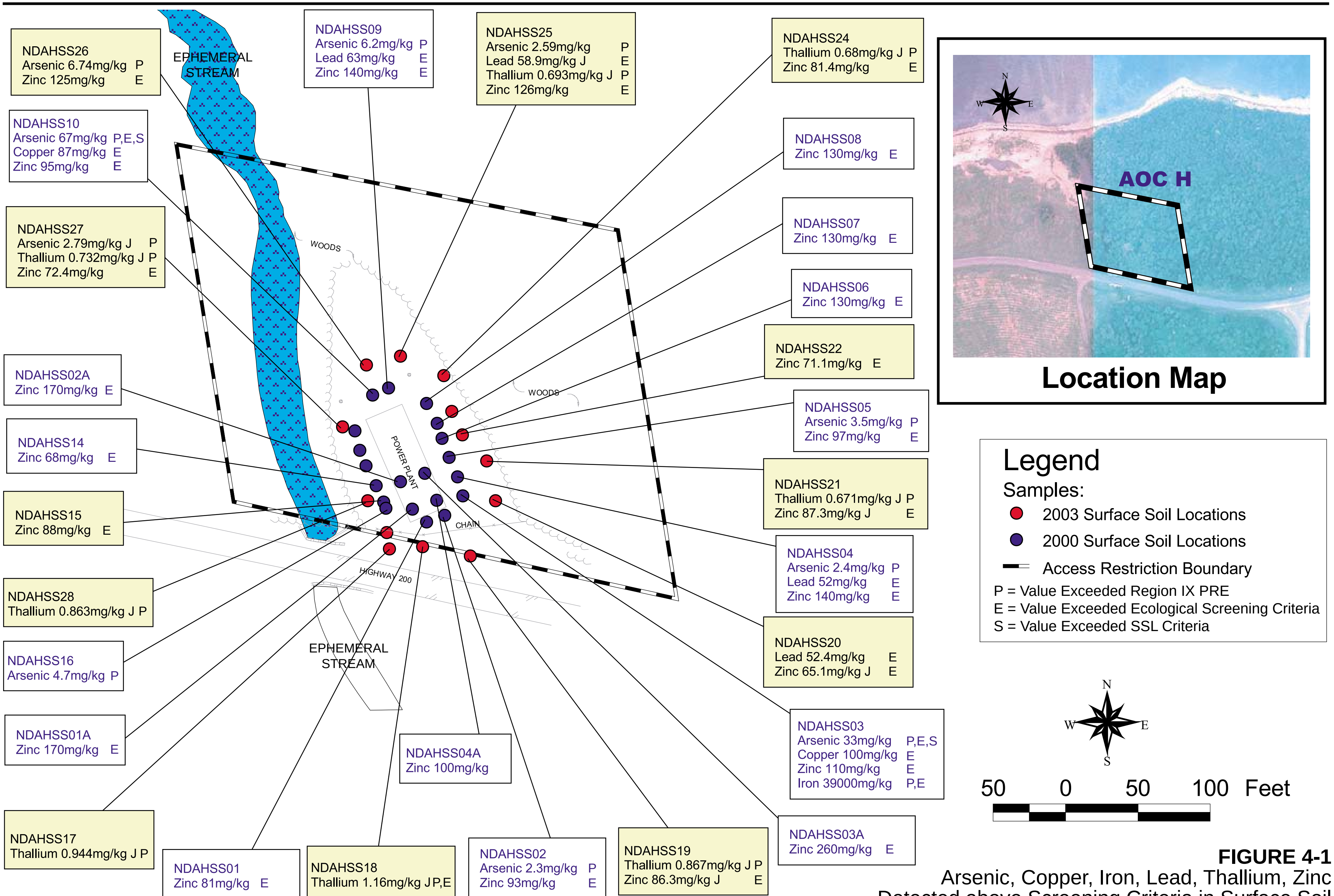
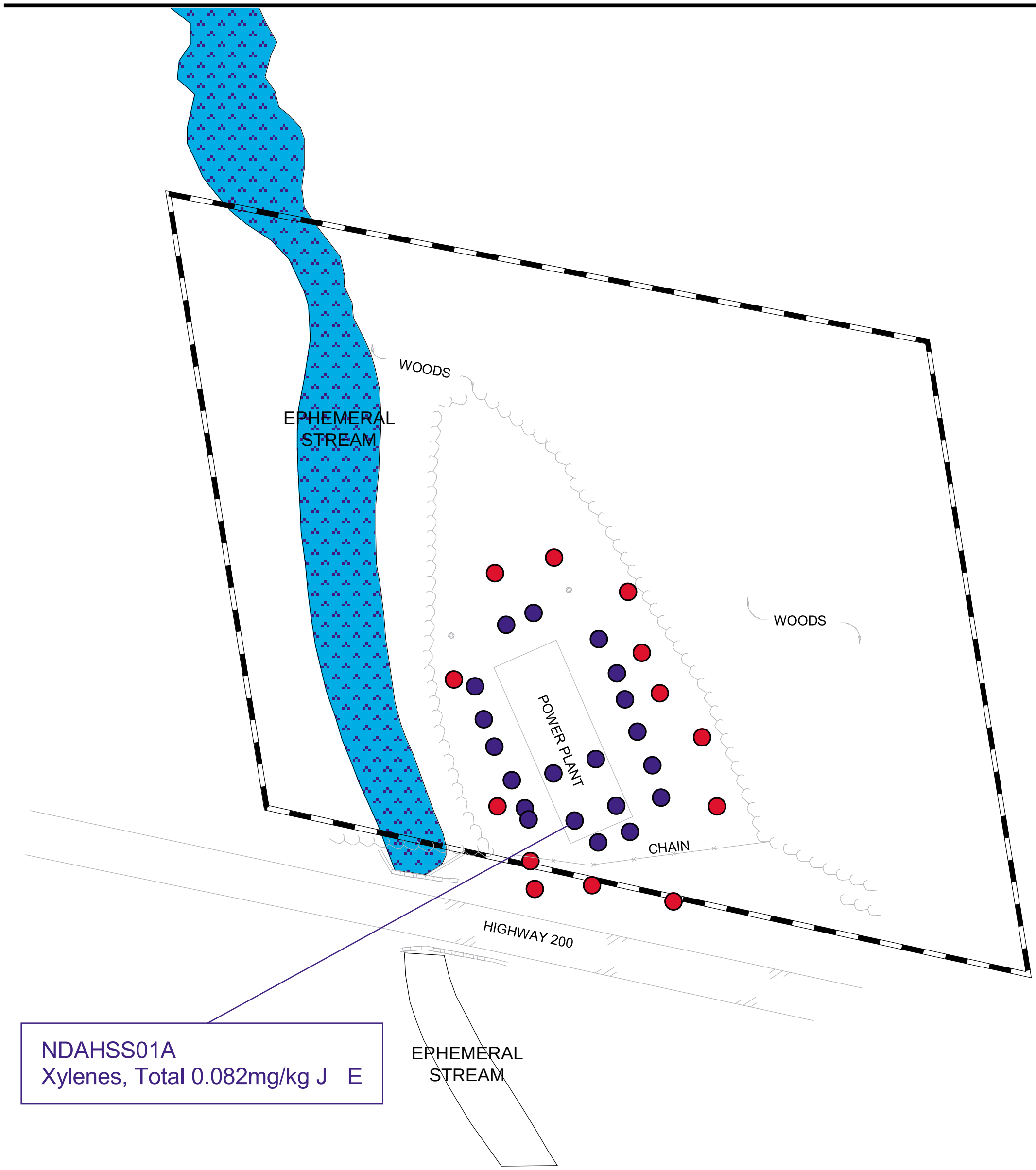
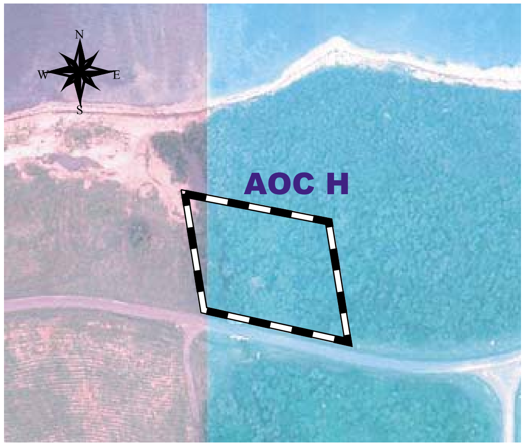


FIGURE 4-1
Arsenic, Copper, Iron, Lead, Thallium, Zinc
Detected above Screening Criteria in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Note: Original Figure Created in Color





Location Map

Legend
Samples:
2003 Surface Soil Locations
2000 Surface Soil Locations
Access Restriction Boundary
E = Value Exceeded Ecological Screening Criteria

N W E S

50 0 50 100 Feet

FIGURE 4-2
m, p-Xylene, o-Xylene, Xylenes
Total Detected above Screening Criteria in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL
ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

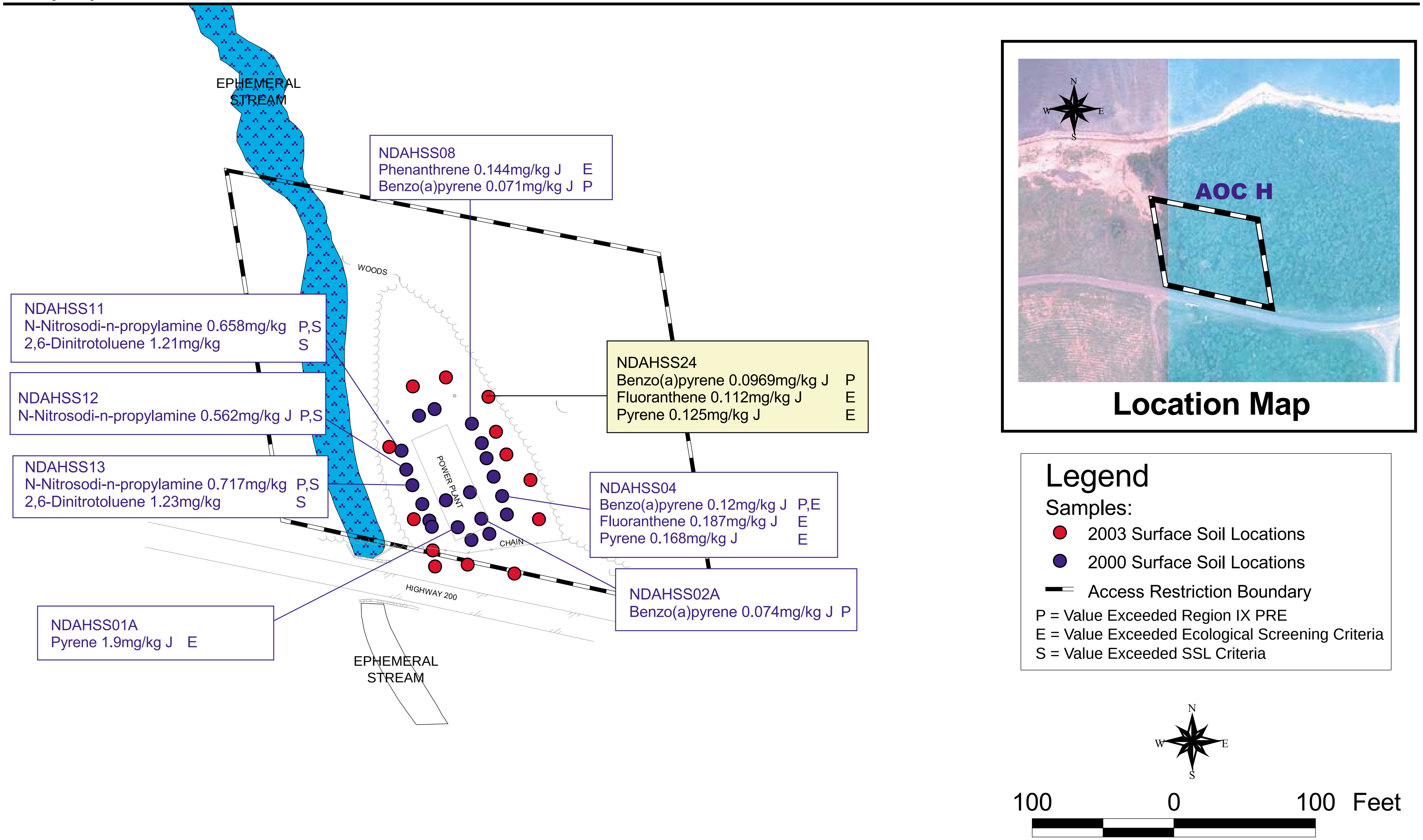
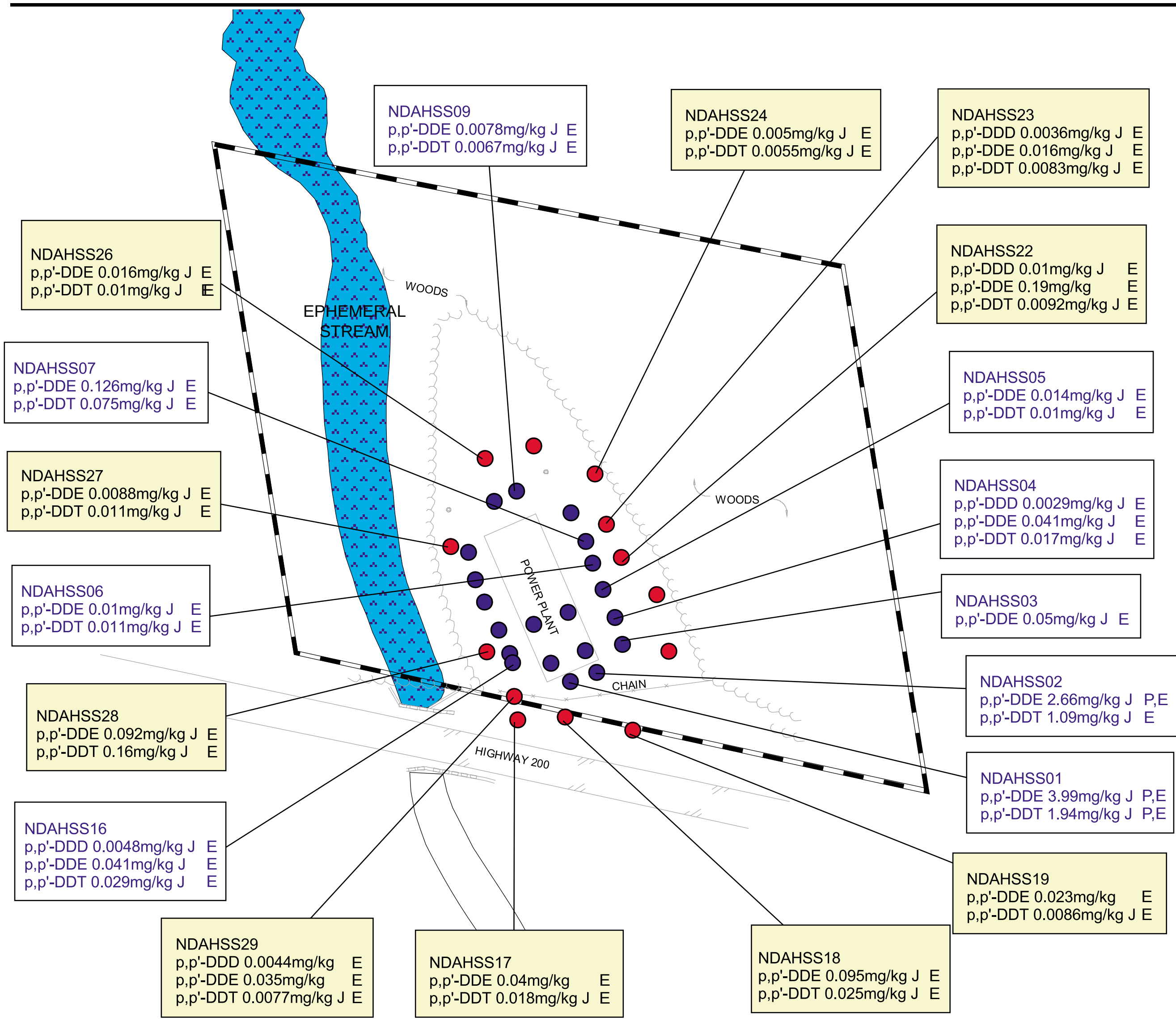


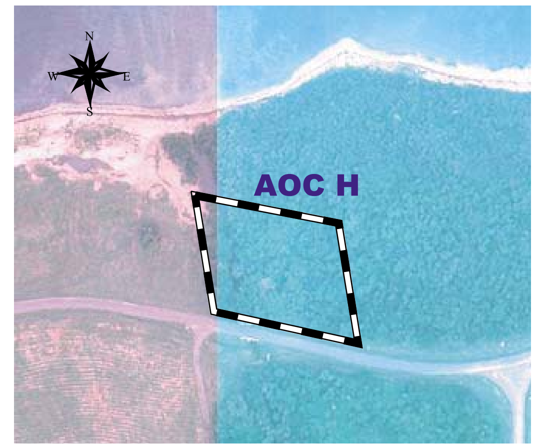
FIGURE 4-3
2, 6-Dinitrotoluene, Benzo(a)pyrene, Fluoranthene, n-Nitrosodi-n-propylamine, Phenanthrene, Pyrene Detected above Screening Criteria in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color





Location Map

Legend

Samples:

2003 Surface Soil Locations

2000 Surface Soil Locations

Access Restriction Boundary

P = Value Exceeded Region IX PRE

E = Value Exceeded Ecological Screening Criteria

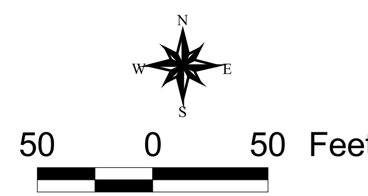


FIGURE 4-4

DDD, DDE, DDT Detected above Screening Criteria in Surface Soil

AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

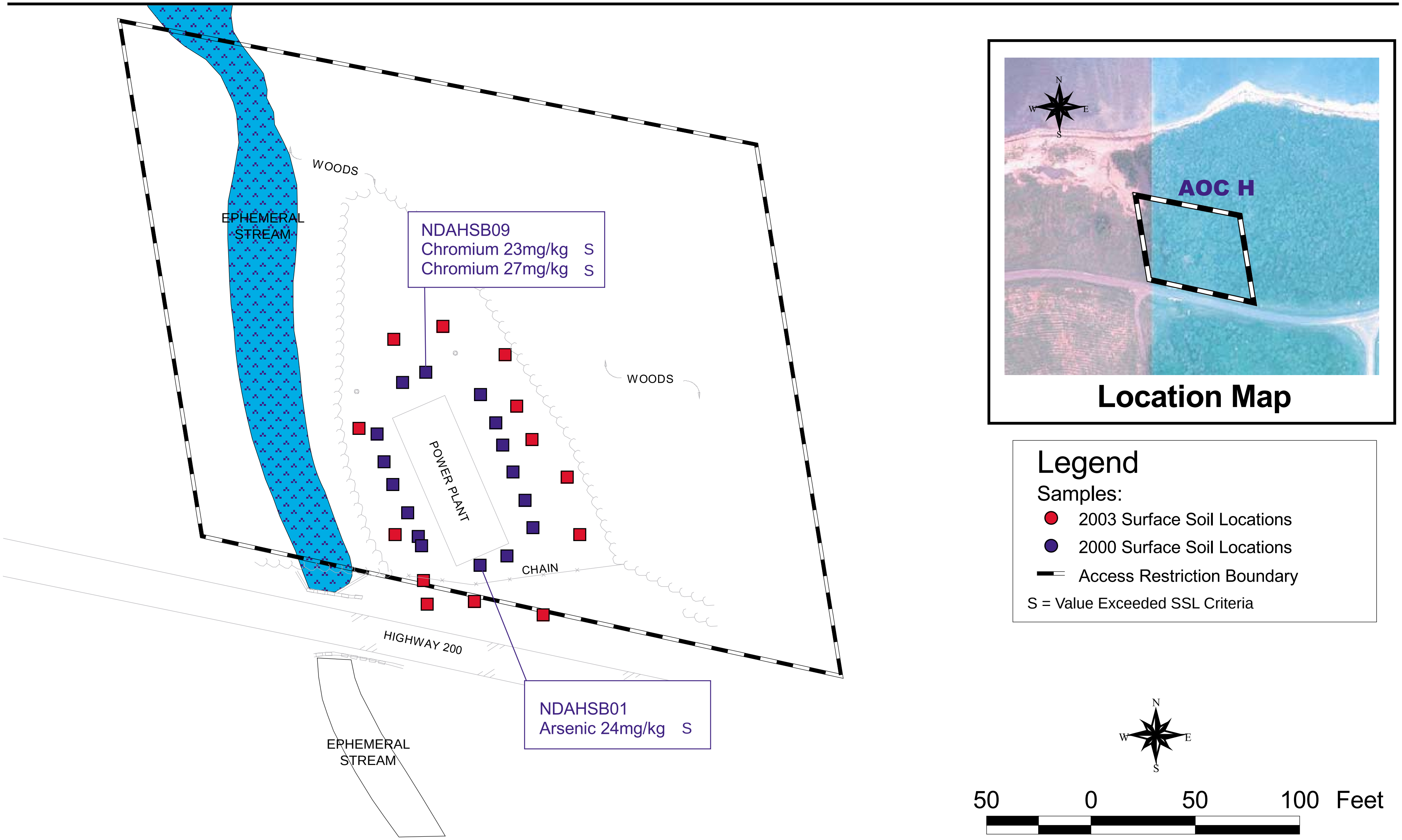


FIGURE 4-5
Arsenic and Chromium Detected above Screening Criteria in Subsurface Soil
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

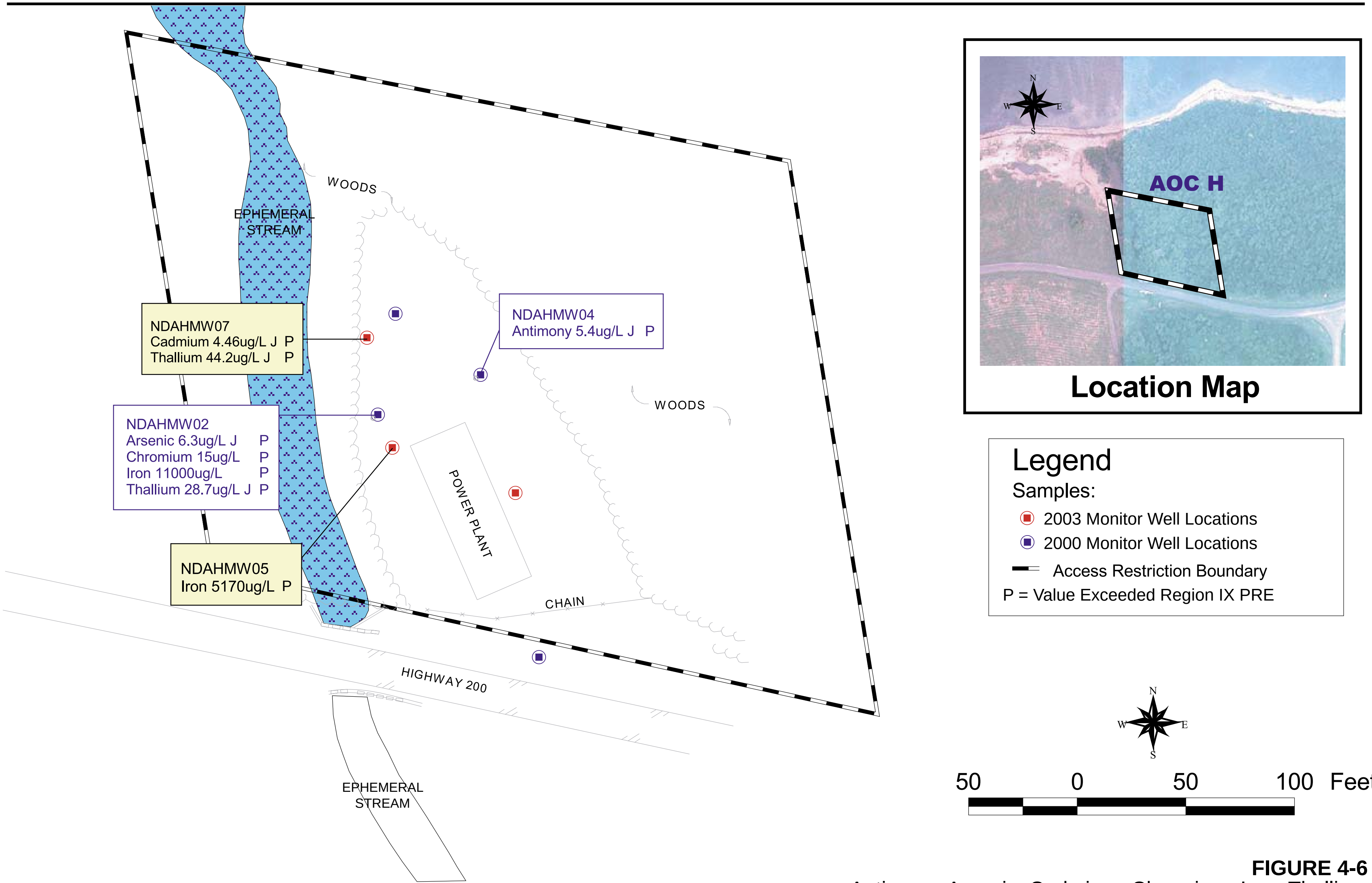


FIGURE 4-6
Antimony, Arsenic, Cadmium, Chromium, Iron, Thallium
Detected above Screening Criteria in Monitoring Wells
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

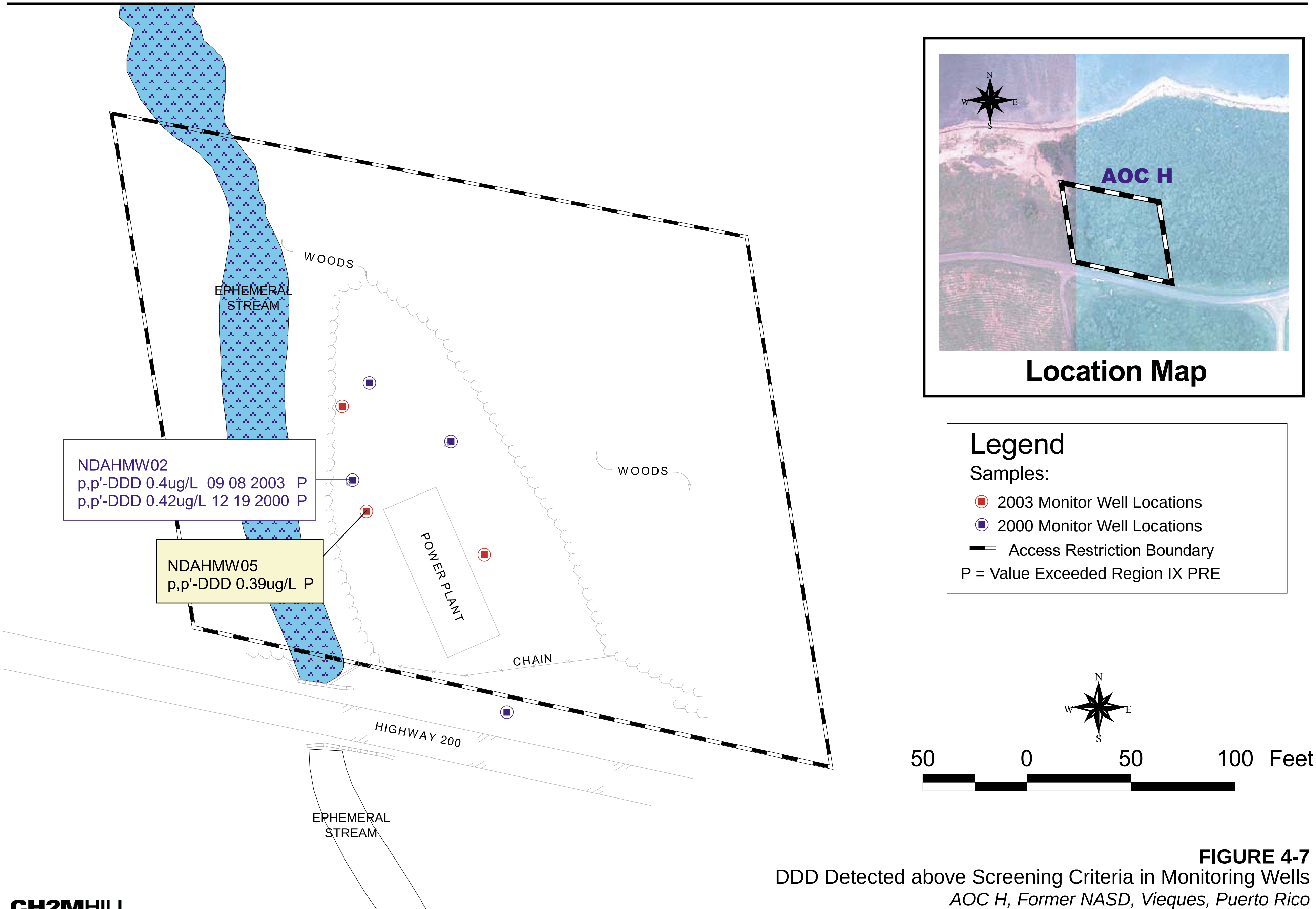
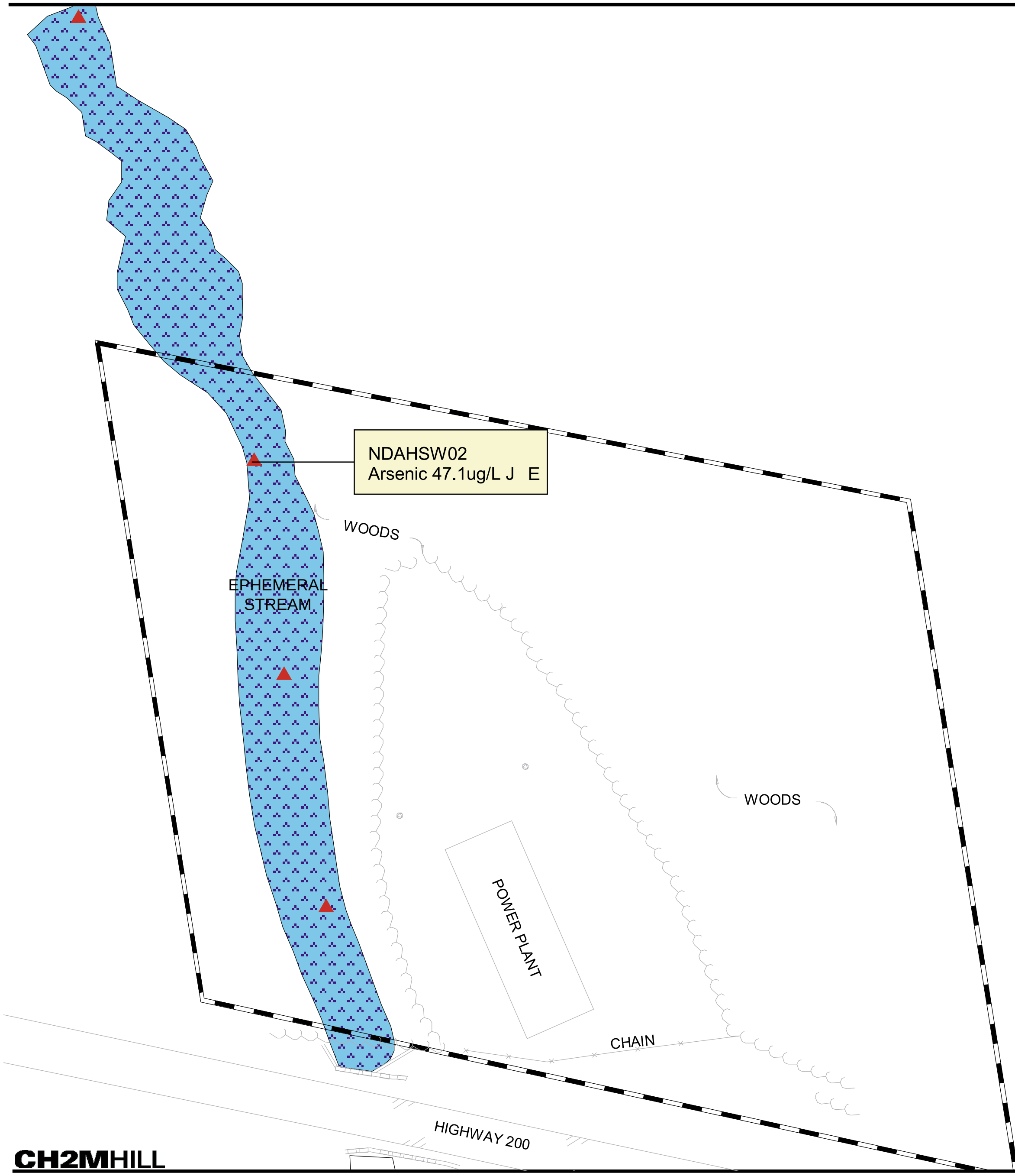
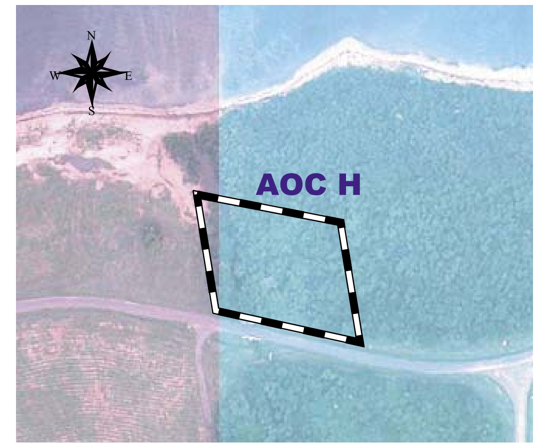


FIGURE 4-7
DDD Detected above Screening Criteria in Monitoring Wells
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

Note: Original Figure Created in Color





Location Map

Legend

Samples:

▲ 2003 Surface Water Locations

E = Value Exceeded Ecological Screening Criteria

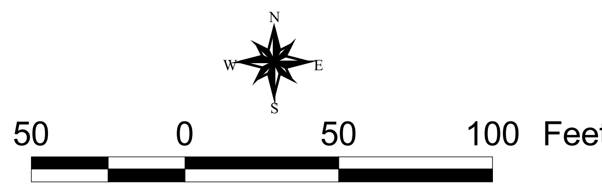
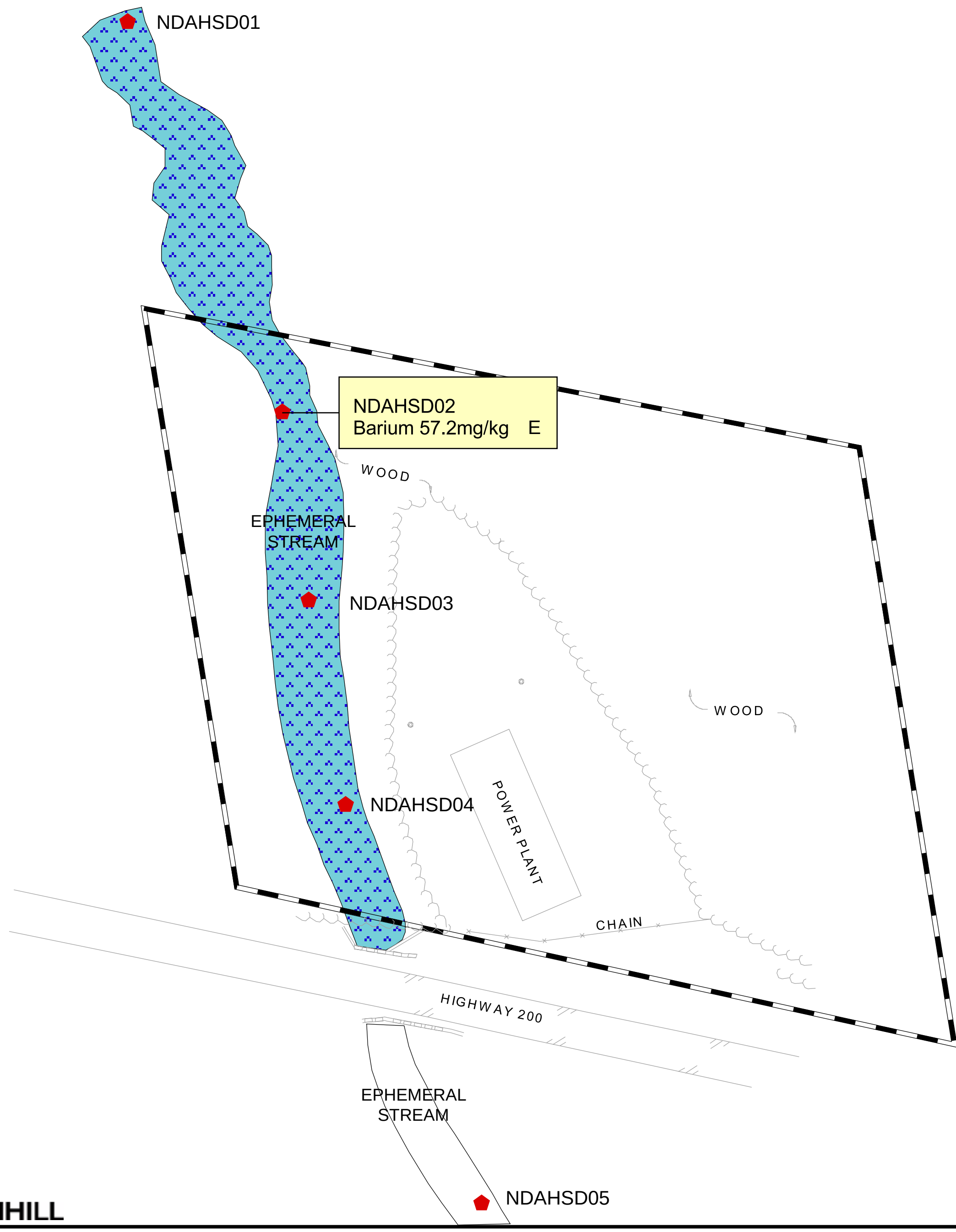


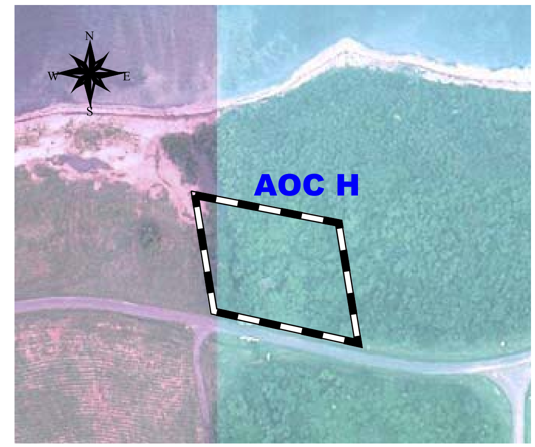
FIGURE 4-8
Arsenic Detected above
Screening Criteria in Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color





Location Map

Legend
Samples:
2003 Sediment Locations
E = Value Exceeded Ecological Screening Criteria

50 0 50 100 Feet

FIGURE 4-9
Barium Detected above Screening Criteria in Sediment
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

SECTION 5

Contaminant Fate and Transport

This section presents a discussion of contaminant migration potential at AOC H through an environmental contaminant fate and transport evaluation. The site physical characteristics, source characteristics, and extent of contamination presented in Sections 2, 3, and 4 were combined to form the basis of this section.

The CSM is also presented in this section and introduces the potential exposure pathways associated with the site.

5.1 Potential Sources for Contamination

The abandoned building at AOC H was used to house power generation equipment and large diesel generators in the early 1940s. Based on the EBS (ERM, 2000), there is no PCB contamination on the floor of the building. Historically, diesel ASTs, which have since been removed, were located on the west side of the building. The ASTs had an estimated capacity of 2,000 to 3,000 gallons. From the 1960s to the 1980s, the Navy used the building for fire-training operations. During these operations, diesel fuel was poured over rubber tires inside the building and ignited to simulate structure fires. No activity has been reported at the site since.

5.2 Conceptual Site Model

The CSM qualitatively defines the various contaminant sources, release mechanisms, relative rates of migration and persistence of contaminants, and migration pathways for contaminants at the site. Based on the available site information, a flow chart of the potential migration pathways, exposure pathways, potential human receptors, and ecological receptors was developed for the site (Figure 5-1). No human receptors are currently located at the site. The site is ecologically active, attracting lizards, bats, and birds. Vegetation around the site is dense. There is a dense thorn scrub forest to the east, a mixed thorn scrub and coastal forest to the west and north, and a grassy road shoulder at the southern end of the site.

A graphical representation of the CSM for AOC H is presented as Figure 5-2. AOC H consists of an abandoned concrete building, approximately 80 feet long and 25 feet wide, located within a relatively flat area. The site is just north of Highway 200 and is approximately 200 feet south of Vieques Passage. A 20- to 40-foot-wide ephemeral stream extends along the western boundary of the site and drains to Vieques Passage. The ephemeral stream has an average depth of 3 to 6 feet. It is filled with brackish water and is mostly stagnant. Based on the June 2003 hydraulic tidal study, there is no tidal influence on surface water in the ephemeral stream; the surface water is influenced by rainfall events.

The lithology at AOC H is variable throughout the site due to alluvial deposition and activities related to construction of the former power plant. The geology primarily consists of intermingled pockets of sand, silty sand, and gravel (Figure 2-5). The abandoned building is situated on top of a discontinuous clay layer. Clay and gravelly clay lenses are also present between depths of 5 and 15 feet bls. Chemicals identified as exceeding Region IX PRGs, Ecological Screening Criteria, and/or SSLs in site soil comprise inorganics, VOCs, SVOCs, and pesticides.

Groundwater at AOC H exists under unconfined conditions on the fringes of the Resolución Valley aquifer system. The general groundwater flow direction is northerly toward Vieques Passage; however, in the southern portion of the site, groundwater flows in a more westerly direction toward the ephemeral stream (Figure 2-6). The depth to groundwater is approximately 7 feet bls. Groundwater elevations, which are deeper than the bottom of the ephemeral stream, indicate that groundwater was not discharging into surface water in the ephemeral stream during the sampling period. However, this could change depending on seasonal differences in groundwater elevations.

The field data collected during the 2000 and 2003 groundwater sampling events are summarized in Tables 5-1 and 5-2. Table 5-3 summarizes total (unfiltered) and dissolved (filtered) metals data for several metals. These data indicate that the aquifer is likely under oxic to reducing conditions. The ORP values during the 2003 sampling ranged from -12.2 to 301. Dissolved oxygen values were generally low in most wells. During the 2003 sampling event, dissolved (filtered) manganese in well NDAHMW02, NDAHMW05, NDAHMW06, and NDAHMW07 were elevated and similar to the unfiltered results indicating that manganese reducing conditions are likely present in some portions of the aquifer. Dissolved iron concentrations in wells NDAHMW02 and NDAHMW05 were also elevated and close to the unfiltered values, suggesting that iron reducing conditions are also present in some portions of the aquifer. Under iron reducing conditions, several ORP-sensitive metals, such as iron, manganese, and arsenic, are often found at elevated concentrations due to natural geochemical processes facilitated by groundwater bacteria.

A hydraulic tidal study was conducted in June 2003. Tidal fluctuations up to 0.2 foot were observed in monitoring wells NDAHMW03 and NDAHMW04, located in the central portion of the site. No tidal influence was observed in monitoring well NDAHMW02, located adjacent to the ephemeral stream. However, groundwater elevations in this well increased slightly during a rain event in which the surface water elevation in the ephemeral stream also rose. This further indicates that surface water is most likely a recharge point for groundwater. The rain event and increase in the surface water elevation did not have an impact on the interior wells. Tables 5-1 and 5-2 present the salinity and specific conductance data for the site wells. Based on specific conductance data collected during groundwater sampling events, groundwater in wells adjacent to the ephemeral stream has higher salinity than in wells in the interior of the site.

5.3 Potential Routes of Migration

The primary mechanisms for contaminant transport from the source area at AOC H are surface runoff to the ephemeral stream and vertical migration. Contaminants, which spilled or leaked onto the ground surface during site activities, may have leached through the vadose zone and been transported into the groundwater system. Contaminants bound to surface soil may be transported by stormwater runoff to surface water and sediment in the adjacent ephemeral stream. Surface soil may also be released to the air by wind erosion.

5.3.1 Soil to Atmosphere Pathway

Wind erosion is considered a potential mechanism for release of site contaminants to the atmosphere from soil because inorganics constitute most of the contaminants identified at the site. Inorganics, pesticides, and many SVOCs tend to bind to the soil and can be released to the atmosphere as dust during windy conditions. The site is located within a heavily vegetated area, which limits dust emissions. Therefore, this migration pathway is not considered significant.

Volatilization, the primary mechanism for releasing volatile contaminants from soil to the atmosphere, is not considered a significant part of potential contaminant release at the site. Only total xylenes in a single soil sample exceeded screening criteria in soil at AOC H and the concentrations were low.

5.3.2 Surface Runoff Pathway

Contaminants in site soil may be transported by surface runoff to surface water and sediment contained in the ephemeral stream. Contaminants transported in surface runoff can be either in the dissolved phase or as suspended particulates, which can then settle out into sediment.

Only inorganics are identified as exceeding screening criteria in surface water (arsenic) and sediment (barium). These compounds were detected in site soil but also occur naturally in the environment.

The degree to which surface soil can be eroded and contribute to the runoff pathway at a particular location is dependent on a variety of site-specific factors, including topography, soil type, climatological factors, and nature of surface cover present (such as pavement or vegetation). The presence of vegetative cover or pavement over contaminated soil reduces the potential for runoff to cause migration of contaminated soil and reduces the amount of soil transported offsite in runoff. Even in areas at which no vegetative cover is present, soil particulates may not be readily detached from the bulk soil matrix. The rainfall impact intensity or surface water velocity must be great enough to detach individual soil particles from the bulk soil. Forces resisting particle detachment are related to such factors as grain size, the angle of friction with surrounding grains, and the cohesive forces with which each grain adheres to the soil mass.

Climatological factors and precipitation patterns are also important in determining the degree to which surface soil contributes sediment to runoff. Not all rainfall events release sufficient precipitation to cause surface runoff. A significant portion of total precipitation does not become runoff; most precipitation is returned to the atmosphere via evaporation or evapotranspiration and some infiltrates into groundwater. Typically, for unpaved areas, surface water runoff is expected to be on the order of 10 to 20 percent of total precipitation. Areas with flat topography or more permeable soils are in the low end of this range. When a storm event does provide adequate rainfall to cause surface runoff, suspended soil particles that are mobilized into the runoff are also subject to sedimentation forces and some of the suspended soil particles may redeposit in the soil prior to migrating offsite.

5.3.3 Soil to Groundwater Pathway

Chemicals detected in soils may migrate through the soil column to the underlying shallow groundwater. Recharge to the groundwater aquifer primarily occurs through infiltration of rainfall. The movement of water through the unsaturated soil can dissolve contaminants and transport them to the underlying groundwater, serving as a source of contaminants to groundwater. Some of the factors that influence this process include the mobility of the detected chemical, the nature of the soils, rainfall, other climatological factors, and depth to groundwater. Arsenic and chromium were the only two chemicals that exceeded their leachability screening criteria for subsurface soil. Chemicals that exceeded criteria in groundwater at AOC H include inorganics and DDD.

5.4 Contaminant Persistence

The mobility and persistence of the chemicals at the site are determined by their physical, chemical, and biological interaction with the environment. Mobility is the potential for a chemical to migrate from a site, and persistence is a measure of how long a chemical will remain in the environment.

5.4.1 Physical and Chemical Properties of Contaminant Groups

Various basic physical and chemical properties affect the transport of chemicals in the environment at the site. In general, chemicals that are soluble, volatile, or leachable tend to be mobile. Mobile chemicals are likely to be released and transported from the source and are not persistent, while persistent chemicals tend to remain localized in the source area and are resistant to chemical and biological degradation reactions. Sorption, volatilization, degradation, transformation, and bioaccumulation are considered the most important processes.

5.4.1.1 Sorption

Sorption is the tendency for chemicals to adsorb to and desorb from materials in the media through which the contaminants are being transported. The subsurface materials likely to sorb chemicals typically are clays and organic material. In addition, inorganic chemicals adsorb onto iron, manganese, and aluminum oxyhydroxide or oxide coatings on soil and sediment grains. The conventional measure of sorption for a chemical is the soil-water distribution coefficient K_d. The K_d for organic chemicals is the product of a partition coefficient (K_{oc}) and the fraction of organic carbon (f_{oc}). In general, chemicals with a K_{oc} greater than 10,000 mL/g (e.g., many SVOCs) have high degrees of adsorption and consequently low mobility, while chemicals with a K_{oc} lower than 1,000 mL/g (e.g., many VOCs) have lower degrees of adsorption and consequently higher mobility.

5.4.1.2 Volatilization

Volatilization is the tendency for some chemicals, particularly VOCs, to change from a liquid or adsorbed state to a gas. A conventional measure of volatility is Henry's Law Constant (H). Compounds with H values higher than 10^{-3} atmosphere-cubic meter per mole (atm-m^3/M) are expected to volatilize readily from water to air, while those with H values lower than 10^{-5} atm-m^3/M are relatively nonvolatile. Most inorganic chemicals are not volatile under normal temperature and pressure conditions.

5.4.1.3 Degradation

Degradation is the transformation of one chemical to another by such processes as hydrolysis, photolysis, and biodegradation. Hydrolysis is the reaction of a chemical with water, and photolysis is the result of exposing the chemical to light. Degradation is commonly expressed as a half-life that combines all the processes that may be operating.

5.4.1.4 Transformation

Transformation occurs when metals are increased or reduced in valence state by oxidation or reduction, respectively. Transformation may have a significant effect on the mobility of a metal, either increasing or decreasing it. Transformation can be caused by Eh and pH changes and by microbial or nonmicrobial (abiotic) processes.

5.4.1.5 Bioaccumulation

Bioaccumulation is the extent to which a chemical will partition from water into the lipophilic parts (e.g., fat) of an organism. Bioaccumulation commonly is estimated by the octanol-water partition coefficient, K_{ow}. Chemicals with high values of K_{ow} tend to avoid the aqueous phase and remain in soil longer or bioaccumulate in the lipid tissue of exposed organisms. Accumulation of a chemical in the tissue of the organism can be quantified by a bioconcentration factor (BCF), which is the ratio of the concentration of the chemical in the tissue to the concentration in the water. BCFs are both contaminant-specific and species-specific. Inorganic chemicals and SVOCs tend to have higher K_{ow} values, so they bioaccumulate more extensively than VOCs.

5.4.2 Fate and Transport of Contaminant Groups

Table 5-4 summarizes some of the relevant physical and chemical parameters for potential contaminants at AOC H. The fate and transport of chemicals that exceeded screening criteria are discussed as groups (i.e., VOCs, SVOCs, pesticides, and inorganics) in the subsections below.

5.4.2.1 Volatile Organic Compounds

Only total xylenes in a single soil sample exceeded screening criteria in surface soil. Concentrations in soil were well below the residential PRG. No VOCs exceeded criteria for any other media.

Total xylenes were estimated at a low concentration (0.082 mg/kg) in one surface soil sample (NDAHSS01, collected inside the building). This compound is moderately mobile in soil and leaches into the subsurface. Sorption is more extensive in dry soils and increases with the amount of organic matter in the soil. In surface soil and surface water, it quickly volatilizes into the atmosphere. Total xylenes can be biodegraded in soil or groundwater. In surface soil, it can undergo photooxidation. Total xylenes bioaccumulate at modest levels in aquatic organisms and plants (ATSDR, 1995).

5.4.2.2 Semivolatile Organic Compounds

Polynuclear aromatic hydrocarbons (PAHs) and n-nitrosodi-n-propylamine exceeded screening criteria in surface soil. SVOCs did not exceed criteria for any other media.

N-nitrosodi-n-propylamine

N-nitrosodi-n-propylamine is an impurity found in some pesticides and during the manufacture of some rubber products. It is not a persistent compound in the environment. N-nitrosodi-n-propylamine has a high mobility in soil and is expected to leach into groundwater. Although it has a low volatility, it rapidly volatilizes from surface soil. In water and surface soil, it undergoes photolysis if exposed to sunlight. N-nitrosodi-n-propylamine undergoes aerobic and anaerobic biodegradation in subsurface soil and groundwater (ATSDR, 1989). Bioaccumulation in aquatic organisms is not expected to be important at this site.

Polycyclic Aromatic Hydrocarbons

PAHs are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances. Particulate emissions to ambient air can result from adsorption onto soot particles that can be carried on wind currents and then returned to the surface (dry deposition). High-molecular-weight PAHs are more likely to be transported via particulate emissions, while low-molecular-weight PAHs have a greater tendency to volatilize (ATSDR, 1995a). Four PAHs, primarily low-molecular-weight compounds, exceeded screening criteria in soil at AOC H.

Solubility, volatility, biodegradability, and toxicity vary widely across this class of compounds (ATSDR, 1995a). Except for phenanthrene, PAHs at AOC H are essentially immobile in soil with very high distribution coefficients and very low water solubilities. Phenanthrene has a low mobility in soil. These PAHs are most likely to sorb tightly to soil or other organic matter and are not likely to volatize. A primary fate and transport mechanism is migration of adsorbed PAHs with surface soil and sediment.

Photolysis and biodegradation are two common attenuation mechanisms for PAHs (Howard, et al., 1991). Although all PAHs transform in the presence of light via photolysis, their rates are highly variable. Photolysis may reduce concentrations of these chemicals in surface waters or surface soils but is not relevant for subsurface soils. Biodegradation of PAHs in soils is also extremely variable across the chemical class. Generally, the PAHs with three or fewer rings biodegrade more readily than the higher-molecular-weight PAHs. Factors that affect the rate of biodegradation in soil include the types of microorganisms present, the availability of nutrients, the presence of oxygen, and the chemical concentration. The extent to which chemicals may biodegrade also can be affected by their presence in mixtures. If both stable and mobile PAHs are present in a mixture, the less readily degradable materials may be co-metabolized at a rate similar to or higher than those of the more readily degradable compounds (Howard et al., 1991).

Animals and microorganisms can metabolize PAHs to products that ultimately reach complete degradation. PAHs in soil may be assimilated by plants, degraded by soil microorganisms, or accumulated to relatively high levels in the soils. High PAH concentrations in soil can lead to increased populations of soil microorganisms that are capable of degrading the compounds. PAHs can be taken into the mammalian body by inhalation, skin contact, or ingestion but are poorly absorbed from the gastrointestinal tract.

Specific enzymes present in mammals metabolize PAHs, thus making the PAHs water-soluble and available for excretion. Although metabolic pathways detoxify PAHs, some metabolic intermediates may be toxic, mutagenic, or carcinogenic to the host (ATSDR, 1995a).

5.4.2.3 Chlorinated Pesticides

Three chlorinated pesticides (DDD, DDE, and DDT) exceeded screening criteria in surface soil at AOC H. DDE and DDD enter the environment as a contaminant or breakdown product of DDT. All three pesticides were detected in subsurface soil but below screening criteria. DDD exceeded screening criteria in one groundwater sample.

In general, these chlorinated pesticides have low H values and are not expected to volatilize significantly. However, they will volatilize from soil surfaces, depending on the temperature and humidity. These compounds have a low water solubility and very high K_{oc} values, indicating that these pesticides are more likely to sorb to soil and are not likely to leach to groundwater if organic matter is present. The most likely migration pathways for pesticides are transport in particulate emissions and transport of sorbed materials in surface runoff. Most DDT in soil will biodegrade slowly to DDE and DDD. All three pesticides have a high K_{ow}, suggesting a high potential for bioaccumulation and biomagnification in the food web (ATSDR, 1993b, 1993c, 1993d, 1994b).

5.4.2.4 Explosives

2,6-DNT exceeded screening criteria in surface soil. Explosives were not detected in any other exposure media at AOC H. 2,6-DNT weakly sorbs to soil and has a moderate mobility. Due to its low H value and vapor pressure, it is not expected to volatilize from surface soil or water. 2,6-DNT can be degraded via oxidation, photolysis, and biotransformation in soil and water. However, it is expected to persist in water due to its high solubility. Therefore it will be transported primarily by aqueous media. Because of its low K_{ow}, 2,6-DNT is not expected to bioaccumulate in animals. 2,6-DNT can be taken up by plants from contaminated water or soil (ATSDR, 1998b).

5.4.2.5 Metals

Metals have been detected in all media at AOC H. Many of these metals are naturally occurring and their reported presence may or may not indicate a contaminant release. Additionally metals that are present at low levels in site media may create Type I errors during laboratory analysis. In surface soil, antimony, arsenic, iron, lead, and thallium exceeded their respective background levels and residential PRGs. In subsurface soil, arsenic and total chromium exceeded screening criteria. However, total chromium was reported below the background concentration in all samples. In sediment, the only metal that exceeded criteria was barium, which was detected below the basewide background level.

In the water phase, the total metal concentration includes the dissolved metal concentration and the suspended metal concentration, which is sorbed to colloidal particles. Therefore, elevated metals concentrations in groundwater may be due to the suspended load and not just to the dissolved aqueous chemistry. For all aqueous samples collected at AOC H, dissolved and total metals were analyzed. In surface water, arsenic, total was detected in just one sample. Dissolved arsenic was not detected. In groundwater, aluminum, antimony, arsenic, cadmium, chromium, iron, and thallium exceeded their respective background levels and residential PRGs. Only dissolved concentrations of cadmium, iron, and thallium exceeded their background levels and screening criteria (see Table 4-11).

Fate and Transport of Metals

The potential release and migration of metals in the subsurface environment is a complicated process. Because metals are typically not volatile, emissions to ambient air are usually in the form of particulate emissions. The mobility of metals depends on factors such as the overall groundwater composition, pH, metal complex formation, valence state of the metal, and cation-ion exchange capacity. Changes in the oxidation-reduction potential (ORP) in soil or groundwater can affect the chemical species present. Metals can occur in the environment as a free ion or as a complexed species, which is composed of a positively charged cation and negatively charge anion or neutral molecule. Complexing generally increases the solubility and mobility of metals in groundwater. Additionally, the type of complex a metal forms depends on whether the species is hard (strongly held electron field) or soft (deformable electron field). Hard species form stronger bonds than soft species (EPA, 1996d, 2004).

The distribution between soil and water for metals is much more difficult to estimate than for organic compounds. Since the sorption of metals depends on pH, the metal concentration, the species present, and the type of complex formation, a single distribution coefficient or isotherm equation cannot be used to predict metal adsorption. Literature values for K_d can vary by more than two orders of magnitude (ERG, 2003). Generally, metal adsorption increases with pH. Inorganics most often sorb to clay minerals, organic matter, and iron and manganese oxyhydroxides. The surface charge of organic matter and oxyhydroxides is strongly pH-dependent, becoming more negative as pH increases and more positive as pH decreases. Metals may be sorbed on the surface of the soil or fixed to the interior of the soil, where they are unavailable for release to water. After available sorption sites are filled, most metals are incorporated into the structures of major mineral precipitates, as coprecipitates. At very high concentrations, they may be precipitated into pure metal phases.

The solubility of metals is also dependent on several factors. The solubility of cations decreases as pH increases. For a few cations (Be^{+2}, Zn^{+2}, Al^{+3}, and Fe^{+2}), metal solubility increases again at alkaline pH values. The solubility of metals may decrease depending on the complex formation. Some cations may complex with oxygen and hydroxide, forming insoluble oxyhydroxides, or may complex with phosphate, sulfate, and carbonate to form insoluble mineral precipitates. Metal sulfide complexes, which form in reducing environments, are extremely insoluble, and their formation tends to reduce the total metals concentrations. Metals may be removed from the water phase through mechanisms such as precipitation and irreversible sorption (EPA, 1979).

Metal concentrations are usually reported as total metal concentrations. However, metal toxicity is a function of the concentrations of specific metal species, not the total concentration. Furthermore, in the water phase, the total metal concentration includes the dissolved metal concentration and the suspended metal concentration, which is sorbed to colloidal particles. As a result, the groundwater data may reflect metals concentrations that are associated with a significant percentage of colloidal material. Although the groundwater samples at AOC H were filtered with a 0.45-micron filter, studies indicated that the most mobile particles were in the range of 0.1 to 0.55 micron and contributed as much as much as 40 percent of the total mobile metals (EPA, 1979). Therefore, elevated metals concentrations in groundwater may be due to the suspended load and not just to the dissolved aqueous chemistry.

The total concentration of metals in soils is generally not a reliable guide to the extent of total metal uptake by plants. The free metals ion activity in the soil water has been shown to be a better indicator of bioavailability and toxic response than is the total soil metal content (ERG, 2003). It is assumed that for a metal to be taken up by a plant or to exert an effect on plant growth, it must be present in solution. Therefore, factors that influence the speciation and solubility of heavy metals in soils also affect bioconcentration. The pH of soils can also impact the amount of plant uptake of certain chemicals.

The fate and transport properties of metals identified as being potential risk drivers (see Section 6) are discussed in more detail below.

Iron and Manganese

Iron and manganese are naturally occurring elements which are ubiquitous in the environment. Manganese is a hard cation which is often precipitated in soils to manganese minerals. Iron is a hard cation in the Fe^{+3} oxidation state and a borderline cation in the Fe^{+2} oxidation state. The transport of these elements is dependent on their species and the pH and ORP of the soil or water environment. Both iron oxyhydroxides and manganese oxides are relatively insoluble in oxidizing environments and are strong sorbants of other metals. These oxyhydroxides and oxides can be used by microorganisms as electron acceptors under reducing conditions and are reduced to more soluble forms in a process known as bioreduction or reductive dissolution.

Manganese is a natural component of most foods. It may be significantly bioconcentrated at lower trophic levels in water. Iron bioaccumulates in organisms but its bioavailability is dependent on its species (ATSDR, 2000).

Thallium

Thallium is released to the atmosphere primarily from anthropogenic processes, such as the burning of coal and smelting. The mobility of thallium in water is limited by the low solubility of thallium oxides, and it is soluble only in highly reduced environments, in the charged ionic form. Thallium is strongly adsorbed by montmorillonite clays and manganese oxides. Thallium bioaccumulates in plants and animals (ATSDR, 1992).

Arsenic and Vanadium

Arsenic and vanadium are inorganics that occur naturally in the earth’s crust and are released to soil and groundwater from natural and anthropogenic sources. These metals can be transported from soil by wind erosion or runoff, or they may leach into the subsurface. In oxidizing environments, they exist primarily as oxyanions (hard anions that contain oxygen) and are relatively mobile. However, they can be adsorbed by clays, iron oxyhydroxides, aluminum hydroxides, manganese compounds, and organic material at acidic and neutral pHs. Arsenic and vanadium can be reduced from higher to lower valance states by organic matter, divalent metals, and dissolved sulfide. Under reducing conditions, insoluble arsenic sulfides are precipitated.

Arsenic bioaccumulates in aquatic organisms and may pass through the food web. However, biomagnification of arsenic in aquatic food webs has not been documented.

Vanadium does not appear to bioconcentrate significantly in plants or aquatic organisms (ATSDR, 1992b).

5.4.3 Surface Runoff Contaminant Migration

One of the potential migration pathways at AOC H is the transport of site soil by stormwater runoff to surface water and sediment.

5.4.3.1 Surface Soil to Surface Water Migration

Total and dissolved arsenic are the only chemicals that exceeded screening criteria in surface water. Total concentrations of arsenic were detected in one surface water sample (NDAHSW02). Dissolved arsenic was not detected in this sample or in any other surface water samples. Background concentrations for surface water at AOC H were not established because the proposed background location was dry during the 2003 investigation. Therefore, a comparison cannot be made. Arsenic was detected at elevated levels in soil samples on the northern side of the building. However, it was not detected in surface water samples collected in the same general area (Figure 5-3). Therefore, the presence of arsenic in surface water at AOC H is most likely not related to site-activities.

Arsenic was detected in downgradient sediment sample SD-1 and downgradient surface water sample SW-2 at concentrations that exceeded background levels or screening criteria. Arsenic was also detected at elevated levels in soil samples on the northern side of the building, but it was not detected at elevated levels adjacent to the ephemeral stream or within the ephemeral stream adjacent to this location. Most of the surface soil samples along the ephemeral stream have arsenic levels below background levels. In addition, all of the arsenic concentrations in the ephemeral stream sediment samples are below base-wide background sediment arsenic concentration. Therefore, the presence of arsenic in surface water and sediment at AOC H is most likely not related to site-activities.

5.4.3.2 Surface Soil to Sediment Migration

Barium was reported above its site-specific background concentration in one sediment sample (NDAHSD02). However, it was reported below its basewide background level in all sediment samples. Therefore, barium concentrations are considered to be naturally occurring in sediment and not related to site activities.

5.4.4 Subsurface Leaching Contaminant Migration

Another potential pathway at AOC H is the migration of contaminants from surface soil into the subsurface. Infiltration of rainfall may have leached some contaminants into subsurface soil and subsequently the groundwater system.

5.4.4.1 Surface Soil to Subsurface Soil Migration

Arsenic was the only chemical detected above the background concentration of 2.2 mg/kg in two subsurface soil samples (NDAHSB01 and NDAHSB03). The average concentration of arsenic in subsurface soil was 2.4 mg/kg, similar to the background value of 2.2 mg/kg. Arsenic was only detected in a single well at the site in the unfiltered sample, and no dissolved arsenic was detected, indicating that arsenic does not appear to be leaching into site groundwater.

5.4.4.2 Soil to Groundwater Contaminant Migration

As noted above, groundwater in the southern portion of AOC H flows westerly toward the ephemeral stream and in the northern portion of the site in a northerly direction toward Vieques Passage. The hydraulic gradient at the site appears to be fairly low (less than 0.010 foot per foot). Typically, contaminants do not move as rapidly as the groundwater because of adsorption of the contaminant on the geologic media. Retardation of metals is a complex process and is affected by sorption, ion exchange, speciation, precipitation, colloid formation, biofixation, natural organic matter interactions, anion exclusion, pH, ORP, salinity, competing ions, surface area, and densities (ERG, 2002).

Monitoring well NDAHMW01 was used as the site-specific background well for inorganics. Basewide background levels have also been established for several compounds, but no background levels have been established for organic compounds in groundwater.

The following observations were made for chemicals that exceeded criteria in groundwater:

DDD was detected in two monitoring wells at AOC H. It was detected in NDAHMW02 in 2000 and 2003 and in monitoring well NDAHMW05 in 2003. Since this well was not installed until after the 2000 sampling event, it was only sampled once. Both wells are located downgradient of soil sampling locations where chlorinated pesticides have been detected. DDT, DDE and DDD were detected in soil well below concentrations that can cause leaching of these pesticides. For example, the SSL for DDD at a DAF = 1 is 0.8 mg/kg. The highest soil concentration of DDD was 0.01 mg/kg. It is likely that the presence of fine turbidity in the groundwater sample contributed to the detection of DDD in groundwater samples.

- The tidal study conducted at AOC H indicated that the wells located adjacent to the ephemeral stream had measurable connectivity to the ephemeral stream. Wells located farther from the ephemeral stream did not show as much influence during the study. Because the wells along the western edge (NDAHMW02, NDAHMW05, and NDAHMW07) of the site are closer to the ephemeral stream, a higher salinity in water from these wells is expected and is reflected in the specific conductance measurements made in 2000. Saline water contains aluminum, calcium, iron, magnesium, potassium, chlorides and other inorganic chemicals (Stumm and Morgan, 1981). In areas with salt water intrusion, the redox conditions are favorable to producing higher dissolved inorganic chemical concentrations in groundwater.
- The total dissolved solids (TDS) estimated based on specific conductance data indicated higher TDS measurements in wells closer to the ephemeral stream than in the wells farther away from the ephemeral stream. The most exceedances for inorganic chemicals above criteria were reported in downgradient monitoring wells located adjacent to the ephemeral stream.
- Concentrations of total antimony, cadmium, chromium, and dissolved cadmium exceeded their basewide background concentrations in only one monitoring well each. Concentrations that exceeded background were only slightly higher than the background value. Concentrations of total arsenic slightly exceeded the basewide background value for dissolved arsenic in one monitoring well (NDAHMW02 in 2000); no basewide background value is established for total arsenic. When NDAHMW02 was

resampled in 2003, arsenic was not detected in this well. Therefore, arsenic is likely not site-related.

- Concentrations of total aluminum and iron were reported as exceeding their site-specific and basewide background concentrations in NDAHMW02 in 2000. These metals did not exceed their background levels when the well was resampled in 2003. Dissolved concentrations of iron and aluminum had exceedances of their background levels in a few downgradient monitoring wells in 2000 and 2003. However, aluminum and iron in soil were reported at concentrations below or consistent with background levels. Therefore, the source of aluminum and iron in groundwater is most likely a function of reducing or turbidity conditions in groundwater rather than site-related activities.

Overall, the data suggest that soils at the site are not source of groundwater contamination through leaching, as detected inorganic chemicals are similar to background levels. The groundwater inorganic chemical levels are likely due to the saline water recharge from the ditch and other natural geochemical conditions that influence the suspended and dissolved inorganic chemical levels in the aqueous media in the area.

TABLE 5-1
Summary of ORP Measurements During Expanded PA/SI
AOC H, Former NASD, Vieques, Puerto Rico

Well	ORP, mV	Comments
NDAHMW01	142	samples were slightly cloudy
NDAHMW02	28	medium turbidity
NDAHMW03	250	low turbidity
NDAHMW04	258	Odorless

TABLE 5-2
Summary of Field Sampling Data for Groundwater, 2003
AOC H, Former NASD, Vieques, Puerto Rico

Well	DO, mg/L	ORP, mV	Specific Conductance, µmhos/cm	TDS, mg/L*	Turbidity, NTU
NDAHMW01	5.5	301	11,800	7,000	19.2
NDAHMW02	1 - 7.1	-12.2	28,500	16,800	16.2
NDAHMW05	1.1 - 2.4	15.6	34,248	20,200	4.1
NDAHMW06	0.6 - 1.8	2.9	10,820	6,400	4.6
NDAHMW07	0.5 - 1	188	40,200	23,700	8.1

* TDS estimated equal to as specific conductance (µmhos/cm) times 0.59, in mg/L. (Hem, 1985).

TABLE 5-3
Summary of Arsenic, Iron, Manganese, and Thallium Concentrations in Groundwater
AOC H, Former NASD, Vieques, Puerto Rico

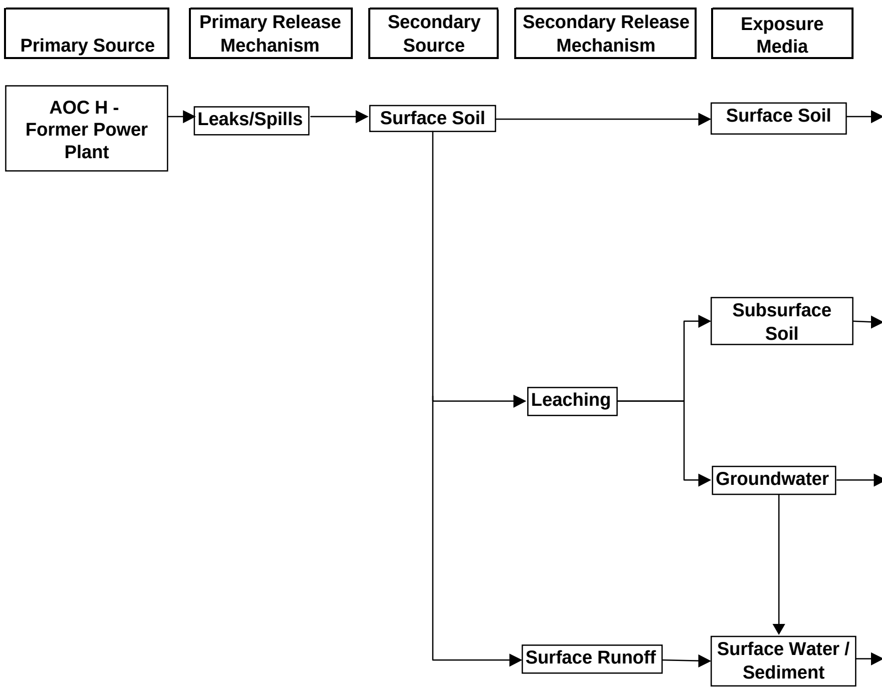
Chemical	Station ID	Sample Date	Concentration			
			Total	Qualifer	Dissolved	Qualifer
ARSENIC	NDAHMW02	12/19/00	6.3	J	ND	
	NDAHGW01	09/08/03	2.04	U	2.04	U
	NDAHGW01	12/19/00	2.9	U	2.9	U
IRON	NDAHMW02	12/19/00	11000	=	ND	
	NDAHMW05	09/08/03	5170	=	4180	=
	NDAHMW02	09/08/03	4580	=	3290	=
	NDAHMW03	12/19/00	4500	=	ND	
	NDAHMW06	09/09/03	83	J	ND	
	NDAHGW01	09/08/03	7560	=	16.7	U
	NDAHGW01	12/19/00	8200	=	120	=
MANGANESE	NDAHMW05	09/08/03	14800	=	15400	=
	NDAHMW02	09/08/03	14100	=	14600	=
	NDAHMW07	09/07/03	12700	=	13300	=
	NDAHMW02	12/19/00	8300	=	5800	=
	NDAHMW04	12/19/00	1800	=	1800	=
	NDAHMW03	12/19/00	1100	=	92	=
	NDAHMW06	09/09/03	620	=	590	=
	NDAHGW01	09/08/03	1100	=	39.5	=
	NDAHGW01	12/19/00	250	=	150	=
THALLIUM	NDAHMW07	09/07/03	44.2	J	ND	
	NDAHMW02	09/08/03	28.7	J	ND	
	NDAHMW03	12/19/00	10	=	ND	
	NDAHMW02	12/19/00	6.6	J	ND	
	NDAHMW05	09/08/03	ND		26.2	J
	NDAHGW01	09/08/03	3.28	J	2.54	U
	NDAHGW01	12/19/00	10	=	9	J

TABLE 5-4
Fate and Transport Parameters for Selected COPCs
AOC H, Former NASD, Vieques, Puerto Rico

Compound	Chemical Group	Organic Carbon Partition Coefficient/ Koc (L/Kg)		Soil Distribution Coefficient/ Kd (L/Kg)		Water Solubility (mg/L)		Henry's Law Constant/H (atm*m3/Mol)		Octanol Water Partition Coefficient/ Kow (L/kg)	
ANTIMONY	Inorganic			4.50E+01	a						
ARSENIC	Inorganic			2.90E+01	a						
BARIUM	Inorganic			4.10E+01	a						
CADMIUM	Inorganic			7.50E+01	a						
CHROMIUM, TOTAL	Inorganic			1.90E+01	a						
COPPER	Inorganic			5.01E+02	c						
LEAD	Inorganic			1.58E+04	c						
SELENIUM	Inorganic			5.00E+00	a						
THALLIUM	Inorganic			7.10E+01	a						
VANADIUM	Inorganic			1.00E+03	a						
ZINC	Inorganic			6.20E+01	a						
p,p'-DDD	Pesticide	1.00E+06	a			9.00E-02	a	4.00E-06	a	1.05E+06	b
p,p'-DDE	Pesticide	4.47E+06	a			1.20E-01	a	2.10E-05	a	3.24E+06	b
p,p'-DDT	Pesticide	2.63E+06	a			2.50E-02	a	8.10E-06	a	1.05E+06	b
2,6-DINITROTOLUENE	Explosive	6.92E+01	a			1.82E+02	a	7.46E-07	a	5.25E+01	b
BENZO(a)PYRENE	SVOC	1.02E+06	a			1.62E-03	a	1.13E-06	a	1.15E+06	b
FLUORANTHENE	SVOC	1.07E+05	a			2.06E-01	a	1.61E-05	a	7.94E+04	b
N-NITROSODI-n-PROPYLAMINE	SVOC	2.40E+01	a			9.89E+03	a	2.25E-06	a	2.04E+01	b
PHENANTHRENE	SVOC	1.41E+04	b			1.20E+00	b	2.56E-05	b	2.82E+04	b
PYRENE	SVOC	1.05E+05	a			1.35E-01	a	1.10E-05	a	3.80E+06	b
M-XYLENE	VOC	4.07E+02	a			1.61E+02	a	7.34E-03	a	1.58E+03	b
O-XYLENE	VOC	3.63E+02	a			1.78E+02	a	5.20E-03	a	1.32E+03	b
P-XYLENE	VOC	3.89E+02	a			1.85E+02	a	7.66E-03	a	1.41E+03	b

Notes:
1. The soil distribution parameter for metals assumes a typical soil pH of 6.8.
2. Transport properties for inorganics are high variable dependent the chemical species and the site-specific environment. Therefore, the solubility, H, and Kow were not listed for metals.

Sources:
a. EPA July 1996. *Soil Screening Guidance: User's Guide, Attachment C.* Office of Solid Waste and Emergency Response, EPA, Washington, DC.
b. ASTDR. Toxicological Profiles: http://www.atsdr.cdc.gov/toxpro2.html#Final
c. HydroGeoLogic, Inc. June 1999. *Draft Partition Coefficients for Metals in Surface Water, Soil, and Waste.* Prepared for EPA.
SVOC = Semi-volatile organic compound
VOC = Volatile organic compound
L/Kg = liters per kilogram
mg/L = milligrams per liter
atm*m^3/Mol = atmosphere times cubic meters per mole



Exposure Media	Exposure Route	Potential Human Receptors: Maintenance Worker	Industrial Worker	Construction Worker	Residential: Adult	Residential: Child	Recreational: Adult	Recreational: Child	Recreational: Youth	Potential Ecological Receptors: Terrestrial: Plants	Terrestrial: Animals	Aquatic
Surface Soil	Ingestion	X	X	X	X	X	X	X	X		X	
	Dermal Contact	X	X	X	X	X	X	X	X		X*	
	Inhalation	X	X	X	X	X	X	X	X		X*	
	Root Uptake									X		
Subsurface Soil	Ingestion			X								
	Dermal Contact			X								
	Inhalation			X								
Groundwater	Ingestion		X	X	X	X						
	Dermal Contact		X	X	X	X						
	Inhalation		X	X	X	X						
Surface Water / Sediment	Ingestion						X	X	X			X
	Dermal Contact						X	X	X			X

Legend

X - Potentially complete exposure pathways identified

* - Receptor not evaluated quantitatively in Section 6.0

Figure 5-1
Conceptual Site Model for AOC H: Former Power Plant Site
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

Note: Original Figure Created in Color

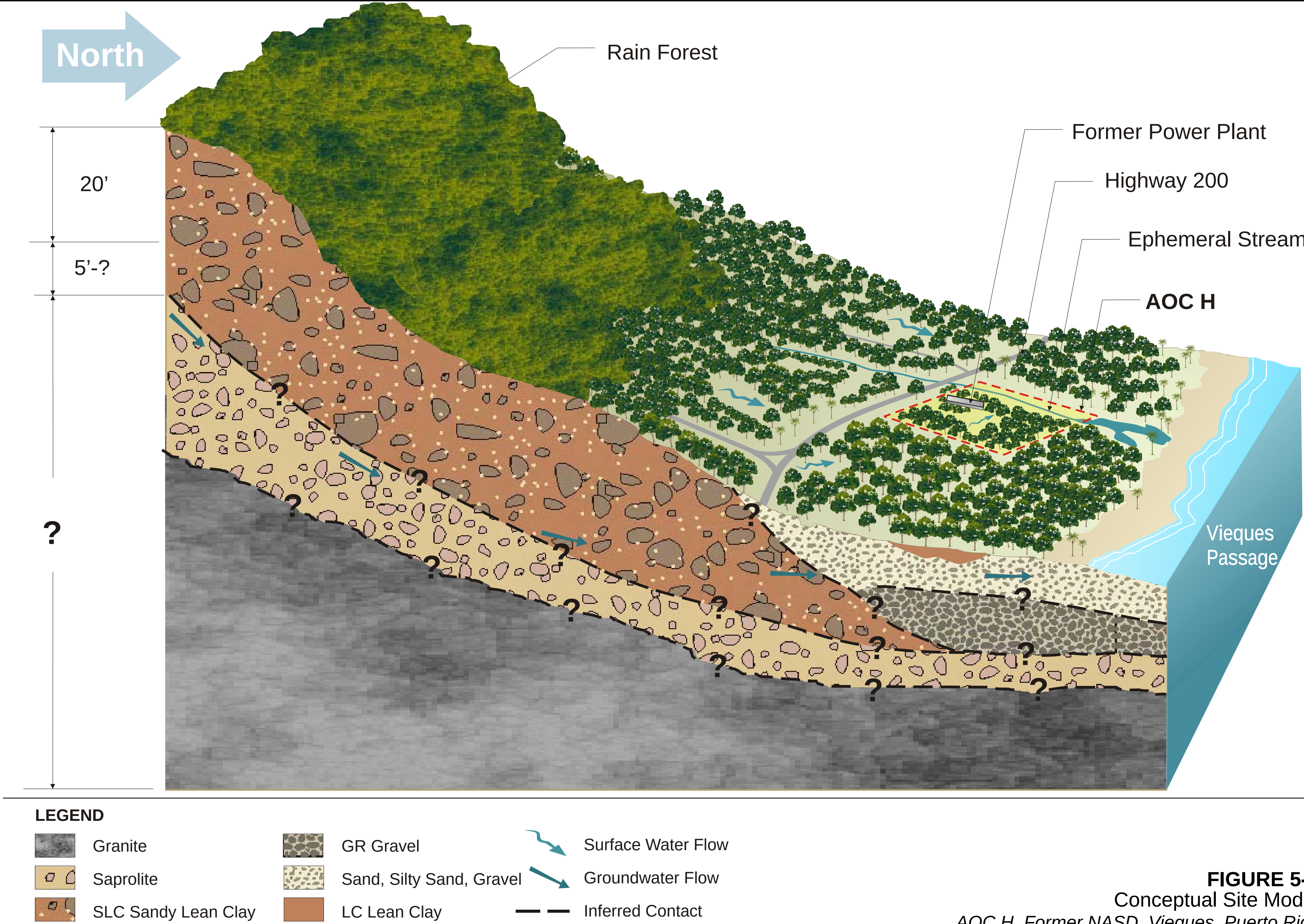


FIGURE 5-2
Conceptual Site Model
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES022007006TPA

Note: Original Figure Created in Color

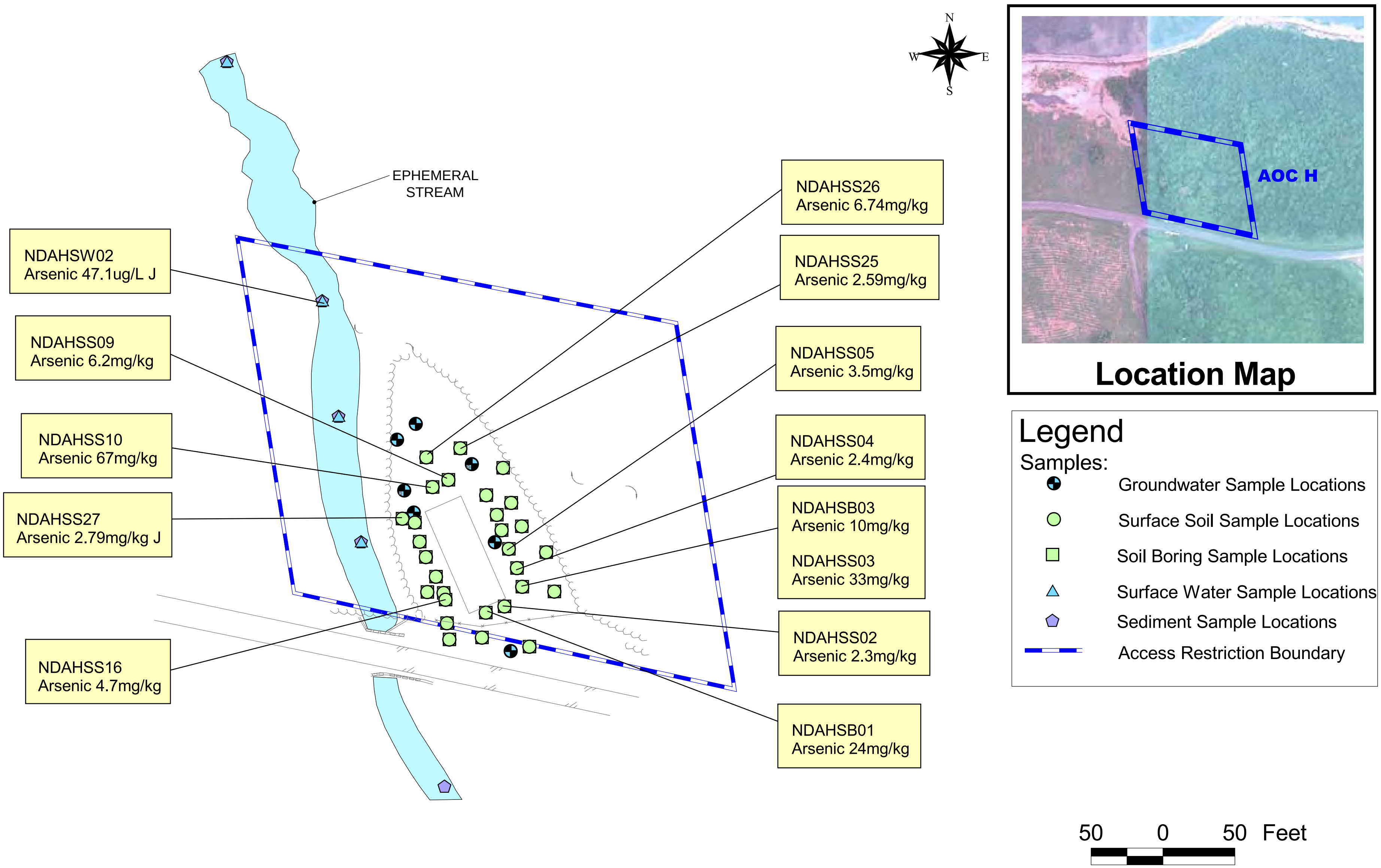


FIGURE 5-3
Arsenic Detections above Background in All Exposure Media
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

SECTION 6

Human Health Risk Assessment

A human health risk assessment (HHRA) was conducted for AOC H, as proposed in the work plan (CH2M HILL, 2003b). The data used for this risk assessment are presented in Section 4, and the fate and transport of the detected chemicals are discussed in Section 5.

6.1 Baseline Human Health Risk Assessment

This section presents results for a baseline risk assessment from potential exposure to various environmental media at AOC H. The baseline risk assessment refers to the risks characterized under "as is" conditions, based on the assumption that no remedial actions are conducted for the current and potential future land use. The human health risk assessment evaluated potential risks and hazards that could result from exposures to site media including soil, sediment, surface water, and groundwater at AOC H. The assumptions used for the quantitative exposure and risk estimations are conservative and are the same as those presented in the work plan and other risk assessment reports prepared for the former NASD (CH2M HILL, 2003a). All of the potential exposure pathways were considered during the risk assessment, and future residential land use was conservatively assumed for AOC H, although site conditions, such as its small size and location near a roadway and immediately adjacent to a ephemeral stream, tend to preclude this site from residential land use. A future residential exposure scenario was included for comparison, as regulatory agencies often request inclusion of this pathway in risk assessments. Inorganic chemicals detected in site media were retained for risk estimation, without comparing them to background levels.

The risk assessment is in accordance with the pertinent EPA guidance, most of which is included in the documents listed below.

- EPA, 1989. *Risk Assessment Guidance for Superfund (RAGS),* Volume 1: *Human Health Evaluation Manual.* Part A. EPA/540/1-89/002.
- EPA, 1990b. *Guidance for Data Usability in Risk Assessment*. EPA/540/G-90/008.
- EPA, 1991a. *Risk Assessment Guidance for Superfund (RAGS),* Volume I: *Human Health Evaluation Manual.* Supplemental Guidance: *Standard Default Exposure Factors.* OSWER Directive 9285.6-03.
- EPA, 1997b. *Exposure Factors Handbook*. EPA/600/P-95/002Fa.
- EPA, 2001b. *Risk Assessment Guidance for Superfund (RAGS),* Volume I: *Human Health Evaluation Manual.* Part E: *Supplemental Guidance for Dermal Risk Assessment.* Interim.
- EPA, 2001d. *Risk Assessment Guidance for Superfund* (RAGS), Volume I: *Human Health Evaluation Manual.* Part D: *Standardized Planning, Reporting and Review of Superfund Risk Assessments.* Final. December.

The risk assessment approach used was discussed with the EPA, PREQB, and their consultants during the preparation of the no further action (NFA) report for nine sites at the former NASD (CH2M HILL, 2003a). The same risk assessment approach and assumptions agreed upon for the other sites at the former NASD were implemented at this site as well. The risk assessment was presented in the RAGS Part D format to ensure consistent documentation of the risk calculation process and input assumptions, as requested by the EPA and PREQB during their review of an earlier report (CH2M HILL, 2003a). Copies of the site-specific risk assessment tables, provided in RAGS Part D format, are presented in Appendix J.

6.2 Conceptual Site Exposure Model

A more detailed discussion on fate and transport pathways and the CSM is presented in Section 5. The CSM qualitatively defines the various contaminant sources, release mechanisms, migration, and persistence of contaminants in the media at the site. Based on the available site information, a flow chart of the potential migration pathways for detected chemicals, exposure pathways for the environmental media, potential human receptors, and ecological receptors was prepared and represented in Figure 5-1, and a graphic of the CSM was presented Figure 5-2.

AOC H is an abandoned building that was used to house power generation equipment and large diesel generators in the early 1940s. Based on the investigations conducted during the EBS (ERM, 2000), there is no PCB contamination on the floor of the building. From the 1960s to the 1980s, the Navy used the building for fire-training operations. During these operations, diesel fuel was poured over rubber tires inside the building and ignited to simulate structure fires. No activity has been reported at the site since. The diesel used for the fire training was stored in ASTs located on the west side of the building. These ASTs have since been removed.

Currently, AOC H consists of an abandoned concrete building, approximately 80 feet long and 25 feet wide, located within a relatively flat area. The building and the surrounding area is relatively small, about one-half acre in size. The site is a few feet north of Highway 200 and is approximately 200 feet south of Vieques Passage (Figures 2-2 and 2-3).

A 20- to 40-foot-wide, and 3- to 6-foot-deep ephemeral stream extends along the western boundary of the site; it drains to Vieques Passage and can receive backwash during tidal surges. There is no water south of the bridge on Highway 200. The drain under the bridge that connects the upstream water flow to the ephemeral stream is a few feet above the water level in the ephemeral stream, so the ephemeral stream south of the bridge has water only during rain events. However, the ephemeral stream contains water continuously on the north side of the bridge. It is filled with brackish water and is mostly stagnant. Based on the June 2003 hydraulic tidal study, there is no daily tidal influence on surface water in the ephemeral stream, though it was observed to have elevated water levels after rainfall events. Groundwater in wells nearer to the ephemeral stream had an increase in the water levels as well. Sand barriers tend to shift with storm events, making the connection between the ephemeral stream and Vieques Passage dynamic and subject to change with extreme weather conditions.

The site is inactive and overgrown at the present time. The site is ecologically active, attracting lizards, bats, and birds. Vegetation around the site is dense. There is a thorn scrub forest to the east, a mixed thorn scrub and coastal forest to the west and north, and a grassy road shoulder at its southern end. Photographs included in Section 2 present the site conditions and visual features at AOC H. The future land use according to the Puerto Rico Planning Board (PRPB) for this area of the former NASD is as a resource conservation area with no development in the future. However, the location of the abandoned building is adjacent to the main access road, Highway 200, and thus is readily accessible to visitors driving to Green Beach on the northwestern edge of the island. However, it does not offer an attractive location due to the dense vegetation around the building.

The risk assessment included all potential exposure pathways under current and future land use to provide a range of risk management options. Potential future human receptors included in the risk estimations are recreational visitors or trespassers, as well as workers involved in maintenance along the road. In accordance with the conservative approach adopted for this risk assessment, various worker populations were evaluated: maintenance workers, industrial workers, and construction workers. A residential land use is also assumed to estimate the worst-case exposure conditions, although it is highly unlikely that housing would be built on this site.

The exposure media evaluated for AOC H were soils (surface and subsurface), sediment, surface water, and groundwater. Direct exposures to both surface and subsurface soils were evaluated. Subsurface soil exposures could occur to a construction worker and future residents, if the site is developed and construction occurs in the area as part of future development. The site groundwater is brackish, making it unsuitable as potable water source. However, for conservative risk evaluation, groundwater was evaluated for potential future potable use. Exposure routes evaluated for all of the human receptors included ingestion, dermal contact, and inhalation exposure to soil, and ingestion and dermal contact with sediment, surface water and groundwater. No volatile chemicals were identified in groundwater, sediment, or surface water, so the inhalation exposure pathway is incomplete for these media. The exposure pathways, receptors, and routes are discussed further in the exposure assessment section.

6.3 Current and Future Land Use

Figure 6-1 presents the future land use plan for former NASD according to the Puerto Rico Planning Board. Although the former NASD occupies approximately 8,000 acres, most of the area is undeveloped. AOC H and the surrounding area were transferred to the MOV. The site is not in use; it is proposed to be retained as a conservation area along with the coastal lands in this portion of the island, and thus, future development is not likely for this site. However, it may be released for unrestricted land use if the risk assessment results indicate that site conditions are protective of human health and the environment. Currently, the building is occupied by fruit bats and thus has some ecological significance, which is discussed further in Section 7.

6.4 Groundwater Quality at AOC H

The lithology throughout AOC H is variable due to alluvial deposition and activities related to construction of the former power plant. The geology primarily consists of intermingled pockets of sand, silty sand, and gravel (Figure 2-5). The abandoned building is situated on top of a discontinuous clay layer. Clay and gravelly clay lenses are also present from 5 to 15 feet bls.

Groundwater flows generally north-northwest toward the Vieques Passage; however, in the southern portion of the site, groundwater flows in a more westerly direction toward the ephemeral stream (Figure 2-6). The depth to groundwater ranges from approximately 3 to 8 feet bls, depending on the season and location at AOC H.

A hydraulic tidal study was conducted in June 2003. Tidal fluctuations up to 0.2 foot were observed in monitoring wells NDAHMW03 and NDAHMW04, located in the central portion of the site. In monitoring well NDAHMW02, no tidal influence was observed, though water levels there are influenced by water levels in the ephemeral stream. The rain event and increase in the surface water elevation did not significantly impact the interior wells during the study. Specific conductance data collected during groundwater sampling events indicate that groundwater from wells adjacent to the ephemeral stream has higher salinity than groundwater from the interior of the site.

Based on an evaluation of the field data collected during sampling events, the groundwater at AOC H (as at all coastal sites) is influenced by the brackish surface water in the vicinity. In addition, the shallow groundwater is brackish, making it unsuitable for potable use.

6.5 Summary of Sample Collection and Analysis

Section 3 presents a discussion of the sampling conducted for the RI. Section 4 presents a detailed analysis of the samples collected for site characterization, collected during the Expanded PA/SI and the RI at AOC H. Analytical results are presented in Appendix G. Surface and subsurface soils were evaluated for direct exposure potential through contact with human receptors and indirect exposure potential through fugitive dust emissions and leaching to groundwater. Surface soil, sediment, surface water, and groundwater samples were collected as part of the Expanded PA/SI, and additional samples were collected for all four media as part of the RI. Figures 4-1 through 4-9 show the sampling locations for surface soils, subsurface soils, groundwater, sediment, and surface water, as well as chemicals identified as exceeding the screening criteria and background during preliminary screening in Section 4.

A total of 33 surface soil samples and subsurface soil samples were collected from this small site and are included for selection of COPCs in the HHRA (Table 6-1).

Six monitoring wells and one temporary well are located at the site to monitor the shallow aquifer: four were installed and sampled in 2000, and two were resampled in 2003. Three new monitoring wells were also installed during the RI and sampled as described in Section 4. Thus, a total of nine groundwater samples were included for the risk assessment (Table 6-2). Depth to groundwater at one monitoring well (MW-06) exceeds 6 feet bls and therefore was not included in the dataset for groundwater available for contact by construction workers (i.e., the 0 to 6 ft interval).

Four sediment and four surface water samples were collected from the adjacent ephemeral stream for assessment of potential runoff from AOC H (Figure 4-9). Additionally, one upstream sediment sample was collected from the dry ephemeral stream upstream of the ephemeral stream, south of the bridge at Highway 200 (Figure 3-4).

Copies of the sampling logs and boring logs for individual samples are included in Appendixes A through E.

6.5.1 COPC Selection for Human Health Risk Assessment

The screening criteria used for the COPC selection are discussed in detail in Section 4, where each of the samples was compared against the screening criteria (Appendix G, Table G-2). The potential migration and fate of the detected chemicals are discussed in Section 5. In the risk assessment, maximum concentrations of detected chemicals were compared to the current EPA Region 9 screening criteria for each sampling matrix. Although several of the inorganic chemicals occur above PRGs, these levels may be below background levels. No chemicals were eliminated based on their occurrence at background levels; this decision is consistent with recommendations from the reviewing agencies. The final site recommendations will be based on results of the human health and ecological risk assessments, as well as comparisons with the background levels appropriate for the inorganic chemicals.

The sampled media include surface soils, subsurface soils, sediment, surface water, and groundwater. For sediment and surface water COPC selection, EPA Region 9 soil and groundwater PRG values, respectively, were used. The following COPC selection process and the screening criteria used are listed by media below:

- Surface soil results were screened against human health direct exposure risk-based criteria for soils (residential) selected from the EPA Region 9 PRG table (EPA, 2002d). Noncarcinogenic risk-based concentration (RBC) values were reduced by a factor of 10 (Hazard Index [HI] = 0.1) to account for the potential presence of multiple chemicals.
- Subsurface soil as deep as 6 feet bls could be exposed during construction activities. Therefore, concentrations in soils down to this depth were compared against industrial PRG values, and the COPCs selected were evaluated for construction worker and residential exposures.
- Surface and subsurface soil results were compared against soil-to-groundwater leachability criteria (SSL) at a dilution attenuation factor (DAF) of 10. The leachability-based comparison results were discussed in Section 5.0.
- Sediment sample maximum detected concentrations were compared against residential soil PRG values for COPC selection for a recreational scenario.
- Surface water samples were compared against potable water use based tap-water PRG values, and chemicals with exceedances were identified as COPCs for a recreational scenario.

- Groundwater samples were screened against human health direct contact exposure risk-based criteria for groundwater. These values were the latest EPA Region 9 tap-water PRGs.

Chemicals with concentrations below the PRGs were eliminated, and those with concentrations above the PRGs were retained as COPCs. Tables 6-1 through 6-4 present the COPCs selected by comparing maximum detected concentrations in each medium against the screening criteria noted above. A more detailed listing of the COPC screening is presented in Table 2s in RAGS Part D format in Appendix J.

Table 6-1 presents the COPCs identified for surface and subsurface soil at AOC H. For surface soil, two polycyclic aromatic hydrocarbons (PAHs) (n-nitroso-di-n-propylamine and benzo(a)pyrene), two chlorinated pesticides, and several metals were identified as COPCs based on exceeding residential criteria. The site's past use as a fire training area and associated site maintenance-related pesticide use could be the source of the organic chemicals identified in the site soils. All other COPCs were inorganic chemicals that also occur commonly in the background and were compared against background levels at the end of this section. However, all the inorganic chemicals detected were screened by comparing maximum detected concentrations against screening criteria. Chemicals that exceeded criteria were included as COPCs, as listed in Table 6-1. For subsurface soil (2-6 ft), only arsenic was identified as a COPC (Table 6-1). For total soil (0-6 ft), arsenic and n-nitroso-di-n-propylamine were identified as COPCs for construction workers. At the end of this risk assessment, inorganic chemical levels were compared with background levels to determine if their occurrence is site-related.

In Table 6-2, the groundwater COPCs are compared against screening criteria for potable use. One organic and several inorganic chemicals were identified as COPCs. The organo-chlorine pesticide p,p'-DDD was detected twice in well NDAHMW02 and once in NDAHMW05 (Figures 4-4 and 4-5). Total arsenic was detected, but dissolved arsenic was not detected in any of the site wells. The detected arsenic was included as a groundwater COPC for the risk assessment. Only total (unfiltered) groundwater sample results were included in the risk assessment. In addition, the groundwater COPCs identified for a construction worker (based on all groundwater data for locations where groundwater may be present within 6 ft of the site surface) are presented. For this groundwater data grouping, p,p'-DDD and various inorganics were identified as COPCs.

The COPCs identified for sediments and surface water are identified in Tables 6-3 and 6-4, respectively. For both media, only inorganic chemicals were identified as COPCs. Surface water unfiltered sample results were included for the HHRA.

Although COPC selection was not based on background levels comparisons, at the end of the risk assessment the detected inorganic chemicals were compared with background levels to determine whether the estimated risks are site-related. For soil background levels, previously established basewide background levels were used for comparison with site soil inorganic chemical levels to determine whether the COPCs qualify as chemicals of concern (COCs). One monitoring well, NDAHMW01, was installed directly south of the site adjacent to the road (Figure 3-3). This location is upgradient of the site and represents background conditions. Although this single well presents only limited data, it was used to represent background conditions for the site. Site-specific background samples were also collected for sediment at AOC H. Collection of a background surface water sample was proposed in the work plan; however, due to the absence of standing water south (upstream) of the site, no such background surface water sample could be collected. The sitewide background surface water data will be used for comparison with AOC H surface water data.

6.6 Exposure Assessment

An exposure assessment was performed to evaluate the potential exposure of the identified human receptors to the site media based on current or anticipated future land use for AOC H. The exposure assessment included potential exposure pathways for human receptors, potential routes of exposure, exposure factors assumed, and exposure concentrations estimated.

6.6.1 Potentially Exposed Populations

The U.S. Navy ceased facility-wide operations on the former NASD on April 30, 2001, in accordance with the January 30, 2000, Presidential Directive to the Secretary of Defense relating to the transfer of lands of the Navy-owned western portion of Vieques. The land transfer was completed on May 1, 2001, and the Navy has had no presence in this portion of the island since that date. The potential future land use plan prepared by the PRPB is presented in Figure 6-1. Additional land transfer details are provided in Section 2.7 regarding the regulatory status of the site.

The former NASD is currently an inactive facility. The area that includes AOC H is part of the property transferred to the MOV, and no specific plans exist for future use of this site and its surrounding area. However, for AOC H, unrestricted land use was assumed; it is the most conservatively protective assumption available for risk assessments. No known human receptors are present, based on the existing land use at AOC H. Because the site is adjacent to Highway 200, it is plausible for visitors to access the site. In accordance with anticipated future land use considerations, the following potentially exposed populations were identified for the risk assessment:

- Maintenance workers
- Construction workers
- Industrial workers
- Recreational receptors (adult, youth, and child)
- Residential receptors (adult and child)

Other potentially exposed populations could exist, though their exposures would likely be lower than exposures to the populations listed above. If the listed receptors are protected, all other potentially exposed populations will also be protected.

Exposure assumptions were selected to be conservatively representative and thus estimate the possible upper-bound exposures by using the reasonable maximum exposure (RME) levels from the EPA guidance. In addition, when multiple exposure factors were available, the most conservative factor was selected to ensure conservatism in the exposure assessment. The exposure factors were selected from various sources such as the following EPA guidance:

- EPA, 1989. *Risk Assessment Guidance for Superfund (RAGS)*, Volume I*: Human Health Evaluation Manual*. Part A, Interim final. December.
- *EPA, 1991a: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final*. OSWER Directive 9285.6-03. March
- EPA, 1997b. Exposure Factors Handbook. EPA/600/P-95/002Fa.
- EPA, 2001b. *Risk Assessment Guidance for Superfund (RAGS),* Volume I*: Human Health Evaluation Manual*. Part E, *Supplemental Guidance for Dermal Risk Assessment*, Interim draft. September 2001.
- EPA, 2001c. *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites,* Peer Review Draft. OSWER 9355.4. March.

The following subsections provide descriptions of the individual potentially exposed populations that were evaluated in this risk assessment. Table 6-5 presents the exposure pathways and receptor summaries included in this risk assessment.

6.6.1.1 Maintenance Workers

No maintenance activities are occurring at AOC H at the present time. This exposure pathway under current conditions, therefore, is incomplete. The site is located in a conservation area that is not planned for any future development. However, if in the future the site is developed for an alternative land use, the site activities may include mowing and facilities maintenance. Based on the likely occupational duties, it was assumed that maintenance workers would have the potential for direct or indirect contact with surface soils. A direct exposure to groundwater was not assumed for a maintenance worker. The site groundwater is not currently being used (i.e., pumped), and the activities assumed for a maintenance worker would not result in exposures to site groundwater. Therefore, the groundwater exposure pathway is incomplete for a maintenance worker, and this pathway was not evaluated for the maintenance worker scenario. The exposure assumptions for this scenario include a maintenance activity occurring once a week (52 days/year), with the workers spending the entire workday on the site. The soil ingestion rate (IR) is 100 milligrams per day (mg/day), for an exposure duration (ED) of 25 years. The tables in Appendix J include the relevant details on these exposure assumptions

6.6.1.2 Construction Workers

A future construction worker scenario was evaluated for total soil (0-6 ft) exposure at AOC H. The COPCs were selected by comparing detected concentrations in soil samples from the 0-6 ft interval against industrial PRGs. Typically, construction work is assumed to last for 6 months, resulting in an EF of 250 workdays per year, and an ED of 0.5 year (6 months). The soil IR for a construction worker is 330 mg/day, which is higher than for any other worker scenario. With the exception of the particulate emission factor (PEF), all other exposure factors are similar to those of an industrial worker scenario, as shown in the risk tables in Appendix J. The exposure point concentrations (EPCs) for a construction worker were calculated by using the total soils analytical data.

Dermal contact exposures to site groundwater within 6 ft of land surface were also evaluated. The COPCs were selected by comparing detected concentrations from all groundwater sampling locations except MW-06 (where groundwater exceeds 6 ft bls) to tap water PRGs..

6.6.1.3 Industrial Workers

This scenario was evaluated assuming that the site may be used for a future industrial facility where a worker spends the entire workday at the site in direct contact with soils and using site groundwater while at work. This is a conservative assumption, considering that the site is small in area and the surrounding area is too close to Highway 200 and the ephemeral stream for additional industrial development. For risk management purposes, the site was evaluated for a future industrial land use.

Industrial workers were also assumed to be indoor workers and to have potential exposure to site groundwater as a potable water source. The industrial worker assumptions include a soil IR of 100 mg/day and a groundwater IR of 1 liter (L)/day (EPA, 2001c). The EF is 250 days/year, and the ED is 25 years. The dermal exposure route assumptions were selected for all receptors from the EPA dermal guidance, as cited above.

6.6.1.4 Recreational Receptors

Currently, it is possible that visitors traveling on Highway 200 could casually access the site, although vegetation growth is dense at the present time. Recreational receptors are assumed to have direct contact with site soils, surface water, and sediment. Recreational users are not expected to have exposure to site groundwater, so a groundwater exposure pathway is incomplete. Though the site is too small for recreational activities involving an entire outing time within the site, such a scenario was assumed as a conservatively protective pathway evaluation. Both recreational adult and child receptors were evaluated. Adult and youth receptors were assumed to have an IR of 100 mg/kg, each. A child receptor is assumed to have a soil IR of 200 mg/day. All three recreational receptors are assumed to visit the site both days of the weekend, every weekend of the year. The EF for an adult is 104 days/year with an ED of 24 years. Exposure for youth is assumed to have a EF of 104 days for a duration (ED) of 10 years. A youth is assumed to be 8 to 18 years of age; an exposure duration (ED) of 10 years is assumed. The EF value of 52 days/year assumes one visit per week (i.e., each weekend) throughout the year. The ephemeral stream adjacent to the site is small, relatively narrow, overgrown, and surrounded by steep edges. It is not similar to a pool of water such as rivers, lakes, or oceans. The frequency of exposure is assumed to be half the time a recreational visitor is present at the site.

6.6.1.5 Residential Receptors

To evaluate the most conservative future land use scenario for the site, residential land use was considered to occur where site-specific conditions permit. Future residents were assumed to have direct contact with surface and subsurface soils and to use site groundwater as their potable water source. The site is an abandoned concrete building, has an ephemeral stream adjacent to it, is small in area, and is close to the access road; these elements make it undesirable for residential use. However, this scenario was evaluated to provide the most conservatively protective risk estimation. If the risks for this scenario are within target limits, the site can be used for unrestricted (i.e., residential) land use. The default exposure assumptions for an adult and child were used, as listed in the above guidance. A child is assumed to have an EF of 350 days/year and an ED of 6 years. For an adult, the EF is 350 days/year, and the ED is 24 years. Thus, the total ED for a residential receptor is 30 years.

6.6.2 Exposure Route Factors

The exposure route factors used for intake and risk estimates at the site, for each receptor identified, are listed in Table 4.1 through 4.9 of the RAGS Part D tables (Appendix J), as well as the site-specific risk estimation tables. All of the risk estimations are presented in RAGS Part D format in this RI report, as the EPA guidance recommends using this format to minimize the narrative text documentation in the report.

6.6.2.1 Surface and Subsurface Soil Ingestion

Table 4s of Appendix J include detailed listing of the exposure factors and equations used for soil intake assessments. Ingestion exposures to surface soil were evaluated for the appropriate receptors and media identified in the site-specific CSM. Subsurface soil (2-6 ft) exposure was also evaluated for a future residential receptor, and total soil (0-6 ft) exposure was evaluated for a future construction worker.

6.6.2.2 Groundwater Ingestion

The shallow water-bearing zone has brackish water that is not suitable for potable use at AOC H. The tidal study indicated a connectivity between the ephemeral stream and the site groundwater, particularly in the water closer to the ephemeral stream; this also suggests that the groundwater in this area is similar to the ephemeral stream water, which has high salinity. However, for conservative risk evaluation purposes, potable use is assumed.

6.6.2.3 Sediment Ingestion

Ingestion exposures to sediments were evaluated for the recreational receptors. The ingestion intake assumptions are based on common use at other federal sites, developed using best professional judgment in consultation with EPA at other federal sites (see Table 4s in Appendix J).

6.6.2.4 Surface Water Ingestion

Ingestion exposures to surface water were evaluated for the recreational receptors. The citation for the selected exposure factors is listed in footnotes to Table 4s in Appendix J, per RAGS Part D guidance.

6.6.2.5 Surface and Subsurface Soil Dermal Contact

The skin surface area available for contact was estimated using best professional judgment and was based on current practices derived from EPA guidance (EPA, 2001b). The surface areas used were selected from the latest dermal guidance (RAGS Part E, EPA, 2001b). The soil adherence factors were estimated using body-part and activity-specific data, also from RAGS Part E. In addition, the dermal exposure estimation was performed according to the equations in RAGS Part E (Table 4s, Appendix J).

6.6.2.6 Groundwater Dermal Contact

Residential receptors were assumed to have dermal contact with groundwater. Dermal contact was assumed to occur through showering/bathing. An industrial worker is assumed to have a dermal exposure via handwashing while at work. A construction worker is assumed to dermally contact shallow groundwater that has seeped into excavations. The dermal exposure estimation was performed according to the equations in RAGS Part E (Table 4s, Appendix J).

6.6.2.7 Sediment Dermal Contact

Dermal contact with sediments during wading in the ephemeral stream was evaluated for the recreational receptors. The dermal contact intake assumptions are included in Table 4.3 in Appendix J for an adult, a youth, and a child. These assumptions are based on common use at other federal sites, developed using best professional judgement in consultation with EPA at other federal sites (see Appendix J).

6.6.2.8 Surface Water Dermal Contact

Dermal contact with surface water during wading in the ephemeral stream was evaluated for the recreational receptors. The dermal contact intake assumptions are included in Table 4.4 in Appendix J for AOC H for an adult, a youth, and a child. These assumptions are based on common use at other federal sites, developed using best professional judgment in consultation with EPA at other federal sites (see Appendix J).

6.6.2.9 Surface and Subsurface Soil Inhalation

Inhalation of dust from surface soils was assumed to occur for workers, recreational users, and residential receptors. For construction workers, total soil exposure via inhalation of dust was evaluated.

The default PEF of 1.36×10^{9} m^3/kg from the latest supplement to the EPA soil screening guidance listed above (EPA, 2001c) was selected for all receptors except the construction worker. The site is mostly overgrown with no clear space for mowing/maintenance. The remains of the former building are covered with vines and weeds. Thus, there is no exposed soil for generation of dust. The conservative assumptions used in the default PEF derivation by EPA were used because this pathway does not significantly contribute to overall intake from various pathways. Any calculation of site-specific PEF values would be for a hypothetical configuration of the exposed areas for dust generation, and thus will not be more pertinent to the site.

For the construction worker scenario, a site-specific PEF of 1.33×10^{7} m^3/kg was calculated using equations presented in EPA guidance (EPA, 2002). The calculated PEF is presented in Table 4.9 Supplement in Appendix J.

6.6.2.10 Groundwater Inhalation

This pathway was determined not to be applicable at AOC H, as there is no VOC contamination in the groundwater.

6.6.2.11 Chemical-Specific Factors

Dermal absorption factors (ABS_{dermal}) and permeability constants (Kp) were obtained from RAGS Part E, as listed above (see Table 7s in Appendix J).

6.6.3 Exposure Quantitation

Intake estimates and EPCs are discussed below.

6.3.3.1 Intake Estimates

The intake estimates for each exposure route identified are listed along with the intake factors used for intake estimations in the RAGS Part D tables (Appendix J). For each receptor identified in the exposure assessment as having a complete exposure pathway, chemical- and media-specific intakes, known as chronic daily intakes (CDI), were estimated using the appropriate exposure factors and assumptions. The exposure assumptions used for the scenarios identified above are listed in Appendix J.

Chronic exposure (represented by CDI) is expressed in terms of milligrams of chemicals contacting the body/kilogram of body weight/day (mg/kg/day). For the exposure routes evaluated, the following generic equation applies:

$$Exposure(mg / kg / day) = \frac{C \; x \; IR \; x \; ED \; x \; EF}{BW \; x \; AT}$$

where

C = concentration of chemical in medium, or EPC
IR = intake or ingestion rate
EF = exposure frequency
ED = exposure duration
BW = body weight
AT = averaging time (period over which exposure is averaged)

Appendix J includes tables (Table 4s) of exposure factors for the potential receptors, exposure routes, and exposure pathways.

6.6.3.2 Exposure Point Concentration

The EPC is the reasonable upper-bound estimate of the mean concentration that is contacted over the exposure period. EPA recommends that the EPC be near the UCL95 , which is approximately 95 percent of the arithmetic average (EPA, 1989).

The UCL95 was calculated using site data and the latest EPA's ProUCL tool (EPA, 2003a). The estimated EPC values were the upper confidence limits at 95% or higher (UCL97.5% and UCL99%) above the mean. In estimating the EPCs, one-half the detection limit was assumed for nondetects. The results of the estimated EPCs for surface soil, subsurface soil, groundwater, sediment, and surface water are summarized in Tables 6-6 to 6-9 and presented in Table 3s in more detail in Appendix J.

The ProUCL version (v. 2.1) that was available at the time the RI Report was written was used to prepare the risk assessment for all receptors except construction workers. The table below presents a comparison of UCL estimates using ProUCL version 2.1 and version 3.00.02 for soil and groundwater COPCs in the risk assessment. ProUCL was not used to calculate EPCs for COPCs in surface water or sediment due to the small number of samples available (four from each medium). The table indicates that most of the UCLs remained similar or decreased (which would result in unchanged or decreased risk estimates). Only two surface soil EPCs (DDT and arsenic) were higher using ProUCL v. 3.00.02; EPCs for two surface soil COPCs (iron and manganese) were lower, and EPCs for the remaining eight surface soil COPCs remained the same. If surface soil risk estimates were revised based on EPCs calculated using ProUCL v. 3.00.02, they would be slightly higher than those based on ProUCL v. 2.1, but the overall conclusions for the receptors would remain the same (risk estimates would remain within the target risk range).

Only one subsurface soil COPC (arsenic) was identified in the risk assessment for residents and industrial workers. The EPC of arsenic was slightly higher using ProUCL v. 3.00.02. Therefore, if subsurface soil risk estimates were revised based on EPCs calculated using ProUCL v. 3.00.02, they would be slightly higher than those based on ProUCL v. 2.1, but the overall conclusions for the receptor would remain the same (the risk estimate would remain within the target risk range).

The EPCs for the groundwater COPCs were the same for some COPCs and lower for other COPCs using ProUCL v. 3.00.02. Therefore, if groundwater risk estimates were revised based on EPCs calculated using ProUCL v. 3.00.02, they would be lower than those based on ProUCL v. 2.1.

Thus, using the most recent version of ProUCL would result in slightly higher risk estimates for soil and lower risk estimates for groundwater, and the overall conclusions for each receptor would remain the same (i.e., within the target risk range).
The most recent version of ProUCL (v 3.00.02) available at the time that the construction worker risk estimates were revised was used to calculate EPCs for soil and groundwater for the construction worker scenario.

COMPARISON OF COPC UCL95% VALUES BETWEEN PROUCL V. 2.1 AND PROUCL V. 3.00.02

Medium	COPC	ProUCL v.2.1	ProUCL v. 3.00.02
Surface Soil	Benzo(a)pyrene	0.1	0.1
	n-nitroso-di-n-propylamine	0.7	0.7
	p,p'-DDE	1.7	1.7
	p,p'-DDT	0.6	0.8
	Aluminum	8259.6	8259.6
	Antimony	1.1	1.1
	Arsenic	19.0	27.3
	Chromium, total	20.1	20.2
	Iron	21318.2	18906.0
	Manganese	484.3	430.2
	Thallium	0.6	0.6
	Vanadium	47.8	47.8
Subsurface Soil	Arsenic	6.6	9.5
Groundwater	p,p'-DDD	0.42	0.4
	Aluminum	9100	8389.6
	Antimony	5.4	5.4
	Arsenic	6.3	6.3
	Barium	347.45	347.5
	Cadmium	2.99	2.6
	Chromium, total	15	9.8
	Iron	7025	7025.3
	Manganese	14800	14800.0
	Thallium	44.2	28.4
	Vanadium	70.0	38.1

6.7 Toxicity Assessment

The toxicity criteria used in this risk assessment were obtained from the following sources:

- The Integrated Risk Information System (IRIS), a database available through the EPA National Center for Environmental Assessment (NCEA) in Cincinnati, Ohio. IRIS, prepared and maintained by the EPA, is an electronic database (http://www.epa.gov/iris/) containing health risk and EPA regulatory guidance information regarding specific chemicals. This database was the primary source of toxicity values used.
- For chemicals with no toxicity criteria listed on IRIS, EPA Region 2 contacted the National Center for Environmental Assessment (NCEA) for interim toxicity criteria. The toxicity profiles provided by EPA are included in Tables 4s and 5s in Appendix J.
- For vanadium, as IRIS or NCEA did not have a toxicity criterion, the Health Effects Assessment Summary Tables (HEAST) was used. HEAST is provided by the EPA Office of Solid Waste and Emergency Response (OSWER; EPA, 1997c), which compiles toxicity values published in various health effects documents issued by EPA.
- For chromium, a hexavalent chromium-based toxicity factor was used as a conservative risk evaluation measure.

The toxicity profiles for aluminum and iron were provided by EPA Region 2 for an earlier report and are included in Appendix J. The toxicity criteria for the COPCs are presented in Table 5s and 6s in Appendix J.

6.7.1 Dermal Toxicity Factors

Adjustments of oral toxicity values were considered to estimate the effects of a dose absorbed through the skin. Recommended ABS_{GI} values from RAGS Part E (EPA, 2001b) were used. These values are provided in the RAGS Part D-formatted tables in Appendix J for the identified COPCs.

6.7.2 Inhalation Toxicity Factors

Inhalation reference dose values (RfDs) derived from inhalation reference concentration values (RfCs) were listed in Table 5s (Appendix J). Inhalation cancer slope factors (CSFs) derived from inhalation unit risk factors are listed in Table 6s (Appendix J).

6.8 Risk Characterization

The exposure and toxicity information was integrated to estimate the potential cancer risks and noncancer HI. The estimated excess lifetime cancer risk (ELCR) and HI are provided for use in site-specific risk management decisions. The cumulative ELCRs and HIs are compared against the target risk ranges. For the purposes of risk management decision making, the target risk range of 1E-4 to 1E-6 (1 to 100 in a million) was used for site risk estimations, in accordance with EPA guidance, which provides the acceptable risk range for site risk estimations and decision making. Typically, results falling within or below this range are considered a reasonable basis for recommending NFA at a site. An HI value above

1.0 is further evaluated if any individual target organ HIs exceed a value of 1.0. Unless the cumulative HI to a target organ exceeds 1.0, it is typically not considered an exceedance or unacceptable hazard. The conservative approach used in this analysis and the uncertainty inherent in the risk assessment were considered when interpreting the results. The uncertainty associated with risk assessment is discussed in the uncertainty section below.

For **a current maintenance worker**, the ELCR for exposure to surface soils is 3.2E-6, which is within the target risk range of 1E-4 to 1E-6. The estimated HI for exposure to surface soils is 0.08 and is below the target HI of 1.0 for noncarcinogenic exposure. Thus, maintenance worker exposure to site surface soils is not a carcinogenic or noncarcinogenic health risk.

For **a future industrial worker**, the combined ELCR for exposure to surface soils and groundwater is 4.8E-5, which is within the target risk range of 1E-4 to 1E-6. The estimated HI for exposure to surface soils is 0.37 and is below the target HI of 1.0 for noncarcinogenic exposure. The estimated HI from groundwater is 11, which is above the target value of 1.0, due to the presence of thallium, iron, and manganese. The noncarcinogenic HI is above the target limit, primarily from inorganic chemicals in groundwater.

The ELCR and HI for a **construction worker** exposed to total soils and groundwater were 4E-7 and 5, respectively; the HI is above the target level due to manganese concentrations in groundwater. Thus, construction worker exposure to shallow groundwater in excavations presents a potential HI concern.

The estimated combined ELCRs for a **current/future recreational adult, youth,** and **child** exposed to surface soils, surface water, and sediment are 1.0E-5, 6.4E-6, and 1.7E-5, respectively, and are within the target risk range. HIs for a recreational adult, youth, and child are 0.23, 0.34, and 1.3, respectively. Only the child scenario exceeded a value of 1.0, and the target-organ-specific HI did not exceed 1.0. Thus, the site does not present an exposure concern for site trespassers or visitors.

For a **future residential adult**, the ELCRs are 1.9E-5 from surface soil, 5.2E-6 from subsurface soil and 9.0E-5 from groundwater. The combined ELCR of 1.4 E-4 is slightly higher than the upper-bound target of the cancer risk from arsenic in soil and groundwater. The HIs of 0.43 for surface soil and 0.03 for subsurface soil are both below the target value. The HI of 31 from groundwater is due to thallium, iron, manganese, and vanadium in groundwater.

For a **future residential child**, the ELCRs are 4.2E-5 from surface soil, 1.2E-5 from subsurface soil, and 5.2E-5 from groundwater, primarily from arsenic. These values are all within the target risk range. The combined ELCR of 1.1E-4 is slightly higher than the upper-bound target of the cancer risk from arsenic in soil and groundwater. The HI for exposure to surface soils is 3.6, which exceeds the target HI of 1.0, due to vanadium in soils. The HI for exposure to groundwater is 73 due to thallium, iron, manganese, vanadium, and arsenic in groundwater.

6.9 Uncertainties

This subsection summarizes the general uncertainties associated with various risk assessment steps.

The risk assessment included several assumptions regarding site conditions, EPC estimations, receptor behaviors, and exposure factors. Because these are assumed values, there is an inherent uncertainty associated with these hypothetical scenarios, as well as practical limitations to obtaining an actual value versus an assumed value. Also, the inclusion of chemicals that occur in background conditions attributes risks to a site, even though these chemicals are not likely to be related to the site operations. The toxicity factors supplied by the EPA use several extrapolation methods that contain inherent uncertainty and tend to include conservatively protective assumptions during such extrapolations. Such uncertainty in toxicity factors is not addressed in this assessment, as EPA sources provide adequate documentation of such uncertainty.

6.9.1 COPC Selection

The chemicals detected above the criteria are all inorganic chemicals that occur in soils as part of the natural mineralogy. All the COPCs identified in site soils have also been detected in the background soils. With few exceptions, the detected concentrations (Tables 6-11 and 6-12) are within the range of background samples presented in the draft soil, groundwater, surface water, and sediment background investigation report (CH2M HILL, 2001c) and site-specific background levels for groundwater and sediment. Site shallow groundwater is brackish, hydraulically connected with the surface water in the ephemeral stream, and unsuitable for potable use. Selection of COPCs based on potable water use criteria is part of the conservative approach used for this RA. This adds significant uncertainty to the risk estimations and does not add meaningful value to site management decision making; however, they are included based on existing guidance.

For some of the inorganic chemicals, there are no generic SSLs. However, these chemicals were detected within the range of background concentrations (see Table 6-11) for soils at the former NASD and are not attributable to site activities. Thus, they do not present a site-related specific threat of migration to groundwater. Therefore, despite the lack of a quantitative screening value, these COPCs do not represent site-related contamination but are probably part of the soil mineralogy; thus, there is no significance to the absence of SSL values.

Past operations at AOC H do not indicate the potential for release of thallium. Also, the groundwater analytical results obtained using a method that is capable of detecting thallium below the PRG levels did not identify thallium as a final COC. Thus, its presence is not suspected to be the result of a release, it is not pervasive in site media, and it is within health protective levels. Therefore, the estimated concentrations detected will not alter the risk assessment conclusions.

6.9.2 Exposure Assessment

The site is an abandoned power plant that was also used for firefighter training, but no activities are occurring at the present time. The site is overgrown with native plants. The assumption of future industrial and residential use is overly conservative. Groundwater in this area is brackish, so the potable use assumption is unrealistic and overly conservative. For the foreseeable future, any alteration to land use is unlikely to change the land use for the site itself, so exposure evaluations represent overly conservative assumptions for the risk estimations. Exposure assumptions in the risk assessment for AOC H are overly conservative, as they assume that each of the receptors spent their time within this small area. The statistical average estimates are based on a relatively large dataset (e.g., 64 soil samples) and thus are associated with relatively high confidence levels.

In the HHRA, it was assumed that hypothetical future residents are exposed to soil in the 0-to-2-ft interval, and the EPCs used in the intake calculations were based on soil concentrations detected in this surface interval. This assumption is expected to represent the most reasonable exposure scenario for a hypothetical future resident. However, the impact of assuming a deeper soil exposure interval (0-to-6 ft) was evaluated to determine if residential exposures to subsurface soil yield higher EPCs and therefore higher risk estimates. Results of this evaluation are provided in Appendix K as Tables K-1, K-2, and K-3. The EPCs for the 0-to-6-ft interval are provided in Attachment A to Appendix K. As shown in Table K-3 of Appendix K, with the exception of benzo(a)pyrene and manganese, the calculated EPCs for the 0-to-6-ft interval are lower than the EPCs for the 0-to-2-ft interval. The EPCs for benzo(a)pyrene and manganese in the 0-to-6-ft interval are only slightly higher than the EPCs in the 0-to-2-ft interval. Therefore, use of an assumed soil exposure depth of 0-to-2 ft versus 0-to-6 ft is not expected to significantly affect the results of the HHRA. However, the impact of the assumed residential exposure interval on the soil risk estimates is discussed quantitatively in Section 6.9.4.

The EPC for manganese in groundwater that was used to evaluate a construction worker exposure was based on the maximum detected concentration. However, a 6-month exposure to the maximum detection concentration (as assumed in the risk assessment) is unrealistic and results in an overestimate of exposure for a construction worker.

6.9.3 Toxicity Assessment

The uncertainty associated with extrapolation of animal toxicity data to humans is described in the EPA databases. Also, most of the inorganic chemicals, particularly iron, are essential nutrients, introducing additional uncertainty to the toxicity assumptions. In addition, all the toxicity studies are based on exposure to the pure form of the inorganic, and bioavailability limitations from exposures to soil minerals are not part of the toxicity assessments; this adds further uncertainty to these toxicity factors. The toxicity assessments conducted by EPA for thallium and vanadium have high uncertainty, as these are interim toxicity values developed in the 1990s due to the absence of adequate scientific studies to establish sufficiently peer-reviewed toxicity factors to be listed on the IRIS substance list. The available toxicity information does not include various mineral forms of these metals and their bioavailability to be applicable to those detected in soil minerals at Vieques.

Additionally, aluminum and iron toxicity reference doses were provisional values from 2001 obtained from NCEA at the draft phase of this risk assessment. These values have been withdrawn since that time. Because future toxicity factors for these constituents, if/when developed, may be different from those used in this risk assessment, the actual hazards/toxicity may be higher or lower than those estimated in this risk assessment. However, the next section in this document compares these naturally occurring inorganic chemicals to their respective background levels. Aluminum concentrations did not exceed its background level, and the concentrations of iron were comparable to its background level, which indicate any toxicity associated with these constituents is likely attributable to background.

Vanadium toxicity criteria have been revised by EPA since the original draft of the risk assessment report. Although the revised toxicity criteria would result in an estimation of a higher HI value for vanadium, the maximum vanadium concentration in site soil of 63 mg/kg is less than the established background concentration of 130 mg/kg. Thus, revision to the risk assessment is not warranted because it will not change the existing findings that vanadium is not from site operations and is consistent with background concentrations.

As noted above, the toxicity reference doses for certain constituents utilized during preparation of the risk assessment were provisional values from 2001 obtained from NCEA. Since that time, the NCEA provisional values for aluminum, iron, and vanadium have been withdrawn. Although it is EPA's policy to utilize the most current toxicity values for published reports, for this site-specific situation, the calculations will not be redone with the most current toxicity values because the ultimate conclusions regarding aluminum, iron, and vanadium would remain the same because their site-specific concentrations are comparable to background levels.

6.9.4 Risk Characterization

The propagation of uncertainty in the other steps such as COPC selection, exposure assessment, and toxicity assessment also introduces uncertainty into the risk estimates.

The HI estimated for a residential scenario was above 1.0 based on potable use of the site groundwater under a future residential land use scenario due to the presence of inorganic chemicals in groundwater. The inorganic chemicals contributing to an HI above 1.0 are thallium (HI=35), iron (HI=22), manganese (HI=7), vanadium (HI=5), and arsenic (HI=1.3). However, these metals were detected in samples analyzed for total metal concentrations, but not detected in the dissolved metals analyses from the same wells (see Table 4-6). These HIs represent the potential hazards associated with the ingestion of unfiltered water as a potable drinking water supply. Based on the quantitative data presented, that demonstrates that groundwater must be filtered prior to use as a potable drinking water supply, the HIs associated with actual exposure are likely to be lower.

The risk estimates for the hypothetical future residents are based on an assumed soil exposure depth of 0-to-2 ft. However, the impact of assuming a deeper soil exposure interval (0-to-6 ft) was evaluated to determine if residential exposures to subsurface soil yield higher risk estimates. Results of this evaluation are provided in Appendix K as Tables K-1, K-2, and K-3. The EPCs for the 0-to-6-ft interval are provided in Attachment A to Appendix K. As shown in Table K-3 of Appendix K and summarized below, the estimated ELCRs and screening HIs (all target organs combined) associated with soil exposures for both child and adult residents ***are lower*** for the 0-to-6-ft interval than for the 0-to-2-ft interval, as summarized below:

- Child Resident – Soil Exposure Scenarios
  - 0-2 ft soil interval – ELCR = $4x10^{-5}$, screening HI = 4
  - 0-6 ft soil interval – ELCR = $2x10^{-5}$, screening HI = 3
- Adult – Soil Exposure Scenarios
  - 0-2 ft soil interval – ELCR = $2x10^{-5}$, screening HI = 0.4
  - 0-6 ft soil interval – ELCR = $7x10^{-6}$, screening HI = 0.3

Therefore, use of a deeper soil exposure interval (0-to-6 ft) in the HHRA would lower the ELCR and HI estimates for future hypothetical child and adult residential receptors.

6.10 Comparison with Background Levels

A background study was conducted to characterize the environmental media for the western portion of Vieques Island (CH2M HILL, 2002b). The primary purpose of the study was to develop a set of background values for inorganic chemicals that occur commonly in environmental media; these values would then be used in comparison with values from sites investigated in the former NASD. Background soil characteristics are discussed in the Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M HILL, October 16, 2002b). The report notes that the soil inorganic concentrations from all soil types were statistically comparable.

Surface soil samples were collected from 0 to 6 inches bls from 26 background locations in the western portion of Vieques Island. Subsurface soil samples were collected from 11 of the surface soil sampling locations at depths ranging from 2 to 6 feet bls, depending on the depth to rock in the sampling area. Five rock samples were also collected from the southwestern end of Vieques. In addition, groundwater was sampled from five newly installed background wells. Also, a site-specific background well (NADHMW01) was installed upgradient of AOC H. One upstream sediment background sample was collected from the adjacent surface water body, and no surface water background samples could be collected as the ephemeral stream is dry in the upstream location.

Tables 6-11 and 6-12 show a comparison of the site soil and groundwater data against background levels. The sediment and surface water inorganic chemicals did not contribute to any cancer risks or HIs above target levels for any of the receptors. Therefore, a background comparison discussion is not included in this section for sediment or surface water.

The cancer risks or noncancer HIs from chemicals occurring in the background are also identified to determine whether estimated cancer risks or HIs are related to the site or are result of background conditions.

When risks and HI are similar to those of background conditions, site risk management actions are not recommended. The possible limitation of comparisons with site-specific background is availability of limited background data, and representativeness of the background hydrogeological conditions compared to site hydrogeological conditions. For example, only one sediment sample from a dry ephemeral stream is selected to represent sediments in the ephemeral stream, and one round of sampling from a single background well were used to compare with the site data. No site-specific surface water background data were collected for AOC H. This adds to uncertainty in a comparison of background data against site data. Table 6-10 includes a summary of the risks and HI estimated for the various receptors from potential exposure to soils, sediments, surface water, and groundwater.

6.10.1 Soils

Table 6-11 presents a comparison of background inorganic chemical levels for the chemicals contributing to cancer risks and/or HI above the target limits. These chemicals are identified as arsenic in surface and subsurface soil and vanadium in surface soil. As can be noted from the table, vanadium concentrations in site soil are within the background levels.

However, arsenic is elevated in both surface and subsurface soil above background levels. Therefore, arsenic is further discussed below.

6.10.1.1 Arsenic

Cumulative risks, when combined with the cancer risks from groundwater, were 4.5E-5 for an industrial worker , 1.0E-04 for a residential adult , and 1.3E-4 for a residential child (no groundwater exposure related risks were assumed for a recreational child). Site groundwater is not fit for potable use due to high salinity, thus the cumulative risks estimated for arsenic from both media are not applicable to this site. However, arsenic levels in site soil were above background soil levels. Therefore, to aid in site management decision whether to make site available for unrestricted future land use, the following discussion on arsenic distribution is included.

The highest arsenic level was reported in **surface soil** sample location NDAHSS10 at 67 mg/kg (see Table 4-4 and Figures 4-1 and 6-2) and compared to a background level of 2.2 mg/kg (see Table 6-11). The adjacent samples around this highest detected sample show slightly elevated concentrations (NDAHSS09 at 6.2 mg/kg and NDAHSS26 at 6.74 mg/kg). The second-highest arsenic level of 33 mg/kg was detected inside the building on the dirt floor, NDAHSS03, and is also elevated above background levels (Table 4-4 and Figure 3-1). Other soil samples (NDAHSS16, NDAHSS05, NDAHSS27, NDAHSS25, NDAHSS04, NDAHSS02, and NDAHSS06) had concentrations ranging between 4.7 mg/kg to 2.2 mg/kg, which were all also above background levels.

The **subsurface soil** had arsenic concentrations ranging between 0.016 mg/kg to 24 mg/kg (see Table 4-5 and Figure 6-3). Two subsurface soil locations had concentrations well above background. The maximum subsurface soil concentration was at NDAHSB01 at 24 mg/kg and at NDAHSB03 at 10 mg/kg. All other samples had arsenic levels at concentrations lower than the background value of 2.2 mg/kg. Both surface and subsurface soil arsenic concentrations were elevated at NDAHSS03 and NDAH SB03, from soils in the southeast corner of the building.

It is possible that site soils were disturbed, and thus subsurface soils also have elevated arsenic levels. The elevated arsenic is possibly from past pesticide use in and around the building, as other pesticides were also detected in the soils around the building.

Overall, arsenic at AOC H is elevated above background levels, though risks from arsenic in soils alone are within the target cancer risk range.

6.10.1.2 Vanadium

The noncancer HI was above a target value of 1.0 for a residential child at a value of 1.3 (Table 6-10). None of the other receptors had an HI above 1.0. The maximum site soil vanadium level was 63 mg/kg, compared to the background value of 130 mg/kg (Table 6-

10). None of the site vanadium levels exceeded the background levels; therefore, no further actions are recommended to address vanadium in soil at AOC H.

6.10.2 Groundwater

Table 6-12 presents a comparison of site groundwater inorganic levels with the background levels. Figure 6-4 presents the distribution of all detected inorganic chemicals that contribute to the cumulative cancer risks and HI above the target levels. Of the inorganic COPCs, arsenic, iron, manganese, thallium, and vanadium were identified to contribute to the cancer risks and HIs where totals for these exceeded the target values in groundwater.

The groundwater exposures are assumed to be possible for an industrial worker, residential adult and child, and construction worker. The estimated ELCR from exposure to groundwater to an industrial worker is 3E-5, from arsenic, and the estimated HI is 11, from iron, manganese, thallium, and vanadium. For a residential adult, the estimated ELCR from groundwater is 9E-5, almost entirely from arsenic, and the estimated HI from groundwater to an adult is 31, from iron, manganese, thallium, and vanadium. The residential child estimated ELCR is 5E-5, and the estimated HI is 73 from the same chemicals as for a residential adult. The ELCR estimated for a construction worker is 4E-7 and the estimated HI is 5 due to manganese in groundwater.

The tidal study conducted at AOC H indicated that the wells located adjacent to the ephemeral stream had measurable connectivity, where elevated water levels in the ephemeral stream were also reflected in the wells along the ephemeral stream (NDAHMW02). Wells located farther from the ephemeral stream did not show as much influence in the one monitoring event. Because the wells along the western edge (NDAHMW02, NDAHMW05, and NDAHMW07) of the site are closer to the ephemeral stream, an increase in salinity in water from these wells is expected and is reflected in the specific conductance measurements made in 2003.

The field data collected during the 2000 and 2003 groundwater sampling events are listed in Table 4-6 and summarized in Tables 5-1 and 5-2. Table 5-3 summarizes total (unfiltered) and dissolved (filtered) metals data for several metals. These data indicate that the aquifer is likely under oxic to reducing conditions. The ORP values during the 2003 sampling ranged from -12.2 to 301. Dissolved oxygen values were generally low in most wells.

During the 2003 sampling event, dissolved (filtered) manganese in wells NDAHMW02, NDAHMW05, NDAHMW06, and NDAHMW07 were elevated and similar to the unfiltered results, indicating that manganese-reducing conditions are likely present in some portions of the aquifer. Dissolved iron concentrations in wells NDAHMW02 and NDAHMW05 were also elevated and close to the unfiltered values, suggesting that iron-reducing conditions are also present in some portions of the aquifer. Under iron-reducing conditions, several ORP-sensitive metals, such as iron, manganese, and arsenic, are often found at elevated concentrations due to natural geochemical processes facilitated by groundwater bacteria.

6.10.2.1 Arsenic

Arsenic is the primary risk driver in soil and groundwater at the site. Arsenic was detected in one of the five wells at NDAHMW02, at a concentration 6.3 µg/L. Arsenic was not detected in this same well when resampled in 2003. However, this sample had elevated detection limits (see Appendix G). The filtered sample from the same well did not have detectable arsenic levels in either round of sampling. Arsenic was not detected in any other wells at this site.

As previously discussed, the well NDAHMW02 with the single arsenic detection is located along the ephemeral stream, which was shown to have hydraulic influence on groundwater elevations in wells near the ephemeral stream. The absence of arsenic detection in the subsequent sampling and the absence of dissolved arsenic in this well indicate that the one-time detection could be from suspended particulates. The turbidity measured in this well during the 2000 sampling event in which arsenic was detected ranged from 15.4 to 53.2 NTUs, which is above EPA's target maximum turbidity of 10 NTUs for groundwater samples. The turbidity data suggest that the detection of arsenic may have been related to the presence of suspended particulates during that sampling event. Its absence in wells closer to the site indicates that groundwater arsenic is not likely related to the site. Thus no further investigations or actions are recommended to address arsenic in site groundwater.

6.10.2.2 Iron

The HI from iron in groundwater is 22 to a residential child. Iron was detected at 8,200 µg/L in the site-specific background well, and only one well, NDAHMW02, exceeded this value in 2000 sampling, at a concentration of 11,000 µg/L. This well is adjacent to the ephemeral stream along with the other wells where total and dissolved iron was reported at the site (see Figures 3-3 and 6-4 and Table 4-6).

Dissolved iron concentrations in wells NDAHMW02 and NDAHMW05 were also elevated and close to the unfiltered values, suggesting that iron-reducing conditions are also present in some portions of the aquifer. Under iron-reducing conditions, several ORP-sensitive metals, such as iron, manganese, and arsenic, are often found at elevated concentrations due to natural geochemical processes facilitated by groundwater bacteria. Soil iron levels were not elevated. Overall, the groundwater iron at the site likely represents the normal geochemical conditions and does not appear to be associated with site activities.

6.10.2.3 Manganese

The HI from manganese in groundwater is 7 for a residential child and 5 for a construction worker. The maximum detected manganese, at 14,500 µg/L, was in well NDAHMW05. Wells NDAHMW02 and NDAHMW07 had very similar concentrations (see Table 4-6). The total manganese levels in the background well is 1,100 µg/L. The sitewide background level for manganese was 17,000 µg/L (see Table 4-11). The dissolved manganese levels are also elevated at the site, particularly in wells along the ephemeral stream.

The manganese concentrations detected in site surface and subsurface soil were comparable to base-wide background concentration. In addition, none of the site groundwater manganese concentrations (total or dissolved) exceeded the base-wide background concentrations. In addition, there is no known or suspected anthropogenic source of manganese at AOC H. Therefore, the manganese detected in AOC H soil and groundwater is attributable to background and, thus, no actions are recommended with respect to manganese in groundwater at AOC H.

6.10.2.4 Thallium

The HI from thallium in groundwater is 35 to a residential child. The maximum detected thallium, at 44.2 µg/L, is in well NDAHMW07, located near the ephemeral stream. Dissolved thallium was not detected in the same well. The site-specific background well had total thallium at 10 µg/L, and the basewide thallium background level value is reported at 18 µg/L. One other well (NDAHMW02) had thallium above background level at 28.7 µg/L; however, no dissolved thallium is reported in this well. Thus the detected thallium is likely from suspended particulates in the wells located adjacent to the ephemeral stream. Therefore, no further investigation or actions are recommended to address thallium in groundwater at AOC H.

6.10.2.5 Vanadium

The HI from vanadium in groundwater is 4.5 to a residential child. The maximum reported vanadium, at 70 µg/L, was from well NDAHMW02, from the 2000 sampling. The dissolved vanadium from the same well was at 2.8 µg/L (Tables 4-6 and 4-11). The background vanadium level was 43 µg/L in the site-specific background well, and the basewide background level was 75 µg/L. The dissolved vanadium levels in site wells were all below background levels in the latest round of sampling. Well NDAHMW02 did not have detectable levels of vanadium. The detected vanadium in site wells is likely from background conditions and not associated with site activities. Therefore, no actions are recommended to address vanadium in site groundwater.

6.11 HHRA Summary and Conclusions

The extensive sampling conducted for the small area around the building at AOC H indicated that elevated levels of chemicals associated with past site uses as a power plant or fire training area and historical pesticide application do not present excessive risk. Additionally, no hazardous waste that is attributable to the former power plant operations or fire training remains at the site. Detected chemicals were screened against criteria as described in Section 4 to determine the nature and extent of contamination. The chemicals identified as COPCs were two PAH, two pesticides, and inorganics in soils, a pesticide and inorganic chemicals in groundwater, and only inorganic chemicals in sediment and surface water. The inorganic chemicals detected in site media are also detected in background samples and are likely part of the background soil mineralogy. Arsenic was elevated in site soils and could be from past site pesticide applications.

The risk assessment evaluated the exposure of potential receptor populations such as maintenance workers, industrial workers, construction workers, recreational receptors (adult, youth and child), and residential receptors (adult and child). The estimated carcinogenic risks were at 1E-5 level for soils to recreational child, industrial adult, residential adult and child; however, carcinogenic risks for the individual media are below the upper limit of the target risk range. Arsenic in soil is elevated above background levels around the power plant building.

The estimated HI for soils was slightly above target limits for the residential child due to the presence of vanadium in soils. Also, estimated HIs from groundwater exposure through potable use were above target limits due to metals (manganese, iron, thallium, vanadium, and arsenic). The estimated HI from groundwater exposures by a construction worker was above the target level due to manganese. The detected metals in site wells were only slightly elevated above the background levels, and found in wells located along the ephemeral stream (e.g., NDAHMW02, NDAHMW05, and NDAHMW07). Observed slightly elevated metals are likely from geochemical processes influencing the metals chemistry in site groundwater as discussed previously. The water in this area of the site is brackish.

The cancer risks and HI from soil inorganic chemical levels are within the range of target risks and HI from soil alone. The only exception is the vanadium HI >1.0; however, vanadium levels are within the background levels. The cumulative risks from soil and groundwater results in cancer risks and HI combined to be above target limits. However, groundwater risks and HIs are not site-related. Also, site groundwater is brackish and not suitable for potable use.

Due to the absence of cancer risks and HIs above target limits from site-related chemicals, the site does not pose a human health risk, and no further actions are proposed to protect public health at AOC H under CERCLA. No additional sampling or monitoring of the soil is necessary because the conditions at the site are protective of human health.

TABLE 6-1
Chemicals of Potential Concern (COPCs) in Surface and Subsurface Soil Selected for Human Health Risk Assessment
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Minimum [1] Concentration	Qualifier	Maximum [2] Concentration	Qualifier	Units	Detection Frequency	Screening Toxicity Value	[3]	COPC Flag
Surface Soil (0-2 ft)									
BENZO(a)PYRENE	0.03	J	0.12	J	MG/KG	14/32	0.06	CA	YES
N-NITROSODI-n-PROPYLAMINE	0.56	J	0.72		MG/KG	3/32	0.07	CA	YES
p,p'-DDE	0.0014	J	3.99	J	MG/KG	21/31	1.72	CA	YES
p,p'-DDT	0.0013	J	1.94	J	MG/KG	19/31	1.72	CA*	YES
ALUMINUM	3400	J	11000	J	MG/KG	32/32	7614.20	NC	YES
ANTIMONY	0.34	J	6	J	MG/KG	25/32	3.13	NC	YES
ARSENIC	0.44	J	67		MG/KG	32/32	0.39	CA*	YES
CHROMIUM, TOTAL	7.83		50		MG/KG	32/32	30.1	CA**	YES
IRON	7700		39000		MG/KG	32/32	2346.32	NC	YES
MANGANESE	140		720		MG/KG	32/32	176.24	NC	YES
THALLIUM	0.29	J	1.16	J	MG/KG	13/32	0.52	NC	YES
VANADIUM	21		63		MG/KG	32/32	54.75	NC	YES
Subsurface Soil (2-6 ft)									
ARSENIC	0.16	J	24.00		MG/KG	22/32	1.59	CA	YES
Total Soil (0-6 ft)									
ARSENIC	0.16	J	67.00		MG/KG	53/62	1.59	CA	YES
N-NITROSODI-n-PROPYLAMINE	0.56	J	0.72		MG/KG	3/62	0.25	CA	YES

Note:

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] EPA Region 9 PRGs TABLE, October 1, 2002, U.S. EPA Region 9.

PRG value for chromium VI used for total chromium.

J = Estimated Value CA* (where: NC < 100X CA)

CA = Carcinogenic

NC = Noncarcinogenic

TABLE 6-2

Chemicals of Potential Concern (COPCs) in Groundwater for Human Health Risk Assessment

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Units	Detection Frequency	Minimum [1] Concentration	Qualifier	Maximum [1] Concentration	Qualifier	Location of Maximum Concentration	Screening Toxicity Value [3]		COPC Flag
All Groundwater (Potable Use)										
p,p'-DDD	µg/L	3/9	0.39		0.42	J	AOC-H-MW02	0.28	CA	YES
ALUMINUM	µg/L	9/9	112	J	9100		AOC-H-MW02	3649.87	NC	YES
ANTIMONY	µg/L	2/9	2.62	J	5.4	J	AOC-H-MW04	1.46	NC	YES
ARSENIC	µg/L	1/9	6.30	J	6.3	J	AOC-H-MW02	0.04	CA	YES
BARIUM	µg/L	9/9	63.1	J	490.0		AOC-H-MW02	255.50	NC	YES
CADMIUM	µg/L	3/9	0.41	J	4.46	J	NDAHMW07	1.82	NC	YES
CHROMIUM, TOTAL	µg/L	5/9	5.20	J	15.0		AOC-H-MW02	10.95	NC	YES
IRON	µg/L	7/9	83	J	11000		AOC-H-MW02	1094.99	NC	YES
MANGANESE	µg/L	9/9	250		14800		NDAHMW05	87.60	NC	YES
THALLIUM	µg/L	6/9	3.28	J	44.2	J	NDAHMW07	0.24	NC	YES
VANADIUM	µg/L	7/9	6	J	70		AOC-H-MW02	25.55	NC	YES
ANTIMONY, DISSOLVED	µg/L	1/9	5.4	J	5.4	J	AOC-H-MW04	1.46	NC	YES
BARIUM, DISSOLVED	µg/L	9/9	51	J	460		AOC-H-MW02	255.50	NC	YES
CADMIUM, DISSOLVED	µg/L	3/9	4.99	J	6.30	J	NDAHMW05	1.82	NC	YES
IRON, DISSOLVED	µg/L	4/9	16.9	J	4180		NDAHMW05	1094.99	NC	YES
MANGANESE, DISSOLVED	µg/L	9/9	41.1		15400		NDAHMW05	87.60	NC	YES
THALLIUM, DISSOLVED	µg/L	2/9	9.0	J	26	J	NDAHMW05	0.24	NC	YES
All Groundwater Except MW-06 (In Excavations)										
p,p'-DDD	µg/L	3/8	0.39		0.42	J	AOC-H-MW02	0.28	CA	YES
ALUMINUM	µg/L	8/8	130	J	9100		AOC-H-MW02	3649.87	NC	YES
ANTIMONY	µg/L	1/8	5.40	J	5.4	J	AOC-H-MW04	1.46	NC	YES
ARSENIC	µg/L	1/8	6.30	J	6.3	J	AOC-H-MW02	0.04	CA	YES
BARIUM	µg/L	8/8	86.0	J	490.0		AOC-H-MW02	255.50	NC	YES
CADMIUM	µg/L	2/8	0.44	J	4.46	J	NDAHMW07	1.82	NC	YES
CHROMIUM, TOTAL	µg/L	5/8	5.20	J	15.0		AOC-H-MW02	10.95	NC	YES
IRON	µg/L	6/8	4500		11000		AOC-H-MW02	1094.99	NC	YES
MANGANESE	µg/L	8/8	250		14800		NDAHMW05	87.60	NC	YES
THALLIUM	µg/L	6/8	3.28	J	44.2	J	NDAHMW07	0.24	NC	YES
VANADIUM	µg/L	6/8	6	J	70		AOC-H-MW02	25.55	NC	YES
ANTIMONY, DISSOLVED	µg/L	1/8	5.4	J	5.4	J	AOC-H-MW04	1.46	NC	YES
BARIUM, DISSOLVED	µg/L	8/8	51	J	460		AOC-H-MW02	255.50	NC	YES
CADMIUM, DISSOLVED	µg/L	3/8	4.99	J	6.30	J	NDAHMW05	1.82	NC	YES
IRON, DISSOLVED	µg/L	3/8	120.0	J	4180		NDAHMW05	1094.99	NC	YES
MANGANESE, DISSOLVED	µg/L	8/8	39.5		15400		NDAHMW05	87.60	NC	YES
THALLIUM, DISSOLVED	µg/L	2/8	9.0	J	26	J	NDAHMW05	0.24	NC	YES

Note:

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] EPA Region 9 PRGs TABLE, October 1, 2002, U.S. EPA Region 9.

PRG value for chromium VI used for total chromium.

MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards

J = Estimated Value

CA = Carcinogenic

NC = Noncarcinogenic

TABLE 6-3

Chemicals of Potential Concern (COPCs) in Sediment for Human Health Risk Assessment

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Units	Detection Frequency	Minimum [1] Concentration Qualifier		Maximum [2] Concentration Qualifier		Location of Maximum Concentration	Screening [3] Toxicity Value		COPC Flag
ARSENIC	MG/KG	3/4	0.20	J	0.88	J	NDAHSD01	0.39	CA*	YES
IRON	MG/KG	4/4	6040		8620	=	NDAHSD04	2346	NC	YES
THALLIUM	MG/KG	3/4	0.4	J	0.5	J	NDAHSD02	0.5	NC	YES

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] EPA Region 9 PRGs TABLE, October 1, 2002, U.S. EPA Region 9.

PRG value for chromium VI used for total chromium.

J = Estimated Value

CA = Carcinogenic

NC = Noncarcinogenic

TABLE 6-4
Chemicals of Potential Concern (COPCs) for Surface water - HHRA
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Units	Detection Frequency	Minimum [1] Concentration Qualifier		Maximum [2] Concentration Qualifier		Location of Maximum Concentration	Screening Toxicity Value	[3]	COPC Flag
ARSENIC	µg/L	1/4	47.1	J	47.1	J	NDAHSW02	0.0	CA	YES
CADMIUM	µg/L	1/4	7.7	J	7.7	J	NDAHSW02	1.8	NC	YES
CHROMIUM, TOTAL	µg/L	1/4	16.2	J	16.2	J	NDAHSW02	10.9	NC	YES
MANGANESE	µg/L	4/4	385.0		654.0		NDAHSW03	87.6	NC	YES
SELENIUM	µg/L	1/4	63.9	J	63.9	J	NDAHSW02	18.2	NC	YES
MANGANESE, DISSOLVED	µg/L	4/4	902000.0		939000.0		NDAHSW01	87.6	NC	YES
MERCURY, DISSOLVED	µg/L	4/4	70.0	J	419.0	J	NDAHSW04	1.1	NC	YES
SELENIUM, DISSOLVED	µg/L	4/4	460000.0		486000.0		NDAHSW01	18.2	NC	YES

[1] Minimum/Maximum detected concentrations.
[2] Maximum concentration is used for screening.
[3] EPA Region 9 PRGs TABLE, October 1, 2002, U.S. EPA Region 9.
PRG value for chromium VI used for total chromium.
J = Estimated Value
CA = Carcinogenic
NC = Noncarcinogenic

TABLE 6-5
Potentially Complete Exposure Pathways and Receptors in Risk Assessment
AOC H, Former NASD, Vieques Island

Future Receptor	Media	Exposure Route and Point of Exposure	Pathway Selected for Evaluation	Reason for Selection or Exclusion
Maintenance Worker	Surface Soil	Ingestion, dermal contact, and inhalation exposure to COPCs in site surface soils	Yes	Scenario is protective of an occasional maintenance work.
Industrial Worker	Surface Soil	Ingestion, dermal contact, and inhalation exposure to COPCs in site surface soils	Yes	Area could be developed in the future for industrial use. Both site soil and groundwater exposure is assumed.
	Groundwater	Ingestion, dermal contact exposure to COPCs in groundwater	Yes	Groundwater is not suiTABLE for poTABLE/industrial use; however, for conservative risk estimation, this medium was included
Construction Worker	Total Soil	Ingestion, dermal contact and inhalation exposure to COPCs in total soils (0-6 ft)	Yes	Scenario is protective of occasional construction activities at the site.
	Groundwater	Dermal contact exposure to COPCs in groundwater	Yes	Shallow groundwater may seep into excavations where groundwater is within 6 ft of land surface
Recreational Users (adult, youth and child)	Surface Soil	Ingestion, dermal contact, and inhalation exposure to COPCs in site surface soils	Yes	Area could be developed in the future for recreational use and would be protective of an occasional trespasser.
	Surface Water	Ingestion, dermal contact, and inhalation exposure to COPCs in site surface water	Yes	Area could be developed in the future for recreational use and would be protective of any occasional trespasser.
	Sediment	Ingestion, and dermal contact, exposure to COPCs in sediments	Yes	Area could be developed in the future for recreational use and would be protective of any occasional trespasser.
Residents (adult and child)	Surface Soil	Ingestion, dermal contact, and inhalation exposure to COPCs in site surface soils	Yes	Although the site is unlikely to be considered for residential development, this is a worst-case scenario for comparison purposes.
	Subsurface Soil	Ingestion, dermal contact and inhalation exposure to COPCs in site subsurface soils	Yes	Scenario is evaluated as a complete exposure pathway, if the site is disturbed for construction at a future time exposing subsurface soil.
	Groundwater	Ingestion and dermal contact exposure to COPCs in site surface soils	Yes	Although the site is unlikely to be considered for residential development, and groundwater is not suiTABLE for poTABLE use, this is a worst-case scenario for comparison purposes.

TABLE 6-6
Exposure Point Concentration (EPCs) for Soil - HHRA
AOC H, Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)		Maximum Concentration	Q	Exposure Point Concentration	
							Value	Statistic
Surface Soil (0-2 ft)								
BENZO(a)PYRENE	MG/KG	0.8	5.4	(NP)	0.1	J	0.1	Max
N-NITROSODI-n-PROPYLAMINE	MG/KG	0.9	2.9	(NP)	0.7		0.7	Max
p,p'-DDE	MG/KG	0.2	1.7	(NP)	4.0	J	1.7	99% Cheb-m
p,p'-DDT	MG/KG	0.1	0.6	(NP)	1.9	J	0.6	97.5% Cheb-m
ALUMINUM	MG/KG	7647.5	8259.6	(N)	11000.0	J	8259.6	95% UCL-N
ANTIMONY	MG/KG	0.8	1.1	(T)	6.3	J	1.1	95% UCL-T
ARSENIC	MG/KG	5.0	19.0	(NP)	67.0		19.0	97.5% Cheb-m
CHROMIUM, TOTAL	MG/KG	17.4	20.1	(T)	50.0		20.1	95% UCL-T
IRON	MG/KG	17428.1	21318.2	(NP)	39000.0		21318.2	95% Cheb-m
MANGANESE	MG/KG	395.8	484.3	(NP)	720.0		484.3	95% Cheb-m
THALLIUM	MG/KG	0.4	0.6	(NP)	1.2	J	0.6	95% Cheb-m
VANADIUM	MG/KG	44.9	47.8	(N)	63.0		47.8	95% UCL-N
Subsurface Soil (2-6 ft)								
ARSENIC	MG/KG	1.7	6.6	(NP)	24.0		6.6	97.5% Cheb-m
Total Soil (0-6 ft)								
ARSENIC	MG/KG	3.42	3.97	(T)	67.0		3.97	95% UCL-T
N-NITROSODI-n-PROPYLAMINE	MG/KG	32.9	144.0	(NP)	0.717		0.717	Max

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration
ProUCL, Version 2.1 used for surface and subsurface soil (since available at time original HHRA prepared).
ProUCL, Version 3.00.02 used for total soil (since available at time revised construction worker risks were calculated).
ProUCL used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T);
95% Chebyshev (MVUE) UCL (95% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m);
97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m)
N = Normal
J = Estimated Value
T = Log-Transformed

TABLE 6-7
Exposure Point Concentration (EPCs) for Groundwater - HHRA
AOC H, Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)		Maximum Concentration (Qualifier)	Exposure Point Concentration		
						Value	Units	Statistic
All Groundwater (Potable Use)								
p,p'-DDD	UG/L	0.14	0.55	(NP)	0.42 J	0.42	UG/L	Max
ALUMINUM	UG/L	2991.89	24392.13	(T)	9100	9100	UG/L	Max
ANTIMONY	UG/L	5.6	16.73	(NP)	5.4 J	5.4	UG/L	Max
ARSENIC	UG/L	4.81	13.88	(NP)	6.3 J	6.3	UG/L	Max
BARIUM	UG/L	258.23	347.45	(N)	490.00	347.45	UG/L	95% UCL-N
CADMIUM	UG/L	1.04	2.99	(T)	4.46 J	2.99	UG/L	95% Cheb
CHROMIUM, TOTAL	UG/L	6.49	26.55	(T)	15	15	UG/L	Max
IRON	UG/L	4576.56	7025.34	(N)	11000	7025	UG/L	95% UCL-N
MANGANESE	UG/L	6085.56	43946.20	(T)	14800	14800	UG/L	Max
THALLIUM	UG/L	13.16	75.52	(T)	44.2 J	44.2	UG/L	Max
VANADIUM	UG/L	23.73	175.81	(T)	70.0	70.0	UG/L	Max
All Groundwater Except MW-06 (In Excavations)								
p,p'-DDD	UG/L	1.6E-01	8.7E-01	(NP)	4.2E-01 J	4.2E-01	UG/L	Max
ALUMINUM	UG/L	3.4E+03	5.7E+03	(N)	9.1E+03	5.7E+03	UG/L	95% Stud-t
ANTIMONY	UG/L	6.0E+00	2.6E+01	(NP)	5.4E+00 J	5.4E+00	UG/L	Max
ARSENIC	UG/L	5.3E+00	2.1E+01	(NP)	6.3E+00 J	6.3E+00	UG/L	Max
BARIUM	UG/L	2.8E+02	3.7E+02	(N)	4.9E+02	3.7E+02	UG/L	95% Stud-t
CADMIUM	UG/L	1.1E+00	6.5E+00	(NP)	4.5E+00 J	4.5E+00	UG/L	Max
CHROMIUM, TOTAL	UG/L	7.3E+00	1.1E+01	(N)	1.5E+01	1.1E+01	UG/L	95% Stud-t
IRON	UG/L	5.1E+03	7.7E+03	(N)	1.1E+04	7.7E+03	UG/L	95% Stud-t
MANGANESE	UG/L	6.8E+03	1.8E+04	(G)	1.5E+04	1.5E+04	UG/L	Max
THALLIUM	UG/L	1.5E+01	2.4E+01	(N)	4.4E+01 J	2.4E+01	UG/L	95% Stud-t
VANADIUM	UG/L	2.5E+01	4.1E+01	(N)	7.0E+01	4.1E+01	UG/L	95% Stud-t

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
ProUCL, Version 2.1 used for groundwater (potable use) since available at time original HHRA prepared.
ProUCL, Version 3.00.02 used for groundwater (in excavations) since available at time revised construction worker risks were calculated.
ProUCL used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N);
95% Chebyshev (MVUE) UCL (95% Cheb)
N = Normal J = Estimated Value
T = Log-Transformed

TABLE 6-8
Exposure Point Concentration (EPCs) for Sediment - HHRA
AOC H, Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
							Value	Units	Statistic	Rationale
ARSENIC	MG/KG	0.33	3.03	(T)	0.88	J	0.88	MG/KG	95% UCL-T	(4)
IRON	MG/KG	9318	14457	(T)	15500		14457	MG/KG	95% UCL-T	(4)
THALLIUM	MG/KG	0.50	0.87	(N)	1.12	J	0.87	MG/KG	95% UCL-N	(4)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicates, maximum value was used
ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, (USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).
Statistics: 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T);
N = Normal J = Estimated Value
T = Log-Transformed

TABLE 6-9
Exposure Point Concentration (EPCs) for Surface water - HHRA
AOC H, Former NASD, Vieques, Puerto Rico

Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)		Maximum Concentration (Qualifier)		Exposure Point Concentration		
							Value	Units	Statistic
ARSENIC	UG/L	27.07	56.17	(NP)	47.1	J	47.1	UG/L	Max
CADMIUM	UG/L	4.59	9.11	(NP)	7.7	J	7.7	UG/L	Max
CHROMIUM, TOTAL	UG/L	8.32	19.77	(NP)	16.2	J	16.2	UG/L	Max
MANGANESE	UG/L	530.5	843.39	(T)	654.0		654.0	UG/L	Max
SELENIUM	UG/L	31.73	78.47	(NP)	63.9	J	63.9	UG/L	Max

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicates, maximum value was used
ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC,
(USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).
Statistics: Maximum Detected Value (Max);
N = Normal J = Estimated Value
T = Log-Transformed
NP = Non-Parametric

TABLE 6-10
Risk Results Summary
AOC H, Former NASD, Vieques, Puerto Rico

Receptor	Exposure Medium	Cancer Risk	Hazard Index	Max HI/target organ	
Maintenance worker	surface soil	3.2E-06	0.08	NA	
Industrial worker	surface soil	1.5E-05	0.37	NA	
	groundwater*	3.3E-05	11.0	5.4	Liver, Blood, Hair
Construction worker	total soil	3E-07	0.05	NA	
	groundwater	8.0E-08	5	5	CNS
Recreational -Adult	surface soil	7.0E-06	0.20	NA	
	sediment	9.8E-08	0.005	NA	
	surface water	3.3E-06	0.02	NA	
Recreational - Youth	surface soil	4.2E-06	0.31	NA	
	sediment	5.6E-08	0.002	NA	
	surface water	2.1E-06	0.03	NA	
Recreational - Child	surface soil	1.2E-05	1.1	NA	
	sediment	1.3E-07	0.04	NA	
	surface water	4.2E-06	0.17	NA	
Residential -Adult	surface soil	1.9E-05	0.43	NA	
	subsurface soil	5.2E-06	0.03	NA	
	groundwater*	9.0E-05	31	15.0	Liver, Blood, Hair
Residential - Child	surface soil	4.2E-05	3.6	1.3	kidney
	subsurface soil	1.2E-05	0.3	NA	
	groundwater*	5.2E-05	73	35	Liver, Blood, Hair
COPCs Contributing to risk >1E-06, or HI>1.0		arsenic in soil (surface and subsurface) and groundwater	vanadium in soil and thallium, iron, manganese, vanadium and arsenic in groundwater.		

Note:

* Groundwater is brackish and not suitable for potable use

TABLE 6-11
Comparison of Surface Soil Inorganic COPCs with Background Levels
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (mg/Kg)	Minimum Detect (mg/Kg)	Mean Concentration [1] (mg/Kg)	Background Concentration[3] UTL95% (mg/Kg)	Minimum (mg/Kg)	Maximum (mg/Kg)
Surface Soil								
ARSENIC	33	33	**67**	0.435	4.88	2.2	0.57	2.5
VANADIUM	33	33	63	21	44.4	130	9	130
Subsurface Soil								
ARSENIC	31	21	**24**	0.161	1.68	2.2	0.57	2.5

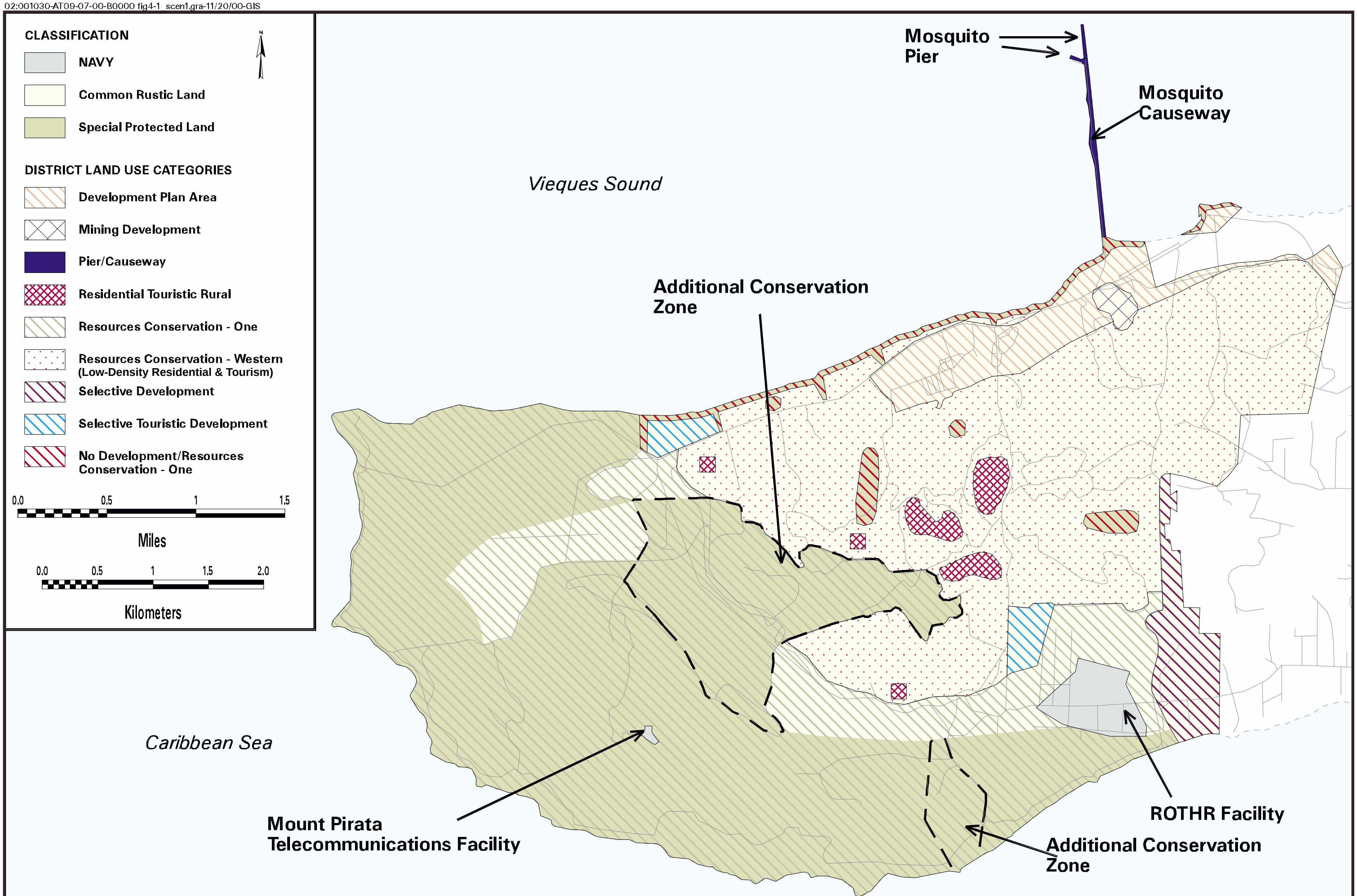
[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] EPA Region 9 residential PRG for surface soil and industrial PRG for subsurface soil.
[3] for soils -Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M Hill, 2002).

TABLE 6-12
Comparison of Groundwater Inorganic COPCs with Background Levels
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Number Analyzed	Number Detected	Maximum Detect (ug/L)	Minimum Detect (ug/L)	Mean Concentration [1] (ug/L)	Tap Water PRG [2]	Background Concentrations Site-Specific [3] (ug/L)	Background Concentrations Base-Wide [4] (ug/L)
Total Inogranic Chemicals								
ARSENIC	7	1	6.3	6.3	5.83	0.0448	ND	NA
IRON	7	5	11000	83	3630	1090	8200	4800
MANGANESE	7	7	14800	620	7630	87.6	1100	17000
THALLIUM	7	4	44.2	6.6	15	0.241	10	18
VANADIUM	7	5	70	6	18.9	25.5	43	75
Dissolved Inorganic Chemicals								
ARSENIC, DISSOLVED	7	0	0	ND	5.14	0.0448	ND	5.5
IRON, DISSOLVED	7	2	4180	3290	1090	1090	120	490
MANGANESE, DISSOLVED	7	7	15400	92	7370	87.6	150	18000
THALLIUM, DISSOLVED	7	1	26.2	26.2	8.28	0.241	9	16
VANADIUM, DISSOLVED	7	4	12.7	2.8	5.4	25.5	20	32

[1] Mean concentration is based on 1/2 the detection limit for non-detects.
[2] USEPA Region IX tap water PRG (2002) based on a hazard index (HI) of 0.1 for non-carcinogens.
[3] Site-specific background sample from well NDAHMW01.
[4] Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report (CH2M HILL, 2002).
NA indicates that the information is not available or not applicable.

02:001030-AT09-07-00-B0000 fig4-1_scen1.gra-11/20/00-GIS



Source: PRPB 2000, US Navy 2000

Figure 6-1
Proposed Land Use and Zoning Classifications by Puerto Rico Planning Board
Former NASD, Vieques Island, Puerto Rico

CH2MHILL

E012004004GNV

Note: Original Figure Created in Color

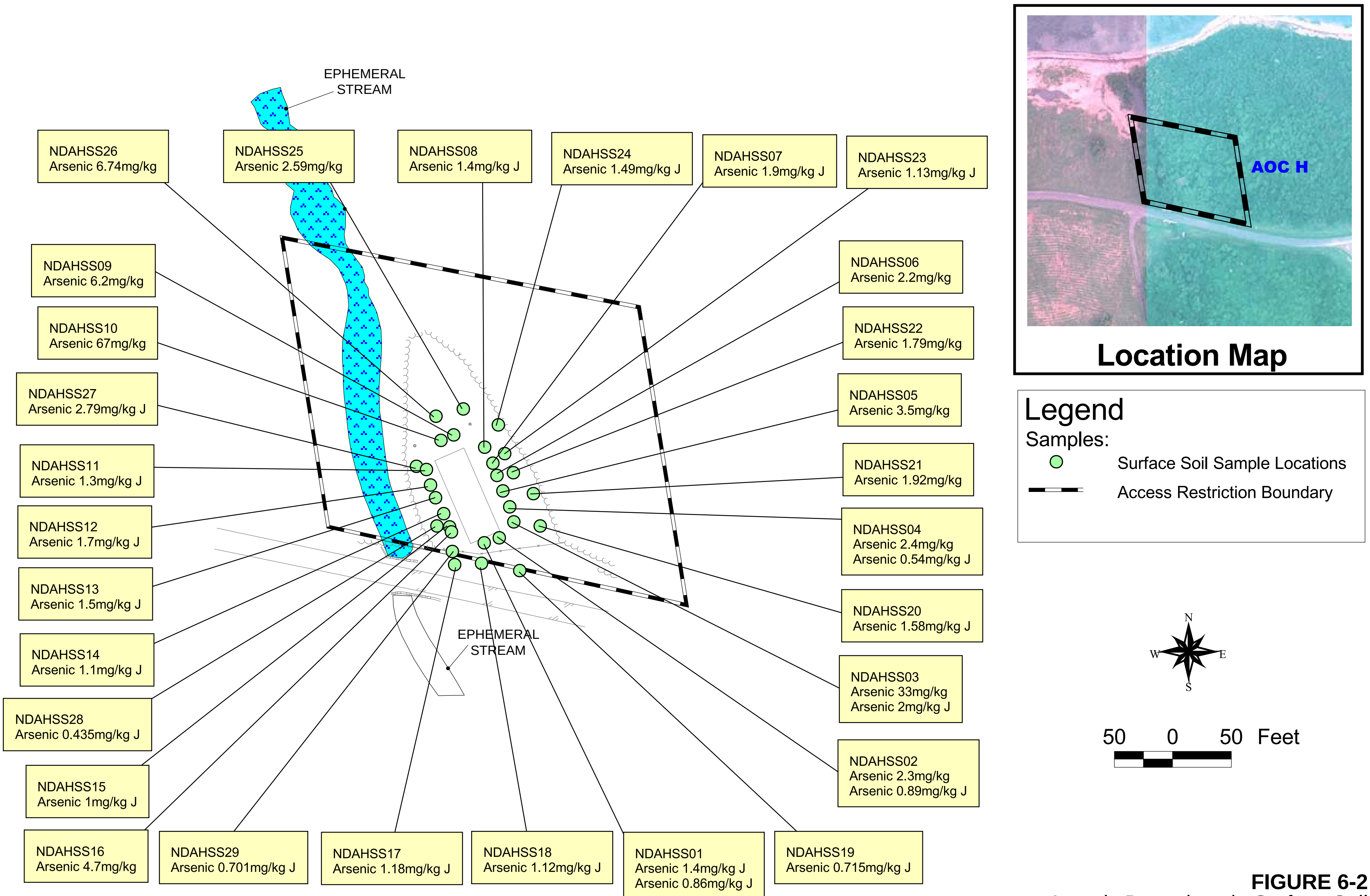
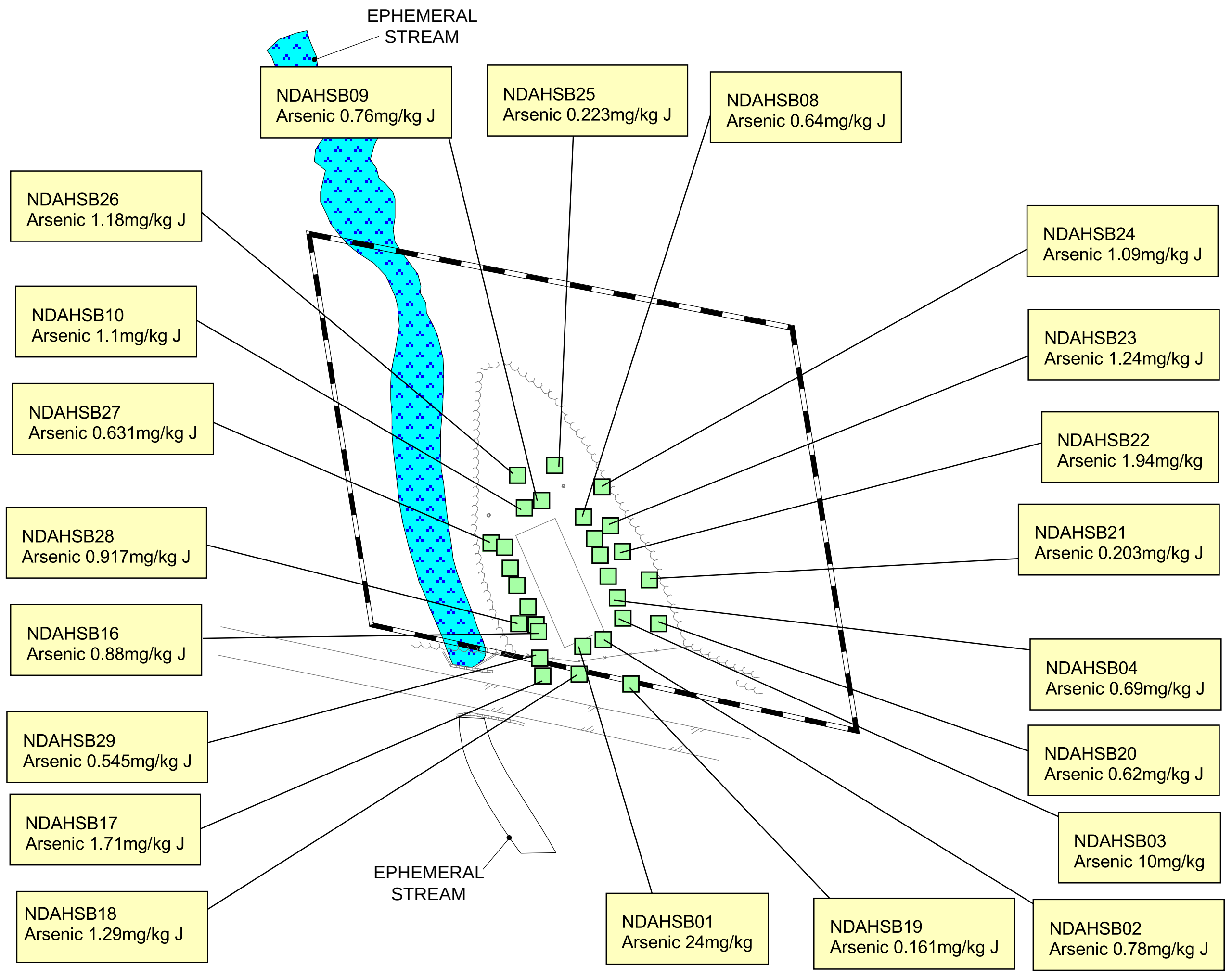


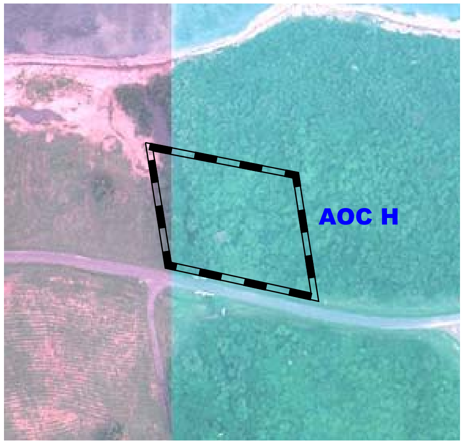
FIGURE 6-2
Arsenic Detections in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES022007006TPA_180357.RI.DF.AH

Note: Original Figure Created in Color





Location Map

Samples:

▢	Soil Boring Sample Locations
▬ ▬	Access Restriction Boundary

FIGURE 6-3
Arsenic Detections in Subsurface Soil
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

Note: Original Figure Created in Color

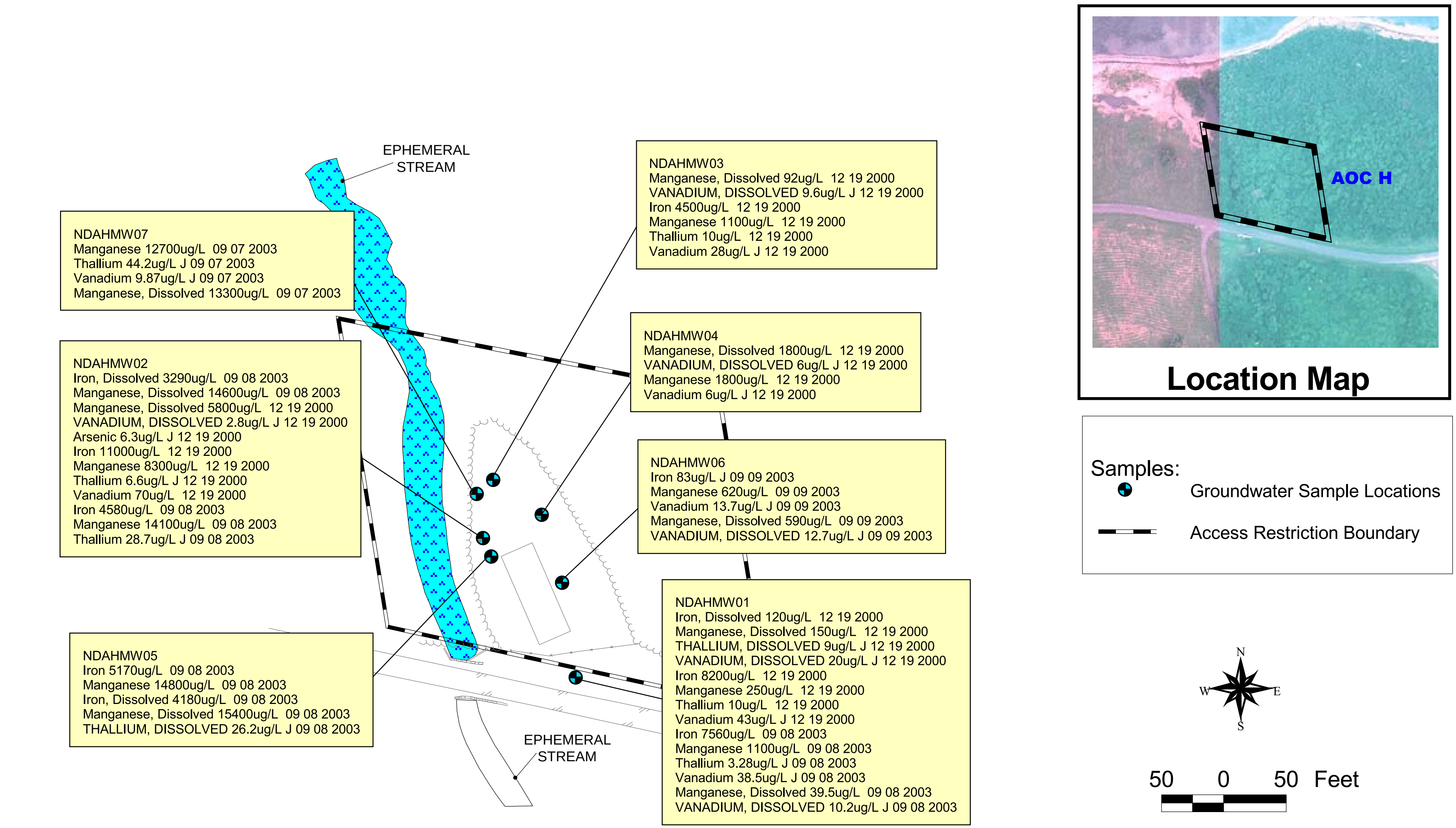


FIGURE 6-4
Arsenic, Iron, Manganese, Thallium and Vanadium Detections in Groundwater
AOC H, Former NASD, Vieques, Puerto Rico

CH2MHILL

ES122005001TPA_180357.RI.DF.AH

SECTION 7

Ecological Risk Assessment

This section presents a screening ecological risk assessment (SERA), constituting Steps 1 and 2 of the ecological risk assessment (ERA) process, and the first step (Step 3) of a baseline ecological risk assessment (BERA) for AOC H. AOC H is located within the former NASD, Vieques.

An ERA was conducted to evaluate the potential adverse effects to the environment at AOC H. The following subsection defines the objectives of the ERA and describes the ERA process.

7.1 Ecological Risk Assessment Process

This ERA was conducted in accordance with the *Navy Policy for Conducting Ecological Risk Assessments* (CNO, 1999) and the EPA Ecological Risk Assessment Guidance for Superfund (EPA, 1997). The Navy ERA policy, which describes a process consisting of eight steps organized into three tiers, is conceptually similar to the eight-step ERA process outlined in the EPA ERA guidance for Superfund. The major differences between the Navy ERA policy and the EPA ERA guidance are that the former:

- Provides clearly defined criteria for exiting the ERA process at specific points
- Divides Step 3 (the first step of the BERA) into two distinct sub-steps (Steps 3A and 3B), with a potential exit point after Step 3A
- Incorporates risk management considerations throughout all tiers of the ERA process

Steps 1 and 2 of the ERA process comprise the SERA, which is conducted using intentionally conservative assumptions. If complete exposure pathways exist at a site and the results of the SERA indicate that risks are possible, the site normally continues on to Step 3, the first step in the BERA, for the pathways, COPCs, and receptors identified in the SERA.

In Step 3A, a refined evaluation of exposure estimates is conducted using more realistic assumptions and additional methodologies relative to those used in the SERA, which is intended to be a very conservative assessment. Examples of more realistic exposure assumptions include using central tendency estimates (rather than maximums) for media concentrations, exposure parameters, and bioaccumulation factors. Examples of additional methodologies include consideration of upgradient and background concentrations, detection frequency, and bioavailability.

If risk estimates (and their associated uncertainty) are acceptable following Step 3A, the site will meet the conditions of the exit criterion specified in the Navy policy. If the Step 3A evaluation does not support an acceptable risk determination within acceptable uncertainty, the site continues to Step 3B.

In Step 3B, the preliminary conceptual model from the SERA is refined based upon the results of the Step 3A evaluation to develop a revised list of key receptors, critical exposure pathways, Chemicals of Concern (COCs - risk drivers), assessment endpoints, measurement endpoints, and risk hypotheses. Based upon the revised conceptual model, the lines of evidence to be used in characterizing risk are determined. Agreement on the revised conceptual model, COCs, exposure pathways, endpoints, and risk hypotheses constitutes the Scientific Management Decision Point (SMDP) at the end of Step 3.

7.1.1 Objectives of the ERA

The objectives of the SERA are to:

- Determine if potential risks to ecological receptors warrant either: (1) additional assessment beyond the conservative screening steps of the ERA process (unacceptable ecological risks are possible); or (2) the removal of the site from further ecological consideration (no unacceptable ecological risks likely).
- Focus subsequent steps of the ERA process on the specific chemicals, pathways, and receptors of potential concern if unacceptable ecological risks are possible.
- Identify any data gaps or areas of unacceptable uncertainty that may require the collection of additional data to support ERA evaluations beyond the screening level.

If the site is not screened out in the SERA, the evaluation continues to Step 3. The general objectives of the Step 3 ERA are to:

- Refine the risk estimates from the SERA to determine if risks to ecological receptors from site-related chemicals are likely to occur based upon realistic exposure scenarios.
- Focus subsequent data collection activities if potential risks are indicated, uncertainties are unacceptably high, and/or data gaps are identified.

At the conclusion of Step 3, there are three possible decision points:

- **No further action is warranted.** This decision is appropriate if the evaluation indicates that sufficient data are available on which to base a conclusion of no unacceptable risk within acceptable uncertainty.
- **Further data are required.** This decision is appropriate if the evaluation indicates that the potential for unacceptable risk exists and additional data to refine these estimates (e.g., additional analytical data, toxicity testing, measures of bioavailability) are needed. In this case, the site continues to Step 4 of the ERA process.
- **Take remedial action.** This decision may be appropriate for circumstances in which the potential for unacceptable risks was identified but these potential risks could best be addressed through remedial action (e.g., presumptive remedy) rather than additional study.

7.2 Screening Ecological Risk Assessment

As discussed in Section 7.1, Steps 1 and 2 of the ERA process constitute the SERA, which is conducted using intentionally conservative assumptions. The principal components of the SERA are problem formulation, exposure estimation, effects evaluation, and risk calculation.

7.2.1 Screening Problem Formulation

Problem formulation establishes the goals, scope, and focus of the ERA. As part of problem formulation, the environmental setting of AOC H is characterized in terms of the habitats and biota known to be present. The types and concentrations of chemicals present in ecologically relevant media are also described. A preliminary conceptual model is developed for AOC H that describes potential sources, potential transport pathways, potential exposure pathways and routes, and potential receptors. Assessment endpoints, measurement endpoints, and risk hypotheses are then selected to evaluate those receptors for which complete and potentially critical exposure pathways are likely to exist. The fate, transport, and toxicological properties of the chemicals present at AOC H, particularly the potential to bioaccumulate, are also considered during this process.

7.2.1.1 Environmental Setting

AOC H is located approximately 1,000 feet east of the entrance to the NASD Public Works Area (PWA), just north of Highway 200, and covers about 2 acres. The site is located approximately 500 feet south of the Atlantic Ocean. The site ranges from sea level to 10 feet amsl. The AOC H site is an abandoned concrete building approximately 80 feet long and 25 feet wide and the area surrounding the building. An ephemeral stream is located along the west side of the site. Figure 2-2 shows the location of AOC H within the former NASD property and its present land use.

The building housed power generation equipment from 1941 to 1943, prior to Navy activities. The power equipment included large diesel generators that provided electricity to a nearby community. Historically, aboveground storage tanks (ASTs) associated with the generators were reportedly located on the west side of the building and provided an estimated 2,000 to 3,000 gallons of diesel fuel storage. These tanks are no longer onsite. The building and its surroundings included for sampling and investigation cover an area less than 0.5 acre, although the designated site size is approximately 2 acres to provide a buffer around the building. Figure 2-3 is an aerial photograph of AOC H showing the building, the adjacent ephemeral stream, and dense overgrown conditions that surround the site.

After 1943, the building was vacant until the 1960s, when it was used for fire training operations. The firefighter training included the use of diesel fuel which was poured over rubber tires inside the building and ignited to simulate structure fires. The fire training activities ceased in the 1980s. The building has remained abandoned and is now overgrown with vines and tall shrubs. An ecological survey indicated the building is used by fruit bats as a daytime roost.

The ephemerals stream along the western boundary of the site drains to the north to Vieques Passage. At the confluence with the ocean, a natural sand berm occasionally builds up from wave action along the beach, blocking direct connection to the ocean and creating stagnant conditions in the ephemeral stream from the beach south to the bridge at Highway 200. This highway extends along the southern boundary of the site. Upstream of Highway 200, the ephemeral stream bottom is usually dry and heavily vegetated, serving only to transport water during rain events. The typically flooded segment of the ephemeral stream along the western edge of the site varies from 20 to 40 feet wide and averages 3 to 6 feet deep.

AOC H is underlain by an unconfined groundwater system, which is composed of alluvial deposits made up of sands, silty sands, and gravels. Groundwater was encountered at the site at a depth of approximately 7 feet bls. The generalized groundwater flow is north in the direction of Vieques Passage. Site-specific groundwater flow is generally to the west toward the ephemeral stream; in the northern portion of the site, the flow is to the north toward Vieques Passage. Wells on this site ran dry upon purging and were slow to recharge, making them difficult to sample.

Based on the above information, AOC H is relatively undisturbed (except for recently cleared vegetation around the building perimeter to facilitate investigations) and provides suitable terrestrial habitat for plant, invertebrate, reptile, bird, and mammal communities. The adjacent aquatic brackish water/saltwater habitat associated with the ephemeral stream is supportive of fish, invertebrate, aquatic plant (mangroves), and semi-aquatic bird communities.

Physiographic Features

The major physiographic features (climate, topography, geology/soils, hydrology, and hydrogeology) of the former NASD and AOC H are described in Section 2.

Habitats and Biota

The description of the vegetative community and wildlife is based on a site visit conducted by an ecologist during the RI sampling activities in 2003 and on a detailed habitat characterization conducted at AOC H by Geo-Marine (2001). The habitat characterization was conducted to determine the presence of plant and animal species and to determine whether preferred habitat was present for any federally endangered or threatened plant and animal species.

Vegetation communities at AOC H were initially characterized into broad community types based on color signatures from true-color aerial photographs. Vegetation communities were delineated based on species composition and structure by viewing magnified stereo pairs of aerial photography. The community types were marked on overlying acetate for use in the field (May 15-19, 2000). Personnel walked transects through AOC H to: (1) verify that the community types were identified and delineated correctly from the true color aerial photography, (2) identify the species composition of the dominant vegetation, (3) identify the wildlife species present in AOC H, (4) identify habitat that may potentially support federally designated threatened and endangered species within and contiguous to the site, and (5) identify any obvious impacts potentially related to site activities.

Flora

Vegetation immediately around the building on AOC H had been cleared for the installation of monitoring wells prior to the habitat survey. The area to the east consists of dense thorn scrub. West of the building, a mixed thorn scrub and coastal forest transitions to a ephemeral stream area that drains to the north toward Vieques Passage. Along the ephemeral stream, a strip of woody vegetation approximately 10 to 12 feet wide occurs on both sides of the bank. Water within the ephemeral stream was brackish during the survey. To the north, a dense mixed thorn scrub and coastal forest habitat is present.

Dominant shrubs identified on the site included tantan, Christmas tree, and brisselet. The sandy ground was covered with tantan seedlings. The dominant herbs observed on the site include malva colorada and better man better. Hurricane grass was observed on the southern boundary of the site. AOC H is bordered to the south by the grassy road shoulder, which is maintained frequently.

The vegetation observed at AOC H, the reference site (thorn scrub habitat to the east), and the ephemeral stream area to the west is listed in Table 7-1. The reference area was not known be affected by activities at AOC H, and based on its relatively flat topography and groundwater flow direction (away from the reference area), there is no known transport pathway of contaminants from AOC H to the vegetation in the reference site. The vegetation at AOC H was similar to the thorn scrub forest of the adjacent reference site; no differences in the vegetation communities were identified. The thorn scrub forest consisted of two canopy layers (shrub and tree), which provide little sunlight for a herbaceous layer. The only herb recorded in the reference site was the exotic monk orchid.

Fauna

During the wildlife surveys, several species were observed using the abandoned power plant building and adjacent habitat. The exterior of the building provides shade, foraging areas, and cover for an abundant number of lizards such as the garden lizard, common lizard, and spotted lizard. A ground lizard was seen immediately adjacent to the site among thorn scrub. In addition, the building provides a roosting place for a population of approximately 150 West Indian fruit bats. Numerous seeds from bat droppings littered the floor of the building. Fruits collected in the building included the moca tree, quenepa plant, and the Indian almond tree. Only one of these plant species was observed onsite, suggesting that these roosting bats forage offsite.

Bird species observed near the building included gray kingbird, Adelaide warbler, and common ground dove. No evidence was observed to indicate that the AOC has had a negative impact on wildlife diversity or habitat. The recently cleared vegetation may have reduced structural diversity, but recovery of vegetation would be expected to occur.

Rare, Threatened, and Endangered Species

Sixteen federally listed species are known to occur or have the potential to occur on NASD Vieques (Table 7-3).

Before the fieldwork was conducted, a literature search was performed for each federally protected species. During the May 15-19, 2000, surveys, biologists walked transects through each site and identified any federally protected species seen and noted the presence or absence of preferred habitat for the species.

No endangered or threatened species were observed within the AOC H area. Cobana negra, a federally threatened tree, has been found between the boundary of black mangrove communities, salt flats, and the upland communities at NASD. This species is also known to occur in coastal forests of southeastern Puerto Rico. The preferred habitat for cobana negra was not present at this site.

The threatened Arctic peregrine falcon has been observed at Naval Station Roosevelt Roads in Puerto Rico. This species uses open grassland areas for potential feeding areas. This habitat type was present immediately adjacent to the site. The brown pelican and the roseate tern are not likely to use this terrestrial site but may be seen nearby due to the proximity of nearby marine habitat.

7.2.1.2 Summary of Available Analytical Data

Several investigations have been conducted onsite to evaluate the presence of contaminants from historical site activities. These investigations included analyses of soil, groundwater, surface water, and sediment.

An EBS was performed on the site (ERM, 2000). Soil wipe samples were collected from the building's concrete floor to determine if PCBs were present. The analysis concluded PCB contamination was not present.

The Expanded PA/SI field investigation was performed by CH2M HILL to determine if contaminants of concern existed on this site (CH2M HILL, 2000d). Sixteen surface/subsurface soil samples were collected at the building perimeter and four surface soil samples were collected inside of the building to characterize the extent of site contamination. One upgradient and three downgradient groundwater samples were collected from site monitoring wells.

Based on EPA and PREQB comments, analytical results from the previous investigations indicated a need for further investigation at AOC H. Additional data were collected during August and September 2003 as part of this RI effort to further characterize the sites and define the nature and extent of contamination in site media. The details of the RI are discussed in Section 3.

7.2.1.3 Preliminary Conceptual Model

A complete discussion on fate and transport pathways and the conceptual site model (CSM) is presented in Section 5. The CSM qualitatively defines the various contaminant sources, release mechanisms, relative rates of migration and persistence of contaminants, and migration pathways for contaminants at the site. Based on the available site information, a flow chart of the potential migration pathways, exposure pathways, potential human receptors, and potential ecological receptors was identified for the site (Figure 5-1).

Potential Source Area

AOC H was used to house power generation equipment and large diesel generators in the early 1940s. Historically, 2,000- to 3,000-gallon diesel ASTs were located on the west side of the building. From the 1960s to the 1980s, the Navy used the building for fire training operations. During these operations, diesel fuel was poured over rubber tires inside the building and ignited.

Transport Pathways and Exposure Media

A transport pathway describes the mechanisms whereby chemicals may be transported from a source of contamination to ecologically relevant media. These transport pathways are shown on Figure 5-1.

The primary mechanisms for contaminant transport from the source area at AOC H are surface runoff to the ephemeral stream and vertical migration. Contaminants that spilled or leaked onto the ground surface during site activities may have leached through the vadose zone and been transported into the groundwater system. Contaminants bound to surface soil may be transported by stormwater runoff to surface water and sediment in the adjacent ephemeral stream. Surface water and sediment samples in the perimeter surface water body reflect locations of groundwater discharge from the site. Surface soil may also be released to the air by wind erosion.

Contaminants in site soil may be transported by surface runoff to surface water and sediment contained in the ephemeral stream, along the western boundary of the site. Contaminants transported in surface runoff can be either in the dissolved phase or as suspended particulates, which can then settle out into sediment. The site is heavily vegetated, which can minimize this runoff transport pathway and limit dust emissions associated with an air pathway.

Chemicals detected in soils may migrate through the soil column to the underlying shallow groundwater. Recharge to the groundwater aquifer primarily occurs through infiltration of rainfall. The movement of water through the unsaturated soil can dissolve contaminants and transport them to the underlying groundwater, serving as a source of contaminants to groundwater. As described earlier, groundwater in the southern portion of AOC H flows west toward the ephemeral stream and in the northern portion to the north toward Vieques Passage. However, groundwater does not appear to discharge to surface water based on groundwater elevations. The hydraulic gradient at the site appears to be fairly low (less than 0.010 foot per foot). Typically, contaminants will not move as rapidly as the groundwater because of adsorption of the contaminant on the geologic media. Retardation of metals is a complex process and is affected by sorption, iron exchange, speciation, precipitation, colloid formation, biofixation, natural organic matter interactions, anion exclusion, pH, ORP, salinity, competing ions, surface area, and densities.

Exposure Pathways and Routes

An exposure pathway links a source of contamination with one or more receptors through exposure via one or more media and exposure routes. Exposure, and thus potential risk, can only occur if complete exposure pathways exist. Figure 5-1 shows the potentially complete exposure pathways to ecological receptors at AOC H.

Potentially complete exposure pathways to terrestrial receptors (e.g., mammals and birds) using the upland habitats present on AOC H exist (exposure to surface soils). Potentially complete exposure pathways to aquatic (e.g., benthic invertebrates and fish) and semi-aquatic (e.g., herons) receptors using the ephemeral stream also exist (exposure to surface water and sediment).

An exposure route describes the specific mechanism(s) by which a receptor is exposed to a chemical present in an environmental medium. Terrestrial plants may be exposed to chemicals present in surface soils through their root surfaces during water and nutrient uptake. No submergent aquatic plants were observed in the ephemeral stream west of the AOC H power house..

Animals may be exposed to chemicals through: (1) direct inhalation of gaseous chemicals or of chemicals adhered to airborne particulate matter; (2) incidental ingestion of contaminated abiotic media (soil or sediment) during feeding or preening activities; (3) the direct ingestion of contaminated water; (4) the ingestion of contaminated plant and/or animal tissues for chemicals that have entered food webs; and/or (5) dermal contact with contaminated abiotic media.

Based upon the general fate properties (relatively high adsorption to solids) of the chemicals present on AOC H (primarily metals and PAHs) and the protection offered by hair or feathers, potential dermal exposures for upper trophic level receptors are not considered significant relative to ingestion exposures and are not evaluated in this ERA. Upper trophic level receptors considered in this ERA would not likely be exposed, via inhalation, to significant airborne sources of chemicals because the site is heavily vegetated and little wind erosion of the soils would be expected. Furthermore, the primary chemicals present on the site (metals and PAHs) typically adsorb to soil, suggesting that the potential for volatilization and thus exposure via inhalation is very limited. Incidental ingestion of soil or sediment during feeding, preening, or grooming activities is, however, considered in the risk estimates. Direct contact is considered for lower trophic level receptors (e.g., soil and benthic invertebrates).

Direct ingestion of drinking water is only considered when the salinity is below 15 parts per thousand, the approximate toxic threshold for wildlife receptors (Humphreys, 1988). The adjacent ephemeral stream is brackish to saline due to its proximity to Vieques Passage. However, as a conservative measure, based on the potential for this ephemeral stream to carry freshwater during storm events, water from the ephemeral stream was considered to serve as a possible source of drinking water for wildlife.

Receptors

Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all ecological receptors present at a site. Therefore, specific receptor species or species groups (e.g., red-tailed hawk) are often selected as surrogates to evaluate potential risks to larger portions of the ecological community (guilds; e.g., carnivorous birds) used to represent the assessment endpoints (e.g., survival and reproduction of carnivorous birds). Selection criteria typically include those species that:

- Are known to occur, or are likely to occur, at the site.
- Have a particular ecological, economic, or aesthetic value.
- Are representative of taxonomic groups, life history traits, and/or trophic levels in the habitats present at the site for which complete exposure pathways are likely to exist.
- Can, because of toxicological sensitivity or potential exposure magnitude, be expected to represent potentially sensitive populations at the site.

The following upper trophic level receptor species have been chosen for exposure modeling based upon the criteria listed above:

- Norway rat (*Rattus norvegicus*) - terrestrial mammalian omnivore.
- Indian mongoose (*Herpestes auropunctatus*) - terrestrial mammalian omnivore.

- Pearly-eyed thrasher (*Margarops fuscatus*) - terrestrial avian omnivore.
- Red-tailed hawk (*Buteo jamaicensis*) - terrestrial avian carnivore.
- Green heron (*Butorides virescens*) - wetland/aquatic avian piscivore.
- Spotted sandpiper (*Actitis macularia*) - wetland/aquatic avian invertivore.

Upper trophic level receptor species quantitatively evaluated in the ERA were limited to birds and mammals, the taxonomic groups with the most available information regarding exposure and toxicological effects. Because of the limited amount of ingestion-related toxicological data available for reptiles, exposures via the food web for these taxa were evaluated using bird and mammal receptors as surrogates.

Lower trophic level receptor species were evaluated in the ERA based upon those taxonomic groupings for which screening values have been developed; these groupings and screening values are used in most ERAs. As such, specific species of aquatic biota (e.g., fish and macroinvertebrates) were not chosen as receptors because of the limited information available for specific species and because these receptors were evaluated on a community level via a comparison to surface water and sediment screening values. Similarly, terrestrial plants and soil invertebrates were evaluated using soil screening values developed for these groups.

Endpoints and Risk Hypotheses

The conclusion of the screening problem formulation includes the selection of ecological endpoints and risk hypotheses, which are based upon the preliminary conceptual model. Two types of endpoints, assessment endpoints and measurement endpoints, are defined as part of the ERA process (EPA, 1997). An assessment endpoint is an explicit expression of the environmental component or value that is to be protected. A measurement endpoint is a measurable ecological characteristic that is related to the component or value chosen as the assessment endpoint. The considerations for selecting assessment and measurement endpoints are summarized in EPA (1997) and discussed in detail in Suter (1989, 1990, 1993). Risk hypotheses are testable hypotheses about the relationship among the assessment endpoints and their predicted responses when exposed to contaminants.

Endpoints define ecological attributes that are to be protected (assessment endpoints) and measurable characteristics of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has or may occur. Assessment endpoints most often relate to attributes of biological populations or communities, and are intended to focus the risk assessment on particular components of the ecosystem that could be adversely affected by chemicals attributable to the site (EPA, 1997). Assessment endpoints contain an entity (e.g., heron population) and an attribute of that entity (e.g., survival rate). Individual assessment endpoints usually encompass a group of species or populations (the receptor) with some common characteristic, such as specific exposure route or contaminant sensitivity, with the receptor then used to represent the assessment endpoint in the risk evaluation.

Assessment and measurement endpoints may involve ecological components from any level of biological organization, from individual organisms to the ecosystem itself. Effects on individual organisms are important for some receptors, such as rare and endangered species; population- and community-level effects are typically more relevant to ecosystems.

Population- and community-level effects are usually difficult to evaluate directly without long-term and extensive study. However, measurement endpoint evaluations at the individual level, such as an evaluation of the effects of chemical exposure on reproduction, can be used to predict effects on an assessment endpoint at the population or community level. In addition, use of criteria values designed to protect the majority (e.g., 95 percent) of the components of a community (e.g., National Recommended Water Quality Criteria for the Protection of Aquatic Life) can be useful in evaluating potential community- and/or population-level effects.

Table 7-4 shows the preliminary assessment endpoints, risk hypotheses, and measurement endpoints used in the screening portion (Steps 1 and 2) of the ERA. Table 7-4 also shows the receptors associated with each endpoint.

7.2.2 Screening Exposure Estimation

Maximum concentrations were used in the screening portion of the ERA to conservatively estimate potential chemical exposures for the ecological receptors selected to represent the assessment endpoints at AOC H. Food web exposures for upper trophic level receptor species were determined by estimating the chemical-specific concentrations in each dietary component using uptake and food web models. Incidental ingestion of soil or sediment was also included when calculating the total level of exposure. Maximum sediment, surface water, or surface soil concentrations were used in all screening food web calculations to provide a conservative assessment.

For conservatism, the maximum reporting limit for chemicals analyzed for but not detected was also compared to medium-specific screening values and (where applicable) used for food web exposure modeling. This was done to determine if reporting limits were less than or equal to chemical concentrations at which potential adverse effects to ecological receptors may occur.

7.2.2.1 Exposure Estimation

Upper trophic level receptor exposures (via the food web) to chemicals present in surface soil, sediment, and surface water were determined by estimating the concentration of each bioaccumulating chemical in each relevant dietary component. Incidental ingestion of soil or sediment was included when calculating the total exposure, as was exposure via drinking water from the onsite ephemeral stream. Since receptors (and their prey) are not exposed directly to groundwater at this site, food web exposures were not calculated based upon groundwater concentrations.

Only chemicals with the potential to bioaccumulate were evaluated for exposures via food webs. This list of bioaccumulating chemicals is provided in Table 7-5 for relevant constituents and is based upon the list provided by EPA (2000b).

Dietary items for which tissue concentrations were modeled included aquatic invertebrates, fish, terrestrial plants, soil invertebrates, and small mammals. For the screening portion of the ERA, the uptake of chemicals from the abiotic media into these food items was based upon conservative (e.g., maximum) bioconcentration factors (BCFs) or bioaccumulation factors (BAFs) from the literature. Default factors of 1.0 were used only when data were unavailable for a chemical in the literature.

Screening Exposure Point Concentrations

Maximum media concentrations were used as exposure point concentrations for exposure estimation and food web modeling in the screening portion of the ERA. Exposure point concentrations (concentrations in aquatic invertebrates, fish, terrestrial plant, soil invertebrate, and small mammal prey items) for semi-aquatic and terrestrial upper trophic level receptors were estimated using bioaccumulation models and maximum measured surface water, sediment, and surface soil concentrations. The methodology and models used to derive these estimates are described below.

Terrestrial Plants. Tissue concentrations in the aboveground vegetative portion of terrestrial plants were estimated by multiplying the maximum surface soil concentration for each chemical by chemical-specific soil-to-plant BCFs obtained from the literature. The BCF values used were based upon root uptake from soil and upon the ratio between dry-weight soil and dry-weight plant tissue. Literature values based upon the ratio between dry-weight soil and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BCF by the estimated solids content for terrestrial plants (15 percent [0.15]; Sample et al., 1997).

For inorganic chemicals without literature-based BCFs, a soil-to-plant BCF of 1.0 was assumed. For organic chemicals without literature-based BCFs, soil-to-plant BCFs were estimated using the algorithm provided in Travis and Arms (1988):

$$\log B_v = 1.588 - (0.578)\ (\log K_{ow})$$

where

B_v	=	Soil-to-plant BCF (unitless; dry-weight basis)
K_{ow}	=	Octanol-water partitioning coefficient (unitless)

The log K_{ow} values used in the calculations were obtained mostly from EPA (1995b, 1996a) and are listed in Table 7-5. The soil-to-plant BCFs used in the screening portion of the ERA are shown in Table 7-6.

Soil Invertebrates. Tissue concentrations in soil invertebrates (earthworms) were estimated by multiplying the maximum surface soil concentration for each chemical by chemical-specific BCFs or BAFs obtained from the literature. BCFs are calculated by dividing the concentration of a chemical in the tissues of an organism by the concentration of that same chemical in the surrounding environmental medium (in this case, soil) without accounting for uptake via the diet. BAFs consider both direct exposure to soil and exposure via the diet. Since earthworms consume soil, BAFs are more appropriate values and were used in the food web models when available. BAFs based upon depurated analyses (soil was purged from the gut of the earthworm prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of soil is accounted for separately in the food web model.

The BCF/BAF values used were based upon the ratio between dry-weight soil and dry-weight earthworm tissue. Literature values based upon the ratio between dry-weight soil and wet-weight earthworm tissue were converted to a dry-weight basis by dividing the wet-weight BCF/BAF by the estimated solids content for earthworms (16 percent [0.16]; EPA, 1993). For chemicals without available measured BAFs or BCFs, an earthworm BAF of 1.0 was assumed. The soil-to-invertebrate BCFs/BAFs used in the screening portion of the ERA are shown in Table 7-6.

Small Mammals. Whole-body tissue concentrations in small mammals (i.e., Norway rat for this site) were estimated using one of two methodologies. For chemicals with literature-based soil-to-small mammal BAFs, the small mammal tissue concentration was calculated by multiplying the maximum surface soil concentration for each chemical by a chemical-specific soil-to-small mammal BAF obtained from the literature. The BAF values used were based upon the ratio between dry-weight soil and whole-body dry-weight tissue. Literature values based upon the ratio between dry-weight soil and wet-weight tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for small mammals (32 percent [0.32]; EPA, 1993). The soil-to-small mammal BAFs used in the screening portion of the ERA are shown in Table 7-6.

For chemicals without soil-to-small mammal BAF values, an alternate approach was used to estimate whole-body tissue concentrations. Because most chemical exposure for small mammals occurs via the diet, it was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF (wet-weight basis) of 1.0 was assumed. The use of a diet to whole-body BAF of 1.0 is likely to result in a conservative estimate of chemical concentrations for chemicals that are not known to biomagnify in terrestrial food webs (such as PAHs) based upon reported literature values for chemicals that are known to biomagnify in food webs. For example, a maximum BAF (wet-weight) value of 1.0 was reported by Simmons and McKee (1992) for PCBs based on laboratory studies with white-footed mice. Menzie et al. (1992) reported BAF values (wet-weight) for DDT of 0.3 for voles and 0.2 for short-tailed shrews.

Benthic Invertebrates. Tissue concentrations in benthic invertebrates were estimated by multiplying the maximum sediment concentration for each chemical by chemical-specific sediment-to-invertebrate BAFs obtained from the literature. The BAF values used were based upon the ratio between dry-weight sediment and dry-weight invertebrate tissue. BAFs based upon depurated analyses (sediment was purged from the gut of the organism prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of sediment is accounted for separately in the food web model.

Literature values based upon the ratio between dry-weight sediment and wet-weight invertebrate tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for benthic invertebrates (21 percent [0.21]; EPA, 1993). For chemicals without literature-based sediment-to-invertebrate BAFs, a BAF of 1.0 was assumed. The sediment-to-invertebrate BAFs used in the screening portion of the ERA are shown in Table 7-7.

Fish. Tissue concentrations in whole-body fish were estimated by multiplying the maximum sediment concentration for each chemical by chemical-specific sediment-to-fish BAFs obtained from the literature. The BAF values used were based upon the ratio between dry-weight sediment and dry-weight fish tissue. Literature values based upon the ratio between dry-weight sediment and wet-weight fish tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for fish (25 percent

[0.25]; EPA, 1993). For chemicals without literature-based sediment-to-fish BAFs, a BAF of 1.0 was assumed. The sediment-to-fish BAFs used in the screening portion of the ERA are shown in Table 7-7.

Dietary Intakes

Dietary intakes for each upper trophic level receptor species were calculated using the following formula (modified from EPA [1993]):

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

where

DI_x	=	Dietary intake for chemical x (mg chemical/kg body weight/day)
FIR	=	Food ingestion rate (kg/day, dry-weight)
FC_{xi}	=	Concentration of chemical x in food item i (mg/kg, dry-weight)
PDF_i	=	Proportion of diet composed of food item i (dry-weight basis)
SC_x	=	Concentration of chemical x in soil/sediment (mg/kg, dry-weight)
PDS	=	Proportion of diet composed of soil/sediment (dry-weight basis)
WIR	=	Water ingestion rate (L/day)
WC_x	=	Concentration of chemical x in water (mg/L)
BW	=	Body weight (kg, wet-weight)

Receptor-specific values used as inputs to this equation for the screening portion of the ERA are provided in Table 7-8. Consistent with the conservative approach used for a SERA, the minimum adult body weight and maximum food and water ingestion rates from the scientific literature were used for each receptor. It was assumed that chemicals were 100 percent bioavailable to the receptor and it was also assumed that each receptor spent 100 percent of its time on the site (i.e., an area use factor [AUF] of 1.0 was assumed).

7.2.3 Screening Effects Evaluation

The purpose of the screening effects evaluation is to establish chemical exposure levels (screening values) that represent conservative thresholds for adverse ecological effects. One set of screening values is typically developed for each selected assessment endpoint.

7.2.3.1 Medium-Specific Screening Values

Medium-specific screening values were established for each ecologically relevant media. Screening value sources were based on prior agency recommendations following review of the workplan. Based upon the preliminary conceptual model, direct exposure to surface soil, surface water, and sediment are potentially complete pathways at AOC H.

The soil screening values used were the lower of the plant and soil invertebrate ecological soil screening levels (eco-SSLs) from EPA (2005). If eco-SSLs were not available, the soil screening values used were from the Oak Ridge National Laboratory, which has identified soil screening values specific to soil invertebrates and microbial processes (Efroymson et al., 1997a), and terrestrial plants (Efroymson et al., 1997b). Where screening values were available for multiple receptors in these ORNL references, the most conservative value was chosen. In some instances where soil screening values were not available from these three primary sources, three other references were consulted comprising the Canadian protocol for deriving environmental soil quality guidelines (SQGs; CCME, 1996), Dutch Soil Quality Standards (MHSPE, 1994), and U.S. Fish and Wildlife Service soil screening values presented by Beyer (1990). The lowest screening value from these three sources was then selected for screening. The surface water screening values used were the more stringent values from two sources, the Puerto Rico Water Quality Standards Regulation (EQB, 2003) and the U.S. National Recommended Water Quality Criteria (NRWQC) for the protection of aquatic life (EPA, 2002). Surface water at AOC H is saline, thus chronic NRWQC criteria for saltwater were used. Similarly, the Puerto Rico standards identified for coastal/estuarine waters were used in the assessment. Table 3-8 (Section 3) summarizes the field surface water quality parameters for this site. Salinity values at the four surface water stations ranged from 25.8 to 32.2 parts per thousand, and therefore demonstrate that the on-site surface water body is saline.

The sediment screening values were selected from National Oceanic and Atmospheric Administration (NOAA) publications (Long and Morgan, 1990; Long et al., 1995) and the State of Florida (MacDonald, 1994). The selected screening effect level is the lower of the effects range-low (ER-L) (Long et al., 1995) and threshold effect level (TEL; MacDonald et al., 1996). In cases where the Contract Laboratory Program's (CLP) practical quantitation limit (PQL) is above the screening value, the screening value defaults to the PQL (EPA, 1995).

7.2.3.2 Ingestion Screening Values

Ingestion screening values for dietary exposures were derived for each mammalian and avian receptor species and chemical evaluated in the ERA. Toxicological information from the literature for wildlife species most closely related to the receptor species was used, when available, but was supplemented by laboratory studies of non-wildlife species (e.g., chickens and laboratory rats) when necessary. The ingestion screening values are expressed as milligrams of the chemical per kilogram body weight of the receptor per day (mg/kg-BW/day).

Growth and reproduction were emphasized as assessment endpoints because they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied chronic toxicological endpoints for ecological receptors. If several chronic toxicity studies were available from the literature, the most appropriate study was selected for each receptor species based upon study design, study methodology, study duration, study endpoint, and test species. Ingestion screening values were derived for both chronic No Observed Adverse Effect Levels (NOAELs) and chronic chronic Lowest Observed Adverse Effect Levels (LOAELs) endpoints. The applicable uncertainty factors from Table 7-8a were applied to derive these screening values, where necessary. Ingestion screening values for mammals and birds are summarized in Tables 7-9 and 7-10, respectively.

7.2.4 Screening Risk Calculation

The screening risk calculation is the final step in a SERA. In this step, the maximum exposure concentrations (abiotic media) or exposure doses (upper trophic level receptor species) are compared to the corresponding screening values to derive screening risk estimates. The outcome of this step is a list of COPCs for each medium-pathway-receptor combination evaluated or a conclusion of acceptable risk.

7.2.4.1 Selection of Chemicals of Potential Concern (COPCs)

COPCs are selected using the hazard quotient (HQ) method. HQs are calculated by dividing the chemical concentration in the medium being evaluated by the corresponding medium-specific screening value or by dividing the exposure dose by the corresponding ingestion screening value. Detected chemicals with HQs greater than or equal to 1.0 are considered COPCs in the SERA. Detected chemicals for which toxicological data were not available were also identified as COPCs in the SERA. Undetected chemicals with maximum reporting limits that exceeded screening values are addressed in the uncertainty section. Undetected chemicals without available screening values were not identified as COPCs.

HQs exceeding 1.0 indicate the potential for risk since the chemical concentration or dose (exposure) exceeds the screening value (effect). However, screening values and exposure estimates are derived using intentionally conservative assumptions such that HQs greater than or equal to 1.0 do not necessarily indicate that risks are present or impacts are occurring. Rather, they identify chemical-pathway-receptor combinations requiring further evaluation. HQs that are less than 1.0 indicate that risks are very unlikely, enabling a conclusion of no unacceptable risk to be reached with high confidence.

Surface Soil

Maximum surface soil concentrations are compared to screening values in Table 7-11. Based upon this comparison, 10 metals (aluminum, arsenic, chromium, copper, iron, manganese, selenium, thallium, vanadium, and zinc), three pesticides (DDD, DDE, DDT), four PAHs (benzo(a)pyrene, fluoranthene, phenanthrene, and pyrene), total PAHs, and one VOC (total xylenes) had HQs equaling or exceeding 1.0, based upon detected concentrations, and were therefore identified as COPCs. In addition, one pesticide, 13 SVOCs, and 3 VOCs were retained as COPCs because screening values were not available for comparison to detected concentrations.

Surface Water

Maximum surface water concentrations are compared to screening values in Table 7-12. Based upon this comparison, one metal (arsenic) had a HQ equaling or exceeding 1.0 based upon the detected total (unfiltered) concentration and was identified as a COPC. In addition, four detected metals and one SVOC were retained as COPCs because screening values were not available for comparison to detected concentrations.

Sediment

Maximum sediment concentrations are compared to screening values in Table 7-13. Eight metals were retained as COPCs because screening values were not available for comparison to detected concentrations.

Food Web Exposures

HQs based upon maximum exposure doses for each upper trophic level receptor are listed in Table 7-14 and the concentrations in each of the exposure dose dietary components and the total exposure dose for each upper trophic level receptor and chemical evaluated are provided in a series of tables (J1 through J6a) in Appendix J. Based upon a comparison to NOAELs, nine metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc) and one pesticide (DDE) had HQs equaling or exceeding 1.0 for one or more upper trophic level receptors and were identified as COPCs. Six PCBs and four SVOCs had maximum reporting limits exceeded screening values, however they were not detected in any sample and were therefore not retained as COPCs.

Ingestion screening values were not available for avian or mammalian receptors for two organic chemicals (4-bromophenyl-phenylether and 4-chlorophenyl-phenylether), and ingestion screening values were not available for avian receptors for three chemicals (1,1,2,2-tetrachloroethane, hexachlorocyclopentadiene, and hexachloroethane). Only 4-bromophenyl-phenylether was detected on the site and was retained as a COPC. The remaining chemicals were not detected and therefore were not identified as COPCs.

7.2.5 Screening Risk Conclusions

COPCs were identified in surface soil, surface water, and sediment at AOC H, as well as from food web exposures. These COPCs are summarized in Table 7-15.

7.3 Baseline Ecological Risk Assessment

The SERA resulted in a set of COPCs for each medium evaluated. This set of COPCs includes chemicals with HQs equaling or exceeding 1.0 (based upon maximum exposures) and detected chemicals for which toxicological data (screening values) were not available.

7.3.1 Refinement of Conservative Screening Assumptions

Step 3 initiates the problem formulation phase of the BERA. The BERA begins with a preliminary step (Step 3A) in which the conservative assumptions used in the SERA are refined and risk estimates are recalculated using the same conceptual model for the site. The refinement may also include consideration of other factors such as upgradient and background data, detection frequency, chemical-specific bioavailability, and area use factor for wildlife.

The assumptions, parameter values, and methods that were modified for the Step 3A refinement were as follows:

- Risk estimates based upon maximum chemical concentrations in media were supplemented by risk estimates based upon average (arithmetic mean) chemical concentrations. In addition, BAFs and BCFs were based upon, or modeled from, central tendency estimates (e.g., median or mean) from the literature as opposed to the maximum estimates used in the SERA for many chemicals. Revised BAF/ BCF values used in Step 3A are provided in Tables 7-16 and 7-17.

  In the BERA, using central tendency estimates (rather than high end or maximums) for exposure parameters such as BAFs provides a more representative estimate of potential exposures and risks to receptor populations (the focus of the assessment endpoints) of upper trophic level receptors. Because these upper trophic level species are highly mobile, they would be expected to effectively average their exposure over time as they forage within the area defining their home range (which extends to offsite areas).

Average prey concentrations at Step 3A are most appropriately estimated using central tendency estimates of media concentrations and accumulation factors. For example, the wildlife dietary exposure models contained in the Wildlife Exposure Factors Handbook (EPA, 1993) specify the calculation of an average daily dose. Increasing the representativeness of the exposure estimates relative to population-level effects is consistent with the intent of the Step 3A evaluation. In cases where adequate spatial sampling coverage exists, mean concentrations are also appropriate for evaluating potential risks to populations of lower trophic level receptors because the members of the population are expected to be found throughout a site (where suitable habitat is present), rather than concentrated in one particular area. While effects on individual organisms might be important for some receptors, such as rare and endangered species, population- and community-level effects are typically more relevant to ecosystems. A discussion of the uncertainties associated with the number of available samples and their spatial distribution is presented in Section 7.5.

- Central tendency estimates (e.g., mean, median, midpoint) for body weight and ingestion rate (Table 7-18) were used to develop exposure estimates for upper trophic level receptors, rather than the minimum body weights and maximum ingestion rates used in the SERA. Central tendency estimates for these exposure parameters are more relevant for a BERA because they better represent the characteristics of a greater proportion of the individuals in the population. Populations (rather than individual organisms) were emphasized during the development of the assessment endpoints for the ERA.

- The SERA conservatively identified a chemical as a food web COPC if the estimated dose for at least one upper trophic level receptor exceeded the NOAEL. The actual dose that is protective of an individual receptor, however, will fall between the NOAEL and the LOAEL. Both the NOAEL and LOAEL were used for comparison in the BERA.

- Site-specific upgradient concentrations and basewide background concentrations were also considered in the refinement.

- EPA guidance (EPA, 1996b) indicates that the dissolved metal fraction should be preferentially used to the total metal fraction in surface water screening. For conservatism, total metal concentrations were included in the SERA for the surface water screen. Since high levels of suspended solids and sediment-adsorbed metals could result in overstating bioavailable surface water concentrations (and thus potential exposures and risks), filtered metal concentrations (representing the dissolved fraction) in surface water were also evaluated through a comparison to screening values based upon the dissolved metal fraction.

- Site size was included in the food web model to develop an area use factor that accounts for wildlife site use in comparison to their home range (Table 7-18).

Only complete, critical pathways identified in the SERA were re-evaluated in Step 3A of the ERA. Similarly, only COPCs and receptors identified in the SERA as requiring further evaluation were addressed in Step 3A. Although many aspects of the estimation of exposure were modified in Step 3A (see above), the screening values (effects) used in Step 3A were the same as the values used in the SERA, unless there was adequate justification available to provide an alternate screening value. Although the same basic conceptual model from the SERA was also used in Step 3A, the endpoints and risk hypotheses from the SERA were modified slightly to better reflect the Step 3A analysis (Table 7-19).

7.3.2 Refined (Step 3A) Risk Characterization

Based upon the results of the SERA, the assessment endpoints, measurement endpoints, and risk hypotheses were modified for the Step 3A evaluation (Table 7-19). Modifications included changing the measurement endpoints to reflect the assumptions and methods used in the Step 3A evaluation. The results of the refined risk characterization are discussed in the following subsections.

7.3.2.1 Surface Soil

Mean chemical concentrations in surface soils from AOC H are compared to screening values in Table 7-20. Based upon this comparison, six metals (aluminum, chromium, iron, manganese, vanadium, and zinc), two pesticides (DDE, DDT), and four PAHs (benzo[a]pyrene, fluoranthene, phenanthrene, and pyrene) had mean HQs that equaled or exceeded 1.0 and were identified as preliminary chemicals of concern (PCOCs). Mean HQs for three of the PAHs were higher than the maximum HQs due to the influence of elevated detection limits for nondetected PAHs on the calculation of mean PAH concentrations.

M,p-Xylene and o-xylene, which did not have screening values, were eliminated since the mean HQ for total xylenes was below 1.0. The frequency of detection for total xylenes was 1 in 20 samples.

7.3.2.2 Surface Water

Mean chemical concentrations in surface water from the ephemeral stream are compared to screening values in Table 7-21. A screening value was available only for arsenic, for which the mean HQ exceeded 1.0. Arsenic was retained as a PCOC. In addition, four detected metals and one SVOC were retained as PCOCs because screening values were not available for comparison.

7.3.2.3 Sediment

Mean chemical concentrations in sediment from the lagoon system are presented in Table 7-22, however no screening values were available based on the initial literature sources. Alternate literature sources however were evaluated, from which screening values were identified for six of the metals. Apparent Effects Threshold (AET) values were available from NOAA SQUIRT tables (NOAA, 1999) for aluminum– 18,000 mg/kg; barium – 48 mg/kg; cobalt – 10 mg/kg; iron – 220,000 mg/kg; manganese – 260 mg/kg; and vanadium – 57 mg/kg. Mean sediment concentrations for all six metals were below these screening values and were therefore not carried forward as PCOCs, while beryllium and thallium did not have screening values available and were retained as PCOCs.

7.3.2.4 Food Web Exposures

HQs based upon average exposure doses for each upper trophic level receptor are listed in Table 7-23. Based upon a comparison to NOAELs, only zinc (1.7) had an HQ that exceeded 1.0 for the pearly-eyed thrasher. However, the LOAEL was not exceeded for zinc (HQ of

0.19) and the site is small; therefore, the exposure dose for zinc is expected to be protective of the population, which is the assessment endpoint being evaluated. Because none of the LOAELs were exceeded, and NOAELs were not exceeded for any other terrestrial or aquatic receptor, no PCOCs for upper trophic level receptors were retained for further evaluation.

7.3.3 Risk Evaluation

The potential for adverse effects associated with the PCOCs identified in Section 7.3.2 and Tables 7-20 through 7-22 are evaluated in this section. The goal of this evaluation is to finalize a list of COCs.

7.3.3.1 Surface Soil Exposures

Six metals (aluminum, chromium, iron, lead, manganese, vanadium, and zinc), two pesticides (DDE, DDT), and four PAHs (benzo(a)pyrene, fluoranthene, phenanthrene, and pyrene) were identified as PCOCs in surface soils from AOC H. Onsite inorganic surface soil concentrations for these metals were compared to background upper tolerance limit (UTL) concentrations in Table 7-24. Background data were not available for organic chemicals.

Aluminum, chromium, manganese, and vanadium did not exceed the background UTL in any sample. Iron had a single low exceedance of the background UTL, with a maximum ratio of 1.04. Thus the levels of these five soil metals are consistent with background conditions.

Zinc exceeded the background UTL. The mean HQ for zinc at this site was 1.9. The screening value of 50 mg/kg for zinc is protective of plants; however, vegetation throughout the site is dense and diverse, and comparable to reference plant communities. The Oak Ridge National Laboratory provides other screening values protective of soil microorganisms (100 mg/kg) and soil invertebrates (200 mg/kg) which are more appropriate for site conditions. Considering these two screening values, maximum HQs for zinc would range from 1.3 to 2.6, and mean HQs would be less than 1.0. Based on the low magnitude of screening value exceedances for plants, soil invertebrates, and microbial communities, the risk associated with zinc is likely to be low.

The pesticides DDE and DDT were identified as PCOCs in soil. These chemicals exceeded the soil screening value in 18 to 19 of 32 samples. The screening value used was 0.0025 mg/kg for total DDD/DDE/DDT and is a Target Value (MHSPE, 1994) that is scientifically based on standards for surface water and drinking water. The Ministry of Housing, Spatial Planning and Environment has also identified an Intervention Value of 4.0 mg/kg for total DDD/DDE/DDT, which is based on ecological effects. Only one of the 33 soil samples exceeds this screening value. This sample (NDE004) was collected along the front edge of the abandoned building. Other samples collected from areas surrounding this location indicate that elevated DDE and DDT were isolated to this location. The risk associated with direct exposure of DDE and DDT to terrestrial invertebrates and plants is likely to be low considering the limited extent of elevated levels of contamination (greater than the intervention value) and the limited habitat present at the one location that exceeded the intervention value.

The PAHs benzo(a)pyrene, fluoranthene, and phenanthrene were identified as PCOCs. However, soil concentrations exceeded screening values in only 1 to 2 of 33 samples, and maximum HQs were low, ranging from 1.2 to 1.9. Pyrene was an exception in that it exceeded the screening value in only 3 of 33 samples, but the maximum HQ was 19 due to a single elevated detection of 1.9 mg/kg at the edge of the abandoned building where tire burning was conducted. The maximum HQ based on the remaining 32 samples is 1.7, and 30 of the samples are below the screening value of 0.1 mg/kg. As a result, pyrene is unlikely to pose an unacceptable risk due to the low magnitude of screening value exceedance and its limited distribution. The remaining 6 PAHs did not have screening values and therefore could not be quantitatively evaluated. Maximum detections were less than or equal to 0.190 mg/kg, which is comparable to detections of the other PAHs with screening values.

Seven other SVOCs and one VOC were detected but could not be evaluated quantitatively because screening values were not available. For bis(2-ethylhexyl)phthalate an alternate literature source was evaluated. Detections of bis(2-ethylhexyl)phthalate did not exceed the screening value of 10 mg/kg (IPCS, 1992); thus it was not carried forward as a PCOC. The single detection of the VOC 1,1-dichloroethene was low (0.00078 mg/kg) in comparison to screening values for other VOCs, which range from 0.001 to 1,000 mg/kg (see Table 7-11). Alternate screening values could not be identified for 2,6 dinitrotoluene, 2-methylnaphthalene, 3-nitroanaline, 4-bromophenyl phenyl ether, isophorone, and n-nitroso-n-propylamine. These chemicals were infrequently detected, ranging from 1 to 3 detections in 33 surface soil samples (except 2-methylnaphthalene which was detected in 6 of 33 samples). Detections typically occurred in samples adjacent to the western side of the abandoned building. These chemicals could not be quantitatively evaluated.

7.3.3.2 Surface Water Exposures

Five inorganics (aluminum, arsenic, barium, cobalt, and manganese) were identified as COPCs due to screening value exceedance (arsenic only) or lack of screening values. Of these, aluminum, arsenic, and cobalt were detected only as total (unfiltered) inorganics. Because these inorganics were not detected in any of the filtered (dissolved) surface water samples, they are likely associated with suspended sediment particulates and not readily bioavailable to directly exposed aquatic organisms. As a result, these inorganics were not considered for further evaluation as COPCs.

Surface water background data were unavailable for this site.

Aluminum, arsenic, and cobalt were detected only as total (unfiltered metals). Since these metals were not detected in any of the filtered (dissolved) surface water samples, they are not readily bioavailable to directly exposed aquatic organisms. As a result, these undetected dissolved metals will not be considered further.

Total and dissolved barium and manganese were detected in all four surface water samples. No screening values or background values were available to quantitatively assess potential risk. The SVOC caprolactam was detected in one surface water sample. No screening values are available to evaluate this chemical quantitatively.

7.3.3.3 Sediment Exposures

Eight inorganics (aluminum, barium, beryllium, cobalt, iron, manganese, thallium, and vanadium) were identified as COPCs in sediment from AOC H. Onsite concentrations of these parameters were compared to concentrations in an upgradient sediment sample.

Except for barium, all other inorganics were below background levels. Barium is not widely distributed, exceeded basewide background in only one sample, and does not have a literature screening value available; thus the potential for unacceptable risk is likely to be low, and therefore it was not considered further as a COPC.

Beryllium and thallium were identified as PCOCs in sediment from AOC H. Onsite concentrations of these parameters were compared to concentrations in an upgradient sediment sample in Table 7-25. Ratios were developed for comparing maximum site concentrations with upgradient sediment concentrations. Maximum site concentrations of beryllium slightly exceeded the upgradient concentration (ratio of 1.02), while maximum site concentrations of thallium were below the upgradient concentration (ratio 0.4). Because these inorganics were comparable to or below background conditions, they are not likely to pose unacceptable risk to directly exposed aquatic organisms, and therefore they will not be considered further as PCOCs.

7.3.3.4 Food Web Exposures

The results of the food web exposure modeling identified no COCs. Based upon a comparison to LOAELs, no HQ exceeded one for any of the terrestrial or aquatic receptors. Only the HQ for zinc (pearly-eyed thrasher) exceeded one based upon the NOAEL (HQ of 1.73). The ingestion screening value for zinc used in the HQ calculation was based upon a 44-week chronic study with chickens; endpoints were based upon reproductive effects. The experiment-derived NOAEL (14.5 mg/kg/day) was about a factor of nine lower than the experiment-derived LOAEL (131 mg/kg/day). The actual threshold of an effect is somewhere between the NOAEL and LOAEL. This threshold is often estimated by calculating the geometric mean of the NOAEL and LOAEL. For zinc, this value (43.6 mg/kg/day) would not be exceeded by the calculated dose for the pearly-eyed thrasher, suggesting no unacceptable risk.

7.3.3.5 Summary of COCs

In summary, none of the COPCs carried forward from Step 2 were considered as final COCs following the Step 3A refinement. Although some metals and a few organic chemicals were identified as COPCs, risks to lower trophic level receptors were negligible based on low magnitude of screening value exceedances and comparisons to background/upgradient data. Also, no significant risks were identified for upper trophic level wildlife from potential food web exposures.

7.4 Uncertainties

Uncertainties are present in all risk assessments because of the limitations of the available data and the need to make certain assumptions and extrapolations based upon incomplete information. The uncertainty in this ERA is mainly attributable to the following factors:

- Reporting Limits - Reporting limits for some undetected analytes exceeded applicable screening values in some media. Because these chemicals were not detected, they are not known to be present on the site but the potential for unacceptable risks cannot be totally discounted because the reporting limits are higher than the screening values.

- Selection of COPCs - Chemicals without available screening values for a medium were not retained as COPCs in the SERA portion of the assessment unless they were detected. This could result in an underestimation of risks if these chemicals are actually present on the site at ecologically significant concentrations. For the Step 2 screen: (1) 1 pesticide, 12 SVOCs, and 3 VOCs detected in surface soil lacked screening values; (2) 4 inorganics and 1 SVOC detected in surface water lacked screening values; and (3) 8 inorganics detected in sediment lacked screening values. These chemicals were evaluated in Step 3 through a combination of background/upgradient comparisons and a comparison to toxicological information from the literature. Thus, the uncertainty associated with the lack of screening values for these detected chemicals is low because there were other, relevant data that allowed them to be evaluated.

- Evaluation of Soils - The quantitative evaluation of chemical concentrations in soils was restricted to surface soils from the 0- to 6-inch depth range, where the highest exposures for most ecological receptors would be expected to occur.

- Ingestion Screening Values - Data on the toxicity of many chemicals to the receptor species were sparse or lacking, requiring the extrapolation of data from other wildlife species or from laboratory studies with nonwildlife species. This is a typical limitation and extrapolation for ecological risk assessments because so few wildlife species have been tested directly for most chemicals. The uncertainties associated with toxicity extrapolation were minimized through the selection of the most appropriate test species for which suitable toxicity data were available. The factors considered in selecting a test species to represent a receptor species included taxonomic relatedness, trophic level, foraging method, and similarity of diet.

  A second uncertainty related to the derivation of ingestion screening values applies to metals. Most of the toxicological studies on which the ingestion screening values for metals were based used forms of the metal (such as salts) that have high water solubility and high bioavailability to receptors. Since the analytical samples on which site-specific exposure estimates were based measured total metal, regardless of form, and these highly bioavailable forms are expected to compose only a fraction of the total metal concentration, this is likely to result in an overestimation of potential risks for these chemicals.

  A third source of uncertainty associated with the derivation of ingestion screening values concerns the use of uncertainty factors. For example, NOAELs were extrapolated to LOAELs using an uncertainty factor of ten. This approach is likely to be conservative since Dourson and Stara (1983) determined that 96 percent of the chemicals included in a data review had LOAEL/NOAEL ratios of five or less. The use of an uncertainty factor of 10, although potentially conservative, also serves to counter some of the uncertainty associated with interspecies extrapolations, for which a specific uncertainty factor was not used.

- Chemical Mixtures - Information on the ecotoxicological effects of chemical interactions is generally lacking, which required (as is standard for ecological risk assessments) that the chemicals be evaluated on a compound-by-compound basis during the comparison to screening value. This could result in an underestimation of risk (if there are additive or synergistic effects among chemicals) or an overestimation of risks (if there are antagonistic effects among chemicals).

- Receptor Species Selection - Reptiles were selected as receptors in the ERA, but were not evaluated quantitatively even when exposure pathways were complete. These taxa were evaluated using other fauna (birds and mammals) as surrogates due to the general lack of taxon-specific toxicological data. This represents an uncertainty in the assessment

  It was also assumed that reptiles were not exposed to significantly higher concentrations of chemicals and were not more sensitive to chemicals than the other receptor species evaluated. This assumption was a source of uncertainty in the ERA. In addition, there is some uncertainty associated with the use of specific receptor species to represent larger groups of organisms (e.g., guilds).

- Food Web Exposure Modeling - Chemical concentrations in terrestrial and aquatic food items (plants, earthworms, small mammals, benthic invertebrates, and fish) were modeled from measured media concentrations and were not directly measured. The use of generic, literature-derived exposure models and bioaccumulation factors introduces some uncertainty into the resulting estimates. The values selected and methodology employed were intended to provide a conservative (SERA) or realistic (Step 3A) estimate of potential food web exposure concentrations.

  Another source of uncertainty is the use of default assumptions for exposure parameters such as BCFs and BAFs. Although BCFs or BAFs for many bioaccumulative chemicals were readily available from the literature and were used in the ERA, the use of a default factor of 1.0 to estimate the concentration of some chemicals in receptor prey items is a source of uncertainty.

  Area use factors were assumed to equal 1.0 in the Screening Exposure Estimation. This is a conservative assumption since a significant percentage of each upper trophic level receptor species time could be spent foraging offsite in unimpacted areas or areas where chemical concentrations are expected to be significantly lower.

- Total Versus Dissolved Metals - EPA guidance (EPA, 1996b) indicates that the dissolved metal fraction should be preferentially used to the total metal fraction in surface water screening. Both total and dissolved concentrations were used in the ERA for the surface water screen. High levels of suspended solids and sediment-adsorbed metals would result in overstating bioavailable water concentrations and thus potential exposures and risks.

- Mean Versus Maximum Media Concentrations - As is typical in an ERA, a finite number of samples of environmental media are used to develop the exposure estimates. The maximum measured concentration provides a conservative estimate for immobile biota or those with a limited home range. The most realistic exposure estimates for mobile species with relatively large home ranges and for species populations (even those that are immobile or have limited home ranges) are those based upon the mean chemical concentrations in each medium to which these receptors are exposed. This is reflected in the wildlife dietary exposure models contained in the Wildlife Exposure Factors Handbook (EPA, 1993), which specify the use of average media concentrations. Given the mobility of the upper trophic level receptor species used in the ERA, the use of maximum chemical concentrations (rather than mean concentrations) in the SERA to estimate the exposure via food webs is very conservative. This conservatism was reduced to more realistic levels in the values selected for use in the Step 3A evaluation.

- Comparisons to Background/Upgradient Concentrations - Background or upgradient concentrations were used to judge the site-relatedness of individual chemicals in particular media. If site chemical concentrations were consistent with these levels, it was assumed that the concentrations were not site-related. There exists the possibility that concentrations below background or reference were indeed site-related, rendering the assumption false. However the impact of this possibility is minimal since chemicals at concentrations consistent with background or reference conditions should exhibit no different ecological effects than commonly occurring in areas not affected by releases, regardless of their source.

  A single background sediment sample was collected for AOC H. This sample was collected from the stream in an area that was upgradient of potential influences from AOC H. It is appropriate to conclude that there is a range of concentrations attributable to background for any inorganic constituent, and that the datum for a particular constituent from a single background sample represents only one point in that range. Therefore, the single sediment sample collected upstream of AOC H represents a single point in the range of background sediment conditions for the site. The uncertainty associated with use of the single data point as representative of background is relatively low because the upgradient comparison was only used for two inorganics (beryllium and thallium), neither of which is likely site-related.

- Spatial Distribution of Samples - The number and spatial distribution of the analytical samples were sufficient to adequately estimate potential ecological risks. Thirty-three soil samples were collected from AOC H which is approximately 2 acres in size. These samples surrounded and were in close proximity to the former power plant facility. Four surface water and sediment samples were collected from the adjacent ephemeral stream, which was approximately 300 feet long.

TABLE 7-1
Plant Species Observed at AOC H
AOC H, Former NASD, Vieques, Puerto Rico

		STRATUM		
Common Name	**Scientific Name**	**AOC H**	**Reference Site**	**Ephemeral stream/Lagoon**
Better Man Better	*Achyrantes aspera*	H		T/S
Hurricane Grass	*Bothriochloa pertusa*	G		
Gumbo Limbo	*Bursera simaruba*	T/S	T/S	
Papaya	*Carica papaya*			T/S
Wild Coffee	*Casearia guianensis*			T/S
Pudding Vine	*Cissus verticillata*	V		V
Coconut Palm	*Cocos nucifera*		T/S	
Manjack	*Cordia obliqua*		T/S	T/S
Brisselet	*Erythroxylum brevipes*	T/S		T/S
Black Mampoo	*Guapira fragans*			T/S
Jasmine	*Jasminum fluminense*	V	V	V
White Mangrove	*Laguncularia racemosa*		T/S	
Tantan, Wild Tamarind	*Leucaena leucocephala*	T/S	T/S	T/S
Lonchocarpus	*Lonchocarpus heptaphyllus*		T/S	
Quenepa	*Melicoccus bijugatus*	T/S	T/S	
Malva colorada	*Melochia nodiflora*	H		
Monk orchid	*Oeceoclades maculata*			H
Bejuco de costilla	*Paullinia pinnata*			V
Black Wattle	*Piper amalago*	T/S		T/S
Christmas Tree	*Randia aculeata*	T/S		
Bitter Bush species	*Rauvolfia* sp.	T/S		
Red Mangrove	*Rhizophora mangle*		T/S	
Rain Tree, Licorice	*Samanea saman*			T/S
Basket with	*Serjania polyhphylla*		V	
Indian Almond	*Terminalia catappa*		T/S	
Broomstick	*Trichilia hirta*		T/S	T/S
Basket Wiss	*Trichostigma octandrum*	V		V
Indian Jujube	*Ziziphus mauritiana*	T/S	T/S	T/S

T/S = tree or shrub
H = herbaceous
V = vine
G = grass

TABLE 7-2
Wildlife Observed at AOC H
AOC H, Former NASD, Vieques, Puerto Rico

Common Name	Scientific Name	AOC H	Adjacent Habitat/ Reference Site
Mammals			
West Indian Fruit Bat	*Artibeus jamaicensis*	X	
Reptiles			
Ground Lizard	*Ameiva exsul*		X
Anole (Common Lizard)	*Anolis cristatellus*	X	
Grass Anole (Garden Lizard)	*Anolis pulchellus*	X	
Anole (Spotted Lizard)	*Anolis stratulus*	X	
Birds			
Bananaquit	*Coereba flaveola*		X
Common Ground Dove	*Columbina passerina*	X	X
Adelaide Warbler	*Dendroica adelaidae*	X	X
Northern Mockingbird	*Mimus polyglottos*		X
Greater Antillean Grackle	*Quiscalus niger*		X
Louisiana Waterthrush	*Seiurus motacilla*		X
Gray Kingbird	*Tyrannus dominicensis*	X	X
Zenaida Dove	*Zenaida aurita*		X

TABLE 7-3
Federally Listed Species Occurring or Potentially Occurring at NASD Vieques
AOC H, Former NASD, Vieques, Puerto Rico

Scientific Name (Common Name)	Federal Status
Plants	
Chaemacrista glandulosa var. mirabilis (Herb)	Endangered
Stahlia monosperma (Cobana negra)	Threatened
Calyptranthes thomasiana (Tree)	Endangered
Eugenia woodburyana (Evergreen tree)	Endangered
Goetzea elegans (Beautiful goetzea)	Endangered
Reptiles and Amphibians	
Chelonia mydas (Green sea turtle)	Threatened
Dermochelys coriacea (Leatherback sea turtle)	Endangered
Caretta caretta (Loggerhead sea turtle)	
Eretmochelys imbricata (Hawksbill sea turtle)	Endangered
Birds	
Falco peregrinus tundrius (Arctic peregrine falcon)	Threatened
Pelecanus occidentalis occidentalis (Brown pelican)	Endangered
Sterna dougalli dougalli (Roseate tern)	Endangered
Mammals	
Physeter macrocephalus (Sperm whale)	Endangered
Balaenoptera physalus (Fin whale)	Endangered
Megaptera novaeangliae (Humpback whale)	Endangered
Trichechus manatus (West Indian manatee)	Endangered

Source: Geo-Marine Inc., 2001

TABLE 7-4
Preliminary Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
AOC H, Former NASD, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Terrestrial Habitats			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect soil invertebrate communities?	Comparison of maximum chemical concentrations in surface soil with soil screening values.	Soil invertebrates
Survival, growth, and reproduction of terrestrial plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect terrestrial plant communities?	Comparison of maximum chemical concentrations in surface soil with soil screening values.	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to terrestrial reptile populations?	Evidence of potential risk to other upper trophic level terrestrial receptors evaluated in the ERA.	--
Survival, growth, and reproduction of avian terrestrial omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on maximum surface soil concentrations.	Pearly-eyed thrasher
Survival, growth, and reproduction of avian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume small mammals from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on maximum surface soil concentrations.	Red-tailed hawk
Survival, growth, and reproduction of mammalian terrestrial omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on maximum surface soil concentrations.	Norway rat
Survival, growth, and reproduction of mammalian terrestrial omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume small mammals, soil invertebrates, and plants from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on maximum surface soil concentrations.	Indian mongoose
Aquatic Habitats			
Survival, growth, and reproduction of benthic invertebrate communities	Are site-related chemical concentrations in sediment sufficient to adversely affect benthic invertebrate communities?	Comparison of maximum chemical concentrations in sediment with medium-specific screening values.	Benthic invertebrates

TABLE 7-4
Preliminary Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints
AOC H, Former NASD, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Survival, growth, and reproduction of water-column invertebrate communities	Are site-related chemical concentrations in surface water sufficient to adversely affect water-column invertebrate communities?	Comparison of maximum chemical concentrations in surface water with medium-specific screening values.	Water-column invertebrates
Survival, growth, and reproduction of aquatic plant communities	Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect aquatic plant communities?	Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values.	Aquatic plants
Survival, growth, and reproduction of fish communities	Are site-related chemical concentrations in surface water sufficient to adversely effect fish communities?	Comparison of maximum chemical concentrations in surface water with medium-specific screening values.	Fish
Survival, growth, and reproduction of avian aquatic/wetland invertivore populations	Are site-related chemical concentrations in sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume primarily invertebrates from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on maximum sediment concentrations.	Spotted sandpiper
Survival, growth, and reproduction of avian aquatic/wetland piscivore populations	Are site-related chemical concentrations in sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume primarily fish from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on maximum sediment concentrations.	Green heron

TABLE 7-5
Bioaccumulative Chemicals List and Log K_{ow} Values for Relevant Chemicals
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference
Inorganics			
Arsenic	-- - --	--	--
Cadmium	-- - --	--	--
Chromium	-- - --	--	--
Copper	-- - --	--	--
Lead	-- - --	--	--
Mercury	-- - --	--	--
Nickel	-- - --	--	--
Selenium	-- - --	--	--
Silver	-- - --	--	--
Zinc	-- - --	--	--
Pesticides/PCBs			
4,4'-DDD	5.90 - 6.65	6.10	USEPA 1995b
4,4'-DDE	5.63 - 6.96	6.76	USEPA 1995b
4,4'-DDT	5.56 - 7.01	6.53	USEPA 1995b
Aldrin	5.11 - 7.50	6.50	USEPA 1995b
alpha-BHC	3.75 - 3.81	3.80	USEPA 1995b
alpha-Chlordane	5.80 - 6.41	6.32	USEPA 1995b
Aroclor-1016	-- - --	5.60	Sample et al. 1996
Aroclor-1221	-- - --	4.70	Jones et al. 1997
Aroclor-1232	-- - --	5.10	Jones et al. 1997
Aroclor-1242	-- - --	5.60	Jones et al. 1997
Aroclor-1248	-- - --	6.20	Jones et al. 1997
Aroclor-1254	-- - --	6.50	Jones et al. 1997
Aroclor-1260	-- - --	6.80	Jones et al. 1997
beta-BHC	3.75 - 3.84	3.81	USEPA 1995b
delta-BHC	-- - --	4.10	USEPA 1996a
Dieldrin	3.63 - 6.20	5.37	USEPA 1995b
Endosulfan I	3.55 - 3.85	3.83	USEPA 1995b
Endosulfan II	3.62 - 4.52	4.52	USEPA 1995b
Endrin	2.92 - 5.20	5.06	USEPA 1995b
gamma-BHC (Lindane)	3.61 - 3.90	3.73	USEPA 1995b
gamma-Chlordane	5.80 - 6.41	6.32	USEPA 1995b

TABLE 7-5
Bioaccumulative Chemicals List and Log K_{ow} Values for Relevant Chemicals
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Log K_{ow} Range	Selected log K_{ow}	Reference
Heptachlor	4.93 - 6.26	6.26	USEPA 1995b
Heptachlor epoxide	3.50 - 5.40	5.00	USEPA 1995b
Methoxychlor	4.20 - 5.60	5.08	USEPA 1995b
Toxaphene	4.33 - 5.56	5.50	USEPA 1995b
Volatile and Semivolatile Organics			
1,1,2,2-Tetrachloroethane	2.31 - 2.64	2.39	USEPA 1995b
1,2,4-Trichlorobenzene	3.89 - 4.23	4.01	USEPA 1995b
1,2-Dichlorobenzene	3.20 - 3.61	3.43	USEPA 1995b
1,3-Dichlorobenzene	-- - --	3.50	USEPA 1996a
1,4-Dichlorobenzene	3.26 - 3.62	3.42	USEPA 1995b
4-Bromophenyl-phenylether	4.89 - 5.24	5.00	USEPA 1995b
4-Chlorophenyl-phenylether	4.08 - 5.09	4.95	USEPA 1995b
Acenaphthene	3.77 - 4.49	3.92	USEPA 1995b
Acenaphthylene	-- - --	4.10	USEPA 1996a
Anthracene	4.44 - 4.80	4.55	USEPA 1995b
Benzo(a)anthracene	5.61 - 5.79	5.70	USEPA 1995b
Benzo(a)pyrene	5.98 - 6.34	6.11	USEPA 1995b
Benzo(b)fluoranthene	5.79 - 6.40	6.20	USEPA 1995b
Benzo(g,h,i)perylene	6.58 - 7.05	6.70	USEPA 1995b
Benzo(k)fluoranthene	6.12 - 6.27	6.20	USEPA 1995b
Chrysene	5.41 - 5.79	5.70	USEPA 1995b
Dibenz(a,h)anthracene	6.50 - 6.88	6.69	USEPA 1995b
Fluoranthene	4.84 - 5.39	5.12	USEPA 1995b
Fluorene	4.04 - 4.40	4.21	USEPA 1995b
Hexachlorobenzene	5.23 - 6.92	5.89	USEPA 1995b
Hexachlorobutadiene	4.74 - 5.16	4.81	USEPA 1995b
Hexachlorocyclopentadiene	5.05 - 5.51	5.39	USEPA 1995b
Hexachloroethane	3.82 - 4.14	4.00	USEPA 1995b
Indeno(1,2,3-cd)pyrene	6.58 - 6.72	6.65	USEPA 1995b
Pentachlorophenol	5.01 - 5.24	5.09	USEPA 1995b
Phenanthrene	4.37 - 4.57	4.55	USEPA 1995b
Pyrene	4.76 - 5.52	5.11	USEPA 1995b

TABLE 7-6
Soil Bioconcentration and Bioaccumulation Factors For Plants, Soil Invertebrates, and Small Mammals - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)		Soil-Rat BAF (dry weight)[1]	
Chemical	**Value**	**Reference**	**Value**	**Reference**	**Value**	**Reference**
Inorganics						
Arsenic	9.074	Bechtel Jacobs 1998a	0.925	Sample et al. 1998a	0.071	Sample et al. 1998b
Cadmium	22.88	Bechtel Jacobs 1998a	190.0	Sample et al. 1998a	1.705	Sample et al. 1998b
Chromium	0.480	Bechtel Jacobs 1998a	11.42	Sample et al. 1998a	0.800	Sample et al. 1998b
Copper	7.400	Bechtel Jacobs 1998a	5.492	Sample et al. 1998a	0.867	Sample et al. 1998b
Lead	10.60	Bechtel Jacobs 1998a	228.3	Sample et al. 1998a	0.995	Sample et al. 1998b
Mercury	12.23	Bechtel Jacobs 1998a	33.00	Sample et al. 1998a	0.192	Sample et al. 1998b
Nickel	22.21	Bechtel Jacobs 1998a	7.802	Sample et al. 1998a	0.800	Sample et al. 1998b
Selenium	77.00	Bechtel Jacobs 1998a	13.73	Sample et al. 1998a	1.754	Sample et al. 1998b
Silver	0.040	Bechtel Jacobs 1998a	19.50	Sample et al. 1998a	0.810	Sample et al. 1998b
Zinc	34.29	Bechtel Jacobs 1998a	49.51	Sample et al. 1998a	5.850	Sample et al. 1998b
Pesticides/PCBs						
4,4'-DDD	0.0151	Travis and Arms 1988	2.00	Menzie et al. 1992	--	see Section 7.2.2.1 (Small Mammals)
4,4'-DDE	0.0216	Travis and Arms 1988	10.6	Menzie et al. 1992	--	see Section 7.2.2.1 (Small Mammals)
4,4'-DDT	0.0237	Travis and Arms 1988	0.70	Menzie et al. 1992	--	see Section 7.2.2.1 (Small Mammals)
Aldrin	0.0431	Travis and Arms 1988	3.30	Edwards and Bohlen 1992	--	see Section 7.2.2.1 (Small Mammals)
alpha-BHC	0.2633	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
alpha-Chlordane	0.0172	Travis and Arms 1988	4.00	Edwards and Bohlen 1992	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1016	0.0224	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1221	0.0744	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1232	0.0437	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1242	0.0224	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1248	0.0101	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1254	0.0068	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
Aroclor-1260	0.0045	Travis and Arms 1988	65.2	Sample et al. 1998a	--	see Section 7.2.2.1 (Small Mammals)
beta-BHC	0.2633	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
delta-BHC	0.1653	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Dieldrin	0.3089	Travis and Arms 1988	8.00	Beyer and Gish 1980	--	see Section 7.2.2.1 (Small Mammals)
Endosulfan I	0.3436	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Endosulfan II	0.3131	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Endrin	0.7948	Travis and Arms 1988	3.60	Edwards and Bohlen 1992	--	see Section 7.2.2.1 (Small Mammals)
gamma-BHC (Lindane)	0.3173	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
gamma-Chlordane	0.0172	Travis and Arms 1988	4.00	Edwards and Bohlen 1992	--	see Section 7.2.2.1 (Small Mammals)
Heptachlor	0.0548	Travis and Arms 1988	3.00	Edwards and Bohlen 1992	--	see Section 7.2.2.1 (Small Mammals)
Heptachlor epoxide	0.3673	Travis and Arms 1988	8.39	USEPA 1999	--	see Section 7.2.2.1 (Small Mammals)
Methoxychlor	0.1447	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Toxaphene	0.1217	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Semivolatile Organics						
1,2,4-Trichlorobenzene	0.2186	Travis and Arms 1988	0.56	Beyer 1996	--	see Section 7.2.2.1 (Small Mammals)
1,2-Dichlorobenzene	0.5475	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
1,3-Dichlorobenzene	0.3673	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
1,4-Dichlorobenzene	0.5055	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
4-Bromophenyl-phenylether	0.0578	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
4-Chlorophenyl-phenylether	0.1697	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Acenaphthene	0.2564	Travis and Arms 1988	0.30	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Acenaphthylene	0.1653	Travis and Arms 1988	0.22	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Anthracene	0.1051	Travis and Arms 1988	0.32	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Benzo(a)anthracene	0.0222	Travis and Arms 1988	0.27	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Benzo(a)pyrene	0.0135	Travis and Arms 1988	0.34	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Benzo(b)fluoranthene	0.0174	Travis and Arms 1988	0.21	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Benzo(g,h,i)perylene	0.0061	Travis and Arms 1988	0.15	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Benzo(k)fluoranthene	0.0112	Travis and Arms 1988	0.21	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Chrysene	0.0289	Travis and Arms 1988	0.44	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Dibenz(a,h)anthracene	0.0068	Travis and Arms 1988	0.49	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Fluoranthene	0.0617	Travis and Arms 1988	0.37	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Fluorene	0.1790	Travis and Arms 1988	0.20	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Hexachlorobenzene	0.0367	Travis and Arms 1988	1.69	Beyer 1996	--	see Section 7.2.2.1 (Small Mammals)
Hexachlorobutadiene	0.0705	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Hexachlorocyclopentadiene	0.0467	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Hexachloroethane	0.2399	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)
Indeno(1,2,3-cd)pyrene	0.0061	Travis and Arms 1988	0.41	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Pentachlorophenol	0.0492	Travis and Arms 1988	8.00	van Gestel and Ma 1988	--	see Section 7.2.2.1 (Small Mammals)
Phenanthrene	0.1154	Travis and Arms 1988	0.28	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Pyrene	0.0687	Travis and Arms 1988	0.39	Beyer and Stafford 1993	--	see Section 7.2.2.1 (Small Mammals)
Volatile Organics						
1,1,2,2-Tetrachloroethane	1.7899	Travis and Arms 1988	1.00	--	--	see Section 7.2.2.1 (Small Mammals)

[1] BAFs developed for omnivorous small mammals.

TABLE 7-7
Sediment Bioaccumulation Factors For Benthic Invertebrates and Fish - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
Chemical	**Value**	**Reference**	**Value**	**Reference**
Inorganics				
Arsenic	4.330	Bechtel Jacobs 1998b	0.126	Pascoe et al. 1996
Cadmium	4.878	Bechtel Jacobs 1998b	0.164	Pascoe et al. 1996
Chromium	0.186	Bechtel Jacobs 1998b	0.038	Krantzberg and Boyd 1992
Copper	23.87	Bechtel Jacobs 1998b	0.100	Krantzberg and Boyd 1992
Lead	0.503	Bechtel Jacobs 1998b	0.070	Krantzberg and Boyd 1992
Mercury	3.981	Bechtel Jacobs 1998b	4.580	Cope et al. 1990
Nickel	0.237	Bechtel Jacobs 1998b	1.000	--
Selenium	1.000	--	1.000	--
Silver	0.180	Hirsch 1998	1.000	--
Zinc	8.479	Bechtel Jacobs 1998b	0.147	Pascoe et al. 1996
Pesticides/PCBs				
4,4'-DDD	0.350	Oliver and Niimi 1988	2.250	Oliver and Niimi 1988
4,4'-DDE	3.360	Oliver and Niimi 1988	26.20	Oliver and Niimi 1988
4,4'-DDT	2.280	Oliver and Niimi 1988	8.800	Oliver and Niimi 1988
Aldrin	1.000	--	1.000	--
alpha-BHC	1.000	--	1.000	--
alpha-Chlordane	1.000	--	1.000	--
Aroclor-1016	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
Aroclor-1221	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
Aroclor-1232	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
Aroclor-1242	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
Aroclor-1248	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
Aroclor-1254	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
Aroclor-1260	51.31	Bechtel Jacobs 1998b	12.94	Oliver and Niimi 1988
beta-BHC	1.000	--	1.000	--
delta-BHC	1.000	--	1.000	--
Dieldrin	4.520	Standley 1997	1.000	--
Endosulfan I	1.000	--	1.000	--
Endosulfan II	1.000	--	1.000	--
Endrin	1.000	--	1.000	--
gamma-BHC (Lindane)	1.000	--	6.200	Oliver and Niimi 1988
gamma-Chlordane	1.000	--	1.000	--
Heptachlor	1.000	--	1.000	--
Heptachlor epoxide	1.000	--	1.000	--
Methoxychlor	1.000	--	1.000	--
Toxaphene	1.000	--	1.000	--
Semivolatile Organics				
1,2,4-Trichlorobenzene	0.480	Oliver and Niimi 1988	0.074	Parkerton et al. 1993
1,2-Dichlorobenzene	1.000	--	0.085	Parkerton et al. 1993
1,3-Dichlorobenzene	1.000	--	0.085	Parkerton et al. 1993
1,4-Dichlorobenzene	1.000	--	0.085	Parkerton et al. 1993
4-Bromophenyl-phenylether	1.000	--	1.000	--
4-Chlorophenyl-phenylether	1.000	--	1.000	--
Acenaphthene	2.040	Maruya et al. 1997	1.000	--
Acenaphthylene	2.040	Acenaphthene value	1.000	--
Anthracene	0.271	Maruya et al. 1997	1.000	--
Benzo(a)anthracene	1.400	Maruya et al. 1997	1.000	--
Benzo(a)pyrene	0.191	Maruya et al. 1997	1.000	--
Benzo(b)fluoranthene	0.160	Maruya et al. 1997	1.000	--
Benzo(g,h,i)perylene	0.295	Maruya et al. 1997	1.000	--
Benzo(k)fluoranthene	0.421	Maruya et al. 1997	1.000	--
Chrysene	0.335	Maruya et al. 1997	1.000	--
Dibenz(a,h)anthracene	0.271	Anthracene value	1.000	--
Fluoranthene	0.312	Maruya et al. 1997	1.000	--
Fluorene	1.130	Maruya et al. 1997	1.000	--
Hexachlorobenzene	0.860	Oliver and Niimi 1988	0.940	Oliver and Niimi 1988
Hexachlorobutadiene	0.610	Oliver and Niimi 1988	0.384	Parkerton et al. 1993
Hexachlorocyclopentadiene	1.000	--	1.000	--
Hexachloroethane	1.000	--	1.000	--
Indeno(1,2,3-cd)pyrene	0.355	Maruya et al. 1997	1.000	--
Pentachlorophenol	1.000	--	1.000	--
Phenanthrene	0.652	Maruya et al. 1997	1.000	--
Pyrene	0.803	Maruya et al. 1997	1.000	--
Volatile Organics				
1,1,2,2-Tetrachloroethane	1.000	--	1.000	--

TABLE 7-8a

Uncertainty Factors Applied to Ingestion-Based Screening Values

AOC H, Former NASD, Vieques, Puerto Rico

Convert From	Convert To	Uncertainty Factor
Chronic NOAEL	Chronic NOAEL	1
Chronic LOAEL	Chronic NOAEL	5
Subchronic NOAEL	Chronic NOAEL	10
Subchronic LOAEL	Chronic NOAEL	20
Acute NOAEL	Chronic NOAEL	30
Acute LOAEL	Chronic NOAEL	50
LD50	Chronic NOAEL	100

Uncertainty factors from Wentsel et al. (1996)

Durations are defined as follows (USEPA 1999; Sample et al. 1996):

- Acute: <14 days
- Subchronic: 14 - 90 days
- Chronic: >90 days or during critical life stage

TABLE 7-8
Exposure Parameters for Upper Trophic Level Ecological Receptors - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)	
	Value	Reference	Value	Reference	Value	Reference
Birds						
Pearly-eyed thrasher	0.095	Oberle 2000	0.0127	allometric equation	0.0131	allometric equation
Green heron	0.158	Sample et al. 1997	0.0227	allometric equation	0.0458	allometric equation
Red-tailed hawk	0.957	USEPA 1993	0.0680	allometric equation	0.0395	Sample and Suter 1994
Spotted sandpiper	0.029	Dunning 1993	0.0089	allometric equation	0.0093	allometric equation
Mammals						
Norway rat	0.250	Pass and Freeth 1993	0.0810	allometric equation	0.0270	allometric equation
Indian Mongoose	0.305	Nellis 1989	0.0683	allometric equation	0.0489	allometric equation

TABLE 7-8 (continued)
Exposure Parameters for Upper Trophic Level Ecological Receptors - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Benthic Invert.	Reference	Value	Reference
Birds									
Pearly-eyed thrasher	0	95.4	0	0	0	0	--	4.6	Sample and Suter 1994; value is for American robin
Green heron	0	0	0	100	0	0	--	0	Sample et al. 1997
Red-tailed hawk	0	0	100	0	0	0	--	0	Sample and Suter 1994
Spotted sandpiper	0	0	0	0	0	82	--	18	Beyer et al. 1994
Mammals									
Norway rat	98	0	0	0	0	0	--	2.0	Beyer et al. 1994; value is for deer mouse
Indian Mongoose	0	87	0	0	0	0	--	13	Sample and Suter 1994; value is for short-tailed shrew

TABLE 7-9
Ingestion Screening Values for Mammals
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Arsenic	mouse	0.03	3 generations	oral in water	reproduction	1.26	0.25 [a]	Sample et al. 1996
Arsenic	dog	10.0	2 years	oral in diet	systemic	6.00 [b]	1.20	ATSDR 1993a
Cadmium	rat	0.303	6 weeks	oral (gavage)	reproduction	10.0	1.00	Sample et al. 1996
Cadmium	dog	10.0	3 months	oral in diet	reproduction	3.75 [b]	0.75	ATSDR 1999a
Chromium	rat	0.35	1 year	oral in water	body weight/intake	16.4 [b]	3.28	Sample et al. 1996
Copper	mouse	0.03	1 month + GD 0-19	oral in diet	developmental	104	78.0	ATSDR 1990a
Copper	mink	1.00	357 days	oral in diet	reproduction	15.1	11.7	Sample et al. 1996
Lead	rat	0.35	3 generations	oral in diet	reproduction	80.0	8.00	Sample et al. 1996
Mercury	rat	0.35	3 generations	oral in diet	reproduction	0.16	0.032	Sample et al. 1996
Mercury	mink	1.00	93 days	oral in diet	survival/weight loss	0.25 [c]	0.15 [c]	Sample et al. 1996
Nickel	rat	0.35	3 generations	oral in diet	reproduction	80.0	40.0	Sample et al. 1996
Nickel	dog	10.0	2 years	oral in diet	systemic	62.5	25.0	ATSDR 1997a
Selenium	rat	0.35	1 year	oral in water	reproduction	0.33	0.20	Sample et al. 1996
Silver	rat	0.35	2 weeks	oral in water	survival	45.3 [d]	9.06 [e]	ATSDR 1990b
Zinc	rat	0.35	GD 1-16	oral in diet	reproduction	320	160	Sample et al. 1996
Zinc	mink	1.00	25 weeks	oral	reproduction	104 [b]	20.8	ATSDR 1994a
Pesticides/PCBs								
4,4'-DDD	rat	0.35	2 years	oral in diet	reproduction	4.00	0.80	Sample et al. 1996
4,4'-DDD	dog	10.0	2 generations	oral in diet	reproduction	5.00	1.00	ATSDR 1994b
4,4'-DDE	rat	0.35	2 years	oral in diet	reproduction	4.00	0.80	Sample et al. 1996
4,4'-DDE	dog	10.0	2 generations	oral in diet	reproduction	5.00	1.00	ATSDR 1994b
4,4'-DDT	rat	0.35	2 years	oral in diet	reproduction	4.00	0.80	Sample et al. 1996
4,4'-DDT	dog	10.0	2 generations	oral in diet	reproduction	5.00	1.00	ATSDR 1994b
Aldrin	rat	0.35	3 generations	oral in diet	reproduction	1.00	0.20	Sample et al. 1996
alpha-BHC	rat	0.35	4 generations	oral in diet	reproduction	3.20	1.60	Sample et al. 1996
alpha-Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	4.58	Sample et al. 1996
Aroclor-1016	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1016	mink	1.00	18 months	oral in diet	reproduction	3.43	1.37	Sample et al. 1996
Aroclor-1221	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1221	mink	1.00	7 months	oral in diet	reproduction	0.69	0.14 [a]	Sample et al. 1996
Aroclor-1232	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1232	mink	1.00	7 months	oral in diet	reproduction	0.69	0.14 [a]	Sample et al. 1996
Aroclor-1242	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1242	mink	1.00	7 months	oral in diet	reproduction	0.69	0.14 [a]	Sample et al. 1996
Aroclor-1248	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1248	mink	1.00	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
Aroclor-1254	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1254	mink	1.00	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
Aroclor-1260	oldfield mouse	0.014	12 months	oral in diet	reproduction	0.68	0.14 [a]	Sample et al. 1996
Aroclor-1260	mink	1.00	4.5 months	oral in diet	reproduction	0.69	0.14	Sample et al. 1996
beta-BHC	rat	0.35	4 generations	oral in diet	reproduction	3.20	1.60	Sample et al. 1996
delta-BHC	rat	0.35	4 generations	oral in diet	reproduction	3.20	1.60	Sample et al. 1996
Dieldrin	rat	0.35	3 generations	oral in diet	reproduction	0.20	0.04 [a]	Sample et al. 1996
Dieldrin	dog	10	15.7 months	oral in diet	systemic	0.14	0.03 [a]	ATSDR 1993b
Endosulfan I	rat	0.35	30 days	oral (gavage)	fertility	7.50 [b]	1.50	Sample et al. 1996
Endosulfan I	dog	10.0	2 years	oral in diet	systemic	5.00 [b]	1.00	ATSDR 1993c
Endosulfan II	rat	0.35	30 days	oral (gavage)	fertility	7.50 [b]	1.50	Sample et al. 1996
Endosulfan II	dog	10.0	2 years	oral in diet	systemic	5.00 [b]	1.00	ATSDR 1993c
Endrin	mouse	0.03	120 days	oral in diet	reproduction	0.92	0.18 [a]	Sample et al. 1996
gamma-BHC (Lindane)	rat	0.35	3 generations	oral in diet	reproduction	40.0 [b]	8.00	Sample et al. 1996
gamma-Chlordane	mouse	0.03	6 generations	oral in diet	reproduction	9.16	4.58	Sample et al. 1996

TABLE 7-9
Ingestion Screening Values for Mammals
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Heptachlor	mouse	0.03	70 days	oral in diet	reproduction	1.63 f	0.33 g	ATSDR 1993d
Heptachlor	mink	1.00	181 days	oral in diet	reproduction	1.00	0.20 a	Sample et al. 1996
Heptachlor epoxide	mouse	0.03	70 days	oral in diet	reproduction	1.63 f	0.33 g	ATSDR 1993d
Heptachlor epoxide	mink	1.00	181 days	oral in diet	reproduction	1.00	0.20 a	Sample et al. 1996
Methoxychlor	rat	0.35	11 months	oral in diet	reproduction	8.00	4.00	Sample et al. 1996
Toxaphene	rat	0.35	3 generations	oral in diet	reproduction	40.0 b	8.00	Sample et al. 1996
Semivolatile Organics								
1,2,4-Trichlorobenzene	rat	0.35	3 generations	oral in water	reproduction	106	53	Coulston and Kolbye 1994
1,2-Dichlorobenzene	rat	0.35	chronic	oral (gavage)	liver/kidney	429 b	85.7	Coulston and Kolbye 1994
1,3-Dichlorobenzene	rat	0.35	chronic	oral (gavage)	liver/kidney	429 b	85.7	Coulston and Kolbye 1994
1,4-Dichlorobenzene	rat	0.35	GD 6-15	oral (gavage)	developmental	500	250	ATSDR 1998a
4-Bromophenyl-phenylether	--	--	--	--	--	NA	NA	--
4-Chlorophenyl-phenylether	--	--	--	--	--	NA	NA	--
Acenaphthene	mouse	0.03	13 weeks	oral (gavage)	reproduction	700	350	ATSDR 1995a
Acenaphthylene	mouse	0.03	13 weeks	oral (gavage)	reproduction	700	350	ATSDR 1995a
Anthracene	mouse	0.03	13 weeks	oral (gavage)	reproduction	5,000 b	1,000	ATSDR 1995a
Benzo(a)anthracene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Benzo(a)pyrene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Benzo(b)fluoranthene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Benzo(g,h,i)perylene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Benzo(k)fluoranthene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Chrysene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Dibenz(a,h)anthracene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Fluoranthene	mouse	0.03	13 weeks	oral (gavage)	reproduction	2,500 b	500	ATSDR 1995a
Fluorene	mouse	0.03	13 weeks	oral (gavage)	reproduction	2,500 b	500	ATSDR 1995a
Hexachlorobenzene	rat	0.35	4 generations	oral in diet	reproduction	2.00	1.00	ATSDR 1996b
Hexachlorobenzene	dog	10.0	1 year	oral	systemic	12.0	1.20	ATSDR 1996b
Hexachlorobutadiene	rat	0.35	GD 1-22; LD 1-21	oral in diet	developmental	20.0	2.00	ATSDR 1994c
Hexachlorocyclopentadiene	mouse	0.03	GD 6-15	oral (gavage)	developmental	375 b	75.0	ATSDR 1999b
Hexachloroethane	rat	0.35	GD 6-16	oral (gavage)	reproduction	500	100	ATSDR 1997b
Indeno(1,2,3-cd)pyrene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Pentachlorophenol	rat	0.35	2 generations	oral in diet	developmental	25.0	5.00 a	ATSDR 1994d
Phenanthrene	mouse	0.03	13 weeks	oral (gavage)	reproduction	2,500 b	500	ATSDR 1995a
Pyrene	mouse	0.03	GD 7-16	oral (gavage)	reproduction	10.0	2.00 a	Sample et al. 1996
Volatile Organics								
1,1,2,2-Tetrachloroethane	rat	0.35	78 weeks	oral (gavage)	reproduction	380 b	76.0	ATSDR 1996a

[a] Uncertainty factor of 5 applied to LOAEL
[b] Uncertainty factor of 5 applied to NOAEL
[c] Does not include subchronic uncertainty factor of 10
[d] Derived from a subchronic NOAEL of 181.2 and an uncertainty factor of 4
[e] Derived from a subchronic NOAEL of 181.2 and an uncertainty factor of 20
[f] Derived from a subchronic NOAEL of 6.50 and an uncertainty factor of 4
[g] Derived from a subchronic NOAEL of 6.50 and an uncertainty factor of 20

TABLE 7-10
Ingestion Screening Values for Birds
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Inorganics								
Arsenic	brown-headed cowbird	0.049	7 months	oral in diet	survival	7.38	2.46	Sample et al. 1996
Arsenic	mallard	1.00	128 days	oral in diet	survival	12.8	5.14	Sample et al. 1996
Cadmium	mallard	1.15	90 days	oral in diet	reproduction	20.0	1.45	Sample et al. 1996
Chromium	American black duck	1.25	10 months	oral in diet	reproduction	5.00	1.00	Sample et al. 1996
Copper	chicken (chicks)	0.534	10 weeks	oral in diet	growth/survival	61.7	47.0	Sample et al. 1996
Lead	Japanese quail	0.15	12 weeks	oral in diet	reproduction	11.3	1.13	Sample et al. 1996
Lead	American kestrel	0.13	7 months	oral in diet	reproduction	19.3 b	3.85	Sample et al. 1996
Mercury	red-tailed hawk	1.10	12 weeks	oral in diet	survival/neurological	1.20	0.49	USEPA 1995b
Mercury	mallard	1.00	3 generations	oral in diet	reproduction	0.078	0.026	USEPA 1997b
Nickel	mallard	0.782	90 days	oral in diet	growth/survival	107	77.4	Sample et al. 1996
Selenium	black-crowned night-heron	0.88	94 days	oral in diet	reproduction	9.00 b	1.80	Sample et al. 1996
Selenium	mallard	1.00	100 days	oral in diet	reproduction	0.80	0.40	Sample et al. 1996
Selenium	screech owl	0.20	13.7 weeks	oral in diet	reproduction	1.50	0.44	Sample et al. 1996
Silver	mallard	1.10	14 days	oral in diet	survival	178 c	35.6 d	USEPA 1999
Silver	chicken (chicks)	0.80	not specified	oral in diet	growth	35.0	7.00 a	Eisler 1996
Zinc	chicken	1.94	44 weeks	oral in diet	reproduction	131	14.5	Sample et al. 1996
Pesticides/PCBs								
4,4'-DDD	Japanese quail	0.11	3 generations	oral in diet	reproduction	5.00	0.50	USEPA 1995b
4,4'-DDD	barn owl	0.47	2 years	oral in diet	reproduction	0.40 b	0.08	Blus 1996
4,4'-DDD	mallard	1.00	2 years	oral in diet	reproduction	0.60	0.12	USEPA 1995b
4,4'-DDD	bald eagle	4.74	112 days	oral in diet	survival	3.00	0.30	USEPA 1995b
4,4'-DDE	Japanese quail	0.11	3 generations	oral in diet	reproduction	5.00	0.50	USEPA 1995b
4,4'-DDE	barn owl	0.47	2 years	oral in diet	reproduction	0.40 b	0.08	Blus 1996
4,4'-DDE	mallard	1.00	2 years	oral in diet	reproduction	0.60	0.12	USEPA 1995b
4,4'-DDE	bald eagle	4.74	112 days	oral in diet	survival	3.00	0.30	USEPA 1995b
4,4'-DDT	Japanese quail	0.11	3 generations	oral in diet	reproduction	5.00	0.50	USEPA 1995b
4,4'-DDT	barn owl	0.47	2 years	oral in diet	reproduction	0.40 b	0.08	Blus 1996
4,4'-DDT	mallard	1.00	2 years	oral in diet	reproduction	1.50	0.60	USEPA 1995b
4,4'-DDT	bald eagle	4.74	112 days	oral in diet	survival	3.00	0.30	USEPA 1995b
Aldrin	ring-necked pheasant	1.14	5 days	oral in diet	survival	0.35 b	0.07 e	Hill et al. 1975
Aldrin	mallard	1.00	5 days	oral in diet	survival	0.78 b	0.16 f	Hill et al. 1975
alpha-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
alpha-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	survival	10.7	2.14	Sample et al. 1996
alpha-Chlordane	mallard	1.00	not specified	oral in diet	reproduction	4.00 b	0.80	Wiemeyer 1996
Aroclor-1016	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1016	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
Aroclor-1221	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1221	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
Aroclor-1232	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1232	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
Aroclor-1242	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1242	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
Aroclor-1248	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1248	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
Aroclor-1254	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1254	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
Aroclor-1260	screech owl	0.181	2 generations	oral in diet	reproduction	2.05 b	0.41	Sample et al. 1996
Aroclor-1260	mallard	1.00	1 month	oral in diet	reproduction	7.50 b	1.50	USEPA 1995b
beta-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
delta-BHC	Japanese quail	0.15	90 days	oral in diet	reproduction	2.25	0.56	Sample et al. 1996
Dieldrin	barn owl	0.466	2 years	oral in diet	reproduction	0.39 b	0.08	Sample et al. 1996

TABLE 7-10
Ingestion Screening Values for Birds
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Endosulfan I	gray partridge	0.40	4 weeks	oral in diet	reproduction	50.0 b	10.0	Sample et al. 1996
Endosulfan II	gray partridge	0.40	4 weeks	oral in diet	reproduction	50.0 b	10.0	Sample et al. 1996
Endrin	mallard	1.15	>200 days	oral in diet	reproduction	1.50 b	0.30	Sample et al. 1996
Endrin	screech owl	0.181	>83 days	oral in diet	reproduction	0.10	0.02 a	Sample et al. 1996
gamma-BHC (Lindane)	mallard	1.00	8 weeks	oral (gavage)	reproduction	20.0	4.00 a	Sample et al. 1996
gamma-Chlordane	red-winged blackbird	0.064	84 days	oral in diet	survival	10.7	2.14	Sample et al. 1996
gamma-Chlordane	mallard	1.00	not specified	oral in diet	reproduction	4.00 b	0.80	Wiemeyer 1996
Heptachlor	ring-necked pheasant	1.14	5 days	oral in diet	survival	1.38 b	0.28 g	Hill et al. 1975
Heptachlor	mallard	1.00	5 days	oral in diet	survival	2.40 b	0.48 h	Hill et al. 1975
Heptachlor epoxide	ring-necked pheasant	1.14	5 days	oral in diet	survival	1.38 b	0.28 g	Hill et al. 1975
Heptachlor epoxide	mallard	1.00	5 days	oral in diet	survival	2.40 b	0.48 h	Hill et al. 1975
Methoxychlor	chicken	1.50	16 weeks	oral in diet	reproduction	1,775 b	355	Wiemeyer 1996
Toxaphene	American black duck	1.00	2 seasons	oral in diet	reproduction	5.00	1.00	Wiemeyer 1996
Semivolatile Organics								
1,2,4-Trichlorobenzene	northern bobwhite	0.19	14 days	oral	survival	161 i	32.2 j	TERRETOX 2002
1,2-Dichlorobenzene	northern bobwhite	0.19	14 days	oral	survival	161 i	32.2 j	TERRETOX 2002
1,3-Dichlorobenzene	northern bobwhite	0.19	14 days	oral	survival	161 i	32.2 j	TERRETOX 2002
1,4-Dichlorobenzene	northern bobwhite	0.19	14 days	oral	survival	161 i	32.2 j	TERRETOX 2002
4-Bromophenyl-phenylether	--	--	--	--	--	NA	NA	--
4-Chlorophenyl-phenylether	--	--	--	--	--	NA	NA	--
Acenaphthene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Acenaphthylene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Anthracene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Benzo(a)anthracene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Benzo(a)pyrene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Benzo(b)fluoranthene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Benzo(g,h,i)perylene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Benzo(k)fluoranthene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Chrysene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Dibenz(a,h)anthracene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Fluoranthene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Fluorene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Hexachlorobenzene	Japanese quail	0.15	90 days	oral in diet	reproduction	0.565	0.113	Coulston and Kolbye 1994; TERRETOX 2002
Hexachlorobutadiene	Japanese quail	0.15	90 days	oral in diet	reproduction	17.0 b	3.39	Coulston and Kolbye 1994; TERRETOX 2002
Hexachlorocyclopentadiene	--	--	--	--	--	NA	NA	--
Hexachloroethane	--	--	--	--	--	NA	NA	--
Indeno(1,2,3-cd)pyrene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Pentachlorophenol	chicken	1.50	8 weeks	oral in diet	systemic/growth	8.52 l	4.26 m	Eisler 1989
Phenanthrene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Pyrene	chicken	1.50	35 days	oral in diet	reproduction	35.5 b	7.10 k	Rigdon and Neal 1963
Volatile Organics								
1,1,2,2-Tetrachloroethane	--	--	--	--	--	NA	NA	--

[a]Uncertainty factor of 5 applied to LOAEL
[b]Uncertainty factor of 5 applied to NOAEL
[c]Derived from an acute LOAEL of 1,780 and an uncertainty factor of 10
[d]Derived from an acute LOAEL of 1,780 and an uncertainty factor of 50
[e]Derived from a LD50 of 7.01 and an uncertainty factor of 100
[f]Derived from a LD50 of 15.5 and an uncertainty factor of 100
[g]Derived from a LD50 of 27.53 and an uncertainty factor of 100
[h]Derived from a LD50 of 48.0 and an uncertainty factor of 100
[i]Derived from an acute LOAEL of 1,608 and an uncertainty factor of 10
[j]Derived from an acute LOAEL of 1,608 and an uncertainty factor of 50
[k]Uncertainty factor of 10 applied to subchronic NOAEL of 71.0
[l]Uncertainty factor of 10 applied to subchronic LOAEL of 85.2
[m]Uncertainty factor of 10 applied to subchronic NOAEL of 42.6

TABLE 7-11
Step 2 Screening Statistics and COPC Selection - AOC H - Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentra-tion Detected	Sample ID of Maximum Concentration	Screening Value	Reference	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
Inorganics (MG/KG)									
ALUMINUM	-- - --	33 / 33	11000	NDE015, NDE176	50	Efroymson et al. 1997a	33 / 33	220	**YES**
ANTIMONY	0.25 - 0.28	26 / 33	6.3	NDE178	78	USEPA 2005	0 / 33	0.1	NO
ARSENIC	-- - --	33 / 33	67	NDE023	18	USEPA 2005	2 / 33	3.7	**YES**
BARIUM	-- - --	33 / 33	290	NDE023	330	USEPA 2005	0 / 33	0.9	NO
BERYLLIUM	0.035 - 0.039	22 / 33	0.26	NDE023	40	USEPA 2005	0 / 33	0.01	NO
CADMIUM	0.0128 - 0.032	13 / 33	0.291	NDAHSS26-R01	32	USEPA 2005	0 / 33	0.01	NO
CALCIUM [2]	-- - --	33 / 33	34000	NDE019, NDE179	NSV	--	-- / --	NSV	NO
CHROMIUM, TOTAL	-- - --	33 / 33	50	NDE176	0.4	Efroymson et al. 1997b	33 / 33	125	**YES**
COBALT	-- - --	33 / 33	10.2	NDAHSS19-R01	13	USEPA 2005	0 / 33	0.8	NO
COPPER	-- - --	33 / 33	100	NDE009	50	Efroymson et al. 1997b	2 / 33	2.0	**YES**
IRON	-- - --	33 / 33	39000	NDE178	200	Efroymson et al. 1997b	33 / 33	195	**YES**
LEAD	-- - --	33 / 33	63	NDE021	120	USEPA 2005	0 / 33	0.5	NO
MAGNESIUM [2]	-- - --	33 / 33	8400	NDE009	NSV	--	-- / --	NSV	NO
MANGANESE	-- - --	33 / 33	720	NDE023	100	Efroymson et al. 1997b	33 / 33	7.2	**YES**
MERCURY	-- - --	33 / 33	0.0625	NDAHSS25-R01	0.3	Efroymson et al. 1997a	0 / 33	0.2	NO
NICKEL	-- - --	33 / 33	26	NDE178	30	Efroymson et al. 1997a	0 / 33	0.9	NO
POTASSIUM [2]	-- - --	33 / 33	3400	NDE009	NSV	--	-- / --	NSV	NO
SELENIUM	0.48 - 0.54	22 / 33	1.4	NDE013	1	Efroymson et al. 1997a	2 / 33	1.4	**YES**
SILVER	0.024 - 0.067	12 / 33	0.17	NDE017	2	Efroymson et al. 1997a	0 / 33	0.1	NO
SODIUM [2]	-- - --	33 / 33	590	NDE009	NSV	--	-- / --	NSV	NO
THALLIUM	0.36 - 0.4	13 / 33	1.16	NDAHSS18-R01	1	Efroymson et al. 1997a	1 / 33	1.2	**YES**
VANADIUM	-- - --	33 / 33	63	NDE176	2	Efroymson et al. 1997a	33 / 33	32	**YES**
ZINC	-- - --	33 / 33	260	NDE178	50	Efroymson et al. 1997a	29 / 33	5.2	**YES**
Pesticides/Polychlorinated Biphenyls (MG/KG)									
PCB-1016 (AROCHLOR 1016)	0.034 - 0.039	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.001	NO
PCB-1221 (AROCHLOR 1221)	0.07 - 0.079	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.002	NO
PCB-1232 (AROCHLOR 1232)	0.034 - 0.039	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.001	NO
PCB-1242 (AROCHLOR 1242)	0.034 - 0.039	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.001	NO
PCB-1248 (AROCHLOR 1248)	0.034 - 0.039	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.001	NO
PCB-1254 (AROCHLOR 1254)	0.034 - 0.039	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.001	NO
PCB-1260 (AROCHLOR 1260)	0.034 - 0.039	0 / 20	--	--	40	Efroymson et al. 1997a	-- / --	0.001	NO
ALDRIN	0.0018 - 0.0021	0 / 32	--	--	0.0025	Friday 1998	-- / --	0.8	NO
ALPHA BHC (ALPHA HEXACHLOR	0.0018 - 0.0021	0 / 32	--	--	0.0025	Friday 1998	-- / --	0.8	NO
ALPHA ENDOSULFAN	0.0018 - 0.0021	0 / 32	--	--	NSV	--	-- / --	NSV	NO
ALPHA-CHLORDANE	0.0018 - 0.0021	0 / 32	--	--	NSV	--	-- / --	NSV	NO
BETA BHC (BETA HEXACHLORO(	0.0018 - 0.0021	0 / 32	--	--	0.001	Friday 1998	-- / --	2.1	--[3]
BETA ENDOSULFAN	0.0034 - 0.0041	0 / 32	--	--	NSV	--	-- / --	NSV	NO
DELTA BHC (DELTA HEXACHLOR	0.0018 - 0.0021	0 / 32	--	--	NSV	--	-- / --	NSV	NO
DIELDRIN	0.0034 - 0.0041	0 / 32	--	--	0.0005	Friday 1998	-- / --	8.2	--[3]
ENDOSULFAN SULFATE	0.0034 - 0.0041	0 / 32	--	--	NSV	--	-- / --	NSV	NO
ENDRIN	0.0034 - 0.0041	0 / 32	--	--	0.001	Friday 1998	-- / --	4.1	--[3]
ENDRIN ALDEHYDE	0.0034 - 0.0041	0 / 32	--	--	0.1	Friday 1998	-- / --	0.04	NO
ENDRIN KETONE	0.0034 - 0.0041	0 / 32	--	--	0.1	Friday 1998	-- / --	0.04	NO
GAMMA BHC (LINDANE)	0.0018 - 0.0021	0 / 32	--	--	0.00005	Friday 1998	-- / --	42	--[3]
GAMMA-CHLORDANE	0.0018 - 0.0021	0 / 32	--	--	NSV	--	-- / --	NSV	NO
HEPTACHLOR	0.0018 - 0.0021	0 / 32	--	--	NSV	--	-- / --	NSV	NO
HEPTACHLOR EPOXIDE	0.0018 - 0.0021	0 / 32	--	--	NSV	--	-- / --	NSV	NO
METHOXYCHLOR	0.018 - 0.02	1 / 32	0.00074	NDAHSS19-R01	NSV	--	-- / --	NSV	**YES**
p,p'-DDD	0.0034 - 0.0039	12 / 31	0.01	NDAHSS22-R01	0.0025	Friday 1998	5 / 31	4.0	**YES**
p,p'-DDE	0.0035 - 0.0039	22 / 32	3.99	NDE004	0.0025	Friday 1998	19 / 32	1596	**YES**
p,p'-DDT	0.0035 - 0.0039	19 / 32	1.94	NDE004	0.0025	Friday 1998	18 / 32	776	**YES**
TOXAPHENE	0.177 - 0.21	0 / 32	--	--	NSV	--	-- / --	NSV	NO
Semi-volatile Organic Compounds (MG/KG)									
1,2,4-TRICHLOROBENZENE	0.416 - 28.2	0 / 20	--	--	20	Efroymson et al. 1997b	-- / --	1.4	--[3]
1,2-DICHLOROBENZENE	0.416 - 28.2	0 / 20	--	--	NSV	--	-- / --	NSV	NO
1,3-DICHLOROBENZENE	0.416 - 28.2	0 / 20	--	--	NSV	--	-- / --	NSV	NO
1,4-DICHLOROBENZENE	0.416 - 28.2	0 / 20	--	--	20	Efroymson et al. 1997b	-- / --	1.4	--[3]
2,4,5-TRICHLOROPHENOL	1.05 - 84.5	0 / 32	--	--	4	Efroymson et al. 1997a	-- / --	21	--[3]
2,4,6-TRICHLOROPHENOL	0.351 - 28.2	0 / 33	--	--	10	Efroymson et al. 1997b	-- / --	2.8	--[3]
2,4-DICHLOROPHENOL	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2,4-DIMETHYLPHENOL	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2,4-DINITROPHENOL	1.05 - 84.5	0 / 33	--	--	20	Efroymson et al. 1997a	-- / --	4.2	--[3]
2,4-DINITROTOLUENE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2,6-DINITROTOLUENE	0.351 - 28.2	2 / 33	1.23	NDE030	NSV	--	-- / --	NSV	**YES**
2-CHLORONAPHTHALENE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2-CHLOROPHENOL	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2-METHYLNAPHTHALENE	0.351 - 28.2	6 / 32	0.19	NDE021	NSV	--	-- / --	NSV	**YES**
2-METHYLPHENOL (o-CRESOL)	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2-NITROANILINE	1.05 - 84.5	0 / 33	--	--	NSV	--	-- / --	NSV	NO
2-NITROPHENOL	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
3,3'-DICHLOROBENZIDINE	0.712 - 56.3	0 / 33	--	--	NSV	--	-- / --	NSV	NO
3-NITROANILINE	1.05 - 84.5	1 / 33	0.048	NDE030	NSV	--	-- / --	NSV	**YES**
4,6-DINITRO-2-METHYLPHENOL	1.05 - 84.5	0 / 33	--	--	NSV	--	-- / --	NSV	NO
4-BROMOPHENYL PHENYL ETHE	0.351 - 28.2	3 / 33	0.267	NDE030	NSV	--	-- / --	NSV	**YES**
4-CHLORO-3-METHYLPHENOL	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO

TABLE 7-11
Step 2 Screening Statistics and COPC Selection - AOC H - Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Reference	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
4-CHLOROANILINE	0.411 - 28.2	0 / 21	--	--	NSV	--	-- / --	NSV	NO
4-CHLOROPHENYL PHENYL ETH	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
4-METHYLPHENOL (p-CRESOL)	0.351 - 0.411	0 / 13	--	--	NSV	--	-- / --	NSV	NO
4-NITROANILINE	1.05 - 84.5	0 / 33	--	--	NSV	--	-- / --	NSV	NO
4-NITROPHENOL	1.05 - 84.5	0 / 33	--	--	7	Efroymson et al. 1997b	-- / --	12	--[3]
ACENAPHTHENE	0.351 - 28.2	0 / 33	--	--	20	Efroymson et al. 1997a	-- / --	1.4	--[3]
ACENAPHTHYLENE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
ACETOPHENONE	0.351 - 0.379	0 / 12	--	--	NSV	--	-- / --	NSV	NO
ANTHRACENE	0.351 - 28.2	0 / 33	--	--	0.1	Friday 1998	-- / --	282	--[3]
ATRAZINE	0.351 - 0.411	0 / 13	--	--	0.00005	Friday 1998	-- / --	8220	--[3]
Benzaldehyde	0.351 - 0.379	0 / 4	--	--	NSV	--	-- / --	NSV	NO
BENZO(a)ANTHRACENE	0.351 - 28.2	10 / 33	0.112	NDE011	NSV	--	-- / --	NSV	**YES**
BENZO(a)PYRENE	0.356 - 28.2	15 / 33	0.12	NDE011	0.1	Friday 1998	1 / 33	1.2	**YES**
BENZO(b)FLUORANTHENE	0.363 - 28.2	19 / 33	0.133	NDE011	NSV	--	-- / --	NSV	**YES**
BENZO(g,h,i)PERYLENE	0.356 - 28.2	10 / 33	0.06	NDE177	1	Friday 1998	0 / 33	0.06	NO
BENZO(k)FLUORANTHENE	0.356 - 28.2	16 / 33	0.124	NDE011	NSV	--	-- / --	NSV	**YES**
BENZYL BUTYL PHTHALATE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
BIPHENYL (DIPHENYL)	0.351 - 0.411	0 / 13	--	--	NSV	--	-- / --	NSV	NO
bis(2-CHLOROETHOXY) METHAN	0.351 - 28.2	0 / 28	--	--	NSV	--	-- / --	NSV	NO
bis(2-CHLOROETHYL) ETHER (2	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
bis(2-CHLOROISOPROPYL) ETHE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
bis(2-ETHYLHEXYL) PHTHALATE	0.351 - 28.2	8 / 33	0.117	NDAHSS24-R01	NSV	--	-- / --	NSV	**YES**
CAPROLACTAM	0.351 - 0.411	0 / 13	--	--	NSV	--	-- / --	NSV	NO
CARBAZOLE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
CHRYSENE	0.363 - 28.2	18 / 33	0.155	NDE011	NSV	--	-- / --	NSV	**YES**
CRESOLS, m & p	0.416 - 28.2	0 / 20	--	--	NSV	--	-- / --	NSV	NO
DI-n-BUTYL PHTHALATE	0.351 - 28.2	0 / 33	--	--	200	Efroymson et al. 1997a	-- / --	0.1	NO
DI-n-OCTYLPHTHALATE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
DIBENZ(a,h)ANTHRACENE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
DIBENZOFURAN	0.351 - 28.2	3 / 33	0.051	NDE019	NSV	--	-- / --	NSV	**YES**
DIETHYL PHTHALATE	0.351 - 28.2	0 / 33	--	--	100	Efroymson et al. 1997a	-- / --	0.3	NO
DIMETHYL PHTHALATE	0.351 - 28.2	0 / 33	--	--	200	Efroymson et al. 1997b	-- / --	0.1	NO
FLUORANTHENE	0.351 - 28.2	16 / 33	0.187	NDE011	0.1	Friday 1998	2 / 33	1.9	**YES**
FLUORENE	0.351 - 28.2	0 / 32	--	--	30	Efroymson et al. 1997b	-- / --	0.9	NO
HEXACHLOROBENZENE	0.351 - 28.2	0 / 33	--	--	1000	Efroymson et al. 1997b	-- / --	0.03	NO
HEXACHLOROBUTADIENE	0.351 - 28.2	0 / 33	--	--	NSV	--	-- / --	NSV	NO
HEXACHLOROCYCLOPENTADIEN	0.351 - 28.2	0 / 33	--	--	10	Efroymson et al. 1997a	-- / --	2.8	--[3]
HEXACHLOROETHANE	0.416 - 28.2	0 / 20	--	--	NSV	--	-- / --	NSV	NO
INDENO(1,2,3-c,d)PYRENE	0.351 - 28.2	8 / 33	0.0848		NSV	--	-- / --	NSV	**YES**
ISOPHORONE	0.351 - 28.2	2 / 33	0.112	NDE028	NSV	--	-- / --	NSV	**YES**
N-NITROSODI-n-PROPYLAMINE	0.351 - 28.2	3 / 33	0.717	NDE030	NSV	--	-- / --	NSV	**YES**
N-NITROSODIPHENYLAMINE	0.351 - 28.2	0 / 33	--	--	20	Efroymson et al. 1997b	-- / --	1.4	--[3]
NAPHTHALENE	0.351 - 28.2	3 / 32	0.09	NDE019	0.1	Friday 1998	0 / 32	0.9	NO
NITROBENZENE	0.351 - 28.2	0 / 33	--	--	40	Efroymson et al. 1997b	-- / --	0.7	NO
PENTACHLOROPHENOL	1.05 - 84.5	0 / 32	--	--	5	USEPA 2005	-- / --	17	--[3]
PHENANTHRENE	0.351 - 28.2	8 / 33	0.144	NDE019	0.1	Friday 1998	1 / 33	1.4	**YES**
PHENOL	0.351 - 28.2	0 / 33	--	--	30	Efroymson et al. 1997b	-- / --	0.9	NO
PYRENE	0.351 - 11.5	17 / 33	1.9	NDE176	0.1	Friday 1998	3 / 33	19	**YES**
Total PAHs	3.45 - 109.25	23 / 33	255.7	NDE176	1	Friday 1998	23 / 33	256	**YES**
Volatile Organic Compounds (MG/KG)									
1,1,1-TRICHLOROETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
1,1,2,2-TETRACHLOROETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
1,1,2-TRICHLOROETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
1,1-DICHLOROETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
1,1-DICHLOROETHENE	0.01 - 0.948	1 / 20	0.00078	NDE021	NSV	--	-- / --	NSV	**YES**
1,2-DICHLOROETHANE	0.01 - 0.948	0 / 20	--	--	4	Friday 1998	-- / --	0.2	NO
1,2-DICHLOROPROPANE	0.01 - 0.948	0 / 20	--	--	700	Efroymson et al. 1997b	-- / --	0.001	NO
2-HEXANONE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
BENZENE	0.01 - 0.948	0 / 20	--	--	0.05	Friday 1998	-- / --	19	--[3]
BROMODICHLOROMETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
BROMOFORM	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
BROMOMETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
CARBON DISULFIDE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
CARBON TETRACHLORIDE	0.01 - 0.948	0 / 20	--	--	1000	Efroymson et al. 1997b	-- / --	0.001	NO
CHLOROBENZENE	0.01 - 0.948	0 / 20	--	--	40	Efroymson et al. 1997b	-- / --	0.02	NO
CHLOROETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
CHLOROFORM	0.01 - 0.948	0 / 20	--	--	0.001	Friday 1998	-- / --	948	--[3]
CHLOROMETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
cis-1,3-DICHLOROPROPENE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
DIBROMOCHLOROMETHANE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
ETHYLBENZENE	0.01 - 0.948	0 / 20	--	--	0.05	Friday 1998	-- / --	19	--[3]
M,P-XYLENE (SUM OF ISOMERS	0.01 - 0.015	1 / 20	0.058	NDE176	NSV	--	-- / --	NSV	**YES**
METHYL ISOBUTYL KETONE (4-M	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
METHYLENE CHLORIDE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
O-XYLENE (1,2-DIMETHYLBENZE	0.01 - 0.015	1 / 20	0.024	NDE176	NSV	--	-- / --	NSV	**YES**
STYRENE	0.01 - 0.948	0 / 20	--	--	300	Efroymson et al. 1997a	-- / --	0.003	NO
TETRACHLOROETHYLENE(PCE)	0.01 - 0.948	0 / 20	--	--	0.01	Friday 1998	-- / --	95	--[3]

TABLE 7-11
Step 2 Screening Statistics and COPC Selection - AOC H - Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Reference	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
TOLUENE	0.01 - 0.948	0 / 20	--	--	200	Efroymson et al. 1997a	-- / --	0.005	NO
trans-1,3-DICHLOROPROPENE	0.01 - 0.948	0 / 20	--	--	NSV	--	-- / --	NSV	NO
TRICHLOROETHYLENE (TCE)	0.01 - 0.948	0 / 20	--	--	0.001	Friday 1998	-- / --	948	--[3]
VINYL CHLORIDE	0.01 - 0.948	0 / 20	--	--	0.1	Friday 1998	-- / --	9.5	--[3]
XYLENES, TOTAL	0.01 - 0.015	1 / 20	0.082	NDE176	0.05	Friday 1998	1 / 20	1.6	**YES**
Explosives (MG/KG)									
1,3,5-TRINITROBENZENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
1,3-DINITROBENZENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
2,4,6-TRINITROTOLUENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
2,4-DINITROTOLUENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
2,6-DINITROTOLUENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
2-NITROTOLUENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
3-NITROTOLUENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
4-NITROTOLUENE	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
HEXAHYDRO-1,3,5-TRINITRO-1,3	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
NITROBENZENE	0.13 - 0.15	0 / 13	--	--	40	Efroymson et al. 1997b	-- / --	0.004	NO
OCTAHYDRO-1,3,5,7-TETRANITR	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO
Perchlorate	0.0946 - 0.129	0 / 13	--	--	NSV	--	-- / --	NSV	NO
TETRYL	0.13 - 0.15	0 / 13	--	--	NSV	--	-- / --	NSV	NO

NSV - No screening value
1 - Maximum HQ based on maximum concentration detected unless frequency of detection is zero, in which case it is based on maximum reporting limit - indicated by shaded cells.
2 - Macronutrient - Not considered to be a COPC.
3 - Chemical not detected, however detection limit exceeded screening value. Chemical not retained as COPC - see Section 7.5 (Uncertainties)

TABLE 7-12
Step 2 Screening Statistics and COPC Selection - AOC H - Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
Inorganics (UG/L)								
ALUMINUM	700 - 700	1 / 4	1740	NDAHSW02-R01	NSV	-- / --	NSV	**YES**
ALUMINUM, DISSOLVED	700 - 700	0 / 4	--	--	NSV	-- / --	NSV	NO
ANTIMONY	50 - 50	0 / 4	--	--	4300	-- / --	0.01	NO
ANTIMONY, DISSOLVED	50 - 50	0 / 4	--	--	4300	-- / --	0.01	NO
ARSENIC	40.8 - 40.8	1 / 4	47.1	NDAHSW02-R01	1.4	1 / 4	33.64	**YES**
ARSENIC, DISSOLVED	40.8 - 40.8	0 / 4	--	--	1.4	-- / --	29	-- [3]
BARIUM	-- - --	4 / 4	162	NDAHSW02-R01	NSV	-- / --	NSV	**YES**
BARIUM, DISSOLVED	-- - --	4 / 4	163	NDAHSW02-R01	NSV	-- / --	NSV	**YES**
BERYLLIUM	1.89 - 1.89	0 / 4	--	--	NSV	-- / --	NSV	NO
BERYLLIUM, DISSOLVED	1.89 - 1.89	0 / 4	--	--	NSV	-- / --	NSV	NO
CADMIUM	7.12 - 7.12	1 / 4	7.7	NDAHSW02-R01	9.3	0 / 4	0.83	NO
CADMIUM, DISSOLVED	7.12 - 7.12	0 / 4	--	--	9.3	-- / --	0.77	NO
CALCIUM [2]	-- - --	4 / 4	383000	NDAHSW03-R01	NSV	-- / --	NSV	NO
CALCIUM, DISSOLVED [2]	-- - --	4 / 4	346000	NDAHSW01-R01	NSV	-- / --	NSV	NO
CHROMIUM, TOTAL	11.4 - 11.4	1 / 4	16.2	NDAHSW02-R01	50.4	0 / 4	0.32	NO
CHROMIUM, DISSOLVED	11.4 - 11.4	0 / 4	--	--	50	-- / --	0.23	NO
COBALT	11.4 - 11.4	1 / 4	19.6	NDAHSW02-R01	NSV	-- / --	NSV	**YES**
COBALT, DISSOLVED	11.4 - 11.4	0 / 4	--	--	NSV	-- / --	NSV	NO
COPPER	23.4 - 23.4	0 / 4	--	--	3.7	-- / --	6.32	-- [3]
COPPER, DISSOLVED	23.4 - 23.4	0 / 4	--	--	3.1	-- / --	7.55	-- [3]
IRON	334 - 334	0 / 4	--	--	NSV	-- / --	NSV	NO
IRON, DISSOLVED	334 - 334	0 / 4	--	--	NSV	-- / --	NSV	NO
LEAD	35.2 - 35.2	0 / 4	--	--	8.1	-- / --	4.35	-- [3]
LEAD, DISSOLVED	35.2 - 35.2	0 / 4	--	--	8.1	-- / --	4.35	-- [3]
MAGNESIUM [2]	-- - --	4 / 4	1050000	NDAHSW03-R01	NSV	-- / --	NSV	NO
MAGNESIUM, DISSOLVED [2]	-- - --	4 / 4	939000	NDAHSW01-R01	NSV	-- / --	NSV	NO
MANGANESE	-- - --	4 / 4	654	NDAHSW03-R01	NSV	-- / --	NSV	**YES**
MANGANESE, DISSOLVED	-- - --	4 / 4	419	NDAHSW04-R01	NSV	-- / --	NSV	**YES**

TABLE 7-12
Step 2 Screening Statistics and COPC Selection - AOC H - Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient[1]	COPC?
MERCURY	-- - --	4 / 4	0.0351	NDAHSW04-R01	0.051	0 / 4	0.69	NO
MERCURY, DISSOLVED	0.0162 - 0.016	2 / 4	0.0303	NDAHSW03-R01	0.051	0 / 4	0.59	NO
NICKEL	19.9 - 19.9	0 / 4	--	--	8.2	-- / --	2.43	--[3]
NICKEL, DISSOLVED	19.9 - 19.9	0 / 4	--	--	8.2	-- / --	2.43	--[3]
POTASSIUM[2]	-- - --	4 / 4	482000	NDAHSW03-R01	NSV	-- / --	NSV	NO
POTASSIUM, DISSOLVED[2]	-- - --	4 / 4	486000	NDAHSW01-R01	NSV	-- / --	NSV	NO
SELENIUM	42 - 42	1 / 4	63.9	NDAHSW02-R01	71	0 / 4	0.90	NO
SELENIUM, DISSOLVED	42 - 42	1 / 4	67.9	NDAHSW01-R01	71	0 / 4	0.96	NO
SILVER	9.44 - 9.44	0 / 4	--	--	1.9	-- / --	4.97	--[3]
SILVER, DISSOLVED	9.44 - 9.44	0 / 4	--	--	1.9	-- / --	4.97	--[3]
SODIUM[2]	-- - --	4 / 4	7680000	NDAHSW01-R01	NSV	-- / --	NSV	NO
SODIUM, DISSOLVED[2]	-- - --	4 / 4	7750000	NDAHSW01-R01	NSV	-- / --	NSV	NO
THALLIUM	50.8 - 50.8	0 / 4	--	--	NSV	-- / --	NSV	NO
THALLIUM, DISSOLVED	50.8 - 50.8	0 / 4	--	--	NSV	-- / --	NSV	NO
VANADIUM	8.94 - 8.94	0 / 4	--	--	NSV	-- / --	NSV	NO
VANADIUM, DISSOLVED	8.94 - 8.94	0 / 4	--	--	NSV	-- / --	NSV	NO
ZINC	8.18 - 8.18	0 / 4	--	--	81	-- / --	0.10	NO
ZINC, DISSOLVED	8.18 - 8.18	0 / 4	--	--	81	-- / --	0.10	NO
Pesticides (UG/L)								
ALDRIN	0.0099 - 0.01	0 / 4	--	--	0.0014	-- / --	7.14	--[3]
ALPHA BHC (ALPHA HEXACHLOROCYC	0.0099 - 0.01	0 / 4	--	--	NSV	-- / --	NSV	NO
ALPHA ENDOSULFAN	0.0099 - 0.01	0 / 4	--	--	0.056	-- / --	0.18	NO
ALPHA-CHLORDANE	0.0099 - 0.01	0 / 4	--	--	NSV	-- / --	NSV	NO
BETA BHC (BETA HEXACHLOROCYCLO	0.0099 - 0.01	0 / 4	--	--	NSV	-- / --	NSV	NO
BETA ENDOSULFAN	0.02 - 0.02	0 / 4	--	--	0.056	-- / --	0.36	NO
DELTA BHC (DELTA HEXACHLOROCYC	0.0099 - 0.01	0 / 4	--	--	NSV	-- / --	NSV	NO
DIELDRIN	0.02 - 0.02	0 / 4	--	--	0.0014	-- / --	14	--[3]
ENDOSULFAN SULFATE	0.02 - 0.02	0 / 4	--	--	NSV	-- / --	NSV	NO
ENDRIN	0.02 - 0.02	0 / 4	--	--	0.0023	-- / --	8.70	--[3]

TABLE 7-12

Step 2 Screening Statistics and COPC Selection - AOC H - Surface Water

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient[1]	COPC?
ENDRIN ALDEHYDE	0.02 - 0.02	0 / 4	--	--	NSV	-- / --	NSV	NO
ENDRIN KETONE	0.02 - 0.02	0 / 4	--	--	NSV	-- / --	NSV	NO
GAMMA BHC (LINDANE)	0.0099 - 0.01	0 / 4	--	--	0.16	-- / --	0.06	NO
GAMMA-CHLORDANE	0.0099 - 0.01	0 / 4	--	--	NSV	-- / --	NSV	NO
HEPTACHLOR	0.0099 - 0.01	0 / 4	--	--	0.0021	-- / --	4.76	--[3]
HEPTACHLOR EPOXIDE	0.0099 - 0.01	0 / 4	--	--	0.0036	-- / --	2.78	--[3]
METHOXYCHLOR	0.099 - 0.1	0 / 4	--	--	0.03	-- / --	3.33	--[3]
p,p'-DDD	0.02 - 0.02	0 / 4	--	--	NSV	-- / --	NSV	NO
p,p'-DDE	0.02 - 0.02	0 / 4	--	--	NSV	-- / --	NSV	NO
p,p'-DDT	0.02 - 0.02	0 / 4	--	--	0.001	-- / --	20	--[3]
TOXAPHENE	0.05 - 0.051	0 / 4	--	--	0.0002	-- / --	255	--[3]
Semi-volatile Organic Compounds (UG/L)								
2,4,5-TRICHLOROPHENOL	20.2 - 20.5	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4,6-TRICHLOROPHENOL	5 - 5.1	0 / 4	--	--	21	-- / --	0.24	NO
2,4-DICHLOROPHENOL	5 - 5.1	0 / 4	--	--	93	-- / --	0.05	NO
2,4-DIMETHYLPHENOL	5 - 5.1	0 / 4	--	--	540	-- / --	0.01	NO
2,4-DINITROPHENOL	20.2 - 20.5	0 / 4	--	--	70	-- / --	0.29	NO
2,4-DINITROTOLUENE	5 - 5.1	0 / 4	--	--	0.11	-- / --	46	--[3]
2,6-DINITROTOLUENE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
2-CHLORONAPHTHALENE	5 - 5.1	0 / 4	--	--	1700	-- / --	0.003	NO
2-CHLOROPHENOL	5 - 5.1	0 / 4	--	--	120	-- / --	0.04	NO
2-METHYLNAPHTHALENE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
2-METHYLPHENOL (o-CRESOL)	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
2-NITROANILINE	20.2 - 20.5	0 / 4	--	--	NSV	-- / --	NSV	NO
2-NITROPHENOL	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
3,3'-DICHLOROBENZIDINE	5 - 5.1	0 / 4	--	--	0.4	-- / --	13	--[3]
3-NITROANILINE	20.2 - 20.5	0 / 4	--	--	NSV	-- / --	NSV	NO
4,6-DINITRO-2-METHYLPHENOL	20.2 - 20.5	0 / 4	--	--	NSV	-- / --	NSV	NO
4-BROMOPHENYL PHENYL ETHER	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
4-CHLORO-3-METHYLPHENOL	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO

TABLE 7-12

Step 2 Screening Statistics and COPC Selection - AOC H - Surface Water

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
4-CHLOROANILINE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
4-CHLOROPHENYL PHENYL ETHER	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
4-METHYLPHENOL (p-CRESOL)	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
4-NITROANILINE	20.2 - 20.5	0 / 4	--	--	NSV	-- / --	NSV	NO
4-NITROPHENOL	20.2 - 20.5	0 / 4	--	--	NSV	-- / --	NSV	NO
ACENAPHTHENE	5 - 5.1	0 / 4	--	--	1200	-- / --	0.004	NO
ACENAPHTHYLENE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
ACETOPHENONE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
ANTHRACENE	5 - 5.1	0 / 4	--	--	9600	-- / --	0.001	NO
ATRAZINE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
Benzaldehyde	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
BENZO(a)ANTHRACENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
BENZO(a)PYRENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
BENZO(b)FLUORANTHENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
BENZO(g,h,i)PERYLENE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
BENZO(k)FLUORANTHENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
BENZYL BUTYL PHTHALATE	5 - 5.1	0 / 4	--	--	3000	-- / --	0.002	NO
BIPHENYL (DIPHENYL)	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
bis(2-CHLOROETHOXY) METHANE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
bis(2-CHLOROETHYL) ETHER (2-CHLOR	5 - 5.1	0 / 4	--	--	0.31	-- / --	16	--[3]
bis(2-CHLOROISOPROPYL) ETHER	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
bis(2-ETHYLHEXYL) PHTHALATE	10.1 - 10.2	0 / 4	--	--	18	-- / --	0.57	NO
CAPROLACTAM	-- - --	1 / 1	0.52	NDAHSW01-R01	NSV	-- / --	NSV	**YES**
CARBAZOLE	10.1 - 10.2	0 / 4	--	--	NSV	-- / --	NSV	NO
CHRYSENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
DI-n-BUTYL PHTHALATE	5 - 5.1	0 / 4	--	--	2700	-- / --	0.002	NO
DI-n-OCTYLPHTHALATE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
DIBENZ(a,h)ANTHRACENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
DIBENZOFURAN	5 - 5.1	0 / 4	--	--	1000	-- / --	0.01	NO
DIETHYL PHTHALATE	5 - 5.1	0 / 4	--	--	23000	-- / --	0.0002	NO

TABLE 7-12
Step 2 Screening Statistics and COPC Selection - AOC H - Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
DIMETHYL PHTHALATE	5 - 5.1	0 / 4	--	--	313000	-- / --	0.00002	NO
FLUORANTHENE	5 - 5.1	0 / 4	--	--	300	-- / --	0.02	NO
FLUORENE	5 - 5.1	0 / 4	--	--	1300	-- / --	0.004	NO
HEXACHLOROBENZENE	5 - 5.1	0 / 4	--	--	0.0075	-- / --	680	--[3]
HEXACHLOROBUTADIENE	5 - 5.1	0 / 4	--	--	4.4	-- / --	1.16	--[3]
HEXACHLOROCYCLOPENTADIENE	5 - 5.1	0 / 4	--	--	240	-- / --	0.02	NO
HEXACHLOROETHANE	5 - 5.1	0 / 4	--	--	19	-- / --	0.27	NO
INDENO(1,2,3-c,d)PYRENE	5 - 5.1	0 / 4	--	--	0.044	-- / --	116	--[3]
ISOPHORONE	5 - 5.1	0 / 4	--	--	360	-- / --	0.01	NO
N-NITROSODI-n-PROPYLAMINE	5 - 5.1	0 / 4	--	--	0.05	-- / --	102	--[3]
N-NITROSODIPHENYLAMINE	5 - 5.1	0 / 4	--	--	50	-- / --	0.10	NO
NAPHTHALENE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
NITROBENZENE	5 - 5.1	0 / 4	--	--	17	-- / --	0.30	NO
PENTACHLOROPHENOL	20.2 - 20.5	0 / 4	--	--	7.9	-- / --	2.59	--[3]
PHENANTHRENE	5 - 5.1	0 / 4	--	--	NSV	-- / --	NSV	NO
PHENOL	5 - 5.1	0 / 4	--	--	21000	-- / --	0.0002	NO
PYRENE	5 - 5.1	0 / 4	--	--	960	-- / --	0.01	NO
Explosives (UG/L)								
1,3,5-TRINITROBENZENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
1,3-DINITROBENZENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4,6-TRINITROTOLUENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4-DINITROTOLUENE	2.5 - 2.5	0 / 4	--	--	0.11	-- / --	23	--[3]
2,6-DINITROTOLUENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
2-NITROTOLUENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
3-NITROTOLUENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
4-NITROTOLUENE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
HEXAHYDRO-1,3,5-TRINITRO-1,3,5,7-TE	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
NITROBENZENE	2.5 - 2.5	0 / 4	--	--	17	-- / --	0.15	NO
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO
Perchlorate	20 - 20	0 / 4	--	--	NSV	-- / --	NSV	NO

TABLE 7-12

Step 2 Screening Statistics and COPC Selection - AOC H - Surface Water

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
TETRYL	2.5 - 2.5	0 / 4	--	--	NSV	-- / --	NSV	NO

NSV - No screening value

1 - Maximum HQ based on maximum concentration detected unless frequency of detection is zero, in which case it is based on maximum reporting limit - indicated by shaded cells.

2 - Macronutrient - Not considered to be a COPC.

3 - Chemical not detected, however detection limit exceeded screening value. Chemical not retained as COPC - see Section 7.5 (Uncertainties)

TABLE 7-13
Step 2 Screening Statistics and COPC Selection - AOC H - Sediment
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
Inorganics (MG/KG)								
ALUMINUM	-- - --	4 / 4	3320	NDAHSD01-R01	NSV	-- / --	NSV	**YES**
ANTIMONY	0.0817 - 0.0829	2 / 4	0.333	NDAHSD01-R01	12	0 / 4	0.03	NO
ARSENIC	0.132 - 0.132	3 / 4	0.882	NDAHSD01-R01	7.24	0 / 4	0.12	NO
BARIUM	-- - --	4 / 4	57.2	NDAHSD02-R01	NSV	-- / --	NSV	**YES**
BERYLLIUM	-- - --	4 / 4	0.0647	NDAHSD02-R01	NSV	-- / --	NSV	**YES**
CADMIUM	0.0104 - 0.0121	0 / 4	--	--	1.2	-- / --	0.01	NO
CALCIUM [2]	-- - --	4 / 4	2660	NDAHSD02-R01	NSV	-- / --	NSV	NO
CHROMIUM, TOTAL	-- - --	4 / 4	13.4	NDAHSD01-R01	81	0 / 4	0.17	NO
COBALT	-- - --	4 / 4	4.27	NDAHSD04-R01	NSV	-- / --	NSV	**YES**
COPPER	-- - --	4 / 4	9.76	NDAHSD02-R01	18.7	0 / 4	0.52	NO
IRON	-- - --	4 / 4	8620	NDAHSD04-R01	NSV	-- / --	NSV	**YES**
LEAD	-- - --	4 / 4	1.49	NDAHSD02-R01	30.2	0 / 4	0.05	NO
MAGNESIUM [2]	-- - --	4 / 4	3430	NDAHSD01-R01	NSV	-- / --	NSV	NO
MANGANESE	-- - --	4 / 4	109	NDAHSD02-R01	NSV	-- / --	NSV	**YES**
MERCURY	0.00134 - 0.00134	3 / 4	0.0127	NDAHSD02-R01	0.13	0 / 4	0.10	NO
NICKEL	-- - --	4 / 4	4.39	NDAHSD01-R01	15.9	0 / 4	0.28	NO
POTASSIUM [2]	-- - --	4 / 4	1090	NDAHSD04-R01	NSV	-- / --	NSV	NO
SELENIUM	0.163 - 0.19	0 / 4	--	--	NSV	-- / --	NSV	NO
SILVER	0.0197 - 0.023	1 / 4	0.0268	NDAHSD04-R01	2	0 / 4	0.01	NO
SODIUM [2]	-- - --	4 / 4	3290	NDAHSD01-R01	NSV	-- / --	NSV	NO
THALLIUM	0.0998 - 0.0998	3 / 4	0.494	NDAHSD02-R01	NSV	-- / --	NSV	**YES**
VANADIUM	-- - --	4 / 4	26.9	NDAHSD02-R01	NSV	-- / --	NSV	**YES**
ZINC	-- - --	4 / 4	13.6	NDAHSD04-R01	124	0 / 4	0.11	NO
Pesticides (MG/KG)								
ALDRIN	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
ALPHA BHC (ALPHA HEXACHLOROCYCLO	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
ALPHA ENDOSULFAN	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
ALPHA-CHLORDANE	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
BETA BHC (BETA HEXACHLOROCYCLOHE	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO

TABLE 7-13

Step 2 Screening Statistics and COPC Selection - AOC H - Sediment

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
BETA ENDOSULFAN	0.0043 - 0.0045	0 / 4	--	--	NSV	-- / --	NSV	NO
DELTA BHC (DELTA HEXACHLOROCYCLO	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
DIELDRIN	0.0043 - 0.0045	0 / 4	--	--	0.0033	-- / --	1.36	--[3]
ENDOSULFAN SULFATE	0.0043 - 0.0045	0 / 4	--	--	NSV	-- / --	NSV	NO
ENDRIN	0.0043 - 0.0045	0 / 4	--	--	0.0033	-- / --	1.36	--[3]
ENDRIN ALDEHYDE	0.0043 - 0.0045	0 / 4	--	--	NSV	-- / --	NSV	NO
ENDRIN KETONE	0.0043 - 0.0045	0 / 4	--	--	NSV	-- / --	NSV	NO
GAMMA BHC (LINDANE)	0.0022 - 0.0023	0 / 4	--	--	0.0033	-- / --	0.70	NO
GAMMA-CHLORDANE	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
HEPTACHLOR	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
HEPTACHLOR EPOXIDE	0.0022 - 0.0023	0 / 4	--	--	NSV	-- / --	NSV	NO
METHOXYCHLOR	0.022 - 0.023	0 / 4	--	--	NSV	-- / --	NSV	NO
p,p'-DDD	0.0043 - 0.0045	0 / 4	--	--	0.0033	-- / --	1.36	--[3]
p,p'-DDE	0.0043 - 0.0045	1 / 4	0.00012	NDAHSD04-R01	0.0033	0 / 4	0.04	NO
p,p'-DDT	0.0043 - 0.0045	0 / 4	--	--	0.0033	-- / --	1.36	--[3]
TOXAPHENE	0.22 - 0.23	0 / 4	--	--	NSV	-- / --	NSV	NO
Semi-volatile Organic Compounds (MG/KG)								
2,4,5-TRICHLOROPHENOL	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4,6-TRICHLOROPHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4-DICHLOROPHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4-DIMETHYLPHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4-DINITROPHENOL	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4-DINITROTOLUENE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2,6-DINITROTOLUENE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2-CHLORONAPHTHALENE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2-CHLOROPHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2-METHYLNAPHTHALENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
2-METHYLPHENOL (o-CRESOL)	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
2-NITROANILINE	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
2-NITROPHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO

TABLE 7-13
Step 2 Screening Statistics and COPC Selection - AOC H - Sediment
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
3,3'-DICHLOROBENZIDINE	0.856 - 0.903	0 / 4	--	--	NSV	-- / --	NSV	NO
3-NITROANILINE	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
4,6-DINITRO-2-METHYLPHENOL	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
4-BROMOPHENYL PHENYL ETHER	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
4-CHLORO-3-METHYLPHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
4-CHLOROPHENYL PHENYL ETHER	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
4-METHYLPHENOL (p-CRESOL)	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
4-NITROANILINE	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
4-NITROPHENOL	1.26 - 1.33	0 / 4	--	--	NSV	-- / --	NSV	NO
ACENAPHTHENE	0.422 - 0.445	0 / 4	--	--	0.016	-- / --	28	--[3]
ACENAPHTHYLENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
ACETOPHENONE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
ANTHRACENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
ATRAZINE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
Benzaldehyde	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
BENZO(a)ANTHRACENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
BENZO(a)PYRENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
BENZO(b)FLUORANTHENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
BENZO(g,h,i)PERYLENE	0.422 - 0.445	0 / 4	--	--	0.655	-- / --	0.68	NO
BENZO(k)FLUORANTHENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
BENZYL BUTYL PHTHALATE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
BIPHENYL (DIPHENYL)	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
bis(2-CHLOROETHYL) ETHER (2-CHLORO	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
bis(2-CHLOROISOPROPYL) ETHER	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
bis(2-ETHYLHEXYL) PHTHALATE	0.422 - 0.445	0 / 4	--	--	0.182	-- / --	2.45	--[3]
CAPROLACTAM	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
CARBAZOLE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
CHRYSENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
DI-n-BUTYL PHTHALATE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO

TABLE 7-13

Step 2 Screening Statistics and COPC Selection - AOC H - Sediment

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
DI-n-OCTYLPHTHALATE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
DIBENZ(a,h)ANTHRACENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
DIBENZOFURAN	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
DIETHYL PHTHALATE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
DIMETHYL PHTHALATE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
FLUORANTHENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
FLUORENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
HEXACHLOROBENZENE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
HEXACHLOROCYCLOPENTADIENE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
INDENO(1,2,3-c,d)PYRENE	0.422 - 0.445	0 / 4	--	--	0.665	-- / --	0.67	NO
ISOPHORONE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
N-NITROSODI-n-PROPYLAMINE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
N-NITROSODIPHENYLAMINE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
NITROBENZENE	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
PENTACHLOROPHENOL	1.26 - 1.33	0 / 4	--	--	0.36	-- / --	3.69	--[3]
PHENANTHRENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
PHENOL	0.422 - 0.445	0 / 4	--	--	NSV	-- / --	NSV	NO
PYRENE	0.422 - 0.445	0 / 4	--	--	0.33	-- / --	1.35	--[3]
Explosives (MG/KG)								
1,3,5-TRINITROBENZENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
1,3-DINITROBENZENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4,6-TRINITROTOLUENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
2,4-DINITROTOLUENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
2,6-DINITROTOLUENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
2-NITROTOLUENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
3-NITROTOLUENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
4-NITROTOLUENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
HEXAHYDRO-1,3,5-TRINITRO-1,3,5,7-TETR	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
NITROBENZENE	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO

TABLE 7-13

Step 2 Screening Statistics and COPC Selection - AOC H - Sediment

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Detection Limit Range for Non-detects	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient [1]	COPC?
OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO
Perchlorate	0.105 - 0.115	0 / 4	--	--	NSV	-- / --	NSV	NO
TETRYL	0.158 - 0.166	0 / 4	--	--	NSV	-- / --	NSV	NO

NSV - No screening value

1 - Maximum HQ based on maximum concentration detected unless frequency of detection is zero, in which case it is based on maximum reporting limit - indicated by shaded cells.

2 - Macronutrient - Not considered to be a COPC.

3 - Chemical not detected, however detection limit exceeded screening value. Chemical not retained as COPC - see Section 7.5 (Uncertainties)

TABLE 7-14
Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Terrestrial								Aquatic			
	Norway rat		Indian mongoose		Pearly-eyed thrasher		Red-tailed hawk		Spotted sandpiper		Green heron	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics												
Arsenic	**256**	**51.2**	**8.38**	**1.68**	**3.49**	**1.16**	0.08	0.03	0.21	0.08	<0.01	<0.01
Cadmium	0.71	0.07	**10.3**	**2.06**	**5.01**	0.36	0.01	<0.01	0.01	<0.01	<0.01	<0.01
Chromium	0.81	0.16	**24.6**	**4.92**	**75.3**	**15.1**	**1.65**	0.33	**1.43**	0.29	0.15	0.03
Copper	**1.01**	0.75	**6.73**	**5.20**	**1.55**	**1.18**	0.08	0.06	**1.30**	0.99	<0.01	<0.01
Lead	**8.85**	0.88	**251**	**25.1**	**491**	**98.2**	0.67	0.13	0.08	0.02	<0.01	<0.01
Mercury	**2.53**	0.51	**1.93**	**1.16**	0.55	0.23	<0.01	<0.01	0.53	0.18	0.65	0.22
Nickel	**1.53**	0.76	**1.15**	0.46	0.35	0.25	0.01	0.01	0.01	<0.01	0.02	0.01
Selenium	**57.1**	**34.6**	**13.6**	**8.27**	**5.78**	**1.70**	0.24	0.07	0.20	0.10	0.04	<0.01
Silver	<0.01	<0.01	0.05	0.01	0.06	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	**5.90**	**2.95**	**86.7**	**17.3**	**117**	**12.9**	**4.33**	0.48	**2.12**	0.23	0.04	<0.01
Pesticides/PCBs												
4,4'-DDD	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
4,4'-DDE	0.02	<0.01	**5.99**	**1.20**	**11.2**	**1.12**	**3.63**	0.73	<0.01	<0.01	<0.01	<0.01
4,4'-DDT	0.01	<0.01	0.23	0.05	0.38	0.04	0.13	0.03	<0.01	<0.01	0.04	<0.01
Aldrin	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-BHC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-Chlordane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aroclor-1016	<0.01	<0.01	0.26	0.10	0.20	0.04	0.01	<0.01	NA	NA	NA	NA
Aroclor-1221	<0.01	<0.01	**5.23**	**1.05**	**1.65**	0.33	0.02	<0.01	NA	NA	NA	NA
Aroclor-1232	<0.01	<0.01	**2.58**	0.52	0.82	0.16	0.01	<0.01	NA	NA	NA	NA
Aroclor-1242	<0.01	<0.01	**2.58**	0.52	0.82	0.16	0.01	<0.01	NA	NA	NA	NA
Aroclor-1248	<0.01	<0.01	**2.54**	0.52	0.82	0.16	0.01	<0.01	NA	NA	NA	NA
Aroclor-1254	<0.01	<0.01	**2.54**	0.52	0.82	0.16	0.01	<0.01	NA	NA	NA	NA
Aroclor-1260	<0.01	<0.01	**2.54**	0.52	0.82	0.16	0.01	<0.01	NA	NA	NA	NA
beta-BHC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-BHC	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01	<0.01	0.17	0.03	0.06	0.01	<0.01	<0.01	0.07	0.01	0.02	<0.01
Endosulfan I	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan II	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01	<0.01	0.01	<0.01	0.10	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-BHC (Lindane)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-Chlordane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE 7-14
Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Terrestrial								Aquatic			
	Norway rat		Indian mongoose		Pearly-eyed thrasher		Red-tailed hawk		Spotted sandpiper		Green heron	
	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Methoxychlor	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toxaphene	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.07	0.01	0.07	0.01
Semivolatile Organics												
1,2,4-Trichlorobenzene	0.01	<0.01	0.05	0.03	0.07	0.01	<0.01	<0.01	NA	NA	NA	NA
1,2-Dichlorobenzene	0.02	<0.01	0.05	0.01	0.12	0.02	0.01	<0.01	NA	NA	NA	NA
1,3-Dichlorobenzene	0.01	<0.01	0.05	0.01	0.12	0.02	<0.01	<0.01	NA	NA	NA	NA
1,4-Dichlorobenzene	<0.01	<0.01	0.02	<0.01	0.12	0.02	<0.01	<0.01	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	<0.01	<0.01	<0.01	<0.01	0.18	0.04	0.02	<0.01	0.04	<0.01	0.02	<0.01
Acenaphthylene	<0.01	<0.01	<0.01	<0.01	0.14	0.03	0.01	<0.01	0.04	<0.01	0.02	<0.01
Anthracene	<0.01	<0.01	<0.01	<0.01	0.19	0.04	0.01	<0.01	<0.01	<0.01	0.02	<0.01
Benzo(a)anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.02	<0.01
Benzo(a)pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Benzo(b)fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Benzo(g,h,i)perylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Benzo(k)fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	<0.01
Chrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Dibenz(a,h)anthracene	0.04	<0.01	**1.26**	0.25	0.28	0.06	0.02	<0.01	<0.01	<0.01	0.02	<0.01
Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Fluorene	<0.01	<0.01	<0.01	<0.01	0.13	0.03	0.01	<0.01	0.02	<0.01	0.02	<0.01
Hexachlorobenzene	0.17	0.09	**6.04**	0.60	**57.0**	**11.4**	**3.02**	0.04	**1.12**	0.22	**1.08**	0.22
Hexachlorobutadiene	0.14	0.01	**2.26**	0.23	**1.15**	0.23	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachlorocyclopentadiene	<0.01	<0.01	0.06	0.01	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	<0.01	<0.01	0.05	<0.01	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Pentachlorophenol	0.13	0.03	**19.2**	**3.85**	**21.0**	**10.5**	**1.10**	0.55	0.10	0.05	0.09	0.05
Phenanthrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	<0.01
Pyrene	<0.01	<0.01	0.07	0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01
Volatile Organics												
1,1,2,2-Tetrachloroethane	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	NA	NA	NA	NA	NA

Hazard Quotients greater than or equal to 1 are bolded and shaded

TABLE 7-15
Summary of COPCs - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil		Surface Water		Sediment		Food Web	
	MD	NSV	MD	NSV	MD	NSV	MD	NSV
Inorganics								
Aluminum	X			X		X		
Antimony								
Arsenic	X		X				X	
Barium				X		X		
Bariium, dissolved				X				
Beryllium						X		
Cadmium							X	
Chromium	X						X	
Cobalt				X		X		
Copper	X						X	
Iron	X					X		
Lead							X	
Manganese	X			X		X		
Manganese, dissolved				X				
Mercury							X	
Nickel							X	
Selenium	X						X	
Thallium	X					X		
Vanadium	X					X		
Zinc	X						X	
Pesticides/PCBs								
p,p'-DDD	X							
p,p'-DDE	X						X	
p,p'-DDT	X							
Aroclor-1221							X*	
Aroclor-1232							X*	
Aroclor-1242							X*	
Aroclor-1248							X*	
Aroclor-1254							X*	
Aroclor-1260							X*	
Methoxychlor		X						
Semivolatile Organic Compounds								
2-Methylnaphthylene		X						
2,6-Dinitrotoluene		X						
3-Nitroaniline		X						
4-Bromophenyl phenyl ether		X						
Benzo(a)anthracene		X						
Benzo(a)pyrene	X							
Benzo(b)fluoranthene		X						
Benzo(k)fluoranthene		X						
bis(2-ethylhexyl)phthalate		X						
Caprolactam				X				
Chrysene		X						
Dibenzofuran		X						
Dibenz(a,h)anthracene							X*	
Fluoranthene	X							
Hexachlorobenzene							X*	
Hexachlorobutadiene							X*	
Indeno(1,2,3-c,d)pyrene		X						
Isophorone		X						
N-Nitrosodi-n-propylamine		X						
Pentachlorophenol							X*	
Phenanthrene	X							
Pyrene	X							
Total PAHs	X							
Volatile Organic Compounds								
1,1-Dichloroethene		X						
m,p Xylene		X						
o-Xylene		X						
Xylenes. Total	X							

MD - Result based on maximum detection
NSV - Result based on no screening value available
* - Chemical was not detected; maximum detection limit used in analysis. Chemical not retained as a COPC.

Table 7-16
Soil Bioconcentration and Bioaccumulation Factors For Plants, Soil Invertebrates, and Small Mammals - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)		Soil-Rat BAF (dry weight)[1]	
	Value	Reference	Value	Reference	Value	Reference
Inorganics						
Arsenic	0.037	Bechtel Jacobs 1998a	0.258	Sample et al. 1998a	0.003	Sample et al. 1998b
Cadmium	0.514	Bechtel Jacobs 1998a	7.660	Sample et al. 1998a	0.144	Sample et al. 1998b
Chromium	0.048	Bechtel Jacobs 1998a	0.320	Sample et al. 1998a	0.092	Sample et al. 1998b
Copper	0.123	Bechtel Jacobs 1998a	0.468	Sample et al. 1998a	0.111	Sample et al. 1998b
Lead	0.038	Bechtel Jacobs 1998a	0.307	Sample et al. 1998a	0.055	Sample et al. 1998b
Mercury	0.344	Bechtel Jacobs 1998a	1.186	Sample et al. 1998a	0.054	Sample et al. 1998b
Nickel	0.034	Bechtel Jacobs 1998a	1.656	Sample et al. 1998a	0.168	Sample et al. 1998b
Selenium	0.567	Bechtel Jacobs 1998a	0.982	Sample et al. 1998a	0.258	Sample et al. 1998b
Zinc	0.358	Bechtel Jacobs 1998a	2.482	Sample et al. 1998a	0.509	Sample et al. 1998b
Pesticides/PCBs						
4,4'-DDE	0.0048	Travis and Arms 1988	10.60	Menzie et al. 1992	--	see text

[1] BAFs developed for omnivorous small mammals.

Table 7-17
Sediment Bioaccumulation Factors For Benthic Invertebrates and Fish - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment-Invertebrate BAF (dry weight)		Sediment-Fish BAF (dry weight)	
	Value	Reference	Value	Reference
Inorganics				
Chromium	0.083	Bechtel Jacobs 1998b	0.038	Krantzberg and Boyd 1992
Copper	0.919	Bechtel Jacobs 1998b	0.100	Krantzberg and Boyd 1992
Zinc	0.954	Bechtel Jacobs 1998b	0.147	Pascoe et al. 1996

TABLE 7-18
Exposure Parameters for Upper Trophic Level Ecological Receptors - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

Receptor	Body Weight (kg)		Water Ingestion Rate (L/day)		Food Ingestion Rate (kg/day - dry)		Area Use Factor	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Birds								
Pearly-eyed thrasher	0.096	Oberle 2000	0.0123	allometric equation; USEPA 1993a	0.0127	allometric equation; USEPA 1993a	1.0	Information on home range size was not available. Set to maximum value of 1.0
Green heron	0.212	Dunning 1993	0.0209	allometric equation; USEPA 1993a	0.0405	allometric equation; USEPA 1993a	1.0	Information on home range size was not available. Set to maximum value of 1.0
Red-tailed hawk	1.13	Sample and Suter 1994	0.0639	allometric equation; USEPA 1993a	0.0360	Sample and Suter 1994	0.002	Exposure area (0.4 acres)/home range (233 acres); Home range from Sample and Suter 1994
Spotted sandpiper	0.040	Dunning 1993	0.0069	allometric equation; USEPA 1993a	0.0072	allometric equation; USEPA 1993a	1.0	Exposure area (0.4 acres)/home range (0.25 acres); Home range from USEPA 1993a; Set to maximum value of 1.0
Mammals								
Norway rat	0.438	Pass and Freeth 1993	0.0470	allometric equation; USEPA 1993a	0.0192	allometric equation; USEPA 1993a	1.0	Exposure area (0.4 acres)/home range (0.24 acres); Home range from Stroud 1982; Set to maximum value of 1.0
Indian mongoose	0.434	Nellis 1989	0.0467	allometric equation; USEPA 1993a	0.0346	allometric equation; USEPA 1993a	0.125	Exposure area (0.4 acres)/home range (3.2 acres); Home range from Nellis 1989

TABLE 7-18 (continued)
Exposure Parameters for Upper Trophic Level Ecological Receptors - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

Receptor	Dietary Composition (percent)							Soil/ Sediment Ingestion (percent)	
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Benthic Invert.	Reference	Value	Reference
Birds									
Pearly-eyed thrasher	20	75.4	0	0	0	0	Oberle 2000; estimated based on description of diet	4.6	Sample and Suter 1994; value is for American robin
Green heron	0	0	0	71	0	29	Sample et al. 1997	0	Sample et al. 1997
Red-tailed hawk	0	0	100	0	0	0	USEPA 1993a; Sample and Suter 1994	0	Sample and Suter 1994
Spotted sandpiper	0	0	0	0	0	82	USEPA 1993a	18	Beyer et al. 1994
Mammals									
Norway rat	49	49	0	0	0	0	Linzey, 1998; estimated based on description of diet	2.0	Beyer et al. 1994; value is for deer mouse
Indian mongoose	9.7	61	16.3	0.0	0	0	Nellis 1989; estimated based on description of diet	13	Sample and Suter 1994; value is for short-tailed shrew

TABLE 7-19
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Terrestrial Habitats			
Survival, growth, and reproduction of terrestrial soil invertebrate communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect soil invertebrate communities?	Comparison of mean chemical concentrations in surface soil with soil screening values.	Soil invertebrates
Survival, growth, and reproduction of terrestrial plant communities	Are site-related chemical concentrations in surface soil sufficient to adversely effect terrestrial plant communities?	Comparison of mean chemical concentrations in surface soil with soil screening values.	Terrestrial plants
Survival, growth, and reproduction of terrestrial reptile populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to terrestrial reptile populations?	Evidence of potential risk to other upper trophic level terrestrial receptors evaluated in the ERA.	--
Survival, growth, and reproduction of avian terrestrial invertivore/omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on mean surface soil conc	Pearly-eyed thrasher
Survival, growth, and reproduction of avian terrestrial carnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume small mammals from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on mean surface soil conc	Red-tailed hawk
Survival, growth, and reproduction of mammalian terrestrial omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume terrestrial plants and soil invertebrates from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on mean surface soil conc	Norway rat
Survival, growth, and reproduction of mammalian terrestrial omnivore populations	Are site-related chemical concentrations in surface soil sufficient to cause adverse effects (on growth, survival, or reproduction) to mammalian receptor populations that may consume small mammals, soil invertebrates, and plants from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on mean surface soil conc	Indian mongoose

TABLE 7-19
Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

Assessment Endpoint	Risk Hypothesis	Measurement Endpoint	Receptor
Aquatic Habitats			
Survival, growth, and reproduction of benthic invertebrate communities	Are site-related chemical concentrations in sediment sufficient to adversely effect benthic invertebrate communities?	Comparison of mean chemical concentrations in sediment with medium-specific screening values.	Benthic invertebrates
Survival, growth, and reproduction of fish communities	Are site-related chemical concentrations in sediment sufficient to adversely effect fish communities?	Comparison of mean chemical concentrations in sediment with medium-specific screening values.	Fish
Survival, growth, and reproduction of avian aquatic/wetland invertivore populations	Are site-related chemical concentrations in sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume primarily invertebrates from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on mean sediment concentr	Spotted sandpiper
Survival, growth, and reproduction of avian aquatic/wetland piscivore populations	Are site-related chemical concentrations in sediment sufficient to cause adverse effects (on growth, survival, or reproduction) to avian receptor populations that may consume primarily fish from the site?	Comparison of literature-derived chronic No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL) values for survival, growth, and/or reproductive effects with modeled dietary exposure doses based on mean sediment concentr	Green heron

Table 7-20
Step 3 Screening Statistics - AOC H - Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient
Inorganics (MG/KG)								
ALUMINUM	33 / 33	11000	NDE015, NDE176	7580	50	33 / 33	220	152
ARSENIC	33 / 33	67	NDE023	4.88	18	2 / 33	3.7	0.27
CHROMIUM, TOTAL	33 / 33	50	NDE176	17.1	0.4	33 / 33	125	43
COPPER	33 / 33	100	NDE009	31.8	50	2 / 33	2.0	0.64
IRON	33 / 33	39000	NDE178	17300	200	33 / 33	195	87
MANGANESE	33 / 33	720	NDE023	396	100	33 / 33	7.2	3.96
SELENIUM	22 / 33	1.4	NDE013	0.507	1	2 / 33	1.4	0.51
THALLIUM	13 / 33	1.16	NDAHSS18-R01	0.387	1	1 / 33	1.2	0.39
VANADIUM	33 / 33	63	NDE176	44.4	2	33 / 33	32	22.2
ZINC	33 / 33	260	NDE178	96.4	50	29 / 33	5.2	1.93
Pesticides/Polychlorinated Biphenyls (MG/KG)								
METHOXYCHLOR	1 / 32	0.00074	NDAHSS19-R01	0.00901	NSV	-- / --	NSV	NSV
p,p'-DDD	12 / 31	0.01	NDAHSS22-R01	0.00228	0.0025	5 / 31	4.0	0.91
p,p'-DDE	22 / 32	3.99	NDE004	0.234	0.0025	19 / 32	1596	94
p,p'-DDT	19 / 32	1.94	NDE004	0.109	0.0025	18 / 32	776	43.6
Semi-volatile Organic Compounds (MG/KG)								
2,6-DINITROTOLUENE	2 / 33	1.23	NDE030	0.876	NSV	-- / --	NSV	NSV
2-METHYLNAPHTHALENE	6 / 32	0.19	NDE021	0.812	NSV	-- / --	NSV	NSV
3-NITROANILINE	1 / 33	0.048	NDE030	2.43	NSV	-- / --	NSV	NSV
4-BROMOPHENYL PHENYL ETHER	3 / 33	0.267	NDE030	0.815	NSV	-- / --	NSV	NSV
BENZO(a)ANTHRACENE	10 / 33	0.112	NDE011	0.769	NSV	-- / --	NSV	NSV
BENZO(a)PYRENE	15 / 33	0.12	NDE011	0.12	0.1	1 / 33	1.2	1.20
BENZO(b)FLUORANTHENE	19 / 33	0.133	NDE011	0.733	NSV	-- / --	NSV	NSV
BENZO(k)FLUORANTHENE	16 / 33	0.124	NDE011	0.743	NSV	-- / --	NSV	NSV
bis(2-ETHYLHEXYL) PHTHALATE	8 / 33	0.117	NDAHSS24-R01	0.797	NSV	-- / --	NSV	NSV
CHRYSENE	18 / 33	0.155	NDE011	0.738	NSV	-- / --	NSV	NSV
DIBENZOFURAN	3 / 33	0.051	NDE019	0.802	NSV	-- / --	NSV	NSV
FLUORANTHENE	16 / 33	0.187	NDE011	0.187	0.1	2 / 33	1.9	1.87
ISOPHORONE	2 / 33	0.112	NDE028	0.809	NSV	-- / --	NSV	NSV
N-NITROSODI-n-PROPYLAMINE	3 / 33	0.717	NDE030	0.852	NSV	-- / --	NSV	NSV
PHENANTHRENE	8 / 33	0.144	NDE019	0.144	0.1	1 / 33	1.4	1.44
PYRENE	17 / 33	1.9	NDE176	0.377	0.1	3 / 33	19	3.77
Total PAHs	23 / 33	255.7	NDE176	14.48	1	23 / 33	256	14.48
Volatile Organic Compounds (MG/KG)								
1,1-DICHLOROETHENE	1 / 20	0.00078	NDE021	0.0285	NSV	-- / --	NSV	NSV
M,P-XYLENE (SUM OF ISOMERS)	1 / 20	0.058	NDE176	0.008	NSV	-- / --	NSV	NSV
O-XYLENE (1,2-DIMETHYLBENZENE)	1 / 20	0.024	NDE176	0.0063	NSV	-- / --	NSV	NSV
XYLENES, TOTAL	1 / 20	0.082	NDE176	0.0092	0.05	1 / 20	1.6	0.18

Shaded cells indicate maximum detected value used since the arithmetic mean exceeded the maximum due to elevated detectoin limits.

TABLE 7-21
Step 3 Screening Statistics - AOC H - Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient
Inorganics (UG/L)								
ALUMINUM	1 / 4	1740	NDAHSW02-R01	698	NSV	-- / --	NSV	NSV
ARSENIC	1 / 4	47.1	NDAHSW02-R01	27.1	1.4	1 / 4	34	19
BARIUM	4 / 4	162	NDAHSW02-R01	154	NSV	-- / --	NSV	NSV
BARIUM, DISSOLVED	4 / 4	163	NDAHSW02-R01	151	NSV	-- / --	NSV	NSV
COBALT	1 / 4	19.6	NDAHSW02-R01	9.17	NSV	-- / --	NSV	NSV
MANGANESE	4 / 4	654	NDAHSW03-R01	531	NSV	-- / --	NSV	NSV
MANGANESE, DISSOLVED	4 / 4	419	NDAHSW04-R01	204	NSV	-- / --	NSV	NSV
Semi-volatile Organic Compounds (UG/L)								
CAPROLACTAM	1 / 1	0.52	NDAHSW01-R01	0.52	NSV	-- / --	NSV	NSV

TABLE 7-22
Step 3 Screening Statistics - AOC H - Sediment
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Frequency of Detection	Maximum Concentration Detected	Sample ID of Maximum Concentration	Arithmetic Mean	Screening Value	Frequency of Exceedance	Maximum Hazard Quotient	Mean Hazard Quotient
Inorganics (MG/KG)								
ALUMINUM	4 / 4	3320	NDAHSD01-R01	2870	18,000	0 / 4	0.18	0.16
BARIUM	4 / 4	57.2	NDAHSD02-R01	22.4	48	1 / 4	1.19	0.47
BERYLLIUM	4 / 4	0.0647	NDAHSD02-R01	0.0504	NSV	-- / --	NSV	NSV
COBALT	4 / 4	4.27	NDAHSD04-R01	3.5	10	0 / 4	0.43	0.35
IRON	4 / 4	8620	NDAHSD04-R01	7770	220,000	0 / 4	0.04	0.04
MANGANESE	4 / 4	109	NDAHSD02-R01	83.1	260	0 / 4	0.42	0.32
THALLIUM	3 / 4	0.494	NDAHSD02-R01	0.349	NSV	-- / --	NSV	NSV
VANADIUM	4 / 4	26.9	NDAHSD02-R01	23	57	0 / 4	0.47	0.40

TABLE 7-23
Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 3
AOC H, Former NASD, Vieques, Puerto Rico

	Terrestrial								Aquatic			
	Norway rat		Indian mongoose		Pearly-eyed thrasher		Red-tailed hawk		Spotted sandpiper		Green heron	
Chemical	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL	NOAEL	LOAEL
Inorganics												
Arsenic	0.15	0.03	0.01	<0.01	0.07	0.02	<0.01	<0.01	--	--	--	--
Cadmium	0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	--	--	--	--
Chromium	0.05	<0.01	0.02	<0.01	0.67	0.13	<0.01	<0.01	0.32	0.06	0.07	0.01
Copper	<0.01	<0.01	0.01	<0.01	0.04	0.03	<0.01	<0.01	0.03	0.02	0.01	<0.01
Lead	0.03	<0.01	0.01	<0.01	0.26	0.05	<0.01	<0.01	--	--	--	--
Mercury	0.03	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	--	--	--	--
Nickel	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	--	--	--	--
Selenium	0.11	0.06	0.02	0.01	0.15	0.04	<0.01	<0.01	--	--	--	--
Zinc	0.04	0.02	0.09	0.02	**1.74**	0.19	<0.01	<0.01	0.13	0.01	0.06	<0.01
Pesticides/PCBs												
4,4'-DDE	0.07	0.01	0.02	<0.01	0.49	0.05	<0.01	<0.01	--	--	--	--

Hazard Quotients greater than or equal to 1 are bolded and shaded

TABLE 7-24
Comparison of PCOC Surface Soil Concentrations to Background Concentrations
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	AOC H Surface Soil (mg/kg) Frequency of Detection	Maximum Detected Concentration	Arithmetic Mean	Background Upper Tolerance Limit (UTL)	Frequency of UTL Exceedance	Maximum Ratio of Site Soils to Background UTL
Inorganics (MG/KG)						
ALUMINUM	33 / 33	11000	7580	29,000	0 / 33	0.38
CHROMIUM, TOTAL	33 / 33	50	17.1	74	0 / 33	0.68
IRON	33 / 33	39000	17300	37,531	1 / 33	1.04
MANGANESE	33 / 33	720	396	1,167	0 / 33	0.62
VANADIUM	33 / 33	63	44.4	130	0 / 33	0.48
ZINC	33 / 33	260	96.4	65	20 / 33	4.00

TABLE 7-25

Comparison of PCOC Sediment Concentrations to Upgradient Concentrations

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	AOC H Sediment (mg/kg)			Upgradient Concentration	Ratio of Site Maximum to Upgradient
	Frequency of Detection	Maximum Detected Concentration	Arithmetic Mean		
Inorganics (MG/KG)					
BERYLLIUM	4 / 4	0.0647	0.0504	0.06	1.02
THALLIUM	3 / 4	0.494	0.349	1.12	0.44

SECTION 8

Remedial Investigation Summary and Recommendations

8.1 Summary

8.1.1 Site Investigations

AOC H was sampled two times, once during the Expanded PA/SI (CH2M HILL, 2002d) and again during the RI. The sampling for the RI was described in a work plan reviewed (CH2M HILL, 2003b) and approved by the CERCLA Technical Committee (CTC). The sampling activities conducted at AOC H during the Expanded PA/SI and RI fieldwork of 2000 through 2003 consisted of surface and subsurface soil sampling, groundwater sampling from permanent wells, and sampling of ephemeral stream for sediment and surface water.

Site-specific background sampling was conducted from upgradient location for groundwater by installing one well (NDAHMW01) and one sediment sample. The ephemeral stream upstream of the site is dry, so background surface water sampling was not conducted.

A tidal study was conducted for the influence of the water level fluctuations at the site, and the results indicated that the ephemerals stream is not affected by tides in the Vieques Passage. However, a rain event increased the ephemeral stream levels as well as the site well water levels along the site boundary near the ephemeral stream. The wells on the eastern side of the site, farther from the ephemeral stream, did not show a water level fluctuation. Thus site groundwater appears to be influenced by the ephemeral stream water levels along the western side of the site.

Surface water and sediment samples were collected in the ephemeral stream adjacent to where groundwater west of the power plant building likely discharges, based on the groundwater flow direction shown in Figure 2-6. Other than inorganics (which may have a natural origin) and DDE (which was also detected in the background sediment sample), none of the constituents detected in site soil or groundwater was detected in the surface water or sediment samples collected immediately west of the power plant building or the next closest downstream location. Further, both the human health and ecological risk assessments determined there were no unacceptable human health or ecological risks associated with exposure to surface water and sediment in the ephemeral stream. This suggests the existing groundwater conditions at the site do not represent a potential source of contamination to the ephemeral stream that results in unacceptable risks.

The above information suggests that even in the absence of a groundwater monitoring point on the west side of the power plant building, there are sufficient data, for both groundwater and other media, that collectively indicate the site has been sufficiently characterized and the risks adequately assessed. Existing data are sufficient to determine that AOC H groundwater does not pose an unacceptable risk to potential receptors, based on actual constituent concentrations, the non-potable nature of the groundwater, and that environmental media at its discharge location (i.e., the ephemeral stream) do no pose unacceptable risks to potential receptors.

8.1.2 Nature and Extent Determination

8.1.2.1 Surface Soil

A total of 33 surface soil sample locations were sampled during the Expanded PA/SI and during the RI and are combined to characterize the site conditions. All of the surface soil samples were analyzed for TCL organic chemicals, VOCs, SVOCs, pesticides/PCBs, explosives and perchlorate, and TAL inorganic chemicals.

Inorganic Chemicals

A total of 23 inorganic analytes were detected in surface soil samples collected at AOC H (see Table 4-4). Twelve inorganic analytes were detected above screening criteria in at least one surface soil sample. Eight metals (aluminum, antimony, arsenic, iron, lead, manganese, thallium, and vanadium) exceeded their respective EPA Region 9 residential PRGs (HI = 0.1).

Twelve metals (aluminum, antimony, arsenic, chromium, copper, iron, lead, manganese, selenium, thallium, vanadium, and zinc) exceeded their respective ecological screening criteria in at least one surface soil sample. Three inorganic chemicals (antimony, arsenic, and chromium) were detected above their respective leachability criteria in surface soil. Each of the organic chemicals that exceeded the screening criteria and inorganic chemicals detected above screening criteria and background levels, which included arsenic, copper, iron, lead, thallium, and zinc, are presented in Figure 4-1.

Organic Chemicals

Pesticides: Four pesticides were detected in surface soil samples collected at AOC H; these are DDD, DDE, DDT, and methoxychlor. DDD, DDE, and DDT were detected above available screening criteria in at least one surface soil sample. Methoxychlor was also detected, but concentrations were below available screening criteria.

SVOCs: Nineteen SVOCs were detected in surface soil samples collected at AOC H. Two of the detected SVOCs, benzo(a)pyrene and n-nitrosodi-n-propylamine, were above their respective residential PRGs. Three of the detected SVOCs were above their respective ecological screening criteria, and 13 others did not have ecological screening criteria. N-nitroso-n-propylamine and 2,6-dinitrotoluene were detected above their respective SSLs.

VOCs: Two VOCs, xylenes and 1,1-dichloroethene, were detected in the surface soil samples collected at AOC H (see Table 4-4). Xylene exceeded its ecological screening criterion in one sample.

All the detected chemicals were evaluated through human health and ecological risk assessments.

8.1.2.2 Subsurface Soil

Thirty-one subsurface soil samples were collected during the Expanded PA/SI and the RI at AOC H. The subsurface soil samples were analyzed for TCL organic chemicals, VOCs, SVOCs, pesticides, explosives and perchlorate, and TAL inorganic chemicals.

Organic Chemicals

No organic chemicals were detected above screening criteria.

Inorganic Chemicals

A total of 23 inorganic analytes were detected in subsurface soil samples collected at AOC H (see Table 4-5). Arsenic and chromium were each detected above their respective SSLs in subsurface soil. No organic chemicals were detected above screening criteria. Only arsenic exceeded its SSL and background value.

All the chemicals detected in soils were evaluated through human health and ecological risk assessments.

8.1.2.3 Groundwater

The local groundwater flow direction is generally toward Vieques Passage.

Four monitoring wells were installed and sampled as part of the Expanded PA/SI. The samples were analyzed for total and dissolved metals, VOCs, SVOCs, PCBs, and pesticides.

During the RI, samples were collected from two of the existing monitor wells (NDAHMW01 and NDAHMW02). Three new monitoring wells were installed and sampled. Groundwater samples were analyzed for total and dissolved metals, SVOCs, pesticides, explosives, and perchlorate. One of the monitoring wells (NDAHMW01) was installed upgradient of the site and is used as a site-specific background well.

Inorganic Chemicals

A total of 21 inorganic analytes were detected in unfiltered groundwater samples (see Table 4-6), and 20 were detected in filtered samples (see Table 4-6). Ten metals (aluminum, antimony, arsenic, barium, cadmium, chromium, iron, manganese, thallium, and vanadium) were detected above screening criteria in unfiltered samples. Six metals were detected above their respective EPA Region 9 tap-water PRGs in filtered samples: antimony, barium, cadmium, iron, manganese, and thallium.

Organic Chemicals

Of the organic chemicals detected, no VOCs or SVOCs were above screening criteria. Pesticides, DDD, DDE, and DDT were detected in groundwater samples collected from monitoring wells NDAHMW02 and NDAHMW05, located at the western boundary of the AOC H.

All of the detected inorganic and organic chemicals were included for human health risk assessment. No direct exposure is expected to ecological receptors; thus groundwater was not included for ecological risk assessment.

8.1.2.4 Surface Water

During the Expanded PA/SI, surface water samples were not collected. During the RI, five surface water samples were to be collected, including one background surface water sample. The site-specific background location was dry during sampling, so the background sample could not be collected. The other four surface water samples were collected as proposed and were analyzed for total and dissolved (filtered) metals, SVOCs, pesticides, explosives, and perchlorate.

The site surface water was sampled at four locations during the RI. The surface water analytical results indicated the presence of one inorganic chemical (arsenic) at a concentration above ecological screening criterion in one unfiltered sample. One SVOC (caprolactam) was detected in one surface water sample at AOC H. No screening criteria were available for this constituent for comparison. Pesticides, explosives, or perchlorate were not detected in any of the surface water samples.

Inorganic Analytes

Thirteen inorganic chemicals were detected in site surface water samples. One inorganic chemical, arsenic, exceeded its ecological screening criterion in one unfiltered sample.

Organic Analytes

No organic chemicals were identified as exceeding criteria.

8.1.2.5 Sediment

During the Expanded PA/SI, sediment samples were not collected at AOC H. During the RI, five sediment samples were collected and analyzed for metals, SVOCs, pesticides, explosives, and perchlorate. One of the RI sediment samples (NDAHSD05) was collected as a site-specific background sample. All of the sediment samples were analyzed for total and dissolved (filtered) metals, SVOCs, pesticides, explosives, and perchlorate.

Site sediment samples were collected at five locations during the RI. The sediment analytical results indicated the presence of 21 inorganic chemicals. Screening criteria were not available for twelve of the detected inorganics. No pesticides were detected above screening criteria in the sediment samples. No SVOCs, explosives, or perchlorate were detected in sediment samples.

Inorganic Analytes

Twenty-one inorganic chemicals were detected in site sediment samples (see Table 4-8). Barium exceeded its ecological screening criterion.

Organic Analytes

No organic chemicals were identified as exceeding criteria in sediments.

8.1.3 Chemical Fate and Transport

Some of the detected chemicals were identified as exceeding the screening criteria. The fate and transport of these chemicals in each medium were evaluated to determine their long-term potential to remain in the environmental media and the potential for them to transfer across media.

The groundwater occurs approximately 7 ft bls and flows regionally to the north toward Vieques Passage. In the southern portion of AOC H, groundwater flows to the west toward the ephemeral stream and in the northern portion to the north toward Vieques Passage. The hydraulic gradient at the site appears to be fairly low (less than 0.010 foot per foot). Typically, contaminants do not move as rapidly as the groundwater because of adsorption of the contaminant on the geologic media. Retardation of metals is a complex process and is affected by sorption, ion exchange, speciation, precipitation, colloid formation, biofixation, natural organic matter interactions, anion exclusion, pH, ORP, salinity, competing ions, surface area, and densities (ERG, 2002).

The potential migration pathways for site media include surface runoff and leaching from surface soil and leaching for subsurface soil to the groundwater. The volatilization to air pathway is not considered important.

Surface soil around the power plant building has elevated arsenic levels. PAHs were also identified as COPCs for the surface soils at AOC H. Arsenic and PAHs could run off to the adjacent ephemeral stream. However, the sediment samples from areas immediately adjacent to the site did not indicate the presence of PAHs. One sediment sample farther north of the site had arsenic. However, surface soil samples located slightly away from the building did not have elevated arsenic. Thus runoff may not be related to the detected sediment arsenic. No other surface soil constituents were identified above criteria in sediments.

Another potential contaminant migration pathway is the migration of contaminants from surface soil into the subsurface (soil and groundwater). Infiltration of rainfall may have leached some contaminants into subsurface soil and subsequently the groundwater system. However, only arsenic and chromium were detected above their respective SSL values and, of these, only arsenic exceeded its background value. Site groundwater had a single arsenic detect from 2000 sampling, which was not detected upon resampling in 2003. Chromium was not identified in site groundwater. Therefore, no evidence of significant leaching of chemicals to the subsurface was found in the RI.

The potential for site groundwater contamination and offsite migration was evaluated. Monitoring well NDAHMW01 was used as the site-specific background well for inorganics. Basewide background levels have also been established for several compounds, but no background levels have been established for organic compounds in groundwater.

DDD was detected in two monitoring wells at AOC H above its tap-water PRG. It was detected in NDAHMW02 in 2000 and 2003 and in monitoring well NDAHMW05 in 2003. Since this well was not installed until after the 2000 sampling event, it was only sampled once. It is likely that the presence of fine turbidity in the groundwater sample contributed to the detection of DDD in groundwater samples.

Several inorganic chemicals were detected in site wells, particularly closer to the ephemeral stream. The detected inorganic chemicals are likely from suspended particulates, as their detections were sporadic and lack spatial association with site soil contamination areas. In groundwater, concentrations of dissolved antimony, dissolved arsenic, total and dissolved barium, dissolved chromium, total and dissolved manganese, and total and dissolved vanadium were all below either their site-specific or their basewide background concentration. This suggests that their presence is not site-related. Overall, the data suggest that only limited migration is occurring at the site.

Arsenic was detected in downgradient sediment sample SD-1 and downgradient surface water sample SW-2 at concentrations that exceeded background levels or screening criteria. Arsenic was also detected at elevated levels in soil samples on the northern side of the building, but it was not detected at elevated levels adjacent to the ephemeral stream or within the ephemeral stream adjacent to this location. Most of the surface soil samples along the ephemeral stream have arsenic levels below background levels. In addition, all of the arsenic concentrations in the ephemeral stream sediment samples are below base-wide background sediment arsenic concentration. Therefore, the presence of arsenic in surface water and sediment at AOC H is most likely not related to site-activities.

8.1.4 Human Health Risk Assessment

Site exposure media evaluated were the surface and subsurface soil and groundwater. All the detected chemicals in the Expanded PA/SI and the RI were included for COPC selection. The maximum detected chemical concentration was compared against the screening criteria presented in the RAGS Part D tables in Appendix J.

Detected chemicals were screened against criteria as described in Section 4 to determine the nature and extent of contamination. The chemicals identified as COPCs were: inorganic chemicals and one PAH in soils; a pesticide and inorganic chemicals in groundwater; and only one chemical in sediment and surface water. Arsenic was elevated in site soils and could be from past site pesticide applications.

Based on anticipated future land use considerations, the following potentially exposed populations were included for quantitative risk assessment:

- Maintenance workers
- Construction workers
- Industrial workers
- Recreational receptors (adult, youth, and child)
- Residential receptors (adult and child)

Other potentially exposed populations could exist, though their exposures would likely be lower than exposures to the populations listed above.

The risk characterization included the results of risk estimations. The estimated carcinogenic risks were at 1E-5 level for soils to recreational child, industrial adult, residential adult and child. However, all are below the upper limit of the target risk range. Arsenic in soil is elevated above background levels around the power plant building in some of the locations.

The HI for soils was slightly above the target limit for the residential child due to the presence of vanadium in soils. However, soil vanadium was within the background levels. Also, HIs from groundwater exposure through potable use were above the target limits due to manganese, iron, thallium, vanadium, and arsenic. The detected metals in site wells are similar to background levels and found in wells along the ephemerals stream (e.g., NDAHMW02, NDAHMW05, and NDAHMW07). Observed elevated metals are likely from natural geochemical processes in site groundwater. The water in this area of the site is brackish.

The risks and HI from soil inorganic chemical levels are within the range of acceptable risks and HI, from soil alone. The cumulative risks combined from soil and groundwater results in cancer risks and HIs above the target limits. However, groundwater risks and HIs are not site-related. Also, site groundwater is brackish and not suitable for potable use.

Due to the absence of cancer risks and HIs above the target limits from site-related chemicals, the site does not pose a human health risk, and no further actions are proposed at AOC H under CERCLA. No additional sampling or monitoring of the soil is necessary because the conditions at the site are protective of human health.

8.1.5 Ecological Risk Assessment Summary

A screening ecological risk assessment (SERA), constituting Steps 1 and 2 of the ecological risk assessment (ERA) process, and the first step (Step 3) of a baseline ecological risk assessment (BERA) were conducted for AOC H. An ERA was conducted to evaluate the potential adverse effects to the environment at AOC H. The objectives of the ERA and a description of the ERA process follow.

8.1.5.1 Problem formulation

The goals, scope, and focus of the ERA are established. As part of problem formulation, the environmental setting of AOC H is characterized in terms of the habitats and biota known to be present. Table 7-4 shows the preliminary assessment endpoints, risk hypotheses, and measurement endpoints used in the screening portion (Steps 1 and 2) of the ERA. Table 7-4 also shows the receptors associated with each endpoint. No endangered or threatened species were observed within the AOC H area.

8.1.5.2 Exposure estimation

Maximum concentrations were used in the screening portion of the ERA to conservatively estimate potential chemical exposures for the ecological receptors selected to represent the assessment endpoints at AOC H. Food web exposures for upper trophic level receptor species were determined by estimating the chemical-specific concentrations in each dietary component using uptake and food web models. Maximum sediment or surface soil concentrations were used in all screening food web calculations to provide a conservative assessment. For conservatism, the maximum reporting limit for chemicals analyzed for but not detected was also compared to medium-specific screening values and (where applicable) used for food web exposure modeling. This was done to determine whether reporting limits were less than or equal to chemical concentrations at which potential adverse effects to ecological receptors may occur.

8.1.5.3 Risk characterization

The goal of this evaluation is to finalize a list of COCs. The ERA refinement step conclusions are summarized as follows by medium.

Surface Soil Exposures

Six metals (aluminum, chromium, iron, lead, manganese, vanadium, and zinc), two pesticides (DDE, DDT), and four PAHs (benzo[a]pyrene, fluoranthene, phenanthrene, and pyrene) were identified as PCOCs in surface soils from AOC H. Onsite inorganic surface soil concentrations for these metals were compared to background upper tolerance limit (UTL) concentrations. Aluminum, chromium, manganese, and vanadium did not exceed the background UTL in any sample. Iron had a single low exceedance of the background UTL, with a maximum ratio of 1.04. Thus the levels of these five soil metals are consistent with background conditions.

Zinc exceeded the background UTL. The mean HQ for zinc at this site was 1.9. The screening value of 50 mg/kg for zinc is protective of plants; however, vegetation throughout the site is dense and diverse and comparable to reference plant communities. Based on the low magnitude of screening value exceedances for plants, soil invertebrates, and microbial communities, the risk associated with zinc is likely to be low.

The pesticides DDE and DDT were identified as PCOCs in soil. These chemicals exceeded the soil screening value in 19 of 32 samples. The risk associated with direct exposure of DDE and DDT to terrestrial invertebrates and plants is likely to be low considering the limited extent of elevated levels of contamination.

The PAHs benzo(a)pyrene, fluoranthene, and phenanthrene were identified as PCOCs. However, soil concentrations exceeded screening values in only 2 of 33 samples, and maximum HQs were low.

Seven other SVOCs and one VOC were detected but could not be evaluated quantitatively because screening values were not available. These chemicals were infrequently detected, ranging from 1 to 3 detections in 33 surface soil samples. Detections typically occurred in samples adjacent to the western side of the abandoned building. Because of their low frequency and magnitude of detection, these chemicals are not considered COCs.

Surface Water Exposures

Five inorganics (aluminum, arsenic, barium, cobalt, and manganese) were identified as COPCs due to screening value exceedance (arsenic only) or lack of screening values. Of these, aluminum, arsenic, and cobalt were detected only as total (unfiltered) inorganics. Because these inorganics were not detected in any of the filtered (dissolved) surface water samples, they are likely associated with suspended sediment particulates and not readily bioavailable to directly exposed aquatic organisms. As a result, these inorganics were not considered for further evaluation as COPCs.

Sediment Exposures

Eight inorganics (aluminum, barium, beryllium, cobalt, iron, manganese, thallium, and vanadium) were identified as COPCs in sediment from AOC H. Onsite concentrations of these parameters were compared to concentrations in an upgradient sediment sample. Except for barium, all other inorganics were below background levels. Barium is not widely distributed, exceeded basewide background in only one sample, and does not have a literature screening value available; thus the potential for unacceptable risk is likely to be low, and therefore it was not considered further as a COPC.

Food Web Exposures

Results of food web modeling indicated no COCs. No HQs were exceeded for any terrestrial or aquatic receptors.

8.1.5.4 Summary of Ecological COCs

In summary, none of the COPCs carried forward from Step 2 were considered as final COCs following the Step 3A refinement. Although some metals and a few organic chemicals were identified as COPCs, risks to lower trophic level receptors were negligible based on low magnitude of screening value exceedances and comparisons to background/upgradient data. Also, no significant risks were identified for upper trophic level wildlife from potential food web exposures.

8.1.5.5 Rare, Threatened, or Endangered Species

Sixteen federally listed species are known to occur or have the potential to occur on the former NASD at Vieques.

Before the fieldwork was conducted, a literature search was performed for each federally protected species. During surveys in 2000, biologists walked transects through each site and identified any federally protected species seen and noted the presence or absence of preferred habitat for the species.

No endangered or threatened species were observed within the AOC H area. Cobana negra, a federally threatened tree, has been found between the boundary of black mangrove communities, salt flats, and the upland communities at NASD. This species is also known to occur in coastal forests of southeastern Puerto Rico. The preferred habitat for cobana negra was not present at this site.

The threatened Arctic peregrine falcon has been observed at Naval Station Roosevelt Roads in Puerto Rico. This species uses open grassland areas for potential feeding areas. This habitat type was present immediately adjacent to the site. The brown pelican and the roseate tern are not likely to use this terrestrial site but may be seen nearby due to the proximity of nearby marine habitat.

8.1.6 Cultural Resources

No cultural resources are expected to be encountered at AOC H based on its recent history and the lack of documented evidence of such resources.

8.2 Recommendations

Overall human health risks are within target limits for soils and groundwater, sediment, and surface water individually. However, the combined cancer risks and HIs are above the target limits. Soils have elevated arsenic levels, although the risks are within the target risk range. Groundwater is not potable due to the brackish nature of the water. There are no unacceptable risks to ecological receptors from direct exposure to surface water, sediment, or surface soil. No significant risks were identified for upper trophic level wildlife from potential food web exposures.

The HHRA and the ERA indicated that sufficient data are available on which to base a conclusion of no unacceptable risk within acceptable uncertainty at AOC H. The HHRA is based on the most conservative assumption of unrestricted land use. Given the low risk estimates for site-related chemicals, no additional sampling or remedial actions are recommended for AOC H based upon the results of the RI.

SECTION 9
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APPENDIX A

Boring Logs

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS17	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Cloudy, hot, humid** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0950** END : **8-26-03 @ 1000** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, some clay, trace gravel, trace organic material (humus)	Sample NDAHSS17 collected @ 1000 No odor
0.5	0.5					
					END OF SOIL BORING @ 0.5' bgs	
1						
1.5						
2						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS18	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Cloudy, hot, humid** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 1000** END : **8-26-03 @ 1015** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, some gravel, trace clay, trace roots, trace organic material (humus)	Sample NDAHSS18 collected @ 1015 No odor
0.5	0.5					
					END OF SOIL BORING @ 0.5' bgs	
1						
1.5						
2						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS19	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Cloudy, hot, humid** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 1015** END : **8-26-03 @ 1020** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus)	Sample NDAHSS19 collected @ 1020 No odor
0.5	0.5					
					END OF SOIL BORING @ 0.5' bgs	
1						
1.5						
2						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS20	SHEET 1 OF 1

CH2MHILL

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0900** END : **8-26-03 @ 0905** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0					
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus), some brick fragments	Surface soil sample NDAHSS20 collected @ 0900 Also Collected field duplilcate sample NDAHFD04 P-R01 No odor
0.5	0.5					
					END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS21	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-032 @ 0855** END : **8-26-03 @ 0900** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0	NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus), some brick fragments	Surface soil sample NDAHSS21-R01 collected @ 0855 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS22	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0835** END : **8-26-03 @ 0840** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0	NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus), some brick fragments	Surface soil sample NDAHSS22 colleced @ 0835 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Issac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS23	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0845** END : **8-26-03 @ 085** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0	NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus), some brick fragments	Surface soil sample NDAHSS23 collected @ 0845 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS24	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0830** END : **8-26-03 @ 0835** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0	NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus)	Surface soil sample NDAHSS24 collected @ 0830 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS25	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **08-26-03 @ 0820** END : **08-26-03 @ 0825** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0	NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus)	Surface soil sample NDAHSS25 collected @ 0820 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS26	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0815** END : **8-26-03 @ 0820** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.0	NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus)	Surface soil sample NDAHSS26 collected @ 0815 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS27	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Light rain, cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED: **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0905** END : **8-26-03 @ 0910** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus), some brick fragments	Sample NDAHSS27 collected @ 0910 Also Collected NDAHFD06P-R01 Field Duplicate 6 at this location. No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1						
1.5						
2						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS28	SHEET 1 OF 1

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Cloudy, hot** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED: **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0910** END : **8-26-03 @ 0915** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus), some brick fragments	Sample NDAHSS28 collected @ 0915 Also collected MS/MD at this location. No odor Note: Barbwire present on surface adjacent to soil boring location.
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1						
1.5						
2						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSS29	SHEET 1 OF 1

CH2MHILL

SURFACE SOIL LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8-26-03**

WEATHER: **Cloudy, hot, humid** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED: **Hand Auger / Stainless Bowl and Spoon**

WATER LEVELS : **NA** START : **8-26-03 @ 0945** END : **8-26-03 @ 0950** LOGGER : **I.Lynch**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		NA	HA	NA	0.0-0.5' POORLY GRADED SAND (SP), Brown, moist, loose, trace clay, trace gravel, trace organic material (humus)	Sample NDAHSS29 collected @ 0950 No odor
0.5	0.5				END OF SOIL BORING @ 0.5' bgs	
1						
1.5						
2						
2.5						

Sampler Signature: **Isaac Lynch** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER
171119.FI.ZZ	NDAHSB17 SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/06 @1005** END : **8/26/03 @ 1010** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
2						
4	4.0	20	SS1	10-12-17-50 (29)	4.0-6.0' CLAYEY SAND (SC), Brown (10YR 4/3), dry, medium dense, some fine to coarse gravel, some fine to medium sand.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB17 @ 1010
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER
171119.FI.ZZ	NDAHSB18 SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 1020** END : **8/26/03 @ 1025** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	15-21-17-12 (38)	4.0-6.0' LEAN CLAY WITH SAND (CL), Dark Yellowish Brown (10YR, 4/4), dry, hard, some fine to coarse gravel, some medium sand, trace glass fragments (fill).	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB18 @ 1025
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB19	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 1030** END : **8/26/03 @ 1035** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	10-10-12-12 (22)	4.0-6.0' <u>SANDY SILT</u> (ML), Yellowish Brown (10YR, 5/8), dry, medium dense, some fine to coarse sand, some fine gravel.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB19 @ 1035
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB20	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0910** END : **8/26/03 @ 0915** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	21-19-13-12 (32)	4.0-6.0' SANDY LEAN CLAY (CL), Dark Yellowish Brown (10YR, 4/4), dry, hard, fine to medium sand, some fine gravel.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB20 @ 0915 Collected field duplicate NDAHFD04
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB21	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0905** END : **8/26/03 @ 0910** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	7-9-9-10 (18)	4.0-6.0' SILTY SAND (SM), Yellowish Brown (10YR 5/6), moist, medium dense, fine to coarse sand, trace gravel (weathered rock).	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB21 @ 0910
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB22	SHEET 1 OF 1

CH2MHILL

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0856** END : **8/26/03 @ 0900** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	7-10-12-12 (22)	4.0-6.0' CLAYEY SAND (SC), Brown (10YR, 5/3), dry, medium dense, fine to coarse sand.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB22 @ 0900
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB23	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0850** END : **8/26/03 @ 0855** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	9-13-15-17 (28)	4.0-6.0' POORLY GRADED SAND (SP), Brownish Yellow (10YR 6/6), dry, medium dense, medium to coarse sand, note: quartz sand.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB23 @ 0855
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB24	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0836** END : **8/26/03 @ 0840** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
2						
4	4.0	24	SS1	10-12-14-14 (26)	4.0-6.0' WELL GRADED SAND WITH GRAVEL (SW), Yellowish Brown (10YR 5/8), moist, medium dense, medium sand to fine gravel, subrounded gravel, note: some red brick fragments.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB24 @ 0840
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB25	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Rain** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0820** END : **8/26/03 @ 0836** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	20	SS1	10-13-15-16 (28)	4.0-6.0' SILTY SAND (SM), Yellowish Brown (10YR, 5/6), moist, medium dense, medium sand, trace fine gravel, subangular to subrounded gravel.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB25 @ 0836
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB26	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Raining, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0805** END : **8/26/03 @ 0815** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0					
		20	SS1	7-8-9-15 (17)	4.0-6.0' SILTY SAND (SM), Dark Brown (10YR 3/3), moist, medium dense, fine sand, trace fine gravel, sub angular to sub rounded gravel.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB26 @ 0815
6	6.0					
					END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB27	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0925** END : **8/26/03 @ 0930** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	7-9-5-5 (14)	4.0-6.0' CLAYEY GRAVEL WITH SAND (GC), Dark Yellowish Brown (10YR, 4/4), moist, medium dense, medium sand to coarse gravel, note: appears to be fill material.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB27 @ 0930
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB28	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0940** END : **8/26/03 @ 0945** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0	24	SS1	9-10-11-13 (21)	4.0-6.0' <u>CLAYEY SAND</u> (SC), Yellowish Brown (10YR, 5/6), dry, medium dense, fine to coarse sand, some coarse gravel, subangular gravel, note: appears to be fill.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB28 @ 0945 Collected MS, MSD at this location
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSB29	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/26/03**

WEATHER: **Overcast, humid** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger, 4.25" ID, 2" split spoon with 140 lb hammer**

WATER LEVELS : **NA** START : **8/26/03 @ 0950** END : **8/26/03 @ 1000** LOGGER : **E. ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
2						
4	4.0					
		24	SS1	13-14-12-13 (26)	4.0-6.0' CLAYEY SAND (SC), Yellowish Brown (10YR, 5/6), dry, medium dense, fine to medium sand, some fine gravel.	0.0 ppm 0.0 ppm 0.0 ppm Collected sample NDAHSB29 @ 1000
6	6.0				END OF SOIL BORING @ 6.0' bgs.	
8						
10						

Sampler Signature: **E. ISERN** Date: **08/26/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHMW05	SHEET 1 OF 1

CH2MHILL

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/15/03**

WEATHER: **Overcast** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger (HAS), 4.25" ID, 2" split-spoon with 140 lb hammer**

WATER LEVELS : **7.0 FT** START : **08/15/2003 @ 1350** END : **8/15/03 @ 1600** LOGGER : **E.ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone / Above Hole
	0.0					
	2.0	18	SS-1	11 - 10 - 15 - 23 (25)	0.0-1.0' LEAN CLAY (CL), Strong Brown (7.5YR 5/8), dry, very stiff, some silt, some coarse gravel (angular), few red brick fragments, few organic materials (roots, from 0 to 0.5').	0.0 ppm 0.0 ppm NA
	4.0	14	SS-2	4 - 7 - 5 - 5 (12)	2.0-4.0' - LEAN CLAY (CL), Strong Brown (7.5YR 4/6), dry, stiff, some silt, some organic material (roots), few coarse gravel (subangular), few red brick fragments.	0.0 ppm 0.0 ppm NA
5	6.0	13	SS-3	5 - 4 - 3 - 4 (7)	4.0-4.5' Same as above. 4.5-6.0' SILTY SAND (SM), Strong Brown (7.5YR 5/6), moist, loose, coarse sand (quartz), some clay, few coarse gravel.	0.0 ppm 0.0 ppm NA
	8.0	11	SS-4	3 - 4 - 4 - 6 (8)	6.0-7.0' Same as above. 7.0-8.0' POORLY GRADED SAND (SP), Grayish Green (5G, 4/2), saturated, loose, coarse sand (quartz), strong chemical odor.	0.1 ppm 0.0 ppm NA Note: Saturated at 7.0' bgs. 4.0 ppm 0.0 ppm NA
10	10.0	12	SS-5	2 - 3 - 3 - 5 (6)	8.0-8.5' WELL GRADED SAND (SW), Greenish Gray (5G 6/1), saturated, loose, coarse gravel (sapprolite), very angular, no odor. 8.5-9.0' Same as above with no gravel.	0.0 ppm 0.0 ppm NA
15						
					END OF SOIL BORING @ 16.0' bgs.	Note: Monitoring well AOC H - MW05 installed with screened interval from 5.0' to 15.0'. See well completion diagram for details.
20						
25						

Sampler Signature: **E. ISERN** Date: **08/15/2003**

CH2MHILL

PROJECT NUMBER 171119.FI.ZZ

BORING NUMBER NDAHMW06 SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/19/03**

WEATHER: **Partly cloudy** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger (HAS), 4.25" ID, 2" split-spoon with 140 lb hammer**

WATER LEVELS : **7.0 FT** START : **08/19/2003 @ 0740** END : **8/19/03 @ 0800** LOGGER : **E.ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm):	Breathing Zone	Above Hole
	0.0							
	2.0	24	SS-1	5 - 12 - 6 - 7 (18)	0.0-1.0' SANDY LEAN CLAY (CL), Light Yellowish Brown (2.5Y, 6/3), saturated, very stiff, medium to coarse sand. 1.0-2.0' LEAN CLAY (CL), Dark Yellowish Brown (10YR, 4/4), dry, soft.	0.4 ppm	0.0 ppm	NA
	4.0	14	SS-2	6 - 3 - 4 - 3 (7)	2.0-3.0' POORLY GRADED SAND (SP), Yellowish Brown (10YR, 5/8), dry, loose, fine to medium sand (quartz). 3.0-4.0' SILT (ML), Dark Yellowish Brown (10YR 4/4), dry, very stiff, some coarse gravel.	0.3 ppm	0.3 ppm	NA
5	6.0	24	SS-3	10 - 8 - 10 - 13 (18)	4.0-6.0' POORLY GRADED SAND (SP), Yellowish Brown (10YR, 5/8), dry, medium dense, fine to medium sand.	0.0 ppm	0.0 ppm	NA
	8.0	12	SS-4	8 - 6 - 4 - 5 (10)	6.0-7.0' GRAVELLY LEAN CLAY (CL), Brown (7.5YR, 4/4), moist, stiff, medium sand, few coarse gravel (weathered, subangular). 7.0-8.0' CLAYEY SAND (SC), Yellowish Brown (10YR, 5/6), saturated, loose, medium sand, quartz.	0.1 ppm Note: Saturated at 7.0' bgs.	0.1 ppm	NA
10								
15								
20								
25					END OF SOIL BORING @ 26.0' bgs.	Note: Monitoring well AOC H - MW06 installed with screened interval from 15.0' to 25.0'. See well completion diagram for details.		

Sampler Signature: **E. ISERN** Date: **08/19/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHMW07	SHEET 1 OF 1

SOIL BORING LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **8/14/03**

WEATHER: **Partly cloudy** DRILLING CONTRACTOR : **Environmental Drilling Service (EDS), Orlando, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger (HAS), 4.25" ID, 2" split-spoon with 140 lb hammer**

WATER LEVELS : **7.0 FT** START : **08/14/2003 @ 1550** END : **8/15/03 @ 0915** LOGGER : **E.ISERN**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm):	Breathing Zone	Above Hole
5	4.0 6.0	20	SS -1	9 - 9 - 12 - 11 (21)	4.0-6.0' LEAN CLAY (CL), Yellowish Brown (10YR 5/8), dry, very stiff, some coarse sand, some gravel (subangular).	0.0 ppm	0.0 ppm	NA
10	9.0 11.0	18	SS - 2	6 - 12 - 19 - 19 (31)	9.0-11.0' LEAN CLAY (CL), mottled - Strong Brown (7.5YR 5/8), and Very Pale Brown (10YR, 8/2), with Black streaks, moist, some coarse sand (quartz).	0.0 ppm	0.0 ppm	NA
15								
					END OF SOIL BORING @ 16.0' bgs.	Note: Monitoring well AOC H-MW07 installed with screened interval from 5.0' to 15.0'. See well completion diagram for details.		
20								
25								

Sampler Signature: **E. ISERN** Date: **08/15/2003**

APPENDIX B

Well Completion

	PROJECT NUMBER	WELL NUMBER
CH2MHILL	171119. FI. ZZ	NDAHMW05 SHEET 1 OF 1

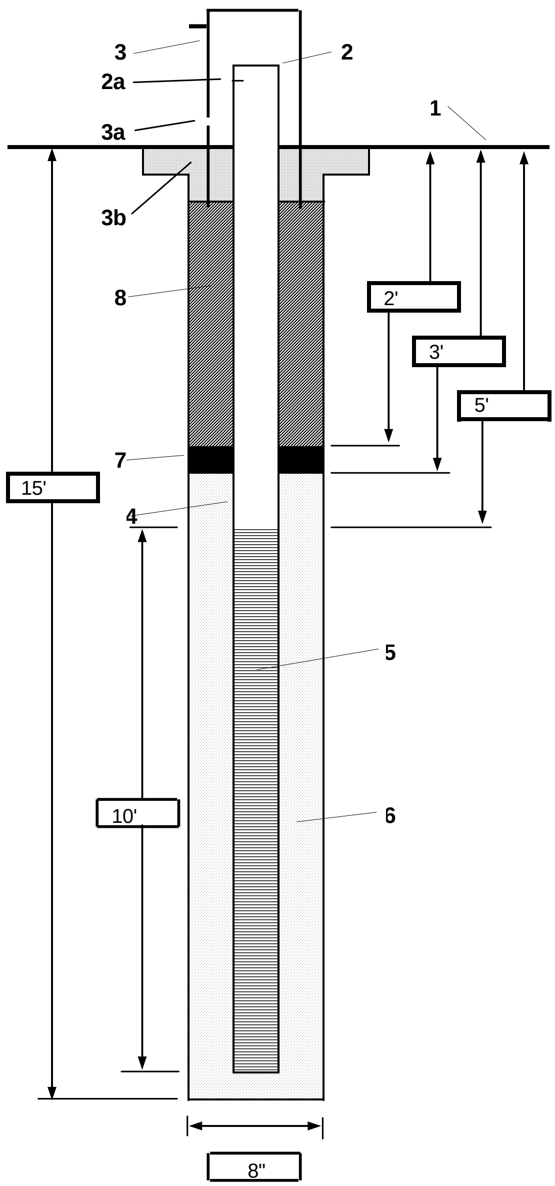
WELL COMPLETION DIAGRAM

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H**

DRILLING CONTRACTOR : **ENVIRONMENTAL DRILLING SERVICE (EDS), ORLANDO, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger (HSA), 4.25" ID, 2" split-spoon with 140 lb. hammer**

WATER LEVELS : **7.0 FT** START : **8/15/03 @ 1405** END : **8/15/03 @ 1700** LOGGER : **E.ISERN**



1- Ground elevation at well: TBD

2- Top of casing elevation: 7.53 ft. amsl
a) vent hole?: none

3- Wellhead protection cover type: above ground steel casing
a) weep hole?: none
b) concrete pad dimensions: 3' X 3'

4- Dia./type of well casing: 2" / Sch 40 PVC

5- Type/slot size of screen: Sch 40 PVC / 0.010" slot

6- Type screen filter: 20-30 SAND
a) Quantity used: 5 Bags (50 lbs)

7- Type of seal: SUPER GEL-X (CETCO)
a) Quantity used: 1/2 Bag (25 lbs)

8- Grout
a) Grout mix used: PORTLAND CEMENT TYPE 1
b) Method of placement: POUR
c) Vol. of well casing grout: 6 gallons

Development method: Disposable Teflon bailer

Development time: 2.5 hours

Estimated purge volume: 30 gallons

Comments

PROJECT NUMBER	WELL NUMBER	
171119. FI. ZZ	NDAHMW06	SHEET 1 OF 1

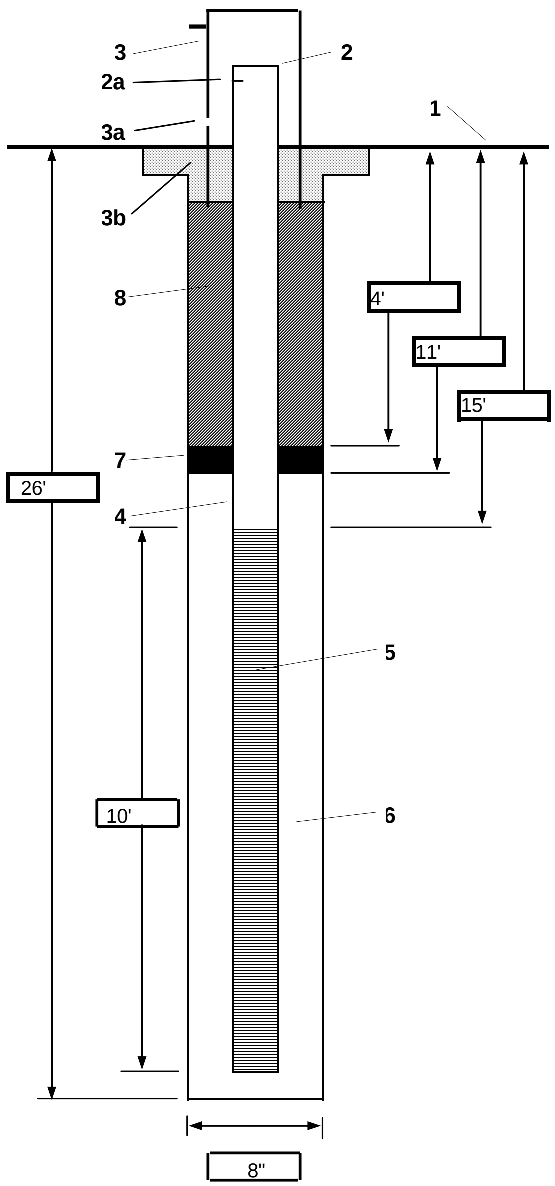
WELL COMPLETION DIAGRAM

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H**

DRILLING CONTRACTOR : **ENVIRONMENTAL DRILLING SERVICE (EDS), ORLANDO, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger (HSA), 4.25" ID, 2" split-spoon with 140 lb. hammer**

WATER LEVELS : **7.0 FT** START : **8/22/03 @ 1130** END : **8/22/03 @ 1730** LOGGER : **E.ISERN**



1- Ground elevation at well	TBD
2- Top of casing elevation	9.96 ft amsl
a) vent hole?	none
3- Wellhead protection cover type	above ground steel casing
a) weep hole?	none
b) concrete pad dimensions	3' X 3'
4- Dia./type of well casing	2" / Sch 40 PVC
5- Type/slot size of screen	Sch 40 PVC / 0.010" slot
6- Type screen filter	20-30 SAND - 400 lbs
a) Quantity used	30-65 SAND - 100 lbs
7- Type of seal	SUPER GEL-X POWDER BENTONITE
a) Quantity used	30 lbs
8- Grout	
a) Grout mix used	PORTLAND CEMENT TYPE 1
b) Method of placement	POUR
c) Vol. of well casing grout	9 gallons
Development method	Disposable Teflon bailer
Development time	5 hours
Estimated purge volume	40 gals
Comments	

CH2MHILL	PROJECT NUMBER 171119. FI. ZZ	WELL NUMBER NDAHMW07	SHEET 1 OF 1

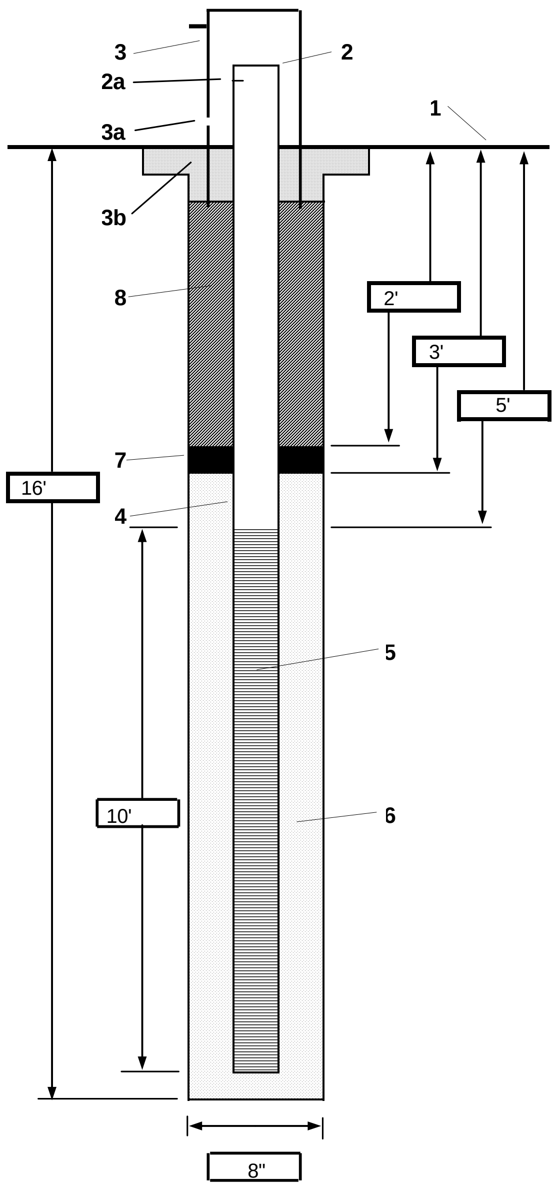
WELL COMPLETION DIAGRAM

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H**

DRILLING CONTRACTOR : **ENVIRONMENTAL DRILLING SERVICE (EDS), ORLANDO, FL**

DRILLING METHOD AND EQUIPMENT USED : **Hollow Stem Auger (HSA), 4.25" ID, 2" split-spoon with 140 lb. hammer**

WATER LEVELS : **7.0 FT** START : **8/14/03 @ 1550** END : **8/15/03 @ 0915** LOGGER : **E.ISERN**



1-	Ground elevation at well	TBD
2-	Top of casing elevation	5.76 ft amsl
	a) vent hole?	none
3-	Wellhead protection cover type	above ground steel casing
	a) weep hole?	none
	b) concrete pad dimensions	3' X 3'
4-	Dia./type of well casing	2" / Sch 40 PVC
5-	Type/slot size of screen	Sch 40 PVC / 0.010" slot
6-	Type screen filter	20- 30 SILICA STANDARD SAND BRAND
	a) Quantity used	350 lbs
7-	Type of seal	SUPER GEL X BENTONITE
	a) Quantity used	20 lbs
8-	Grout	
	a) Grout mix used	PORTLAND CEMENT / WATER
	b) Method of placement	POUR
	c) Vol. of well casing grout	4 gallons
	Development method	Whale pump/ disposable Teflon bailer
	Development time	6 hours
	Estimated purge volume	71 gal

Comments

APPENDIX C

Well Development

CH2MHILL	PROJECT NUMBER 171119 FL. ZZ	WELL NUMBER NDAHMW05	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H**

DEVELOPMENT CONTRACTOR : **CH2M HILL**

DEVELOPMENT METHOD AND EQUIPMENT USED : **Disposable Teflon Bailer**

START WATER LEVELS : **8.9 FEET** START : **8/21/03 @ 0920** END : **8/21/03 @ 1200** LOGGER : **E. Isern**

MAXIMUM DRAWDOWN DURING PUMPING: **NA**

RANGE AND AVERAGE DISCHARGE RATE: **NA**

TOTAL QUANTITY OF WATER DISCHARGED: **30 Gal.**

DISPOSITION OF DISCHARGE WATER: **Drum**

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
920	0	8.9					Light tan color, high sediments, odorless
1200	30						Clear, odorless
	Removed sediments with bailer. Well cleared up afterwards.						

PROJECT NUMBER 171119 FL. ZZ	WELL NUMBER NDAHMW06	SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H**

DEVELOPMENT CONTRACTOR : **CH2M HILL**

DEVELOPMENT METHOD AND EQUIPMENT USED : **Disposable Teflon Bailer**

START WATER LEVELS : **13.85 ft** START : **8/21/03 @ 0910** END : **8/21/03 @ 1155** LOGGER : **E. Isern**

MAXIMUM DRAWDOWN DURING PUMPING: **NA**

RANGE AND AVERAGE DISCHARGE RATE: **NA**

TOTAL QUANTITY OF WATER DISCHARGED: **30 Gal.**

DISPOSITION OF DISCHARGE WATER: **Drum**

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
	Removed sediments with bailer. Well cleared up afterwards.						

PROJECT NUMBER	WELL NUMBER
171119 FL. ZZ	NDAHMW07 SHEET 1 OF 1

WELL DEVELOPMENT LOG

PROJECT : **NASD, VIEQUES, RI/FS INVESTIGATION** LOCATION : **AOC H**

DEVELOPMENT CONTRACTOR : **CH2M HILL**

DEVELOPMENT METHOD AND EQUIPMENT USED : **Whale Pump Surging**

START WATER LEVELS : **7.08 feet** START : **8/20/03 @ 1445** END : **8/22/03 @ 1630** LOGGER : **M. Brown**

MAXIMUM DRAWDOWN DURING PUMPING: **Well ran dry**

RANGE AND AVERAGE DISCHARGE RATE: **0.5 gal/min (with pump)**

TOTAL QUANTITY OF WATER DISCHARGED: **71 gal**

DISPOSITION OF DISCHARGE WATER: **Drum**

Time	Water Volume Discharged (gal)	Water Level (ft BTOC)	Turbidity (NTU)	Temperature (°C)	pH	Conductivity (µmhos/cm)	Remarks (color, odor, sheen, sediment, etc.)
8/20 @ 1500	0	13	999+	28.56	7.14	5,350	Orange, odorless
1540	1	16.7	999+	28.57	7.11	5,090	Orange, well running dry
1605	2	17.3	999+	28.79	7.15	67,110	Orange, high sediment
		Stopped using whale pump because of clogging					
08/21 0930	2						Began bailing
950	9						High turbidity, Stopped bailing
1015							Began bailing again
1030	14	Dry	84.5	27.99	6.62	26,211	Milky White
1100	18	Dry	34.4	28.48	7.19	25,694	Opaque
1135	24	Dry	259	28.11	7.13	27,006	Light Yellow Opaque
8/22 1305	30	Dry	246	28.97	6.95	28,024	Light Yellow Opaque
1400	39	Dry	573	28.83	7.02	29,804	Light Yellow Opaque
1430	47	Dry	210	28.25	7.02	28,406	Light Yellow Opaque
1520	59	Dry	348	28.99	6.90	33,268	Light Yellow Opaque
1630	71	Dry	---	28.37	6.75	36,453	Light Yellow Opaque

APPENDIX D

Groundwater Sampling Data

GROUNDWATER SAMPLING DATA SHEET

CH2M HILL, INC.

Project Number: **171119.FI.ZZ**

Client: **LANTDIV**
Location: **AOC H**
Event: **NASD RI/FS INVESTIGATION**
Date: **09/07/2003**
Weather: **Sunny, Wind- E at 5 mph**
Temp 93 ^{o}F

Well ID: **NDAHMW01**
Sample ID: **NDAHGW01**
MS/MSD: YES / **NO**
Sample Team: **S. Salazar**
T. Casey

Total Depth: **20.31** FT.(BTOC)
Depth to water: (-) **10.23** FT.(BTOC)
Water Column: **10.08** FT.
(x) **0.163** GAL/FT.
Well Volume: **1.6** GAL.
Total Purge Volume: **1.6** GAL.

Measuring Device: **Dipper T Water level Indicator**
Date and Time: **09/07/03 @ 1544**
WELL DIAMETER
[(2" DIA.= .163 GAL/FT.) (4" DIA. = .653 GAL/FT.)]
(1" DIA.= .041 GAL/FT.) (1 1/4 " DIA.= .064 GAL/FT.)

Purge Device: **Peristaltic Pump**
Sample Time **9/8/03 @ 0920**
Sample Appearance **Clear, odorless**
Flow rate: 500ml/min = 0.14 gal/min

FIELD PARAMETERS

Time	Purged Vol. (gals)	pH	Cond. μmhos/cm	Temp., °C	DO	ORP	Turbidity	Depth to Water, FT BTOC	Color / Odor / Comments
1544	0.7	6.99	10970	30.13	5.49	259.6	19.2	11	Clear/odorless
1547	Stopped pump because of draw down. Added more tubing								
1551	NA	7.48	Tried to take other readings but too much draw down						
1555	NA	7.25	11800	29.87	54.1	300.5		12.84	Clear/odorless
1557	No reading. Too much drawdown. Flow rate is adjusted 411 mL/min = 0.11 gal							15.38	Clear/odorless
1558	Stopped pump. No water in well.								
1603	Still no water (purged dry). Waited until next day to collect samples so that well could recover.								
	Samples were collected on 9/8/03 at 0920. Laboratory analysis on sample are:								
	Total Metals, Dissolved Metals, SVOC, Chlorinated Pesticides, Explosives, and Perchlorates								

Signed by: **T. Casey** Date and Time **09/08/2003 @ 0920**

GROUNDWATER SAMPLING DATA SHEET

CH2M HILL, INC.

Project Number: 171119.FI.ZZ

Client: **LANTDIV**
Location: **AOC H**
Event: **NASD RI/FS INVESTIGATION**
Date: **09/08/2003**
Weather: **Intermittent rain, 85 ^{o}F**

Well ID: **NDAHMW02**
Sample ID: **NDAHGW02**
MS/MSD: YES / **NO**
Sample Team: **E. Isern**
T. Casey

Total Depth: **20.96** FT.(BTOC)
Depth to water: **9.5** FT.(BTOC)
Water Column: **11.46** FT.
(x) **0.163** GAL/FT.
Well Volume: **1.87** GAL.
Total Purge Volume: **4.76** GAL.
Purge Device: **Peristatic Pump**
Sample Time **1425**
Sample Appearance **Clear**
Flow rate 500 ml/min = 0.14 gal/min

Measuring Device: **Dipper T Water level Indicator**
Date and Time: **09/08/2003 @ 1125**
WELL DIAMETER
[(2" DIA.= .163 GAL/FT.) (4" DIA. = .653 GAL/FT.)]
(1" DIA.= .041 GAL/FT.) (1 1/4 " DIA.= .064 GAL/FT.)

FIELD PARAMETERS

Time	Purged Vol. (gals)	pH	Cond. μmhos/cm	Temp., °C	DO*	ORP	Turbidity	Depth to Water, FT BTOC	Color / Odor / Comments
1129	0	7.34	15241	29.51	71.1	111.8	9.35	9.5	clear/ odorless
1134	0.7	7	13175	28.02	13.4	124.1	10.5	11.9	clear/ odorless
1138	Flowrate adjusted to 250 mL/min = 0.04 gal/min								
1139	1.33	6.99	13063	28.22	13.4	123.3	12.9	13.47	clear/ odorless
1146	1.82	7.12	11167	28.27	17.9	118.8	33.2	14.91	clear/ odorless
1146	Flowrate adjusted to 200 mL/min = 0.06 gal/min								
1151	2.12	7.15	14360	28.05	32.2	68.1	30.1	15.65	clear/ odorless
1158	2.54	7.11	19319	28.03	53.3	-18.2	23.1	16.85	clear/ odorless
1204	2.9	7.07	22695	28.51	63.4	-26.2	21.1	18.5	clear/ odorless
1210	3.26	7.04	24976	28.71	73.8	-23.8	17.6	18.02	clear/ odorless
1221	3.92	7.01	27208	28.46	82.4	-20.7	16.3	18.45	clear/ odorless
1227	4.28	6.95	28338	28.6	83.9	-14	12.2	18.85	clear/ odorless
1235	4.76	6.9	28500	28.63	88.6	-12.2	16.2	19.19	clear/ odorless
	Some laboratory analytical parameters as previous samples								
* Values in %. See Page 2 for calculated values in mg/L									

Signed by: **T. Casey** Date and Time **09/08/2003 @1445**

PAGE 2 **Well ID: NDAHMW02**

FIELD PARAMETERS

Time	Purged Vol. (gals)	pH	Cond. μmhos/cm	Temp., °C	DO	ORP	Turbidity	Color / Odor / Comments
					5.54			Calculated values in mg/L
					1.04			
					1.04			
					1.39			
					2.5			
					4.15			
					4.94			
					5.75			
					6.42			
					6.53			
					6.9			

Notes:

GROUNDWATER SAMPLING DATA SHEET

CH2M HILL, INC.

Project Number: **171119.FI.ZZ**

Client: **LANTDIV**
Location: **AOC H**
Event: **NASD RI/FS INVESTIGATION**
Date: **09/08/2003**
Weather: **Intermittent rain, 85 ^{o}F**

Well ID: **NDAHMW05**
Sample ID: **NDAHGW05**
MS/MSD: YES / **NO**
Sample Team: **E. Isern**
T. Casey

Total Depth: **18.60** FT.(BTOC)
Depth to water: (-) **8.98** FT.(BTOC)
Water Column: **9.62** FT.
(x) **0.163** GAL/FT.
Well Volume: **1.57** GAL.
Total Purge Volume: **5.15** GAL.
Purge Device: **Peristaltic Pump**
Sample Time **11:05**
Sample Appearance **Clear, odorless**

Measuring Device: **Dipper T Water level Indicator**
Date and Time: **9/8/2003 @ 1020**

WELL DIAMETER
[(2" DIA.= .163 GAL/FT.) (4" DIA. = .653 GAL/FT.)]
(1" DIA.= .041 GAL/FT.) (1 1/4 " DIA.= .064 GAL/FT.)

FIELD PARAMETERS

Time	Purged Vol. (gals)	pH	Cond. μmhos/cm	Temp., °C	DO	ORP	Turbidity	Depth to Water, FT BTOC	Color / Odor / Comments
1021	0.53	6.55	33117	28.45	30.4	156.5	193	8.98	Clear/odorless
1026	1.23	6.51	33346	28.47	22.0	102.8	65	8.98	Clear/odorless
1032	2.07	6.47	33906	28.63	19.9	56.6	31	8.97	Clear/odorless
1038	2.91	6.42	34218	28.75	16.2	36.4	N/A	8.97	Clear/odorless
1043	3.61	6.42	34224	28.76	15.9	36.1	14.9	8.98	Clear/odorless
1048	4.31	6.49	34178	28.54	13.8	10.6	6.48	9.01	Clear/odorless
1054	5.15	6.43	34248	28.77	15.4	15.6	4.05	9.02	Clear/odorless
Same laboratory analytical parameteres as previous samples									
				DO mg/l (Calculated values) for above measurements %Sat DO					
					2.37				
					1.71				
					1.55				
					1.26				
					1.24				
					1.85				
					1.2				

Signed by: **T. Casey** Date and Time **09/08/2003 @ 1115**

GROUNDWATER SAMPLING DATA SHEET

CH2M HILL, INC.

Project Number: 171119.FI.ZZ

Client: **LANTDIV**
Well ID: **NDAHMW06**
Location: **AOC H**
Sample ID: **NDAHGW06**
Event: **NASD RI/FS INVESTIGATION**
MS/MSD: YES / **NO**
Date: **09/09/2003**
Sample Team: **E. Isern, F. Sengiali, T. Casey**
Weather: **Cloudy, Hot, Wind from the north**

Total Depth: **27.8** FT.(BTOC)
Measuring Device: **Dipper T Water level Indicator**
Depth to water: **13.85** FT.(BTOC)
Date and Time: **9/9/03 @ 0846**
Water Column: **13.95** FT.
WELL DIAMETER
(x) **0.163** GAL/FT.
[(2" DIA.= .163 GAL/FT.) (4" DIA. = .653 GAL/FT.)]
Well Volume: **2.27** GAL.
(1" DIA.= .041 GAL/FT.) (1 1/4 " DIA.= .064 GAL/FT.)
Total Purge Volume: **3.53** GAL.
Purge Device: **Peristaltic Pump**
Sample Time **9:30**
Sample Appearance **Clear, Odorless**

FIELD PARAMETERS

Time	Purged Vol. (gals)	pH	Cond. µmhos/cm	Temp., °C	DO	ORP	Turbidity	Depth to Water, FT BTOC	Color / Odor / Comments
8:48	0.3	6.56	10760	27.34	22.4	70.8	72.4	10.91	Cloudy, No Odor
8:53	1	7.03	10950	27.12	11	20.8	48.2	13.85	Cloudy, No Odor
Changed flowrate to 100 mL/min = 0.03 gal/min									
8:59	1.18	7.13	10910	27.29	10.2	44.4	40.4	13.85	Cloudy, No Odor
Adjusted flowrate to 295 mL/min = 0.09 gal/min									
9:04	1.63	7.14	10860	27.25	8.4	41.2	24.5	13.75	Cloudy, No Odor
9:10	2.17	7.14	10830	27.29	8.5	18.2	16.9	13.75	Cloudy, No Odor
9:15	2.63	7.13	10830	27.29	7.6	5.4	9.47	13.73	Clear, No Odor
9:20	3.08	7.15	10820	27.29	9.8	0.5	6.55	13.74	Clear, No Odor
9:25	3.53	7.12	10820	27.35	9	2.9	4.62	13.74	Clear, No Odor
	Laboratory analytical parameters								
	Pest								
	SVOC								
	Explosives								
	Perchlorates								
	Dissolved Metals								
	Total Metals								

Signed by: **T. Casey**
Date and Time **09/09/2003 @ 0940**

GROUNDWATER SAMPLING DATA SHEET

CH2M HILL, INC.

Project Number: **171119.FI.ZZ**

Client: **LANTDIV**

Location: **AOC H**

Event: **NASD RI/FS INVESTIGATION**

Date: **09/07/2003**

Weather: **Sunny, Wind- E at 5mph**

Temp 93 ^{o}F

Well ID: **NDAHMW07**

Sample ID: **NDAHGW07**

MS/MSD **YES** / NO

Sample Team: **E. ISERN**

F. SENGIALI

Total Depth: **19.27** FT.(BTOC)

Depth to water: (-) **7.11** FT.(BTOC)

Water Column: **12.16** FT.

(x) **0.163** GAL/FT.

Well Volume: **1.98** GAL.

Total Purge Volume: **10** GAL.

Measuring Device: **Dipper T Water level Indicator**

Date and Time: **9/08/03 @ 1540**

WELL DIAMETER

[(2" DIA.= .163 GAL/FT.) (4" DIA. = .653 GAL/FT.)]

(1" DIA.= .041 GAL/FT.) (1 1/4 " DIA.= .064 GAL/FT.)

Purge Device: **Peristaltic Pump**

Sample Time **1650**

Sample Appearance **Clear, odorless**

FIELD PARAMETERS

Time	Purged Vol. (gals)	pH	Cond. μmhos/cm	Temp., °C	DO	ORP	Turbidity	Depth to Water, FT BTOC	Color / Odor / Comments
1540	0	7.16	31260	28.8	5.11	111.1	11.9	7.11	Clear, odorless
1545	0.5	6.89	33670	28.5	5.67	139	73.7	8.08	Clear, odorless
1550	1	6.81	36060	28.45	5.79	156.2	41.6	7.95	Clear, odorless
1555	1.5	6.77	37190	28.45	6.27	170.5	28.4	7.92	Clear, odorless
1600	2	6.75	38090	28.45	6.71	177.3	23.8	7.85	Clear, odorless
1605	2.5	6.73	38780	28.48	7.07	175.9	19.6	7.85	Clear, odorless
1615	3.5	6.69	39170	28.55	11.03	170.9	17.8	7.89	Clear, odorless
1620	4	6.7	39510	28.44	11.61	181.4	17.2	7.9	Clear, odorless
1625	4.5	6.7	39790	28.4	12.11	184.8	14.4	7.9	Clear, odorless
1630	5	6.71	39538	28.35	12.5	184.4	N/A	7.9	Clear, odorless
1635	Recalibrated DO probe to 100% Saturation								
1640	9	6.69	39840	28.17	8.37	192.7	13.4	7.9	Clear, odorless
1645	9.5	6.7	40200	28.32	8.91	187.7	8.05	7.9	Clear, odorless
1650	COLLECT SAMPLE **NDAHGW07, MS & MSD**								
	YSI	SERIAL	#01A0138						
	HACH	Turbidity	#990900022719						
	Sample analysis parameters: Total metals, dissolved metals, SVOCs, Chlorinated Pesticides,								
	Explosives, and Perchlorates.								

Signed by: **T. Casey**

Date and Time **09/08/2003**

APPENDIX E

Sediment Sampling

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSD01	SHEET 1 OF 1

SEDIMENT LOG

PROJECT : **NASD RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **09/29/2003**

WEATHER: **Hot, Breezy** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **Ponar w/ Stainless Steel Pan and spoon**

WATER LEVELS : **1.5 feet deep** START : **NA** END : **1440** LOGGER : **R. Gorsira**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		6	Ponar	NA	0.0' to 0.5' SAND (SP), black, saturated, coarse, very loose, abundant shell fragments, organic matter on top of sediment, no odor.	Note: All equipment deconed prior to use. Sample collection from aluminum canoe Collected NDAHSD01 and NDAHFD03P-R Field Dupe @ 1440 for same parameters. Water depth @ 1.5'
0.5	0.5					
					END OF BORING AT 0.5 feet.	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **I. Lynch** Date: **09/29/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSD02	SHEET 1 OF 1

SEDIMENT LOG

PROJECT : **NASD RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **09/29/2003**

WEATHER: **Hot, Breezy** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED : **3 inch Stainless Steel Hand Auger, Pan, and Spoon**

WATER LEVELS : **3 feet deep.** START : **NA** END : **1500** LOGGER : **R. Gorsira**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		6	HA	NA	0.0 to 0.25' SAND (SP), black, saturated, coarse, very loose, few shell fragments to 4", organic matter present on top of sediment, slight sulfur odor. 0.25' to 0.5' ORGANIC CLAY (OH), dark gray, saturated, very soft, no sand, few gravel.	
0.5	0.5				END OF BORING AT 0.5 feet	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **I. Lynch** Date: **09/29/2003**

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSD03	SHEET 1 OF 1

SEDIMENT LOG

PROJECT : **NASD RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **09/29/2003**

WEATHER: **Hot, Sunny** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED **Ponar w/ Stainless Steel Pan and Spoon**

WATER LEVELS : **3 feet deep** START : **NA** END : **1535** LOGGER : **R. Gorsira**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		6	Ponar	NA	0.0 to 0.5' <u>SAND</u> (SP), black, saturated, coarse, very loose, few shell fragments, organic matter present on top of sediment, slight sulfur odor.	Water 3 feet deep.
0.5	0.5					
					END OF BORING AT 0.5 feet.	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **I. Lynch** Date: **09/29/2003**

PROJECT NUMBER	BORING NUMBER	
171119.FI.ZZ	NDAHSD04	SHEET 1 OF 1

SEDIMENT LOG

PROJECT : **NASD RI/FS INVESTIGATION** LOCATION : **AOC H** DATE: **09/29/2003**

WEATHER: **Hot, Sunny, Breezy** DRILLING CONTRACTOR : **CH2M HILL**

DRILLING METHOD AND EQUIPMENT USED **Ponar w/ Stainless Steel Pan and Spoon**

WATER LEVELS : **water 2 feet deep** START : **NA** END : **1550** LOGGER : **R. Gosira**

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
		6	Ponar	NA	0.0 to 0.5' SAND (SP), black, saturated, coarse, very loose, some fine to coarse gravel, some organic material present (roots, leaves), very slight sulfide odor.	Water depth is 2 feet.
0.5	0.5					
					END OF BORING AT 0.5 feet.	
1.0						
1.5						
2.0						
2.5						

Sampler Signature: **I. Lynch** Date: **09/29/2003**

CH2MHILL

Surface Water Quality Sampling Field Data

SITE: AOCH, NASD, Vieques

FIELD CREW: I. Lynch, R. Gorsira   NDAHSW01

DATE: 09/30/2003   **CLOUD COVER:** None. Sunny, Breezy

SAMPLE TIME: 1200   **ANTECEDENT RAIN:** None

DEPTH OF WATER (FT): 1 foot deep   **AMBIENT TEMPERATURE:** 90's °F

FLOW VELOCITY AND DIRECTION: None. Stagnant body of water.

FIELD MEASUREMENTS

Time	Conductivity (µmhos)	DO (mg/L)	Salinity (ppt)	Temperature (°C)	pH (su)	ORP	Turbidity (NTU)	Location (% Total Depth)
12:00	41,600	2.51	26.52	29.46	7.57	-41	31	0

SAMPLE PARAMETERS (GRAB OR COMPOSITE **) : Metals, Diss Metals (W/0.45um Filter), Pest, SVOC, EXP, Perc**

OBSERVATIONS

COLOR: CLEAR, AMBER, TAN, BROWN, GREY, MILKY WHITE, **OTHER: LIGHT BROWN, Turns milky with movement**

ODOR: NONE **, LOW** , MEDIUM , HIGH , VERY STRONG , **H2S** , FUEL LIKE , CHEMICAL ?, UNKNOWN

TURBIDITY: NONE , **LOW** , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

COMMENTS: Observed a lot of plant debris in the water. Very windy, moving surface water.

Note: Abundant loose sediment on bottom of canal in this area and is easily stirred.

All surface water samples collected from canoe with 12V pump and TFE Tubing. **Sample ID- NDAHSW01-R01**

OTHER: PLEASE USE BACK OF SHEET.FOR SKETCHING MAPS , **SEE BACK OF SHT** Y / **N.**

Q.C. SAMPLE TYPE: DUPLICATE , EQUIPMENT BLANK , **OTHER : MS/MSD**

SIGNED/SAMPLER: **I. Lynch 09/30/03**

CH2MHILL

Surface Water Quality Sampling Field Data

SITE: AOC H, NASD, Vieques

FIELD CREW: I. Lynch, R. Gorsira — NDAHSW02

DATE: 09/30/2003 — **CLOUD COVER:** Sunny

SAMPLE TIME: 1135 — **ANTECEDENT RAIN:** None noted

DEPTH OF WATER (FT): 4.5 ft — **AMBIENT TEMPERATURE:** 90's ^{o}F

FLOW VELOCITY AND DIRECTION: None. Stagnant body of water.

FIELD MEASUREMENTS

Time	Conductivity (µmhos)	DO (mg/L)	Salinity (ppt)	Temperature (°C)	pH (SU)	ORP	Turbidity (NTU)	Location (% Total Depth)
11:35	40,480	2.41	25.79	28.63	7.56	58.8	12.5	0
11:38	44,440	1.61	28.3	29.64	7.53	-280	14.3	50
11:40	49,460	1.6	32.2	29.14	6.95	-325	-	90

SAMPLE PARAMETERS (GRAB OR COMPOSITE **) : Metals, Diss Metals (W/0.45um Filter), Pest, SVOC, EXP, Perc**

OBSERVATIONS

COLOR: CLEAR, AMBER, TAN, BROWN, GREY, MILKY WHITE, **OTHER: LIGHT BROWN, Turns milky with movement**

ODOR: NONE **, LOW** , MEDIUM , HIGH , VERY STRONG , **H2S** , FUEL LIKE , CHEMICAL ?, UNKNOWN

TURBIDITY: NONE , **LOW** , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

COMMENTS: Observed a lot of plant debris in the water. Horse feces floating around area where sample was collected. Canal is 4-5 ft deep in the middle.

All surface water samples collected from canoe with 12V pump and TFE Tubing. Collected sample from mid-depth of canal.

Sample ID - NDAHSW02-R01

OTHER: PLEASE USE BACK OF SHEET.FOR SKETCHING MAPS , **SEE BACK OF SHT** Y / **N.**

Q.C. SAMPLE TYPE: DUPLICATE , EQUIPMENT BLANK , OTHER :

SIGNED/SAMPLER: **I. Lynch 09/30/03**

CH2MHILL

Surface Water Quality Sampling Field Data

SITE: AOC H, NASD, Vieques

FIELD CREW: I. Lynch, R. Gorsira   NDAHSW03

DATE: 09/30/2003   **CLOUD COVER:** Sunny

SAMPLE TIME: 1110   **ANTECEDENT RAIN:** None

DEPTH OF WATER (FT): Surface   **AMBIENT TEMPERATURE:** 90's ^oF

FLOW VELOCITY AND DIRECTION: None. Stagnant body of water.

FIELD MEASUREMENTS

Time	Conductivity (µmhos)	DO (mg/L)	Salinity (ppt)	Temperature (°C)	pH (su)	ORP	Turbidity (NTU)	Location (% Total Depth)
11:10	40,990	2.03	26.04	28.8	7.49	48.9*	17.9	0

SAMPLE PARAMETERS (GRAB OR COMPOSITE **) : Metals, Diss Metals (W/0.45um Filter), Pest, SVOC, EXP, Perc**

OBSERVATIONS

COLOR: CLEAR, AMBER, TAN, BROWN, GREY, MILKY WHITE, **OTHER: LIGHT BROWN, Turns milky with movement**

ODOR: NONE **, LOW** , MEDIUM , HIGH , VERY STRONG , **H2S** , FUEL LIKE , CHEMICAL ?, UNKNOWN

TURBIDITY: NONE , **LOW** , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

COMMENTS: Observed a lot of plant debris in the water. Canal is little deeper and wider at this station. All surface water samples collected from canoe with 12V pump and TFE Tubing. * Note: Double checked the ORP and came out with the same positive number.

Sample ID NDAHSW03-R01, NDAHFD02P-R01

OTHER: PLEASE USE BACK OF SHEET.FOR SKETCHING MAPS , **SEE BACK OF SHT** Y / **N.**

Q.C. SAMPLE TYPE: **DUPLICATE** , EQUIPMENT BLANK , OTHER : **FD2**

SIGNED/SAMPLER: **I. Lynch 09/30/03**

CH2MHILL

Surface Water Quality Sampling Field Data

SITE: AOC H, NASD, Vieques

FIELD CREW: I. Lynch, R. Gorsira NDAHSW04

DATE: 09/30/2003 CLOUD COVER: Sunny

SAMPLE TIME: 1040 ANTECEDENT RAIN: None noted

DEPTH OF WATER (FT): 1.0 ft AMBIENT TEMPERATURE: 90's °F

FLOW VELOCITY AND DIRECTION: No flow, stagnant water.

FIELD MEASUREMENTS

Time	Conductivity (µmhos)	DO (mg/L)	Salinity (ppt)	Temperature (°C)	pH (su)	ORP	Turbidity (NTU)	Location (% Total Depth)
1040	40,310	1.66	25.75	27.95	7.5	-285	34.5	0

SAMPLE PARAMETERS (**GRAB** OR COMPOSITE) : **Metals, Diss Metals (W/0.45um Filter), Pest, SVOC, EXP, Perc**

OBSERVATIONS

COLOR: CLEAR, AMBER, TAN, BROWN, GREY, MILKY WHITE, **OTHER: Light Brown, Tannic. Turns milky (with movement)**

ODOR: NONE , **LOW** , MEDIUM , HIGH , VERY STRONG , **H2S** , FUEL LIKE , CHEMICAL ?, UNKNOWN

TURBIDITY: NONE , **LOW** , MEDIUM , HIGH , VERY TURBID. HEAVY SILTS

COMMENTS: Observed a lot of plant debris in the water. All surface water samples collected from canoe with 12V pump and TFE Tubing

Note: Went back to double check ORP (still getting negative readings).

Sample ID - NDAHSW04-R01

OTHER: PLEASE USE BACK OF SHEET.FOR SKETCHING MAPS , **SEE BACK OF SHT** Y / **N.**

Q.C. SAMPLE TYPE: DUPLICATE , EQUIPMENT BLANK , OTHER :

SIGNED/SAMPLER: **I. Lynch 09/30/03**

APPENDIX F

Survey Data Points

LOCATION	NORTHING	EASTING	ELEVATION (meters)	MATRIX	Elevation (feet)
NDAJMW05	2005187.9005	229984.5224	2.566	MW	8.419
NDAJSB09	2005186.1093	229980.0231	1.511	SB	4.957
NDAJSS09	2005186.1093	229980.0231	1.511	SS	4.957
NDAJSB10	2005195.3238	229971.3230	1.324	SB	4.344
NDAJSS10	2005195.3238	229971.3230	1.324	SS	4.344
NDAJMW06	2005212.0613	229981.3548	2.296	MW	7.533
NDAJMW08	2005155.7399	229956.6115	2.876	MW	9.436
NDAJSD05	2005235.9091	230001.5090	-0.268	SD	-0.879
NDAJSW05	2005235.9091	230001.5090	-0.268	SW	-0.879
NDAJSD03	2005211.1959	230011.0320	-0.268	SD	-0.879
NDAJSW03	2005211.1959	230011.0320	-0.268	SW	-0.879
NDAJSD01	2005176.6921	230010.6640	-0.268	SD	-0.879
NDAJSS01	2005176.6921	230010.6640	-0.268	SS	-0.879
NDAJSW06	2005139.1232	230012.0409	-0.268	SW	-0.879
NDAJSW07	2005114.2501	230016.0917	-0.268	SW	-0.879
NDAJSW08	2005073.7458	230014.8352	-0.268	SW	-0.879
NDAJSW04 (OLD)	2005183.3354	230003.5035	1.984	SW	6.509
NDAJSS06	2005146.7755	229999.9001	2.296	SS	7.533
NDAJSB06	2005146.7755	229999.9001	2.296	SB	7.533
NDAJMW03 (OLD)	2005151.0208	229994.4657	3.011	MW	9.879
NDAJMW07	2005130.8923	230000.8775	3.224	MW	10.577
NDAJSS07	2005129.6690	230004.9475	2.289	SS	7.510
NDAJSB07	2005129.6690	230004.9475	2.289	SB	7.510
NDAJSS08	2005113.0237	230003.8939	2.326	SS	7.631
NDAJSB08	2005113.0237	230003.8939	2.326	SB	7.631
NDAJMW09	2005215.8768	230030.2994	2.260	MW	7.415
NDW06MW07	2005123.9511	229085.6294	0.371	MW	1.217
NDW06MW08	2005166.3333	229144.8558	0.294	MW	0.965
NDW06MW05	2005084.8047	228926.9912	0.608	MW	1.995
NDW06MW06	2005087.1604	228999.6686	0.667	MW	2.188
NDW06SS13	2005095.6450	228928.4717	-0.208	SS	-0.682
NDW06SB13	2005095.6450	228928.4717	-0.208	SB	-0.682
NDW06SB23	2005106.5957	228919.0981	-0.247	SB	-0.810
NDW06SS10	2005103.1424	228969.9926	-0.225	SS	-0.738
NDW06SB10	2005103.1424	228969.9926	-0.225	SB	-0.738
NDW06SS09	2005099.5381	228971.0322	-0.197	SS	-0.646
NDW06SB09	2005099.5381	228971.0322	-0.197	SB	-0.646
NDW06SS11	2005106.8421	228974.1226	-0.311	SS	-1.020
NDW06SB11	2005106.8421	228974.1226	-0.311	SB	-1.020
NDW06SS12	2005103.9311	228976.8327	-0.313	SS	-1.027
NDW06SB12	2005103.9311	228976.8327	-0.313	SB	-1.027
NDW06SS18	2005107.3233	228981.0855	-0.394	SS	-1.293
NDW06SB18	2005107.3233	228981.0855	-0.394	SB	-1.293
NDW06SS17	2005111.9954	228980.2082	-0.377	SS	-1.237
NDW06SB17	2005111.9954	228980.2082	-0.377	SB	-1.237
NDW06SS16	2005119.1732	228978.0738	-0.354	SS	-1.161
NDW06SB16	2005119.1732	228978.0738	-0.354	SB	-1.161
NDW06SS15	2005119.6790	228972.3818	-0.405	SS	-1.329
NDW06SB15	2005119.6790	228972.3818	-0.405	SB	-1.329
NDW06SS14	2005113.0277	228966.6157	-0.358	SS	-1.175
NDW06SB14	2005113.0277	228966.6157	-0.358	SB	-1.175

LOCATION	NORTHING	EASTING	ELEVATION (meters)	MATRIX	Elevation (feet)
NDW06SW09	2005144.1059	229030.2056	-0.397	SW	-1.302
NDW06SS21	2005092.7849	229000.3693	-0.335	SS	-1.099
NDW06SB21	2005092.7849	229000.3693	-0.335	SB	-1.099
NDW06SS22	2005097.5658	229012.0329	-0.353	SS	-1.158
NDW06SB22	2005097.5658	229012.0329	-0.353	SB	-1.158
NDW06SS20	2005111.1818	229019.6890	-0.325	SS	-1.066
NDW06SB20	2005111.1818	229019.6890	-0.325	SB	-1.066
NDW06SS19	2005101.2975	228982.4597	-0.403	SS	-1.322
NDW06SB19	2005101.2975	228982.4597	-0.403	SB	-1.322
NDW06SD10	2005037.9901	228926.6101	-1.432	SD	-4.698
NDW06SD11	2005040.7826	228931.7005	-0.937	SD	-3.074
NDW06SD09	2004964.9626	228975.2998	-1.248	SD	-4.094
NDW06SD08	2004965.9398	229062.0735	-1.306	SD	-4.285
NDW06SD07	2005013.6464	229186.0681	-1.260	SD	-4.134
NDW06SD06	2004638.2397	228700.0409	-1.518	SD	-4.980
NDW06SD13	2005052.8636	228922.1839	-1.394	SD	-4.573
NDW06SD12	2005051.5733	228917.7086	-1.526	SD	-5.007
NDW06SD03	2005112.7555	228915.3806	-1.081	SD	-3.547
NDW06SD14	2005120.5198	228900.2491	-0.857	SD	-2.812
NDW06SD05	2005119.8667	228941.5796	-1.018	SD	-3.340
NDW06SW10	2004703.7365	228150.1794	-0.528	SW	-1.732
NDW06SD15	2004703.7365	228150.1794	-0.528	SD	-1.732
NDW06SW11	2005005.5060	228203.3643	-1.197	SW	-3.927
NDW06SD16	2005005.5060	228203.3643	-1.197	SD	-3.927
NDW06SW08	2005108.5423	229013.3736	-0.381	SW	-1.250
NDAHSS29	2006037.3785	233087.0447	2.342	SS	7.684
NDAHSB29	2006037.3785	233087.0447	2.342	SB	7.684
NDAHSS18	2006034.3403	233094.5574	2.488	SS	8.163
NDAHSB18	2006034.3403	233094.5574	2.488	SB	8.163
NDAHSS19	2006032.3892	233104.5813	2.677	SS	8.783
NDAHSB19	2006032.3892	233104.5813	2.677	SB	8.783
NDAHSS20	2006044.0734	233109.8721	2.617	SS	8.586
NDAHSB20	2006044.0734	233109.8721	2.617	SB	8.586
NDAHSS21	2006052.4757	233108.0936	2.358	SS	7.736
NDAHSB21	2006052.4757	233108.0936	2.358	SB	7.736
NDAHSS22	2006057.9443	233102.9168	2.035	SS	6.676
NDAHSB22	2006057.9443	233102.9168	2.035	SB	6.676
NDAHSS23	2006062.8715	233100.6571	1.797	SS	5.896
NDAHSB23	2006062.8715	233100.6571	1.797	SB	5.896
NDAHSS24	2006070.3758	233099.0019	1.668	SS	5.472
NDAHSB24	2006070.3758	233099.0019	1.668	SB	5.472
NDAHSS25	2006074.5020	233089.9264	1.132	SS	3.714
NDAHSB25	2006074.5020	233089.9264	1.132	SB	3.714
NDAHMW06	2006054.5730	233097.2942	3.037	MW	9.964
NDAHSD05	2006002.8789	233086.5382	0.426	SD	1.398
NDAHSS28	2006044.0516	233082.9703	1.873	SS	6.145
NDAHSB28	2006044.0516	233082.9703	1.873	SB	6.145
NDAHMW05	2006060.9216	233080.0478	2.295	MW	7.530
NDAHMW07	2006076.3062	233076.5103	1.756	MW	5.761
NDAHSS27	2006059.6069	233077.6844	1.238	SS	4.062
NDAHSB27	2006059.6069	233077.6844	1.238	SB	4.062

LOCATION	NORTHING	EASTING	ELEVATION (meters)	MATRIX	Elevation (feet)
NDAHSS26	2006072.6188	233082.7231	0.958	SS	3.143
NDAHSB26	2006072.6188	233082.7231	0.958	SB	3.143
NDAHSS17	2006033.9391	233087.5917	2.676	SS	8.780
NDAHSB17	2006033.9391	233087.5917	2.676	SB	8.780
NDAHMW02 (OLD)	2006065.5152	233078.0043	1.771	MW	5.810
NDAHMW04 (OLD)	2006071.0747	233092.3672	1.953	MW	6.407
NDAHSD04	2006054.6881	233068.8617	-0.323	SD	-1.060
NDAHSW04	2006054.6881	233068.8617	-0.323	SW	-1.060
NDAHSD03	2006081.3024	233064.0805	-0.323	SD	-1.060
NDAHSW03	2006081.3024	233064.0805	-0.323	SW	-1.060
NDAHSD02	2006105.7829	233060.6586	-0.323	SD	-1.060
NDAHSW02	2006105.7829	233060.6586	-0.323	SW	-1.060
NDAHSD01	2006156.5358	233040.5081	-0.323	SD	-1.060
NDAHSW01	2006156.5358	233040.5081	-0.323	SW	-1.060
NDW07MW08	2004987.4453	231689.1040	31.720	MW	104.068
NDW07SS19	2004989.2000	231646.4100	21.510	SS	70.571
NDW07SS18	2005004.7932	231632.4951	18.222	SS	59.783
NDW07SB15	2005006.6368	231631.9268	18.764	SB	61.561
NDW07SS15	2005006.6368	231631.9268	18.764	SS	61.561
NDW07SS16	2005016.7041	231635.3390	24.185	SS	79.347
NDW07SB16	2005016.7041	231635.3390	24.185	SB	79.347
NDW07SS14	2005037.5924	231626.1489	23.206	SS	76.135
NDW07SB14	2005037.5924	231626.1489	23.206	SB	76.135
NDW07SB10	2005017.5126	231611.5464	16.314	SB	53.523
NDW07SS10	2005017.5126	231611.5464	16.314	SS	53.523
NDW07SS09	2005036.3430	231604.9954	18.379	SS	60.298
NDW07SB09	2005036.3430	231604.9954	18.379	SB	60.298
NDW07SS07	2005070.1236	231587.6962	14.787	SS	48.514
NDW07SB07	2005070.1236	231587.6962	14.787	SB	48.514
NDW07SS08	2005069.5062	231583.9881	13.576	SS	44.541
NDW07SB08	2005069.5062	231583.9881	13.576	SB	44.541
NDW07MW04	2005111.1373	231568.0382	19.284	MW	63.268
NDW07SS13	2005088.8284	231588.8651	18.520	SS	60.761
NDW07SB13	2005088.8284	231588.8651	18.520	SB	60.761
NDW07SS12	2005086.2228	231584.1098	15.489	SS	50.817
NDW07SB12	2005086.2228	231584.1098	15.489	SB	50.817
NDW07SS11	2005082.0002	231577.2839	11.249	SS	36.906
NDW07SB11	2005082.0002	231577.2839	11.249	SB	36.906
NDW07MW05	2005185.0927	231494.2009	15.462	MW	50.728
NDW07SS20	2005160.2407	231477.0480	8.484	SS	27.835
NDW07SS21	2005361.0410	231406.5809	1.447	SS	4.747
NDW07MW07	2005304.3575	231370.2007	9.876	MW	32.401
NDW07SS17	2005025.1036	231641.4145	25.305	SS	83.021
NDW07SB17	2005025.1036	231641.4145	25.305	SB	83.021
NDW07MW06	2005323.9983	231462.3911	9.279	MW	30.443
NDW07MW06A	2005318.7675	231457.7330	9.403	MW	30.850
NDW07SD04	2005562.6557	231639.5762	-0.204	SD	-0.669
NDW07SD05	2005463.7283	231534.3847	0.838	SD	2.749

APPENDIX G

Data Summary Tables

Analytical Data Summary

StationID		NDAHSS17		NDAHSS18		NDAHSS19		NDAHSS20	
SampleID		NDAHSS17-R01		NDAHSS18-R01		NDAHSS19-R01		NDAHFD04P-R01	
Date Collected		08/26/03		08/26/03		08/26/03		08/26/03	
SampleType		N		N		N		FD	
Parameter	**Units**								
1,3-Dinitrobenzene	ug/Kg	141	U	130	U	150	U	131	U
2,4-Dinitrotoluene	ug/Kg	141	U	130	U	150	U	131	U
2,6-Dinitrotoluene	ug/Kg	141	U	130	U	150	U	131	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/Kg	141	U	130	U	150	U	131	U
2-Nitrotoluene	ug/Kg	141	U	130	U	150	U	131	U
3-Nitrotoluene	ug/Kg	141	U	130	U	150	U	131	U
4-Nitrotoluene	ug/Kg	141	U	130	U	150	U	131	U
Nitrobenzene	ug/Kg	141	U	130	U	150	U	131	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	141	U	130	U	150	U	131	U
Tetryl	ug/Kg	141	UJ	130	UJ	150	UJ	131	UJ
1,3,5-Trinitrobenzene	ug/Kg	141	U	130	U	150	U	131	U
2,4,6-trinitrotoluene	ug/Kg	141	U	130	U	150	U	131	U

Analytical Data Summary

	StationID	NDAHSS20		NDAHSS21		NDAHSS22		NDAHSS23	
	SampleID	NDAHSS20-R01		NDAHSS21-R01		NDAHSS22-R01		NDAHSS23-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,3-Dinitrobenzene	ug/Kg	132	U	132	U	135	U	137	U
2,4-Dinitrotoluene	ug/Kg	132	U	132	U	135	U	137	U
2,6-Dinitrotoluene	ug/Kg	132	U	132	U	135	U	137	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/Kg	132	U	132	U	135	U	137	U
2-Nitrotoluene	ug/Kg	132	U	132	U	135	U	137	U
3-Nitrotoluene	ug/Kg	132	U	132	U	135	U	137	U
4-Nitrotoluene	ug/Kg	132	U	132	U	135	U	137	U
Nitrobenzene	ug/Kg	132	U	132	U	135	U	137	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	132	U	132	U	135	U	137	U
Tetryl	ug/Kg	132	UJ	132	UJ	135	UJ	137	UJ
1,3,5-Trinitrobenzene	ug/Kg	132	U	132	U	135	U	137	U
2,4,6-trinitrotoluene	ug/Kg	132	U	132	U	135	U	137	U

Analytical Data Summary

StationID		NDAHSS24		NDAHSS25		NDAHSS26		NDAHSS27	
SampleID		NDAHSS24-R01		NDAHSS25-R01		NDAHSS26-R01		NDAHFD06P-R01	
Date Collected		08/26/03		08/26/03		08/26/03		08/26/03	
SampleType		N		N		N		FD	
Parameter	**Units**								
1,3-Dinitrobenzene	ug/Kg	135	U	139	U	142	U	138	U
2,4-Dinitrotoluene	ug/Kg	135	U	139	U	142	U	138	U
2,6-Dinitrotoluene	ug/Kg	135	U	139	U	142	U	138	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/Kg	135	U	139	U	142	U	138	U
2-Nitrotoluene	ug/Kg	135	U	139	U	142	U	138	U
3-Nitrotoluene	ug/Kg	135	U	139	U	142	U	138	U
4-Nitrotoluene	ug/Kg	135	U	139	U	142	U	138	U
Nitrobenzene	ug/Kg	135	U	139	U	142	U	138	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	135	U	139	U	142	U	138	U
Tetryl	ug/Kg	135	UJ	139	UJ	142	UJ	138	UJ
1,3,5-Trinitrobenzene	ug/Kg	135	U	139	U	142	U	138	U
2,4,6-trinitrotoluene	ug/Kg	135	U	139	U	142	U	138	U

Analytical Data Summary

StationID		NDAHSS27		NDAHSS28		NDAHSS29	
SampleID		NDAHSS27-R01		NDAHSS28-R01		NDAHSS29-R01	
Date Collected		08/26/03		08/26/03		08/26/03	
SampleType		N		N		N	
Parameter	**Units**						
1,3-Dinitrobenzene	ug/Kg	138	U	139	U	135	U
2,4-Dinitrotoluene	ug/Kg	138	U	139	U	135	U
2,6-Dinitrotoluene	ug/Kg	138	U	139	U	135	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/Kg	138	U	139	U	135	U
2-Nitrotoluene	ug/Kg	138	U	139	U	135	U
3-Nitrotoluene	ug/Kg	138	U	139	U	135	U
4-Nitrotoluene	ug/Kg	138	U	139	U	135	U
Nitrobenzene	ug/Kg	138	U	139	U	135	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	138	U	139	U	135	U
Tetryl	ug/Kg	138	UJ	139	UJ	135	UJ
1,3,5-Trinitrobenzene	ug/Kg	138	U	139	U	135	U
2,4,6-trinitrotoluene	ug/Kg	138	U	139	U	135	U

	StationID	AOCHSB001		AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004	
	SampleID	NDE004		NDE005FD1		NDE007		NDE009		NDE011	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		FD		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	9700	=	9000	=	9900	=	5600	=	8400	=
Antimony	mg/Kg	1.6	J	1.5	J	0.86	J	0.68	J	0.77	J
Arsenic	mg/Kg	1.4	J	1.5	J	2.3	=	33	=	2.4	=
Barium	mg/Kg	60	J	51	J	54	J	130	J	130	J
Beryllium	mg/Kg	0.11	J	0.036	U	0.036	U	0.038	U	0.036	U
Cadmium	mg/Kg	0.029	U	0.029	U	0.029	U	0.031	U	0.029	U
Calcium	mg/Kg	8800	=	7400	=	12000	=	32000	=	21000	=
Chromium, Total	mg/Kg	20	J	20	J	20	J	10	J	18	J
Cobalt	mg/Kg	9	J	8.1	J	8.3	J	4	J	8.2	J
Copper	mg/Kg	31	=	28	=	29	=	100	=	41	=
Iron	mg/Kg	18000	=	17000	=	17000	=	12000	=	19000	=
Lead	mg/Kg	20	=	19	=	22	=	45	=	52	=
Magnesium	mg/Kg	4300	=	4200	=	4900	=	8400	=	5000	=
Manganese	mg/Kg	490	=	410	=	440	=	510	=	580	=
Mercury	mg/Kg	0.027	J	0.026	J	0.04	J	0.024	J	0.032	J
Nickel	mg/Kg	8.4	J	8.1	J	9.7	=	4.7	J	9.3	=
Potassium	mg/Kg	1400	=	1300	=	1400	=	3400	=	1900	=
Selenium	mg/Kg	1	J	0.86	J	0.83	J	0.65	J	0.8	J
Silver	mg/Kg	0.062	U	0.062	U	0.062	U	0.066	U	0.062	U
Sodium	mg/Kg	230	J	180	J	210	J	590	J	460	J
Thallium	mg/Kg	0.37	U	0.37	U	0.37	U	0.4	U	0.37	U
Vanadium	mg/Kg	52	=	49	=	45	=	29	=	45	=
Zinc	mg/Kg	81	=	76	=	93	=	110	=	140	=

	StationID	AOCHSB005		AOCHSB006		AOCHSB007		AOCHSB009		AOCHSB010	
	SampleID	NDE013		NDE015		NDE017		NDE021		NDE023	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	9900	=	11000	=	9300	=	6600	=	7100	=
Antimony	mg/Kg	1.2	J	2	J	1.2	J	0.77	J	0.47	J
Arsenic	mg/Kg	3.5	=	2.2	=	1.9	J	6.2	=	67	=
Barium	mg/Kg	140	J	50	J	110	J	76	J	290	J
Beryllium	mg/Kg	0.12	J	0.035	U	0.036	U	0.18	J	0.26	J
Cadmium	mg/Kg	0.029	U	0.029	U	0.03	U	0.031	U	0.029	U
Calcium	mg/Kg	16000	=	33000	=	17000	=	15000	=	9000	=
Chromium, Total	mg/Kg	14	J	36	J	20	J	17	J	16	J
Cobalt	mg/Kg	8.6	J	9.1	J	7.2	J	6.7	J	9	J
Copper	mg/Kg	28	=	34	=	42	=	36	=	87	=
Iron	mg/Kg	23000	=	19000	=	17000	=	17000	=	21000	=
Lead	mg/Kg	21	=	43	=	47	=	63	=	29	=
Magnesium	mg/Kg	5900	=	7700	=	5600	=	2900	=	2800	=
Manganese	mg/Kg	560	=	390	=	390	=	370	=	720	=
Mercury	mg/Kg	0.037	J	0.021	J	0.025	J	0.051	=	0.035	J
Nickel	mg/Kg	7.4	J	16	=	10	=	8.4	J	7.2	J
Potassium	mg/Kg	1500	=	1200	=	1200	=	1600	=	1600	=
Selenium	mg/Kg	1.4	=	0.98	J	1.1	J	0.62	J	0.82	J
Silver	mg/Kg	0.06	U	0.06	U	0.17	J	0.064	U	0.062	U
Sodium	mg/Kg	260	J	300	J	270	J	260	J	130	J
Thallium	mg/Kg	0.36	U	0.36	U	0.37	U	0.38	U	0.37	U
Vanadium	mg/Kg	55	=	54	=	41	=	36	=	62	=
Zinc	mg/Kg	97	=	130	=	130	=	140	=	95	=

	StationID	AOCHSB010		AOCHSB011		AOCHSB012		AOCHSB013		AOCHSB014	
	SampleID	NDE024FD1		NDE026		NDE028		NDE030		NDE032	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	FD		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	7700	J	8100	J	7100	J	6700	J	5900	J
Antimony	mg/Kg	0.27	UJ	0.27	UJ	0.27	UJ	0.27	UJ	0.28	UJ
Arsenic	mg/Kg	43	=	1.3	J	1.7	J	1.5	J	1.1	J
Barium	mg/Kg	63	=	57	=	52	=	52	=	51	=
Beryllium	mg/Kg	0.17	J	0.11	J	0.038	U	0.037	U	0.039	U
Cadmium	mg/Kg	0.031	U	0.03	U	0.031	U	0.03	U	0.032	U
Calcium	mg/Kg	11000	=	7300	=	8100	=	8200	=	8900	=
Chromium, Total	mg/Kg	8.1	=	13	=	12	=	11	=	13	=
Cobalt	mg/Kg	6.9	J	7.6	J	7.1	J	6.8	J	5.9	J
Copper	mg/Kg	110	=	26	=	19	=	19	=	20	=
Iron	mg/Kg	17000	=	18000	=	17000	=	16000	=	20000	=
Lead	mg/Kg	24	=	11	=	12	=	11	=	15	=
Magnesium	mg/Kg	2100	=	3800	=	3600	=	3300	=	2700	=
Manganese	mg/Kg	360	=	410	=	370	=	360	=	340	=
Mercury	mg/Kg	0.033	J	0.043	J	0.041	J	0.05	=	0.029	J
Nickel	mg/Kg	4.4	J	6.2	J	6.1	J	5.5	J	5.5	J
Potassium	mg/Kg	1500	J	1500	J	1200	J	1200	J	1200	J
Selenium	mg/Kg	0.53	UJ	0.52	UJ	0.53	UJ	0.52	UJ	0.54	UJ
Silver	mg/Kg	0.065	U	0.064	U	0.065	U	0.064	U	0.067	U
Sodium	mg/Kg	230	J	110	J	140	J	130	J	110	J
Thallium	mg/Kg	0.39	U	0.38	U	0.39	U	0.38	U	0.4	U
Vanadium	mg/Kg	46	=	49	=	46	=	44	=	48	=
Zinc	mg/Kg	88	=	50	=	51	=	49	=	68	=

Analytical Data Summary

StationID		AOCHSB015		AOCHSB016		AOCHSS001		AOCHSS002		AOCHSS003	
SampleID		NDE034		NDE037		NDE176		NDE177		NDE178	
Date Collected		12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
SampleType		N		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	6200	J	7300	J	11000	J	5600	J	4600	J
Antimony	mg/Kg	0.26	UJ	0.25	UJ	1	J	0.26	UJ	6.3	J
Arsenic	mg/Kg	1	J	4.7	=	0.86	J	0.89	J	2	J
Barium	mg/Kg	50	=	66	=	59	=	42	J	69	=
Beryllium	mg/Kg	0.035	U	0.11	J	0.15	J	0.12	J	0.037	U
Cadmium	mg/Kg	0.029	U	0.028	U	0.21	J	0.029	U	0.03	U
Calcium	mg/Kg	20000	=	13000	=	31000	=	30000	=	30000	=
Chromium, Total	mg/Kg	13	=	14	=	50	=	18	=	46	=
Cobalt	mg/Kg	6.3	J	7.1	J	9.1	J	5.3	J	6.3	J
Copper	mg/Kg	19	=	23	=	34	=	21	=	48	=
Iron	mg/Kg	17000	=	15000	=	19000	=	14000	=	39000	=
Lead	mg/Kg	13	=	16	=	27	=	13	=	18	=
Magnesium	mg/Kg	2900	=	3800	=	5800	=	2800	=	2600	=
Manganese	mg/Kg	340	=	410	=	350	=	290	=	390	=
Mercury	mg/Kg	0.019	J	0.04	J	0.02	J	0.052	=	0.014	J
Nickel	mg/Kg	4.8	J	7	J	15	=	5.9	J	26	=
Potassium	mg/Kg	1300	J	1300	J	2000	J	1400	J	1100	J
Selenium	mg/Kg	0.49	UJ	0.48	UJ	0.5	UJ	0.5	UJ	0.52	UJ
Silver	mg/Kg	0.061	U	0.06	U	0.062	U	0.062	U	0.064	U
Sodium	mg/Kg	220	J	200	J	460	J	340	J	310	J
Thallium	mg/Kg	0.36	U	0.36	U	0.37	U	0.37	U	0.38	U
Vanadium	mg/Kg	51	=	43	=	63	=	33	=	27	=
Zinc	mg/Kg	88	=	62	=	170	=	170	=	260	=

StationID		AOCHSS004		NDAHSS17		NDAHSS18		NDAHSS19		NDAHSS19	
SampleID		NDE179		NDAHSS17-R01		NDAHSS18-R01		NDAHSS19-R01		NDAHSS19-R01DL1	
Date Collected		12/05/00		08/26/03		08/26/03		08/26/03		08/26/03	
SampleType		N		N		N		N		LR	
Parameter	**Units**										
Aluminum	mg/Kg	3400	J	9300	=	10400	=	9760	=		
Antimony	mg/Kg	0.61	J	0.394	J	0.882	J	1.17	J		
Arsenic	mg/Kg	0.54	J	1.18	J	1.12	J	0.715	J		
Barium	mg/Kg	23	J	60.4	=	36.7	=	76.5	=		
Beryllium	mg/Kg	0.035	U	0.143	J	0.101	J	0.133	J		
Cadmium	mg/Kg	0.028	U	0.0466	J	0.0742	J	0.11	J		
Calcium	mg/Kg	34000	=	4460	=	6830	=	4840	=		
Chromium, Total	mg/Kg	12	=	15.4	=	23.9	=	23.7	=		
Cobalt	mg/Kg	3.2	J	7.72	J	8.42	J	10.2	J		
Copper	mg/Kg	12	=	25.6	=	26.4	=	30.9	=		
Iron	mg/Kg	7700	=	18100	J	22400	J	20600	J		
Lead	mg/Kg	8.3	=	16.4	=	16.6	=	26.9	=		
Magnesium	mg/Kg	2000	=	3460	=	7220	=	4750	=		
Manganese	mg/Kg	140	=	441	=	368	=			636	=
Mercury	mg/Kg	0.0049	J	0.0308	J	0.00904	J	0.0227	J		
Nickel	mg/Kg	3.9	J	7.56	=	13.8	=	10.3	=		
Potassium	mg/Kg	860	J	1550	=	1100	=	1330	=		
Selenium	mg/Kg	0.48	UJ	0.47	J	0.382	J	0.677	J		
Silver	mg/Kg	0.06	U	0.0709	J	0.0702	J	0.0346	J		
Sodium	mg/Kg	360	J	187	J	252	J	268	J		
Thallium	mg/Kg	0.36	U	0.944	J	1.16	J	0.867	J		
Vanadium	mg/Kg	21	=	51.6	=	51.3	=	61	=		
Zinc	mg/Kg	100	=	61.8	J	59.1	J	86.3	J		

Analytical Data Summary

	StationID	NDAHSS20		NDAHSS20		NDAHSS21		NDAHSS22		NDAHSS23	
	SampleID	NDAHFD04P-R01		NDAHSS20-R01		NDAHSS21-R01		NDAHSS22-R01		NDAHSS23-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	8710	=	9140	=	5720	=	6990	=	6850	=
Antimony	mg/Kg	0.492	J	0.393	J	0.362	J	0.585	J	0.393	J
Arsenic	mg/Kg	1.1	J	1.58	J	1.92	=	1.79	=	1.13	J
Barium	mg/Kg	40.7	=	41.5	=	61.7	=	56.1	=	52.1	=
Beryllium	mg/Kg	0.084	J	0.0904	J	0.1	J	0.114	J	0.112	J
Cadmium	mg/Kg	0.069	J	0.0873	J	0.116	J	0.135	J	0.0699	J
Calcium	mg/Kg	11200	=	13100	=	20300	=	29600	=	21700	=
Chromium, Total	mg/Kg	17	=	22.4	=	7.83	=	10.9	=	9.51	=
Cobalt	mg/Kg	6.42	j	7.99	J	5.16	J	5.58	J	5.7	J
Copper	mg/Kg	19.6	=	22.2	=	22.2	=	23	=	20.3	=
Iron	mg/Kg	14100	=	17100	J	14600	J	14400	=	13400	=
Lead	mg/Kg	20.8	J	52.4	=	27	=	23.7	J	18.3	J
Magnesium	mg/Kg	4680	=	6130	=	2330	=	3320	=	2670	=
Manganese	mg/Kg	336	J	369	=	313	=	325	J	352	J
Mercury	mg/Kg	0.0221	J	0.0231	J	0.0367	J	0.0303	=	0.0383	=
Nickel	mg/Kg	9.31	=	12.3	=	3.55	J	4.81	J	4.1	J
Potassium	mg/Kg	1230	=	1310	=	1500	=	1950	=	1380	=
Selenium	mg/Kg	0.369	J	0.657	J	0.449	J	0.38	J	0.3	J
Silver	mg/Kg	0.0491	J	0.024	U	0.0253	U	0.0511	J	0.0579	J
Sodium	mg/Kg	371	J	262	J	244	J	349	J	261	J
Thallium	mg/Kg	0.62	J	0.611	J	0.671	J	0.429	J	0.488	J
Vanadium	mg/Kg	40.8	=	48.9	=	40.4	=	43.2	=	40.1	=
Zinc	mg/Kg	60.3	=	65.1	J	87.3	J	71.1	=	56.7	=

	StationID	NDAHSS24		NDAHSS25		NDAHSS26		NDAHSS27		NDAHSS27	
	SampleID	NDAHSS24-R01		NDAHSS25-R01		NDAHSS26-R01		NDAHFD06P-R01		NDAHSS27-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		FD		N	
Parameter	**Units**										
Aluminum	mg/Kg	7030	=	6380	=	10300	=	7530	=	7690	=
Antimony	mg/Kg	0.422	J	0.381	J	0.661	J	0.64	J	0.457	J
Arsenic	mg/Kg	1.49	J	2.59	=	6.74	=	2.48	=	2.79	J
Barium	mg/Kg	55.5	=	85.7	=	77	=	54.9	=	62.7	=
Beryllium	mg/Kg	0.115	J	0.13	J	0.128	J	0.118	J	0.126	J
Cadmium	mg/Kg	0.102	J	0.152	J	0.291	J	0.147	J	0.159	J
Calcium	mg/Kg	14800	=	18600	=	22200	=	29700	=	10900	=
Chromium, Total	mg/Kg	10.1	=	8.84	=	17.4	=	10.2	=	11.9	=
Cobalt	mg/Kg	6.07	J	5.11	J	7.81	J	6	J	6.99	J
Copper	mg/Kg	24.6	=	37.4	=	36.5	=	22	=	24.6	=
Iron	mg/Kg	14800	=	15100	=	17200	=	15000	=	16800	=
Lead	mg/Kg	25.4	J	58.9	J	44	J	13.5	J	14.6	J
Magnesium	mg/Kg	2690	=	2330	=	5500	=	2580	=	3280	=
Manganese	mg/Kg	375	J	309	J	404	J	325	J	359	J
Mercury	mg/Kg	0.0351	=	0.0625	=	0.053	=	0.0286	J	0.0291	=
Nickel	mg/Kg	4.92	J	4.49	J	10.4	=	4.46	J	5.87	J
Potassium	mg/Kg	1360	=	1730	=	1810	=	1560	=	1420	=
Selenium	mg/Kg	0.285	J	0.234	J	0.597	J	0.367	J	0.357	J
Silver	mg/Kg	0.0608	J	0.0651	J	0.0583	J	0.0332	J	0.0383	J
Sodium	mg/Kg	211	J	282	J	347	J	328	J	221	J
Thallium	mg/Kg	0.68	J	0.693	J	0.287	J	0.45	J	0.732	J
Vanadium	mg/Kg	43.2	=	36.1	=	44.5	=	44.3	=	48	=
Zinc	mg/Kg	81.4	=	126	=	125	=	65.2	=	72.4	=

	StationID	NDAHSS28		NDAHSS29	
	SampleID	NDAHSS28-R01		NDAHSS29-R01	
	Date Collected	08/26/03		08/26/03	
	SampleType	N		N	
Parameter	**Units**				
Aluminum	mg/Kg	3840	=	7920	=
Antimony	mg/Kg	0.34	J	0.534	J
Arsenic	mg/Kg	0.435	J	0.701	J
Barium	mg/Kg	27.9	J	54.4	=
Beryllium	mg/Kg	0.0799	J	0.12	J
Cadmium	mg/Kg	0.0128	U	0.0454	J
Calcium	mg/Kg	5400	=	5980	=
Chromium, Total	mg/Kg	7.98	=	13.8	=
Cobalt	mg/Kg	3.26	J	8.39	=
Copper	mg/Kg	11.1	=	24.8	=
Iron	mg/Kg	11200	=	16300	=
Lead	mg/Kg	4.43	J	8.68	J
Magnesium	mg/Kg	1630	=	3250	=
Manganese	mg/Kg	182	J	384	J
Mercury	mg/Kg	0.0168	J	0.0194	J
Nickel	mg/Kg	3.26	J	6.24	J
Potassium	mg/Kg	721	J	1330	=
Selenium	mg/Kg	0.353	J	0.616	J
Silver	mg/Kg	0.0356	J	0.0611	J
Sodium	mg/Kg	142	J	213	J
Thallium	mg/Kg	0.863	J	0.613	J
Vanadium	mg/Kg	35.9	=	48	=
Zinc	mg/Kg	31.5	=	44.7	=

	StationID	NDAHSS17		NDAHSS18		NDAHSS19		NDAHSS20		NDAHSS20		NDAH
	SampleID	NDAHSS17-R01		NDAHSS18-R01		NDAHSS19-R01		NDAHFD04P-R01		NDAHSS20-R01		NDAHSS
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03		08/2
	SampleType	N		N		N		FD		N		N
Parameter	**Units**											
Perchlorate	ug/Kg	113	U	100	U	119	U	91.6	U	106	U	129

Analytical Data Summary

	StationID	SS21		NDAHSS22		NDAHSS23		NDAHSS24		NDAHSS25		NDAHSS26	
	SampleID	S21-R01		NDAHSS22-R01		NDAHSS23-R01		NDAHSS24-R01		NDAHSS25-R01		NDAHSS26-R01	
	Date Collected	6/03		08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N		N		N	
Parameter	**Units**												
Perchlorate	ug/Kg		U	111	U	97.1	U	111	U	109	U	96.5	U

Analytical Data Summary

	StationID	NDAHSS27		NDAHSS27		NDAHSS28		NDAHSS29	
	SampleID	NDAHFD06P-R01		NDAHSS27-R01		NDAHSS28-R01		NDAHSS29-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
Parameter	**Units**								
Perchlorate	ug/Kg	113	U	94.6	U	124	U	99	U

Analytical Data Summary

	StationID	NDAHSS17		NDAHSS18		NDAHSS19		NDAHSS20	
	SampleID	NDAHSS17-R01		NDAHSS18-R01		NDAHSS19-R01		NDAHFD04P-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		FD	
Parameter	**Units**								
Aldrin	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	2	UJ	1.8	UJ	2.1	UJ	1.8	U
Gamma bhc (lindane)	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Alpha-chlordane	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Gamma-chlordane	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
p,p'-DDD	ug/Kg	0.52	J	2.1	J	0.86	R	6.6	J
p,p'-DDE	ug/Kg	40	=	95	J	23	=	69	J
p,p'-DDT	ug/Kg	18	J	25	J	8.6	J	4.6	=
Dieldrin	ug/Kg	3.8	U	3.5	U	4.1	U	3.5	U
Alpha endosulfan	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Beta endosulfan	ug/Kg	3.8	U	3.5	U	4.1	U	3.5	U
Endosulfan sulfate	ug/Kg	3.8	U	3.5	U	4.1	U	3.5	U
Endrin	ug/Kg	3.8	U	3.5	U	4.1	U	3.5	U
Endrin aldehyde	ug/Kg	3.8	U	3.5	U	4.1	U	3.5	U
Endrin ketone	ug/Kg	3.8	U	3.5	U	4.1	U	3.5	UJ
Heptachlor epoxide	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Heptachlor	ug/Kg	2	U	1.8	U	2.1	U	1.8	U
Methoxychlor	ug/Kg	20	U	18	U	0.74	J	18	U
Toxaphene	ug/Kg	200	U	180	U	210	U	180	U

	StationID	NDAHSS20		NDAHSS21		NDAHSS22		NDAHSS23	
	SampleID	NDAHSS20-R01		NDAHSS21-R01		NDAHSS22-R01		NDAHSS23-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
Aldrin	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Gamma bhc (lindane)	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Alpha-chlordane	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Gamma-chlordane	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
p,p'-DDD	ug/Kg	3.5	R	3.6	U	10	J	3.6	J
p,p'-DDE	ug/Kg	3.5	R	1.4	J	190	=	16	J
p,p'-DDT	ug/Kg	3.5	R	3.6	U	9.2	J	8.3	J
Dieldrin	ug/Kg	3.5	R	3.6	U	3.6	U	3.6	UJ
Alpha endosulfan	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Beta endosulfan	ug/Kg	0.073	R	3.6	U	3.6	U	3.6	UJ
Endosulfan sulfate	ug/Kg	3.5	R	3.6	U	3.6	U	3.6	UJ
Endrin	ug/Kg	3.5	R	3.6	U	3.6	U	3.6	UJ
Endrin aldehyde	ug/Kg	3.5	R	3.6	U	3.6	U	3.6	UJ
Endrin ketone	ug/Kg	3.5	R	3.6	U	3.6	UJ	3.6	UJ
Heptachlor epoxide	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Heptachlor	ug/Kg	1.8	R	1.9	U	1.8	U	1.8	UJ
Methoxychlor	ug/Kg	18	R	19	U	18	U	18	UJ
Toxaphene	ug/Kg	1.5	R	190	U	180	U	180	UJ

Analytical Data Summary

	StationID	NDAHSS24		NDAHSS25		NDAHSS26		NDAHSS27	
	SampleID	NDAHSS24-R01		NDAHSS25-R01		NDAHSS26-R01		NDAHFD06P-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		FD	
Parameter	**Units**								
Aldrin	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Gamma bhc (lindane)	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Alpha-chlordane	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Gamma-chlordane	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
p,p'-DDD	ug/Kg	3.6	U	0.62	J	2.3	J	3	J
p,p'-DDE	ug/Kg	5	J	2.5	J	16	J	7.5	=
p,p'-DDT	ug/Kg	5.5	J	1.3	J	10	J	2.2	J
Dieldrin	ug/Kg	3.6	U	3.6	U	3.8	U	3.6	U
Alpha endosulfan	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Beta endosulfan	ug/Kg	3.6	U	3.6	U	3.8	U	3.6	U
Endosulfan sulfate	ug/Kg	3.6	U	3.6	U	3.8	U	3.6	U
Endrin	ug/Kg	3.6	U	3.6	U	3.8	U	3.6	U
Endrin aldehyde	ug/Kg	3.6	U	3.6	U	3.8	U	3.6	U
Endrin ketone	ug/Kg	3.6	U	3.6	U	3.8	UJ	3.6	UJ
Heptachlor epoxide	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Heptachlor	ug/Kg	1.8	U	1.9	U	1.9	U	1.9	U
Methoxychlor	ug/Kg	18	U	19	U	19	U	19	U
Toxaphene	ug/Kg	180	U	190	U	190	U	190	U

Analytical Data Summary

StationID		NDAHSS27		NDAHSS28		NDAHSS29	
SampleID		NDAHSS27-R01		NDAHSS28-R01		NDAHSS29-R01	
Date Collected		08/26/03		08/26/03		08/26/03	
SampleType		N		N		N	
Parameter	**Units**						
Aldrin	ug/Kg	1.9	U	1.9	U	1.8	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	1.9	U	1.9	U	1.8	U
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	1.9	U	1.9	U	1.8	U
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	1.9	U	1.9	U	1.8	U
Gamma bhc (lindane)	ug/Kg	1.9	U	1.9	U	1.8	U
Alpha-chlordane	ug/Kg	1.9	U	1.9	U	1.8	U
Gamma-chlordane	ug/Kg	1.9	U	1.9	U	1.8	U
p,p'-DDD	ug/Kg	1.9	J	1.1	J	4.4	=
p,p'-DDE	ug/Kg	8.8	J	92	J	35	=
p,p'-DDT	ug/Kg	11	J	160	J	7.7	J
Dieldrin	ug/Kg	3.6	U	3.7	U	3.5	U
Alpha endosulfan	ug/Kg	1.9	U	1.9	U	1.8	U
Beta endosulfan	ug/Kg	3.6	U	3.7	U	3.5	U
Endosulfan sulfate	ug/Kg	3.6	U	3.7	U	3.5	U
Endrin	ug/Kg	3.6	U	3.7	U	3.5	U
Endrin aldehyde	ug/Kg	3.6	U	3.7	U	3.5	U
Endrin ketone	ug/Kg	3.6	UJ	3.7	UJ	3.5	UJ
Heptachlor epoxide	ug/Kg	1.9	U	1.9	U	1.8	U
Heptachlor	ug/Kg	1.9	U	1.9	U	1.8	U
Methoxychlor	ug/Kg	19	U	19	U	18	U
Toxaphene	ug/Kg	190	U	190	U	180	U

	StationID	AOCHSB001		AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004	
	SampleID	NDE004		NDE005FD1		NDE007		NDE009		NDE011	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		FD		N		N		N	
Parameter	**Units**										
PCB-1016 (AROCHLOR 1016)	ug/Kg	35	UJ	36	UJ	35	UJ	38	UJ	36	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	72	UJ	73	UJ	72	UJ	77	UJ	72	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	35	UJ	36	UJ	35	UJ	38	UJ	36	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	35	UJ	36	UJ	35	UJ	38	UJ	36	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	35	UJ	36	UJ	35	UJ	38	UJ	36	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	35	UJ	36	UJ	35	UJ	38	UJ	36	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	35	UJ	36	UJ	35	UJ	38	UJ	36	UJ

Analytical Data Summary

	StationID	AOCHSB005		AOCHSB006		AOCHSB007		AOCHSB009		AOCHSB010	
	SampleID	NDE013		NDE015		NDE017		NDE021		NDE023	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N		N	
Parameter	**Units**										
PCB-1016 (AROCHLOR 1016)	ug/Kg	34	UJ	34	UJ	36	UJ	37	UJ	35	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	70	UJ	70	UJ	73	UJ	76	UJ	72	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	34	UJ	34	UJ	36	UJ	37	UJ	35	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	34	UJ	34	UJ	36	UJ	37	UJ	35	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	34	UJ	34	UJ	36	UJ	37	UJ	35	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	34	UJ	34	UJ	36	UJ	37	UJ	35	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	34	UJ	34	UJ	36	UJ	37	UJ	35	UJ

	StationID	AOCHSB010		AOCHSB011		AOCHSB012		AOCHSB013		AOCHSB014	
	SampleID	NDE024FD1		NDE026		NDE028		NDE030		NDE032	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	FD		N		N		N		N	
Parameter	**Units**										
PCB-1016 (AROCHLOR 1016)	ug/Kg	38	UJ	37	UJ	37	UJ	37	UJ	39	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	77	UJ	75	UJ	76	UJ	75	UJ	79	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	38	UJ	37	UJ	37	UJ	37	UJ	39	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	38	UJ	37	UJ	37	UJ	37	UJ	39	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	38	UJ	37	UJ	37	UJ	37	UJ	39	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	38	UJ	37	UJ	37	UJ	37	UJ	39	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	38	UJ	37	UJ	37	UJ	37	UJ	39	UJ

Analytical Data Summary

StationID		AOCHSB015		AOCHSB016		AOCHSS001		AOCHSS002		AOCHSS003	
SampleID		NDE034		NDE037		NDE176		NDE177		NDE178	
Date Collected		12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
SampleType		N		N		N		N		N	
Parameter	**Units**										
PCB-1016 (AROCHLOR 1016)	ug/Kg	35	UJ	35	UJ	36	UJ	36	UJ	37	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	71	UJ	70	UJ	73	UJ	72	UJ	75	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	35	UJ	35	UJ	36	UJ	36	UJ	37	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	35	UJ	35	UJ	36	UJ	36	UJ	37	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	35	UJ	35	UJ	36	UJ	36	UJ	37	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	35	UJ	35	UJ	36	UJ	36	UJ	37	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	35	UJ	35	UJ	36	UJ	36	UJ	37	UJ

Analytical Data Summary

	StationID	AOCHSS004	
	SampleID	NDE179	
	Date Collected	12/05/00	
	SampleType	N	
Parameter	**Units**		
PCB-1016 (AROCHLOR 1016)	ug/Kg	35	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	70	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	35	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	35	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	35	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	35	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	35	UJ

Analytical Data Summary

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Parameter	Units	AOCHSB001		AOCHSB001		AOCHSB002		AOCHSB003	
SampleID		NDE004		NDE005FD1		NDE007		NDE009	
Date Collected		12/05/00		12/05/00		12/05/00		12/05/00	
SampleType		N		FD		N		N	
1,2,4-TRICHLOROBENZENE	ug/Kg	475	U	471	U	455	U	556	U
1,2-DICHLOROBENZENE	ug/Kg	475	U	471	U	455	U	556	U
1,3-DICHLOROBENZENE	ug/Kg	475	U	471	U	455	U	556	U
1,4-DICHLOROBENZENE	ug/Kg	475	U	471	U	455	U	556	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1420	U	1410	U	1370	U	1670	U
2,4,6-TRICHLOROPHENOL	ug/Kg	475	U	471	U	455	U	556	U
2,4-DICHLOROPHENOL	ug/Kg	475	U	471	U	455	U	556	U
2,4-DIMETHYLPHENOL	ug/Kg	475	U	471	U	455	U	556	U
2,4-DINITROPHENOL	ug/Kg	1420	U	1410	U	1370	U	1670	U
2,4-DINITROTOLUENE	ug/Kg	475	U	471	U	455	U	556	U
2,6-DINITROTOLUENE	ug/Kg	475	U	471	U	455	U	556	U
2-CHLORONAPHTHALENE	ug/Kg	475	U	471	U	455	U	556	U
2-CHLOROPHENOL	ug/Kg	475	U	471	U	455	U	556	U
2-METHYLNAPHTHALENE	ug/Kg	475	U	471	U	455	U	556	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	475	U	471	U	455	U	556	U
2-NITROANILINE	ug/Kg	1420	U	1410	U	1370	U	1670	U
2-NITROPHENOL	ug/Kg	475	U	471	U	455	U	556	U
3,3'-DICHLOROBENZIDINE	ug/Kg	949	U	942	U	910	U	1110	U
3-NITROANILINE	ug/Kg	1420	U	1410	U	1370	U	1670	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1420	U	1410	U	1370	U	1670	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	475	U	471	U	455	U	556	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	475	U	471	U	455	U	556	U
4-CHLOROANILINE	ug/Kg	475	U	471	U	455	U	556	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	475	U	471	U	455	U	556	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1420	U	1410	U	1370	U	1670	U
4-NITROPHENOL	ug/Kg	1420	U	1410	U	1370	U	1670	U
ACENAPHTHENE	ug/Kg	475	U	471	U	455	U	556	U
ACENAPHTHYLENE	ug/Kg	475	U	471	U	455	U	556	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	475	U	471	U	455	U	556	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	32	J	30	J	455	U	556	U
BENZO(a)PYRENE	ug/Kg	43	J	41	J	455	U	556	U
BENZO(b)FLUORANTHENE	ug/Kg	72	J	84	J	455	U	556	U
BENZO(g,h,i)PERYLENE	ug/Kg	475	U	471	U	455	U	556	U

Analytical Data Summary

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Parameter	Units	AOCHSB004		AOCHSB005		AOCHSB006		AOCHSB007	
SampleID		NDE011		NDE013		NDE015		NDE017	
Date Collected		12/05/00		12/05/00		12/05/00		12/05/00	
SampleType		N		N		N		N	
1,2,4-TRICHLOROBENZENE	ug/Kg	480	U	439	U	416	U	488	U
1,2-DICHLOROBENZENE	ug/Kg	480	U	439	U	416	U	488	U
1,3-DICHLOROBENZENE	ug/Kg	480	U	439	U	416	U	488	U
1,4-DICHLOROBENZENE	ug/Kg	480	U	439	U	416	U	488	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1440	U	1320	U	1250	U	1460	U
2,4,6-TRICHLOROPHENOL	ug/Kg	480	U	439	U	416	U	488	U
2,4-DICHLOROPHENOL	ug/Kg	480	U	439	U	416	U	488	U
2,4-DIMETHYLPHENOL	ug/Kg	480	U	439	U	416	U	488	U
2,4-DINITROPHENOL	ug/Kg	1440	U	1320	U	1250	U	1460	U
2,4-DINITROTOLUENE	ug/Kg	480	U	439	U	416	U	488	U
2,6-DINITROTOLUENE	ug/Kg	480	U	439	U	416	U	488	U
2-CHLORONAPHTHALENE	ug/Kg	480	U	439	U	416	U	488	U
2-CHLOROPHENOL	ug/Kg	480	U	439	U	416	U	488	U
2-METHYLNAPHTHALENE	ug/Kg	55	J	28	J	416	U	488	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	480	U	439	U	416	U	488	U
2-NITROANILINE	ug/Kg	1440	U	1320	U	1250	U	1460	U
2-NITROPHENOL	ug/Kg	480	U	439	U	416	U	488	U
3,3'-DICHLOROBENZIDINE	ug/Kg	961	U	878	U	831	U	976	U
3-NITROANILINE	ug/Kg	1440	U	1320	U	1250	U	1460	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1440	U	1320	U	1250	U	1460	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	480	U	439	U	416	U	488	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	480	U	439	U	416	U	488	U
4-CHLOROANILINE	ug/Kg	480	U	439	U	416	U	488	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	480	U	439	U	416	U	488	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1440	U	1320	U	1250	U	1460	U
4-NITROPHENOL	ug/Kg	1440	U	1320	U	1250	U	1460	U
ACENAPHTHENE	ug/Kg	480	U	439	U	416	U	488	U
ACENAPHTHYLENE	ug/Kg	480	U	439	U	416	U	488	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	480	U	439	U	416	U	488	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	112	J	439	U	49	J	488	U
BENZO(a)PYRENE	ug/Kg	120	J	439	U	53	J	488	U
BENZO(b)FLUORANTHENE	ug/Kg	133	J	439	U	65	J	62	J
BENZO(g,h,i)PERYLENE	ug/Kg	480	U	439	U	416	U	488	U

	StationID	AOCHSB009		AOCHSB010		AOCHSB010		AOCHSB011	
	SampleID	NDE021		NDE023		NDE024FD1		NDE026	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		FD		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg	531	U	517	U	561	U	559	U
1,2-DICHLOROBENZENE	ug/Kg	531	U	517	U	561	U	559	U
1,3-DICHLOROBENZENE	ug/Kg	531	U	517	U	561	U	559	U
1,4-DICHLOROBENZENE	ug/Kg	531	U	517	U	561	U	559	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1590	U	1550	U	1680	U	1680	U
2,4,6-TRICHLOROPHENOL	ug/Kg	531	U	517	U	561	U	559	U
2,4-DICHLOROPHENOL	ug/Kg	531	U	517	U	561	U	559	U
2,4-DIMETHYLPHENOL	ug/Kg	531	U	517	U	561	U	559	U
2,4-DINITROPHENOL	ug/Kg	1590	U	1550	U	1680	U	1680	U
2,4-DINITROTOLUENE	ug/Kg	531	U	517	U	561	U	559	U
2,6-DINITROTOLUENE	ug/Kg	531	U	517	U	1220	=	1210	=
2-CHLORONAPHTHALENE	ug/Kg	531	U	517	U	561	U	559	U
2-CHLOROPHENOL	ug/Kg	531	U	517	U	561	U	559	U
2-METHYLNAPHTHALENE	ug/Kg	190	J	36	J	561	U	559	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	531	U	517	U	561	U	559	U
2-NITROANILINE	ug/Kg	1590	U	1550	U	1680	U	1680	U
2-NITROPHENOL	ug/Kg	531	U	517	U	561	U	559	U
3,3'-DICHLOROBENZIDINE	ug/Kg	1060	U	1030	U	1120	U	1120	U
3-NITROANILINE	ug/Kg	1590	U	1550	U	1680	U	1680	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1590	U	1550	U	1680	U	1680	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	531	U	517	U	228	J	238	J
4-CHLORO-3-METHYLPHENOL	ug/Kg	531	U	517	U	561	U	559	U
4-CHLOROANILINE	ug/Kg	531	U	517	U	561	U	559	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	531	U	517	U	561	U	559	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1590	U	1550	U	1680	U	1680	U
4-NITROPHENOL	ug/Kg	1590	U	1550	U	1680	U	1680	U
ACENAPHTHENE	ug/Kg	531	U	517	U	561	U	559	U
ACENAPHTHYLENE	ug/Kg	531	U	517	U	561	U	559	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	531	U	517	U	561	U	559	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	531	U	29	J	561	U	559	U
BENZO(a)PYRENE	ug/Kg	37	J	517	U	561	U	559	U
BENZO(b)FLUORANTHENE	ug/Kg	50	J	517	U	561	U	559	U
BENZO(g,h,i)PERYLENE	ug/Kg	531	U	517	U	561	U	559	U

	StationID	AOCHSB012		AOCHSB013		AOCHSB014		AOCHSB015	
	SampleID	NDE028		NDE030		NDE032		NDE034	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg	594	U	567	U	575	U	551	U
1,2-DICHLOROBENZENE	ug/Kg	594	U	567	U	575	U	551	U
1,3-DICHLOROBENZENE	ug/Kg	594	U	567	U	575	U	551	U
1,4-DICHLOROBENZENE	ug/Kg	594	U	567	U	575	U	551	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1780	U	1700	U	1730	U	1650	U
2,4,6-TRICHLOROPHENOL	ug/Kg	594	U	567	U	575	U	551	U
2,4-DICHLOROPHENOL	ug/Kg	594	U	567	U	575	U	551	U
2,4-DIMETHYLPHENOL	ug/Kg	594	U	567	U	575	U	551	U
2,4-DINITROPHENOL	ug/Kg	1780	U	1700	U	1730	U	1650	U
2,4-DINITROTOLUENE	ug/Kg	594	U	567	U	575	U	551	U
2,6-DINITROTOLUENE	ug/Kg	594	U	1230	=	575	U	551	U
2-CHLORONAPHTHALENE	ug/Kg	594	U	567	U	575	U	551	U
2-CHLOROPHENOL	ug/Kg	594	U	567	U	575	U	551	U
2-METHYLNAPHTHALENE	ug/Kg	594	U	567	U	575	U	551	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	594	U	567	U	575	U	551	U
2-NITROANILINE	ug/Kg	1780	U	1700	U	1730	U	1650	U
2-NITROPHENOL	ug/Kg	594	U	567	U	575	U	551	U
3,3'-DICHLOROBENZIDINE	ug/Kg	1190	U	1130	U	1150	U	1100	U
3-NITROANILINE	ug/Kg	1780	U	48	J	1730	U	1650	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1780	U	1700	U	1730	U	1650	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	217	J	267	J	575	U	551	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	594	U	567	U	575	U	551	U
4-CHLOROANILINE	ug/Kg	594	U	567	U	575	U	551	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	594	U	567	U	575	U	551	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1780	U	1700	U	1730	U	1650	U
4-NITROPHENOL	ug/Kg	1780	U	1700	U	1730	U	1650	U
ACENAPHTHENE	ug/Kg	594	U	567	U	575	U	551	U
ACENAPHTHYLENE	ug/Kg	594	U	567	U	575	U	551	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	594	U	567	U	575	U	551	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	594	U	567	U	575	U	551	U
BENZO(a)PYRENE	ug/Kg	594	U	567	U	575	U	551	U
BENZO(b)FLUORANTHENE	ug/Kg	594	U	40	J	575	U	551	U
BENZO(g,h,i)PERYLENE	ug/Kg	594	U	567	U	575	U	551	U

	StationID	AOCHSB016		AOCHSS001		AOCHSS002		AOCHSS003	
	SampleID	NDE037		NDE176		NDE177		NDE178	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg	518	U	28200	U	521	U	11500	U
1,2-DICHLOROBENZENE	ug/Kg	518	U	28200	U	521	U	11500	U
1,3-DICHLOROBENZENE	ug/Kg	518	U	28200	U	521	U	11500	U
1,4-DICHLOROBENZENE	ug/Kg	518	U	28200	U	521	U	11500	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1550	U	84500	U	1560	U	34400	U
2,4,6-TRICHLOROPHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
2,4-DICHLOROPHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
2,4-DIMETHYLPHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
2,4-DINITROPHENOL	ug/Kg	1550	U	84500	U	1560	U	34400	U
2,4-DINITROTOLUENE	ug/Kg	518	U	28200	U	521	U	11500	U
2,6-DINITROTOLUENE	ug/Kg	518	U	28200	U	521	U	11500	U
2-CHLORONAPHTHALENE	ug/Kg	518	U	28200	U	521	U	11500	U
2-CHLOROPHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
2-METHYLNAPHTHALENE	ug/Kg	518	U	28200	U	521	U	11500	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	518	U	28200	U	521	U	11500	U
2-NITROANILINE	ug/Kg	1550	U	84500	U	1560	U	34400	U
2-NITROPHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
3,3'-DICHLOROBENZIDINE	ug/Kg	1040	U	56300	U	1040	U	22900	U
3-NITROANILINE	ug/Kg	1550	U	84500	U	1560	U	34400	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1550	U	84500	U	1560	U	34400	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	518	U	28200	U	521	U	11500	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
4-CHLOROANILINE	ug/Kg	518	U	28200	U	521	U	11500	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	518	U	28200	U	521	U	11500	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1550	U	84500	U	1560	U	34400	U
4-NITROPHENOL	ug/Kg	1550	U	84500	U	1560	U	34400	U
ACENAPHTHENE	ug/Kg	518	U	28200	U	521	U	11500	U
ACENAPHTHYLENE	ug/Kg	518	U	28200	U	521	U	11500	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	518	U	28200	U	521	U	11500	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	29	J	28200	U	521	U	11500	U
BENZO(a)PYRENE	ug/Kg	50	J	28200	U	74	J	11500	U
BENZO(b)FLUORANTHENE	ug/Kg	58	J	28200	U	521	U	11500	U
BENZO(g,h,i)PERYLENE	ug/Kg	518	U	28200	U	60	J	11500	U

	StationID	AOCHSS004		NDAHSS17		NDAHSS18		NDAHSS19	
	SampleID	NDE179		NDAHSS17-R01		NDAHSS18-R01		NDAHSS19-R01	
	Date Collected	12/05/00		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg	884	U						
1,2-DICHLOROBENZENE	ug/Kg	884	U						
1,3-DICHLOROBENZENE	ug/Kg	884	U						
1,4-DICHLOROBENZENE	ug/Kg	884	U						
2,4,5-TRICHLOROPHENOL	ug/Kg	2650	U	1140	U	1050	U	1220	R
2,4,6-TRICHLOROPHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
2,4-DICHLOROPHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
2,4-DIMETHYLPHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
2,4-DINITROPHENOL	ug/Kg	2650	U	1140	U	1050	U	1230	UJ
2,4-DINITROTOLUENE	ug/Kg	884	U	379	U	351	U	411	UJ
2,6-DINITROTOLUENE	ug/Kg	884	U	379	U	351	U	411	UJ
2-CHLORONAPHTHALENE	ug/Kg	884	U	379	U	351	U	411	UJ
2-CHLOROPHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
2-METHYLNAPHTHALENE	ug/Kg	884	U	379	U	351	U	408	R
2-METHYLPHENOL (o-CRESOL)	ug/Kg	884	U	379	U	351	U	411	UJ
2-NITROANILINE	ug/Kg	2650	U	1140	U	1050	U	1230	UJ
2-NITROPHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
3,3'-DICHLOROBENZIDINE	ug/Kg	1770	U	769	U	712	U	835	UJ
3-NITROANILINE	ug/Kg	2650	U	1140	U	1050	U	1230	UJ
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	2650	U	1140	U	1050	U	1230	UJ
4-BROMOPHENYL PHENYL ETHER	ug/Kg	884	U	379	U	351	U	411	UJ
4-CHLORO-3-METHYLPHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
4-CHLOROANILINE	ug/Kg	884	U	379	R	351	R	411	UJ
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	884	U	379	U	351	U	411	UJ
4-METHYLPHENOL (p-CRESOL)	ug/Kg			379	U	351	U	411	UJ
4-NITROANILINE	ug/Kg	2650	U	1140	U	1050	U	1230	UJ
4-NITROPHENOL	ug/Kg	2650	U	1140	U	1050	U	1230	UJ
ACENAPHTHENE	ug/Kg	884	U	379	U	351	U	411	UJ
ACENAPHTHYLENE	ug/Kg	884	U	379	U	351	U	411	UJ
ACETOPHENONE	ug/Kg			379	U	351	U	408	R
ANTHRACENE	ug/Kg	884	U	379	U	351	U	411	UJ
ATRAZINE	ug/Kg			379	U	351	U	411	UJ
BENZALDEHYDE	ug/Kg			379	U	351	U	408	R
BENZO(a)ANTHRACENE	ug/Kg	884	U	36	J	29.9	J	411	UJ
BENZO(a)PYRENE	ug/Kg	884	U	42	J	50.2	J	32.3	J
BENZO(b)FLUORANTHENE	ug/Kg	884	U	59.5	J	92	J	60.8	J
BENZO(g,h,i)PERYLENE	ug/Kg	884	U	46.5	J	49.5	J	32.8	J

	StationID	NDAHSS20		NDAHSS20		NDAHSS21		NDAHSS22	
	SampleID	NDAHFD04P-R01		NDAHSS20-R01		NDAHSS21-R01		NDAHSS22-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg								
1,2-DICHLOROBENZENE	ug/Kg								
1,3-DICHLOROBENZENE	ug/Kg								
1,4-DICHLOROBENZENE	ug/Kg								
2,4,5-TRICHLOROPHENOL	ug/Kg	1040	U	1060	U	1080	U	1080	U
2,4,6-TRICHLOROPHENOL	ug/Kg	348	U	353	U	362	U	358	U
2,4-DICHLOROPHENOL	ug/Kg	348	U	353	U	362	U	358	U
2,4-DIMETHYLPHENOL	ug/Kg	348	U	353	U	362	U	358	U
2,4-DINITROPHENOL	ug/Kg	1040	U	1060	U	1080	U	1080	U
2,4-DINITROTOLUENE	ug/Kg	348	U	353	U	362	U	358	U
2,6-DINITROTOLUENE	ug/Kg	348	U	353	U	362	U	358	U
2-CHLORONAPHTHALENE	ug/Kg	348	U	353	U	362	U	358	U
2-CHLOROPHENOL	ug/Kg	348	U	353	U	362	U	358	U
2-METHYLNAPHTHALENE	ug/Kg	348	U	353	U	362	U	358	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	348	U	353	U	362	U	358	U
2-NITROANILINE	ug/Kg	1040	U	1060	U	1080	U	1080	U
2-NITROPHENOL	ug/Kg	348	U	353	U	362	U	358	U
3,3'-DICHLOROBENZIDINE	ug/Kg	707	U	718	U	735	U	728	U
3-NITROANILINE	ug/Kg	1040	U	1060	U	1080	U	1080	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1040	U	1060	U	1080	U	1080	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	348	U	353	U	362	U	358	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	348	U	353	U	362	U	358	U
4-CHLOROANILINE	ug/Kg	348	R	353	R	362	R	358	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	348	U	353	U	362	U	358	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	348	U	353	U	362	U	358	U
4-NITROANILINE	ug/Kg	1040	U	1060	U	1080	U	1080	U
4-NITROPHENOL	ug/Kg	1040	U	1060	U	1080	U	1080	U
ACENAPHTHENE	ug/Kg	348	U	353	U	362	U	358	U
ACENAPHTHYLENE	ug/Kg	348	U	353	U	362	U	358	U
ACETOPHENONE	ug/Kg	348	U	353	U	362	U	358	U
ANTHRACENE	ug/Kg	348	U	353	U	362	U	358	U
ATRAZINE	ug/Kg	348	U	353	U	362	U	358	U
BENZALDEHYDE	ug/Kg	348	R	353	U	362	U	358	R
BENZO(a)ANTHRACENE	ug/Kg	32.5	J	353	U	362	U	358	U
BENZO(a)PYRENE	ug/Kg	31.1	J	28.3	J	26.7	J	358	U
BENZO(b)FLUORANTHENE	ug/Kg	52.4	J	50.2	J	27.9	J	27.1	J
BENZO(g,h,i)PERYLENE	ug/Kg	24.5	J	24.9	J	27.4	J	21.7	J

	StationID	NDAHSS23		NDAHSS24		NDAHSS25		NDAHSS26	
	SampleID	NDAHSS23-R01		NDAHSS24-R01		NDAHSS25-R01		NDAHSS26-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg								
1,2-DICHLOROBENZENE	ug/Kg								
1,3-DICHLOROBENZENE	ug/Kg								
1,4-DICHLOROBENZENE	ug/Kg								
2,4,5-TRICHLOROPHENOL	ug/Kg	1070	U	1060	U	1090	U	1130	U
2,4,6-TRICHLOROPHENOL	ug/Kg	356	U	354	U	364	U	377	U
2,4-DICHLOROPHENOL	ug/Kg	356	U	354	U	364	U	377	U
2,4-DIMETHYLPHENOL	ug/Kg	356	U	354	U	364	U	377	U
2,4-DINITROPHENOL	ug/Kg	1070	U	1060	U	1090	U	1130	U
2,4-DINITROTOLUENE	ug/Kg	356	U	354	U	364	U	377	U
2,6-DINITROTOLUENE	ug/Kg	356	U	354	U	364	U	377	U
2-CHLORONAPHTHALENE	ug/Kg	356	U	354	U	364	U	377	U
2-CHLOROPHENOL	ug/Kg	356	U	354	U	364	U	377	U
2-METHYLNAPHTHALENE	ug/Kg	356	U	354	U	95.6	J	377	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	356	U	354	U	364	U	377	U
2-NITROANILINE	ug/Kg	1070	U	1060	U	1090	U	1130	U
2-NITROPHENOL	ug/Kg	356	U	354	U	364	U	377	U
3,3'-DICHLOROBENZIDINE	ug/Kg	723	U	720	U	739	U	765	U
3-NITROANILINE	ug/Kg	1070	U	1060	U	1090	U	1130	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1070	U	1060	U	1090	U	1130	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	356	U	354	U	364	U	377	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	356	U	354	U	364	U	377	U
4-CHLOROANILINE	ug/Kg	356	R	354	R	364	R	377	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	356	U	354	U	364	U	377	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	356	U	354	U	364	U	377	U
4-NITROANILINE	ug/Kg	1070	U	1060	U	1090	U	1130	U
4-NITROPHENOL	ug/Kg	1070	U	1060	U	1090	U	1130	U
ACENAPHTHENE	ug/Kg	356	U	354	U	364	U	377	U
ACENAPHTHYLENE	ug/Kg	356	U	354	U	364	U	377	U
ACETOPHENONE	ug/Kg	356	U	354	U	364	U	377	U
ANTHRACENE	ug/Kg	356	U	354	U	364	U	377	U
ATRAZINE	ug/Kg	356	U	354	U	364	U	377	U
BENZALDEHYDE	ug/Kg	356	R	354	R	364	R	377	R
BENZO(a)ANTHRACENE	ug/Kg	356	U	94.6	J	45.1	J	377	U
BENZO(a)PYRENE	ug/Kg	356	U	96.9	J	42.6	J	377	U
BENZO(b)FLUORANTHENE	ug/Kg	25	J	93.5	J	54.4	J	18.7	J
BENZO(g,h,i)PERYLENE	ug/Kg	356	U	58.9	J	42.2	J	377	U

	StationID	NDAHSS27		NDAHSS27		NDAHSS28		NDAHSS29	
	SampleID	NDAHFD06P-R01		NDAHSS27-R01		NDAHSS28-R01		NDAHSS29-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg								
1,2-DICHLOROBENZENE	ug/Kg								
1,3-DICHLOROBENZENE	ug/Kg								
1,4-DICHLOROBENZENE	ug/Kg								
2,4,5-TRICHLOROPHENOL	ug/Kg	1080	U	1090	U	1100	U	1050	U
2,4,6-TRICHLOROPHENOL	ug/Kg	361	U	363	U	365	U	351	U
2,4-DICHLOROPHENOL	ug/Kg	361	U	363	U	365	U	351	U
2,4-DIMETHYLPHENOL	ug/Kg	361	U	363	U	365	U	351	U
2,4-DINITROPHENOL	ug/Kg	1080	U	1090	U	1100	U	1050	U
2,4-DINITROTOLUENE	ug/Kg	361	U	363	U	365	U	351	U
2,6-DINITROTOLUENE	ug/Kg	361	U	363	U	365	U	351	U
2-CHLORONAPHTHALENE	ug/Kg	361	U	363	U	365	U	351	U
2-CHLOROPHENOL	ug/Kg	361	U	363	U	365	U	351	U
2-METHYLNAPHTHALENE	ug/Kg	361	U	363	U	365	U	351	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	361	U	363	U	365	U	351	U
2-NITROANILINE	ug/Kg	1080	U	1090	U	1100	U	1050	U
2-NITROPHENOL	ug/Kg	361	U	363	U	365	U	351	U
3,3'-DICHLOROBENZIDINE	ug/Kg	734	U	738	U	741	U	713	U
3-NITROANILINE	ug/Kg	1080	U	1090	U	1100	U	1050	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1080	U	1090	U	1100	U	1050	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	361	U	363	U	365	U	351	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	361	U	363	U	365	U	351	U
4-CHLOROANILINE	ug/Kg	361	R	363	R	365	R	351	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	361	U	363	U	365	U	351	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	361	U	363	U	365	U	351	U
4-NITROANILINE	ug/Kg	1080	U	1090	U	1100	U	1050	U
4-NITROPHENOL	ug/Kg	1080	U	1090	U	1100	U	1050	U
ACENAPHTHENE	ug/Kg	361	U	363	U	365	U	351	U
ACENAPHTHYLENE	ug/Kg	361	U	363	U	365	U	351	U
ACETOPHENONE	ug/Kg	361	U	363	U	365	U	351	U
ANTHRACENE	ug/Kg	361	U	363	U	365	U	351	U
ATRAZINE	ug/Kg	361	U	363	U	365	U	351	U
BENZALDEHYDE	ug/Kg	361	R	363	R	365	R	351	R
BENZO(a)ANTHRACENE	ug/Kg	361	U	363	U	365	U	351	U
BENZO(a)PYRENE	ug/Kg	361	U	363	U	365	U	25.7	J
BENZO(b)FLUORANTHENE	ug/Kg	361	U	363	U	365	U	44.9	J
BENZO(g,h,i)PERYLENE	ug/Kg	361	U	363	U	365	U	24.4	J

Parameter	Units	AOCHSB001		AOCHSB001		AOCHSB002		AOCHSB003	
StationID		AOCHSB001		AOCHSB001		AOCHSB002		AOCHSB003	
SampleID		NDE004		NDE005FD1		NDE007		NDE009	
Date Collected		12/05/00		12/05/00		12/05/00		12/05/00	
SampleType		N		FD		N		N	
BENZO(k)FLUORANTHENE	ug/Kg	54	J	72	J	455	U	556	U
BENZYL BUTYL PHTHALATE	ug/Kg	475	U	471	U	455	U	556	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	475	U	471	U	455	U	556	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	475	U	471	U	455	U	556	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	475	U	471	U	455	U	556	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	475	U	471	U	455	U	556	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	475	U	471	U	455	U	556	U
CHRYSENE	ug/Kg	57	J	83	J	29	J	556	U
CRESOLS, m & p	ug/Kg	475	U	471	U	455	U	556	U
DI-n-BUTYL PHTHALATE	ug/Kg	475	U	49	J	455	U	556	U
DI-n-OCTYLPHTHALATE	ug/Kg	475	U	471	U	455	U	556	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	475	U	471	U	455	U	556	U
DIBENZOFURAN	ug/Kg	475	U	471	U	455	U	556	U
DIETHYL PHTHALATE	ug/Kg	475	U	471	U	455	U	556	U
DIMETHYL PHTHALATE	ug/Kg	475	U	471	U	455	U	556	U
FLUORANTHENE	ug/Kg	56	J	111	J	455	U	556	U
FLUORENE	ug/Kg	475	U	471	U	455	U	556	U
HEXACHLOROBENZENE	ug/Kg	475	U	471	U	455	U	556	U
HEXACHLOROBUTADIENE	ug/Kg	475	U	471	U	455	U	556	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	475	U	471	U	455	U	556	U
HEXACHLOROETHANE	ug/Kg	475	U	471	U	455	U	556	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	26	J	471	U	455	U	556	U
ISOPHORONE	ug/Kg	475	U	471	U	455	U	556	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	475	U	471	U	455	U	556	U
N-NITROSODIPHENYLAMINE	ug/Kg	475	U	471	U	455	U	556	U
NAPHTHALENE	ug/Kg	475	U	471	U	455	U	556	U
NITROBENZENE	ug/Kg	475	U	471	U	455	U	556	U
PENTACHLOROPHENOL	ug/Kg	1420	U	1410	U	1370	U	1670	U
PHENANTHRENE	ug/Kg	475	U	36	J	455	U	556	U
PHENOL	ug/Kg	475	U	471	U	455	U	556	U
PYRENE	ug/Kg	57	J	92	J	455	U	556	U

	StationID	AOCHSB004		AOCHSB005		AOCHSB006		AOCHSB007	
	SampleID	NDE011		NDE013		NDE015		NDE017	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	124	J	439	U	66	J	44	J
BENZYL BUTYL PHTHALATE	ug/Kg	480	U	439	U	416	U	488	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	480	U	439	U	416	U	488	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	480	U	439	U	416	U	488	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	480	U	439	U	416	U	488	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	480	U	439	U	416	U	488	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	480	U	439	U	416	U	488	U
CHRYSENE	ug/Kg	155	J	439	U	68	J	50	J
CRESOLS, m & p	ug/Kg	480	U	439	U	416	U	488	U
DI-n-BUTYL PHTHALATE	ug/Kg	480	U	439	U	416	U	488	U
DI-n-OCTYLPHTHALATE	ug/Kg	480	U	439	U	416	U	488	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	480	U	439	U	416	U	488	U
DIBENZOFURAN	ug/Kg	480	U	439	U	416	U	488	U
DIETHYL PHTHALATE	ug/Kg	480	U	439	U	416	U	488	U
DIMETHYL PHTHALATE	ug/Kg	480	U	439	U	416	U	488	U
FLUORANTHENE	ug/Kg	187	J	439	U	82	J	69	J
FLUORENE	ug/Kg	480	U	439	U	416	U	488	U
HEXACHLOROBENZENE	ug/Kg	480	U	439	U	416	U	488	U
HEXACHLOROBUTADIENE	ug/Kg	480	U	439	U	416	U	488	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	480	U	439	U	416	U	488	U
HEXACHLOROETHANE	ug/Kg	480	U	439	U	416	U	488	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	54	J	439	U	416	U	488	U
ISOPHORONE	ug/Kg	480	U	439	U	416	U	488	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	480	U	439	U	416	U	488	U
N-NITROSODIPHENYLAMINE	ug/Kg	480	U	439	U	416	U	488	U
NAPHTHALENE	ug/Kg	480	U	439	U	416	U	488	U
NITROBENZENE	ug/Kg	480	U	439	U	416	U	488	U
PENTACHLOROPHENOL	ug/Kg	1440	U	1320	U	1250	U	1460	U
PHENANTHRENE	ug/Kg	83	J	439	U	32	J	34	J
PHENOL	ug/Kg	480	U	439	U	416	U	488	U
PYRENE	ug/Kg	168	J	439	U	76	J	66	J

Parameter	Units	AOCHSB009		AOCHSB010		AOCHSB010		AOCHSB011	
	SampleID	NDE021		NDE023		NDE024FD1		NDE026	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		FD		N	
BENZO(k)FLUORANTHENE	ug/Kg	44	J	517	U	561	U	559	U
BENZYL BUTYL PHTHALATE	ug/Kg	531	U	517	U	561	U	559	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	531	U	517	U	561	U	559	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	531	U	517	U	561	U	559	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	531	U	517	U	561	U	559	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	531	U	517	U	561	U	559	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	531	U	517	U	561	U	559	U
CHRYSENE	ug/Kg	59	J	517	U	561	U	559	U
CRESOLS, m & p	ug/Kg	531	U	517	U	561	U	559	U
DI-n-BUTYL PHTHALATE	ug/Kg	531	U	517	U	561	U	559	U
DI-n-OCTYLPHTHALATE	ug/Kg	531	U	517	U	561	U	559	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	531	U	517	U	561	U	559	U
DIBENZOFURAN	ug/Kg	38	J	517	U	561	U	559	U
DIETHYL PHTHALATE	ug/Kg	531	U	517	U	561	U	559	U
DIMETHYL PHTHALATE	ug/Kg	531	U	517	U	561	U	559	U
FLUORANTHENE	ug/Kg	40	J	33	J	561	U	559	U
FLUORENE	ug/Kg	531	U	517	U	561	U	559	U
HEXACHLOROBENZENE	ug/Kg	531	U	517	U	561	U	559	U
HEXACHLOROBUTADIENE	ug/Kg	531	U	517	U	561	U	559	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	531	U	517	U	561	U	559	U
HEXACHLOROETHANE	ug/Kg	531	U	517	U	561	U	559	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	531	U	517	U	561	U	559	U
ISOPHORONE	ug/Kg	531	U	517	U	108	J	106	J
N-NITROSODI-n-PROPYLAMINE	ug/Kg	531	U	517	U	595	=	658	=
N-NITROSODIPHENYLAMINE	ug/Kg	531	U	517	U	561	U	559	U
NAPHTHALENE	ug/Kg	69	J	517	U	561	U	559	U
NITROBENZENE	ug/Kg	531	U	517	U	561	U	559	U
PENTACHLOROPHENOL	ug/Kg	1590	U	1550	U	1680	U	1680	U
PHENANTHRENE	ug/Kg	92	J	37	J	561	U	559	U
PHENOL	ug/Kg	531	U	517	U	561	U	559	U
PYRENE	ug/Kg	49	J	32	J	561	U	559	U

	StationID	AOCHSB012		AOCHSB013		AOCHSB014		AOCHSB015	
	SampleID	NDE028		NDE030		NDE032		NDE034	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	594	U	567	U	575	U	551	U
BENZYL BUTYL PHTHALATE	ug/Kg	594	U	567	U	575	U	551	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	594	U	567	U	575	U	551	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	594	U	567	U	575	U	551	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	594	U	567	U	575	U	551	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	594	U	567	U	575	U	551	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	594	U	567	U	575	U	551	U
CHRYSENE	ug/Kg	594	U	567	U	575	U	551	U
CRESOLS, m & p	ug/Kg	594	U	567	U	575	U	551	U
DI-n-BUTYL PHTHALATE	ug/Kg	594	U	567	U	575	U	551	U
DI-n-OCTYLPHTHALATE	ug/Kg	594	U	567	U	575	U	551	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	594	U	567	U	575	U	551	U
DIBENZOFURAN	ug/Kg	594	U	567	U	575	U	551	U
DIETHYL PHTHALATE	ug/Kg	594	U	567	U	575	U	551	U
DIMETHYL PHTHALATE	ug/Kg	594	U	567	U	575	U	551	U
FLUORANTHENE	ug/Kg	594	U	567	U	575	U	551	U
FLUORENE	ug/Kg	594	U	567	U	575	U	551	U
HEXACHLOROBENZENE	ug/Kg	594	U	567	U	575	U	551	U
HEXACHLOROBUTADIENE	ug/Kg	594	U	567	U	575	U	551	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	594	U	567	U	575	U	551	U
HEXACHLOROETHANE	ug/Kg	594	U	567	U	575	U	551	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	594	U	37	J	575	U	551	U
ISOPHORONE	ug/Kg	112	J	567	U	575	U	551	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	562	J	717	=	575	U	551	U
N-NITROSODIPHENYLAMINE	ug/Kg	594	U	567	U	575	U	551	U
NAPHTHALENE	ug/Kg	594	U	567	U	575	U	551	U
NITROBENZENE	ug/Kg	594	U	567	U	575	U	551	U
PENTACHLOROPHENOL	ug/Kg	1780	U	1700	U	1730	U	1650	U
PHENANTHRENE	ug/Kg	594	U	567	U	575	U	551	U
PHENOL	ug/Kg	594	U	567	U	575	U	551	U
PYRENE	ug/Kg	594	U	567	U	575	U	551	U

	StationID	AOCHSB016		AOCHSS001		AOCHSS002		AOCHSS003	
	SampleID	NDE037		NDE176		NDE177		NDE178	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	53	J	28200	U	521	U	11500	U
BENZYL BUTYL PHTHALATE	ug/Kg	518	U	28200	U	521	U	11500	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	518	U	28200	U	521	U	11500	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	518	U	28200	U	521	U	11500	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	518	U	28200	U	521	U	11500	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	518	U	28200	U	521	U	11500	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	518	U	28200	U	521	U	11500	U
CHRYSENE	ug/Kg	54	J	28200	U	521	U	11500	U
CRESOLS, m & p	ug/Kg	518	U	28200	U	521	U	11500	U
DI-n-BUTYL PHTHALATE	ug/Kg	518	U	28200	U	521	U	11500	U
DI-n-OCTYLPHTHALATE	ug/Kg	518	U	28200	U	521	U	11500	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	518	U	28200	U	521	U	11500	U
DIBENZOFURAN	ug/Kg	518	U	28200	U	521	U	11500	U
DIETHYL PHTHALATE	ug/Kg	518	U	28200	U	521	U	11500	U
DIMETHYL PHTHALATE	ug/Kg	518	U	28200	U	521	U	11500	U
FLUORANTHENE	ug/Kg	53	J	28200	U	521	U	11500	U
FLUORENE	ug/Kg	518	U	28200	U	521	U	11500	U
HEXACHLOROBENZENE	ug/Kg	518	U	28200	U	521	U	11500	U
HEXACHLOROBUTADIENE	ug/Kg	518	U	28200	U	521	U	11500	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	518	U	28200	U	521	U	11500	U
HEXACHLOROETHANE	ug/Kg	518	U	28200	U	521	U	11500	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	518	U	28200	U	521	U	11500	U
ISOPHORONE	ug/Kg	518	U	28200	U	521	U	11500	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	518	U	28200	U	521	U	11500	U
N-NITROSODIPHENYLAMINE	ug/Kg	518	U	28200	U	521	U	11500	U
NAPHTHALENE	ug/Kg	518	U	28200	U	521	U	11500	U
NITROBENZENE	ug/Kg	518	U	28200	U	521	U	11500	U
PENTACHLOROPHENOL	ug/Kg	1550	U	84500	U	1560	U	34400	U
PHENANTHRENE	ug/Kg	518	U	28200	U	521	U	11500	U
PHENOL	ug/Kg	518	U	28200	U	521	U	11500	U
PYRENE	ug/Kg	58	J	1900	J	521	U	11500	U

	StationID	AOCHSS004		NDAHSS17		NDAHSS18		NDAHSS19	
	SampleID	NDE179		NDAHSS17-R01		NDAHSS18-R01		NDAHSS19-R01	
	Date Collected	12/05/00		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	884	U	42.1	J	70	J	39.4	J
BENZYL BUTYL PHTHALATE	ug/Kg	884	U	379	U	351	U	411	UJ
BIPHENYL (DIPHENYL)	ug/Kg			379	U	351	U	411	UJ
bis(2-CHLOROETHOXY) METHANE	ug/Kg	884	U	379	R	351	R	408	R
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	884	U	379	U	351	U	411	UJ
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	884	U	379	U	351	U	411	UJ
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	884	U	379	U	351	U	411	UJ
CAPROLACTAM	ug/Kg			379	U	351	U	411	UJ
CARBAZOLE	ug/Kg	884	U	379	U	351	U	411	UJ
CHRYSENE	ug/Kg	884	U	44	J	69.9	J	41.6	J
CRESOLS, m & p	ug/Kg	884	U						
DI-n-BUTYL PHTHALATE	ug/Kg	884	U	379	U	351	U	411	UJ
DI-n-OCTYLPHTHALATE	ug/Kg	884	U	379	U	351	U	411	UJ
DIBENZ(a,h)ANTHRACENE	ug/Kg	884	U	379	U	351	U	411	UJ
DIBENZOFURAN	ug/Kg	884	U	379	U	351	U	411	UJ
DIETHYL PHTHALATE	ug/Kg	884	U	379	U	351	U	411	UJ
DIMETHYL PHTHALATE	ug/Kg	884	U	379	U	351	U	411	UJ
FLUORANTHENE	ug/Kg	884	U	36.9	J	29.1	J	411	UJ
FLUORENE	ug/Kg	884	U	379	U	351	U	408	R
HEXACHLOROBENZENE	ug/Kg	884	U	379	U	351	U	411	UJ
HEXACHLOROBUTADIENE	ug/Kg	884	U	379	U	351	U	411	UJ
HEXACHLOROCYCLOPENTADIENE	ug/Kg	884	U	379	U	351	U	411	UJ
HEXACHLOROETHANE	ug/Kg	884	U	379	R	351	R	408	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	884	U	56.7	J	63.6	J	44.2	J
ISOPHORONE	ug/Kg	884	U	379	U	351	U	411	UJ
N-NITROSODI-n-PROPYLAMINE	ug/Kg	884	U	379	U	351	U	411	UJ
N-NITROSODIPHENYLAMINE	ug/Kg	884	U	379	U	351	U	411	UJ
NAPHTHALENE	ug/Kg	884	U	379	U	351	U	408	R
NITROBENZENE	ug/Kg	884	U	379	U	351	U	411	UJ
PENTACHLOROPHENOL	ug/Kg	2650	U	1140	U	1050	U	1220	R
PHENANTHRENE	ug/Kg	884	U	379	U	351	U	411	UJ
PHENOL	ug/Kg	884	U	379	U	351	U	411	UJ
PYRENE	ug/Kg	884	U	43.2	J	45	J	411	UJ

Parameter	Units	NDAHSS20		NDAHSS20		NDAHSS21		NDAHSS22	
StationID		NDAHSS20		NDAHSS20		NDAHSS21		NDAHSS22	
SampleID		NDAHFD04P-R01		NDAHSS20-R01		NDAHSS21-R01		NDAHSS22-R01	
Date Collected		08/26/03		08/26/03		08/26/03		08/26/03	
SampleType		FD		N		N		N	
BENZO(k)FLUORANTHENE	ug/Kg	38.8	J	35.9	J	22	J	19.6	J
BENZYL BUTYL PHTHALATE	ug/Kg	348	U	353	U	362	U	358	U
BIPHENYL (DIPHENYL)	ug/Kg	348	U	353	U	362	U	358	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	348	U	353	R	362	R	358	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	348	U	353	U	362	U	358	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	348	U	353	U	362	U	358	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	76.6	J	353	U	362	U	85.3	J
CAPROLACTAM	ug/Kg	348	U	353	U	362	U	358	U
CARBAZOLE	ug/Kg	348	U	353	U	362	U	358	U
CHRYSENE	ug/Kg	49.8	J	47.1	J	25.4	J	24.7	J
CRESOLS, m & p	ug/Kg								
DI-n-BUTYL PHTHALATE	ug/Kg	348	U	353	U	362	U	358	U
DI-n-OCTYLPHTHALATE	ug/Kg	348	U	353	U	362	U	358	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	348	U	353	U	362	U	358	U
DIBENZOFURAN	ug/Kg	348	U	353	U	362	U	358	U
DIETHYL PHTHALATE	ug/Kg	348	U	353	U	362	U	358	U
DIMETHYL PHTHALATE	ug/Kg	348	U	353	U	362	U	358	U
FLUORANTHENE	ug/Kg	42.6	J	38.5	J	24.6	J	25.8	J
FLUORENE	ug/Kg	348	U	353	U	362	U	358	U
HEXACHLOROBENZENE	ug/Kg	348	U	353	U	362	U	358	U
HEXACHLOROBUTADIENE	ug/Kg	348	U	353	U	362	U	358	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	348	U	353	U	362	U	358	U
HEXACHLOROETHANE	ug/Kg	348	R	353	R	362	R	358	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	36.8	J	353	U	362	U	358	U
ISOPHORONE	ug/Kg	348	U	353	U	362	U	358	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	348	U	353	U	362	U	358	U
N-NITROSODIPHENYLAMINE	ug/Kg	348	U	353	U	362	U	358	U
NAPHTHALENE	ug/Kg	348	U	353	U	362	U	358	U
NITROBENZENE	ug/Kg	348	U	353	U	362	U	358	U
PENTACHLOROPHENOL	ug/Kg	1040	U	1060	U	1080	U	1080	U
PHENANTHRENE	ug/Kg	348	U	353	U	362	U	358	U
PHENOL	ug/Kg	348	U	353	U	362	U	358	U
PYRENE	ug/Kg	48	J	43.5	J	29.6	J	29	J

	StationID	NDAHSS23		NDAHSS24		NDAHSS25		NDAHSS26	
	SampleID	NDAHSS23-R01		NDAHSS24-R01		NDAHSS25-R01		NDAHSS26-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	356	U	76.3	J	33.9	J	377	U
BENZYL BUTYL PHTHALATE	ug/Kg	356	U	354	U	364	U	377	U
BIPHENYL (DIPHENYL)	ug/Kg	356	U	354	U	364	U	377	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	356	U	354	U	364	U	377	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	356	U	354	U	364	U	377	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	356	U	354	U	364	U	377	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	82.7	J	117	J	83.1	J	72.9	J
CAPROLACTAM	ug/Kg	356	U	354	U	364	U	377	U
CARBAZOLE	ug/Kg	356	U	354	U	364	U	377	U
CHRYSENE	ug/Kg	22.5	J	97.2	J	67.1	J	377	U
CRESOLS, m & p	ug/Kg								
DI-n-BUTYL PHTHALATE	ug/Kg	356	U	354	U	364	U	377	U
DI-n-OCTYLPHTHALATE	ug/Kg	356	U	354	U	364	U	377	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	356	U	354	U	364	U	377	U
DIBENZOFURAN	ug/Kg	356	U	354	U	29.4	J	377	U
DIETHYL PHTHALATE	ug/Kg	356	U	354	U	364	U	377	U
DIMETHYL PHTHALATE	ug/Kg	356	U	354	U	364	U	377	U
FLUORANTHENE	ug/Kg	27.2	J	112	J	52.2	J	377	U
FLUORENE	ug/Kg	356	U	354	U	364	U	377	U
HEXACHLOROBENZENE	ug/Kg	356	U	354	U	364	U	377	U
HEXACHLOROBUTADIENE	ug/Kg	356	U	354	U	364	U	377	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	356	U	354	U	364	U	377	U
HEXACHLOROETHANE	ug/Kg	356	R	354	R	364	R	377	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	356	U	84.8	J	48.9	J	377	U
ISOPHORONE	ug/Kg	356	U	354	U	364	U	377	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	356	U	354	U	364	U	377	U
N-NITROSODIPHENYLAMINE	ug/Kg	356	U	354	U	364	U	377	U
NAPHTHALENE	ug/Kg	356	U	354	U	42.4	J	377	U
NITROBENZENE	ug/Kg	356	U	354	U	364	U	377	U
PENTACHLOROPHENOL	ug/Kg	1070	U	1060	U	1090	U	1130	U
PHENANTHRENE	ug/Kg	356	U	21.1	J	81.6	J	377	U
PHENOL	ug/Kg	356	U	354	U	364	U	377	U
PYRENE	ug/Kg	28.2	J	125	J	54.8	J	377	U

Parameter	Units	NDAHSS27		NDAHSS27		NDAHSS28		NDAHSS29	
	SampleID	NDAHFD06P-R01		NDAHSS27-R01		NDAHSS28-R01		NDAHSS29-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
BENZO(k)FLUORANTHENE	ug/Kg	361	U	363	U	365	U	28.3	J
BENZYL BUTYL PHTHALATE	ug/Kg	361	U	363	U	365	U	351	U
BIPHENYL (DIPHENYL)	ug/Kg	361	U	363	U	365	U	351	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	361	U	363	U	365	U	351	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL E	ug/Kg	361	U	363	U	365	U	351	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	361	U	363	U	365	U	351	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	81.8	J	76.6	J	90.5	J	81.9	J
CAPROLACTAM	ug/Kg	361	U	363	U	365	U	351	U
CARBAZOLE	ug/Kg	361	U	363	U	365	U	351	U
CHRYSENE	ug/Kg	361	U	363	U	365	U	24.1	J
CRESOLS, m & p	ug/Kg								
DI-n-BUTYL PHTHALATE	ug/Kg	361	U	363	U	365	U	351	U
DI-n-OCTYLPHTHALATE	ug/Kg	361	U	363	U	365	U	351	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	361	U	363	U	365	U	351	U
DIBENZOFURAN	ug/Kg	361	U	363	U	365	U	351	U
DIETHYL PHTHALATE	ug/Kg	361	U	363	U	365	U	351	U
DIMETHYL PHTHALATE	ug/Kg	361	U	363	U	365	U	351	U
FLUORANTHENE	ug/Kg	361	U	363	U	365	U	351	U
FLUORENE	ug/Kg	361	U	363	U	365	U	351	U
HEXACHLOROBENZENE	ug/Kg	361	U	363	U	365	U	351	U
HEXACHLOROBUTADIENE	ug/Kg	361	U	363	U	365	U	351	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	361	U	363	U	365	U	351	U
HEXACHLOROETHANE	ug/Kg	361	R	363	R	365	R	351	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	361	U	363	U	365	U	351	U
ISOPHORONE	ug/Kg	361	U	363	U	365	U	351	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	361	U	363	U	365	U	351	U
N-NITROSODIPHENYLAMINE	ug/Kg	361	U	363	U	365	U	351	U
NAPHTHALENE	ug/Kg	361	U	363	U	365	U	351	U
NITROBENZENE	ug/Kg	361	U	363	U	365	U	351	U
PENTACHLOROPHENOL	ug/Kg	1080	U	1090	U	1100	U	1050	U
PHENANTHRENE	ug/Kg	361	U	363	U	365	U	351	U
PHENOL	ug/Kg	361	U	363	U	365	U	351	U
PYRENE	ug/Kg	361	U	363	U	365	U	351	U

	StationID	AOCHSB001		AOCHSB001		AOCHSB002		AOCHSB003	
	SampleID	NDE004		NDE005FD1		NDE007		NDE009	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		FD		N		N	
Parameter	**Units**								
ACETONE	ug/Kg	10	R	10	R	10	R	15	R
BROMODICHLOROMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
BROMOMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
BENZENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
TOLUENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
CARBON DISULFIDE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
CHLOROBENZENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
CHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
CHLOROMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
CARBON TETRACHLORIDE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
DIBROMOCHLOROMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,1-DICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,2-DICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,1-DICHLOROETHENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,2-DICHLOROPROPANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
ETHYLBENZENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
2-HEXANONE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	10	R	10	R	15	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
METHYLENE CHLORIDE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
STYRENE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
BROMOFORM	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
CHLOROFORM	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
VINYL CHLORIDE	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
XYLENES, TOTAL	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	UJ	10	UJ	10	UJ	15	UJ

	StationID	AOCHSB004		AOCHSB005		AOCHSB006		AOCHSB007	
	SampleID	NDE011		NDE013		NDE015		NDE017	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
ACETONE	ug/Kg	10	R	10	R	21	R	19	R
BROMODICHLOROMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
BROMOMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
BENZENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
TOLUENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
CARBON DISULFIDE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
CHLOROBENZENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
CHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
CHLOROMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
CARBON TETRACHLORIDE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
DIBROMOCHLOROMETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,1-DICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,2-DICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,1-DICHLOROETHENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,2-DICHLOROPROPANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
ETHYLBENZENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
2-HEXANONE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	10	R	10	R	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
METHYLENE CHLORIDE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
STYRENE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
BROMOFORM	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
CHLOROFORM	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
VINYL CHLORIDE	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
XYLENES, TOTAL	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	UJ	10	UJ	10	UJ	10	UJ

	StationID	AOCHSB009		AOCHSB010		AOCHSB010		AOCHSB011	
	SampleID	NDE021		NDE023		NDE024FD1		NDE026	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		FD		N	
Parameter	**Units**								
ACETONE	ug/Kg	21	R	10	R	11	R	10	R
BROMODICHLOROMETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
BROMOMETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
BENZENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
TOLUENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
CARBON DISULFIDE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
CHLOROBENZENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
CHLOROETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
CHLOROMETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
CARBON TETRACHLORIDE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
DIBROMOCHLOROMETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,1-DICHLOROETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,2-DICHLOROETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,1-DICHLOROETHENE	ug/Kg	0.78	J	10	U	11	UJ	10	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,2-DICHLOROPROPANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
ETHYLBENZENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
2-HEXANONE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	13	R	10	R	11	R	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
METHYLENE CHLORIDE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
STYRENE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
BROMOFORM	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
CHLOROFORM	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
VINYL CHLORIDE	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
XYLENES, TOTAL	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	13	UJ	10	U	11	UJ	10	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	13	UJ	10	U	11	UJ	10	UJ

	StationID	AOCHSB012		AOCHSB013		AOCHSB014		AOCHSB015	
	SampleID	NDE028		NDE030		NDE032		NDE034	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
ACETONE	ug/Kg	11	R	32	R	30	R	38	R
BROMODICHLOROMETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
BROMOMETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
BENZENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
TOLUENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
CARBON DISULFIDE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
CHLOROBENZENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
CHLOROETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
CHLOROMETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
CARBON TETRACHLORIDE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
DIBROMOCHLOROMETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,1-DICHLOROETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,2-DICHLOROETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,1-DICHLOROETHENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,2-DICHLOROPROPANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
ETHYLBENZENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
2-HEXANONE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	11	R	10	R	10	R	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
METHYLENE CHLORIDE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
STYRENE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
BROMOFORM	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
CHLOROFORM	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
VINYL CHLORIDE	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
XYLENES, TOTAL	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	11	UJ	10	UJ	10	UJ	10	UJ

	StationID	AOCHSB016		AOCHSS001		AOCHSS002		AOCHSS003	
	SampleID	NDE037		NDE176		NDE177		NDE178	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
ACETONE	ug/Kg	10	R	948	R	10	R	11	R
BROMODICHLOROMETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
BROMOMETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
BENZENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
TOLUENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
CARBON DISULFIDE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
CHLOROBENZENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
CHLOROETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
CHLOROMETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
CARBON TETRACHLORIDE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
DIBROMOCHLOROMETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,1-DICHLOROETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,2-DICHLOROETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,1-DICHLOROETHENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,2-DICHLOROPROPANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
ETHYLBENZENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
2-HEXANONE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	948	R	10	R	11	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
METHYLENE CHLORIDE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
STYRENE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
BROMOFORM	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
CHLOROFORM	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
VINYL CHLORIDE	ug/Kg	10	UJ	948	U	10	UJ	11	UJ
XYLENES, TOTAL	ug/Kg	10	UJ	82	J	10	UJ	11	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	UJ	58	J	10	UJ	11	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	UJ	24	J	10	UJ	11	UJ

Parameter	Units		
	StationID	AOCHSS004	
	SampleID	NDE179	
	Date Collected	12/05/00	
	SampleType	N	
ACETONE	ug/Kg	12	R
BROMODICHLOROMETHANE	ug/Kg	12	UJ
BROMOMETHANE	ug/Kg	12	UJ
BENZENE	ug/Kg	12	UJ
TOLUENE	ug/Kg	12	UJ
CARBON DISULFIDE	ug/Kg	12	UJ
CHLOROBENZENE	ug/Kg	12	UJ
CHLOROETHANE	ug/Kg	12	UJ
CHLOROMETHANE	ug/Kg	12	UJ
CARBON TETRACHLORIDE	ug/Kg	12	UJ
DIBROMOCHLOROMETHANE	ug/Kg	12	UJ
1,1-DICHLOROETHANE	ug/Kg	12	UJ
1,2-DICHLOROETHANE	ug/Kg	12	UJ
1,1-DICHLOROETHENE	ug/Kg	12	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	12	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	12	UJ
1,2-DICHLOROPROPANE	ug/Kg	12	UJ
ETHYLBENZENE	ug/Kg	12	UJ
2-HEXANONE	ug/Kg	12	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	12	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	12	UJ
METHYLENE CHLORIDE	ug/Kg	12	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	12	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	12	UJ
STYRENE	ug/Kg	12	UJ
BROMOFORM	ug/Kg	12	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	12	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	12	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	12	UJ
CHLOROFORM	ug/Kg	12	UJ
VINYL CHLORIDE	ug/Kg	12	UJ
XYLENES, TOTAL	ug/Kg	12	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	12	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	12	UJ

	StationID	NDAHSB17		NDAHSB18		NDAHSB19		NDAHSB20		NDAH
	SampleID	NDAHSB17-R01		NDAHSB18-R01		NDAHSB19-R01		NDAHFD05P-R01		NDAHSE
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/2(
	SampleType	N		N		N		FD		N
Parameter	**Units**									
1,3-Dinitrobenzene	ug/Kg	133	U	150	U	127	U	130	U	129
2,4-Dinitrotoluene	ug/Kg	133	U	150	U	127	U	130	U	129
2,6-Dinitrotoluene	ug/Kg	133	U	150	U	127	U	130	U	129
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoci	ug/Kg	133	U	150	U	127	U	130	U	129
2-Nitrotoluene	ug/Kg	133	U	150	U	127	U	130	U	129
3-Nitrotoluene	ug/Kg	133	U	150	U	127	U	130	U	129
4-Nitrotoluene	ug/Kg	133	U	150	U	127	U	130	U	129
Nitrobenzene	ug/Kg	133	U	150	U	127	U	130	U	129
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	133	U	150	U	127	U	130	U	129
Tetryl	ug/Kg	133	UJ	150	UJ	127	UJ	130	UJ	129
1,3,5-Trinitrobenzene	ug/Kg	133	U	150	U	127	U	130	U	129
2,4,6-trinitrotoluene	ug/Kg	133	U	150	U	127	U	130	U	129

	StationID	SB20	NDAHSB21		NDAHSB22		NDAHSB23		NDAHSB24	
	SampleID	320-R01	NDAHSB21-R01		NDAHSB22-R01		NDAHSB23-R01		NDAHSB24-R01	
	Date Collected	6/03	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	I	N		N		N		N	
Parameter	Units									
1,3-Dinitrobenzene	ug/Kg	U	128	U	128	U	127	U	130	U
2,4-Dinitrotoluene	ug/Kg	U	128	U	128	U	127	U	130	U
2,6-Dinitrotoluene	ug/Kg	U	128	U	128	U	127	U	130	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoci	ug/Kg	U	128	U	128	U	127	U	130	U
2-Nitrotoluene	ug/Kg	U	128	U	128	U	127	U	130	U
3-Nitrotoluene	ug/Kg	U	128	U	128	U	127	U	130	U
4-Nitrotoluene	ug/Kg	U	128	U	128	U	127	U	130	U
Nitrobenzene	ug/Kg	U	128	U	128	U	127	U	130	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	U	128	U	128	U	127	U	130	U
Tetryl	ug/Kg	UJ	128	UJ	128	UJ	127	UJ	130	UJ
1,3,5-Trinitrobenzene	ug/Kg	U	128	U	128	U	127	U	130	U
2,4,6-trinitrotoluene	ug/Kg	U	128	U	128	U	127	U	130	U

	StationID	NDAHSB25		NDAHSB26		NDAHSB27		NDAHSB28		NDAH
	SampleID	NDAHSB25-R01		NDAHSB26-R01		NDAHSB27-R01		NDAHSB28-R01		NDAHSI
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/2
	SampleType	N		N		N		N		N
Parameter	**Units**									
1,3-Dinitrobenzene	ug/Kg	136	U	135	U	137	U	152	U	130
2,4-Dinitrotoluene	ug/Kg	136	U	135	U	137	U	152	U	130
2,6-Dinitrotoluene	ug/Kg	136	U	135	U	137	U	152	U	130
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoci	ug/Kg	136	U	135	U	137	U	152	U	130
2-Nitrotoluene	ug/Kg	136	U	135	U	137	U	152	U	130
3-Nitrotoluene	ug/Kg	136	U	135	U	137	U	152	U	130
4-Nitrotoluene	ug/Kg	136	U	135	U	137	U	152	U	130
Nitrobenzene	ug/Kg	136	U	135	U	137	U	152	U	130
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	136	U	135	U	137	U	152	U	130
Tetryl	ug/Kg	136	UJ	135	UJ	137	UJ	152	UJ	130
1,3,5-Trinitrobenzene	ug/Kg	136	U	135	U	137	U	152	U	130
2,4,6-trinitrotoluene	ug/Kg	136	U	135	U	137	U	152	U	130

	StationID	SB29
	SampleID	329-R01
	Date Collected	6/03
	SampleType	l
Parameter	Units	
1,3-Dinitrobenzene	ug/Kg	U
2,4-Dinitrotoluene	ug/Kg	U
2,6-Dinitrotoluene	ug/Kg	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoci	ug/Kg	U
2-Nitrotoluene	ug/Kg	U
3-Nitrotoluene	ug/Kg	U
4-Nitrotoluene	ug/Kg	U
Nitrobenzene	ug/Kg	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	U
Tetryl	ug/Kg	UJ
1,3,5-Trinitrobenzene	ug/Kg	U
2,4,6-trinitrotoluene	ug/Kg	U

Analytical Data Summary

Parameter	Units	AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004		AOCHSB005	
SampleID		NDE006		NDE008		NDE010		NDE012		NDE014	
Date Collected		12/05/00		12/05/00		12/05/00		12/05/00		12/05/00	
SampleType		N		N		N		N		N	
Aluminum	mg/Kg	5900	=	2500	=	6900	=	4200	=	2900	=
Antimony	mg/Kg	0.9	J	0.25	UJ	0.59	J	0.44	J	0.25	UJ
Arsenic	mg/Kg	24	=	0.78	J	10	=	0.69	J	0.3	U
Barium	mg/Kg	44	J	26	J	87	J	160	J	23	J
Beryllium	mg/Kg	0.039	U	0.035	U	0.035	U	0.035	U	0.035	U
Cadmium	mg/Kg	0.032	U	0.028	U	0.029	U	0.029	U	0.028	U
Calcium	mg/Kg	4800	=	1400	=	5200	=	2100	=	1900	=
Chromium, Total	mg/Kg	16	J	3.6	J	10	J	5.3	J	3.6	J
Cobalt	mg/Kg	5.9	J	2.2	J	6.9	J	7.9	J	2.4	J
Copper	mg/Kg	17	=	7	=	31	=	15	=	7.7	=
Iron	mg/Kg	16000	=	6900	=	19000	=	12000	=	7800	=
Lead	mg/Kg	7.5	=	1.8	=	8.6	=	2.5	=	2	=
Magnesium	mg/Kg	2300	=	840	J	3600	=	1600	=	980	J
Manganese	mg/Kg	310	=	160	=	370	=	680	=	110	=
Mercury	mg/Kg	0.013	J	0.0026	U	0.011	J	0.0038	J	0.0032	J
Nickel	mg/Kg	5.5	J	1.2	J	4.2	J	2.7	J	1.2	J
Potassium	mg/Kg	1100	J	440	J	2700	=	980	J	650	J
Selenium	mg/Kg	0.91	J	0.48	U	1.3	=	0.84	J	0.55	J
Silver	mg/Kg	0.068	U	0.06	U	0.061	U	0.061	U	0.06	U
Sodium	mg/Kg	140	J	43	J	200	J	48	J	60	J
Thallium	mg/Kg	0.41	U	0.36	U	0.36	U	0.36	U	0.36	U
Vanadium	mg/Kg	44	=	20	=	52	=	36	=	22	=
Zinc	mg/Kg	33	=	8.8	=	41	=	16	=	13	=

	StationID	AOCHSB008		AOCHSB009		AOCHSB006		AOCHSB007		AOCHSB008	
	SampleID	NDE019		NDE022		NDE016		NDE018		NDE020	
	Date Collected	12/05/00		12/05/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	5300	=	5200	=	3100	=	4300	=	4200	=
Antimony	mg/Kg	0.36	J	0.27	UJ	0.38	J	0.44	J	0.27	UJ
Arsenic	mg/Kg	1.4	J	0.32	U	0.31	U	0.31	U	0.64	J
Barium	mg/Kg	110	J	63	=	20	J	200	=	86	=
Beryllium	mg/Kg	0.15	J	0.22	J	0.035	U	0.15	J	0.15	J
Cadmium	mg/Kg	0.03	U	0.03	U	0.028	U	0.029	U	0.03	U
Calcium	mg/Kg	34000	=	1800	=	2700	=	2700	=	8400	=
Chromium, Total	mg/Kg	7.9	J	5.7	=	6.4	=	13	=	8.9	=
Cobalt	mg/Kg	4.2	J	5.1	J	3.1	J	16	=	4.2	J
Copper	mg/Kg	50	=	14	=	10	=	16	=	16	=
Iron	mg/Kg	12000	=	15000	=	9300	=	15000	=	11000	=
Lead	mg/Kg	48	=	1.2	=	5.7	=	4.4	=	5.9	=
Magnesium	mg/Kg	3600	=	2000	=	1400	=	3100	=	2500	=
Manganese	mg/Kg	390	=	600	=	150	=	1000	=	520	=
Mercury	mg/Kg	0.041	J	0.0034	J	0.0026	U	0.0026	U	0.0028	U
Nickel	mg/Kg	4	J	2.9	J	3.1	J	3.4	J	7.5	J
Potassium	mg/Kg	2600	=	1000	J	560	J	970	J	1300	=
Selenium	mg/Kg	0.5	UJ	0.76	J	0.79	J	0.57	J	0.51	U
Silver	mg/Kg	0.063	U	0.064	U	0.06	U	0.06	U	0.064	U
Sodium	mg/Kg	420	J	170	J	59	J	46	J	240	J
Thallium	mg/Kg	0.37	U	0.38	U	0.36	U	0.36	U	0.38	U
Vanadium	mg/Kg	29	=	36	=	27	=	40	=	31	=
Zinc	mg/Kg	130	=	17	J	20	J	26	J	27	J

Analytical Data Summary

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Parameter	Units	AOCHSB009		AOCHSB009		AOCHSB010		AOCHSB011		AOCHSB012	
	SampleID	NDE203		NDE204		NDE025		NDE027		NDE029	
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N		N	
Aluminum	mg/Kg	9700	=	11000	=	5200	=	4000	=	5000	=
Antimony	mg/Kg	0.44	J	0.49	J	0.28	UJ	0.27	UJ	0.28	UJ
Arsenic	mg/Kg	0.76	J	0.35	U	1.1	J	0.32	U	0.34	U
Barium	mg/Kg	69	=	120	=	74	=	60	=	57	=
Beryllium	mg/Kg	0.48	J	0.42	J	0.18	J	0.16	J	0.19	J
Cadmium	mg/Kg	0.032	U	0.033	U	0.031	U	0.03	U	0.032	U
Calcium	mg/Kg	1800	=	3000	=	2000	=	2900	=	3900	=
Chromium, Total	mg/Kg	23	=	27	=	6.7	=	6.4	=	8.1	=
Cobalt	mg/Kg	8.4	J	15	=	5.8	J	5.5	J	6.1	J
Copper	mg/Kg	23	=	30	=	16	=	10	=	15	=
Iron	mg/Kg	22000	=	28000	=	18000	=	13000	=	17000	=
Lead	mg/Kg	2.1	=	2.2	=	1.1	=	1.2	=	1.1	=
Magnesium	mg/Kg	3000	=	4200	=	2000	=	1600	=	2000	=
Manganese	mg/Kg	420	=	850	=	960	=	290	=	300	=
Mercury	mg/Kg	0.0029	U	0.003	U	0.0029	U	0.0041	J	0.0094	J
Nickel	mg/Kg	6.9	J	9.2	J	2.5	J	2.3	J	2.7	J
Potassium	mg/Kg	630	J	840	J	1000	J	830	J	1100	J
Selenium	mg/Kg	0.9	J	0.89	J	1.2	J	0.61	J	0.65	J
Silver	mg/Kg	0.067	U	0.069	U	0.066	U	0.064	U	0.067	U
Sodium	mg/Kg	590	J	850	J	290	J	130	J	310	J
Thallium	mg/Kg	0.43	J	0.41	U	0.39	U	0.38	U	0.4	U
Vanadium	mg/Kg	79	=	75	=	46	=	34	=	54	=
Zinc	mg/Kg	20	J	28	J	16	J	15	J	18	J

Analytical Data Summary

	StationID	AOCHSB013		AOCHSB014		AOCHSB015		AOCHSB015		AOCHSB016	
	SampleID	NDE031		NDE033		NDE035		NDE036FD1		NDE038	
	Date Collected	12/06/00		12/07/00		12/07/00		12/07/00		12/07/00	
	SampleType	N		N		N		FD		N	
Parameter	**Units**										
Aluminum	mg/Kg	3200	=	7000	=	8900	=	8500	=	9400	=
Antimony	mg/Kg	0.26	UJ	0.27	UJ	0.27	UJ	0.27	UJ	0.44	J
Arsenic	mg/Kg	0.32	U	0.32	U	0.33	U	0.32	U	0.88	J
Barium	mg/Kg	29	J	85	=	98	=	84	=	81	=
Beryllium	mg/Kg	0.17	J	0.21	J	0.24	J	0.23	J	0.26	J
Cadmium	mg/Kg	0.029	U	0.03	U	0.031	U	0.03	U	0.03	U
Calcium	mg/Kg	1700	=	6200	J	4100	J	5200	J	3300	J
Chromium, Total	mg/Kg	3.3	=	8.9	J	11	J	9.5	J	10	J
Cobalt	mg/Kg	4.1	J	7	J	9	J	8.5	J	9	J
Copper	mg/Kg	17	=	23	=	28	=	24	=	25	=
Iron	mg/Kg	11000	=	19000	=	20000	=	19000	=	22000	=
Lead	mg/Kg	0.92	=	12	=	1.7	=	2.1	=	1.9	=
Magnesium	mg/Kg	1400	=	2500	=	2800	=	2700	=	3000	=
Manganese	mg/Kg	160	=	350	=	560	=	500	=	420	=
Mercury	mg/Kg	0.0027	U	0.015	J	0.014	J	0.011	J	0.0088	J
Nickel	mg/Kg	1.7	J	3.7	J	4.3	J	3.9	J	4.2	J
Potassium	mg/Kg	700	J	1300	=	1600	=	1500	=	1800	=
Selenium	mg/Kg	0.5	U	1.2	=	0.99	J	0.9	J	1	J
Silver	mg/Kg	0.062	U	0.064	U	0.065	U	0.063	U	0.064	U
Sodium	mg/Kg	180	J	230	J	110	J	130	J	190	J
Thallium	mg/Kg	0.37	U	0.38	U	0.39	U	0.38	U	0.38	U
Vanadium	mg/Kg	37	=	51	=	61	=	54	=	65	=
Zinc	mg/Kg	15	J	48	=	30	=	27	=	28	=

	StationID	AOCHSB016		NDAHSB17		NDAHSB18		NDAHSB19		NDAHSB20	
	SampleID	NDE039FD1		NDAHSB17-R01		NDAHSB18-R01		NDAHSB19-R01		NDAHFD05P-R01	
	Date Collected	12/07/00		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N		FD	
Parameter	**Units**										
Aluminum	mg/Kg	8900	=	6550	=	6880	=	2930	=	5050	=
Antimony	mg/Kg	0.55	J	0.218	J	0.253	J	0.14	J	0.199	J
Arsenic	mg/Kg	2.4	=	1.71	J	1.29	J	0.161	J	0.372	J
Barium	mg/Kg	75	=	61.3	=	81.4	=	25.4	J	40.9	=
Beryllium	mg/Kg	0.24	J	0.112	J	0.122	J	0.0591	J	0.0933	J
Cadmium	mg/Kg	0.03	U	0.0442	J	0.219	J	0.0127	U	0.012	U
Calcium	mg/Kg	2900	J	9420	=	15100	=	1540	=	6560	=
Chromium, Total	mg/Kg	10	J	7.61	=	9.05	=	3.51	=	6.04	=
Cobalt	mg/Kg	9.2	J	5.79	J	5.74	J	3.24	J	4.81	J
Copper	mg/Kg	25	=	20.6	=	27.2	=	8.56	=	21.3	=
Iron	mg/Kg	23000	=	13900	J	15400	J	9420	J	12100	=
Lead	mg/Kg	1.5	=	18.9	=	29.1	=	1.25	=	5.2	J
Magnesium	mg/Kg	3100	=	2130	=	2660	=	1060	=	1680	=
Manganese	mg/Kg	400	=	316	=	345	=	177	=	286	J
Mercury	mg/Kg	0.0093	J	0.0706	J	0.0719	J	0.00506	J	0.0165	J
Nickel	mg/Kg	4	J	3.48	J	4.17	J	1.25	J	2.36	J
Potassium	mg/Kg	1800	=	1330	=	1820	=	709	J	1390	=
Selenium	mg/Kg	1	J	0.383	J	0.278	J	0.199	U	0.351	J
Silver	mg/Kg	0.063	U	0.0437	J	0.027	U	0.0242	U	0.0424	J
Sodium	mg/Kg	210	J	190	J	297	J	85.1	J	179	J
Thallium	mg/Kg	0.38	U	0.708	J	0.538	J	0.476	J	0.622	J
Vanadium	mg/Kg	68	=	38.5	=	41.8	=	26.5	=	34.3	=
Zinc	mg/Kg	27	=	59.8	J	155	J	13.3	J	49.4	=

	StationID	NDAHSB20		NDAHSB21		NDAHSB22		NDAHSB23		NDAHSB24	
	SampleID	NDAHSB20-R01		NDAHSB21-R01		NDAHSB22-R01		NDAHSB23-R01		NDAHSB24-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	4980	=	2620	=	3760	=	2630	=	3020	=
Antimony	mg/Kg	0.332	J	0.0889	UJ	0.25	J	0.0927	UJ	0.0955	UJ
Arsenic	mg/Kg	0.62	J	0.203	J	1.94	=	1.24	J	1.09	J
Barium	mg/Kg	45.6	=	32.4	=	31	J	29.2	J	37.3	=
Beryllium	mg/Kg	0.0952	J	0.0532	J	0.0805	J	0.0479	J	0.0735	J
Cadmium	mg/Kg	0.0367	J	0.0118	U	0.0126	U	0.0124	U	0.0127	U
Calcium	mg/Kg	9130	=	1070	=	1420	=	1180	=	2900	=
Chromium, Total	mg/Kg	6.98	=	5.15	=	4.32	=	4.4	=	4.54	=
Cobalt	mg/Kg	4.49	J	2.93	J	2.48	J	2.58	J	3.87	J
Copper	mg/Kg	21.5	=	7.04	=	46.4	=	8.18	=	9.45	=
Iron	mg/Kg	12400	J	7810	J	8700	=	8360	J	9070	J
Lead	mg/Kg	6.75	=	0.75	=	2.29	J	1.11	=	1.04	=
Magnesium	mg/Kg	1690	=	895	=	1380	=	975	=	1100	=
Manganese	mg/Kg	283	=	161	=	80.4	=	117	=	277	=
Mercury	mg/Kg	0.0146	J	0.00429	J	0.009	J	0.00644	J	0.00318	J
Nickel	mg/Kg	2.25	J	1.26	J	1.35	J	1.21	J	1.58	J
Potassium	mg/Kg	1400	=	665	J	1050	=	739	J	809	J
Selenium	mg/Kg	0.5	J	0.268	J	0.199	J	0.29	J	0.2	U
Silver	mg/Kg	0.024	U	0.0225	U	0.0238	U	0.0235	U	0.0242	U
Sodium	mg/Kg	196	J	77.3	J	95.9	J	78.8	J	114	J
Thallium	mg/Kg	0.583	J	0.407	J	0.522	J	0.355	J	0.553	J
Vanadium	mg/Kg	36.2	=	22.8	=	25.5	=	25.3	=	27.8	=
Zinc	mg/Kg	54.1	J	10.2	J	17.5	J	12.3	J	15	J

	StationID	NDAHSB25		NDAHSB26		NDAHSB27		NDAHSB28		NDAHSB29	
	SampleID	NDAHSB25-R01		NDAHSB26-R01		NDAHSB27-R01		NDAHSB28-R01		NDAHSB29-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	2110	=	4440	=	5790	=	5360	=	6450	=
Antimony	mg/Kg	0.0958	UJ	0.0987	UJ	0.168	J	0.222	J	0.412	J
Arsenic	mg/Kg	0.223	J	1.18	J	0.631	J	0.917	J	0.545	J
Barium	mg/Kg	32.6	J	44	=	43.7	=	68.5	=	69.1	=
Beryllium	mg/Kg	0.0547	J	0.103	J	0.112	J	0.134	J	0.118	J
Cadmium	mg/Kg	0.0128	U	0.0132	U	0.0122	U	0.0143	U	0.013	U
Calcium	mg/Kg	1300	=	3220	=	4240	=	2780	=	6060	=
Chromium, Total	mg/Kg	3.28	=	6.75	=	7.03	=	6.78	=	8.81	=
Cobalt	mg/Kg	3.14	J	5.08	J	5.65	J	6.25	J	6.8	J
Copper	mg/Kg	7.49	=	14.8	=	16.5	=	15.4	=	18.8	=
Iron	mg/Kg	6660	J	14000	J	15400	J	13200	J	15800	J
Lead	mg/Kg	0.91	=	1.42	=	3.23	=	1.86	=	3.02	=
Magnesium	mg/Kg	748	J	1760	=	2340	=	2030	=	2520	=
Manganese	mg/Kg	271	=	427	=	199	=	544	=	372	=
Mercury	mg/Kg	0.00476	J	0.0061	J	0.0218	J	0.0109	J	0.0195	J
Nickel	mg/Kg	1.13	J	3.17	J	2.71	J	2.86	J	3.24	J
Potassium	mg/Kg	591	J	1020	=	1240	=	1170	=	1510	=
Selenium	mg/Kg	0.2	U	0.411	J	0.384	J	0.572	J	0.362	J
Silver	mg/Kg	0.0242	U	0.0405	J	0.0242	J	0.0293	J	0.0248	U
Sodium	mg/Kg	91.6	J	363	J	737	J	205	J	361	J
Thallium	mg/Kg	0.24	J	0.661	J	0.712	J	0.789	J	0.954	J
Vanadium	mg/Kg	19	=	36.4	=	46.8	=	40.3	=	48.9	=
Zinc	mg/Kg	9.07	J	18.8	J	31	J	22.2	J	26.8	J

Analytical Data Summary

	StationID	NDAHSB17		NDAHSB18		NDAHSB19		NDAHSB20		NDAHSB20	
	SampleID	NDAHSB17-R01		NDAHSB18-R01		NDAHSB19-R01		NDAHFD05P-R01		NDAHSB20-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		FD		N	
Parameter	**Units**										
Perchlorate	ug/Kg	109	U	113	U	120	U	85.1	U	99.7	U

Analytical Data Summary

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	StationID	NDAHSB21		NDAHSB22		NDAHSB23		NDAHSB24		NDAHSB25	
	SampleID	NDAHSB21-R01		NDAHSB22-R01		NDAHSB23-R01		NDAHSB24-R01		NDAHSB25-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N		N	
Parameter	**Units**										
Perchlorate	ug/Kg	105	U	108	U	103	U	103	U	110	U

Analytical Data Summary

	StationID	NDAHSB26		NDAHSB27		NDAHSB28		NDAHSB29	
	SampleID	NDAHSB26-R01		NDAHSB27-R01		NDAHSB28-R01		NDAHSB29-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
Perchlorate	ug/Kg	114	U	127	U	129	U	98.6	U

	StationID	NDAHSB17		NDAHSB18		NDAHSB19		NDAHSB20		NDAH
	SampleID	NDAHSB17-R01		NDAHSB18-R01		NDAHSB19-R01		NDAHFD05P-R01		NDAHSI
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/2
	SampleType	N		N		N		FD		N
Parameter	**Units**									
Aldrin	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Gamma bhc (lindane)	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Alpha-chlordane	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Gamma-chlordane	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
p,p'-DDD	ug/Kg	3.5	UJ	3.9	UJ	3.4	UJ	3.4	U	3.5
p,p'-DDE	ug/Kg	3.5	U	0.2	J	3.4	U	0.1	J	0.14
p,p'-DDT	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Dieldrin	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Alpha endosulfan	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Beta endosulfan	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Endosulfan sulfate	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Endrin	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Endrin aldehyde	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Endrin ketone	ug/Kg	3.5	U	3.9	U	3.4	U	3.4	U	3.5
Heptachlor epoxide	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Heptachlor	ug/Kg	1.8	U	2	U	1.8	U	1.8	U	1.8
Methoxychlor	ug/Kg	18	U	20	U	18	U	18	U	18
Toxaphene	ug/Kg	180	U	200	U	180	U	180	U	180

Analytical Data Summary

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	StationID	SB20	NDAHSB21		NDAHSB22		NDAHSB23		NDAHSB24		
	SampleID	B20-R01	NDAHSB21-R01		NDAHSB22-R01		NDAHSB23-R01		NDAHSB24-R01		
	Date Collected	6/03	08/26/03		08/26/03		08/26/03		08/26/03		
	SampleType	N	N		N		N		N		
Parameter	**Units**										
Aldrin	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Gamma bhc (lindane)	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Alpha-chlordane	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Gamma-chlordane	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
p,p'-DDD	ug/Kg	UJ	3.4	UJ	3.4	UJ	3.4	UJ	3.4	UJ	
p,p'-DDE	ug/Kg	J	3.4	U	3.4	U	3.4	U	3.4	U	
p,p'-DDT	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Dieldrin	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Alpha endosulfan	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Beta endosulfan	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Endosulfan sulfate	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Endrin	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Endrin aldehyde	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Endrin ketone	ug/Kg	U	3.4	U	3.4	U	3.4	U	3.4	U	
Heptachlor epoxide	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Heptachlor	ug/Kg	U	1.8	U	1.8	U	1.7	U	1.8	U	
Methoxychlor	ug/Kg	U	18	U	18	U	17	U	18	U	
Toxaphene	ug/Kg	U	180	U	180	U	170	U	180	U	

	StationID	NDAHSB25		NDAHSB26		NDAHSB27		NDAHSB28		NDAH
	SampleID	NDAHSB25-R01		NDAHSB26-R01		NDAHSB27-R01		NDAHSB28-R01		NDAHSI
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03		08/2
	SampleType	N		N		N		N		N
Parameter	**Units**									
Aldrin	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Gamma bhc (lindane)	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Alpha-chlordane	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Gamma-chlordane	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
p,p'-DDD	ug/Kg	3.6	U	3.6	U	10	J	0.19	J	3.5
p,p'-DDE	ug/Kg	3.6	U	3.6	U	2.7	J	0.61	J	3.2
p,p'-DDT	ug/Kg	3.6	U	3.6	U	37	U	0.48	J	0.82
Dieldrin	ug/Kg	3.6	U	3.6	U	37	U	4	U	3.5
Alpha endosulfan	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Beta endosulfan	ug/Kg	3.6	U	3.6	U	37	U	4	U	3.5
Endosulfan sulfate	ug/Kg	3.6	U	3.6	U	37	U	4	U	3.5
Endrin	ug/Kg	3.6	U	3.6	U	37	U	4	U	3.5
Endrin aldehyde	ug/Kg	3.6	U	3.6	U	37	U	4	U	3.5
Endrin ketone	ug/Kg	3.6	U	3.6	U	37	U	4	U	3.5
Heptachlor epoxide	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Heptachlor	ug/Kg	1.8	U	1.8	U	19	U	2	U	1.8
Methoxychlor	ug/Kg	18	U	18	U	190	U	20	U	18
Toxaphene	ug/Kg	180	U	180	U	1900	U	200	U	180

Parameter	StationID / SampleID / Date Collected / SampleType / Units	SB29 / 329-R01 / 6/03 / N
Aldrin	ug/Kg	R
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	R
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	R
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	R
Gamma bhc (lindane)	ug/Kg	R
Alpha-chlordane	ug/Kg	R
Gamma-chlordane	ug/Kg	R
p,p'-DDD	ug/Kg	R
p,p'-DDE	ug/Kg	J
p,p'-DDT	ug/Kg	J
Dieldrin	ug/Kg	R
Alpha endosulfan	ug/Kg	R
Beta endosulfan	ug/Kg	R
Endosulfan sulfate	ug/Kg	R
Endrin	ug/Kg	R
Endrin aldehyde	ug/Kg	R
Endrin ketone	ug/Kg	R
Heptachlor epoxide	ug/Kg	R
Heptachlor	ug/Kg	R
Methoxychlor	ug/Kg	R
Toxaphene	ug/Kg	R

Analytical Data Summary

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	StationID	AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004		AOCH
	SampleID	NDE006		NDE008		NDE010		NDE012		NDE
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00		12/0
	SampleType	N		N		N		N		
Parameter	Units									
PCB-1016 (AROCHLOR 1016)	ug/Kg	39	UJ	35	UJ	35	UJ	35	UJ	35
PCB-1221 (AROCHLOR 1221)	ug/Kg	80	UJ	70	UJ	72	UJ	71	UJ	70
PCB-1232 (AROCHLOR 1232)	ug/Kg	39	UJ	35	UJ	35	UJ	35	UJ	35
PCB-1242 (AROCHLOR 1242)	ug/Kg	39	UJ	35	UJ	35	UJ	35	UJ	35
PCB-1248 (AROCHLOR 1248)	ug/Kg	39	UJ	35	UJ	35	UJ	35	UJ	35
PCB-1254 (AROCHLOR 1254)	ug/Kg	39	UJ	35	UJ	35	UJ	35	UJ	35
PCB-1260 (AROCHLOR 1260)	ug/Kg	39	UJ	35	UJ	35	UJ	35	UJ	35

	StationID	SB005	AOCHSB008		AOCHSB009		AOCHSB006		AOCHSB007	
	SampleID	014	NDE019		NDE022		NDE016		NDE018	
	Date Collected	5/00	12/05/00		12/05/00		12/06/00		12/06/00	
	SampleType	N	N		N		N		N	
Parameter	**Units**									
PCB-1016 (AROCHLOR 1016)	ug/Kg	UJ	36	UJ	36	U	35	U	35	U
PCB-1221 (AROCHLOR 1221)	ug/Kg	UJ	73	UJ	74	U	70	U	71	U
PCB-1232 (AROCHLOR 1232)	ug/Kg	UJ	36	UJ	36	U	35	U	35	U
PCB-1242 (AROCHLOR 1242)	ug/Kg	UJ	36	UJ	36	U	35	U	35	U
PCB-1248 (AROCHLOR 1248)	ug/Kg	UJ	36	UJ	36	U	35	U	35	U
PCB-1254 (AROCHLOR 1254)	ug/Kg	UJ	36	UJ	36	U	35	U	35	U
PCB-1260 (AROCHLOR 1260)	ug/Kg	UJ	36	UJ	36	U	35	U	35	U

Analytical Data Summary

	StationID	AOCHSB008		AOCHSB009		AOCHSB009		AOCHSB010		AOCH
	SampleID	NDE020		NDE203		NDE204		NDE025		NDE
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00		12/0
	SampleType	N		N		N		N		N
Parameter	Units									
PCB-1016 (AROCHLOR 1016)	ug/Kg	37	U	39	U	39	U	38	U	37
PCB-1221 (AROCHLOR 1221)	ug/Kg	74	U	78	U	80	U	78	U	75
PCB-1232 (AROCHLOR 1232)	ug/Kg	37	U	39	U	39	U	38	U	37
PCB-1242 (AROCHLOR 1242)	ug/Kg	37	U	39	U	39	U	38	U	37
PCB-1248 (AROCHLOR 1248)	ug/Kg	37	U	39	U	39	U	38	U	37
PCB-1254 (AROCHLOR 1254)	ug/Kg	37	U	39	U	39	U	38	U	37
PCB-1260 (AROCHLOR 1260)	ug/Kg	37	U	39	U	39	U	38	U	37

Analytical Data Summary

	StationID	SB011	AOCHSB012		AOCHSB013		AOCHSB014		AOCHSB015	
	SampleID	027	NDE029		NDE031		NDE033		NDE035	
	Date Collected	6/00	12/06/00		12/06/00		12/07/00		12/07/00	
	SampleType	N	N		N		N		N	
Parameter	**Units**									
PCB-1016 (AROCHLOR 1016)	ug/Kg	U	38	U	36	U	37	UJ	38	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	U	78	U	72	U	75	UJ	77	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	U	38	U	36	U	37	UJ	38	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	U	38	U	36	U	37	UJ	38	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	U	38	U	36	U	37	UJ	38	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	U	38	U	36	U	37	UJ	38	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	U	38	U	36	U	37	UJ	38	UJ

Analytical Data Summary

	StationID	AOCHSB015		AOCHSB016		AOCHSB016	
	SampleID	NDE036FD1		NDE038		NDE039FD1	
	Date Collected	12/07/00		12/07/00		12/07/00	
	SampleType	FD		N		FD	
Parameter	Units						
PCB-1016 (AROCHLOR 1016)	ug/Kg	37	UJ	37	UJ	37	UJ
PCB-1221 (AROCHLOR 1221)	ug/Kg	75	UJ	76	UJ	75	UJ
PCB-1232 (AROCHLOR 1232)	ug/Kg	37	UJ	37	UJ	37	UJ
PCB-1242 (AROCHLOR 1242)	ug/Kg	37	UJ	37	UJ	37	UJ
PCB-1248 (AROCHLOR 1248)	ug/Kg	37	UJ	37	UJ	37	UJ
PCB-1254 (AROCHLOR 1254)	ug/Kg	37	UJ	37	UJ	37	UJ
PCB-1260 (AROCHLOR 1260)	ug/Kg	37	UJ	37	UJ	37	UJ

	StationID	AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004	
	SampleID	NDE006		NDE008		NDE010		NDE012	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg	576	U	493	U	468	U	474	U
1,2-DICHLOROBENZENE	ug/Kg	576	U	493	U	468	U	474	U
1,3-DICHLOROBENZENE	ug/Kg	576	U	493	U	468	U	474	U
1,4-DICHLOROBENZENE	ug/Kg	576	U	493	U	468	U	474	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1730	U	1480	U	1400	U	1420	U
2,4,6-TRICHLOROPHENOL	ug/Kg	576	U	493	U	468	U	474	U
2,4-DICHLOROPHENOL	ug/Kg	576	U	493	U	468	U	474	U
2,4-DIMETHYLPHENOL	ug/Kg	576	U	493	U	468	U	474	U
2,4-DINITROPHENOL	ug/Kg	1730	U	1480	U	1400	U	1420	U
2,4-DINITROTOLUENE	ug/Kg	576	U	493	U	468	U	474	U
2,6-DINITROTOLUENE	ug/Kg	576	U	493	U	468	U	474	U
2-CHLORONAPHTHALENE	ug/Kg	576	U	493	U	468	U	474	U
2-CHLOROPHENOL	ug/Kg	576	U	493	U	468	U	474	U
2-METHYLNAPHTHALENE	ug/Kg	576	U	493	U	468	U	474	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	576	U	493	U	468	U	474	U
2-NITROANILINE	ug/Kg	1730	U	1480	U	1400	U	1420	U
2-NITROPHENOL	ug/Kg	576	U	493	U	468	U	474	U
3,3'-DICHLOROBENZIDINE	ug/Kg	1150	U	987	U	937	U	948	U
3-NITROANILINE	ug/Kg	1730	U	1480	U	1400	U	1420	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1730	U	1480	U	1400	U	1420	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	576	U	493	U	468	U	474	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	576	U	493	U	468	U	474	U
4-CHLOROANILINE	ug/Kg	576	U	493	U	468	U	474	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	576	U	493	U	468	U	474	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1730	U	1480	U	1400	U	1420	U
4-NITROPHENOL	ug/Kg	1730	U	1480	U	1400	U	1420	U
ACENAPHTHENE	ug/Kg	576	U	493	U	468	U	474	U
ACENAPHTHYLENE	ug/Kg	576	U	493	U	468	U	474	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	576	U	493	U	468	U	474	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	576	U	493	U	468	U	474	U
BENZO(a)PYRENE	ug/Kg	576	U	493	U	468	U	474	U
BENZO(b)FLUORANTHENE	ug/Kg	576	U	493	U	468	U	474	U
BENZO(g,h,i)PERYLENE	ug/Kg	576	U	493	U	468	U	474	U

	StationID	AOCHSB005		AOCHSB008		AOCHSB009		AOCHSB006	
	SampleID	NDE014		NDE019		NDE022		NDE016	
	Date Collected	12/05/00		12/05/00		12/05/00		12/06/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg	403	U	511	U	576	U	464	U
1,2-DICHLOROBENZENE	ug/Kg	403	U	511	U	576	U	464	U
1,3-DICHLOROBENZENE	ug/Kg	403	U	511	U	576	U	464	U
1,4-DICHLOROBENZENE	ug/Kg	403	U	511	U	576	U	464	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1210	U	1530	U	1730	U	1390	U
2,4,6-TRICHLOROPHENOL	ug/Kg	403	U	511	U	576	U	464	U
2,4-DICHLOROPHENOL	ug/Kg	403	U	511	U	576	U	464	U
2,4-DIMETHYLPHENOL	ug/Kg	403	U	511	U	576	U	464	U
2,4-DINITROPHENOL	ug/Kg	1210	U	1530	U	1730	U	1390	U
2,4-DINITROTOLUENE	ug/Kg	403	U	511	U	576	U	464	U
2,6-DINITROTOLUENE	ug/Kg	403	U	511	U	576	U	464	U
2-CHLORONAPHTHALENE	ug/Kg	403	U	511	U	576	U	464	U
2-CHLOROPHENOL	ug/Kg	403	U	511	U	576	U	464	U
2-METHYLNAPHTHALENE	ug/Kg	403	U	176	J	576	U	464	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	403	U	511	U	576	U	464	U
2-NITROANILINE	ug/Kg	1210	U	1530	U	1730	U	1390	U
2-NITROPHENOL	ug/Kg	403	U	511	U	576	U	464	U
3,3'-DICHLOROBENZIDINE	ug/Kg	807	U	1020	U	1150	U	928	U
3-NITROANILINE	ug/Kg	1210	U	1530	U	1730	U	1390	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1210	U	1530	U	1730	U	1390	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	403	U	511	U	576	U	464	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	403	U	511	U	576	U	464	U
4-CHLOROANILINE	ug/Kg	403	U	511	U	576	U	464	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	403	U	511	U	576	U	464	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1210	U	1530	U	1730	U	1390	U
4-NITROPHENOL	ug/Kg	1210	U	1530	U	1730	U	1390	U
ACENAPHTHENE	ug/Kg	403	U	511	U	576	U	464	U
ACENAPHTHYLENE	ug/Kg	403	U	511	U	576	U	464	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	403	U	511	U	576	U	464	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	403	U	68	J	576	U	464	U
BENZO(a)PYRENE	ug/Kg	403	U	71	J	576	U	464	U
BENZO(b)FLUORANTHENE	ug/Kg	403	U	104	J	576	U	464	U
BENZO(g,h,i)PERYLENE	ug/Kg	403	U	511	U	576	U	464	U

	StationID	AOCHSB007		AOCHSB008		AOCHSB009		AOCHSB009	
	SampleID	NDE018		NDE020		NDE203		NDE204	
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg	461	U	461	U	485	U	603	U
1,2-DICHLOROBENZENE	ug/Kg	461	U	461	U	485	U	603	U
1,3-DICHLOROBENZENE	ug/Kg	461	U	461	U	485	U	603	U
1,4-DICHLOROBENZENE	ug/Kg	461	U	461	U	485	U	603	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1380	U	1380	U	1450	U	1810	U
2,4,6-TRICHLOROPHENOL	ug/Kg	461	U	461	U	485	U	603	U
2,4-DICHLOROPHENOL	ug/Kg	461	U	461	U	485	U	603	U
2,4-DIMETHYLPHENOL	ug/Kg	461	U	461	U	485	U	603	U
2,4-DINITROPHENOL	ug/Kg	1380	U	1380	U	1450	U	1810	U
2,4-DINITROTOLUENE	ug/Kg	461	U	461	U	485	U	603	U
2,6-DINITROTOLUENE	ug/Kg	461	U	461	U	485	U	603	U
2-CHLORONAPHTHALENE	ug/Kg	461	U	461	U	485	U	603	U
2-CHLOROPHENOL	ug/Kg	461	U	461	U	485	U	603	U
2-METHYLNAPHTHALENE	ug/Kg	461	U	461	U	485	U	603	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	461	U	461	U	485	U	603	U
2-NITROANILINE	ug/Kg	1380	U	1380	U	1450	U	1810	U
2-NITROPHENOL	ug/Kg	461	U	461	U	485	U	603	U
3,3'-DICHLOROBENZIDINE	ug/Kg	921	U	923	U	969	U	1210	U
3-NITROANILINE	ug/Kg	1380	U	1380	U	1450	U	1810	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1380	U	1380	U	1450	U	1810	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	461	U	461	U	485	U	603	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	461	U	461	U	485	U	603	U
4-CHLOROANILINE	ug/Kg	461	U	461	U	485	U	603	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	461	U	461	U	485	U	603	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1380	U	1380	U	1450	U	1810	U
4-NITROPHENOL	ug/Kg	1380	U	1380	U	1450	U	1810	U
ACENAPHTHENE	ug/Kg	461	U	461	U	485	U	603	U
ACENAPHTHYLENE	ug/Kg	461	U	461	U	485	U	603	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	461	U	461	U	485	U	603	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	461	U	461	U	485	U	603	U
BENZO(a)PYRENE	ug/Kg	461	U	461	U	485	U	603	U
BENZO(b)FLUORANTHENE	ug/Kg	461	U	461	U	485	U	603	U
BENZO(g,h,i)PERYLENE	ug/Kg	461	U	461	U	485	U	603	U

	StationID	AOCHSB010		AOCHSB011		AOCHSB012		AOCHSB013	
	SampleID	NDE025		NDE027		NDE029		NDE031	
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
1,2,4-TRICHLOROBENZENE	ug/Kg	595	U	580	U	571	U	608	U
1,2-DICHLOROBENZENE	ug/Kg	595	U	580	U	571	U	608	U
1,3-DICHLOROBENZENE	ug/Kg	595	U	580	U	571	U	608	U
1,4-DICHLOROBENZENE	ug/Kg	595	U	580	U	571	U	608	U
2,4,5-TRICHLOROPHENOL	ug/Kg	1790	U	1740	U	1710	U	1830	U
2,4,6-TRICHLOROPHENOL	ug/Kg	595	U	580	U	571	U	608	U
2,4-DICHLOROPHENOL	ug/Kg	595	U	580	U	571	U	608	U
2,4-DIMETHYLPHENOL	ug/Kg	595	U	580	U	571	U	608	U
2,4-DINITROPHENOL	ug/Kg	1790	U	1740	U	1710	U	1830	U
2,4-DINITROTOLUENE	ug/Kg	595	U	580	U	571	U	608	U
2,6-DINITROTOLUENE	ug/Kg	595	U	580	U	571	U	608	U
2-CHLORONAPHTHALENE	ug/Kg	595	U	580	U	571	U	608	U
2-CHLOROPHENOL	ug/Kg	595	U	580	U	571	U	608	U
2-METHYLNAPHTHALENE	ug/Kg	595	U	580	U	571	U	608	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	595	U	580	U	571	U	608	U
2-NITROANILINE	ug/Kg	1790	U	1740	U	1710	U	1830	U
2-NITROPHENOL	ug/Kg	595	U	580	U	571	U	608	U
3,3'-DICHLOROBENZIDINE	ug/Kg	1190	U	1160	U	1140	U	1220	U
3-NITROANILINE	ug/Kg	1790	U	1740	U	1710	U	1830	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1790	U	1740	U	1710	U	1830	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	595	U	580	U	571	U	608	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	595	U	580	U	571	U	608	U
4-CHLOROANILINE	ug/Kg	595	U	580	U	571	U	608	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	595	U	580	U	571	U	608	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	1790	U	1740	U	1710	U	1830	U
4-NITROPHENOL	ug/Kg	1790	U	1740	U	1710	U	1830	U
ACENAPHTHENE	ug/Kg	595	U	580	U	571	U	608	U
ACENAPHTHYLENE	ug/Kg	595	U	580	U	571	U	608	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	595	U	580	U	571	U	608	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	595	U	580	U	571	U	608	U
BENZO(a)PYRENE	ug/Kg	595	U	580	U	571	U	608	U
BENZO(b)FLUORANTHENE	ug/Kg	595	U	580	U	571	U	608	U
BENZO(g,h,i)PERYLENE	ug/Kg	595	U	580	U	571	U	608	U

	StationID	AOCHSB014		AOCHSB015		AOCHSB015		AOCHSB016	
	SampleID	NDE033		NDE035		NDE036FD1		NDE038	
	Date Collected	12/07/00		12/07/00		12/07/00		12/07/00	
	SampleType	N		N		FD		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg	2800	U	2960	U	495	U	553	U
1,2-DICHLOROBENZENE	ug/Kg	2800	U	2960	U	495	U	553	U
1,3-DICHLOROBENZENE	ug/Kg	2800	U	2960	U	495	U	553	U
1,4-DICHLOROBENZENE	ug/Kg	2800	U	2960	U	495	U	553	U
2,4,5-TRICHLOROPHENOL	ug/Kg	8390	U	8880	U	1480	U	1660	U
2,4,6-TRICHLOROPHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
2,4-DICHLOROPHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
2,4-DIMETHYLPHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
2,4-DINITROPHENOL	ug/Kg	8390	U	8880	U	1480	U	1660	U
2,4-DINITROTOLUENE	ug/Kg	2800	U	2960	U	495	U	553	U
2,6-DINITROTOLUENE	ug/Kg	2800	U	2960	U	495	U	553	U
2-CHLORONAPHTHALENE	ug/Kg	2800	U	2960	U	495	U	553	U
2-CHLOROPHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
2-METHYLNAPHTHALENE	ug/Kg	2800	U	2960	U	495	U	553	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	2800	U	2960	U	495	U	553	U
2-NITROANILINE	ug/Kg	8390	U	8880	U	1480	U	1660	U
2-NITROPHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
3,3'-DICHLOROBENZIDINE	ug/Kg	5590	U	5920	U	989	U	1110	U
3-NITROANILINE	ug/Kg	8390	U	8880	U	1480	U	1660	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	8390	U	8880	U	1480	U	1660	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	2800	U	2960	U	236	J	553	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
4-CHLOROANILINE	ug/Kg	2800	U	2960	U	495	U	553	U
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	2800	U	2960	U	495	U	553	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg								
4-NITROANILINE	ug/Kg	8390	U	8880	U	1480	U	1660	U
4-NITROPHENOL	ug/Kg	8390	U	8880	U	1480	U	1660	U
ACENAPHTHENE	ug/Kg	2800	U	2960	U	495	U	553	U
ACENAPHTHYLENE	ug/Kg	2800	U	2960	U	495	U	553	U
ACETOPHENONE	ug/Kg								
ANTHRACENE	ug/Kg	2800	U	2960	U	495	U	553	U
ATRAZINE	ug/Kg								
BENZALDEHYDE	ug/Kg								
BENZO(a)ANTHRACENE	ug/Kg	2800	U	2960	U	495	U	553	U
BENZO(a)PYRENE	ug/Kg	2800	U	2960	U	495	U	553	U
BENZO(b)FLUORANTHENE	ug/Kg	2800	U	2960	U	495	U	553	U
BENZO(g,h,i)PERYLENE	ug/Kg	2800	U	2960	U	495	U	553	U

	StationID	AOCHSB016		NDAHSB17		NDAHSB18		NDAHSB19	
	SampleID	NDE039FD1		NDAHSB17-R01		NDAHSB18-R01		NDAHSB19-R01	
	Date Collected	12/07/00		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg	2840	U						
1,2-DICHLOROBENZENE	ug/Kg	2840	U						
1,3-DICHLOROBENZENE	ug/Kg	2840	U						
1,4-DICHLOROBENZENE	ug/Kg	2840	U						
2,4,5-TRICHLOROPHENOL	ug/Kg	8530	U	1050	U	1170	U	1020	U
2,4,6-TRICHLOROPHENOL	ug/Kg	2840	U	350	U	391	U	340	U
2,4-DICHLOROPHENOL	ug/Kg	2840	U	350	U	391	U	340	U
2,4-DIMETHYLPHENOL	ug/Kg	2840	U	350	U	391	U	340	U
2,4-DINITROPHENOL	ug/Kg	8530	U	1050	U	1170	U	1020	U
2,4-DINITROTOLUENE	ug/Kg	2840	U	350	U	391	U	340	U
2,6-DINITROTOLUENE	ug/Kg	2840	U	350	U	391	U	340	U
2-CHLORONAPHTHALENE	ug/Kg	2840	U	350	U	391	U	340	U
2-CHLOROPHENOL	ug/Kg	2840	U	350	U	391	U	340	U
2-METHYLNAPHTHALENE	ug/Kg	2840	U	350	U	391	U	340	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	2840	U	350	U	391	U	340	U
2-NITROANILINE	ug/Kg	8530	U	1050	U	1170	U	1020	U
2-NITROPHENOL	ug/Kg	2840	U	350	U	391	U	340	U
3,3'-DICHLOROBENZIDINE	ug/Kg	5690	U	710	U	793	U	691	U
3-NITROANILINE	ug/Kg	8530	U	1050	U	1170	U	1020	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	8530	U	1050	U	1170	U	1020	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	2840	U	350	U	391	U	340	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	2840	U	350	U	391	U	340	U
4-CHLOROANILINE	ug/Kg	2840	U	350	R	391	R	340	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	2840	U	350	U	391	U	340	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg			350	U	391	U	340	U
4-NITROANILINE	ug/Kg	8530	U	1050	U	1170	U	1020	U
4-NITROPHENOL	ug/Kg	8530	U	1050	U	1170	U	1020	U
ACENAPHTHENE	ug/Kg	2840	U	350	U	391	U	340	U
ACENAPHTHYLENE	ug/Kg	2840	U	350	U	391	U	340	U
ACETOPHENONE	ug/Kg			350	U	391	U	340	U
ANTHRACENE	ug/Kg	2840	U	350	U	391	U	340	U
ATRAZINE	ug/Kg			350	U	391	U	340	U
BENZALDEHYDE	ug/Kg			350	U	391	U	340	U
BENZO(a)ANTHRACENE	ug/Kg	2840	U	350	U	391	U	340	U
BENZO(a)PYRENE	ug/Kg	2840	U	350	U	391	U	340	U
BENZO(b)FLUORANTHENE	ug/Kg	2840	U	350	U	391	U	340	U
BENZO(g,h,i)PERYLENE	ug/Kg	2840	U	350	U	391	U	340	U

	StationID	NDAHSB20		NDAHSB20		NDAHSB21		NDAHSB22	
	SampleID	NDAHFD05P-R01		NDAHSB20-R01		NDAHSB21-R01		NDAHSB22-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg								
1,2-DICHLOROBENZENE	ug/Kg								
1,3-DICHLOROBENZENE	ug/Kg								
1,4-DICHLOROBENZENE	ug/Kg								
2,4,5-TRICHLOROPHENOL	ug/Kg	1040	U	1030	U	1010	U	1020	U
2,4,6-TRICHLOROPHENOL	ug/Kg	346	U	343	U	338	U	338	U
2,4-DICHLOROPHENOL	ug/Kg	346	U	343	U	338	U	338	U
2,4-DIMETHYLPHENOL	ug/Kg	346	U	343	U	338	U	338	U
2,4-DINITROPHENOL	ug/Kg	1040	U	1030	U	1010	U	1020	U
2,4-DINITROTOLUENE	ug/Kg	346	U	343	U	338	U	338	U
2,6-DINITROTOLUENE	ug/Kg	346	U	343	U	338	U	338	U
2-CHLORONAPHTHALENE	ug/Kg	346	U	343	U	338	U	338	U
2-CHLOROPHENOL	ug/Kg	346	U	343	U	338	U	338	U
2-METHYLNAPHTHALENE	ug/Kg	346	U	343	U	338	U	338	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	346	U	343	U	338	U	338	U
2-NITROANILINE	ug/Kg	1040	U	1030	U	1010	U	1020	U
2-NITROPHENOL	ug/Kg	346	U	343	U	338	U	338	U
3,3'-DICHLOROBENZIDINE	ug/Kg	702	U	696	U	687	U	687	U
3-NITROANILINE	ug/Kg	1040	U	1030	U	1010	U	1020	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1040	U	1030	U	1010	U	1020	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	346	U	343	U	338	U	338	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	346	U	343	U	338	U	338	U
4-CHLOROANILINE	ug/Kg	346	R	343	R	338	R	338	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	346	U	343	U	338	U	338	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	346	U	343	U	338	U	338	U
4-NITROANILINE	ug/Kg	1040	U	1030	U	1010	U	1020	U
4-NITROPHENOL	ug/Kg	1040	U	1030	U	1010	U	1020	U
ACENAPHTHENE	ug/Kg	346	U	343	U	338	U	338	U
ACENAPHTHYLENE	ug/Kg	346	U	343	U	338	U	338	U
ACETOPHENONE	ug/Kg	346	U	343	U	338	U	338	U
ANTHRACENE	ug/Kg	346	U	343	U	338	U	338	U
ATRAZINE	ug/Kg	346	U	343	U	338	U	338	U
BENZALDEHYDE	ug/Kg	346	R	343	U	338	U	338	U
BENZO(a)ANTHRACENE	ug/Kg	346	U	343	U	338	U	338	U
BENZO(a)PYRENE	ug/Kg	346	U	343	U	338	U	338	U
BENZO(b)FLUORANTHENE	ug/Kg	346	U	343	U	338	U	338	U
BENZO(g,h,i)PERYLENE	ug/Kg	346	U	343	U	338	U	338	U

Analytical Data Summary

	StationID	NDAHSB23		NDAHSB24		NDAHSB25		NDAHSB26	
	SampleID	NDAHSB23-R01		NDAHSB24-R01		NDAHSB25-R01		NDAHSB26-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	Units								
1,2,4-TRICHLOROBENZENE	ug/Kg								
1,2-DICHLOROBENZENE	ug/Kg								
1,3-DICHLOROBENZENE	ug/Kg								
1,4-DICHLOROBENZENE	ug/Kg								
2,4,5-TRICHLOROPHENOL	ug/Kg	1010	U	1040	U	1060	U	1080	U
2,4,6-TRICHLOROPHENOL	ug/Kg	338	U	346	U	352	U	360	U
2,4-DICHLOROPHENOL	ug/Kg	338	U	346	U	352	U	360	U
2,4-DIMETHYLPHENOL	ug/Kg	338	U	346	U	352	U	360	U
2,4-DINITROPHENOL	ug/Kg	1010	U	1040	U	1060	U	1080	U
2,4-DINITROTOLUENE	ug/Kg	338	U	346	U	352	U	360	U
2,6-DINITROTOLUENE	ug/Kg	338	U	346	U	352	U	360	U
2-CHLORONAPHTHALENE	ug/Kg	338	U	346	U	352	U	360	U
2-CHLOROPHENOL	ug/Kg	338	U	346	U	352	U	360	U
2-METHYLNAPHTHALENE	ug/Kg	338	U	346	U	352	U	360	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	338	U	346	U	352	U	360	U
2-NITROANILINE	ug/Kg	1010	U	1040	U	1060	U	1080	U
2-NITROPHENOL	ug/Kg	338	U	346	U	352	U	360	U
3,3'-DICHLOROBENZIDINE	ug/Kg	686	U	702	U	716	U	731	U
3-NITROANILINE	ug/Kg	1010	U	1040	U	1060	U	1080	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1010	U	1040	U	1060	U	1080	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	338	U	346	U	352	U	360	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	338	U	346	U	352	U	360	U
4-CHLOROANILINE	ug/Kg	338	R	346	R	352	R	360	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	338	U	346	U	352	U	360	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	338	U	346	U	352	U	360	U
4-NITROANILINE	ug/Kg	1010	U	1040	U	1060	U	1080	U
4-NITROPHENOL	ug/Kg	1010	U	1040	U	1060	U	1080	U
ACENAPHTHENE	ug/Kg	338	U	346	U	352	U	360	U
ACENAPHTHYLENE	ug/Kg	338	U	346	U	352	U	360	U
ACETOPHENONE	ug/Kg	338	U	346	U	352	U	360	U
ANTHRACENE	ug/Kg	338	U	346	U	352	U	360	U
ATRAZINE	ug/Kg	338	U	346	U	352	U	360	U
BENZALDEHYDE	ug/Kg	338	U	346	U	352	U	360	U
BENZO(a)ANTHRACENE	ug/Kg	338	U	346	U	352	U	360	U
BENZO(a)PYRENE	ug/Kg	338	U	346	U	352	U	360	U
BENZO(b)FLUORANTHENE	ug/Kg	338	U	346	U	352	U	360	U
BENZO(g,h,i)PERYLENE	ug/Kg	338	U	346	U	352	U	360	U

StationID		NDAHSB27		NDAHSB28		NDAHSB29	
SampleID		NDAHSB27-R01		NDAHSB28-R01		NDAHSB29-R01	
Date Collected		08/26/03		08/26/03		08/26/03	
SampleType		N		N		N	
Parameter	**Units**						
1,2,4-TRICHLOROBENZENE	ug/Kg						
1,2-DICHLOROBENZENE	ug/Kg						
1,3-DICHLOROBENZENE	ug/Kg						
1,4-DICHLOROBENZENE	ug/Kg						
2,4,5-TRICHLOROPHENOL	ug/Kg	1110	U	1190	U	1050	U
2,4,6-TRICHLOROPHENOL	ug/Kg	371	U	396	U	349	U
2,4-DICHLOROPHENOL	ug/Kg	371	U	396	U	349	U
2,4-DIMETHYLPHENOL	ug/Kg	371	U	396	U	349	U
2,4-DINITROPHENOL	ug/Kg	1110	U	1190	U	1050	U
2,4-DINITROTOLUENE	ug/Kg	371	U	396	U	349	U
2,6-DINITROTOLUENE	ug/Kg	371	U	396	U	349	U
2-CHLORONAPHTHALENE	ug/Kg	371	U	396	U	349	U
2-CHLOROPHENOL	ug/Kg	371	U	396	U	349	U
2-METHYLNAPHTHALENE	ug/Kg	371	U	396	U	349	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	371	U	396	U	349	U
2-NITROANILINE	ug/Kg	1110	U	1190	U	1050	U
2-NITROPHENOL	ug/Kg	371	U	396	U	349	U
3,3'-DICHLOROBENZIDINE	ug/Kg	754	U	805	U	708	U
3-NITROANILINE	ug/Kg	1110	U	1190	U	1050	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1110	U	1190	U	1050	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	371	U	396	U	349	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	371	U	396	U	349	U
4-CHLOROANILINE	ug/Kg	371	R	396	R	349	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	371	U	396	U	349	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	371	U	396	U	349	U
4-NITROANILINE	ug/Kg	1110	U	1190	U	1050	U
4-NITROPHENOL	ug/Kg	1110	U	1190	U	1050	U
ACENAPHTHENE	ug/Kg	371	U	396	U	349	U
ACENAPHTHYLENE	ug/Kg	371	U	396	U	349	U
ACETOPHENONE	ug/Kg	371	U	396	U	349	U
ANTHRACENE	ug/Kg	371	U	396	U	349	U
ATRAZINE	ug/Kg	371	U	396	U	349	U
BENZALDEHYDE	ug/Kg	371	U	396	U	349	U
BENZO(a)ANTHRACENE	ug/Kg	371	U	396	U	349	U
BENZO(a)PYRENE	ug/Kg	371	U	396	U	349	U
BENZO(b)FLUORANTHENE	ug/Kg	371	U	396	U	349	U
BENZO(g,h,i)PERYLENE	ug/Kg	371	U	396	U	349	U

Parameter	Units	AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004	
	SampleID	NDE006		NDE008		NDE010		NDE012	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
BENZO(k)FLUORANTHENE	ug/Kg	576	U	493	U	468	U	474	U
BENZYL BUTYL PHTHALATE	ug/Kg	576	U	493	U	468	U	474	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	576	U	493	U	468	U	474	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	576	U	493	U	468	U	474	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	576	U	493	U	468	U	474	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	576	U	493	U	468	U	474	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	576	U	493	U	468	U	474	U
CHRYSENE	ug/Kg	576	U	493	U	468	U	474	U
CRESOLS, m & p	ug/Kg	576	U	493	U	468	U	474	U
DI-n-BUTYL PHTHALATE	ug/Kg	576	U	493	U	468	U	474	U
DI-n-OCTYLPHTHALATE	ug/Kg	576	U	493	U	468	U	474	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	576	U	493	U	468	U	474	U
DIBENZOFURAN	ug/Kg	576	U	493	U	468	U	474	U
DIETHYL PHTHALATE	ug/Kg	576	U	493	U	468	U	474	U
DIMETHYL PHTHALATE	ug/Kg	576	U	493	U	468	U	474	U
FLUORANTHENE	ug/Kg	576	U	493	U	468	U	474	U
FLUORENE	ug/Kg	576	U	493	U	468	U	474	U
HEXACHLOROBENZENE	ug/Kg	576	U	493	U	468	U	474	U
HEXACHLOROBUTADIENE	ug/Kg	576	U	493	U	468	U	474	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	576	U	493	U	468	U	474	U
HEXACHLOROETHANE	ug/Kg	576	U	493	U	468	U	474	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	576	U	493	U	468	U	474	U
ISOPHORONE	ug/Kg	576	U	493	U	468	U	474	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	576	U	493	U	468	U	474	U
N-NITROSODIPHENYLAMINE	ug/Kg	576	U	493	U	468	U	474	U
NAPHTHALENE	ug/Kg	576	U	493	U	468	U	474	U
NITROBENZENE	ug/Kg	576	U	493	U	468	U	474	U
PENTACHLOROPHENOL	ug/Kg	1730	U	1480	U	1400	U	1420	U
PHENANTHRENE	ug/Kg	576	U	493	U	468	U	474	U
PHENOL	ug/Kg	576	U	493	U	468	U	474	U
PYRENE	ug/Kg	576	U	493	U	468	U	474	U

Parameter	Units	AOCHSB005		AOCHSB008		AOCHSB009		AOCHSB006	
	SampleID	NDE014		NDE019		NDE022		NDE016	
	Date Collected	12/05/00		12/05/00		12/05/00		12/06/00	
	SampleType	N		N		N		N	
BENZO(k)FLUORANTHENE	ug/Kg	403	U	88	J	576	U	464	U
BENZYL BUTYL PHTHALATE	ug/Kg	403	U	511	U	576	U	464	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	403	U	511	U	576	U	464	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	403	U	511	U	576	U	464	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	403	U	511	U	576	U	464	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	403	U	511	U	576	U	464	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	403	U	511	U	576	U	464	U
CHRYSENE	ug/Kg	403	U	121	J	576	U	464	U
CRESOLS, m & p	ug/Kg	403	U	511	U	576	U	464	U
DI-n-BUTYL PHTHALATE	ug/Kg	403	U	511	U	576	U	464	U
DI-n-OCTYLPHTHALATE	ug/Kg	403	U	511	U	576	U	464	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	403	U	511	U	576	U	464	U
DIBENZOFURAN	ug/Kg	403	U	51	J	576	U	464	U
DIETHYL PHTHALATE	ug/Kg	403	U	511	U	576	U	464	U
DIMETHYL PHTHALATE	ug/Kg	403	U	511	U	576	U	464	U
FLUORANTHENE	ug/Kg	403	U	89	J	576	U	464	U
FLUORENE	ug/Kg	403	U	511	U	576	U	464	U
HEXACHLOROBENZENE	ug/Kg	403	U	511	U	576	U	464	U
HEXACHLOROBUTADIENE	ug/Kg	403	U	511	U	576	U	464	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	403	U	511	U	576	U	464	U
HEXACHLOROETHANE	ug/Kg	403	U	511	U	576	U	464	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	403	U	511	U	576	U	464	U
ISOPHORONE	ug/Kg	403	U	511	U	576	U	464	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	403	U	511	U	576	U	464	U
N-NITROSODIPHENYLAMINE	ug/Kg	403	U	511	U	576	U	464	U
NAPHTHALENE	ug/Kg	403	U	90	J	576	U	464	U
NITROBENZENE	ug/Kg	403	U	511	U	576	U	464	U
PENTACHLOROPHENOL	ug/Kg	1210	U	1530	U	1730	U	1390	U
PHENANTHRENE	ug/Kg	403	U	144	J	576	U	464	U
PHENOL	ug/Kg	403	U	511	U	576	U	464	U
PYRENE	ug/Kg	403	U	97	J	576	U	464	U

	StationID	AOCHSB007		AOCHSB008		AOCHSB009		AOCHSB009	
	SampleID	NDE018		NDE020		NDE203		NDE204	
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	461	U	461	U	485	U	603	U
BENZYL BUTYL PHTHALATE	ug/Kg	461	U	461	U	485	U	603	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	461	U	461	U	485	U	603	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	461	U	461	U	485	U	603	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	461	U	461	U	485	U	603	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	461	U	461	U	485	U	603	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	461	U	461	U	485	U	603	U
CHRYSENE	ug/Kg	461	U	461	U	485	U	603	U
CRESOLS, m & p	ug/Kg	461	U	461	U	485	U	603	U
DI-n-BUTYL PHTHALATE	ug/Kg	461	U	461	U	485	U	603	U
DI-n-OCTYLPHTHALATE	ug/Kg	461	U	461	U	485	U	603	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	461	U	461	U	485	U	603	U
DIBENZOFURAN	ug/Kg	461	U	461	U	485	U	603	U
DIETHYL PHTHALATE	ug/Kg	461	U	461	U	485	U	603	U
DIMETHYL PHTHALATE	ug/Kg	461	U	461	U	485	U	603	U
FLUORANTHENE	ug/Kg	461	U	461	U	485	U	603	U
FLUORENE	ug/Kg	461	U	461	U	485	U	603	U
HEXACHLOROBENZENE	ug/Kg	461	U	461	U	485	U	603	U
HEXACHLOROBUTADIENE	ug/Kg	461	U	461	U	485	U	603	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	461	U	461	U	485	U	603	U
HEXACHLOROETHANE	ug/Kg	461	U	461	U	485	U	603	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	461	U	461	U	485	U	603	U
ISOPHORONE	ug/Kg	461	U	461	U	485	U	603	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	461	U	461	U	485	U	603	U
N-NITROSODIPHENYLAMINE	ug/Kg	461	U	461	U	485	U	603	U
NAPHTHALENE	ug/Kg	461	U	461	U	485	U	603	U
NITROBENZENE	ug/Kg	461	U	461	U	485	U	603	U
PENTACHLOROPHENOL	ug/Kg	1380	U	1380	U	1450	U	1810	U
PHENANTHRENE	ug/Kg	461	U	461	U	485	U	603	U
PHENOL	ug/Kg	461	U	461	U	485	U	603	U
PYRENE	ug/Kg	461	U	461	U	485	U	603	U

	StationID	AOCHSB010		AOCHSB011		AOCHSB012		AOCHSB013	
	SampleID	NDE025		NDE027		NDE029		NDE031	
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N	
Parameter	Units								
BENZO(k)FLUORANTHENE	ug/Kg	595	U	580	U	571	U	608	U
BENZYL BUTYL PHTHALATE	ug/Kg	595	U	580	U	571	U	608	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	595	U	580	U	571	U	608	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	595	U	580	U	571	U	608	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	595	U	580	U	571	U	608	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	595	U	580	U	571	U	608	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	595	U	580	U	571	U	608	U
CHRYSENE	ug/Kg	595	U	580	U	571	U	608	U
CRESOLS, m & p	ug/Kg	595	U	580	U	571	U	608	U
DI-n-BUTYL PHTHALATE	ug/Kg	595	U	580	U	571	U	608	U
DI-n-OCTYLPHTHALATE	ug/Kg	595	U	580	U	571	U	608	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	595	U	580	U	571	U	608	U
DIBENZOFURAN	ug/Kg	595	U	580	U	571	U	608	U
DIETHYL PHTHALATE	ug/Kg	595	U	580	U	571	U	608	U
DIMETHYL PHTHALATE	ug/Kg	595	U	580	U	571	U	608	U
FLUORANTHENE	ug/Kg	595	U	580	U	571	U	608	U
FLUORENE	ug/Kg	595	U	580	U	571	U	608	U
HEXACHLOROBENZENE	ug/Kg	595	U	580	U	571	U	608	U
HEXACHLOROBUTADIENE	ug/Kg	595	U	580	U	571	U	608	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	595	U	580	U	571	U	608	U
HEXACHLOROETHANE	ug/Kg	595	U	580	U	571	U	608	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	595	U	580	U	571	U	608	U
ISOPHORONE	ug/Kg	595	U	580	U	571	U	608	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	595	U	580	U	571	U	608	U
N-NITROSODIPHENYLAMINE	ug/Kg	595	U	580	U	571	U	608	U
NAPHTHALENE	ug/Kg	595	U	580	U	571	U	608	U
NITROBENZENE	ug/Kg	595	U	580	U	571	U	608	U
PENTACHLOROPHENOL	ug/Kg	1790	U	1740	U	1710	U	1830	U
PHENANTHRENE	ug/Kg	595	U	580	U	571	U	608	U
PHENOL	ug/Kg	595	U	580	U	571	U	608	U
PYRENE	ug/Kg	595	U	580	U	571	U	608	U

	StationID	AOCHSB014		AOCHSB015		AOCHSB015		AOCHSB016	
	SampleID	NDE033		NDE035		NDE036FD1		NDE038	
	Date Collected	12/07/00		12/07/00		12/07/00		12/07/00	
	SampleType	N		N		FD		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	2800	U	2960	U	495	U	553	U
BENZYL BUTYL PHTHALATE	ug/Kg	2800	U	2960	U	495	U	553	U
BIPHENYL (DIPHENYL)	ug/Kg								
bis(2-CHLOROETHOXY) METHANE	ug/Kg	2800	U	2960	U	495	U	553	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	2800	U	2960	U	495	U	553	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	2800	U	2960	U	495	U	553	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	2800	U	2960	U	495	U	553	U
CAPROLACTAM	ug/Kg								
CARBAZOLE	ug/Kg	2800	U	2960	U	495	U	553	U
CHRYSENE	ug/Kg	2800	U	2960	U	495	U	553	U
CRESOLS, m & p	ug/Kg	2800	U	2960	U	495	U	553	U
DI-n-BUTYL PHTHALATE	ug/Kg	2800	U	2960	U	495	U	553	U
DI-n-OCTYLPHTHALATE	ug/Kg	2800	U	2960	U	495	U	553	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	2800	U	2960	U	495	U	553	U
DIBENZOFURAN	ug/Kg	2800	U	2960	U	495	U	553	U
DIETHYL PHTHALATE	ug/Kg	2800	U	2960	U	495	U	553	U
DIMETHYL PHTHALATE	ug/Kg	2800	U	2960	U	495	U	553	U
FLUORANTHENE	ug/Kg	2800	U	2960	U	495	U	553	U
FLUORENE	ug/Kg	2800	U	2960	U	76	J	553	U
HEXACHLOROBENZENE	ug/Kg	2800	U	2960	U	495	U	553	U
HEXACHLOROBUTADIENE	ug/Kg	2800	U	2960	U	495	U	553	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	2800	U	2960	U	495	U	553	U
HEXACHLOROETHANE	ug/Kg	2800	U	2960	U	495	U	553	U
INDENO(1,2,3-c,d)PYRENE	ug/Kg	2800	U	2960	U	495	U	553	U
ISOPHORONE	ug/Kg	2800	U	2960	U	90	J	553	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	2800	U	2960	U	603	=	553	U
N-NITROSODIPHENYLAMINE	ug/Kg	2800	U	2960	U	495	U	553	U
NAPHTHALENE	ug/Kg	2800	U	2960	U	495	U	553	U
NITROBENZENE	ug/Kg	2800	U	2960	U	495	U	553	U
PENTACHLOROPHENOL	ug/Kg	8390	U	8880	U	1480	U	1660	U
PHENANTHRENE	ug/Kg	2800	U	2960	U	495	U	553	U
PHENOL	ug/Kg	2800	U	2960	U	495	U	553	U
PYRENE	ug/Kg	2800	U	2960	U	495	U	553	U

Parameter	Units	AOCHSB016		NDAHSB17		NDAHSB18		NDAHSB19	
	StationID	AOCHSB016		NDAHSB17		NDAHSB18		NDAHSB19	
	SampleID	NDE039FD1		NDAHSB17-R01		NDAHSB18-R01		NDAHSB19-R01	
	Date Collected	12/07/00		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
BENZO(k)FLUORANTHENE	ug/Kg	2840	U	350	U	391	U	340	U
BENZYL BUTYL PHTHALATE	ug/Kg	2840	U	350	U	391	U	340	U
BIPHENYL (DIPHENYL)	ug/Kg			350	U	391	U	340	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	2840	U	350	R	391	R	340	R
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	2840	U	350	U	391	U	340	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	2840	U	350	U	391	U	340	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	2840	U	350	U	391	U	340	U
CAPROLACTAM	ug/Kg			350	U	391	U	340	U
CARBAZOLE	ug/Kg	2840	U	350	U	391	U	340	U
CHRYSENE	ug/Kg	2840	U	350	U	391	U	340	U
CRESOLS, m & p	ug/Kg	2840	U						
DI-n-BUTYL PHTHALATE	ug/Kg	2840	U	350	U	391	U	340	U
DI-n-OCTYLPHTHALATE	ug/Kg	2840	U	350	U	391	U	340	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	2840	U	350	U	391	U	340	U
DIBENZOFURAN	ug/Kg	2840	U	350	U	391	U	340	U
DIETHYL PHTHALATE	ug/Kg	2840	U	350	U	391	U	340	U
DIMETHYL PHTHALATE	ug/Kg	2840	U	350	U	391	U	340	U
FLUORANTHENE	ug/Kg	2840	U	350	U	391	U	340	U
FLUORENE	ug/Kg	2840	U	350	U	391	U	340	U
HEXACHLOROBENZENE	ug/Kg	2840	U	350	U	391	U	340	U
HEXACHLOROBUTADIENE	ug/Kg	2840	U	350	U	391	U	340	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	2840	U	350	U	391	U	340	U
HEXACHLOROETHANE	ug/Kg	2840	U	350	R	391	R	340	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	2840	U	350	U	391	U	340	U
ISOPHORONE	ug/Kg	2840	U	350	U	391	U	340	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	2840	U	350	U	391	U	340	U
N-NITROSODIPHENYLAMINE	ug/Kg	2840	U	350	U	391	U	340	U
NAPHTHALENE	ug/Kg	2840	U	350	U	391	U	340	U
NITROBENZENE	ug/Kg	2840	U	350	U	391	U	340	U
PENTACHLOROPHENOL	ug/Kg	8530	U	1050	U	1170	U	1020	U
PHENANTHRENE	ug/Kg	2840	U	350	U	391	U	340	U
PHENOL	ug/Kg	2840	U	350	U	391	U	340	U
PYRENE	ug/Kg	2840	U	350	U	391	U	340	U

	StationID	NDAHSB20		NDAHSB20		NDAHSB21		NDAHSB22	
	SampleID	NDAHFD05P-R01		NDAHSB20-R01		NDAHSB21-R01		NDAHSB22-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	FD		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	346	U	343	U	338	U	338	U
BENZYL BUTYL PHTHALATE	ug/Kg	346	U	343	U	338	U	338	U
BIPHENYL (DIPHENYL)	ug/Kg	346	U	343	U	338	U	338	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	346	U	343	R	338	R	338	R
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	346	U	343	U	338	U	338	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	346	U	343	U	338	U	338	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	79.9	J	343	U	338	U	338	U
CAPROLACTAM	ug/Kg	346	U	343	U	338	U	338	U
CARBAZOLE	ug/Kg	346	U	343	U	338	U	338	U
CHRYSENE	ug/Kg	346	U	343	U	338	U	338	U
CRESOLS, m & p	ug/Kg								
DI-n-BUTYL PHTHALATE	ug/Kg	346	U	343	U	338	U	338	U
DI-n-OCTYLPHTHALATE	ug/Kg	346	U	343	U	338	U	338	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	346	U	343	U	338	U	338	U
DIBENZOFURAN	ug/Kg	346	U	343	U	338	U	338	U
DIETHYL PHTHALATE	ug/Kg	346	U	343	U	338	U	338	U
DIMETHYL PHTHALATE	ug/Kg	346	U	343	U	338	U	338	U
FLUORANTHENE	ug/Kg	346	U	343	U	338	U	338	U
FLUORENE	ug/Kg	346	U	343	U	338	U	338	U
HEXACHLOROBENZENE	ug/Kg	346	U	343	U	338	U	338	U
HEXACHLOROBUTADIENE	ug/Kg	346	U	343	U	338	U	338	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	346	U	343	U	338	U	338	U
HEXACHLOROETHANE	ug/Kg	346	R	343	R	338	R	338	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	346	U	343	U	338	U	338	U
ISOPHORONE	ug/Kg	346	U	343	U	338	U	338	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	346	U	343	U	338	U	338	U
N-NITROSODIPHENYLAMINE	ug/Kg	346	U	343	U	338	U	338	U
NAPHTHALENE	ug/Kg	346	U	343	U	338	U	338	U
NITROBENZENE	ug/Kg	346	U	343	U	338	U	338	U
PENTACHLOROPHENOL	ug/Kg	1040	U	1030	U	1010	U	1020	U
PHENANTHRENE	ug/Kg	346	U	343	U	338	U	338	U
PHENOL	ug/Kg	346	U	343	U	338	U	338	U
PYRENE	ug/Kg	346	U	343	U	338	U	338	U

	StationID	NDAHSB23		NDAHSB24		NDAHSB25		NDAHSB26	
	SampleID	NDAHSB23-R01		NDAHSB24-R01		NDAHSB25-R01		NDAHSB26-R01	
	Date Collected	08/26/03		08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N		N	
Parameter	**Units**								
BENZO(k)FLUORANTHENE	ug/Kg	338	U	346	U	352	U	360	U
BENZYL BUTYL PHTHALATE	ug/Kg	338	U	346	U	352	U	360	U
BIPHENYL (DIPHENYL)	ug/Kg	338	U	346	U	352	U	360	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	338	R	346	R	352	R	360	R
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	338	U	346	U	352	U	360	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	338	U	346	U	352	U	360	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	338	U	346	U	352	U	360	U
CAPROLACTAM	ug/Kg	338	U	346	U	352	U	360	U
CARBAZOLE	ug/Kg	338	U	346	U	352	U	360	U
CHRYSENE	ug/Kg	338	U	346	U	352	U	360	U
CRESOLS, m & p	ug/Kg								
DI-n-BUTYL PHTHALATE	ug/Kg	338	U	346	U	352	U	360	U
DI-n-OCTYLPHTHALATE	ug/Kg	338	U	346	U	352	U	360	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	338	U	346	U	352	U	360	U
DIBENZOFURAN	ug/Kg	338	U	346	U	352	U	360	U
DIETHYL PHTHALATE	ug/Kg	338	U	346	U	352	U	360	U
DIMETHYL PHTHALATE	ug/Kg	338	U	346	U	352	U	360	U
FLUORANTHENE	ug/Kg	338	U	346	U	352	U	360	U
FLUORENE	ug/Kg	338	U	346	U	352	U	360	U
HEXACHLOROBENZENE	ug/Kg	338	U	346	U	352	U	360	U
HEXACHLOROBUTADIENE	ug/Kg	338	U	346	U	352	U	360	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	338	U	346	U	352	U	360	U
HEXACHLOROETHANE	ug/Kg	338	R	346	R	352	R	360	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	338	U	346	U	352	U	360	U
ISOPHORONE	ug/Kg	338	U	346	U	352	U	360	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	338	U	346	U	352	U	360	U
N-NITROSODIPHENYLAMINE	ug/Kg	338	U	346	U	352	U	360	U
NAPHTHALENE	ug/Kg	338	U	346	U	352	U	360	U
NITROBENZENE	ug/Kg	338	U	346	U	352	U	360	U
PENTACHLOROPHENOL	ug/Kg	1010	U	1040	U	1060	U	1080	U
PHENANTHRENE	ug/Kg	338	U	346	U	352	U	360	U
PHENOL	ug/Kg	338	U	346	U	352	U	360	U
PYRENE	ug/Kg	338	U	346	U	352	U	360	U

Analytical Data Summary

	StationID	NDAHSB27		NDAHSB28		NDAHSB29	
	SampleID	NDAHSB27-R01		NDAHSB28-R01		NDAHSB29-R01	
	Date Collected	08/26/03		08/26/03		08/26/03	
	SampleType	N		N		N	
Parameter	**Units**						
BENZO(k)FLUORANTHENE	ug/Kg	371	U	396	U	349	U
BENZYL BUTYL PHTHALATE	ug/Kg	371	U	396	U	349	U
BIPHENYL (DIPHENYL)	ug/Kg	371	U	396	U	349	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	371	R	396	R	349	R
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHY	ug/Kg	371	U	396	U	349	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	371	U	396	U	349	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	371	U	396	U	349	U
CAPROLACTAM	ug/Kg	371	U	396	U	349	U
CARBAZOLE	ug/Kg	371	U	396	U	349	U
CHRYSENE	ug/Kg	371	U	396	U	349	U
CRESOLS, m & p	ug/Kg						
DI-n-BUTYL PHTHALATE	ug/Kg	371	U	396	U	349	U
DI-n-OCTYLPHTHALATE	ug/Kg	371	U	396	U	349	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	371	U	396	U	349	U
DIBENZOFURAN	ug/Kg	371	U	396	U	349	U
DIETHYL PHTHALATE	ug/Kg	371	U	396	U	349	U
DIMETHYL PHTHALATE	ug/Kg	371	U	396	U	349	U
FLUORANTHENE	ug/Kg	371	U	396	U	349	U
FLUORENE	ug/Kg	371	U	396	U	349	U
HEXACHLOROBENZENE	ug/Kg	371	U	396	U	349	U
HEXACHLOROBUTADIENE	ug/Kg	371	U	396	U	349	U
HEXACHLOROCYCLOPENTADIENE	ug/Kg	371	U	396	U	349	U
HEXACHLOROETHANE	ug/Kg	371	R	396	R	349	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	371	U	396	U	349	U
ISOPHORONE	ug/Kg	371	U	396	U	349	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	371	U	396	U	349	U
N-NITROSODIPHENYLAMINE	ug/Kg	371	U	396	U	349	U
NAPHTHALENE	ug/Kg	371	U	396	U	349	U
NITROBENZENE	ug/Kg	371	U	396	U	349	U
PENTACHLOROPHENOL	ug/Kg	1110	U	1190	U	1050	U
PHENANTHRENE	ug/Kg	371	U	396	U	349	U
PHENOL	ug/Kg	371	U	396	U	349	U
PYRENE	ug/Kg	371	U	396	U	349	U

	StationID	AOCHSB001		AOCHSB002		AOCHSB003		AOCHSB004	
	SampleID	NDE006		NDE008		NDE010		NDE012	
	Date Collected	12/05/00		12/05/00		12/05/00		12/05/00	
	SampleType	N		N		N		N	
Parameter	**Units**								
ACETONE	ug/Kg	12	R	10	R	10	R	10	R
BROMODICHLOROMETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
BROMOMETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
BENZENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
TOLUENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
CARBON DISULFIDE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
CHLOROBENZENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
CHLOROETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
CHLOROMETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
CARBON TETRACHLORIDE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
DIBROMOCHLOROMETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,1-DICHLOROETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,2-DICHLOROETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,1-DICHLOROETHENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,2-DICHLOROPROPANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
ETHYLBENZENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
2-HEXANONE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	12	R	10	R	10	R	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
METHYLENE CHLORIDE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	12	UJ	10	UJ	1.6	J	10	UJ
STYRENE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
BROMOFORM	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
CHLOROFORM	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
VINYL CHLORIDE	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
XYLENES, TOTAL	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	12	UJ	10	UJ	10	UJ	10	UJ

Analytical Data Summary

Parameter	Units	AOCHSB005		AOCHSB008		AOCHSB009		AOCHSB006	
StationID		AOCHSB005		AOCHSB008		AOCHSB009		AOCHSB006	
SampleID		NDE014		NDE019		NDE022		NDE016	
Date Collected		12/05/00		12/05/00		12/05/00		12/06/00	
SampleType		N		N		N		N	
ACETONE	ug/Kg	22	R	20	R	10	R	21	U
BROMODICHLOROMETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
BROMOMETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
BENZENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
TOLUENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
CARBON DISULFIDE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
CHLOROBENZENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
CHLOROETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
CHLOROMETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
CARBON TETRACHLORIDE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
DIBROMOCHLOROMETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
1,1-DICHLOROETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
1,2-DICHLOROETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
1,1-DICHLOROETHENE	ug/Kg	10	UJ	12	UJ	10	UJ	0.45	J
cis-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
1,2-DICHLOROPROPANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
ETHYLBENZENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
2-HEXANONE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	12	R	10	R	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
METHYLENE CHLORIDE	ug/Kg	10	UJ	12	UJ	10	UJ	0.58	J
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	0.31	J	12	UJ	10	UJ	10	UJ
STYRENE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
BROMOFORM	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
CHLOROFORM	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
VINYL CHLORIDE	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
XYLENES, TOTAL	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	UJ	12	UJ	10	UJ	10	UJ

	StationID	AOCHSB007		AOCHSB008		AOCHSB009		AOCHSB009	
	SampleID	NDE018		NDE020		NDE203		NDE204	
	Date Collected	12/06/00		12/06/00		12/06/00		12/06/00	
	SampleType	N		N		N		N	
Parameter	Units								
ACETONE	ug/Kg	17	U	25	U	10	R	13	R
BROMODICHLOROMETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
BROMOMETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
BENZENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
TOLUENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
CARBON DISULFIDE	ug/Kg	10	U	10	U	10	UJ	12	UJ
CHLOROBENZENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
CHLOROETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
CHLOROMETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
CARBON TETRACHLORIDE	ug/Kg	10	U	10	U	10	UJ	12	UJ
DIBROMOCHLOROMETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
1,1-DICHLOROETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
1,2-DICHLOROETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
1,1-DICHLOROETHENE	ug/Kg	0.55	J	0.52	J	0.78	J	12	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
1,2-DICHLOROPROPANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
ETHYLBENZENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
2-HEXANONE	ug/Kg	10	U	10	U	10	UJ	12	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	10	R	10	R	12	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	U	10	U	10	UJ	12	UJ
METHYLENE CHLORIDE	ug/Kg	10	U	10	U	10	U	12	U
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	U	10	U	10	UJ	12	UJ
STYRENE	ug/Kg	10	U	10	U	10	UJ	12	UJ
BROMOFORM	ug/Kg	10	U	10	U	10	UJ	12	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	10	U	10	U	10	UJ	12	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	10	U	10	U	10	UJ	12	UJ
CHLOROFORM	ug/Kg	10	U	10	U	10	UJ	12	UJ
VINYL CHLORIDE	ug/Kg	10	U	10	U	10	UJ	12	UJ
XYLENES, TOTAL	ug/Kg	10	U	10	U	10	UJ	12	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	U	10	U	10	UJ	12	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	U	10	U	10	UJ	12	UJ

StationID		AOCHSB010		AOCHSB011		AOCHSB012		AOCHSB013	
SampleID		NDE025		NDE027		NDE029		NDE031	
Date Collected		12/06/00		12/06/00		12/06/00		12/06/00	
SampleType		N		N		N		N	
Parameter	**Units**								
ACETONE	ug/Kg	24	U	10	R	10	R	12	R
BROMODICHLOROMETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
BROMOMETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
BENZENE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
TOLUENE	ug/Kg	10	U	0.4	J	10	UJ	11	UJ
CARBON DISULFIDE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
CHLOROBENZENE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
CHLOROETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
CHLOROMETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
CARBON TETRACHLORIDE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
DIBROMOCHLOROMETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
1,1-DICHLOROETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
1,2-DICHLOROETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
1,1-DICHLOROETHENE	ug/Kg	0.59	J	10	UJ	10	UJ	11	UJ
cis-1,3-DICHLOROPROPENE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
trans-1,3-DICHLOROPROPENE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
1,2-DICHLOROPROPANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
ETHYLBENZENE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
2-HEXANONE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	10	R	10	R	11	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
METHYLENE CHLORIDE	ug/Kg	10	U	10	U	10	UJ	11	UJ
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
STYRENE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
BROMOFORM	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
1,1,1-TRICHLOROETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
1,1,2-TRICHLOROETHANE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
TRICHLOROETHYLENE (TCE)	ug/Kg	10	U	0.34	J	10	UJ	11	UJ
CHLOROFORM	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
VINYL CHLORIDE	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
XYLENES, TOTAL	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	U	10	UJ	10	UJ	11	UJ
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	U	10	UJ	10	UJ	11	UJ

Analytical Data Summary

Parameter	Units								
StationID		AOCHSB014		AOCHSB015		AOCHSB015		AOCHSB016	
SampleID		NDE033		NDE035		NDE036FD1		NDE038	
Date Collected		12/07/00		12/07/00		12/07/00		12/07/00	
SampleType		N		N		FD		N	
ACETONE	ug/Kg	10	R	10	R	10	R	10	R
BROMODICHLOROMETHANE	ug/Kg	10	U	10	U	10	U	10	U
BROMOMETHANE	ug/Kg	10	U	10	U	10	U	10	U
BENZENE	ug/Kg	10	U	10	U	10	U	10	U
TOLUENE	ug/Kg	10	U	10	U	10	U	10	U
CARBON DISULFIDE	ug/Kg	10	U	10	U	10	U	10	U
CHLOROBENZENE	ug/Kg	10	U	10	U	10	U	10	U
CHLOROETHANE	ug/Kg	10	U	10	U	10	U	10	U
CHLOROMETHANE	ug/Kg	10	U	10	U	10	U	10	U
CARBON TETRACHLORIDE	ug/Kg	10	U	10	U	10	U	10	U
DIBROMOCHLOROMETHANE	ug/Kg	10	U	10	U	10	U	10	U
1,1-DICHLOROETHANE	ug/Kg	10	U	10	U	10	U	10	U
1,2-DICHLOROETHANE	ug/Kg	10	U	2	J	10	U	10	U
1,1-DICHLOROETHENE	ug/Kg	10	U	10	U	10	U	10	U
cis-1,3-DICHLOROPROPENE	ug/Kg	10	U	10	U	10	U	10	U
trans-1,3-DICHLOROPROPENE	ug/Kg	10	U	10	U	10	U	10	U
1,2-DICHLOROPROPANE	ug/Kg	10	U	10	U	10	U	10	U
ETHYLBENZENE	ug/Kg	10	U	10	U	10	U	10	U
2-HEXANONE	ug/Kg	10	U	10	U	10	U	10	U
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R	10	R	10	R	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	U	10	U	10	U	10	U
METHYLENE CHLORIDE	ug/Kg	10	U	10	U	10	U	10	U
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	U	10	U	10	U	10	U
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	U	10	U	10	U	10	U
STYRENE	ug/Kg	10	U	10	U	10	U	10	U
BROMOFORM	ug/Kg	10	U	10	U	10	U	10	U
1,1,1-TRICHLOROETHANE	ug/Kg	10	U	10	U	10	U	10	U
1,1,2-TRICHLOROETHANE	ug/Kg	10	U	10	U	10	U	10	U
TRICHLOROETHYLENE (TCE)	ug/Kg	10	U	10	U	10	U	10	U
CHLOROFORM	ug/Kg	10	U	10	U	10	U	10	U
VINYL CHLORIDE	ug/Kg	10	U	10	U	10	U	10	U
XYLENES, TOTAL	ug/Kg	10	U	10	U	10	U	10	U
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	U	10	U	10	U	10	U
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	U	10	U	10	U	10	U

Parameter	Units		
	StationID	AOCHSB016	
	SampleID	NDE039FD1	
	Date Collected	12/07/00	
	SampleType	FD	
ACETONE	ug/Kg	10	R
BROMODICHLOROMETHANE	ug/Kg	10	U
BROMOMETHANE	ug/Kg	10	U
BENZENE	ug/Kg	10	U
TOLUENE	ug/Kg	10	U
CARBON DISULFIDE	ug/Kg	0.91	J
CHLOROBENZENE	ug/Kg	10	U
CHLOROETHANE	ug/Kg	10	U
CHLOROMETHANE	ug/Kg	10	U
CARBON TETRACHLORIDE	ug/Kg	10	U
DIBROMOCHLOROMETHANE	ug/Kg	10	U
1,1-DICHLOROETHANE	ug/Kg	10	U
1,2-DICHLOROETHANE	ug/Kg	10	U
1,1-DICHLOROETHENE	ug/Kg	10	U
cis-1,3-DICHLOROPROPENE	ug/Kg	10	U
trans-1,3-DICHLOROPROPENE	ug/Kg	10	U
1,2-DICHLOROPROPANE	ug/Kg	10	U
ETHYLBENZENE	ug/Kg	10	U
2-HEXANONE	ug/Kg	10	U
METHYL ETHYL KETONE (2-BUTANONE)	ug/Kg	10	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANON	ug/Kg	10	U
METHYLENE CHLORIDE	ug/Kg	10	U
1,1,2,2-TETRACHLOROETHANE	ug/Kg	10	U
TETRACHLOROETHYLENE(PCE)	ug/Kg	10	U
STYRENE	ug/Kg	10	U
BROMOFORM	ug/Kg	10	U
1,1,1-TRICHLOROETHANE	ug/Kg	10	U
1,1,2-TRICHLOROETHANE	ug/Kg	10	U
TRICHLOROETHYLENE (TCE)	ug/Kg	10	U
CHLOROFORM	ug/Kg	10	U
VINYL CHLORIDE	ug/Kg	10	U
XYLENES, TOTAL	ug/Kg	10	U
M,P-XYLENE (SUM OF ISOMERS)	ug/Kg	10	U
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/Kg	10	U

Parameter	Units	NDAHMW07		NDAHMW01		NDAHMW01		NDAHMW02		NDAHMW05		NDAHMW06	
SampleID		NDAHGW07-R01		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01		NDAHGW05-R01		NDAHGW06-R01	
Date Collected		09/07/03		09/08/03		09/08/03		09/08/03		09/08/03		09/09/03	
SampleType		N		N		FD		N		N		N	
1,3-Dinitrobenzene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,4-Dinitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,6-Dinitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoc	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Nitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
3-Nitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
4-Nitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Nitrobenzene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Tetryl	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3,5-Trinitrobenzene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,4,6-trinitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U

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	StationID	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04		NDAHMW01		NDAHMW01		NDAHMW02		NDAHMW05		NDAHMW06	
	SampleID	NDE213		NDE214		NDE215		NDE216FD1		NDE217		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01		NDAHGW05-R01		NDAHGW06-R01	
	Date Collected	12/19/00		12/19/00		12/19/00		12/19/00		12/19/00		09/08/03		09/08/03		09/08/03		09/08/03		09/09/03	
	SampleType	N		N		N		FD		N		N		FD		N		N		N	
Parameter	**Units**																				
Aluminum, dissolved	ug/L	95	U	95	U	95	U	100	J	130	J	35	U	47.7	J	350	U	350	U	35	U
Antimony, dissolved	ug/L	2.4	U	2.4	U	2.4	U	2.4	U	5.4	J	2.5	U	2.5	U	25	U	25	U	2.5	U
Arsenic, dissolved	ug/L	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	2.04	U	2.04	U	20.4	U	20.4	U	2.04	U
Barium, dissolved	ug/L	51	J	460	=	190	J	210	=	400	=	63	J	62.2	J	285	J	320	J	58.1	J
Beryllium, dissolved	ug/L	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.0945	U	0.0945	U	0.945	U	0.945	U	0.0945	U
Cadmium, dissolved	ug/L	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.356	U	0.356	U	4.99	J	6.3	J	0.356	U
Calcium, dissolved	ug/L	24000	=	270000	=	180000	=	180000	=	340000	=	15100	=	15100	=	554000	=	712000	=	35900	=
Chromium, dissolved	ug/L	0.87	U	0.87	U	0.87	U	0.87	U	0.87	U	0.57	U	0.81	J	7.91	J	5.71	J	0.57	U
Cobalt, dissolved	ug/L	0.43	U	0.43	U	0.43	U	0.43	U	0.43	U	0.569	U	0.569	U	30.3	J	24.2	J	0.626	J
Copper, dissolved	ug/L	0.8	U	0.8	U	0.8	U	0.8	U	0.8	U	1.21	J	4.58	J	11.7	U	11.7	U	1.17	U
Iron, dissolved	ug/L	120	=	25	U	25	U	25	U	25	U	16.7	U	16.9	J	3290	=	4180	=	16.7	U
Lead, dissolved	ug/L	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.76	U	1.78	J	17.6	U	17.6	U	1.76	U
Magnesium, dissolved	ug/L	13000	=	220000	=	97000	=	100000	=	280000	=	10300	=	10300	=	891000	=	958000	=	25100	=
Manganese, dissolved	ug/L	150	=	5800	=	92	=	110	=	1800	=	39.5	=	41.1	=	14600	=	15400	=	590	=
Mercury, dissolved	ug/L	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.0162	U	0.0162	U	0.0162	UJ	0.0162	UJ	0.0162	U
Nickel, dissolved	ug/L	7.7	J	0.93	U	0.93	U	0.93	U	0.93	U	0.997	U	0.997	U	17.6	J	9.97	U	0.997	U
Potassium, dissolved	ug/L	4100	J	56000	J	12000	J	12000	J	12000	J	4430	J	4430	J	203000	J	183000	J	2170	J
Selenium, dissolved	ug/L	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	2.21	J	3.73	J	21	U	26.5	U	3.56	J
Silver, dissolved	ug/L	0.57	U	0.57	U	0.57	U	0.57	U	0.57	U	0.472	U	0.472	U	4.72	U	4.72	U	0.472	U
Sodium, dissolved	ug/L	280000	=	980000	=	830000	=	890000	=	1E+06	=	273000	=	272000	=	6E+06	=	6E+06	=	163000	=
Thallium, dissolved	ug/L	9	J	3.4	U	3.4	U	3.4	U	3.4	U	2.54	U	2.54	U	25.4	U	26.2	J	2.54	U
Vanadium, dissolved	ug/L	20	J	2.8	J	9.6	J	10	J	6	J	10.2	J	10.6	J	4.47	U	4.47	U	12.7	J
Zinc, dissolved	ug/L	5	U	5	U	5	U	5	U	5	U	1.66	J	1.58	J	4.09	U	4.09	U	0.489	J

Parameter	Units	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04		NDAHMW01		NDAHMW01		NDAHMW02		NDAHMW05	
SampleID		NDE213		NDE214		NDE215		NDE216FD1		NDE217		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01		NDAHGW05-R01	
Date Collected		12/19/00		12/19/00		12/19/00		12/19/00		12/19/00		09/08/03		09/08/03		09/08/03		09/08/03	
SampleType		N		N		N		FD		N		N		FD		N		N	
Aluminum	ug/L	6000	=	9100	=	3800	=	100	J	130	J	6430	=	7050	=	399	J	481	J
Antimony	ug/L	2.4	U	2.4	U	2.4	U	2.4	U	5.4	J	2.5	U	2.5	U	25	U	25	U
Arsenic	ug/L	2.9	U	6.3	J	2.9	U	2.9	U	2.9	U	2.04	U	2.04	U	20.4	U	20.4	U
Barium	ug/L	86	J	490	=	300	=	210	=	400	=	123	J	127	J	279	J	319	J
Beryllium	ug/L	0.33	U	0.33	U	0.33	U	0.33	U	0.33	U	0.0945	U	0.0945	U	0.945	U	0.945	U
Cadmium	ug/L	0.27	U	0.27	U	0.27	U	0.27	U	0.27	U	0.435	J	0.527	J	3.56	U	3.56	U
Calcium	ug/L	35000	=	320000	=	200000	=	170000	=	340000	=	16500	=	16800	=	556000	=	719000	=
Chromium, Total	ug/L	11	=	15	=	5.2	J	3.2	J	0.87	U	10.9	=	11.6	=	9.86	J	5.7	U
Cobalt	ug/L	5.1	J	22	J	12	J	9.3	J	0.43	U	4.68	J	5.1	J	29.9	J	24.5	J
Copper	ug/L	17	J	25	=	16	J	10	J	0.8	U	12.6	J	14.1	J	11.7	U	11.7	U
Iron	ug/L	8200	=	11000	=	4500	=	2900	=	25	U	7560	=	8160	=	4580	=	5170	=
Lead	ug/L	1.6	U	1.6	U	1.6	U	1.6	U	1.6	U	1.76	U	1.76	U	17.6	U	17.6	U
Magnesium	ug/L	19000	=	220000	=	110000	=	98000	=	280000	=	12700	=	12900	=	860000	=	937000	=
Manganese	ug/L	250	=	8300	=	1100	=	1100	=	1800	=	1100	=	1150	=	14100	=	14800	=
Mercury	ug/L	0.025	U	0.025	U	0.025	U	0.025	U	0.025	U	0.0162	U	0.0162	U	0.0165	J	0.0162	UJ
Nickel	ug/L	22	J	59	=	9	J	7.6	J	0.93	U	7.55	J	6.6	J	10.4	J	11.4	J
Potassium	ug/L	4600	J	54000	J	13000	J	12000	J	12000	J	4300	J	4320	J	240000	J	221000	J
Selenium	ug/L	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	2.1	U	2.1	U	21	U	21	U
Silver	ug/L	0.57	U	0.57	U	0.57	U	0.57	U	0.57	U	0.472	U	0.527	J	4.72	U	4.72	U
Sodium	ug/L	290000	=	940000	=	890000	=	850000	=	1200000	=	266000	=	272000	=	5860000	=	6030000	=
Thallium	ug/L	10	=	6.6	J	10	=	8	J	3.4	U	3.28	J	3.26	J	28.7	J	25.4	U
Vanadium	ug/L	43	J	70	=	28	J	24	J	6	J	38.5	J	40.5	J	4.47	U	4.47	U
Zinc	ug/L	19	J	33	=	19	J	11	J	5	U	12.8	J	14.2	J	4.09	U	4.09	U

Analytical Data Summary

		StationID	NDAHMW06	
		SampleID	NDAHGW06-R01	
		Date Collected	09/09/03	
		SampleType	N	
Parameter	Units			
Aluminum	ug/L		112	J
Antimony	ug/L		2.62	J
Arsenic	ug/L		2.04	U
Barium	ug/L		63.1	J
Beryllium	ug/L		0.0945	U
Cadmium	ug/L		0.408	J
Calcium	ug/L		34900	=
Chromium, Total	ug/L		0.57	U
Cobalt	ug/L		0.569	U
Copper	ug/L		1.17	U
Iron	ug/L		83	J
Lead	ug/L		1.76	U
Magnesium	ug/L		24900	=
Manganese	ug/L		620	=
Mercury	ug/L		0.0162	U
Nickel	ug/L		1.47	J
Potassium	ug/L		1870	J
Selenium	ug/L		2.1	U
Silver	ug/L		0.472	U
Sodium	ug/L		163000	=
Thallium	ug/L		2.54	U
Vanadium	ug/L		13.7	J
Zinc	ug/L		0.808	J

Analytical Data Summary

	StationID	NDAHMW07		NDAHMW01		NDAHMW01		NDAHMW02		NDAHMW05		NDAHMW06	
	SampleID	NDAHGW07-R01		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01		NDAHGW05-R01		NDAHGW06-R01	
	Date Collected	09/07/03		09/08/03		09/08/03		09/08/03		09/08/03		09/09/03	
	SampleType	N		N		FD		N		N		N	
Parameter	**Units**												
Perchlorate	ug/L	20	U	20	U	20	U	20	U	20	U	20	U

	StationID	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04		NDAHMW01		NDAHMW01		NDAHMW02		NDAHMW05	
	SampleID	NDE213		NDE214		NDE215		NDE216FD1		NDE217		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01		NDAHGW05-R01	
	Date Collected	12/19/00		12/19/00		12/19/00		12/19/00		12/19/00		08-Sep-03		08-Sep-03		08-Sep-03		08-Sep-03	
	SampleType	N		N		N		FD		N		N		FD		N		N	
Parameter	**Units**																		
Aldrin	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Beta bhc (beta hexachlorocyclohexane)	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Delta bhc (delta hexachlorocyclohexane)	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Gamma bhc (lindane)	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Alpha-chlordane	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Gamma-chlordane	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	U	0.01	U
p,p'-DDD	ug/L	0.028	U	0.42	J	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.4	=	0.39	=
p,p'-DDE	ug/L	0.028	U	0.022	J	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	U	0.018	J
p,p'-DDT	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.028	J	0.02	U	0.02	U	0.02	U	0.02	U
Dieldrin	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	U	0.02	U
Alpha endosulfan	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Beta endosulfan	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	U	0.02	U
Endosulfan sulfate	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	U	0.02	U
Endrin	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	UJ	0.02	UJ
Endrin aldehyde	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	U	0.02	U
Endrin ketone	ug/L	0.028	U	0.023	UJ	0.021	UJ	0.022	UJ	0.021	UJ	0.02	U	0.02	U	0.02	U	0.02	U
Heptachlor epoxide	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	UJ	0.01	UJ
Heptachlor	ug/L	0.014	U	0.012	UJ	0.011	UJ	0.011	UJ	0.011	UJ	0.01	U	0.01	U	0.01	U	0.01	U
Methoxychlor	ug/L	0.141	U	0.116	UJ	0.107	UJ	0.108	UJ	0.105	UJ	0.1	U	0.1	U	0.1	U	0.1	U
Toxaphene	ug/L	1.4	U	1.2	UJ	1.1	UJ	1.1	UJ	1.1	UJ	0.05	U	0.05	U	0.05	UJ	0.05	UJ

Analytical Data Summary

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	StationID	NDAHMW06		NDAHMW07	
	SampleID	NDAHGW06-R01		NDAHGW07-R01	
	Date Collected	09-Sep-03		07-Sep-03	
	SampleType	N		N	
Parameter	**Units**				
Aldrin	ug/L	0.01	U	0.01	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/L	0.01	U	0.01	U
Beta bhc (beta hexachlorocyclohexane)	ug/L	0.01	U	0.01	U
Delta bhc (delta hexachlorocyclohexane)	ug/L	0.01	U	0.01	U
Gamma bhc (lindane)	ug/L	0.01	U	0.01	U
Alpha-chlordane	ug/L	0.01	U	0.01	U
Gamma-chlordane	ug/L	0.01	U	0.01	U
p,p'-DDD	ug/L	0.02	U	0.02	U
p,p'-DDE	ug/L	0.02	U	0.02	U
p,p'-DDT	ug/L	0.02	U	0.02	U
Dieldrin	ug/L	0.02	U	0.02	U
Alpha endosulfan	ug/L	0.01	U	0.01	U
Beta endosulfan	ug/L	0.02	U	0.02	U
Endosulfan sulfate	ug/L	0.02	U	0.02	U
Endrin	ug/L	0.02	U	0.02	UJ
Endrin aldehyde	ug/L	0.02	U	0.02	U
Endrin ketone	ug/L	0.02	U	0.02	U
Heptachlor epoxide	ug/L	0.01	U	0.01	UJ
Heptachlor	ug/L	0.01	U	0.01	U
Methoxychlor	ug/L	0.1	U	0.1	U
Toxaphene	ug/L	0.05	U	0.05	UJ

	StationID	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04	
	SampleID	NDE213		NDE214		NDE215		NDE216FD1		NDE217	
	Date Collected	12/19/00		12/19/00		12/19/00		12/19/00		12/19/00	
	SampleType	N		N		N		FD		N	
Parameter	**Units**										
PCB-1016 (AROCHLOR 1016)	ug/L	0.282	U	0.233	UJ	0.214	UJ	0.215	UJ	0.211	UJ
PCB-1221 (AROCHLOR 1221)	ug/L	0.563	U	0.465	UJ	0.428	UJ	0.43	UJ	0.421	UJ
PCB-1232 (AROCHLOR 1232)	ug/L	0.282	U	0.233	UJ	0.214	UJ	0.215	UJ	0.211	UJ
PCB-1242 (AROCHLOR 1242)	ug/L	0.282	U	0.233	UJ	0.214	UJ	0.215	UJ	0.211	UJ
PCB-1248 (AROCHLOR 1248)	ug/L	0.282	U	0.233	UJ	0.214	UJ	0.215	UJ	0.211	UJ
PCB-1254 (AROCHLOR 1254)	ug/L	0.282	U	0.233	UJ	0.214	UJ	0.215	UJ	0.211	UJ
PCB-1260 (AROCHLOR 1260)	ug/L	0.282	U	0.233	UJ	0.214	UJ	0.215	UJ	0.211	UJ

Parameter	Units	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04		NDAHMW07		NDAHMW01		NDAHMW01		NDAHMW02	
SampleID		NDE213		NDE214		NDE215		NDE216FD1		NDE217		NDAHGW07-R01		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01	
Date Collected		12/19/00		12/19/00		12/19/00		12/19/00		12/19/00		09/07/03		09/08/03		09/08/03		09/08/03	
SampleType		N		N		N		FD		N		N		N		FD		N	
1,2,4,5-TETRACHLOROBENZENE	ug/L											5.1	R	5.1	U	5.1	U	5.2	R
2,4,5-TRICHLOROPHENOL	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
2,4,6-TRICHLOROPHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2,4-DICHLOROPHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2,4-DIMETHYLPHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2,4-DINITROPHENOL	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
2,4-DINITROTOLUENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2,6-DINITROTOLUENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2-CHLORONAPHTHALENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2-CHLOROPHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2-METHYLNAPHTHALENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2-METHYLPHENOL (o-CRESOL)	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
2-NITROANILINE	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
2-NITROPHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
3,3'-DICHLOROBENZIDINE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
3-NITROANILINE	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
4,6-DINITRO-2-METHYLPHENOL	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
4-BROMOPHENYL PHENYL ETHER	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
4-CHLORO-3-METHYLPHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
4-CHLOROANILINE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
4-CHLOROPHENYL PHENYL ETHER	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
4-METHYLPHENOL (p-CRESOL)	ug/L											5.1	U	5.1	U	5.1	U	5.2	U
4-NITROANILINE	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
4-NITROPHENOL	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
ACENAPHTHENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
ACENAPHTHYLENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
ACETOPHENONE	ug/L											5.1	U	5.1	U	5.1	U	5.2	U
ANTHRACENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
ATRAZINE	ug/L											5.1	U	5.1	U	5.1	U	5.2	U
BENZALDEHYDE	ug/L											5.1	U	5.1	U	5.1	U	5.2	U
BENZO(a)ANTHRACENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
BENZO(a)PYRENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
BENZO(b)FLUORANTHENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
BENZO(g,h,i)PERYLENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
BENZO(k)FLUORANTHENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
BENZYL BUTYL PHTHALATE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
BIPHENYL (DIPHENYL)	ug/L											5.1	U	5.1	U	5.1	U	5.2	U
bis(2-CHLOROETHOXY) METHANE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
bis(2-CHLOROETHYL) ETHER (2-CHL(	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
bis(2-CHLOROISOPROPYL) ETHER	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/L	5.4	U	6.2	U	5.2	U	5.2	U	5.4	U	10.2	U	10.2	U	10.2	U	10.3	U
CAPROLACTAM	ug/L											5.1	R	3	J	6.2	J	5.2	R
CARBAZOLE	ug/L											10.2	U	10.2	U	10.2	U	10.3	U
CHRYSENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U

Analytical Data Summary

	StationID	NDAHMW05		NDAHMW06	
	SampleID	NDAHGW05-R01		NDAHGW06-R01	
	Date Collected	09/08/03		09/09/03	
	SampleType	N		N	
Parameter	Units				
1,2,4,5-TETRACHLOROBENZENE	ug/L	5	R	5.2	U
2,4,5-TRICHLOROPHENOL	ug/L	20.2	U	20.6	U
2,4,6-TRICHLOROPHENOL	ug/L	5	U	5.2	U
2,4-DICHLOROPHENOL	ug/L	5	U	5.2	U
2,4-DIMETHYLPHENOL	ug/L	5	U	5.2	U
2,4-DINITROPHENOL	ug/L	20.2	U	20.6	U
2,4-DINITROTOLUENE	ug/L	5	U	5.2	U
2,6-DINITROTOLUENE	ug/L	5	U	5.2	U
2-CHLORONAPHTHALENE	ug/L	5	U	5.2	U
2-CHLOROPHENOL	ug/L	5	U	5.2	U
2-METHYLNAPHTHALENE	ug/L	5	U	5.2	U
2-METHYLPHENOL (o-CRESOL)	ug/L	5	U	5.2	U
2-NITROANILINE	ug/L	20.2	U	20.6	U
2-NITROPHENOL	ug/L	5	U	5.2	U
3,3'-DICHLOROBENZIDINE	ug/L	5	U	5.2	U
3-NITROANILINE	ug/L	20.2	U	20.6	U
4,6-DINITRO-2-METHYLPHENOL	ug/L	20.2	U	20.6	U
4-BROMOPHENYL PHENYL ETHER	ug/L	5	U	5.2	U
4-CHLORO-3-METHYLPHENOL	ug/L	5	U	5.2	U
4-CHLOROANILINE	ug/L	9.9	=	5.2	U
4-CHLOROPHENYL PHENYL ETHER	ug/L	5	U	5.2	U
4-METHYLPHENOL (p-CRESOL)	ug/L	5	U	5.2	U
4-NITROANILINE	ug/L	20.2	U	20.6	U
4-NITROPHENOL	ug/L	20.2	U	20.6	U
ACENAPHTHENE	ug/L	5	U	5.2	U
ACENAPHTHYLENE	ug/L	5	U	5.2	U
ACETOPHENONE	ug/L	5	U	5.2	U
ANTHRACENE	ug/L	5	U	5.2	U
ATRAZINE	ug/L	5	U	5.2	U
BENZALDEHYDE	ug/L	5	U	5.2	U
BENZO(a)ANTHRACENE	ug/L	5	U	5.2	U
BENZO(a)PYRENE	ug/L	5	U	5.2	U
BENZO(b)FLUORANTHENE	ug/L	5	U	5.2	U
BENZO(g,h,i)PERYLENE	ug/L	5	U	5.2	U
BENZO(k)FLUORANTHENE	ug/L	5	U	5.2	U
BENZYL BUTYL PHTHALATE	ug/L	5	U	5.2	U
BIPHENYL (DIPHENYL)	ug/L	5	U	5.2	U
bis(2-CHLOROETHOXY) METHANE	ug/L	5	U	5.2	U
bis(2-CHLOROETHYL) ETHER (2-CHL	ug/L	5	U	5.2	U
bis(2-CHLOROISOPROPYL) ETHER	ug/L	5	U	5.2	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/L	10.1	U	10.3	U
CAPROLACTAM	ug/L	6	J	5.2	R
CARBAZOLE	ug/L	10.1	U	10.3	U
CHRYSENE	ug/L	5	U	5.2	U

	StationID	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04		NDAHMW07		NDAHMW01		NDAHMW01		NDAHMW02	
	SampleID	NDE213		NDE214		NDE215		NDE216FD1		NDE217		NDAHGW07-R01		NDAHGW01-R01		NDAHGWFD01		NDAHGW02-R01	
	Date Collected	12/19/00		12/19/00		12/19/00		12/19/00		12/19/00		09/07/03		09/08/03		09/08/03		09/08/03	
	SampleType	N		N		N		FD		N		N		N		FD		N	
Parameter	Units																		
CRESOLS, m & p	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U								
DI-n-BUTYL PHTHALATE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
DI-n-OCTYLPHTHALATE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
DIBENZ(a,h)ANTHRACENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
DIBENZOFURAN	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
DIETHYL PHTHALATE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
DIMETHYL PHTHALATE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
FLUORANTHENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
FLUORENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
HEXACHLOROBENZENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
HEXACHLOROBUTADIENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
HEXACHLOROCYCLOPENTADIENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
HEXACHLOROETHANE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
INDENO(1,2,3-c,d)PYRENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
ISOPHORONE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
N-NITROSODI-n-PROPYLAMINE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
N-NITROSODIPHENYLAMINE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
NAPHTHALENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
NITROBENZENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
PENTACHLOROPHENOL	ug/L	22	U	21	U	21	U	21	U	22	U	20.4	U	20.4	U	20.4	U	20.6	U
PHENANTHRENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
PHENOL	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U
PYRENE	ug/L	5.4	U	5.2	U	5.2	U	5.2	U	5.4	U	5.1	U	5.1	U	5.1	U	5.2	U

	StationID	NDAHMW05		NDAHMW06	
	SampleID	NDAHGW05-R01		NDAHGW06-R01	
	Date Collected	09/08/03		09/09/03	
	SampleType	N		N	
Parameter	**Units**				
CRESOLS, m & p	ug/L				
DI-n-BUTYL PHTHALATE	ug/L	5	U	5.2	U
DI-n-OCTYLPHTHALATE	ug/L	5	U	5.2	U
DIBENZ(a,h)ANTHRACENE	ug/L	5	U	5.2	U
DIBENZOFURAN	ug/L	5	U	5.2	U
DIETHYL PHTHALATE	ug/L	5	U	5.2	U
DIMETHYL PHTHALATE	ug/L	5	U	5.2	U
FLUORANTHENE	ug/L	5	U	5.2	U
FLUORENE	ug/L	5	U	5.2	U
HEXACHLOROBENZENE	ug/L	5	U	5.2	U
HEXACHLOROBUTADIENE	ug/L	5	U	5.2	U
HEXACHLOROCYCLOPENTADIENE	ug/L	5	U	5.2	U
HEXACHLOROETHANE	ug/L	5	U	5.2	U
INDENO(1,2,3-c,d)PYRENE	ug/L	5	U	5.2	U
ISOPHORONE	ug/L	5	U	5.2	U
N-NITROSODI-n-PROPYLAMINE	ug/L	5	U	5.2	U
N-NITROSODIPHENYLAMINE	ug/L	5	U	5.2	U
NAPHTHALENE	ug/L	5	U	5.2	U
NITROBENZENE	ug/L	5	U	5.2	U
PENTACHLOROPHENOL	ug/L	20.2	U	20.6	U
PHENANTHRENE	ug/L	5	U	5.2	U
PHENOL	ug/L	5	U	5.2	U
PYRENE	ug/L	5	U	5.2	U

	StationID	AOC-H-MW01		AOC-H-MW02		AOC-H-MW03		AOC-H-MW03		AOC-H-MW04	
	SampleID	NDE213		NDE214		NDE215		NDE216FD1		NDE217	
	Date Collected	12/19/00		12/19/00		12/19/00		12/19/00		12/19/00	
	SampleType	N		N		N		FD		N	
Parameter	**Units**										
ACETONE	ug/L	5	R	5	R	5	R	5	R	5	R
BROMODICHLOROMETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
BROMOCHLOROMETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
BROMOMETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
BENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
TOLUENE	ug/L	1.3	=	1.3	=	0.43	J	1	J	1	=
CARBON DISULFIDE	ug/L	1	U	1	U	1	U	1	U	1	U
CHLOROBENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
CHLOROETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
CHLOROMETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
CARBON TETRACHLORIDE	ug/L	1	U	1	U	1	U	1	U	1	U
DIBROMOCHLOROMETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMO-3-CHLOROPROPANE	ug/L	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROBENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
1,3-DICHLOROBENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
1,4-DICHLOROBENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
1,1-DICHLOROETHENE	ug/L	1	U	1	U	1	U	1	U	1	U
cis-1,2-DICHLOROETHYLENE	ug/L	1	U	1	U	1	U	1	U	1	U
trans-1,2-DICHLOROETHENE	ug/L	1	U	1	U	1	U	1	U	1	U
cis-1,3-DICHLOROPROPENE	ug/L	1	U	1	U	1	U	1	U	1	U
trans-1,3-DICHLOROPROPENE	ug/L	1	U	1	U	1	U	1	U	1	U
1,2-DICHLOROPROPANE	ug/L	1	U	1	U	1	U	1	U	1	U
ETHYLBENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	ug/L	1	U	1	U	1	U	1	U	1	U
2-HEXANONE	ug/L	5	U	5	U	5	U	5	U	5	U
METHYL ETHYL KETONE (2-BUTANONE)	ug/L	5	R	5	R	5	R	5	R	5	R
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	ug/L	5	U	5	U	5	U	5	U	5	U
METHYLENE CHLORIDE	ug/L	2	U	2	U	2	U	2	U	2	U
1,1,2,2-TETRACHLOROETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
TETRACHLOROETHYLENE(PCE)	ug/L	1	U	1	U	1	U	1	U	1	U
STYRENE	ug/L	1	U	1	U	1	U	1	U	1	U
BROMOFORM	ug/L	1	U	1	U	1	U	1	U	1	U
1,1,1-TRICHLOROETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
1,1,2-TRICHLOROETHANE	ug/L	1	U	1	U	1	U	1	U	1	U
1,2,4-TRICHLOROBENZENE	ug/L	1	U	1	U	1	U	1	U	1	U
TRICHLOROETHYLENE (TCE)	ug/L	1	U	1	U	1	U	1	U	1	U
CHLOROFORM	ug/L	1	U	1	U	1	U	1	U	1	U
VINYL CHLORIDE	ug/L	1	U	1	U	1	U	1	U	1	U
XYLENES, TOTAL	ug/L	1	U	1	U	1	U	1	U	1	U
M,P-XYLENE (SUM OF ISOMERS)	ug/L	1	U	1	U	1	U	1	U	1	U
O-XYLENE (1,2-DIMETHYLBENZENE)	ug/L	1	U	1	U	1	U	1	U	1	U

Analytical Data Summary

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
1,3-Dinitrobenzene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,4-Dinitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,6-Dinitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2-Nitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
3-Nitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
4-Nitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Nitrobenzene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
Tetryl	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
1,3,5-Trinitrobenzene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U
2,4,6-trinitrotoluene	ug/L	2.5	U	2.5	U	2.5	U	2.5	U	2.5	U

Analytical Data Summary

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
Aluminum, dissolved	ug/L	700	U	700	U	700	U	700	U	700	U
Antimony, dissolved	ug/L	50	U	50	U	50	U	50	U	50	U
Arsenic, dissolved	ug/L	40.8	U	40.8	U	40.8	U	40.8	U	40.8	U
Barium, dissolved	ug/L	142	J	163	J	147	J	150	J	149	J
Beryllium, dissolved	ug/L	1.89	U	1.89	U	1.89	U	1.89	U	1.89	U
Cadmium, dissolved	ug/L	7.12	U	7.12	U	7.12	U	7.12	U	7.12	U
Calcium, dissolved	ug/L	346000	=	342000	=	342000	=	343000	=	335000	=
Chromium, dissolved	ug/L	11.4	U	11.4	U	11.4	U	11.4	U	11.4	U
Cobalt, dissolved	ug/L	11.4	U	11.4	U	11.4	U	11.4	U	11.4	U
Copper, dissolved	ug/L	23.4	U	23.4	U	23.4	U	23.4	U	23.4	U
Iron, dissolved	ug/L	334	U	334	U	334	U	334	U	334	U
Lead, dissolved	ug/L	35.2	U	35.2	U	35.2	U	35.2	U	35.2	U
Magnesium, dissolved	ug/L	939000	=	924000	=	928000	=	925000	=	902000	=
Manganese, dissolved	ug/L	91.7	J	70	J	268	J	234	J	419	J
Mercury, dissolved	ug/L	0.0162	U	0.0162	U	0.0239	J	0.0303	J	0.0224	J
Nickel, dissolved	ug/L	19.9	U	19.9	U	19.9	U	19.9	U	19.9	U
Potassium, dissolved	ug/L	486000	=	479000	=	479000	=	476000	=	460000	=
Selenium, dissolved	ug/L	67.9	J	42	U	42	U	42	U	42	U
Silver, dissolved	ug/L	9.44	U	9.44	U	9.44	U	9.44	U	9.44	U
Sodium, dissolved	ug/L	7750000	=	7660000	=	7670000	=	7630000	=	7400000	=
Thallium, dissolved	ug/L	50.8	U	50.8	U	50.8	U	50.8	U	50.8	U
Vanadium, dissolved	ug/L	8.94	U	8.94	U	8.94	U	8.94	U	8.94	U
Zinc, dissolved	ug/L	8.18	U	8.18	U	8.18	U	8.18	U	8.18	U

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
Aluminum	ug/L	700	U	1740	J	700	U	700	U	700	U
Antimony	ug/L	50	U	50	U	50	U	50	U	50	U
Arsenic	ug/L	40.8	U	47.1	J	40.8	U	40.8	U	40.8	U
Barium	ug/L	146	J	162	J	151	J	151	J	155	J
Beryllium	ug/L	1.89	U	1.89	U	1.89	U	1.89	U	1.89	U
Cadmium	ug/L	7.12	U	7.7	J	7.12	U	7.12	U	7.12	U
Calcium	ug/L	355000	=	371000	=	374000	=	383000	=	371000	=
Chromium, Total	ug/L	11.4	U	16.2	J	11.4	U	11.4	U	11.4	U
Cobalt	ug/L	11.4	U	19.6	J	11.4	U	11.4	U	11.4	U
Copper	ug/L	23.4	U	23.4	U	23.4	U	23.4	U	23.4	U
Iron	ug/L	334	U	334	U	334	U	334	U	334	U
Lead	ug/L	35.2	U	35.2	U	35.2	U	35.2	U	35.2	U
Magnesium	ug/L	961000	=	1010000	=	1020000	=	1050000	=	1020000	=
Manganese	ug/L	450	=	385	=	590	=	654	=	633	=
Mercury	ug/L	0.0259	J	0.0225	J	0.043	J	0.0339	J	0.0351	J
Nickel	ug/L	19.9	U	19.9	U	19.9	U	19.9	U	19.9	U
Potassium	ug/L	481000	J	473000	J	482000	J	482000	J	470000	J
Selenium	ug/L	42	U	63.9	J	42	U	42	U	42	U
Silver	ug/L	9.44	U	9.44	U	9.44	U	9.44	U	9.44	U
Sodium	ug/L	7680000	=	7480000	=	7740000	=	7660000	=	7510000	=
Thallium	ug/L	50.8	U	50.8	U	50.8	U	50.8	U	50.8	U
Vanadium	ug/L	8.94	U	8.94	U	8.94	U	8.94	U	8.94	U
Zinc	ug/L	8.18	U	8.18	U	8.18	U	8.18	U	8.18	U

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
Perchlorate	ug/L	20	U	20	U	20	U	20	U	20	U

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
Aldrin	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/L	0.0099	UJ	0.0099	UJ	0.01	UJ	0.01	UJ	0.01	UJ
Beta bhc (beta hexachlorocyclohexane)	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Delta bhc (delta hexachlorocyclohexane)	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Gamma bhc (lindane)	ug/L	0.0099	UJ	0.0099	UJ	0.01	UJ	0.01	UJ	0.01	UJ
Alpha-chlordane	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Gamma-chlordane	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
p,p'-DDD	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
p,p'-DDE	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
p,p'-DDT	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Dieldrin	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Alpha endosulfan	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Beta endosulfan	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Endosulfan sulfate	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Endrin	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Endrin aldehyde	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Endrin ketone	ug/L	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Heptachlor epoxide	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Heptachlor	ug/L	0.0099	U	0.0099	U	0.01	U	0.01	U	0.01	U
Methoxychlor	ug/L	0.099	U	0.099	U	0.1	U	0.1	U	0.1	U
Toxaphene	ug/L	0.05	U	0.05	U	0.05	U	0.051	U	0.051	U

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
1,2,4,5-TETRACHLOROBENZENE	ug/L	5.1	R	5	R	102	R	5.1	R	5.1	R
2,4,5-TRICHLOROPHENOL	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
2,4,6-TRICHLOROPHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2,4-DICHLOROPHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2,4-DIMETHYLPHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2,4-DINITROPHENOL	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
2,4-DINITROTOLUENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2,6-DINITROTOLUENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2-CHLORONAPHTHALENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2-CHLOROPHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2-METHYLNAPHTHALENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2-METHYLPHENOL (o-CRESOL)	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
2-NITROANILINE	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
2-NITROPHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
3,3'-DICHLOROBENZIDINE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
3-NITROANILINE	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
4,6-DINITRO-2-METHYLPHENOL	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
4-BROMOPHENYL PHENYL ETHER	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
4-CHLORO-3-METHYLPHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
4-CHLOROANILINE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
4-CHLOROPHENYL PHENYL ETHER	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
4-METHYLPHENOL (p-CRESOL)	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
4-NITROANILINE	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
4-NITROPHENOL	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
ACENAPHTHENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
ACENAPHTHYLENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
ACETOPHENONE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
ANTHRACENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
ATRAZINE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZALDEHYDE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZO(a)ANTHRACENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZO(a)PYRENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZO(b)FLUORANTHENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZO(g,h,i)PERYLENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZO(k)FLUORANTHENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BENZYL BUTYL PHTHALATE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
BIPHENYL (DIPHENYL)	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U

	StationID	NDAHSW01		NDAHSW02		NDAHSW03		NDAHSW03		NDAHSW04	
	SampleID	NDAHSW01-R01		NDAHSW02-R01		NDAHFD02P-R01		NDAHSW03-R01		NDAHSW04-R01	
	Date Collected	09/30/03		09/30/03		09/30/03		09/30/03		09/30/03	
	SampleType	N		N		FD		N		N	
Parameter	**Units**										
bis(2-CHLOROETHOXY) METHANE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
bis(2-CHLOROETHYL) ETHER (2-CHLOROETHYL ETH	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
bis(2-CHLOROISOPROPYL) ETHER	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/L	10.2	U	10.1	U	205	U	10.2	U	10.2	U
CAPROLACTAM	ug/L	0.52	J	5	R	102	R	5.1	R	5.1	R
CARBAZOLE	ug/L	10.2	U	10.1	U	205	U	10.2	U	10.2	U
CHRYSENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
DI-n-BUTYL PHTHALATE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
DI-n-OCTYLPHTHALATE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
DIBENZ(a,h)ANTHRACENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
DIBENZOFURAN	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
DIETHYL PHTHALATE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
DIMETHYL PHTHALATE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
FLUORANTHENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
FLUORENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
HEXACHLOROBENZENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
HEXACHLOROBUTADIENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
HEXACHLOROCYCLOPENTADIENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
HEXACHLOROETHANE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
INDENO(1,2,3-c,d)PYRENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
ISOPHORONE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
N-NITROSODI-n-PROPYLAMINE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
N-NITROSODIPHENYLAMINE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
NAPHTHALENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
NITROBENZENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
PENTACHLOROPHENOL	ug/L	20.4	U	20.2	U	410	U	20.5	U	20.4	U
PHENANTHRENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
PHENOL	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U
PYRENE	ug/L	5.1	U	5	U	102	U	5.1	U	5.1	U

Parameter	Units	NDAHSD01		NDAHSD01		NDAHSD02		NDAHSD03	
	SampleID	NDAHFD03P-R01		NDAHSD01-R01		NDAHSD02-R01		NDAHSD03-R01	
	Date Collected	09/29/03		09/29/03		09/29/03		09/29/03	
	SampleType	FD		N		N		N	
1,3-Dinitrobenzene	ug/Kg	165	U	158	U	160	U	162	U
2,4-Dinitrotoluene	ug/Kg	165	U	158	U	160	U	162	U
2,6-Dinitrotoluene	ug/Kg	165	U	158	U	160	U	162	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/Kg	165	U	158	U	160	U	162	U
2-Nitrotoluene	ug/Kg	165	U	158	U	160	U	162	U
3-Nitrotoluene	ug/Kg	165	U	158	U	160	U	162	U
4-Nitrotoluene	ug/Kg	165	U	158	U	160	U	162	U
Nitrobenzene	ug/Kg	165	U	158	U	160	U	162	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	165	U	158	U	160	U	162	U
Tetryl	ug/Kg	165	UJ	158	UJ	160	UJ	162	UJ
1,3,5-Trinitrobenzene	ug/Kg	165	U	158	U	160	U	162	U
2,4,6-trinitrotoluene	ug/Kg	165	U	158	U	160	U	162	U

Analytical Data Summary

	StationID	NDAHSD04		NDAHSD05	
	SampleID	NDAHSD04-R01		NDAHSD05-R01	
	Date Collected	09/29/03		09/30/03	
	SampleType	N		N	
Parameter	**Units**				
1,3-Dinitrobenzene	ug/Kg	166	U	130	U
2,4-Dinitrotoluene	ug/Kg	166	U	130	U
2,6-Dinitrotoluene	ug/Kg	166	U	130	U
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/Kg	166	U	130	U
2-Nitrotoluene	ug/Kg	166	U	130	U
3-Nitrotoluene	ug/Kg	166	U	130	U
4-Nitrotoluene	ug/Kg	166	U	130	U
Nitrobenzene	ug/Kg	166	U	130	U
Hexahydro-1,3,5-trinitro-1,3,5,7-tetrazocine	ug/Kg	166	U	130	U
Tetryl	ug/Kg	166	UJ	130	UJ
1,3,5-Trinitrobenzene	ug/Kg	166	U	130	U
2,4,6-trinitrotoluene	ug/Kg	166	U	130	U

	StationID	NDAHSD01		NDAHSD01		NDAHSD02		NDAHSD03		NDAHSD04	
	SampleID	NDAHFD03P-R01		NDAHSD01-R01		NDAHSD02-R01		NDAHSD03-R01		NDAHSD04-R01	
	Date Collected	09/29/03		09/29/03		09/29/03		09/29/03		09/29/03	
	SampleType	FD		N		N		N		N	
Parameter	**Units**										
Aluminum	mg/Kg	1610	=	3320	=	3080	=	1880	=	3180	=
Antimony	mg/Kg	0.369	J	0.333	J	0.0817	UJ	0.107	J	0.0829	UJ
Arsenic	mg/Kg	0.649	J	0.882	J	0.249	J	0.132	U	0.202	J
Barium	mg/Kg	6.16	J	6	J	57.2	=	13	J	13.2	J
Beryllium	mg/Kg	0.0308	J	0.0486	J	0.0647	J	0.0379	J	0.0503	J
Cadmium	mg/Kg	0.0109	U	0.0104	U	0.0109	U	0.0121	U	0.011	U
Calcium	mg/Kg	76200	J	2590	J	2660	=	890	=	1130	=
Chromium, Total	mg/Kg	2.84	J	13.4	J	4.16	=	3.11	=	7.75	=
Cobalt	mg/Kg	1.42	J	3.56	J	3.85	J	2.31	J	4.27	J
Copper	mg/Kg	3.73	=	7.1	=	9.76	=	6.15	=	9.43	=
Iron	mg/Kg	2950	=	7990	=	8440	=	6040	=	8620	=
Lead	mg/Kg	0.446	=	0.853	=	1.49	=	0.964	=	1.43	=
Magnesium	mg/Kg	1780	=	3430	=	1530	=	1140	=	2140	=
Manganese	mg/Kg	33.6	=	87.6	=	109	=	62.1	=	73.6	=
Mercury	mg/Kg	0.00138	U	0.00134	U	0.0127	J	0.00363	J	0.00181	J
Nickel	mg/Kg	1.02	J	4.39	J	1.93	J	1.28	J	4.25	J
Potassium	mg/Kg	774	=	1040	=	970	=	716	J	1090	=
Selenium	mg/Kg	0.171	U	0.163	U	0.171	U	0.19	U	0.173	U
Silver	mg/Kg	0.0208	U	0.0197	U	0.0207	U	0.023	U	0.0268	J
Sodium	mg/Kg	4000	=	3290	=	2340	=	2800	=	2720	=
Thallium	mg/Kg	0.105	U	0.0998	U	0.494	J	0.432	J	0.422	J
Vanadium	mg/Kg	9.59	=	25.8	=	26.9	=	17.3	=	21.9	=
Zinc	mg/Kg	4.58	=	11.3	=	12.5	=	7.31	=	13.6	=

Analytical Data Summary

Parameter	Units		
StationID		NDAHSD05	
SampleID		NDAHSD05-R01	
Date Collected		09/30/03	
SampleType		N	
Aluminum	mg/Kg	3030	=
Antimony	mg/Kg	0.183	J
Arsenic	mg/Kg	0.271	J
Barium	mg/Kg	22.5	J
Beryllium	mg/Kg	0.0634	J
Cadmium	mg/Kg	0.00969	U
Calcium	mg/Kg	1230	=
Chromium, Total	mg/Kg	7.36	=
Cobalt	mg/Kg	4.12	J
Copper	mg/Kg	10.3	=
Iron	mg/Kg	15500	=
Lead	mg/Kg	1.99	=
Magnesium	mg/Kg	1400	=
Manganese	mg/Kg	126	=
Mercury	mg/Kg	0.00181	J
Nickel	mg/Kg	2.39	J
Potassium	mg/Kg	673	=
Selenium	mg/Kg	0.152	U
Silver	mg/Kg	0.0406	J
Sodium	mg/Kg	90.6	J
Thallium	mg/Kg	1.12	J
Vanadium	mg/Kg	50.4	=
Zinc	mg/Kg	12.1	=

Parameter	Units										
	StationID	NDAHSD01		NDAHSD01		NDAHSD02		NDAHSD03		NDAH	
	SampleID	NDAHFD03P-R01		NDAHSD01-R01		NDAHSD02-R01		NDAHSD03-R01		NDAHSI	
	Date Collected	09/29/03		09/29/03		09/29/03		09/29/03		09/2	
	SampleType	FD		N		N		N		N	
Aldrin	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	2.2	R	2.2	UJ	2.2	UJ	2.3	UJ	2.3	
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Gamma bhc (lindane)	ug/Kg	2.2	R	2.2	UJ	2.2	UJ	2.3	UJ	2.3	
Alpha-chlordane	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Gamma-chlordane	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
p,p'-DDD	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
p,p'-DDE	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	0.12	
p,p'-DDT	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Dieldrin	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Alpha endosulfan	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Beta endosulfan	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Endosulfan sulfate	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Endrin	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Endrin aldehyde	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Endrin ketone	ug/Kg	4.4	R	4.3	U	4.3	U	4.5	U	4.5	
Heptachlor epoxide	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Heptachlor	ug/Kg	2.2	R	2.2	U	2.2	U	2.3	U	2.3	
Methoxychlor	ug/Kg	22	R	22	U	22	U	23	U	23	
Toxaphene	ug/Kg	220	R	220	U	220	U	230	U	230	

	StationID	SD04	NDAHSD05	
	SampleID	04-R01	NDAHSD05-R01	
	Date Collected	9/03	09/30/03	
	SampleType	N	N	
Parameter	Units			
Aldrin	ug/Kg	U	1.8	U
Alpha bhc (alpha hexachlorocyclohexane)	ug/Kg	UJ	1.8	UJ
Beta bhc (beta hexachlorocyclohexane)	ug/Kg	U	1.8	U
Delta bhc (delta hexachlorocyclohexane)	ug/Kg	U	1.8	U
Gamma bhc (lindane)	ug/Kg	UJ	1.8	UJ
Alpha-chlordane	ug/Kg	U	1.8	U
Gamma-chlordane	ug/Kg	U	1.8	U
p,p'-DDD	ug/Kg	U	3.4	U
p,p'-DDE	ug/Kg	J	0.07	J
p,p'-DDT	ug/Kg	U	3.4	U
Dieldrin	ug/Kg	U	3.4	U
Alpha endosulfan	ug/Kg	U	1.8	U
Beta endosulfan	ug/Kg	U	3.4	U
Endosulfan sulfate	ug/Kg	U	3.4	U
Endrin	ug/Kg	U	3.4	U
Endrin aldehyde	ug/Kg	U	3.4	U
Endrin ketone	ug/Kg	U	3.4	U
Heptachlor epoxide	ug/Kg	U	1.8	U
Heptachlor	ug/Kg	U	1.8	U
Methoxychlor	ug/Kg	U	18	U
Toxaphene	ug/Kg	U	180	U

	StationID	NDAHSD01		NDAHSD01		NDAHSD02		NDAHSD03		NDAHSD04		NDAHSD05	
	SampleID	NDAHFD03P-R01		NDAHSD01-R01		NDAHSD02-R01		NDAHSD03-R01		NDAHSD04-R01		NDAHSD05-R01	
	Date Collected	09/29/03		09/29/03		09/29/03		09/29/03		09/29/03		09/30/03	
	SampleType	FD		N		N		N		N		N	
Parameter	**Units**												
Perchlorate	ug/Kg	106	U	105	U	107	U	107	U	115	U	104	U

	StationID	NDAHSD01		NDAHSD01		NDAHSD02		NDAHSD03		NDAH
	SampleID	NDAHFD03P-R01		NDAHSD01-R01		NDAHSD02-R01		NDAHSD03-R01		NDAHSI
	Date Collected	09/29/03		09/29/03		09/29/03		09/29/03		09/2
	SampleType	FD		N		N		N		N
Parameter	Units									
2,4,5-TRICHLOROPHENOL	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
2,4,6-TRICHLOROPHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
2,4-DICHLOROPHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
2,4-DIMETHYLPHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
2,4-DINITROPHENOL	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
2,4-DINITROTOLUENE	ug/Kg	437	U	427	U	422	U	445	U	444
2,6-DINITROTOLUENE	ug/Kg	437	U	427	U	422	U	445	U	444
2-CHLORONAPHTHALENE	ug/Kg	437	U	427	U	422	U	445	U	444
2-CHLOROPHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
2-METHYLNAPHTHALENE	ug/Kg	437	U	427	U	422	U	445	U	444
2-METHYLPHENOL (o-CRESOL)	ug/Kg	437	U	427	U	422	U	445	U	444
2-NITROANILINE	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
2-NITROPHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
3,3'-DICHLOROBENZIDINE	ug/Kg	888	U	868	U	856	U	903	U	902
3-NITROANILINE	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
4-BROMOPHENYL PHENYL ETHER	ug/Kg	437	U	427	U	422	U	445	U	444
4-CHLORO-3-METHYLPHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
4-CHLOROANILINE	ug/Kg	437	R	427	R	422	R	445	R	444
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	437	U	427	U	422	U	445	U	444
4-METHYLPHENOL (p-CRESOL)	ug/Kg	437	U	427	U	422	U	445	U	444
4-NITROANILINE	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
4-NITROPHENOL	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
ACENAPHTHENE	ug/Kg	437	U	427	U	422	U	445	U	444
ACENAPHTHYLENE	ug/Kg	437	U	427	U	422	U	445	U	444
ACETOPHENONE	ug/Kg	437	U	427	U	422	U	445	U	444
ANTHRACENE	ug/Kg	437	U	427	U	422	U	445	U	444
ATRAZINE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZALDEHYDE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZO(a)ANTHRACENE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZO(a)PYRENE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZO(b)FLUORANTHENE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZO(g,h,i)PERYLENE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZO(k)FLUORANTHENE	ug/Kg	437	U	427	U	422	U	445	U	444
BENZYL BUTYL PHTHALATE	ug/Kg	437	U	427	U	422	U	445	U	444
BIPHENYL (DIPHENYL)	ug/Kg	437	U	427	U	422	U	445	U	444
bis(2-CHLOROETHOXY) METHANE	ug/Kg	437	R	427	R	422	R	445	R	444

	StationID	SD04	NDAHSD05	
	SampleID	04-R01	NDAHSD05-R01	
	Date Collected	9/03	09/30/03	
	SampleType		N	
Parameter	**Units**			
2,4,5-TRICHLOROPHENOL	ug/Kg	U	1010	U
2,4,6-TRICHLOROPHENOL	ug/Kg	U	337	U
2,4-DICHLOROPHENOL	ug/Kg	U	337	U
2,4-DIMETHYLPHENOL	ug/Kg	U	337	U
2,4-DINITROPHENOL	ug/Kg	U	1010	UJ
2,4-DINITROTOLUENE	ug/Kg	U	337	U
2,6-DINITROTOLUENE	ug/Kg	U	337	U
2-CHLORONAPHTHALENE	ug/Kg	U	337	U
2-CHLOROPHENOL	ug/Kg	U	337	U
2-METHYLNAPHTHALENE	ug/Kg	U	337	U
2-METHYLPHENOL (o-CRESOL)	ug/Kg	U	337	U
2-NITROANILINE	ug/Kg	U	1010	U
2-NITROPHENOL	ug/Kg	U	337	U
3,3'-DICHLOROBENZIDINE	ug/Kg	U	685	U
3-NITROANILINE	ug/Kg	U	1010	U
4,6-DINITRO-2-METHYLPHENOL	ug/Kg	U	1010	U
4-BROMOPHENYL PHENYL ETHER	ug/Kg	U	337	U
4-CHLORO-3-METHYLPHENOL	ug/Kg	U	337	U
4-CHLOROANILINE	ug/Kg	R	337	R
4-CHLOROPHENYL PHENYL ETHER	ug/Kg	U	337	U
4-METHYLPHENOL (p-CRESOL)	ug/Kg	U	337	U
4-NITROANILINE	ug/Kg	U	1010	U
4-NITROPHENOL	ug/Kg	U	1010	U
ACENAPHTHENE	ug/Kg	U	337	U
ACENAPHTHYLENE	ug/Kg	U	337	U
ACETOPHENONE	ug/Kg	U	337	U
ANTHRACENE	ug/Kg	U	337	U
ATRAZINE	ug/Kg	U	337	U
BENZALDEHYDE	ug/Kg	U	337	U
BENZO(a)ANTHRACENE	ug/Kg	U	337	U
BENZO(a)PYRENE	ug/Kg	U	337	U
BENZO(b)FLUORANTHENE	ug/Kg	U	337	U
BENZO(g,h,i)PERYLENE	ug/Kg	U	337	U
BENZO(k)FLUORANTHENE	ug/Kg	U	337	U
BENZYL BUTYL PHTHALATE	ug/Kg	U	337	U
BIPHENYL (DIPHENYL)	ug/Kg	U	337	U
bis(2-CHLOROETHOXY) METHANE	ug/Kg	R	337	R

	StationID	NDAHSD01		NDAHSD01		NDAHSD02		NDAHSD03		NDAH
	SampleID	NDAHFD03P-R01		NDAHSD01-R01		NDAHSD02-R01		NDAHSD03-R01		NDAHSI
	Date Collected	09/29/03		09/29/03		09/29/03		09/29/03		09/2'
	SampleType	FD		N		N		N		N
Parameter	**Units**									
bis(2-CHLOROETHYL) ETHER (2-CHL	ug/Kg	437	U	427	U	422	U	445	U	444
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	437	U	427	U	422	U	445	U	444
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	437	U	427	U	422	U	445	U	444
CAPROLACTAM	ug/Kg	437	U	427	U	422	U	445	U	444
CARBAZOLE	ug/Kg	437	U	427	U	422	U	445	U	444
CHRYSENE	ug/Kg	437	U	427	U	422	U	445	U	444
DI-n-BUTYL PHTHALATE	ug/Kg	437	U	427	U	422	U	445	U	444
DI-n-OCTYLPHTHALATE	ug/Kg	437	U	427	U	422	U	445	U	444
DIBENZ(a,h)ANTHRACENE	ug/Kg	437	U	427	U	422	U	445	U	444
DIBENZOFURAN	ug/Kg	437	U	427	U	422	U	445	U	444
DIETHYL PHTHALATE	ug/Kg	437	U	427	U	422	U	445	U	444
DIMETHYL PHTHALATE	ug/Kg	437	U	427	U	422	U	445	U	444
FLUORANTHENE	ug/Kg	437	U	427	U	422	U	445	U	444
FLUORENE	ug/Kg	437	U	427	U	422	U	445	U	444
HEXACHLOROBENZENE	ug/Kg	437	U	427	U	422	U	445	U	444
HEXACHLOROBUTADIENE	ug/Kg	437	R	427	R	422	R	445	R	444
HEXACHLOROCYCLOPENTADIENE	ug/Kg	437	U	427	U	422	U	445	U	444
HEXACHLOROETHANE	ug/Kg	437	R	427	R	422	R	445	R	444
INDENO(1,2,3-c,d)PYRENE	ug/Kg	437	U	427	U	422	U	445	U	444
ISOPHORONE	ug/Kg	437	U	427	U	422	U	445	U	444
N-NITROSODI-n-PROPYLAMINE	ug/Kg	437	U	427	U	422	U	445	U	444
N-NITROSODIPHENYLAMINE	ug/Kg	437	U	427	U	422	U	445	U	444
NAPHTHALENE	ug/Kg	437	R	427	R	422	R	445	R	444
NITROBENZENE	ug/Kg	437	U	427	U	422	U	445	U	444
PENTACHLOROPHENOL	ug/Kg	1310	U	1280	U	1260	U	1330	U	1330
PHENANTHRENE	ug/Kg	437	U	427	U	422	U	445	U	444
PHENOL	ug/Kg	437	U	427	U	422	U	445	U	444
PYRENE	ug/Kg	437	U	427	U	422	U	445	U	444

Parameter	Units	StationID: SD04 / SampleID: 04-R01 / Date Collected: 9/03 / SampleType: N		NDAHSD05 / NDAHSD05-R01 / 09/30/03 / N
bis(2-CHLOROETHYL) ETHER (2-CHL	ug/Kg	U	337	U
bis(2-CHLOROISOPROPYL) ETHER	ug/Kg	U	337	U
bis(2-ETHYLHEXYL) PHTHALATE	ug/Kg	U	337	U
CAPROLACTAM	ug/Kg	U	337	U
CARBAZOLE	ug/Kg	U	337	U
CHRYSENE	ug/Kg	U	337	U
DI-n-BUTYL PHTHALATE	ug/Kg	U	337	U
DI-n-OCTYLPHTHALATE	ug/Kg	U	337	U
DIBENZ(a,h)ANTHRACENE	ug/Kg	U	337	U
DIBENZOFURAN	ug/Kg	U	337	U
DIETHYL PHTHALATE	ug/Kg	U	337	U
DIMETHYL PHTHALATE	ug/Kg	U	337	U
FLUORANTHENE	ug/Kg	U	337	U
FLUORENE	ug/Kg	U	337	U
HEXACHLOROBENZENE	ug/Kg	U	337	U
HEXACHLOROBUTADIENE	ug/Kg	R	337	R
HEXACHLOROCYCLOPENTADIENE	ug/Kg	U	337	U
HEXACHLOROETHANE	ug/Kg	R	337	R
INDENO(1,2,3-c,d)PYRENE	ug/Kg	U	337	U
ISOPHORONE	ug/Kg	U	337	U
N-NITROSODI-n-PROPYLAMINE	ug/Kg	U	337	U
N-NITROSODIPHENYLAMINE	ug/Kg	U	337	U
NAPHTHALENE	ug/Kg	R	337	R
NITROBENZENE	ug/Kg	U	337	U
PENTACHLOROPHENOL	ug/Kg	U	1010	U
PHENANTHRENE	ug/Kg	U	337	U
PHENOL	ug/Kg	U	337	U
PYRENE	ug/Kg	U	337	U

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
					Metals (mg/Kg)							
ALUMINUM	NDAHSS01	12/05/2000	11000	J	7610	50	NA	NA	yes	yes	na	na
	NDAHSS06	12/05/2000	11000	=					yes	yes	na	na
	NDAHSS18	08/26/2003	10400	=					yes	yes	na	na
	NDAHSS26	08/26/2003	10300	=					yes	yes	na	na
	NDAHSS02	12/05/2000	9900	=					yes	yes	na	na
	NDAHSS05	12/05/2000	9900	=					yes	yes	na	na
	NDAHSS19	08/26/2003	9760	=					yes	yes	na	na
	NDAHSS01	12/05/2000	9700	=					yes	yes	na	na
	NDAHSS07	12/05/2000	9300	=					yes	yes	na	na
	NDAHSS17	08/26/2003	9300	=					yes	yes	na	na
	NDAHSS20	08/26/2003	9140	=					yes	yes	na	na
	NDAHSS04	12/05/2000	8400	=					yes	yes	na	na
	NDAHSS11	12/05/2000	8100	J					yes	yes	na	na
	NDAHSS29	08/26/2003	7920	=					yes	yes	na	na
	NDAHSS27	08/26/2003	7690	=					yes	yes	na	na
	NDAHSS16	12/05/2000	7300	J					no	yes	na	na
	NDAHSS10	12/05/2000	7100	=					no	yes	na	na
	NDAHSS12	12/05/2000	7100	J					no	yes	na	na
	NDAHSS24	08/26/2003	7030	=					no	yes	na	na
	NDAHSS22	08/26/2003	6990	=					no	yes	na	na
	NDAHSS23	08/26/2003	6850	=					no	yes	na	na
	NDAHSS13	12/05/2000	6700	J					no	yes	na	na
	NDAHSS09	12/05/2000	6600	=					no	yes	na	na
	NDAHSS25	08/26/2003	6380	=					no	yes	na	na
	NDAHSS15	12/05/2000	6200	J					no	yes	na	na
	NDAHSS14	12/05/2000	5900	J					no	yes	na	na
	NDAHSS21	08/26/2003	5720	=					no	yes	na	na
	NDAHSS02	12/05/2000	5600	J					no	yes	na	na
	NDAHSS03	12/05/2000	5600	=					no	yes	na	na
	NDAHSS08	12/05/2000	5300	=					no	yes	na	na
	NDAHSS03	12/05/2000	4600	J					no	yes	na	na
	NDAHSS28	08/26/2003	3840	=					no	yes	na	na
	NDAHSS04	12/05/2000	3400	J					no	yes	na	na
ANTIMONY	NDAHSS03	12/05/2000	6.3	J	3.13	5	2.5	0.25	yes	yes	yes	yes
	NDAHSS06	12/05/2000	2	J					no	no	no	yes
	NDAHSS01	12/05/2000	1.6	J					no	no	no	yes
	NDAHSS05	12/05/2000	1.2	J					no	no	no	yes
	NDAHSS07	12/05/2000	1.2	J					no	no	no	yes
	NDAHSS19	08/26/2003	1.17	J					no	no	no	yes
	NDAHSS01	12/05/2000	1	J					no	no	no	yes
	NDAHSS18	08/26/2003	0.882	J					no	no	no	yes
	NDAHSS02	12/05/2000	0.86	J					no	no	no	yes
	NDAHSS04	12/05/2000	0.77	J					no	no	no	yes
	NDAHSS09	12/05/2000	0.77	J					no	no	no	yes
	NDAHSS03	12/05/2000	0.68	J					no	no	no	yes
	NDAHSS26	08/26/2003	0.661	J					no	no	no	yes
	NDAHSS04	12/05/2000	0.61	J					no	no	no	yes
	NDAHSS22	08/26/2003	0.585	J					no	no	no	yes
	NDAHSS29	08/26/2003	0.534	J					no	no	no	yes
	NDAHSS10	12/05/2000	0.47	J					no	no	no	yes
	NDAHSS27	08/26/2003	0.457	J					no	no	no	yes
	NDAHSS24	08/26/2003	0.422	J					no	no	no	yes
	NDAHSS17	08/26/2003	0.394	J					no	no	no	yes
	NDAHSS20	08/26/2003	0.393	J					no	no	no	yes
	NDAHSS23	08/26/2003	0.393	J					no	no	no	yes
	NDAHSS25	08/26/2003	0.381	J					no	no	no	yes
	NDAHSS21	08/26/2003	0.362	J					no	no	no	yes
	NDAHSS08	12/05/2000	0.36	J					no	no	no	yes
	NDAHSS28	08/26/2003	0.34	J					no	no	no	yes
ARSENIC	NDAHSS10	12/05/2000	67	=	0.39	10	14.5	1.45	yes	yes	yes	yes
	NDAHSS03	12/05/2000	33	=					yes	yes	yes	yes
	NDAHSS26	08/26/2003	6.74	=					yes	no	no	yes
	NDAHSS09	12/05/2000	6.2	=					yes	no	no	yes
	NDAHSS16	12/05/2000	4.7	=					yes	no	no	yes
	NDAHSS05	12/05/2000	3.5	=					yes	no	no	yes
	NDAHSS27	08/26/2003	2.79	J					yes	no	no	yes
	NDAHSS25	08/26/2003	2.59	=					yes	no	no	yes
	NDAHSS04	12/05/2000	2.4	=					yes	no	no	yes
	NDAHSS02	12/05/2000	2.3	=					yes	no	no	yes
	NDAHSS06	12/05/2000	2.2	=					yes	no	no	yes
	NDAHSS03	12/05/2000	2	J					yes	no	no	yes
	NDAHSS21	08/26/2003	1.92	=					yes	no	no	yes
	NDAHSS07	12/05/2000	1.9	J					yes	no	no	yes
	NDAHSS22	08/26/2003	1.79	=					yes	no	no	yes
	NDAHSS12	12/05/2000	1.7	J					yes	no	no	yes
	NDAHSS20	08/26/2003	1.58	J					yes	no	no	yes
	NDAHSS13	12/05/2000	1.5	J					yes	no	no	yes
	NDAHSS24	08/26/2003	1.49	J					yes	no	no	yes
	NDAHSS01	12/05/2000	1.4	J					yes	no	no	no
	NDAHSS08	12/05/2000	1.4	J					yes	no	no	no
	NDAHSS11	12/05/2000	1.3	J					yes	no	no	no
	NDAHSS17	08/26/2003	1.18	J					yes	no	no	no
	NDAHSS23	08/26/2003	1.13	J					yes	no	no	no
	NDAHSS18	08/26/2003	1.12	J					yes	no	no	no
	NDAHSS14	12/05/2000	1.1	J					yes	no	no	no
	NDAHSS15	12/05/2000	1	J					yes	no	no	no
	NDAHSS02	12/05/2000	0.89	J					yes	no	no	no
	NDAHSS01	12/05/2000	0.86	J					yes	no	no	no
	NDAHSS19	08/26/2003	0.715	J					yes	no	no	no
	NDAHSS29	08/26/2003	0.701	J					yes	no	no	no
	NDAHSS04	12/05/2000	0.54	J					yes	no	no	no
	NDAHSS28	08/26/2003	0.435	J					yes	no	no	no

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances			
									PRG	Ecological	SSL 10	SSL 1
BARIUM	NDAHSS10	12/05/2000	290	J	537	500	800	80	no	no	no	yes
	NDAHSS05	12/05/2000	140	J					no	no	no	yes
	NDAHSS03	12/05/2000	130	J					no	no	no	yes
	NDAHSS04	12/05/2000	130	J					no	no	no	yes
	NDAHSS07	12/05/2000	110	J					no	no	no	yes
	NDAHSS08	12/05/2000	110	J					no	no	no	yes
	NDAHSS25	08/26/2003	85.7	=					no	no	no	yes
	NDAHSS26	08/26/2003	77	=					no	no	no	no
	NDAHSS19	08/26/2003	76.5	=					no	no	no	no
	NDAHSS09	12/05/2000	76	J					no	no	no	no
	NDAHSS03	12/05/2000	69	=					no	no	no	no
	NDAHSS16	12/05/2000	66	=					no	no	no	no
	NDAHSS27	08/26/2003	62.7	=					no	no	no	no
	NDAHSS21	08/26/2003	61.7	=					no	no	no	no
	NDAHSS17	08/26/2003	60.4	=					no	no	no	no
	NDAHSS01	12/05/2000	60	J					no	no	no	no
	NDAHSS01	12/05/2000	59	=					no	no	no	no
	NDAHSS11	12/05/2000	57	=					no	no	no	no
	NDAHSS22	08/26/2003	56.1	=					no	no	no	no
	NDAHSS24	08/26/2003	55.5	=					no	no	no	no
	NDAHSS29	08/26/2003	54.4	=					no	no	no	no
	NDAHSS02	12/05/2000	54	J					no	no	no	no
	NDAHSS23	08/26/2003	52.1	=					no	no	no	no
	NDAHSS12	12/05/2000	52	=					no	no	no	no
	NDAHSS13	12/05/2000	52	=					no	no	no	no
	NDAHSS14	12/05/2000	51	=					no	no	no	no
	NDAHSS06	12/05/2000	50	J					no	no	no	no
	NDAHSS15	12/05/2000	50	=					no	no	no	no
	NDAHSS02	12/05/2000	42	J					no	no	no	no
	NDAHSS20	08/26/2003	41.5	=					no	no	no	no
	NDAHSS18	08/26/2003	36.7	=					no	no	no	no
	NDAHSS28	08/26/2003	27.9	J					no	no	no	no
	NDAHSS04	12/05/2000	23	J					no	no	no	no
BERYLLIUM	NDAHSS10	12/05/2000	0.26	J	15.4	10	31.5	3.15	no	no	no	no
	NDAHSS09	12/05/2000	0.18	J					no	no	no	no
	NDAHSS01	12/05/2000	0.15	J					no	no	no	no
	NDAHSS08	12/05/2000	0.15	J					no	no	no	no
	NDAHSS17	08/26/2003	0.143	J					no	no	no	no
	NDAHSS19	08/26/2003	0.133	J					no	no	no	no
	NDAHSS25	08/26/2003	0.13	J					no	no	no	no
	NDAHSS26	08/26/2003	0.128	J					no	no	no	no
	NDAHSS27	08/26/2003	0.126	J					no	no	no	no
	NDAHSS02	12/05/2000	0.12	J					no	no	no	no
	NDAHSS05	12/05/2000	0.12	J					no	no	no	no
	NDAHSS29	08/26/2003	0.12	J					no	no	no	no
	NDAHSS24	08/26/2003	0.115	J					no	no	no	no
	NDAHSS22	08/26/2003	0.114	J					no	no	no	no
	NDAHSS23	08/26/2003	0.112	J					no	no	no	no
	NDAHSS01	12/05/2000	0.11	J					no	no	no	no
	NDAHSS11	12/05/2000	0.11	J					no	no	no	no
	NDAHSS16	12/05/2000	0.11	J					no	no	no	no
	NDAHSS18	08/26/2003	0.101	J					no	no	no	no
	NDAHSS21	08/26/2003	0.1	J					no	no	no	no
	NDAHSS20	08/26/2003	0.0904	J					no	no	no	no
	NDAHSS28	08/26/2003	0.0799	J					no	no	no	no
CADMIUM	NDAHSS26	08/26/2003	0.291	J	3.7	0.4	4	0.4	no	no	no	no
	NDAHSS01	12/05/2000	0.21	J					no	no	no	no
	NDAHSS27	08/26/2003	0.159	J					no	no	no	no
	NDAHSS25	08/26/2003	0.152	J					no	no	no	no
	NDAHSS22	08/26/2003	0.135	J					no	no	no	no
	NDAHSS21	08/26/2003	0.116	J					no	no	no	no
	NDAHSS19	08/26/2003	0.11	J					no	no	no	no
	NDAHSS24	08/26/2003	0.102	J					no	no	no	no
	NDAHSS20	08/26/2003	0.0873	J					no	no	no	no
	NDAHSS18	08/26/2003	0.0742	J					no	no	no	no
	NDAHSS23	08/26/2003	0.0699	J					no	no	no	no
	NDAHSS17	08/26/2003	0.0466	J					no	no	no	no
	NDAHSS29	08/26/2003	0.0454	J					no	no	no	no
CALCIUM	NDAHSS04	12/05/2000	34000	=	EN	EN	EN	EN	na	na	na	na
	NDAHSS08	12/05/2000	34000	=					na	na	na	na
	NDAHSS06	12/05/2000	33000	=					na	na	na	na
	NDAHSS03	12/05/2000	32000	=					na	na	na	na
	NDAHSS01	12/05/2000	31000	=					na	na	na	na
	NDAHSS02	12/05/2000	30000	=					na	na	na	na
	NDAHSS03	12/05/2000	30000	=					na	na	na	na
	NDAHSS22	08/26/2003	29600	=					na	na	na	na
	NDAHSS26	08/26/2003	22200	=					na	na	na	na
	NDAHSS23	08/26/2003	21700	=					na	na	na	na
	NDAHSS04	12/05/2000	21000	=					na	na	na	na
	NDAHSS21	08/26/2003	20300	=					na	na	na	na
	NDAHSS15	12/05/2000	20000	=					na	na	na	na
	NDAHSS25	08/26/2003	18600	=					na	na	na	na
	NDAHSS07	12/05/2000	17000	=					na	na	na	na
	NDAHSS05	12/05/2000	16000	=					na	na	na	na
	NDAHSS09	12/05/2000	15000	=					na	na	na	na
	NDAHSS24	08/26/2003	14800	=					na	na	na	na
	NDAHSS20	08/26/2003	13100	=					na	na	na	na
	NDAHSS16	12/05/2000	13000	=					na	na	na	na
	NDAHSS02	12/05/2000	12000	=					na	na	na	na
	NDAHSS27	08/26/2003	10900	=					na	na	na	na
	NDAHSS10	12/05/2000	9000	=					na	na	na	na
	NDAHSS14	12/05/2000	8900	=					na	na	na	na
	NDAHSS01	12/05/2000	8800	=					na	na	na	na

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS13	12/05/2000	8200	=					na	na	na	na
	NDAHSS12	12/05/2000	8100	=					na	na	na	na
	NDAHSS11	12/05/2000	7300	=					na	na	na	na
	NDAHSS18	08/26/2003	6830	=					na	na	na	na
	NDAHSS29	08/26/2003	5980	=					na	na	na	na
	NDAHSS28	08/26/2003	5400	=					na	na	na	na
	NDAHSS19	08/26/2003	4840	=					na	na	na	na
	NDAHSS17	08/26/2003	4460	=					na	na	na	na
CHROMIUM, TOTAL	NDAHSS01	12/05/2000	50	=	211	0.4	19	1.9	no	yes	yes	yes
	NDAHSS03	12/05/2000	46	=					no	yes	yes	yes
	NDAHSS06	12/05/2000	36	J					no	yes	yes	yes
	NDAHSS18	08/26/2003	23.9	=					no	yes	yes	yes
	NDAHSS19	08/26/2003	23.7	=					no	yes	yes	yes
	NDAHSS20	08/26/2003	22.4	=					no	yes	yes	yes
	NDAHSS01	12/05/2000	20	J					no	yes	yes	yes
	NDAHSS02	12/05/2000	20	J					no	yes	yes	yes
	NDAHSS07	12/05/2000	20	J					no	yes	yes	yes
	NDAHSS02	12/05/2000	18	=					no	yes	no	yes
	NDAHSS04	12/05/2000	18	J					no	yes	no	yes
	NDAHSS26	08/26/2003	17.4	=					no	yes	no	yes
	NDAHSS09	12/05/2000	17	J					no	yes	no	yes
	NDAHSS10	12/05/2000	16	J					no	yes	no	yes
	NDAHSS17	08/26/2003	15.4	=					no	yes	no	yes
	NDAHSS05	12/05/2000	14	J					no	yes	no	yes
	NDAHSS16	12/05/2000	14	J					no	yes	no	yes
	NDAHSS29	08/26/2003	13.8	=					no	yes	no	yes
	NDAHSS11	12/05/2000	13	=					no	yes	no	yes
	NDAHSS14	12/05/2000	13	=					no	yes	no	yes
	NDAHSS15	12/05/2000	13	=					no	yes	no	yes
	NDAHSS04	12/05/2000	12	=					no	yes	no	yes
	NDAHSS12	12/05/2000	12	=					no	yes	no	yes
	NDAHSS27	08/26/2003	11.9	=					no	yes	no	yes
	NDAHSS13	12/05/2000	11	=					no	yes	no	yes
	NDAHSS22	08/26/2003	10.9	=					no	yes	no	yes
	NDAHSS24	08/26/2003	10.1	=					no	yes	no	yes
	NDAHSS03	12/05/2000	10	J					no	yes	no	yes
	NDAHSS23	08/26/2003	9.51	=					no	yes	no	yes
	NDAHSS25	08/26/2003	8.84	=					no	yes	no	yes
	NDAHSS28	08/26/2003	7.98	=					no	yes	no	yes
	NDAHSS08	12/05/2000	7.9	J					no	yes	no	yes
	NDAHSS21	08/26/2003	7.83	=					no	yes	no	yes
COBALT	NDAHSS19	08/26/2003	10.2	J	903	20	NA	NA	no	no	na	na
	NDAHSS01	12/05/2000	9.1	J					no	no	na	na
	NDAHSS06	12/05/2000	9.1	J					no	no	na	na
	NDAHSS01	12/05/2000	9	J					no	no	na	na
	NDAHSS10	12/05/2000	9	J					no	no	na	na
	NDAHSS05	12/05/2000	8.6	J					no	no	na	na
	NDAHSS18	08/26/2003	8.42	J					no	no	na	na
	NDAHSS29	08/26/2003	8.39	=					no	no	na	na
	NDAHSS02	12/05/2000	8.3	J					no	no	na	na
	NDAHSS04	12/05/2000	8.2	J					no	no	na	na
	NDAHSS20	08/26/2003	7.99	J					no	no	na	na
	NDAHSS26	08/26/2003	7.81	J					no	no	na	na
	NDAHSS17	08/26/2003	7.72	J					no	no	na	na
	NDAHSS11	12/05/2000	7.6	J					no	no	na	na
	NDAHSS07	12/05/2000	7.2	J					no	no	na	na
	NDAHSS12	12/05/2000	7.1	J					no	no	na	na
	NDAHSS16	12/05/2000	7.1	J					no	no	na	na
	NDAHSS27	08/26/2003	6.99	J					no	no	na	na
	NDAHSS13	12/05/2000	6.8	J					no	no	na	na
	NDAHSS09	12/05/2000	6.7	J					no	no	na	na
	NDAHSS03	12/05/2000	6.3	J					no	no	na	na
	NDAHSS15	12/05/2000	6.3	J					no	no	na	na
	NDAHSS24	08/26/2003	6.07	J					no	no	na	na
	NDAHSS14	12/05/2000	5.9	J					no	no	na	na
	NDAHSS23	08/26/2003	5.7	J					no	no	na	na
	NDAHSS22	08/26/2003	5.58	J					no	no	na	na
	NDAHSS02	12/05/2000	5.3	J					no	no	na	na
	NDAHSS21	08/26/2003	5.16	J					no	no	na	na
	NDAHSS25	08/26/2003	5.11	J					no	no	na	na
	NDAHSS08	12/05/2000	4.2	J					no	no	na	na
	NDAHSS03	12/05/2000	4	J					no	no	na	na
	NDAHSS28	08/26/2003	3.26	J					no	no	na	na
	NDAHSS04	12/05/2000	3.2	J					no	no	na	na
COPPER	NDAHSS03	12/05/2000	100	=	313	50	NA	NA	no	yes	na	na
	NDAHSS10	12/05/2000	87	=					no	yes	na	na
	NDAHSS08	12/05/2000	50	=					no	no	na	na
	NDAHSS03	12/05/2000	48	=					no	no	na	na
	NDAHSS07	12/05/2000	42	=					no	no	na	na
	NDAHSS04	12/05/2000	41	=					no	no	na	na
	NDAHSS25	08/26/2003	37.4	=					no	no	na	na
	NDAHSS26	08/26/2003	36.5	=					no	no	na	na
	NDAHSS09	12/05/2000	36	=					no	no	na	na
	NDAHSS01	12/05/2000	34	=					no	no	na	na
	NDAHSS06	12/05/2000	34	=					no	no	na	na
	NDAHSS01	12/05/2000	31	=					no	no	na	na
	NDAHSS19	08/26/2003	30.9	=					no	no	na	na
	NDAHSS02	12/05/2000	29	=					no	no	na	na
	NDAHSS05	12/05/2000	28	=					no	no	na	na
	NDAHSS18	08/26/2003	26.4	=					no	no	na	na
	NDAHSS11	12/05/2000	26	=					no	no	na	na
	NDAHSS17	08/26/2003	25.6	=					no	no	na	na
	NDAHSS29	08/26/2003	24.8	=					no	no	na	na

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS24	08/26/2003	24.6	=					no	no	na	na
	NDAHSS27	08/26/2003	24.6	=					no	no	na	na
	NDAHSS16	12/05/2000	23	=					no	no	na	na
	NDAHSS22	08/26/2003	23	=					no	no	na	na
	NDAHSS20	08/26/2003	22.2	=					no	no	na	na
	NDAHSS21	08/26/2003	22.2	=					no	no	na	na
	NDAHSS02	12/05/2000	21	=					no	no	na	na
	NDAHSS23	08/26/2003	20.3	=					no	no	na	na
	NDAHSS14	12/05/2000	20	=					no	no	na	na
	NDAHSS12	12/05/2000	19	=					no	no	na	na
	NDAHSS13	12/05/2000	19	=					no	no	na	na
	NDAHSS15	12/05/2000	19	=					no	no	na	na
	NDAHSS04	12/05/2000	12	=					no	no	na	na
	NDAHSS28	08/26/2003	11.1	=					no	no	na	na
IRON	NDAHSS03	12/05/2000	39000	=	2350	200	NA	NA	yes	yes	na	na
	NDAHSS05	12/05/2000	23000	=					yes	yes	na	na
	NDAHSS18	08/26/2003	22400	J					yes	yes	na	na
	NDAHSS10	12/05/2000	21000	=					yes	yes	na	na
	NDAHSS19	08/26/2003	20600	J					yes	yes	na	na
	NDAHSS14	12/05/2000	20000	=					yes	yes	na	na
	NDAHSS01	12/05/2000	19000	=					yes	yes	na	na
	NDAHSS04	12/05/2000	19000	=					yes	yes	na	na
	NDAHSS06	12/05/2000	19000	=					yes	yes	na	na
	NDAHSS17	08/26/2003	18100	J					yes	yes	na	na
	NDAHSS01	12/05/2000	18000	=					yes	yes	na	na
	NDAHSS11	12/05/2000	18000	=					yes	yes	na	na
	NDAHSS26	08/26/2003	17200	=					yes	yes	na	na
	NDAHSS20	08/26/2003	17100	J					yes	yes	na	na
	NDAHSS02	12/05/2000	17000	=					yes	yes	na	na
	NDAHSS07	12/05/2000	17000	=					yes	yes	na	na
	NDAHSS09	12/05/2000	17000	=					yes	yes	na	na
	NDAHSS12	12/05/2000	17000	=					yes	yes	na	na
	NDAHSS15	12/05/2000	17000	=					yes	yes	na	na
	NDAHSS27	08/26/2003	16800	=					yes	yes	na	na
	NDAHSS29	08/26/2003	16300	=					yes	yes	na	na
	NDAHSS13	12/05/2000	16000	=					yes	yes	na	na
	NDAHSS25	08/26/2003	15100	=					yes	yes	na	na
	NDAHSS16	12/05/2000	15000	=					yes	yes	na	na
	NDAHSS24	08/26/2003	14800	=					yes	yes	na	na
	NDAHSS21	08/26/2003	14600	J					yes	yes	na	na
	NDAHSS22	08/26/2003	14400	=					yes	yes	na	na
	NDAHSS02	12/05/2000	14000	=					yes	yes	na	na
	NDAHSS23	08/26/2003	13400	=					yes	yes	na	na
	NDAHSS03	12/05/2000	12000	=					yes	yes	na	na
	NDAHSS08	12/05/2000	12000	=					yes	yes	na	na
	NDAHSS28	08/26/2003	11200	=					yes	yes	na	na
	NDAHSS04	12/05/2000	7700	=					yes	yes	na	na
LEAD	NDAHSS09	12/05/2000	63	=	400	50	NA	NA	no	yes	na	na
	NDAHSS25	08/26/2003	58.9	J					no	yes	na	na
	NDAHSS20	08/26/2003	52.4	=					no	yes	na	na
	NDAHSS04	12/05/2000	52	=					no	yes	na	na
	NDAHSS08	12/05/2000	48	=					no	no	na	na
	NDAHSS07	12/05/2000	47	=					no	no	na	na
	NDAHSS03	12/05/2000	45	=					no	no	na	na
	NDAHSS26	08/26/2003	44	J					no	no	na	na
	NDAHSS06	12/05/2000	43	=					no	no	na	na
	NDAHSS10	12/05/2000	29	=					no	no	na	na
	NDAHSS01	12/05/2000	27	=					no	no	na	na
	NDAHSS21	08/26/2003	27	=					no	no	na	na
	NDAHSS19	08/26/2003	26.9	=					no	no	na	na
	NDAHSS24	08/26/2003	25.4	J					no	no	na	na
	NDAHSS22	08/26/2003	23.7	J					no	no	na	na
	NDAHSS02	12/05/2000	22	=					no	no	na	na
	NDAHSS05	12/05/2000	21	=					no	no	na	na
	NDAHSS01	12/05/2000	20	=					no	no	na	na
	NDAHSS23	08/26/2003	18.3	J					no	no	na	na
	NDAHSS03	12/05/2000	18	=					no	no	na	na
	NDAHSS18	08/26/2003	16.6	=					no	no	na	na
	NDAHSS17	08/26/2003	16.4	=					no	no	na	na
	NDAHSS16	12/05/2000	16	=					no	no	na	na
	NDAHSS14	12/05/2000	15	=					no	no	na	na
	NDAHSS27	08/26/2003	14.6	J					no	no	na	na
	NDAHSS02	12/05/2000	13	=					no	no	na	na
	NDAHSS15	12/05/2000	13	=					no	no	na	na
	NDAHSS12	12/05/2000	12	=					no	no	na	na
	NDAHSS11	12/05/2000	11	=					no	no	na	na
	NDAHSS13	12/05/2000	11	=					no	no	na	na
	NDAHSS29	08/26/2003	8.68	J					no	no	na	na
	NDAHSS04	12/05/2000	8.3	=					no	no	na	na
	NDAHSS28	08/26/2003	4.43	J					no	no	na	na
MAGNESIUM	NDAHSS03	12/05/2000	8400	=	EN	EN	EN	EN	na	na	na	na
	NDAHSS06	12/05/2000	7700	=					na	na	na	na
	NDAHSS18	08/26/2003	7220	=					na	na	na	na
	NDAHSS20	08/26/2003	6130	=					na	na	na	na
	NDAHSS05	12/05/2000	5900	=					na	na	na	na
	NDAHSS01	12/05/2000	5800	=					na	na	na	na
	NDAHSS07	12/05/2000	5600	=					na	na	na	na
	NDAHSS26	08/26/2003	5500	=					na	na	na	na
	NDAHSS04	12/05/2000	5000	=					na	na	na	na
	NDAHSS02	12/05/2000	4900	=					na	na	na	na
	NDAHSS19	08/26/2003	4750	=					na	na	na	na
	NDAHSS01	12/05/2000	4300	=					na	na	na	na
	NDAHSS11	12/05/2000	3800	=					na	na	na	na

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS16	12/05/2000	3800	=					na	na	na	na
	NDAHSS08	12/05/2000	3600	=					na	na	na	na
	NDAHSS12	12/05/2000	3600	=					na	na	na	na
	NDAHSS17	08/26/2003	3460	=					na	na	na	na
	NDAHSS22	08/26/2003	3320	=					na	na	na	na
	NDAHSS13	12/05/2000	3300	=					na	na	na	na
	NDAHSS27	08/26/2003	3280	=					na	na	na	na
	NDAHSS29	08/26/2003	3250	=					na	na	na	na
	NDAHSS09	12/05/2000	2900	=					na	na	na	na
	NDAHSS15	12/05/2000	2900	=					na	na	na	na
	NDAHSS02	12/05/2000	2800	=					na	na	na	na
	NDAHSS10	12/05/2000	2800	=					na	na	na	na
	NDAHSS14	12/05/2000	2700	=					na	na	na	na
	NDAHSS24	08/26/2003	2690	=					na	na	na	na
	NDAHSS23	08/26/2003	2670	=					na	na	na	na
	NDAHSS03	12/05/2000	2600	=					na	na	na	na
	NDAHSS21	08/26/2003	2330	=					na	na	na	na
	NDAHSS25	08/26/2003	2330	=					na	na	na	na
	NDAHSS04	12/05/2000	2000	=					na	na	na	na
	NDAHSS28	08/26/2003	1630	=					na	na	na	na
MANGANESE	NDAHSS10	12/05/2000	720	=	176	100	NA	NA	yes	yes	na	na
	NDAHSS19	08/26/2003	636	=					yes	yes	na	na
	NDAHSS04	12/05/2000	580	=					yes	yes	na	na
	NDAHSS05	12/05/2000	560	=					yes	yes	na	na
	NDAHSS03	12/05/2000	510	=					yes	yes	na	na
	NDAHSS01	12/05/2000	490	=					yes	yes	na	na
	NDAHSS17	08/26/2003	441	=					yes	yes	na	na
	NDAHSS02	12/05/2000	440	=					yes	yes	na	na
	NDAHSS11	12/05/2000	410	=					yes	yes	na	na
	NDAHSS16	12/05/2000	410	=					yes	yes	na	na
	NDAHSS26	08/26/2003	404	J					yes	yes	na	na
	NDAHSS03	12/05/2000	390	=					yes	yes	na	na
	NDAHSS06	12/05/2000	390	=					yes	yes	na	na
	NDAHSS07	12/05/2000	390	=					yes	yes	na	na
	NDAHSS08	12/05/2000	390	=					yes	yes	na	na
	NDAHSS29	08/26/2003	384	J					yes	yes	na	na
	NDAHSS24	08/26/2003	375	J					yes	yes	na	na
	NDAHSS09	12/05/2000	370	=					yes	yes	na	na
	NDAHSS12	12/05/2000	370	=					yes	yes	na	na
	NDAHSS20	08/26/2003	369	=					yes	yes	na	na
	NDAHSS18	08/26/2003	368	=					yes	yes	na	na
	NDAHSS13	12/05/2000	360	=					yes	yes	na	na
	NDAHSS27	08/26/2003	359	J					yes	yes	na	na
	NDAHSS23	08/26/2003	352	J					yes	yes	na	na
	NDAHSS01	12/05/2000	350	=					yes	yes	na	na
	NDAHSS14	12/05/2000	340	=					yes	yes	na	na
	NDAHSS15	12/05/2000	340	=					yes	yes	na	na
	NDAHSS22	08/26/2003	325	J					yes	yes	na	na
	NDAHSS21	08/26/2003	313	=					yes	yes	na	na
	NDAHSS25	08/26/2003	309	J					yes	yes	na	na
	NDAHSS02	12/05/2000	290	=					yes	yes	na	na
	NDAHSS28	08/26/2003	182	J					yes	yes	na	na
	NDAHSS04	12/05/2000	140	=					no	yes	na	na
MERCURY	NDAHSS25	08/26/2003	0.0625	=	2.35	0.3	NA	NA	no	no	na	na
	NDAHSS26	08/26/2003	0.053	=					no	no	na	na
	NDAHSS02	12/05/2000	0.052	=					no	no	na	na
	NDAHSS09	12/05/2000	0.051	=					no	no	na	na
	NDAHSS13	12/05/2000	0.05	=					no	no	na	na
	NDAHSS11	12/05/2000	0.043	J					no	no	na	na
	NDAHSS08	12/05/2000	0.041	J					no	no	na	na
	NDAHSS12	12/05/2000	0.041	J					no	no	na	na
	NDAHSS02	12/05/2000	0.04	J					no	no	na	na
	NDAHSS16	12/05/2000	0.04	J					no	no	na	na
	NDAHSS23	08/26/2003	0.0383	=					no	no	na	na
	NDAHSS05	12/05/2000	0.037	J					no	no	na	na
	NDAHSS21	08/26/2003	0.0367	J					no	no	na	na
	NDAHSS24	08/26/2003	0.0351	=					no	no	na	na
	NDAHSS10	12/05/2000	0.035	J					no	no	na	na
	NDAHSS04	12/05/2000	0.032	J					no	no	na	na
	NDAHSS17	08/26/2003	0.0308	J					no	no	na	na
	NDAHSS22	08/26/2003	0.0303	=					no	no	na	na
	NDAHSS27	08/26/2003	0.0291	=					no	no	na	na
	NDAHSS14	12/05/2000	0.029	J					no	no	na	na
	NDAHSS01	12/05/2000	0.027	J					no	no	na	na
	NDAHSS07	12/05/2000	0.025	J					no	no	na	na
	NDAHSS03	12/05/2000	0.024	J					no	no	na	na
	NDAHSS20	08/26/2003	0.0231	J					no	no	na	na
	NDAHSS19	08/26/2003	0.0227	J					no	no	na	na
	NDAHSS06	12/05/2000	0.021	J					no	no	na	na
	NDAHSS01	12/05/2000	0.02	J					no	no	na	na
	NDAHSS29	08/26/2003	0.0194	J					no	no	na	na
	NDAHSS15	12/05/2000	0.019	J					no	no	na	na
	NDAHSS28	08/26/2003	0.0168	J					no	no	na	na
	NDAHSS03	12/05/2000	0.014	J					no	no	na	na
	NDAHSS18	08/26/2003	0.00904	J					no	no	na	na
	NDAHSS04	12/05/2000	0.0049	J					no	no	na	na
NICKEL	NDAHSS03	12/05/2000	26	=	156	30	65	6.5	no	no	no	yes
	NDAHSS06	12/05/2000	16	=					no	no	no	yes
	NDAHSS01	12/05/2000	15	=					no	no	no	yes
	NDAHSS18	08/26/2003	13.8	=					no	no	no	yes
	NDAHSS20	08/26/2003	12.3	=					no	no	no	yes
	NDAHSS26	08/26/2003	10.4	=					no	no	no	yes
	NDAHSS19	08/26/2003	10.3	=					no	no	no	yes

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS07	12/05/2000	10	=					no	no	no	yes
	NDAHSS02	12/05/2000	9.7	=					no	no	no	yes
	NDAHSS04	12/05/2000	9.3	=					no	no	no	yes
	NDAHSS01	12/05/2000	8.4	J					no	no	no	yes
	NDAHSS09	12/05/2000	8.4	J					no	no	no	yes
	NDAHSS17	08/26/2003	7.56	=					no	no	no	yes
	NDAHSS05	12/05/2000	7.4	J					no	no	no	yes
	NDAHSS10	12/05/2000	7.2	J					no	no	no	yes
	NDAHSS16	12/05/2000	7	J					no	no	no	yes
	NDAHSS29	08/26/2003	6.24	J					no	no	no	no
	NDAHSS11	12/05/2000	6.2	J					no	no	no	no
	NDAHSS12	12/05/2000	6.1	J					no	no	no	no
	NDAHSS02	12/05/2000	5.9	J					no	no	no	no
	NDAHSS27	08/26/2003	5.87	J					no	no	no	no
	NDAHSS13	12/05/2000	5.5	J					no	no	no	no
	NDAHSS14	12/05/2000	5.5	J					no	no	no	no
	NDAHSS24	08/26/2003	4.92	J					no	no	no	no
	NDAHSS22	08/26/2003	4.81	J					no	no	no	no
	NDAHSS15	12/05/2000	4.8	J					no	no	no	no
	NDAHSS03	12/05/2000	4.7	J					no	no	no	no
	NDAHSS25	08/26/2003	4.49	J					no	no	no	no
	NDAHSS23	08/26/2003	4.1	J					no	no	no	no
	NDAHSS08	12/05/2000	4	J					no	no	no	no
	NDAHSS04	12/05/2000	3.9	J					no	no	no	no
	NDAHSS21	08/26/2003	3.55	J					no	no	no	no
	NDAHSS28	08/26/2003	3.26	J					no	no	no	no
POTASSIUM	NDAHSS03	12/05/2000	3400	=	EN	EN	EN	EN	na	na	na	na
	NDAHSS08	12/05/2000	2600	=					na	na	na	na
	NDAHSS01	12/05/2000	2000	J					na	na	na	na
	NDAHSS22	08/26/2003	1950	=					na	na	na	na
	NDAHSS04	12/05/2000	1900	=					na	na	na	na
	NDAHSS26	08/26/2003	1810	=					na	na	na	na
	NDAHSS25	08/26/2003	1730	=					na	na	na	na
	NDAHSS09	12/05/2000	1600	=					na	na	na	na
	NDAHSS10	12/05/2000	1600	=					na	na	na	na
	NDAHSS17	08/26/2003	1550	=					na	na	na	na
	NDAHSS05	12/05/2000	1500	=					na	na	na	na
	NDAHSS11	12/05/2000	1500	J					na	na	na	na
	NDAHSS21	08/26/2003	1500	=					na	na	na	na
	NDAHSS27	08/26/2003	1420	=					na	na	na	na
	NDAHSS01	12/05/2000	1400	=					na	na	na	na
	NDAHSS02	12/05/2000	1400	=					na	na	na	na
	NDAHSS02	12/05/2000	1400	J					na	na	na	na
	NDAHSS23	08/26/2003	1380	=					na	na	na	na
	NDAHSS24	08/26/2003	1360	=					na	na	na	na
	NDAHSS19	08/26/2003	1330	=					na	na	na	na
	NDAHSS29	08/26/2003	1330	=					na	na	na	na
	NDAHSS20	08/26/2003	1310	=					na	na	na	na
	NDAHSS15	12/05/2000	1300	J					na	na	na	na
	NDAHSS16	12/05/2000	1300	J					na	na	na	na
	NDAHSS06	12/05/2000	1200	=					na	na	na	na
	NDAHSS07	12/05/2000	1200	=					na	na	na	na
	NDAHSS12	12/05/2000	1200	J					na	na	na	na
	NDAHSS13	12/05/2000	1200	J					na	na	na	na
	NDAHSS14	12/05/2000	1200	J					na	na	na	na
	NDAHSS03	12/05/2000	1100	J					na	na	na	na
	NDAHSS18	08/26/2003	1100	=					na	na	na	na
	NDAHSS04	12/05/2000	860	J					na	na	na	na
	NDAHSS28	08/26/2003	721	J					na	na	na	na
SELENIUM	NDAHSS05	12/05/2000	1.4	=	39.1	1	2.5	0.25	no	yes	no	yes
	NDAHSS07	12/05/2000	1.1	J					no	yes	no	yes
	NDAHSS01	12/05/2000	1	J					no	no	no	yes
	NDAHSS06	12/05/2000	0.98	J					no	no	no	yes
	NDAHSS02	12/05/2000	0.83	J					no	no	no	yes
	NDAHSS10	12/05/2000	0.82	J					no	no	no	yes
	NDAHSS04	12/05/2000	0.8	J					no	no	no	yes
	NDAHSS19	08/26/2003	0.677	J					no	no	no	yes
	NDAHSS20	08/26/2003	0.657	J					no	no	no	yes
	NDAHSS03	12/05/2000	0.65	J					no	no	no	yes
	NDAHSS09	12/05/2000	0.62	J					no	no	no	yes
	NDAHSS29	08/26/2003	0.616	J					no	no	no	yes
	NDAHSS26	08/26/2003	0.597	J					no	no	no	yes
	NDAHSS17	08/26/2003	0.47	J					no	no	no	yes
	NDAHSS21	08/26/2003	0.449	J					no	no	no	yes
	NDAHSS18	08/26/2003	0.382	J					no	no	no	yes
	NDAHSS22	08/26/2003	0.38	J					no	no	no	yes
	NDAHSS27	08/26/2003	0.357	J					no	no	no	yes
	NDAHSS28	08/26/2003	0.353	J					no	no	no	yes
	NDAHSS23	08/26/2003	0.3	J					no	no	no	yes
	NDAHSS24	08/26/2003	0.285	J					no	no	no	yes
	NDAHSS25	08/26/2003	0.234	J					no	no	no	no
SILVER	NDAHSS07	12/05/2000	0.17	J	39.1	2	17	1.7	no	no	no	no
	NDAHSS17	08/26/2003	0.0709	J					no	no	no	no
	NDAHSS18	08/26/2003	0.0702	J					no	no	no	no
	NDAHSS25	08/26/2003	0.0651	J					no	no	no	no
	NDAHSS29	08/26/2003	0.0611	J					no	no	no	no
	NDAHSS24	08/26/2003	0.0608	J					no	no	no	no
	NDAHSS26	08/26/2003	0.0583	J					no	no	no	no
	NDAHSS23	08/26/2003	0.0579	J					no	no	no	no
	NDAHSS22	08/26/2003	0.0511	J					no	no	no	no
	NDAHSS27	08/26/2003	0.0383	J					no	no	no	no
	NDAHSS28	08/26/2003	0.0356	J					no	no	no	no
	NDAHSS19	08/26/2003	0.0346	J					no	no	no	no

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
SODIUM	NDAHSS03	12/05/2000	590	J	EN	EN	EN	EN	na	na	na	na
	NDAHSS01	12/05/2000	460	J					na	na	na	na
	NDAHSS04	12/05/2000	460	J					na	na	na	na
	NDAHSS08	12/05/2000	420	J					na	na	na	na
	NDAHSS04	12/05/2000	360	J					na	na	na	na
	NDAHSS22	08/26/2003	349	J					na	na	na	na
	NDAHSS26	08/26/2003	347	J					na	na	na	na
	NDAHSS02	12/05/2000	340	J					na	na	na	na
	NDAHSS03	12/05/2000	310	J					na	na	na	na
	NDAHSS06	12/05/2000	300	J					na	na	na	na
	NDAHSS25	08/26/2003	282	J					na	na	na	na
	NDAHSS07	12/05/2000	270	J					na	na	na	na
	NDAHSS19	08/26/2003	268	J					na	na	na	na
	NDAHSS20	08/26/2003	262	J					na	na	na	na
	NDAHSS23	08/26/2003	261	J					na	na	na	na
	NDAHSS05	12/05/2000	260	J					na	na	na	na
	NDAHSS09	12/05/2000	260	J					na	na	na	na
	NDAHSS18	08/26/2003	252	J					na	na	na	na
	NDAHSS21	08/26/2003	244	J					na	na	na	na
	NDAHSS01	12/05/2000	230	J					na	na	na	na
	NDAHSS27	08/26/2003	221	J					na	na	na	na
	NDAHSS15	12/05/2000	220	J					na	na	na	na
	NDAHSS29	08/26/2003	213	J					na	na	na	na
	NDAHSS24	08/26/2003	211	J					na	na	na	na
	NDAHSS02	12/05/2000	210	J					na	na	na	na
	NDAHSS16	12/05/2000	200	J					na	na	na	na
	NDAHSS17	08/26/2003	187	J					na	na	na	na
	NDAHSS28	08/26/2003	142	J					na	na	na	na
	NDAHSS12	12/05/2000	140	J					na	na	na	na
	NDAHSS10	12/05/2000	130	J					na	na	na	na
	NDAHSS13	12/05/2000	130	J					na	na	na	na
	NDAHSS11	12/05/2000	110	J					na	na	na	na
	NDAHSS14	12/05/2000	110	J					na	na	na	na
THALLIUM	NDAHSS18	08/26/2003	1.16	J	0.516	1	NA	NA	yes	yes	na	na
	NDAHSS17	08/26/2003	0.944	J					yes	no	na	na
	NDAHSS19	08/26/2003	0.867	J					yes	no	na	na
	NDAHSS28	08/26/2003	0.863	J					yes	no	na	na
	NDAHSS27	08/26/2003	0.732	J					yes	no	na	na
	NDAHSS25	08/26/2003	0.693	J					yes	no	na	na
	NDAHSS24	08/26/2003	0.68	J					yes	no	na	na
	NDAHSS21	08/26/2003	0.671	J					yes	no	na	na
	NDAHSS29	08/26/2003	0.613	J					yes	no	na	na
	NDAHSS20	08/26/2003	0.611	J					yes	no	na	na
	NDAHSS23	08/26/2003	0.488	J					no	no	na	na
	NDAHSS22	08/26/2003	0.429	J					no	no	na	na
	NDAHSS26	08/26/2003	0.287	J					no	no	na	na
VANADIUM	NDAHSS01	12/05/2000	63	=	54.7	2	3000	300	yes	yes	no	no
	NDAHSS10	12/05/2000	62	=					yes	yes	no	no
	NDAHSS19	08/26/2003	61	=					yes	yes	no	no
	NDAHSS05	12/05/2000	55	=					yes	yes	no	no
	NDAHSS06	12/05/2000	54	=					no	yes	no	no
	NDAHSS01	12/05/2000	52	=					no	yes	no	no
	NDAHSS17	08/26/2003	51.6	=					no	yes	no	no
	NDAHSS18	08/26/2003	51.3	=					no	yes	no	no
	NDAHSS15	12/05/2000	51	=					no	yes	no	no
	NDAHSS11	12/05/2000	49	=					no	yes	no	no
	NDAHSS20	08/26/2003	48.9	=					no	yes	no	no
	NDAHSS14	12/05/2000	48	=					no	yes	no	no
	NDAHSS27	08/26/2003	48	=					no	yes	no	no
	NDAHSS29	08/26/2003	48	=					no	yes	no	no
	NDAHSS12	12/05/2000	46	=					no	yes	no	no
	NDAHSS02	12/05/2000	45	=					no	yes	no	no
	NDAHSS04	12/05/2000	45	=					no	yes	no	no
	NDAHSS26	08/26/2003	44.5	=					no	yes	no	no
	NDAHSS13	12/05/2000	44	=					no	yes	no	no
	NDAHSS22	08/26/2003	43.2	=					no	yes	no	no
	NDAHSS24	08/26/2003	43.2	=					no	yes	no	no
	NDAHSS16	12/05/2000	43	=					no	yes	no	no
	NDAHSS07	12/05/2000	41	=					no	yes	no	no
	NDAHSS21	08/26/2003	40.4	=					no	yes	no	no
	NDAHSS23	08/26/2003	40.1	=					no	yes	no	no
	NDAHSS25	08/26/2003	36.1	=					no	yes	no	no
	NDAHSS09	12/05/2000	36	=					no	yes	no	no
	NDAHSS28	08/26/2003	35.9	=					no	yes	no	no
	NDAHSS02	12/05/2000	33	=					no	yes	no	no
	NDAHSS03	12/05/2000	29	=					no	yes	no	no
	NDAHSS08	12/05/2000	29	=					no	yes	no	no
	NDAHSS03	12/05/2000	27	=					no	yes	no	no
	NDAHSS04	12/05/2000	21	=					no	yes	no	no
ZINC	NDAHSS03	12/05/2000	260	=	2350	50	6000	600	no	yes	no	no
	NDAHSS01	12/05/2000	170	=					no	yes	no	no
	NDAHSS02	12/05/2000	170	=					no	yes	no	no
	NDAHSS04	12/05/2000	140	=					no	yes	no	no
	NDAHSS09	12/05/2000	140	=					no	yes	no	no
	NDAHSS06	12/05/2000	130	=					no	yes	no	no
	NDAHSS07	12/05/2000	130	=					no	yes	no	no
	NDAHSS08	12/05/2000	130	=					no	yes	no	no
	NDAHSS25	08/26/2003	126	=					no	yes	no	no
	NDAHSS26	08/26/2003	125	=					no	yes	no	no
	NDAHSS03	12/05/2000	110	=					no	yes	no	no
	NDAHSS04	12/05/2000	100	=					no	yes	no	no
	NDAHSS05	12/05/2000	97	=					no	yes	no	no
	NDAHSS10	12/05/2000	95	=					no	yes	no	no

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS02	12/05/2000	93	=					no	yes	no	no
	NDAHSS15	12/05/2000	88	=					no	yes	no	no
	NDAHSS21	08/26/2003	87.3	J					no	yes	no	no
	NDAHSS19	08/26/2003	86.3	J					no	yes	no	no
	NDAHSS24	08/26/2003	81.4	=					no	yes	no	no
	NDAHSS01	12/05/2000	81	=					no	yes	no	no
	NDAHSS27	08/26/2003	72.4	=					no	yes	no	no
	NDAHSS22	08/26/2003	71.1	=					no	yes	no	no
	NDAHSS14	12/05/2000	68	=					no	yes	no	no
	NDAHSS20	08/26/2003	65.1	J					no	yes	no	no
	NDAHSS16	12/05/2000	62	=					no	yes	no	no
	NDAHSS17	08/26/2003	61.8	J					no	yes	no	no
	NDAHSS18	08/26/2003	59.1	J					no	yes	no	no
	NDAHSS23	08/26/2003	56.7	=					no	yes	no	no
	NDAHSS12	12/05/2000	51	=					no	yes	no	no
	NDAHSS11	12/05/2000	50	=					no	no	no	no
	NDAHSS13	12/05/2000	49	=					no	no	no	no
	NDAHSS29	08/26/2003	44.7	=					no	no	no	no
	NDAHSS28	08/26/2003	31.5	=					no	no	no	no
Volatile Organic Compounds (mg/Kg)												
1,1-DICHLOROETHEN	NDAHSS09	12/05/2000	0.00078	J	12.4	NA	0.03	0.003	no	na	no	no
M,P-XYLENE (SUM OI	NDAHSS01	12/05/2000	0.058	J	27.5	NA	105	10.5	no	na	no	no
O-XYLENE (1,2-DIME	NDAHSS01	12/05/2000	0.024	J	27.5	NA	105	10.5	no	na	no	no
XYLENES, TOTAL	NDAHSS01	12/05/2000	0.082	J	27.5	0.05	105	10.5	no	yes	no	no
Semivolatile Organic Compounds (mg/Kg)												
2,6-DINITROTOLUENI	NDAHSS13	12/05/2000	1.23	=	6.11	NA	0.00035	0.00004	no	na	yes	yes
	NDAHSS11	12/05/2000	1.21	=					no	na	yes	yes
2-METHYLNAPHTHAL	NDAHSS09	12/05/2000	0.19	J	160	NA	NA	NA	no	na	na	na
	NDAHSS08	12/05/2000	0.176	J					no	na	na	na
	NDAHSS25	08/26/2003	0.0956	J					no	na	na	na
	NDAHSS04	12/05/2000	0.055	J					no	na	na	na
	NDAHSS10	12/05/2000	0.036	J					no	na	na	na
	NDAHSS05	12/05/2000	0.028	J					no	na	na	na
3-NITROANILINE	NDAHSS13	12/05/2000	0.048	J	NA	NA	NA	NA	na	na	na	na
4-BROMOPHENYL PH	NDAHSS13	12/05/2000	0.267	J	NA	NA	NA	NA	na	na	na	na
	NDAHSS11	12/05/2000	0.238	J					na	na	na	na
	NDAHSS12	12/05/2000	0.217	J					na	na	na	na
BENZO(a)ANTHRACE	NDAHSS04	12/05/2000	0.112	J	0.621	NA	1	0.1	no	na	no	yes
	NDAHSS24	08/26/2003	0.0946	J					no	na	no	no
	NDAHSS08	12/05/2000	0.068	J					no	na	no	no
	NDAHSS06	12/05/2000	0.049	J					no	na	no	no
	NDAHSS25	08/26/2003	0.0451	J					no	na	no	no
	NDAHSS17	08/26/2003	0.036	J					no	na	no	no
	NDAHSS01	12/05/2000	0.032	J					no	na	no	no
	NDAHSS18	08/26/2003	0.0299	J					no	na	no	no
	NDAHSS10	12/05/2000	0.029	J					no	na	no	no
	NDAHSS16	12/05/2000	0.029	J					no	na	no	no
BENZO(a)PYRENE	NDAHSS04	12/05/2000	0.12	J	0.0621	0.1	4	0.4	yes	yes	no	no
	NDAHSS24	08/26/2003	0.0969	J					yes	no	no	no
	NDAHSS02	12/05/2000	0.074	J					yes	no	no	no
	NDAHSS08	12/05/2000	0.071	J					yes	no	no	no
	NDAHSS06	12/05/2000	0.053	J					no	no	no	no
	NDAHSS18	08/26/2003	0.0502	J					no	no	no	no
	NDAHSS16	12/05/2000	0.05	J					no	no	no	no
	NDAHSS01	12/05/2000	0.043	J					no	no	no	no
	NDAHSS25	08/26/2003	0.0426	J					no	no	no	no
	NDAHSS17	08/26/2003	0.042	J					no	no	no	no
	NDAHSS09	12/05/2000	0.037	J					no	no	no	no
	NDAHSS19	08/26/2003	0.0323	J					no	no	no	no
	NDAHSS20	08/26/2003	0.0283	J					no	no	no	no
	NDAHSS21	08/26/2003	0.0267	J					no	no	no	no
	NDAHSS29	08/26/2003	0.0257	J					no	no	no	no
BENZO(b)FLUORANT	NDAHSS04	12/05/2000	0.133	J	0.621	NA	2.5	0.25	no	na	no	no
	NDAHSS08	12/05/2000	0.104	J					no	na	no	no
	NDAHSS24	08/26/2003	0.0935	J					no	na	no	no
	NDAHSS18	08/26/2003	0.092	J					no	na	no	no
	NDAHSS01	12/05/2000	0.072	J					no	na	no	no
	NDAHSS06	12/05/2000	0.065	J					no	na	no	no
	NDAHSS07	12/05/2000	0.062	J					no	na	no	no
	NDAHSS19	08/26/2003	0.0608	J					no	na	no	no
	NDAHSS17	08/26/2003	0.0595	J					no	na	no	no
	NDAHSS16	12/05/2000	0.058	J					no	na	no	no
	NDAHSS25	08/26/2003	0.0544	J					no	na	no	no
	NDAHSS20	08/26/2003	0.0502	J					no	na	no	no
	NDAHSS09	12/05/2000	0.05	J					no	na	no	no
	NDAHSS29	08/26/2003	0.0449	J					no	na	no	no
	NDAHSS13	12/05/2000	0.04	J					no	na	no	no
	NDAHSS21	08/26/2003	0.0279	J					no	na	no	no
	NDAHSS22	08/26/2003	0.0271	J					no	na	no	no
	NDAHSS23	08/26/2003	0.025	J					no	na	no	no
	NDAHSS26	08/26/2003	0.0187	J					no	na	no	no
BENZO(g,h,i)PERYLEI	NDAHSS02	12/05/2000	0.06	J	2300	1	NA	NA	no	no	na	na
	NDAHSS24	08/26/2003	0.0589	J					no	no	na	na
	NDAHSS18	08/26/2003	0.0495	J					no	no	na	na
	NDAHSS17	08/26/2003	0.0465	J					no	no	na	na
	NDAHSS25	08/26/2003	0.0422	J					no	no	na	na
	NDAHSS19	08/26/2003	0.0328	J					no	no	na	na
	NDAHSS21	08/26/2003	0.0274	J					no	no	na	na
	NDAHSS20	08/26/2003	0.0249	J					no	no	na	na
	NDAHSS29	08/26/2003	0.0244	J					no	no	na	na
	NDAHSS22	08/26/2003	0.0217	J					no	no	na	na
BENZO(k)FLUORANT	NDAHSS04	12/05/2000	0.124	J	6.21	NA	24.5	2.45	no	na	no	no
	NDAHSS08	12/05/2000	0.088	J					no	na	no	no

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifier	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS24	08/26/2003	0.0763	J					no	na	no	no
	NDAHSS18	08/26/2003	0.07	J					no	na	no	no
	NDAHSS06	12/05/2000	0.066	J					no	na	no	no
	NDAHSS01	12/05/2000	0.054	J					no	na	no	no
	NDAHSS16	12/05/2000	0.053	J					no	na	no	no
	NDAHSS07	12/05/2000	0.044	J					no	na	no	no
	NDAHSS09	12/05/2000	0.044	J					no	na	no	no
	NDAHSS17	08/26/2003	0.0421	J					no	na	no	no
	NDAHSS19	08/26/2003	0.0394	J					no	na	no	no
	NDAHSS20	08/26/2003	0.0359	J					no	na	no	no
	NDAHSS25	08/26/2003	0.0339	J					no	na	no	no
	NDAHSS29	08/26/2003	0.0283	J					no	na	no	no
	NDAHSS21	08/26/2003	0.022	J					no	na	no	no
	NDAHSS22	08/26/2003	0.0196	J					no	na	no	no
bis(2-ETHYLHEXYL) F	NDAHSS24	08/26/2003	0.117	J	34.7	NA	NA	NA	no	na	na	na
	NDAHSS28	08/26/2003	0.0905	J					no	na	na	na
	NDAHSS22	08/26/2003	0.0853	J					no	na	na	na
	NDAHSS25	08/26/2003	0.0831	J					no	na	na	na
	NDAHSS23	08/26/2003	0.0827	J					no	na	na	na
	NDAHSS29	08/26/2003	0.0819	J					no	na	na	na
	NDAHSS27	08/26/2003	0.0766	J					no	na	na	na
	NDAHSS26	08/26/2003	0.0729	J					no	na	na	na
CHRYSENE	NDAHSS04	12/05/2000	0.155	J	62.1	NA	80	8	no	na	no	no
	NDAHSS08	12/05/2000	0.121	J					no	na	no	no
	NDAHSS24	08/26/2003	0.0972	J					no	na	no	no
	NDAHSS18	08/26/2003	0.0699	J					no	na	no	no
	NDAHSS06	12/05/2000	0.068	J					no	na	no	no
	NDAHSS25	08/26/2003	0.0671	J					no	na	no	no
	NDAHSS09	12/05/2000	0.059	J					no	na	no	no
	NDAHSS01	12/05/2000	0.057	J					no	na	no	no
	NDAHSS16	12/05/2000	0.054	J					no	na	no	no
	NDAHSS07	12/05/2000	0.05	J					no	na	no	no
	NDAHSS20	08/26/2003	0.0471	J					no	na	no	no
	NDAHSS17	08/26/2003	0.044	J					no	na	no	no
	NDAHSS19	08/26/2003	0.0416	J					no	na	no	no
	NDAHSS02	12/05/2000	0.029	J					no	na	no	no
	NDAHSS21	08/26/2003	0.0254	J					no	na	no	no
	NDAHSS22	08/26/2003	0.0247	J					no	na	no	no
	NDAHSS29	08/26/2003	0.0241	J					no	na	no	no
	NDAHSS23	08/26/2003	0.0225	J					no	na	no	no
DIBENZOFURAN	NDAHSS08	12/05/2000	0.051	J	29.1	NA	NA	NA	no	na	na	na
	NDAHSS09	12/05/2000	0.038	J					no	na	na	na
	NDAHSS25	08/26/2003	0.0294	J					no	na	na	na
FLUORANTHENE	NDAHSS04	12/05/2000	0.187	J	229	0.1	2150	215	no	yes	no	no
	NDAHSS24	08/26/2003	0.112	J					no	yes	no	no
	NDAHSS08	12/05/2000	0.089	J					no	no	no	no
	NDAHSS06	12/05/2000	0.082	J					no	no	no	no
	NDAHSS07	12/05/2000	0.069	J					no	no	no	no
	NDAHSS01	12/05/2000	0.056	J					no	no	no	no
	NDAHSS16	12/05/2000	0.053	J					no	no	no	no
	NDAHSS25	08/26/2003	0.0522	J					no	no	no	no
	NDAHSS09	12/05/2000	0.04	J					no	no	no	no
	NDAHSS20	08/26/2003	0.0385	J					no	no	no	no
	NDAHSS17	08/26/2003	0.0369	J					no	no	no	no
	NDAHSS10	12/05/2000	0.033	J					no	no	no	no
	NDAHSS18	08/26/2003	0.0291	J					no	no	no	no
	NDAHSS23	08/26/2003	0.0272	J					no	no	no	no
	NDAHSS22	08/26/2003	0.0258	J					no	no	no	no
	NDAHSS21	08/26/2003	0.0246	J					no	no	no	no
INDENO(1,2,3-c,d)PYF	NDAHSS24	08/26/2003	0.0848	J	0.621	NA	7	0.7	no	na	no	no
	NDAHSS18	08/26/2003	0.0636	J					no	na	no	no
	NDAHSS17	08/26/2003	0.0567	J					no	na	no	no
	NDAHSS04	12/05/2000	0.054	J					no	na	no	no
	NDAHSS25	08/26/2003	0.0489	J					no	na	no	no
	NDAHSS19	08/26/2003	0.0442	J					no	na	no	no
	NDAHSS13	12/05/2000	0.037	J					no	na	no	no
	NDAHSS01	12/05/2000	0.026	J					no	na	no	no
ISOPHORONE	NDAHSS12	12/05/2000	0.112	J	512	NA	0.25	0.025	no	na	no	yes
	NDAHSS11	12/05/2000	0.106	J					no	na	no	yes
NAPHTHALENE	NDAHSS08	12/05/2000	0.09	J	5.59	0.1	42	4.2	no	no	no	no
	NDAHSS09	12/05/2000	0.069	J					no	no	no	no
	NDAHSS25	08/26/2003	0.0424	J					no	no	no	no
N-NITROSODI-n-PRO	NDAHSS13	12/05/2000	0.717	=	0.0695	NA	0.000025	2.5E-06	yes	na	yes	yes
	NDAHSS11	12/05/2000	0.658	=					yes	na	yes	yes
	NDAHSS12	12/05/2000	0.562	J					yes	na	yes	yes
PHENANTHRENE	NDAHSS08	12/05/2000	0.144	J	NA	0.1	NA	NA	na	yes	na	na
	NDAHSS09	12/05/2000	0.092	J					na	no	na	na
	NDAHSS04	12/05/2000	0.083	J					na	no	na	na
	NDAHSS25	08/26/2003	0.0816	J					na	no	na	na
	NDAHSS10	12/05/2000	0.037	J					na	no	na	na
	NDAHSS07	12/05/2000	0.034	J					na	no	na	na
	NDAHSS06	12/05/2000	0.032	J					na	no	na	na
	NDAHSS24	08/26/2003	0.0211	J					na	no	na	na
PYRENE	NDAHSS01	12/05/2000	1.9	J	232	0.1	2100	210	no	yes	no	no
	NDAHSS04	12/05/2000	0.168	J					no	yes	no	no
	NDAHSS24	08/26/2003	0.125	J					no	yes	no	no
	NDAHSS08	12/05/2000	0.097	J					no	no	no	no
	NDAHSS06	12/05/2000	0.076	J					no	no	no	no
	NDAHSS07	12/05/2000	0.066	J					no	no	no	no
	NDAHSS16	12/05/2000	0.058	J					no	no	no	no
	NDAHSS01	12/05/2000	0.057	J					no	no	no	no
	NDAHSS25	08/26/2003	0.0548	J					no	no	no	no
	NDAHSS09	12/05/2000	0.049	J					no	no	no	no

TABLE G-2
Detected Chemicals in Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [1]	Ecological Criteria [2]	SSL [3] (DAF=10)	SSL [4] (DAF=1)	Screening Criteria Exceedances PRG	Ecological	SSL 10	SSL 1
	NDAHSS18	08/26/2003	0.045	J					no	no	no	no
	NDAHSS20	08/26/2003	0.0435	J					no	no	no	no
	NDAHSS17	08/26/2003	0.0432	J					no	no	no	no
	NDAHSS10	12/05/2000	0.032	J					no	no	no	no
	NDAHSS21	08/26/2003	0.0296	J					no	no	no	no
	NDAHSS22	08/26/2003	0.029	J					no	no	no	no
	NDAHSS23	08/26/2003	0.0282	J					no	no	no	no
					Pesticides (mg/Kg)							
METHOXYCHLOR	NDAHSS19	08/26/2003	0.00074	J	30.6	NA	80	8	no	na	no	no
p,p'-DDD	NDAHSS22	08/26/2003	0.01	J	2.44	0.0025	8	0.8	no	yes	no	no
	NDAHSS16	12/05/2000	0.0048	J					no	yes	no	no
	NDAHSS29	08/26/2003	0.0044	=					no	yes	no	no
	NDAHSS23	08/26/2003	0.0036	J					no	yes	no	no
	NDAHSS04	12/05/2000	0.0029	J					no	yes	no	no
	NDAHSS03	12/05/2000	0.0024	J					no	no	no	no
	NDAHSS26	08/26/2003	0.0023	J					no	no	no	no
	NDAHSS18	08/26/2003	0.0021	J					no	no	no	no
	NDAHSS27	08/26/2003	0.0019	J					no	no	no	no
	NDAHSS28	08/26/2003	0.0011	J					no	no	no	no
	NDAHSS25	08/26/2003	0.00062	J					no	no	no	no
	NDAHSS17	08/26/2003	0.00052	J					no	no	no	no
p,p'-DDE	NDAHSS01	12/05/2000	3.99	J	1.72	0.0025	27	2.7	yes	yes	no	yes
	NDAHSS02	12/05/2000	2.66	J					yes	yes	no	no
	NDAHSS22	08/26/2003	0.19	=					no	yes	no	no
	NDAHSS07	12/05/2000	0.126	J					no	yes	no	no
	NDAHSS18	08/26/2003	0.095	J					no	yes	no	no
	NDAHSS28	08/26/2003	0.092	J					no	yes	no	no
	NDAHSS03	12/05/2000	0.05	J					no	yes	no	no
	NDAHSS04	12/05/2000	0.041	J					no	yes	no	no
	NDAHSS16	12/05/2000	0.041	J					no	yes	no	no
	NDAHSS17	08/26/2003	0.04	=					no	yes	no	no
	NDAHSS29	08/26/2003	0.035	=					no	yes	no	no
	NDAHSS19	08/26/2003	0.023	=					no	yes	no	no
	NDAHSS23	08/26/2003	0.016	J					no	yes	no	no
	NDAHSS26	08/26/2003	0.016	J					no	yes	no	no
	NDAHSS05	12/05/2000	0.014	J					no	yes	no	no
	NDAHSS06	12/05/2000	0.01	J					no	yes	no	no
	NDAHSS27	08/26/2003	0.0088	J					no	yes	no	no
	NDAHSS09	12/05/2000	0.0078	J					no	yes	no	no
	NDAHSS24	08/26/2003	0.005	J					no	yes	no	no
	NDAHSS25	08/26/2003	0.0025	J					no	no	no	no
	NDAHSS08	12/05/2000	0.0016	J					no	no	no	no
	NDAHSS21	08/26/2003	0.0014	J					no	no	no	no
p,p'-DDT	NDAHSS01	12/05/2000	1.94	J	1.72	0.0025	16	1.6	yes	yes	no	yes
	NDAHSS02	12/05/2000	1.09	J					no	yes	no	no
	NDAHSS28	08/26/2003	0.16	J					no	yes	no	no
	NDAHSS07	12/05/2000	0.075	J					no	yes	no	no
	NDAHSS16	12/05/2000	0.029	J					no	yes	no	no
	NDAHSS18	08/26/2003	0.025	J					no	yes	no	no
	NDAHSS17	08/26/2003	0.018	J					no	yes	no	no
	NDAHSS04	12/05/2000	0.017	J					no	yes	no	no
	NDAHSS06	12/05/2000	0.011	J					no	yes	no	no
	NDAHSS27	08/26/2003	0.011	J					no	yes	no	no
	NDAHSS05	12/05/2000	0.01	J					no	yes	no	no
	NDAHSS26	08/26/2003	0.01	J					no	yes	no	no
	NDAHSS22	08/26/2003	0.0092	J					no	yes	no	no
	NDAHSS19	08/26/2003	0.0086	J					no	yes	no	no
	NDAHSS23	08/26/2003	0.0083	J					no	yes	no	no
	NDAHSS29	08/26/2003	0.0077	J					no	yes	no	no
	NDAHSS09	12/05/2000	0.0067	J					no	yes	no	no
	NDAHSS24	08/26/2003	0.0055	J					no	yes	no	no
	NDAHSS25	08/26/2003	0.0013	J					no	no	no	no

[1] USEPA Region IX PRG (2002) based on a hazard index (HI) of 0.1 for non-carcinogens.
[2] The lower of the toxicological benchmarks terrestrial plants, (Efroymson, 1997a) or invertebrates and heterotrophs (Efroymson, 1997b).
[3] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factof (DAF) of 10.
[4] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factof (DAF) of 1.

ND indicates that the chemical was not detected.
NA indicates that the information is not available or not applicable.
J indicates that the chemical was detected. The reported value is estimated.
= infdicates that the chemical was detected. The reported value is the measured concentration.

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
				Metals (mg/Kg)						
ALUMINUM	NDAHSB09	12/06/2000	11000	=	100,000	NA	NA	no	na	na
	NDAHSB09	12/06/2000	9700	=				no	na	na
	NDAHSB16	12/07/2000	9400	=				no	na	na
	NDAHSB15	12/07/2000	8900	=				no	na	na
	NDAHSB14	12/07/2000	7000	=				no	na	na
	NDAHSB03	12/05/2000	6900	=				no	na	na
	NDAHSB18	08/26/2003	6880	=				no	na	na
	NDAHSB17	08/26/2003	6550	=				no	na	na
	NDAHSB29	08/26/2003	6450	=				no	na	na
	NDAHSB01	12/05/2000	5900	=				no	na	na
	NDAHSB27	08/26/2003	5790	=				no	na	na
	NDAHSB28	08/26/2003	5360	=				no	na	na
	NDAHSB09	12/05/2000	5200	=				no	na	na
	NDAHSB10	12/06/2000	5200	=				no	na	na
	NDAHSB12	12/06/2000	5000	=				no	na	na
	NDAHSB20	08/26/2003	4980	=				no	na	na
	NDAHSB26	08/26/2003	4440	=				no	na	na
	NDAHSB07	12/06/2000	4300	=				no	na	na
	NDAHSB04	12/05/2000	4200	=				no	na	na
	NDAHSB08	12/06/2000	4200	=				no	na	na
	NDAHSB11	12/06/2000	4000	=				no	na	na
	NDAHSB22	08/26/2003	3760	=				no	na	na
	NDAHSB13	12/06/2000	3200	=				no	na	na
	NDAHSB06	12/06/2000	3100	=				no	na	na
	NDAHSB24	08/26/2003	3020	=				no	na	na
	NDAHSB19	08/26/2003	2930	=				no	na	na
	NDAHSB05	12/05/2000	2900	=				no	na	na
	NDAHSB23	08/26/2003	2630	=				no	na	na
	NDAHSB21	08/26/2003	2620	=				no	na	na
	NDAHSB02	12/05/2000	2500	=				no	na	na
	NDAHSB25	08/26/2003	2110	=				no	na	na
ANTIMONY	NDAHSB01	12/05/2000	0.9	J	41	2.5	0.25	no	no	yes
	NDAHSB03	12/05/2000	0.59	J				no	no	yes
	NDAHSB09	12/06/2000	0.49	J				no	no	yes
	NDAHSB04	12/05/2000	0.44	J				no	no	yes
	NDAHSB07	12/06/2000	0.44	J				no	no	yes
	NDAHSB09	12/06/2000	0.44	J				no	no	yes
	NDAHSB16	12/07/2000	0.44	J				no	no	yes
	NDAHSB29	08/26/2003	0.412	J				no	no	yes
	NDAHSB06	12/06/2000	0.38	J				no	no	yes
	NDAHSB20	08/26/2003	0.332	J				no	no	yes
	NDAHSB18	08/26/2003	0.253	J				no	no	yes
	NDAHSB22	08/26/2003	0.25	J				no	no	no
	NDAHSB28	08/26/2003	0.222	J				no	no	no
	NDAHSB17	08/26/2003	0.218	J				no	no	no
	NDAHSB27	08/26/2003	0.168	J				no	no	no
	NDAHSB19	08/26/2003	0.14	J				no	no	no
ARSENIC	NDAHSB01	12/05/2000	24	=	1.6	14.5	1.45	yes	yes	yes
	NDAHSB03	12/05/2000	10	=				yes	no	yes
	NDAHSB22	08/26/2003	1.94	=				yes	no	yes
	NDAHSB17	08/26/2003	1.71	J				yes	no	yes
	NDAHSB18	08/26/2003	1.29	J				no	no	no
	NDAHSB23	08/26/2003	1.24	J				no	no	no
	NDAHSB26	08/26/2003	1.18	J				no	no	no
	NDAHSB10	12/06/2000	1.1	J				no	no	no
	NDAHSB24	08/26/2003	1.09	J				no	no	no
	NDAHSB28	08/26/2003	0.917	J				no	no	no
	NDAHSB16	12/07/2000	0.88	J				no	no	no
	NDAHSB02	12/05/2000	0.78	J				no	no	no
	NDAHSB09	12/06/2000	0.76	J				no	no	no
	NDAHSB04	12/05/2000	0.69	J				no	no	no
	NDAHSB08	12/06/2000	0.64	J				no	no	no
	NDAHSB27	08/26/2003	0.631	J				no	no	no
	NDAHSB20	08/26/2003	0.62	J				no	no	no
	NDAHSB29	08/26/2003	0.545	J				no	no	no
	NDAHSB25	08/26/2003	0.223	J				no	no	no
	NDAHSB21	08/26/2003	0.203	J				no	no	no
	NDAHSB19	08/26/2003	0.161	J				no	no	no
BARIUM	NDAHSB07	12/06/2000	200	=	6658	800	80	no	no	yes
	NDAHSB04	12/05/2000	160	J				no	no	yes
	NDAHSB09	12/06/2000	120	=				no	no	yes
	NDAHSB15	12/07/2000	98	=				no	no	yes
	NDAHSB03	12/05/2000	87	J				no	no	yes
	NDAHSB08	12/06/2000	86	=				no	no	yes
	NDAHSB14	12/07/2000	85	=				no	no	yes
	NDAHSB18	08/26/2003	81.4	=				no	no	yes
	NDAHSB16	12/07/2000	81	=				no	no	yes
	NDAHSB10	12/06/2000	74	=				no	no	no
	NDAHSB29	08/26/2003	69.1	=				no	no	no

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB09	12/06/2000	69	=				no	no	no
	NDAHSB28	08/26/2003	68.5	=				no	no	no
	NDAHSB09	12/05/2000	63	=				no	no	no
	NDAHSB17	08/26/2003	61.3	=				no	no	no
	NDAHSB11	12/06/2000	60	=				no	no	no
	NDAHSB12	12/06/2000	57	=				no	no	no
	NDAHSB20	08/26/2003	45.6	=				no	no	no
	NDAHSB01	12/05/2000	44	J				no	no	no
	NDAHSB26	08/26/2003	44	=				no	no	no
	NDAHSB27	08/26/2003	43.7	=				no	no	no
	NDAHSB24	08/26/2003	37.3	=				no	no	no
	NDAHSB25	08/26/2003	32.6	J				no	no	no
	NDAHSB21	08/26/2003	32.4	=				no	no	no
	NDAHSB22	08/26/2003	31	J				no	no	no
	NDAHSB23	08/26/2003	29.2	J				no	no	no
	NDAHSB13	12/06/2000	29	J				no	no	no
	NDAHSB02	12/05/2000	26	J				no	no	no
	NDAHSB19	08/26/2003	25.4	J				no	no	no
	NDAHSB05	12/05/2000	23	J				no	no	no
	NDAHSB06	12/06/2000	20	J				no	no	no
BERYLLIUM	NDAHSB09	12/06/2000	0.48	J	1941	31.5	3.15	no	no	no
	NDAHSB09	12/06/2000	0.42	J				no	no	no
	NDAHSB16	12/07/2000	0.26	J				no	no	no
	NDAHSB15	12/07/2000	0.24	J				no	no	no
	NDAHSB09	12/05/2000	0.22	J				no	no	no
	NDAHSB14	12/07/2000	0.21	J				no	no	no
	NDAHSB12	12/06/2000	0.19	J				no	no	no
	NDAHSB10	12/06/2000	0.18	J				no	no	no
	NDAHSB13	12/06/2000	0.17	J				no	no	no
	NDAHSB11	12/06/2000	0.16	J				no	no	no
	NDAHSB07	12/06/2000	0.15	J				no	no	no
	NDAHSB08	12/06/2000	0.15	J				no	no	no
	NDAHSB28	08/26/2003	0.134	J				no	no	no
	NDAHSB18	08/26/2003	0.122	J				no	no	no
	NDAHSB29	08/26/2003	0.118	J				no	no	no
	NDAHSB17	08/26/2003	0.112	J				no	no	no
	NDAHSB27	08/26/2003	0.112	J				no	no	no
	NDAHSB26	08/26/2003	0.103	J				no	no	no
	NDAHSB20	08/26/2003	0.0952	J				no	no	no
	NDAHSB22	08/26/2003	0.0805	J				no	no	no
	NDAHSB24	08/26/2003	0.0735	J				no	no	no
	NDAHSB19	08/26/2003	0.0591	J				no	no	no
	NDAHSB25	08/26/2003	0.0547	J				no	no	no
	NDAHSB21	08/26/2003	0.0532	J				no	no	no
	NDAHSB23	08/26/2003	0.0479	J				no	no	no
CADMIUM	NDAHSB18	08/26/2003	0.219	J	45.1	4	0.4	no	no	no
	NDAHSB17	08/26/2003	0.0442	J				no	no	no
	NDAHSB20	08/26/2003	0.0367	J				no	no	no
CALCIUM	NDAHSB18	08/26/2003	15100	=	NA	NA	NA	na	na	na
	NDAHSB17	08/26/2003	9420	=				na	na	na
	NDAHSB20	08/26/2003	9130	=				na	na	na
	NDAHSB08	12/06/2000	8400	=				na	na	na
	NDAHSB14	12/07/2000	6200	J				na	na	na
	NDAHSB29	08/26/2003	6060	=				na	na	na
	NDAHSB03	12/05/2000	5200	=				na	na	na
	NDAHSB01	12/05/2000	4800	=				na	na	na
	NDAHSB27	08/26/2003	4240	=				na	na	na
	NDAHSB15	12/07/2000	4100	J				na	na	na
	NDAHSB12	12/06/2000	3900	=				na	na	na
	NDAHSB16	12/07/2000	3300	J				na	na	na
	NDAHSB26	08/26/2003	3220	=				na	na	na
	NDAHSB09	12/06/2000	3000	=				na	na	na
	NDAHSB11	12/06/2000	2900	=				na	na	na
	NDAHSB24	08/26/2003	2900	=				na	na	na
	NDAHSB28	08/26/2003	2780	=				na	na	na
	NDAHSB06	12/06/2000	2700	=				na	na	na
	NDAHSB07	12/06/2000	2700	=				na	na	na
	NDAHSB04	12/05/2000	2100	=				na	na	na
	NDAHSB10	12/06/2000	2000	=				na	na	na
	NDAHSB05	12/05/2000	1900	=				na	na	na
	NDAHSB09	12/05/2000	1800	=				na	na	na
	NDAHSB09	12/06/2000	1800	=				na	na	na
	NDAHSB13	12/06/2000	1700	=				na	na	na
	NDAHSB19	08/26/2003	1540	=				na	na	na
	NDAHSB22	08/26/2003	1420	=				na	na	na
	NDAHSB02	12/05/2000	1400	=				na	na	na
	NDAHSB25	08/26/2003	1300	=				na	na	na
	NDAHSB23	08/26/2003	1180	=				na	na	na
	NDAHSB21	08/26/2003	1070	=				na	na	na
CHROMIUM, TOTAL	NDAHSB09	12/06/2000	27	=	64	19	1.9	no	yes	yes

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB09	12/06/2000	23	=				no	yes	yes
	NDAHSB01	12/05/2000	16	J				no	no	yes
	NDAHSB07	12/06/2000	13	=				no	no	yes
	NDAHSB15	12/07/2000	11	J				no	no	yes
	NDAHSB03	12/05/2000	10	J				no	no	yes
	NDAHSB16	12/07/2000	10	J				no	no	yes
	NDAHSB18	08/26/2003	9.05	=				no	no	yes
	NDAHSB08	12/06/2000	8.9	=				no	no	yes
	NDAHSB14	12/07/2000	8.9	J				no	no	yes
	NDAHSB29	08/26/2003	8.81	=				no	no	yes
	NDAHSB12	12/06/2000	8.1	=				no	no	yes
	NDAHSB17	08/26/2003	7.61	=				no	no	yes
	NDAHSB27	08/26/2003	7.03	=				no	no	yes
	NDAHSB20	08/26/2003	6.98	=				no	no	yes
	NDAHSB28	08/26/2003	6.78	=				no	no	yes
	NDAHSB26	08/26/2003	6.75	=				no	no	yes
	NDAHSB10	12/06/2000	6.7	=				no	no	yes
	NDAHSB06	12/06/2000	6.4	=				no	no	yes
	NDAHSB11	12/06/2000	6.4	=				no	no	yes
	NDAHSB09	12/05/2000	5.7	=				no	no	yes
	NDAHSB04	12/05/2000	5.3	J				no	no	yes
	NDAHSB21	08/26/2003	5.15	=				no	no	yes
	NDAHSB24	08/26/2003	4.54	=				no	no	yes
	NDAHSB23	08/26/2003	4.4	=				no	no	yes
	NDAHSB22	08/26/2003	4.32	=				no	no	yes
	NDAHSB02	12/05/2000	3.6	J				no	no	yes
	NDAHSB05	12/05/2000	3.6	J				no	no	yes
	NDAHSB19	08/26/2003	3.51	=				no	no	yes
	NDAHSB13	12/06/2000	3.3	=				no	no	yes
	NDAHSB25	08/26/2003	3.28	=				no	no	yes
COBALT	NDAHSB07	12/06/2000	16	=	1921	NA	NA	no	na	na
	NDAHSB09	12/06/2000	15	=				no	na	na
	NDAHSB15	12/07/2000	9	J				no	na	na
	NDAHSB16	12/07/2000	9	J				no	na	na
	NDAHSB09	12/06/2000	8.4	J				no	na	na
	NDAHSB04	12/05/2000	7.9	J				no	na	na
	NDAHSB14	12/07/2000	7	J				no	na	na
	NDAHSB03	12/05/2000	6.9	J				no	na	na
	NDAHSB29	08/26/2003	6.8	J				no	na	na
	NDAHSB28	08/26/2003	6.25	J				no	na	na
	NDAHSB12	12/06/2000	6.1	J				no	na	na
	NDAHSB01	12/05/2000	5.9	J				no	na	na
	NDAHSB10	12/06/2000	5.8	J				no	na	na
	NDAHSB17	08/26/2003	5.79	J				no	na	na
	NDAHSB18	08/26/2003	5.74	J				no	na	na
	NDAHSB27	08/26/2003	5.65	J				no	na	na
	NDAHSB11	12/06/2000	5.5	J				no	na	na
	NDAHSB09	12/05/2000	5.1	J				no	na	na
	NDAHSB26	08/26/2003	5.08	J				no	na	na
	NDAHSB20	08/26/2003	4.49	J				no	na	na
	NDAHSB08	12/06/2000	4.2	J				no	na	na
	NDAHSB13	12/06/2000	4.1	J				no	na	na
	NDAHSB24	08/26/2003	3.87	J				no	na	na
	NDAHSB19	08/26/2003	3.24	J				no	na	na
	NDAHSB25	08/26/2003	3.14	J				no	na	na
	NDAHSB06	12/06/2000	3.1	J				no	na	na
	NDAHSB21	08/26/2003	2.93	J				no	na	na
	NDAHSB23	08/26/2003	2.58	J				no	na	na
	NDAHSB22	08/26/2003	2.48	J				no	na	na
	NDAHSB05	12/05/2000	2.4	J				no	na	na
	NDAHSB02	12/05/2000	2.2	J				no	na	na
COPPER	NDAHSB22	08/26/2003	46.4	=	4088	NA	NA	no	na	na
	NDAHSB03	12/05/2000	31	=				no	na	na
	NDAHSB09	12/06/2000	30	=				no	na	na
	NDAHSB15	12/07/2000	28	=				no	na	na
	NDAHSB18	08/26/2003	27.2	=				no	na	na
	NDAHSB16	12/07/2000	25	=				no	na	na
	NDAHSB09	12/06/2000	23	=				no	na	na
	NDAHSB14	12/07/2000	23	=				no	na	na
	NDAHSB20	08/26/2003	21.5	=				no	na	na
	NDAHSB17	08/26/2003	20.6	=				no	na	na
	NDAHSB29	08/26/2003	18.8	=				no	na	na
	NDAHSB01	12/05/2000	17	=				no	na	na
	NDAHSB13	12/06/2000	17	=				no	na	na
	NDAHSB27	08/26/2003	16.5	=				no	na	na
	NDAHSB07	12/06/2000	16	=				no	na	na
	NDAHSB08	12/06/2000	16	=				no	na	na
	NDAHSB10	12/06/2000	16	=				no	na	na
	NDAHSB28	08/26/2003	15.4	=				no	na	na
	NDAHSB04	12/05/2000	15	=				no	na	na

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB12	12/06/2000	15	=				no	na	na
	NDAHSB26	08/26/2003	14.8	=				no	na	na
	NDAHSB09	12/05/2000	14	=				no	na	na
	NDAHSB06	12/06/2000	10	=				no	na	na
	NDAHSB11	12/06/2000	10	=				no	na	na
	NDAHSB24	08/26/2003	9.45	=				no	na	na
	NDAHSB19	08/26/2003	8.56	=				no	na	na
	NDAHSB23	08/26/2003	8.18	=				no	na	na
	NDAHSB05	12/05/2000	7.7	=				no	na	na
	NDAHSB25	08/26/2003	7.49	=				no	na	na
	NDAHSB21	08/26/2003	7.04	=				no	na	na
	NDAHSB02	12/05/2000	7	=				no	na	na
IRON	NDAHSB09	12/06/2000	28000	=	100,000	NA	NA	no	na	na
	NDAHSB09	12/06/2000	22000	=				no	na	na
	NDAHSB16	12/07/2000	22000	=				no	na	na
	NDAHSB15	12/07/2000	20000	=				no	na	na
	NDAHSB03	12/05/2000	19000	=				no	na	na
	NDAHSB14	12/07/2000	19000	=				no	na	na
	NDAHSB10	12/06/2000	18000	=				no	na	na
	NDAHSB12	12/06/2000	17000	=				no	na	na
	NDAHSB01	12/05/2000	16000	=				no	na	na
	NDAHSB29	08/26/2003	15800	J				no	na	na
	NDAHSB18	08/26/2003	15400	J				no	na	na
	NDAHSB27	08/26/2003	15400	J				no	na	na
	NDAHSB07	12/06/2000	15000	=				no	na	na
	NDAHSB09	12/05/2000	15000	=				no	na	na
	NDAHSB26	08/26/2003	14000	J				no	na	na
	NDAHSB17	08/26/2003	13900	J				no	na	na
	NDAHSB28	08/26/2003	13200	J				no	na	na
	NDAHSB11	12/06/2000	13000	=				no	na	na
	NDAHSB20	08/26/2003	12400	J				no	na	na
	NDAHSB04	12/05/2000	12000	=				no	na	na
	NDAHSB08	12/06/2000	11000	=				no	na	na
	NDAHSB13	12/06/2000	11000	=				no	na	na
	NDAHSB19	08/26/2003	9420	J				no	na	na
	NDAHSB06	12/06/2000	9300	=				no	na	na
	NDAHSB24	08/26/2003	9070	J				no	na	na
	NDAHSB22	08/26/2003	8700	=				no	na	na
	NDAHSB23	08/26/2003	8360	J				no	na	na
	NDAHSB21	08/26/2003	7810	J				no	na	na
	NDAHSB05	12/05/2000	7800	=				no	na	na
	NDAHSB02	12/05/2000	6900	=				no	na	na
	NDAHSB25	08/26/2003	6660	J				no	na	na
LEAD	NDAHSB18	08/26/2003	29.1	=	750	NA	NA	no	na	na
	NDAHSB17	08/26/2003	18.9	=				no	na	na
	NDAHSB14	12/07/2000	12	=				no	na	na
	NDAHSB03	12/05/2000	8.6	=				no	na	na
	NDAHSB01	12/05/2000	7.5	=				no	na	na
	NDAHSB20	08/26/2003	6.75	=				no	na	na
	NDAHSB08	12/06/2000	5.9	=				no	na	na
	NDAHSB06	12/06/2000	5.7	=				no	na	na
	NDAHSB07	12/06/2000	4.4	=				no	na	na
	NDAHSB27	08/26/2003	3.23	=				no	na	na
	NDAHSB29	08/26/2003	3.02	=				no	na	na
	NDAHSB04	12/05/2000	2.5	=				no	na	na
	NDAHSB22	08/26/2003	2.29	J				no	na	na
	NDAHSB09	12/06/2000	2.2	=				no	na	na
	NDAHSB09	12/06/2000	2.1	=				no	na	na
	NDAHSB05	12/05/2000	2	=				no	na	na
	NDAHSB16	12/07/2000	1.9	=				no	na	na
	NDAHSB28	08/26/2003	1.86	=				no	na	na
	NDAHSB02	12/05/2000	1.8	=				no	na	na
	NDAHSB15	12/07/2000	1.7	=				no	na	na
	NDAHSB26	08/26/2003	1.42	=				no	na	na
	NDAHSB19	08/26/2003	1.25	=				no	na	na
	NDAHSB09	12/05/2000	1.2	=				no	na	na
	NDAHSB11	12/06/2000	1.2	=				no	na	na
	NDAHSB23	08/26/2003	1.11	=				no	na	na
	NDAHSB10	12/06/2000	1.1	=				no	na	na
	NDAHSB12	12/06/2000	1.1	=				no	na	na
	NDAHSB24	08/26/2003	1.04	=				no	na	na
	NDAHSB13	12/06/2000	0.92	=				no	na	na
	NDAHSB25	08/26/2003	0.91	=				no	na	na
	NDAHSB21	08/26/2003	0.75	=				no	na	na
MAGNESIUM	NDAHSB09	12/06/2000	4200	=	NA	NA	NA	na	na	na
	NDAHSB03	12/05/2000	3600	=				na	na	na
	NDAHSB07	12/06/2000	3100	=				na	na	na
	NDAHSB09	12/06/2000	3000	=				na	na	na
	NDAHSB16	12/07/2000	3000	=				na	na	na
	NDAHSB15	12/07/2000	2800	=				na	na	na

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB18	08/26/2003	2660	=				na	na	na
	NDAHSB29	08/26/2003	2520	=				na	na	na
	NDAHSB08	12/06/2000	2500	=				na	na	na
	NDAHSB14	12/07/2000	2500	=				na	na	na
	NDAHSB27	08/26/2003	2340	=				na	na	na
	NDAHSB01	12/05/2000	2300	=				na	na	na
	NDAHSB17	08/26/2003	2130	=				na	na	na
	NDAHSB28	08/26/2003	2030	=				na	na	na
	NDAHSB09	12/05/2000	2000	=				na	na	na
	NDAHSB10	12/06/2000	2000	=				na	na	na
	NDAHSB12	12/06/2000	2000	=				na	na	na
	NDAHSB26	08/26/2003	1760	=				na	na	na
	NDAHSB20	08/26/2003	1690	=				na	na	na
	NDAHSB04	12/05/2000	1600	=				na	na	na
	NDAHSB11	12/06/2000	1600	=				na	na	na
	NDAHSB06	12/06/2000	1400	=				na	na	na
	NDAHSB13	12/06/2000	1400	=				na	na	na
	NDAHSB22	08/26/2003	1380	=				na	na	na
	NDAHSB24	08/26/2003	1100	=				na	na	na
	NDAHSB19	08/26/2003	1060	=				na	na	na
	NDAHSB05	12/05/2000	980	J				na	na	na
	NDAHSB23	08/26/2003	975	=				na	na	na
	NDAHSB21	08/26/2003	895	=				na	na	na
	NDAHSB02	12/05/2000	840	J				na	na	na
	NDAHSB25	08/26/2003	748	J				na	na	na
MANGANESE	NDAHSB07	12/06/2000	1000	=	1946	NA	NA	no	na	na
	NDAHSB10	12/06/2000	960	=				no	na	na
	NDAHSB09	12/06/2000	850	=				no	na	na
	NDAHSB04	12/05/2000	680	=				no	na	na
	NDAHSB09	12/05/2000	600	=				no	na	na
	NDAHSB15	12/07/2000	560	=				no	na	na
	NDAHSB28	08/26/2003	544	=				no	na	na
	NDAHSB08	12/06/2000	520	=				no	na	na
	NDAHSB26	08/26/2003	427	=				no	na	na
	NDAHSB09	12/06/2000	420	=				no	na	na
	NDAHSB16	12/07/2000	420	=				no	na	na
	NDAHSB29	08/26/2003	372	=				no	na	na
	NDAHSB03	12/05/2000	370	=				no	na	na
	NDAHSB14	12/07/2000	350	=				no	na	na
	NDAHSB18	08/26/2003	345	=				no	na	na
	NDAHSB17	08/26/2003	316	=				no	na	na
	NDAHSB01	12/05/2000	310	=				no	na	na
	NDAHSB12	12/06/2000	300	=				no	na	na
	NDAHSB11	12/06/2000	290	=				no	na	na
	NDAHSB20	08/26/2003	283	=				no	na	na
	NDAHSB24	08/26/2003	277	=				no	na	na
	NDAHSB25	08/26/2003	271	=				no	na	na
	NDAHSB27	08/26/2003	199	=				no	na	na
	NDAHSB19	08/26/2003	177	=				no	na	na
	NDAHSB21	08/26/2003	161	=				no	na	na
	NDAHSB02	12/05/2000	160	=				no	na	na
	NDAHSB13	12/06/2000	160	=				no	na	na
	NDAHSB06	12/06/2000	150	=				no	na	na
	NDAHSB23	08/26/2003	117	=				no	na	na
	NDAHSB05	12/05/2000	110	=				no	na	na
	NDAHSB22	08/26/2003	80.4	=				no	na	na
MERCURY	NDAHSB18	08/26/2003	0.0719	J	30.7	NA	NA	no	na	na
	NDAHSB17	08/26/2003	0.0706	J				no	na	na
	NDAHSB27	08/26/2003	0.0218	J				no	na	na
	NDAHSB29	08/26/2003	0.0195	J				no	na	na
	NDAHSB14	12/07/2000	0.015	J				no	na	na
	NDAHSB20	08/26/2003	0.0146	J				no	na	na
	NDAHSB15	12/07/2000	0.014	J				no	na	na
	NDAHSB01	12/05/2000	0.013	J				no	na	na
	NDAHSB03	12/05/2000	0.011	J				no	na	na
	NDAHSB28	08/26/2003	0.0109	J				no	na	na
	NDAHSB12	12/06/2000	0.0094	J				no	na	na
	NDAHSB22	08/26/2003	0.009	J				no	na	na
	NDAHSB16	12/07/2000	0.0088	J				no	na	na
	NDAHSB23	08/26/2003	0.00644	J				no	na	na
	NDAHSB26	08/26/2003	0.0061	J				no	na	na
	NDAHSB19	08/26/2003	0.00506	J				no	na	na
	NDAHSB25	08/26/2003	0.00476	J				no	na	na
	NDAHSB21	08/26/2003	0.00429	J				no	na	na
	NDAHSB11	12/06/2000	0.0041	J				no	na	na
	NDAHSB04	12/05/2000	0.0038	J				no	na	na
	NDAHSB09	12/05/2000	0.0034	J				no	na	na
	NDAHSB05	12/05/2000	0.0032	J				no	na	na
	NDAHSB24	08/26/2003	0.00318	J				no	na	na
NICKEL	NDAHSB09	12/06/2000	9.2	J	2044	65	6.5	no	no	yes

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB08	12/06/2000	7.5	J				no	no	yes
	NDAHSB09	12/06/2000	6.9	J				no	no	yes
	NDAHSB01	12/05/2000	5.5	J				no	no	no
	NDAHSB15	12/07/2000	4.3	J				no	no	no
	NDAHSB03	12/05/2000	4.2	J				no	no	no
	NDAHSB16	12/07/2000	4.2	J				no	no	no
	NDAHSB18	08/26/2003	4.17	J				no	no	no
	NDAHSB14	12/07/2000	3.7	J				no	no	no
	NDAHSB17	08/26/2003	3.48	J				no	no	no
	NDAHSB07	12/06/2000	3.4	J				no	no	no
	NDAHSB29	08/26/2003	3.24	J				no	no	no
	NDAHSB26	08/26/2003	3.17	J				no	no	no
	NDAHSB06	12/06/2000	3.1	J				no	no	no
	NDAHSB09	12/05/2000	2.9	J				no	no	no
	NDAHSB28	08/26/2003	2.86	J				no	no	no
	NDAHSB27	08/26/2003	2.71	J				no	no	no
	NDAHSB04	12/05/2000	2.7	J				no	no	no
	NDAHSB12	12/06/2000	2.7	J				no	no	no
	NDAHSB10	12/06/2000	2.5	J				no	no	no
	NDAHSB11	12/06/2000	2.3	J				no	no	no
	NDAHSB20	08/26/2003	2.25	J				no	no	no
	NDAHSB13	12/06/2000	1.7	J				no	no	no
	NDAHSB24	08/26/2003	1.58	J				no	no	no
	NDAHSB22	08/26/2003	1.35	J				no	no	no
	NDAHSB21	08/26/2003	1.26	J				no	no	no
	NDAHSB19	08/26/2003	1.25	J				no	no	no
	NDAHSB23	08/26/2003	1.21	J				no	no	no
	NDAHSB02	12/05/2000	1.2	J				no	no	no
	NDAHSB05	12/05/2000	1.2	J				no	no	no
	NDAHSB25	08/26/2003	1.13	J				no	no	no
POTASSIUM	NDAHSB03	12/05/2000	2700	=	NA	NA	NA	na	na	na
	NDAHSB18	08/26/2003	1820	=				na	na	na
	NDAHSB16	12/07/2000	1800	=				na	na	na
	NDAHSB15	12/07/2000	1600	=				na	na	na
	NDAHSB29	08/26/2003	1510	=				na	na	na
	NDAHSB20	08/26/2003	1400	=				na	na	na
	NDAHSB17	08/26/2003	1330	=				na	na	na
	NDAHSB08	12/06/2000	1300	=				na	na	na
	NDAHSB14	12/07/2000	1300	=				na	na	na
	NDAHSB27	08/26/2003	1240	=				na	na	na
	NDAHSB28	08/26/2003	1170	=				na	na	na
	NDAHSB01	12/05/2000	1100	J				na	na	na
	NDAHSB12	12/06/2000	1100	J				na	na	na
	NDAHSB22	08/26/2003	1050	=				na	na	na
	NDAHSB26	08/26/2003	1020	=				na	na	na
	NDAHSB09	12/05/2000	1000	J				na	na	na
	NDAHSB10	12/06/2000	1000	J				na	na	na
	NDAHSB04	12/05/2000	980	J				na	na	na
	NDAHSB07	12/06/2000	970	J				na	na	na
	NDAHSB09	12/06/2000	840	J				na	na	na
	NDAHSB11	12/06/2000	830	J				na	na	na
	NDAHSB24	08/26/2003	809	J				na	na	na
	NDAHSB23	08/26/2003	739	J				na	na	na
	NDAHSB19	08/26/2003	709	J				na	na	na
	NDAHSB13	12/06/2000	700	J				na	na	na
	NDAHSB21	08/26/2003	665	J				na	na	na
	NDAHSB05	12/05/2000	650	J				na	na	na
	NDAHSB09	12/06/2000	630	J				na	na	na
	NDAHSB25	08/26/2003	591	J				na	na	na
	NDAHSB06	12/06/2000	560	J				na	na	na
	NDAHSB02	12/05/2000	440	J				na	na	na
SELENIUM	NDAHSB03	12/05/2000	1.3	=	511	2.5	0.25	no	no	yes
	NDAHSB10	12/06/2000	1.2	J				no	no	yes
	NDAHSB14	12/07/2000	1.2	=				no	no	yes
	NDAHSB16	12/07/2000	1	J				no	no	yes
	NDAHSB15	12/07/2000	0.99	J				no	no	yes
	NDAHSB01	12/05/2000	0.91	J				no	no	yes
	NDAHSB09	12/06/2000	0.9	J				no	no	yes
	NDAHSB09	12/06/2000	0.89	J				no	no	yes
	NDAHSB04	12/05/2000	0.84	J				no	no	yes
	NDAHSB06	12/06/2000	0.79	J				no	no	yes
	NDAHSB09	12/05/2000	0.76	J				no	no	yes
	NDAHSB12	12/06/2000	0.65	J				no	no	yes
	NDAHSB11	12/06/2000	0.61	J				no	no	yes
	NDAHSB28	08/26/2003	0.572	J				no	no	yes
	NDAHSB07	12/06/2000	0.57	J				no	no	yes
	NDAHSB05	12/05/2000	0.55	J				no	no	yes
	NDAHSB20	08/26/2003	0.5	J				no	no	yes
	NDAHSB26	08/26/2003	0.411	J				no	no	yes
	NDAHSB27	08/26/2003	0.384	J				no	no	yes

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB17	08/26/2003	0.383	J				no	no	yes
	NDAHSB29	08/26/2003	0.362	J				no	no	yes
	NDAHSB23	08/26/2003	0.29	J				no	no	yes
	NDAHSB18	08/26/2003	0.278	J				no	no	yes
	NDAHSB21	08/26/2003	0.268	J				no	no	yes
	NDAHSB22	08/26/2003	0.199	J				no	no	no
SILVER	NDAHSB17	08/26/2003	0.0437	J	511	17	1.7	no	no	no
	NDAHSB26	08/26/2003	0.0405	J				no	no	no
	NDAHSB28	08/26/2003	0.0293	J				no	no	no
	NDAHSB27	08/26/2003	0.0242	J				no	no	no
SODIUM	NDAHSB09	12/06/2000	850	J	NA	NA	NA	na	na	na
	NDAHSB27	08/26/2003	737	J				na	na	na
	NDAHSB09	12/06/2000	590	J				na	na	na
	NDAHSB26	08/26/2003	363	J				na	na	na
	NDAHSB29	08/26/2003	361	J				na	na	na
	NDAHSB12	12/06/2000	310	J				na	na	na
	NDAHSB18	08/26/2003	297	J				na	na	na
	NDAHSB10	12/06/2000	290	J				na	na	na
	NDAHSB08	12/06/2000	240	J				na	na	na
	NDAHSB14	12/07/2000	230	J				na	na	na
	NDAHSB28	08/26/2003	205	J				na	na	na
	NDAHSB03	12/05/2000	200	J				na	na	na
	NDAHSB20	08/26/2003	196	J				na	na	na
	NDAHSB16	12/07/2000	190	J				na	na	na

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB17	08/26/2003	190	J				na	na	na
	NDAHSB13	12/06/2000	180	J				na	na	na
	NDAHSB09	12/05/2000	170	J				na	na	na
	NDAHSB01	12/05/2000	140	J				na	na	na
	NDAHSB11	12/06/2000	130	J				na	na	na
	NDAHSB24	08/26/2003	114	J				na	na	na
	NDAHSB15	12/07/2000	110	J				na	na	na
	NDAHSB22	08/26/2003	95.9	J				na	na	na
	NDAHSB25	08/26/2003	91.6	J				na	na	na
	NDAHSB19	08/26/2003	85.1	J				na	na	na
	NDAHSB23	08/26/2003	78.8	J				na	na	na
	NDAHSB21	08/26/2003	77.3	J				na	na	na
	NDAHSB05	12/05/2000	60	J				na	na	na
	NDAHSB06	12/06/2000	59	J				na	na	na
	NDAHSB04	12/05/2000	48	J				na	na	na
	NDAHSB07	12/06/2000	46	J				na	na	na
	NDAHSB02	12/05/2000	43	J				na	na	na
THALLIUM	NDAHSB29	08/26/2003	0.954	J	6.7	NA	NA	no	na	na
	NDAHSB28	08/26/2003	0.789	J				no	na	na
	NDAHSB27	08/26/2003	0.712	J				no	na	na
	NDAHSB17	08/26/2003	0.708	J				no	na	na
	NDAHSB26	08/26/2003	0.661	J				no	na	na
	NDAHSB20	08/26/2003	0.583	J				no	na	na
	NDAHSB24	08/26/2003	0.553	J				no	na	na
	NDAHSB18	08/26/2003	0.538	J				no	na	na
	NDAHSB22	08/26/2003	0.522	J				no	na	na
	NDAHSB19	08/26/2003	0.476	J				no	na	na
	NDAHSB09	12/06/2000	0.43	J				no	na	na
	NDAHSB21	08/26/2003	0.407	J				no	na	na
	NDAHSB23	08/26/2003	0.355	J				no	na	na
	NDAHSB25	08/26/2003	0.24	J				no	na	na
VANADIUM	NDAHSB09	12/06/2000	79	=	715	3000	300	no	no	no
	NDAHSB09	12/06/2000	75	=				no	no	no
	NDAHSB16	12/07/2000	65	=				no	no	no
	NDAHSB15	12/07/2000	61	=				no	no	no
	NDAHSB12	12/06/2000	54	=				no	no	no
	NDAHSB03	12/05/2000	52	=				no	no	no
	NDAHSB14	12/07/2000	51	=				no	no	no
	NDAHSB29	08/26/2003	48.9	=				no	no	no
	NDAHSB27	08/26/2003	46.8	=				no	no	no
	NDAHSB10	12/06/2000	46	=				no	no	no
	NDAHSB01	12/05/2000	44	=				no	no	no
	NDAHSB18	08/26/2003	41.8	=				no	no	no
	NDAHSB28	08/26/2003	40.3	=				no	no	no
	NDAHSB07	12/06/2000	40	=				no	no	no
	NDAHSB17	08/26/2003	38.5	=				no	no	no
	NDAHSB13	12/06/2000	37	=				no	no	no
	NDAHSB26	08/26/2003	36.4	=				no	no	no
	NDAHSB20	08/26/2003	36.2	=				no	no	no
	NDAHSB04	12/05/2000	36	=				no	no	no
	NDAHSB09	12/05/2000	36	=				no	no	no
	NDAHSB11	12/06/2000	34	=				no	no	no
	NDAHSB08	12/06/2000	31	=				no	no	no
	NDAHSB24	08/26/2003	27.8	=				no	no	no
	NDAHSB06	12/06/2000	27	=				no	no	no
	NDAHSB19	08/26/2003	26.5	=				no	no	no
	NDAHSB22	08/26/2003	25.5	=				no	no	no
	NDAHSB23	08/26/2003	25.3	=				no	no	no
	NDAHSB21	08/26/2003	22.8	=				no	no	no
	NDAHSB05	12/05/2000	22	=				no	no	no
	NDAHSB02	12/05/2000	20	=				no	no	no
	NDAHSB25	08/26/2003	19	=				no	no	no
ZINC	NDAHSB18	08/26/2003	155	J	100,000	6000	600	no	no	no
	NDAHSB17	08/26/2003	59.8	J				no	no	no
	NDAHSB20	08/26/2003	54.1	J				no	no	no
	NDAHSB14	12/07/2000	48	=				no	no	no
	NDAHSB03	12/05/2000	41	=				no	no	no
	NDAHSB01	12/05/2000	33	=				no	no	no
	NDAHSB27	08/26/2003	31	J				no	no	no
	NDAHSB15	12/07/2000	30	=				no	no	no
	NDAHSB09	12/06/2000	28	J				no	no	no
	NDAHSB16	12/07/2000	28	=				no	no	no
	NDAHSB08	12/06/2000	27	J				no	no	no
	NDAHSB29	08/26/2003	26.8	J				no	no	no
	NDAHSB07	12/06/2000	26	J				no	no	no
	NDAHSB28	08/26/2003	22.2	J				no	no	no
	NDAHSB06	12/06/2000	20	J				no	no	no
	NDAHSB09	12/06/2000	20	J				no	no	no
	NDAHSB26	08/26/2003	18.8	J				no	no	no
	NDAHSB12	12/06/2000	18	J				no	no	no

Table G-2
Detected Chemicals in Suburface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Station ID	Sample Date	Result	Qualifer	Region IX PRG [2]	SSL [1] (DAF=10)	SSL (DAF=1)	Exceedances PRG	Exceedances of SSL 10	Exceedances of SSL 1
	NDAHSB22	08/26/2003	17.5	J				no	no	no
	NDAHSB09	12/05/2000	17	J				no	no	no
	NDAHSB04	12/05/2000	16	=				no	no	no
	NDAHSB10	12/06/2000	16	J				no	no	no
	NDAHSB11	12/06/2000	15	J				no	no	no
	NDAHSB13	12/06/2000	15	J				no	no	no
	NDAHSB24	08/26/2003	15	J				no	no	no
	NDAHSB19	08/26/2003	13.3	J				no	no	no
	NDAHSB05	12/05/2000	13	=				no	no	no
	NDAHSB23	08/26/2003	12.3	J				no	no	no
	NDAHSB21	08/26/2003	10.2	J				no	no	no
	NDAHSB25	08/26/2003	9.07	J				no	no	no
	NDAHSB02	12/05/2000	8.8	=				no	no	no
Volatile Organic Compounds (mg/Kg)										
1,1-DICHLOROETHENE	NDAHSB09	12/06/2000	0.00078	J	410	0.03	0.003	no	no	no
	NDAHSB10	12/06/2000	0.00059	J				no	no	no
	NDAHSB07	12/06/2000	0.00055	J				no	no	no
	NDAHSB08	12/06/2000	0.00052	J				no	no	no
	NDAHSB06	12/06/2000	0.00045	J				no	no	no
1,2-DICHLOROETHANE	NDAHSB15	12/07/2000	0.002	J	0.6	0.01	0.001	no	no	yes
METHYLENE CHLORIDE	NDAHSB06	12/06/2000	0.00058	J	8.881	0.01	0.001	no	no	no
TETRACHLOROETHYLEN	NDAHSB03	12/05/2000	0.0016	J	3.4	0.03	0.003	no	no	no
	NDAHSB05	12/05/2000	0.00031	J				no	no	no
TOLUENE	NDAHSB11	12/06/2000	0.0004	J	520	6	0.6	no	no	no
TRICHLOROETHYLENE (T	NDAHSB11	12/06/2000	0.00034	J	0.11	0.03	0.003	no	no	no
Pesticides (mg/Kg)										
p,p'-DDD	NDAHSB12	12/06/2000	0.013	=	9.951	8	0.8	no	no	no
	NDAHSB27	08/26/2003	0.01	J				no	no	no
	NDAHSB11	12/06/2000	0.0049	=				no	no	no
	NDAHSB03	12/05/2000	0.0035	J				no	no	no
	NDAHSB13	12/06/2000	0.0025	J				no	no	no
	NDAHSB28	08/26/2003	0.00019	J				no	no	no
p,p'-DDE	NDAHSB01	12/05/2000	0.764	J	7.025	27	2.7	no	no	no
	NDAHSB11	12/06/2000	0.419	=				no	no	no
	NDAHSB02	12/05/2000	0.124	J				no	no	no
	NDAHSB12	12/06/2000	0.024	=				no	no	no
	NDAHSB05	12/05/2000	0.0087	J				no	no	no
	NDAHSB07	12/06/2000	0.0045	=				no	no	no
	NDAHSB03	12/05/2000	0.0039	J				no	no	no
	NDAHSB16	12/07/2000	0.0038	J				no	no	no
	NDAHSB29	08/26/2003	0.0032	J				no	no	no
	NDAHSB27	08/26/2003	0.0027	J				no	no	no
	NDAHSB06	12/06/2000	0.002	J				no	no	no
	NDAHSB13	12/06/2000	0.0017	J				no	no	no
	NDAHSB04	12/05/2000	0.0016	J				no	no	no
	NDAHSB10	12/06/2000	0.0015	J				no	no	no
	NDAHSB28	08/26/2003	0.00061	J				no	no	no
	NDAHSB18	08/26/2003	0.0002	J				no	no	no
	NDAHSB20	08/26/2003	0.00014	J				no	no	no
p,p'-DDT	NDAHSB01	12/05/2000	0.928	J	7.025	16	1.6	no	no	no
	NDAHSB02	12/05/2000	0.022	J				no	no	no
	NDAHSB05	12/05/2000	0.0076	J				no	no	no
	NDAHSB07	12/06/2000	0.0025	J				no	no	no
	NDAHSB06	12/06/2000	0.0015	J				no	no	no
	NDAHSB10	12/06/2000	0.0009	J				no	no	no
	NDAHSB29	08/26/2003	0.00082	J				no	no	no
	NDAHSB28	08/26/2003	0.00048	J				no	no	no

[1] USEPA Region IX PRG soil screening level (SSL, 2002) based on a dilution attenuation factof (DAF) of 10.

[2] USEPA Region IX PRG Industrial values

ND indicates that the chemical was not detected.

NA indicates that the information is not available or not applicable.

J indicates that the chemical was detected. The reported value is estimated.

= infdicates that the chemical was detected. The reported value is the measured concentration.

APPENDIX H

Data Quality Evaluation

MEMORANDUM CH2MHILL

Vieques Former NASD AOC H Data Quality Evaluation (DQE)

TO: Vijaya Mylavarapu/GNV

COPIES: Marty Clasen/TPA
Jim Edens/GNV

FROM: Kevin A. Sanders/GNV

DATE: January 31, 2004

Introduction

The purpose of the technical memorandum (TM) is to present the findings of the data quality evaluation (DQE) performed on the multi-media sampling collected as part of Former NASD AOC H PASI and RIFS activities.

The purpose of the data quality evaluation process is to assess the effect of the overall analytical process on the usability of the data. The two major categories of data evaluation are laboratory performance and matrix interferences. Evaluation of laboratory performance is a check for compliance with the method requirements; either the laboratory did, or did not, analyze the samples within the limits of the analytical method. Evaluation of matrix interferences is more subtle and involves the analysis of several areas of results including surrogate spike recoveries, matrix spike recoveries, and duplicate sample results.

AOC H samples were collected during the PASI from December 5th, 2000 through December 20th, 2000 and during the RIFS from August 26th through September 30th, 2003. Field QC samples collected included field duplicates, field blanks, trip blanks (analyzed for VOCs only), and equipment rinsate blanks. The number of each type of sample is listed by analytical method in ***Exhibit 1***. The samples were analyzed for the following analytical fractions:

- Volatile organic compounds (VOCs) by SW-846 method 8260B
- Semivolatile organic compounds (SVOCs) by SW-846 method 8270C
- Organochlorine Pesticides and PCB's by SW846 method 8081A and 8082
- Explosives by SW846 method 8330
- Perchlorates by EPA 314.0 and 314.0M, Ion Chromatography
- Metals by SW-846 method 6010B (ICPES)
- Mercury by SW-846 method 7470A and 7471A

Before the analytical results were released by the laboratory, both the sample results and associated QC data were carefully reviewed to verify sample identity, instrument calibration, detection limits, dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. Additionally, the QC data were reduced and the resulting data were reviewed to ascertain whether they were within the laboratory-defined limits for accuracy and precision. Data nonconformances were discussed in the data package cover letter and case narrative.

The hardcopy data packages were reviewed by the sub-contractor (EDS) utilizing review criteria as specified by the EPA Region II guidelines, basically following that outlined in the Environmental Protection Agency (EPA) guidance document *Contract Laboratory Program National Functional Guidelines for Organic (1999) and Inorganic Data Review (2002) [NFG].*). Areas of review included (when applicable to the method) holding time compliance, calibration verification, blank results, matrix spike precision and accuracy, method accuracy as demonstrated by LCSs, field duplicate results, surrogate recoveries, internal standard performance, and interference checks. A data review worksheet was completed for each of these data packages and any non-conformance documented. This data review and validation process is independent of the laboratory's checks and focuses on the usability of the data to support the project data interpretation and decision-making processes.

Data that were not within the acceptance limits were appended with a qualifying flag, which consists of a single or double-letter abbreviation that reflects a problem with the data. Although the qualifying flags are appended to data records during the database query process, they are also included in the final data summary tables deliverable so that the data will not be used indiscriminately. These also include secondary, or the two-digit "sub-qualifier" flags, which are entered into the comment field of the database. ***Exhibit 2*** presents these codes and their definitions. The following primary flags were used to qualify the data:

- **U -** Undetected. Analyte was analyzed for but not detected above the method detection limit.
- **UJ -** Detection limit estimated. Analyte was analyzed for, and qualified as not detected. The result is estimated.
- **J -** Estimated. The analyte was present, but the reported value may not be accurate or precise.
- **R -** Rejected. The data are unusable. (NOTE: Analyte/compound may or may not be present.)

Numerical sample results that are greater than the method detection limit (MDL) but less than the laboratory reporting limit (RL) are qualified with a "J" for estimated as required by NFG.

The entire database was queried for frequency of detection in blanks and samples, detailed listing of blank detects, matrix spike/matrix spike duplicate (MS/MSD) results, field duplicate precision, surrogate recoveries, preparation and analysis dates pertaining to holding times. The queries were then manipulated to calculate necessary statistics for evaluation of the data.

Once the data review and validation process was completed, the entire data set were reviewed for analyte frequencies of detection, dilution factors that might affect data usability, and patterns of target analyte distribution. The data set was also evaluated to identify potential data limitations, uncertainties, or both in the analytical results. ***Exhibit 3*** presents data which were fully-rejected (data that did not have a dilution, re-extraction, or re-analysis valid result).

Holding Times

The holding times for each parameter were evaluated according to SW-846 requirements. NOTE: The 3rd party validation erroneously flagged 1291 PASI (year 2000) organic records (916 each 8081A, 319 each 8260B, and 56 each 8270C) as "J/UJ" (estimated) for holding times. The analyses were, in fact, within holding times; however, as 3rd party validation is required, the database flags were not changed (See August 2000 memo). All sample analyses met holding time criteria. No flags should have been applied due to missed holding times.

Calibration

Most all calibration criteria pertaining to all methods were met for these samples. Two-hundred and twenty-one results were qualified as estimated (J/UJ). These estimated records included 177 pesticides, 30 PCBs, and 14 selenium. Ninety records were rejected for low relative response factors (RRF). These results included forty-seven 2-butanone and 43 acetone records. Acetone and 2-butanone are noted poor performers by method 8260B and are not contaminants of concern at the SWMU. Additionally, 22 organochlorine pesticide results were estimated (J/UJ) due to second column confirmation percent difference (%D) outside established criteria.

Laboratory Method Accuracy

Laboratory control samples (LCS's) or blank spikes are quality control samples utilized to monitor laboratory method performance. This sample does not possess a difficult matrix as it consists of deionized (DI) laboratory water spiked with the target compounds of interest. With few exceptions, LCS data was within method criteria indicating that the laboratory method was in control.

Exhibit 4 indicates that a total of 173 total records (out of 13,014 total or 1.3%) for individual compounds in select samples were qualified due to LCS recoveries outside control limits. Thirty-five of these records were estimated (UJ) for the explosives compound N-Methyl-N,2,4,6-Tetranitroaniline. Nine, six, and four records were estimated (J/UJ) for zinc, the organochlorine pesticides, and semi-volatiles, respectively.

The rejected records (129) consisted of all semi-volatiles records. All other LCS accuracy and precision criteria were met. These method accuracy and precision data indicate that the laboratory analytical methods were in control.

Potential Field Sampling and Laboratory Contamination

Four types of blank samples were used to monitor potential contamination introduced during field sampling, sample handling, shipping activities, as well as sample preparation and analysis in the laboratory. Types of blank samples included:

- **Trip Blank (TB)**: A sample of analyte free water that is prepared in the laboratory prior to the sampling event. The water is stored in VOC sample containers and is not opened in the field, and travels back to the laboratory with the other samples for VOC analysis. This blank is used to monitor the potential for sample contamination during the sample container trip. One trip blank was included in each sample cooler that contained samples for VOC analysis. Six trip blanks were submitted to the laboratory with these samples.

- **Equipment Rinsate Blank (ERB)**: A sample of the target-free water used for the final rinse during the equipment decontamination process. This blank sample is collected by rinsing the sampling equipment after decontamination and is analyzed for the same analytical parameters as the corresponding samples. This blank is used to monitor potential contamination caused by incomplete equipment decontamination. One equipment rinsate blank should be collected per day of sampling, per type of sampling equipment. Depending on the method, up to eight equipment rinsate blanks were submitted to the laboratory for this field effort.

- **Field Blank or Ambient Blank (FB or AB)**: The field blank is an aliquot of the source water used for equipment decontamination. This blank monitors contamination that may be introduced from the water used for decontamination. One field blank should be collected from each source of decontamination water and analyzed for the same parameters as the associated samples. Up to four field blanks were collected during this sampling event, depending on the method.

- **Laboratory Method Blank or Method Blank (MB)**: A laboratory method blank is ASTM Type II water that is treated as a sample in that it undergoes the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance and contamination introduced during the analytical procedure. One method blank was prepared and analyzed for every twenty samples or per analytical batch, whichever was more frequent.

According to the NFG, concentrations of common organic contaminants detected in samples at less than ten times the concentration of the associated blanks can be attributed to field sampling and laboratory contamination rather than environmental contamination from site activities. Common organic contaminants include acetone, methylene chloride, 2-butanone, and the phthalates. For other inorganic and organic contaminants, five times the concentration detected in the associated blanks (rather than ten times) is used to qualify results as potential field and/or laboratory contamination rather than environmental contamination. The ten times rule was applied on a sample delivery group (SDG) by SDG basis and not globally. Global flag application, however, would account for anomalous data which should also be attributed to laboratory or field blank contamination.

Field sample concentrations less than the action levels (5 or 10 times rule) were qualified as not detected (26 total records).

As presented in ***Exhibit 4,*** three volatile compound contaminants detected in blanks resulted in qualification of field samples. Acetone and methylene chloride were detected several blank types, resulting in 4 and 8 records qualified as non-detect due to blank contamination, respectively. Acetone and methylene chloride are extraction solvents and are common laboratory contaminants. 1,2-Dichloroethane was detected in 2 laboratory method blanks sub-part-per-billion levels. Two records of 1,2-DCA were qualified as non-detect.

Phthalates are plasticizers and common contaminants. The most common phthalates are bis(2-ethylhexyl) phthalate (BEHP), Di-n-butylphthalate, and Diethyl phthalate. Phthalates are often introduced into samples during handling. Gloves are often used when handling sampling equipment such as pumps, hoses, split spoons, dredges and bailers. Additionally, laboratory chemists use gloves when handling samples and extracts. Gloves are coated with plasticizers such as BEHP to facilitate release of the gloves from the skin. BEHP was reported in an ambient and laboratory blank. Eleven BEHP records were qualified as non-detect due to blank contamination. Phenol was detected in 2 ambient and 2 equipment blanks at less than 5 µg/L. A single field sample record was qualified as non-detect for phenol.

Matrix Effects

Surrogate Spike Recovery

Surrogate spike compounds were added to every sample analyzed for the organic parameters including field and laboratory blanks as well as field environmental samples. Surrogate spikes consist of organic compounds which are similar to the method targets in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.

Surrogate spike recoveries were used to monitor both laboratory performance and matrix interferences. Surrogate spike recoveries from field and laboratory blanks were used to evaluate laboratory performance because the blanks should represent an "ideal" sample matrix. Surrogate spike recoveries for field samples were used to evaluate the potential for matrix interferences. According to *NFG*, data are not qualified with respect to surrogate recoveries unless one or more volatile surrogates are out of specifications. Semivolatiles are not qualified unless two or more surrogates, within the same fraction (base/neutral or acid fraction), are out of specification.

Exhibit 4, "Change in Qualifiers", indicates that 1,188 records were qualified due to surrogate recoveries outside control limits. All but 70 (0.5% of the total) of these records were estimated (J/UJ). Sixty-one and 9 records were rejected due to low surrogate recoveries for organochlorine pesticides and semi-volatiles, respectively.

Overall, surrogate recoveries were well within criteria indicating that the specific sample matrix did not greatly influence the overall analytical process or the final numerical sample result.

Matrix Spike/Matrix Spike Duplicate Precision and Accuracy

A matrix spike is an aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix. The matrix spike duplicate is an intra-laboratory-split sample spiked with identical concentrations of target analyte(s). The spiking occurs prior to sample preparation and analysis. They are used to document the precision and accuracy of a method in a given sample matrix. For the MS/MSD measurement, three aliquots of a single sample are analyzed; one native sample and two spiked with target analytes or compounds. Matrix accuracy is evaluated from the spike recoveries, while matrix precision is evaluated from comparison of the found concentrations of the MS and MSD.

Organic results are not qualified upon the results of MS/MSD results alone. Evaluation is in conjunction with surrogate, LCS, and internal standard (if applicable) results. Additionally, many MS/MSD samples require dilution and thus the spike compounds added are diluted out and unable to be evaluated.

Inorganic results may be qualified solely upon the results of the matrix spike/matrix spike duplicate precision and accuracy. Instances where the native sample concentration for a given element exceeds the spike added concentration by a factor of four or more are not evaluated as the spike added would be masked by the native concentration. According to NFG, metals recoveries of greater than 30% and less than 75% recovery are required to be flagged as estimated (J/UJ). Recoveries greater than 125% requires that detections be estimated (J) and non-detects remaining as undetected. Precision requirements for waters and soils are set at 20 and 35 relative percent difference (RPD), respectively. ***Exhibit 4*** indicates that 134 records (all metals) were qualified due to MS or MSD recoveries outside control limits. Of these records all were estimated (J/UJ); none were rejected. The majority of these estimated records were for the element antimony (Sb) in a solid matrix. The EPA 3050 digestion method routinely exhibits poor recoveries of antimony in a solid matrix. Table 1 reflects the number of results estimated per element. The majority of the accuracy and precision results were well within established criteria, indicating that the specific sample matrix did not greatly influence the overall analytical process or the final numerical sample result.

Table 1 – Results estimated due MS/MSD Statistics Outside Criteria by Element and Associated Number of Records

Element	Al	Sb	Ba	Cr	Pb	Mn	Zn
Number of Records	**2**	**77**	**16**	**16**	**11**	**11**	**1**

Serial Dilutions for ICPES

Serial dilutions are performed on samples being quantitated by Inductively Coupled Plasma Emission Spectroscopy (ICPES) in order to aid in the recognition of matrix interferences (spectral overlap, background light and noise, and physical). A field sample with concentrations (ideally) greater than 50 times the instrument detection limit (IDL) are diluted 1+4 (5-fold) and analyzed immediately after the straight native digestate. The qualifying concentrations of the dilution are then multiplied by five and compared to the concentrations of the native sample. A percent difference (%D) is calculated from this comparison and %D's greater than 10% result in associated samples in that analytical batch to be qualified as estimated (J/UJ) for that particular element.

Serial Dilution records estimated due %D's greater than 10% numbered 96. Table 2 lists the element and the associated number of records estimated for the serial dilution statistic.

Table 2 – Results estimated due to Serial Dilutions Outside Criteria by Element and Associated Number of Records

Element	**Al**	**Ca**	**Cr**	**Co**	**Mn**	**K**	**Zn**
Number of Records	**11**	**5**	**5**	**18**	**5**	**34**	**18**

This statistic indicates that the specific sample matrix did not greatly influence the overall analytical process or the final numerical sample result.

Laboratory Duplicate Precision

A laboratory duplicate is an intralaboratory split of a native field sample which is analyzed for the same parameters. Precision is determined from the concentrations of the native and the split duplicate. An aqueous control limit of ± 20% for the RPD was used for original and duplicate sample values greater than or equal to five times the RL. Solid samples utilized a control limit of 35 RPD. A control limit of ± the RL was used if either the sample for the duplicate value was less than five times the RL for waters and 2 times the RL for soils. In the cases where only one result is above the five times the RL level and the other is below, the ± RL criteria were applied.

Of the 101 record sets meeting the aforementioned criteria, only 6 sets were outside criteria (6%). These data indicate that the matrix did not have an influence on the final numerical result.

Field Duplicate Sample Results

Field duplicate analyses measure both field and laboratory precision and can also be affected by the homogeneity of the samples.

Depending on the method, up to four sets of field duplicates were collected during this field effort. Both the native and duplicate samples were analyzed for the same parameters.

An aqueous control limit of ± 20% for the RPD was used for original and duplicate sample values greater than or equal to five times the RL. Solid samples utilized a control limit of 35 RPD. A control limit of ± the RL was used if either the sample for the duplicate value was less than five times the RL for waters and 2 times the RL for soils. In the cases where only one result is above the five times the RL level and the other is below, the ± RL criteria were applied.

There were 251 result sets which were measurable, of which 12 sets were outside established criteria. This resulted in 6 records (4 metals and 2 volatiles) qualified as estimated (J). These statistics indicate that matrix heterogeneity and sampling technique did not greatly influence the final numerical result.

Total versus Dissolved Metals

Aqueous samples were split and a one aliquot per sample field filtered. A comparison between the total and dissolved results was performed in order to establish whether the major cations were associated with the dissolved or total fraction. Results where the total and dissolved concentrations were greater than five times the reporting limit were evaluated as is; that is whether the dissolved fraction was greater than the total. In the instance where one or both concentrations were less than five times the RL, the difference between the two values were compared to the RL. If the difference was less than the RL, the comparison was not performed as the difference would be considered within analytical method error. There were 195 “measurable” sets of data. Ten sets (5.1%) were outside the above outlined criteria. There were no results qualified for the dissolved versus total measurement.

Sample Results Quantitated at or Near the Method Detection Limit (MDL)

The MDL is defined as the minimum concentration of an analyte that can be identified, measured, and reported with 99% confidence that the analyte concentration is greater than zero. Sample results at, or near the MDL are not accurate or precise. This situation is often caused by instrument noise or low-level background shifts rather than a true analyte signal. Concentrations at this level may be Type I (alpha) errors (or false positives) and should be applied in this manner. As concentrations approach a “quantitation limit,” the confidence in the values increase.

Exhibit 4 indicates that 43 metals records were qualified as estimated due to recoveries measured to be outside EPA Region II established control limits for the analysis of the contract required detection limit standard (CRDL). These qualifications support the aforementioned discussion regarding accuracy and precision at or near the MDL or a non-statistically based reporting limit.

PARCCs

Precision--is defined as the agreement between duplicate results, and was estimated by comparing duplicate matrix spike recoveries, and field duplicate sample results. MS/MSD precision was documented as well within control limit criteria for most samples and targets. Other than the documented exceptions, the precision between native and field duplicate sample results were within acceptable criteria for the majority of the measurements indicating that sample matrix did not significantly interfere with the overall analytical process.

Accuracy--is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For the organic analyses, each of the samples was spiked with a surrogate compound; and for organic and inorganic analyses a MS/ MSD, and LCS were spiked with a known reference material before preparation. The surrogate and MS/MSD data provides a measure of the matrix effects as they may affect accuracy and precision on the analytical method. The LCS results demonstrate accuracy of the method. Spike recoveries were within the method acceptance limits for the majority of the measurements; therefore, other than the documented exceptions, there was no evidence of significant matrix interferences that would affect the usability of the data.

Representativeness--this criteria is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition. Representativeness is a subjective parameter and is used to evaluate the efficacy of the sampling plan design. Representativeness was demonstrated by providing full descriptions in the project scoping documents of the sampling techniques and the rationale used for selecting sampling locations.

Completeness--is defined as the percentage of measurements that are judged to be valid compared to the to total number of measurements made. A goal of 90 percent usable data was established in the project scoping document. All fractions per matrix completion percentage were above 90%. The completeness for this sampling event was calculated to be **97.8** percent (12725/13014).

Comparability--is another qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix type, and analytical method. Comparability is limited by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Data from this investigation are comparable with other data collected at the site because only EPA methods were used to analyze the sample and EPA Level IV QC data are available to support the quality of the data.

Summary and Conclusions

Conclusions of the data quality evaluation process include:

- The laboratory analyzed the samples according to the EPA methods stated in the work plan as demonstrated by the deliverable summaries and analytical run sequences
- Sample results for metals above the MDL but less than the RL may be attributed to instrument noise and/or low level contamination and not site-related activities and as such may be false positives
- Sample results for target organic compounds above the MDL but less than the RL should be considered as uncertain but indicative of the presence of that compound at an estimated concentration
- Ninety volatile were rejected for low relative response factors
- Low recoveries of the LCS resulted in 129 (1.0%) semi-volatile records being rejected
- Twenty-six records were qualified as non-detect due to blank contamination
- Seventy (0.5%) records were rejected due to surrogate recoveries less than 10%
- Spike recoveries, surrogates, and field duplicate sample results (other than the exceptions documented in the text and attachments) indicate that the specific sample matrix did not significantly interfere with the analytical process or the final numerical result

The project objectives or PARCCs were met, and the data can be used in the project decision-making process as qualified by the data quality evaluation process.

EXHIBIT 1

Number of Samples Collected by Matrix, Method, and Type

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Analytical Method	Analytical Method Description	Prep Method	N	FD	AB	EB	TB
SB	SW8330	Explosives by HPLC	METHOD	13	1			
SD	SW8330	Explosives by HPLC	METHOD	5	1			
SS	SW8330	Explosives by HPLC	METHOD	13	2			
WG	SW8330	Explosives by HPLC	METHOD	5	1	3	3	
WS	SW8330	Explosives by HPLC	METHOD	4	1			
SB	SW6010B	ICPES Metals	SW3050B	32	3			
SD	SW6010B	ICPES Metals	SW3050B	5	1			
SS	SW6010B	ICPES Metals	SW3050B	32	4			
WG	SW6010B	ICPES Metals	FLDFLT	9	2			
WG	SW6010B	ICPES Metals	SW3010A	9	2	2	6	
WS	SW6010B	ICPES Metals	FLDFLT	4	1	2	2	
WS	SW6010B	ICPES Metals	SW3010A	4	1	2	2	
WG	SW7470A	Mercury (Cold Vapor, Automated)	FLDFLT	9	2	2	2	
WG	SW7470A	Mercury (Cold Vapor, Automated)	METHOD	9	2	2	6	
WS	SW7470A	Mercury (Cold Vapor, Automated)	FLDFLT	4	1	2	2	
WS	SW7470A	Mercury (Cold Vapor, Automated)	METHOD	4	1	2	2	
SB	SW7471A	Mercury (Cold Vapor, Solids)	METHOD	32	3			
SD	SW7471A	Mercury (Cold Vapor, Solids)	METHOD	5	1			
SS	SW7471A	Mercury (Cold Vapor, Solids)	METHOD	32	4			
SB	SW8081	Organochlorine Pesticides	SW3550	13	1			
SD	SW8081	Organochlorine Pesticides	SW3550	5	1			
SS	SW8081	Organochlorine Pesticides	SW3550	13	2			
WG	SW8081A	Organochlorine Pesticides	SW3510	5	1	2	2	
WS	SW8081A	Organochlorine Pesticides	SW3510	4	1			
SB	SW8081/8082	Organochlorine Pesticides and PCBs	SW3550	19	2			
SS	SW8081/8082	Organochlorine Pesticides and PCBs	SW3550	19	2			
WG	SW8081/8082	Organochlorine Pesticides and PCBs -LL	SW3510	4	1	2	6	
SB	E314.0	Perchlorate by Ion Chromatography	METHOD	13	1			
SD	E314.0	Perchlorate by Ion Chromatography	METHOD	5	1			
SS	E314.0	Perchlorate by Ion Chromatography	METHOD	13	2			
WG	E314.0	Perchlorate by Ion Chromatography	NONE	5	1	3	2	
WS	E314.0	Perchlorate by Ion Chromatography	NONE	4	1			
SB	SW8270C	Semivolatile Organics (SVOCs) by GCMS	SW3550	33	3			
SD	SW8270C	Semivolatile Organics (SVOCs) by GCMS	SW3550	5	1			
SS	SW8270C	Semivolatile Organics (SVOCs) by GCMS	SW3550	33	4			
WG	SW8270C	Semivolatile Organics (SVOCs) by GCMS	SW3510	9	2	4	8	
WS	SW8270C	Semivolatile Organics (SVOCs) by GCMS	SW3510	4	1			
SB	SW8260B	Volatiles (VOCs) by GCMS	SW5030	19	2			
SS	SW8260B	Volatiles (VOCs) by GCMS	SW5030	19	2			
WG	SW8260B	Volatiles (VOCs) by GCMS	SW5030	4	1	2	6	6

EXHIBIT 2

Data Validation Sub-Qualifiers and their Definitions

AOC H, Former NASD, Vieques, Puerto Rico

Code	Definition
TN	Tune
BS	Blank Spike/LCS
IS	Internal Standard
MS	Matrix Spike and/or Matrix Spike Duplicate Recovery
MD	Matrix Spike/Matrix Spike Duplicate Precision
2S	Second Source
SD	Serial Dilution
SS	Spiked Surrogate
LR	Lab Re-extraction or Re-Analysis
IC	Initial Calibration
CC	Continuing Calibration Verification
PD	Pesticide Degradation
LD	Lab Duplicate
2C	Second Column (Confirmation)
HT	Holding Time
TD	Dissolved Concentration Greater Than the Total
PS	Post Spike
BL	Blank
RE	Re-extraction
DL	Dilution
IB	In Between MDL and RL
FD	Field Duplicate
OT	Other (Defined in DV Worksheet)
Order of Qualifiers is in Order of Importance, Impact on the Data	

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
WS	NDAHFD02P-R01	FD	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WG	NDAHGW02-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WG	NDAHGW05-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WG	NDAHGW07-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WS	NDAHSW01-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WS	NDAHSW02-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WS	NDAHSW03-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
WS	NDAHSW04-R01	N	1,2,4,5-tetrachlorobenzene	SW8270C	BS
SD	NDAHFD03P-R01	FD	4-Chloroaniline	SW8270C	BS
SS	NDAHFD04P-R01	FD	4-Chloroaniline	SW8270C	BS
SB	NDAHFD05P-R01	FD	4-Chloroaniline	SW8270C	BS
SS	NDAHFD06P-R01	FD	4-Chloroaniline	SW8270C	BS
SB	NDAHSB17-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB18-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB19-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB20-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB21-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB22-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB23-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB24-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB25-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB26-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB27-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB28-R01	N	4-Chloroaniline	SW8270C	BS
SB	NDAHSB29-R01	N	4-Chloroaniline	SW8270C	BS
SD	NDAHSD01-R01	N	4-Chloroaniline	SW8270C	BS
SD	NDAHSD02-R01	N	4-Chloroaniline	SW8270C	BS
SD	NDAHSD03-R01	N	4-Chloroaniline	SW8270C	BS
SD	NDAHSD04-R01	N	4-Chloroaniline	SW8270C	BS
SD	NDAHSD05-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS17-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS18-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS20-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS21-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS22-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS23-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS24-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS25-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS26-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS27-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS28-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHSS29-R01	N	4-Chloroaniline	SW8270C	BS
SS	NDAHFD04P-R01	FD	Benzaldehyde	SW8270C	BS
SB	NDAHFD05P-R01	FD	Benzaldehyde	SW8270C	BS

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
SS	NDAHFD06P-R01	FD	Benzaldehyde	SW8270C	BS
SS	NDAHSS22-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS23-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS24-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS25-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS26-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS27-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS28-R01	N	Benzaldehyde	SW8270C	BS
SS	NDAHSS29-R01	N	Benzaldehyde	SW8270C	BS
SD	NDAHFD03P-R01	FD	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB17-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB18-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB19-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB20-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB21-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB22-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB23-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB24-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB25-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB26-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB27-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB28-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SB	NDAHSB29-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SD	NDAHSD01-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SD	NDAHSD02-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SD	NDAHSD03-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SD	NDAHSD04-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SD	NDAHSD05-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SS	NDAHSS17-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SS	NDAHSS18-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SS	NDAHSS20-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
SS	NDAHSS21-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	BS
WS	NDAHFD02P-R01	FD	caprolactam	SW8270C	BS
WG	NDAHGW02-R01	N	caprolactam	SW8270C	BS
WG	NDAHGW06-R01	N	caprolactam	SW8270C	BS
WG	NDAHGW07-R01	N	caprolactam	SW8270C	BS
WS	NDAHSW02-R01	N	caprolactam	SW8270C	BS
WS	NDAHSW03-R01	N	caprolactam	SW8270C	BS
WS	NDAHSW04-R01	N	caprolactam	SW8270C	BS
SD	NDAHFD03P-R01	FD	Hexachlorobutadiene	SW8270C	BS
SD	NDAHSD01-R01	N	Hexachlorobutadiene	SW8270C	BS
SD	NDAHSD02-R01	N	Hexachlorobutadiene	SW8270C	BS
SD	NDAHSD03-R01	N	Hexachlorobutadiene	SW8270C	BS
SD	NDAHSD04-R01	N	Hexachlorobutadiene	SW8270C	BS

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
SD	NDAHSD05-R01	N	Hexachlorobutadiene	SW8270C	BS
SD	NDAHFD03P-R01	FD	Hexachloroethane	SW8270C	BS
SS	NDAHFD04P-R01	FD	Hexachloroethane	SW8270C	BS
SB	NDAHFD05P-R01	FD	Hexachloroethane	SW8270C	BS
SS	NDAHFD06P-R01	FD	Hexachloroethane	SW8270C	BS
SB	NDAHSB17-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB18-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB19-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB20-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB21-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB22-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB23-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB24-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB25-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB26-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB27-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB28-R01	N	Hexachloroethane	SW8270C	BS
SB	NDAHSB29-R01	N	Hexachloroethane	SW8270C	BS
SD	NDAHSD01-R01	N	Hexachloroethane	SW8270C	BS
SD	NDAHSD02-R01	N	Hexachloroethane	SW8270C	BS
SD	NDAHSD03-R01	N	Hexachloroethane	SW8270C	BS
SD	NDAHSD04-R01	N	Hexachloroethane	SW8270C	BS
SD	NDAHSD05-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS17-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS18-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS20-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS21-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS22-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS23-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS24-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS25-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS26-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS27-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS28-R01	N	Hexachloroethane	SW8270C	BS
SS	NDAHSS29-R01	N	Hexachloroethane	SW8270C	BS
SD	NDAHFD03P-R01	FD	Naphthalene	SW8270C	BS
SD	NDAHSD01-R01	N	Naphthalene	SW8270C	BS
SD	NDAHSD02-R01	N	Naphthalene	SW8270C	BS
SD	NDAHSD03-R01	N	Naphthalene	SW8270C	BS
SD	NDAHSD04-R01	N	Naphthalene	SW8270C	BS
SD	NDAHSD05-R01	N	Naphthalene	SW8270C	BS
SS	NDE176	N	Acetone	SW8260B	CC
WG	NDE213	N	Acetone	SW8260B	IC
WG	NDE214	N	Acetone	SW8260B	IC

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
WG	NDE215	N	Acetone	SW8260B	IC
WG	NDE216FD1	FD	Acetone	SW8260B	IC
WG	NDE217	N	Acetone	SW8260B	IC
SS	NDE004	N	Acetone	SW8260B	IC, CC
SS	NDE005FD1	FD	Acetone	SW8260B	IC, CC
SB	NDE006	N	Acetone	SW8260B	IC, CC
SS	NDE007	N	Acetone	SW8260B	IC, CC
SB	NDE008	N	Acetone	SW8260B	IC, CC
SS	NDE009	N	Acetone	SW8260B	IC, CC
SB	NDE010	N	Acetone	SW8260B	IC, CC
SS	NDE011	N	Acetone	SW8260B	IC, CC
SB	NDE012	N	Acetone	SW8260B	IC, CC
SS	NDE013	N	Acetone	SW8260B	IC, CC
SB	NDE014	N	Acetone	SW8260B	IC, CC
SS	NDE015	N	Acetone	SW8260B	IC, CC
SS	NDE017	N	Acetone	SW8260B	IC, CC
SB	NDE019	N	Acetone	SW8260B	IC, CC
SS	NDE021	N	Acetone	SW8260B	IC, CC
SB	NDE022	N	Acetone	SW8260B	IC, CC
SS	NDE023	N	Acetone	SW8260B	IC, CC
SS	NDE024FD1	FD	Acetone	SW8260B	IC, CC
SS	NDE026	N	Acetone	SW8260B	IC, CC
SB	NDE027	N	Acetone	SW8260B	IC, CC
SS	NDE028	N	Acetone	SW8260B	IC, CC
SB	NDE029	N	Acetone	SW8260B	IC, CC
SS	NDE030	N	Acetone	SW8260B	IC, CC
SB	NDE031	N	Acetone	SW8260B	IC, CC
SS	NDE032	N	Acetone	SW8260B	IC, CC
SB	NDE033	N	Acetone	SW8260B	IC, CC
SS	NDE034	N	Acetone	SW8260B	IC, CC
SB	NDE035	N	Acetone	SW8260B	IC, CC
SB	NDE036FD1	FD	Acetone	SW8260B	IC, CC
SS	NDE037	N	Acetone	SW8260B	IC, CC
SB	NDE038	N	Acetone	SW8260B	IC, CC
SB	NDE039FD1	FD	Acetone	SW8260B	IC, CC
SS	NDE177	N	Acetone	SW8260B	IC, CC
SS	NDE178	N	Acetone	SW8260B	IC, CC
SS	NDE179	N	Acetone	SW8260B	IC, CC
SB	NDE203	N	Acetone	SW8260B	IC, CC
SB	NDE204	N	Acetone	SW8260B	IC, CC
SS	NDE004	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE005FD1	FD	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE006	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE007	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
SB	NDE008	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE009	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE010	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE011	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE012	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE013	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE014	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE015	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE016	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE017	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE018	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE019	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE020	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE021	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE022	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE023	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE024FD1	FD	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE025	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE026	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE027	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE028	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE029	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE030	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE031	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE032	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE033	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE034	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE035	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE036FD1	FD	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE037	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE038	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE039FD1	FD	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE176	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE177	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE178	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SS	NDE179	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE203	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SB	NDE204	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
WG	NDE213	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
WG	NDE214	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
WG	NDE215	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
WG	NDE216FD1	FD	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
WG	NDE217	N	Methyl ethyl ketone (2-butanone)	SW8260B	IC, CC
SD	NDAHFD03P-R01	FD	Aldrin	SW8081	SS

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
SB	NDAHSB29-R01	N	Aldrin	SW8081	SS
SS	NDAHSS20-R01	N	Aldrin	SW8081	SS
SD	NDAHFD03P-R01	FD	alpha bhc (alpha hexachlorocyclohexane)	SW8081	SS
SB	NDAHSB29-R01	N	alpha bhc (alpha hexachlorocyclohexane)	SW8081	SS
SS	NDAHSS20-R01	N	alpha bhc (alpha hexachlorocyclohexane)	SW8081	SS
SD	NDAHFD03P-R01	FD	alpha endosulfan	SW8081	SS
SB	NDAHSB29-R01	N	alpha endosulfan	SW8081	SS
SS	NDAHSS20-R01	N	alpha endosulfan	SW8081	SS
SD	NDAHFD03P-R01	FD	alpha-chlordane	SW8081	SS
SB	NDAHSB29-R01	N	alpha-chlordane	SW8081	SS
SS	NDAHSS20-R01	N	alpha-chlordane	SW8081	SS
SD	NDAHFD03P-R01	FD	beta bhc (beta hexachlorocyclohexane)	SW8081	SS
SB	NDAHSB29-R01	N	beta bhc (beta hexachlorocyclohexane)	SW8081	SS
SS	NDAHSS20-R01	N	beta bhc (beta hexachlorocyclohexane)	SW8081	SS
SD	NDAHFD03P-R01	FD	beta endosulfan	SW8081	SS
SB	NDAHSB29-R01	N	beta endosulfan	SW8081	SS
SS	NDAHSS20-R01	N	beta endosulfan	SW8081	SS
SD	NDAHFD03P-R01	FD	delta bhc (delta hexachlorocyclohexane)	SW8081	SS
SB	NDAHSB29-R01	N	delta bhc (delta hexachlorocyclohexane)	SW8081	SS
SS	NDAHSS20-R01	N	delta bhc (delta hexachlorocyclohexane)	SW8081	SS
SD	NDAHFD03P-R01	FD	Dieldrin	SW8081	SS
SB	NDAHSB29-R01	N	Dieldrin	SW8081	SS
SS	NDAHSS20-R01	N	Dieldrin	SW8081	SS
SD	NDAHFD03P-R01	FD	endosulfan sulfate	SW8081	SS
SB	NDAHSB29-R01	N	endosulfan sulfate	SW8081	SS
SS	NDAHSS20-R01	N	endosulfan sulfate	SW8081	SS
SD	NDAHFD03P-R01	FD	endrin	SW8081	SS
SB	NDAHSB29-R01	N	endrin	SW8081	SS
SS	NDAHSS20-R01	N	endrin	SW8081	SS
SD	NDAHFD03P-R01	FD	endrin aldehyde	SW8081	SS
SB	NDAHSB29-R01	N	endrin aldehyde	SW8081	SS
SS	NDAHSS20-R01	N	endrin aldehyde	SW8081	SS
SD	NDAHFD03P-R01	FD	endrin ketone	SW8081	SS
SB	NDAHSB29-R01	N	endrin ketone	SW8081	SS
SS	NDAHSS20-R01	N	endrin ketone	SW8081	SS
SD	NDAHFD03P-R01	FD	gamma bhc (lindane)	SW8081	SS
SB	NDAHSB29-R01	N	gamma bhc (lindane)	SW8081	SS
SS	NDAHSS20-R01	N	gamma bhc (lindane)	SW8081	SS
SD	NDAHFD03P-R01	FD	gamma-chlordane	SW8081	SS
SB	NDAHSB29-R01	N	gamma-chlordane	SW8081	SS
SS	NDAHSS20-R01	N	gamma-chlordane	SW8081	SS
SD	NDAHFD03P-R01	FD	heptachlor	SW8081	SS
SB	NDAHSB29-R01	N	heptachlor	SW8081	SS
SS	NDAHSS20-R01	N	heptachlor	SW8081	SS

EXHIBIT 3

Data Rejected through Data Validation Process

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Native Sample ID	Native Sample Type	Parameter	Analysis Method	Validation Notes
SD	NDAHFD03P-R01	FD	heptachlor epoxide	SW8081	SS
SB	NDAHSB29-R01	N	heptachlor epoxide	SW8081	SS
SS	NDAHSS20-R01	N	heptachlor epoxide	SW8081	SS
SD	NDAHFD03P-R01	FD	methoxychlor	SW8081	SS
SB	NDAHSB29-R01	N	methoxychlor	SW8081	SS
SS	NDAHSS20-R01	N	methoxychlor	SW8081	SS
SD	NDAHFD03P-R01	FD	p,p'-DDD	SW8081	SS
SB	NDAHSB29-R01	N	p,p'-DDD	SW8081	SS
SS	NDAHSS20-R01	N	p,p'-DDD	SW8081	SS
SD	NDAHFD03P-R01	FD	p,p'-DDE	SW8081	SS
SS	NDAHSS20-R01	N	p,p'-DDE	SW8081	SS
SD	NDAHFD03P-R01	FD	p,p'-DDT	SW8081	SS
SS	NDAHSS20-R01	N	p,p'-DDT	SW8081	SS
SD	NDAHFD03P-R01	FD	toxaphene	SW8081	SS
SB	NDAHSB29-R01	N	toxaphene	SW8081	SS
SS	NDAHSS20-R01	N	toxaphene	SW8081	SS
SS	NDAHSS19-R01	N	2,4,5-Trichlorophenol	SW8270C	SS
SS	NDAHSS19-R01	N	2-Methylnaphthalene	SW8270C	SS
SS	NDAHSS19-R01	N	Acetophenone	SW8270C	SS
SS	NDAHSS19-R01	N	Benzaldehyde	SW8270C	SS
SS	NDAHSS19-R01	N	Bis(2-Chloroethoxy) methane	SW8270C	SS
SS	NDAHSS19-R01	N	Fluorene	SW8270C	SS
SS	NDAHSS19-R01	N	Hexachloroethane	SW8270C	SS
SS	NDAHSS19-R01	N	Naphthalene	SW8270C	SS
SS	NDAHSS19-R01	N	Pentachlorophenol	SW8270C	SS

EXHIBIT 4
Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)
AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE012	N		CLP_PEST	SW3550	p,p'-DDT	0.72	J	3.5	UJ	0.41	3.5	ug/Kg	2C
SB	NDE025	N		CLP_PEST	SW3550	p,p'-DDT	0.9	J	0.9	J	0.45	3.8	ug/Kg	2C
SB	NDE014	N		CLP_PEST	SW3550	p,p'-DDD	1.2	J	3.5	UJ	0.24	3.5	ug/Kg	2C
SS	NDE009	N		CLP_PEST	SW3550	p,p'-DDD	2.4	J	2.4	J	0.26	3.8	ug/Kg	2C
SS	NDE013	N		CLP_PEST	SW3550	p,p'-DDD	1.6	J	3.4	UJ	0.23	3.4	ug/Kg	2C
SS	NDE015	N		CLP_PEST	SW3550	p,p'-DDD	0.83	J	3.4	UJ	0.24	3.4	ug/Kg	2C
SS	NDE021	N		CLP_PEST	SW3550	p,p'-DDD	1.1	J	3.7	UJ	0.26	3.7	ug/Kg	2C
SS	NDE021	N		CLP_PEST	SW3550	p,p'-DDT	6.7	=	6.7	J	0.44	3.7	ug/Kg	2C
SB	NDE012	N		CLP_PEST	SW3550	p,p'-DDD	3.5	U	3.5	UJ	0.24	3.5	ug/Kg	2C
SS	NDE011	N		CLP_PEST	SW3550	p,p'-DDD	2.9	J	2.9	J	0.24	3.6	ug/Kg	2C
SB	NDE010	N		CLP_PEST	SW3550	p,p'-DDT	1	J	3.5	UJ	0.41	3.5	ug/Kg	2C
SB	NDE019	N		CLP_PEST	SW3550	p,p'-DDT	1.4	J	3.6	UJ	0.42	3.6	ug/Kg	2C
SS	NDAHSS19-R01	N		SW8081	SW3550	methoxychlor	0.74	JP	0.74	J	0.32	21	ug/Kg	2C
SS	NDAHSS21-R01	N		SW8081	SW3550	methoxychlor	0.35	JP	19	U	0.28	19	ug/Kg	2C
SB	NDAHSB27-R01DL1	LR	DL	SW8081	SW3550	p,p'-DDE	2.7	JP	2.7	J	0.61	37	ug/Kg	2C
SD	NDAHSD04-R01	N		SW8081	SW3550	p,p'-DDE	0.12	JP	0.12	J	0.073	4.5	ug/Kg	2C
SB	NDAHSB28-R01	N		SW8081	SW3550	p,p'-DDT	0.48	JP	0.48	J	0.23	4	ug/Kg	2C
SS	NDAHSS21-R01	N		SW8081	SW3550	p,p'-DDT	0.56	JP	3.6	U	0.21	3.6	ug/Kg	2C
SS	NDAHSS25-R01	N		SW8081	SW3550	p,p'-DDT	1.3	JP	1.3	J	0.21	3.6	ug/Kg	2C
SS	NDAHSS18-R01DL1	LR	DL	SW8081	SW3550	p,p'-DDE	95	JP	95	J	11	700	ug/Kg	2C
SB	NDE036FD1	FD		SW8260B	SW5030	1,2-Dichloroethane	0.26	J	10	U	0.2	10	ug/Kg	BL
SB	NDE038	N		SW8260B	SW5030	1,2-Dichloroethane	0.26	J	10	U	0.23	10	ug/Kg	BL
SB	NDE016	N		SW8260B	SW5030	Acetone	21	=	21	U	2	10	ug/Kg	BL
SB	NDE018	N		SW8260B	SW5030	Acetone	17	=	17	U	2	10	ug/Kg	BL
SB	NDE020	N		SW8260B	SW5030	Acetone	25	=	25	U	1.7	10	ug/Kg	BL
SB	NDE025	N		SW8260B	SW5030	Acetone	24	=	24	U	1.7	10	ug/Kg	BL
SB	NDE027	N		SW8260B	SW5030	Methylene chloride	0.36	J	10	U	0.31	10	ug/Kg	BL
SB	NDE203	N		SW8260B	SW5030	Methylene chloride	0.83	J	10	U	0.31	10	ug/Kg	BL
SB	NDE204	N		SW8260B	SW5030	Methylene chloride	0.84	J	12	U	0.4	12	ug/Kg	BL
SB	NDE035	N		SW8260B	SW5030	Methylene chloride	0.69	J	10	U	0.33	10	ug/Kg	BL
SB	NDE036FD1	FD		SW8260B	SW5030	Methylene chloride	0.68	J	10	U	0.3	10	ug/Kg	BL
SB	NDE038	N		SW8260B	SW5030	Methylene chloride	0.7	J	10	U	0.34	10	ug/Kg	BL
SB	NDE039FD1	FD		SW8260B	SW5030	Methylene chloride	0.58	J	10	U	0.31	10	ug/Kg	BL
SS	NDE023	N		SW8260B	SW5030	Methylene chloride	0.42	J	10	U	0.32	10	ug/Kg	BL
SB	NDAHSB18-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	43.4	JB	391	U	36.7	391	ug/Kg	BL
SB	NDAHSB20-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	53.7	JB	343	U	32.2	343	ug/Kg	BL
SB	NDAHSB23-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	35.9	JB	338	U	31.8	338	ug/Kg	BL
SB	NDAHSB25-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	69	JB	352	U	33.1	352	ug/Kg	BL
SB	NDAHSB26-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	49.4	J	360	U	33.8	360	ug/Kg	BL
SS	NDAHSS17-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	85.2	JB	379	U	35.6	379	ug/Kg	BL
SS	NDAHSS21-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	49.2	JB	362	U	34	362	ug/Kg	BL
WG	NDE213	N		SW8270C	SW3510	bis(2-Ethylhexyl) phthalate	2.6	J	5.4	U	0.95	5.4	ug/L	BL
WG	NDE214	N		SW8270C	SW3510	bis(2-Ethylhexyl) phthalate	6.2	=	6.2	U	0.9	5.2	ug/L	BL
WG	NDE215	N		SW8270C	SW3510	bis(2-Ethylhexyl) phthalate	4	J	5.2	U	0.91	5.2	ug/L	BL
WG	NDE217	N		SW8270C	SW3510	bis(2-Ethylhexyl) phthalate	2.5	J	5.4	U	0.95	5.4	ug/L	BL
WG	NDAHGW05-R01	N		SW8270C	SW3510	Phenol	5	J	5	U	0.25	5	ug/L	BL
SB	NDE016	N		E200.7	SW3050	Zinc	20	=	20	J	0.53	4.2	mg/Kg	BS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE018	N		E200.7	SW3050	Zinc	26	=	26	J	0.53	4.2	mg/Kg	BS
SB	NDE020	N		E200.7	SW3050	Zinc	27	=	27	J	0.56	4.5	mg/Kg	BS
SB	NDE022	N		E200.7	SW3050	Zinc	17	=	17	J	0.56	4.5	mg/Kg	BS
SB	NDE025	N		E200.7	SW3050	Zinc	16	=	16	J	0.58	4.6	mg/Kg	BS
SB	NDE027	N		E200.7	SW3050	Zinc	15	=	15	J	0.56	4.5	mg/Kg	BS
SB	NDE029	N		E200.7	SW3050	Zinc	18	=	18	J	0.59	4.7	mg/Kg	BS
SB	NDE031	N		E200.7	SW3050	Zinc	15	=	15	J	0.55	4.4	mg/Kg	BS
SB	NDE203	N		E200.7	SW3050	Zinc	20	=	20	J	0.58	4.7	mg/Kg	BS
WG	NDAHGW05-R01	N		SW8270C	SW3510	caprolactam	6	=	6	J	0.3	5	ug/L	BS
WG	NDAHGW01-R01	N		SW8270C	SW3510	caprolactam	3	J	3	J	0.3	5.1	ug/L	BS
WG	NDAHGWFD01	FD		SW8270C	SW3510	caprolactam	6.2	=	6.2	J	0.3	5.1	ug/L	BS
WS	NDAHSW01-R01	N		SW8270C	SW3510	caprolactam	0.52	J	0.52	J	0.3	5.1	ug/L	BS
WG	NDAHGW02-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5.2	U	5.2	R	1.2	5.2	ug/L	BS
WG	NDAHGW05-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5	U	5	R	1.2	5	ug/L	BS
WG	NDAHGW07-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5.1	U	5.1	R	1.2	5.1	ug/L	BS
WS	NDAHFD02P-R01	FD		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	102	U	102	R	25	102	ug/L	BS
WS	NDAHSW01-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5.1	U	5.1	R	1.2	5.1	ug/L	BS
WS	NDAHSW02-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5	U	5	R	1.2	5	ug/L	BS
WS	NDAHSW03-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5.1	U	5.1	R	1.2	5.1	ug/L	BS
WS	NDAHSW04-R01	N		SW8270C	SW3510	1,2,4,5-tetrachlorobenzene	5.1	U	5.1	R	1.2	5.1	ug/L	BS
SB	NDAHSB17-R01	N		SW8270C	SW3550	4-Chloroaniline	350	U	350	R	26.5	350	ug/Kg	BS
SB	NDAHSB18-R01	N		SW8270C	SW3550	4-Chloroaniline	391	U	391	R	29.6	391	ug/Kg	BS
SB	NDAHSB19-R01	N		SW8270C	SW3550	4-Chloroaniline	340	U	340	R	25.8	340	ug/Kg	BS
SB	NDAHSB20-R01	N		SW8270C	SW3550	4-Chloroaniline	343	U	343	R	26	343	ug/Kg	BS
SB	NDAHSB21-R01	N		SW8270C	SW3550	4-Chloroaniline	338	U	338	R	25.6	338	ug/Kg	BS
SB	NDAHSB22-R01	N		SW8270C	SW3550	4-Chloroaniline	338	U	338	R	25.6	338	ug/Kg	BS
SB	NDAHSB23-R01	N		SW8270C	SW3550	4-Chloroaniline	338	U	338	R	25.6	338	ug/Kg	BS
SB	NDAHSB24-R01	N		SW8270C	SW3550	4-Chloroaniline	346	U	346	R	26.2	346	ug/Kg	BS
SB	NDAHSB25-R01	N		SW8270C	SW3550	4-Chloroaniline	352	U	352	R	26.7	352	ug/Kg	BS
SB	NDAHSB26-R01	N		SW8270C	SW3550	4-Chloroaniline	360	U	360	R	27.3	360	ug/Kg	BS
SB	NDAHSB27-R01	N		SW8270C	SW3550	4-Chloroaniline	371	U	371	R	28.1	371	ug/Kg	BS
SB	NDAHSB28-R01	N		SW8270C	SW3550	4-Chloroaniline	396	U	396	R	30	396	ug/Kg	BS
SB	NDAHSB29-R01	N		SW8270C	SW3550	4-Chloroaniline	349	U	349	R	26.4	349	ug/Kg	BS
SB	NDAHFD05P-R01	FD		SW8270C	SW3550	4-Chloroaniline	346	U	346	R	26.2	346	ug/Kg	BS
SD	NDAHFD03P-R01	FD		SW8270C	SW3550	4-Chloroaniline	437	U	437	R	33.1	437	ug/Kg	BS
SD	NDAHSD01-R01	N		SW8270C	SW3550	4-Chloroaniline	427	U	427	R	32.4	427	ug/Kg	BS
SD	NDAHSD02-R01	N		SW8270C	SW3550	4-Chloroaniline	422	U	422	R	31.9	422	ug/Kg	BS
SD	NDAHSD03-R01	N		SW8270C	SW3550	4-Chloroaniline	445	U	445	R	33.7	445	ug/Kg	BS
SD	NDAHSD04-R01	N		SW8270C	SW3550	4-Chloroaniline	444	U	444	R	33.6	444	ug/Kg	BS
SD	NDAHSD05-R01	N		SW8270C	SW3550	4-Chloroaniline	337	U	337	R	25.6	337	ug/Kg	BS
SS	NDAHSS17-R01	N		SW8270C	SW3550	4-Chloroaniline	379	U	379	R	28.7	379	ug/Kg	BS
SS	NDAHSS18-R01	N		SW8270C	SW3550	4-Chloroaniline	351	U	351	R	26.6	351	ug/Kg	BS
SS	NDAHSS20-R01	N		SW8270C	SW3550	4-Chloroaniline	353	U	353	R	26.8	353	ug/Kg	BS
SS	NDAHSS21-R01	N		SW8270C	SW3550	4-Chloroaniline	362	U	362	R	27.4	362	ug/Kg	BS
SS	NDAHFD04P-R01	FD		SW8270C	SW3550	4-Chloroaniline	348	U	348	R	26.4	348	ug/Kg	BS
SS	NDAHFD06P-R01	FD		SW8270C	SW3550	4-Chloroaniline	361	U	361	R	27.4	361	ug/Kg	BS
SS	NDAHSS22-R01	N		SW8270C	SW3550	4-Chloroaniline	358	U	358	R	27.1	358	ug/Kg	BS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDAHSS23-R01	N		SW8270C	SW3550	4-Chloroaniline	356	U	356	R	27	356	ug/Kg	BS
SS	NDAHSS24-R01	N		SW8270C	SW3550	4-Chloroaniline	354	U	354	R	26.8	354	ug/Kg	BS
SS	NDAHSS25-R01	N		SW8270C	SW3550	4-Chloroaniline	364	U	364	R	27.6	364	ug/Kg	BS
SS	NDAHSS26-R01	N		SW8270C	SW3550	4-Chloroaniline	377	U	377	R	28.6	377	ug/Kg	BS
SS	NDAHSS27-R01	N		SW8270C	SW3550	4-Chloroaniline	363	U	363	R	27.5	363	ug/Kg	BS
SS	NDAHSS28-R01	N		SW8270C	SW3550	4-Chloroaniline	365	U	365	R	27.7	365	ug/Kg	BS
SS	NDAHSS29-R01	N		SW8270C	SW3550	4-Chloroaniline	351	U	351	R	26.6	351	ug/Kg	BS
SB	NDAHFD05P-R01	FD		SW8270C	SW3550	Benzaldehyde	346	U	346	R	50.3	346	ug/Kg	BS
SS	NDAHFD04P-R01	FD		SW8270C	SW3550	Benzaldehyde	348	U	348	R	50.7	348	ug/Kg	BS
SS	NDAHFD06P-R01	FD		SW8270C	SW3550	Benzaldehyde	361	U	361	R	52.6	361	ug/Kg	BS
SS	NDAHSS22-R01	N		SW8270C	SW3550	Benzaldehyde	358	U	358	R	52.1	358	ug/Kg	BS
SS	NDAHSS23-R01	N		SW8270C	SW3550	Benzaldehyde	356	U	356	R	51.8	356	ug/Kg	BS
SS	NDAHSS24-R01	N		SW8270C	SW3550	Benzaldehyde	354	U	354	R	51.6	354	ug/Kg	BS
SS	NDAHSS25-R01	N		SW8270C	SW3550	Benzaldehyde	364	U	364	R	52.9	364	ug/Kg	BS
SS	NDAHSS26-R01	N		SW8270C	SW3550	Benzaldehyde	377	U	377	R	54.8	377	ug/Kg	BS
SS	NDAHSS27-R01	N		SW8270C	SW3550	Benzaldehyde	363	U	363	R	52.9	363	ug/Kg	BS
SS	NDAHSS28-R01	N		SW8270C	SW3550	Benzaldehyde	365	U	365	R	53.1	365	ug/Kg	BS
SS	NDAHSS29-R01	N		SW8270C	SW3550	Benzaldehyde	351	U	351	R	51.1	351	ug/Kg	BS
SB	NDAHSB17-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	350	U	350	R	27.6	350	ug/Kg	BS
SB	NDAHSB18-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	391	U	391	R	30.8	391	ug/Kg	BS
SB	NDAHSB19-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	340	U	340	R	26.8	340	ug/Kg	BS
SB	NDAHSB20-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	343	U	343	R	27	343	ug/Kg	BS
SB	NDAHSB21-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	338	U	338	R	26.6	338	ug/Kg	BS
SB	NDAHSB22-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	338	U	338	R	26.7	338	ug/Kg	BS
SB	NDAHSB23-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	338	U	338	R	26.6	338	ug/Kg	BS
SB	NDAHSB24-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	346	U	346	R	27.3	346	ug/Kg	BS
SB	NDAHSB25-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	352	U	352	R	27.8	352	ug/Kg	BS
SB	NDAHSB26-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	360	U	360	R	28.4	360	ug/Kg	BS
SB	NDAHSB27-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	371	U	371	R	29.3	371	ug/Kg	BS
SB	NDAHSB28-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	396	U	396	R	31.2	396	ug/Kg	BS
SB	NDAHSB29-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	349	U	349	R	27.5	349	ug/Kg	BS
SD	NDAHFD03P-R01	FD		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	437	U	437	R	34.5	437	ug/Kg	BS
SD	NDAHSD01-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	427	U	427	R	33.7	427	ug/Kg	BS
SD	NDAHSD02-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	422	U	422	R	33.2	422	ug/Kg	BS
SD	NDAHSD03-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	445	U	445	R	35	445	ug/Kg	BS
SD	NDAHSD04-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	444	U	444	R	35	444	ug/Kg	BS
SD	NDAHSD05-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	337	U	337	R	26.6	337	ug/Kg	BS
SS	NDAHSS17-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	379	U	379	R	29.9	379	ug/Kg	BS
SS	NDAHSS18-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	351	U	351	R	27.6	351	ug/Kg	BS
SS	NDAHSS20-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	353	U	353	R	27.8	353	ug/Kg	BS
SS	NDAHSS21-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	362	U	362	R	28.5	362	ug/Kg	BS
WG	NDAHGW02-R01	N		SW8270C	SW3510	caprolactam	5.2	U	5.2	R	0.3	5.2	ug/L	BS
WG	NDAHGW07-R01	N		SW8270C	SW3510	caprolactam	5.1	U	5.1	R	0.3	5.1	ug/L	BS
WG	NDAHGW06-R01	N		SW8270C	SW3510	caprolactam	5.2	U	5.2	R	0.3	5.2	ug/L	BS
WS	NDAHFD02P-R01	FD		SW8270C	SW3510	caprolactam	102	U	102	R	6	102	ug/L	BS
WS	NDAHSW02-R01	N		SW8270C	SW3510	caprolactam	5	U	5	R	0.3	5	ug/L	BS
WS	NDAHSW03-R01	N		SW8270C	SW3510	caprolactam	5.1	U	5.1	R	0.3	5.1	ug/L	BS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
WS	NDAHSW04-R01	N		SW8270C	SW3510	caprolactam	5.1	U	5.1	R	0.3	5.1	ug/L	BS
SD	NDAHFD03P-R01	FD		SW8270C	SW3550	Hexachlorobutadiene	437	U	437	R	43.7	437	ug/Kg	BS
SD	NDAHSD01-R01	N		SW8270C	SW3550	Hexachlorobutadiene	427	U	427	R	42.7	427	ug/Kg	BS
SD	NDAHSD02-R01	N		SW8270C	SW3550	Hexachlorobutadiene	422	U	422	R	42.2	422	ug/Kg	BS
SD	NDAHSD03-R01	N		SW8270C	SW3550	Hexachlorobutadiene	445	U	445	R	44.5	445	ug/Kg	BS
SD	NDAHSD04-R01	N		SW8270C	SW3550	Hexachlorobutadiene	444	U	444	R	44.4	444	ug/Kg	BS
SD	NDAHSD05-R01	N		SW8270C	SW3550	Hexachlorobutadiene	337	U	337	R	33.7	337	ug/Kg	BS
SB	NDAHSB17-R01	N		SW8270C	SW3550	Hexachloroethane	350	U	350	R	37.1	350	ug/Kg	BS
SB	NDAHSB18-R01	N		SW8270C	SW3550	Hexachloroethane	391	U	391	R	41.4	391	ug/Kg	BS
SB	NDAHSB19-R01	N		SW8270C	SW3550	Hexachloroethane	340	U	340	R	36.1	340	ug/Kg	BS
SB	NDAHSB20-R01	N		SW8270C	SW3550	Hexachloroethane	343	U	343	R	36.4	343	ug/Kg	BS
SB	NDAHSB21-R01	N		SW8270C	SW3550	Hexachloroethane	338	U	338	R	35.9	338	ug/Kg	BS
SB	NDAHSB22-R01	N		SW8270C	SW3550	Hexachloroethane	338	U	338	R	35.9	338	ug/Kg	BS
SB	NDAHSB23-R01	N		SW8270C	SW3550	Hexachloroethane	338	U	338	R	35.9	338	ug/Kg	BS
SB	NDAHSB24-R01	N		SW8270C	SW3550	Hexachloroethane	346	U	346	R	36.7	346	ug/Kg	BS
SB	NDAHSB25-R01	N		SW8270C	SW3550	Hexachloroethane	352	U	352	R	37.4	352	ug/Kg	BS
SB	NDAHSB26-R01	N		SW8270C	SW3550	Hexachloroethane	360	U	360	R	38.2	360	ug/Kg	BS
SB	NDAHSB27-R01	N		SW8270C	SW3550	Hexachloroethane	371	U	371	R	39.4	371	ug/Kg	BS
SB	NDAHSB28-R01	N		SW8270C	SW3550	Hexachloroethane	396	U	396	R	42	396	ug/Kg	BS
SB	NDAHSB29-R01	N		SW8270C	SW3550	Hexachloroethane	349	U	349	R	37	349	ug/Kg	BS
SB	NDAHFD05P-R01	FD		SW8270C	SW3550	Hexachloroethane	346	U	346	R	36.6	346	ug/Kg	BS
SD	NDAHFD03P-R01	FD		SW8270C	SW3550	Hexachloroethane	437	U	437	R	46.4	437	ug/Kg	BS
SD	NDAHSD01-R01	N		SW8270C	SW3550	Hexachloroethane	427	U	427	R	45.3	427	ug/Kg	BS
SD	NDAHSD02-R01	N		SW8270C	SW3550	Hexachloroethane	422	U	422	R	44.7	422	ug/Kg	BS
SD	NDAHSD03-R01	N		SW8270C	SW3550	Hexachloroethane	445	U	445	R	47.2	445	ug/Kg	BS
SD	NDAHSD04-R01	N		SW8270C	SW3550	Hexachloroethane	444	U	444	R	47.1	444	ug/Kg	BS
SD	NDAHSD05-R01	N		SW8270C	SW3550	Hexachloroethane	337	U	337	R	35.8	337	ug/Kg	BS
SS	NDAHSS17-R01	N		SW8270C	SW3550	Hexachloroethane	379	U	379	R	40.2	379	ug/Kg	BS
SS	NDAHSS18-R01	N		SW8270C	SW3550	Hexachloroethane	351	U	351	R	37.2	351	ug/Kg	BS
SS	NDAHSS20-R01	N		SW8270C	SW3550	Hexachloroethane	353	U	353	R	37.5	353	ug/Kg	BS
SS	NDAHSS21-R01	N		SW8270C	SW3550	Hexachloroethane	362	U	362	R	38.4	362	ug/Kg	BS
SS	NDAHFD04P-R01	FD		SW8270C	SW3550	Hexachloroethane	348	U	348	R	36.9	348	ug/Kg	BS
SS	NDAHFD06P-R01	FD		SW8270C	SW3550	Hexachloroethane	361	U	361	R	38.3	361	ug/Kg	BS
SS	NDAHSS22-R01	N		SW8270C	SW3550	Hexachloroethane	358	U	358	R	38	358	ug/Kg	BS
SS	NDAHSS23-R01	N		SW8270C	SW3550	Hexachloroethane	356	U	356	R	37.8	356	ug/Kg	BS
SS	NDAHSS24-R01	N		SW8270C	SW3550	Hexachloroethane	354	U	354	R	37.6	354	ug/Kg	BS
SS	NDAHSS25-R01	N		SW8270C	SW3550	Hexachloroethane	364	U	364	R	38.6	364	ug/Kg	BS
SS	NDAHSS26-R01	N		SW8270C	SW3550	Hexachloroethane	377	U	377	R	40	377	ug/Kg	BS
SS	NDAHSS27-R01	N		SW8270C	SW3550	Hexachloroethane	363	U	363	R	38.6	363	ug/Kg	BS
SS	NDAHSS28-R01	N		SW8270C	SW3550	Hexachloroethane	365	U	365	R	38.7	365	ug/Kg	BS
SS	NDAHSS29-R01	N		SW8270C	SW3550	Hexachloroethane	351	U	351	R	37.3	351	ug/Kg	BS
SD	NDAHFD03P-R01	FD		SW8270C	SW3550	Naphthalene	437	U	437	R	38.4	437	ug/Kg	BS
SD	NDAHSD01-R01	N		SW8270C	SW3550	Naphthalene	427	U	427	R	37.6	427	ug/Kg	BS
SD	NDAHSD02-R01	N		SW8270C	SW3550	Naphthalene	422	U	422	R	37	422	ug/Kg	BS
SD	NDAHSD03-R01	N		SW8270C	SW3550	Naphthalene	445	U	445	R	39.1	445	ug/Kg	BS
SD	NDAHSD04-R01	N		SW8270C	SW3550	Naphthalene	444	U	444	R	39	444	ug/Kg	BS
SD	NDAHSD05-R01	N		SW8270C	SW3550	Naphthalene	337	U	337	R	29.6	337	ug/Kg	BS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	2,4,5-Trichlorophenol	1230	U	1230	R	34.9	1230	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	2-Methylnaphthalene	411	U	411	R	33.7	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Acetophenone	411	U	411	R	38.6	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Benzaldehyde	411	U	411	R	59.8	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Bis(2-Chloroethoxy) methane	411	U	411	R	32.4	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Fluorene	411	U	411	R	22.4	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Hexachloroethane	411	U	411	R	43.6	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Naphthalene	411	U	411	R	36.2	411	ug/Kg	BS
SS	NDAHSS19-R01RE1	LR	RE	SW8270C	SW3550	Pentachlorophenol	1230	U	1230	R	38.6	1230	ug/Kg	BS
WG	NDAHGW02-R01	N		SW8081	SW3510	heptachlor epoxide	0.01	U	0.01	UJ	0.0025	0.01	ug/L	BS
WG	NDAHGW05-R01	N		SW8081	SW3510	heptachlor epoxide	0.01	U	0.01	UJ	0.0025	0.01	ug/L	BS
WG	NDAHGW07-R01	N		SW8081	SW3510	heptachlor epoxide	0.01	U	0.01	UJ	0.0025	0.01	ug/L	BS
WG	NDAHGW02-R01	N		SW8081	SW3510	toxaphene	0.05	U	0.05	UJ	0.031	0.05	ug/L	BS
WG	NDAHGW05-R01	N		SW8081	SW3510	toxaphene	0.05	U	0.05	UJ	0.031	0.05	ug/L	BS
WG	NDAHGW07-R01	N		SW8081	SW3510	toxaphene	0.05	U	0.05	UJ	0.031	0.05	ug/L	BS
SB	NDAHSB17-R01	N		SW8330	METHOD	tetryl	133	U	133	UJ	74.6	133	ug/Kg	BS
SB	NDAHSB18-R01	N		SW8330	METHOD	tetryl	150	U	150	UJ	83.9	150	ug/Kg	BS
SB	NDAHSB19-R01	N		SW8330	METHOD	tetryl	127	U	127	UJ	71.2	127	ug/Kg	BS
SB	NDAHSB20-R01	N		SW8330	METHOD	tetryl	129	U	129	UJ	72.4	129	ug/Kg	BS
SB	NDAHSB21-R01	N		SW8330	METHOD	tetryl	128	U	128	UJ	71.6	128	ug/Kg	BS
SB	NDAHSB22-R01	N		SW8330	METHOD	tetryl	128	U	128	UJ	71.6	128	ug/Kg	BS
SB	NDAHSB23-R01	N		SW8330	METHOD	tetryl	127	U	127	UJ	71.3	127	ug/Kg	BS
SB	NDAHSB24-R01	N		SW8330	METHOD	tetryl	130	U	130	UJ	72.7	130	ug/Kg	BS
SB	NDAHSB25-R01	N		SW8330	METHOD	tetryl	136	U	136	UJ	76.1	136	ug/Kg	BS
SB	NDAHSB26-R01	N		SW8330	METHOD	tetryl	135	U	135	UJ	75.7	135	ug/Kg	BS
SB	NDAHSB27-R01	N		SW8330	METHOD	tetryl	137	U	137	UJ	76.6	137	ug/Kg	BS
SB	NDAHSB28-R01	N		SW8330	METHOD	tetryl	152	U	152	UJ	84.8	152	ug/Kg	BS
SB	NDAHSB29-R01	N		SW8330	METHOD	tetryl	130	U	130	UJ	72.8	130	ug/Kg	BS
SB	NDAHFD05P-R01	FD		SW8330	METHOD	tetryl	130	U	130	UJ	72.6	130	ug/Kg	BS
SD	NDAHFD03P-R01	FD		SW8330	METHOD	tetryl	165	U	165	UJ	92.3	165	ug/Kg	BS
SD	NDAHSD01-R01	N		SW8330	METHOD	tetryl	158	U	158	UJ	88.4	158	ug/Kg	BS
SD	NDAHSD02-R01	N		SW8330	METHOD	tetryl	160	U	160	UJ	89.8	160	ug/Kg	BS
SD	NDAHSD03-R01	N		SW8330	METHOD	tetryl	162	U	162	UJ	90.8	162	ug/Kg	BS
SD	NDAHSD04-R01	N		SW8330	METHOD	tetryl	166	U	166	UJ	92.8	166	ug/Kg	BS
SD	NDAHSD05-R01	N		SW8330	METHOD	tetryl	130	U	130	UJ	72.5	130	ug/Kg	BS
SS	NDAHSS17-R01	N		SW8330	METHOD	tetryl	141	U	141	UJ	79	141	ug/Kg	BS
SS	NDAHSS18-R01	N		SW8330	METHOD	tetryl	130	U	130	UJ	72.6	130	ug/Kg	BS
SS	NDAHSS19-R01	N		SW8330	METHOD	tetryl	150	U	150	UJ	84	150	ug/Kg	BS
SS	NDAHSS20-R01	N		SW8330	METHOD	tetryl	132	U	132	UJ	74	132	ug/Kg	BS
SS	NDAHSS21-R01	N		SW8330	METHOD	tetryl	132	U	132	UJ	73.7	132	ug/Kg	BS
SS	NDAHFD04P-R01	FD		SW8330	METHOD	tetryl	131	U	131	UJ	73.3	131	ug/Kg	BS
SS	NDAHFD06P-R01	FD		SW8330	METHOD	tetryl	138	U	138	UJ	77.4	138	ug/Kg	BS
SS	NDAHSS22-R01	N		SW8330	METHOD	tetryl	135	U	135	UJ	75.4	135	ug/Kg	BS
SS	NDAHSS23-R01	N		SW8330	METHOD	tetryl	137	U	137	UJ	76.8	137	ug/Kg	BS
SS	NDAHSS24-R01	N		SW8330	METHOD	tetryl	135	U	135	UJ	75.4	135	ug/Kg	BS
SS	NDAHSS25-R01	N		SW8330	METHOD	tetryl	139	U	139	UJ	78	139	ug/Kg	BS
SS	NDAHSS26-R01	N		SW8330	METHOD	tetryl	142	U	142	UJ	79.5	142	ug/Kg	BS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDAHSS27-R01	N		SW8330	METHOD	tetryl	138	U	138	UJ	77.5	138	ug/Kg	BS
SS	NDAHSS28-R01	N		SW8330	METHOD	tetryl	139	U	139	UJ	77.6	139	ug/Kg	BS
SS	NDAHSS29-R01	N		SW8330	METHOD	tetryl	135	U	135	UJ	75.5	135	ug/Kg	BS
WG	NDAHGW02-R01	N		SW8081	SW3510	endrin	0.02	U	0.02	UJ	0.0044	0.02	ug/L	CC
WG	NDAHGW05-R01	N		SW8081	SW3510	endrin	0.02	U	0.02	UJ	0.0044	0.02	ug/L	CC
WG	NDAHGW07-R01	N		SW8081	SW3510	endrin	0.02	U	0.02	UJ	0.0044	0.02	ug/L	CC
SB	NDAHSB28-R01	N		SW8081	SW3550	p,p'-DDD	0.19	J	0.19	J	0.16	4	ug/Kg	CC
SS	NDE037	N		E200.7	SW3050	Selenium	0.48	U	0.48	UJ	0.48	1	mg/Kg	CC
SS	NDE179	N		E200.7	SW3050	Selenium	0.48	U	0.48	UJ	0.48	1	mg/Kg	CC
SS	NDE034	N		E200.7	SW3050	Selenium	0.49	U	0.49	UJ	0.49	1.1	mg/Kg	CC
SB	NDE019	N		E200.7	SW3050	Selenium	0.5	U	0.5	UJ	0.5	1.1	mg/Kg	CC
SS	NDE176	N		E200.7	SW3050	Selenium	0.5	U	0.5	UJ	0.5	1.1	mg/Kg	CC
SS	NDE177	N		E200.7	SW3050	Selenium	0.5	U	0.5	UJ	0.5	1.1	mg/Kg	CC
SS	NDE026	N		E200.7	SW3050	Selenium	0.52	U	0.52	UJ	0.52	1.1	mg/Kg	CC
SS	NDE030	N		E200.7	SW3050	Selenium	0.52	U	0.52	UJ	0.52	1.1	mg/Kg	CC
SS	NDE178	N		E200.7	SW3050	Selenium	0.52	U	0.52	UJ	0.52	1.1	mg/Kg	CC
SS	NDAHSS17-R01	N		SW8081	SW3550	p,p'-DDD	0.52	J	0.52	J	0.15	3.8	ug/Kg	CC
SS	NDE024FD1	FD		E200.7	SW3050	Selenium	0.53	U	0.53	UJ	0.53	1.1	mg/Kg	CC
SS	NDE028	N		E200.7	SW3050	Selenium	0.53	U	0.53	UJ	0.53	1.1	mg/Kg	CC
SS	NDE032	N		E200.7	SW3050	Selenium	0.54	U	0.54	UJ	0.54	1.2	mg/Kg	CC
SS	NDE021	N		E200.7	SW3050	Selenium	0.62	B	0.62	J	0.52	1.1	mg/Kg	CC
SS	NDE023	N		E200.7	SW3050	Selenium	0.82	B	0.82	J	0.5	1.1	mg/Kg	CC
SS	NDAHSS18-R01	N		SW8081	SW3550	delta bhc	1.8	U	1.8	UJ	0.076	1.8	ug/Kg	CC
SS	NDAHSS17-R01	N		SW8081	SW3550	delta bhc	2	U	2	UJ	0.083	2	ug/Kg	CC
SS	NDAHSS19-R01	N		SW8081	SW3550	delta bhc	2.1	U	2.1	UJ	0.09	2.1	ug/Kg	CC
SS	NDAHSS18-R01	N		SW8081	SW3550	p,p'-DDD	2.1	J	2.1	J	0.14	3.5	ug/Kg	CC
SB	NDAHSB19-R01	N		SW8081	SW3550	p,p'-DDD	3.4	U	3.4	UJ	0.14	3.4	ug/Kg	CC
SB	NDAHSB21-R01	N		SW8081	SW3550	p,p'-DDD	3.4	U	3.4	UJ	0.13	3.4	ug/Kg	CC
SB	NDAHSB22-R01	N		SW8081	SW3550	p,p'-DDD	3.4	U	3.4	UJ	0.14	3.4	ug/Kg	CC
SB	NDAHSB23-R01	N		SW8081	SW3550	p,p'-DDD	3.4	U	3.4	UJ	0.13	3.4	ug/Kg	CC
SB	NDAHSB24-R01	N		SW8081	SW3550	p,p'-DDD	3.4	U	3.4	UJ	0.14	3.4	ug/Kg	CC
SS	NDAHFD04P-R01	FD		SW8081	SW3550	endrin ketone	3.5	U	3.5	UJ	0.2	3.5	ug/Kg	CC
SS	NDAHSS29-R01	N		SW8081	SW3550	endrin ketone	3.5	U	3.5	UJ	0.2	3.5	ug/Kg	CC
SB	NDAHSB17-R01	N		SW8081	SW3550	p,p'-DDD	3.5	U	3.5	UJ	0.14	3.5	ug/Kg	CC
SB	NDAHSB20-R01	N		SW8081	SW3550	p,p'-DDD	3.5	U	3.5	UJ	0.14	3.5	ug/Kg	CC
SS	NDAHFD06P-R01	FD		SW8081	SW3550	endrin ketone	3.6	U	3.6	UJ	0.21	3.6	ug/Kg	CC
SS	NDAHSS22-R01	N		SW8081	SW3550	endrin ketone	3.6	U	3.6	UJ	0.21	3.6	ug/Kg	CC
SS	NDAHSS27-R01	N		SW8081	SW3550	endrin ketone	3.6	U	3.6	UJ	0.21	3.6	ug/Kg	CC
SS	NDAHSS28-R01	N		SW8081	SW3550	endrin ketone	3.7	U	3.7	UJ	0.21	3.7	ug/Kg	CC
SS	NDAHSS26-R01	N		SW8081	SW3550	endrin ketone	3.8	U	3.8	UJ	0.22	3.8	ug/Kg	CC
SB	NDAHSB18-R01	N		SW8081	SW3550	p,p'-DDD	3.9	U	3.9	UJ	0.16	3.9	ug/Kg	CC
SS	NDAHSS18-R01	N		SW8081	SW3550	p,p'-DDT	25	E	25	J	0.2	3.5	ug/Kg	CC,LR
SS	NDE176	N		SW8260B	SW5030	Acetone	853	J	948	R	182	948	ug/Kg	CC
SD	NDAHSD05-R01	N		SW8270C	SW3550	2,4-Dinitrophenol	1010	U	1010	UJ	48.1	1010	ug/Kg	CC
SD	NDAHFD03P-R01DL1	LR	DL	SW6010B	SW3050B	Calcium	76200	=	76200	J	12.1	3690	mg/Kg	FD
SD	NDAHSD01-R01DL1	LR	DL	SW6010B	SW3050B	Calcium	2590	=	2590	J	4.61	1400	mg/Kg	FD
SD	NDAHFD03P-R01	FD		SW6010B	SW3050B	Chromium, total	2.84	=	2.84	J	0.0351	1.48	mg/Kg	FD

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SD	NDAHSD01-R01	N		SW6010B	SW3050B	Chromium, total	13.4	=	13.4	J	0.0334	1.4	mg/Kg	FD
WG	NDE215	N		SW8260B	SW5030	Toluene	0.43	J	0.43	J	0.28	1	ug/L	FD
WG	NDE216FD1	FD		SW8260B	SW5030	Toluene	1	=	1	J	0.28	1	ug/L	FD
SB	NDE038	N		CLP_PEST	SW3550	p,p'-DDE	3.8	=	3.8	J	0.38	3.7	ug/Kg	IC, FD
WG	NDE213	N		SW8260B	SW5030	2-butanone (MEK)	5	U	5	R	1.7	5	ug/L	IC, CC
WG	NDE214	N		SW8260B	SW5030	2-butanone (MEK)	5	U	5	R	1.7	5	ug/L	IC, CC
WG	NDE215	N		SW8260B	SW5030	2-butanone (MEK)	5	U	5	R	1.7	5	ug/L	IC, CC
WG	NDE216FD1	FD		SW8260B	SW5030	2-butanone (MEK)	5	U	5	R	1.7	5	ug/L	IC, CC
WG	NDE217	N		SW8260B	SW5030	2-butanone (MEK)	5	U	5	R	1.7	5	ug/L	IC, CC
SB	NDE008	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SB	NDE010	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE012	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE014	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE016	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE018	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE020	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.5	10	ug/Kg	IC, CC
SB	NDE022	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.5	10	ug/Kg	IC, CC
SB	NDE025	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.5	10	ug/Kg	IC, CC
SB	NDE027	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SB	NDE029	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE203	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SB	NDE033	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE035	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE036FD1	FD		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SB	NDE038	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE039FD1	FD		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE004	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE005FD1	FD		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE007	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SS	NDE011	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SS	NDE013	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE015	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SS	NDE017	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE023	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE026	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.5	10	ug/Kg	IC, CC
SS	NDE030	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE032	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE034	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SS	NDE037	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.6	10	ug/Kg	IC, CC
SS	NDE177	N		SW8260B	SW5030	2-butanone (MEK)	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE031	N		SW8260B	SW5030	2-butanone (MEK)	11	U	11	R	1.8	11	ug/Kg	IC, CC
SS	NDE024FD1	FD		SW8260B	SW5030	2-butanone (MEK)	11	U	11	R	1.8	11	ug/Kg	IC, CC
SS	NDE028	N		SW8260B	SW5030	2-butanone (MEK)	11	U	11	R	1.9	11	ug/Kg	IC, CC
SS	NDE178	N		SW8260B	SW5030	2-butanone (MEK)	11	U	11	R	1.9	11	ug/Kg	IC, CC
SB	NDE006	N		SW8260B	SW5030	2-butanone (MEK)	12	U	12	R	1.9	12	ug/Kg	IC, CC
SB	NDE019	N		SW8260B	SW5030	2-butanone (MEK)	12	U	12	R	2	12	ug/Kg	IC, CC
SB	NDE204	N		SW8260B	SW5030	2-butanone (MEK)	12	U	12	R	2.1	12	ug/Kg	IC, CC

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE179	N		SW8260B	SW5030	2-butanone (MEK)	12	U	12	R	2	12	ug/Kg	IC, CC
SS	NDE021	N		SW8260B	SW5030	2-butanone (MEK)	13	U	13	R	2.3	13	ug/Kg	IC, CC
SS	NDE009	N		SW8260B	SW5030	2-butanone (MEK)	15	U	15	R	2.5	15	ug/Kg	IC, CC
SS	NDE176	N		SW8260B	SW5030	2-butanone (MEK)	948	U	948	R	163	948	ug/Kg	IC, CC
WG	NDE213	N		SW8260B	SW5030	Acetone	5	U	5	R	4.1	5	ug/L	IC
WG	NDE214	N		SW8260B	SW5030	Acetone	5	U	5	R	4.1	5	ug/L	IC
WG	NDE215	N		SW8260B	SW5030	Acetone	5	U	5	R	4.1	5	ug/L	IC
WG	NDE216FD1	FD		SW8260B	SW5030	Acetone	5	U	5	R	4.1	5	ug/L	IC
WG	NDE217	N		SW8260B	SW5030	Acetone	5	U	5	R	4.1	5	ug/L	IC
SB	NDE008	N		SW8260B	SW5030	Acetone	4	J	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE010	N		SW8260B	SW5030	Acetone	6.7	J	10	R	1.9	10	ug/Kg	IC, CC
SB	NDE012	N		SW8260B	SW5030	Acetone	7.2	J	10	R	1.9	10	ug/Kg	IC, CC
SB	NDE022	N		SW8260B	SW5030	Acetone	10	U	10	R	1.7	10	ug/Kg	IC, CC
SB	NDE027	N		SW8260B	SW5030	Acetone	6.5	J	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE029	N		SW8260B	SW5030	Acetone	6.8	J	10	R	1.9	10	ug/Kg	IC, CC
SB	NDE203	N		SW8260B	SW5030	Acetone	10	U	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE033	N		SW8260B	SW5030	Acetone	9.4	J	10	R	1.9	10	ug/Kg	IC, CC
SB	NDE035	N		SW8260B	SW5030	Acetone	10	B	10	R	1.9	10	ug/Kg	IC, CC
SB	NDE036FD1	FD		SW8260B	SW5030	Acetone	8.8	J	10	R	1.8	10	ug/Kg	IC, CC
SB	NDE038	N		SW8260B	SW5030	Acetone	9.1	J	10	R	2	10	ug/Kg	IC, CC
SB	NDE039FD1	FD		SW8260B	SW5030	Acetone	7.7	J	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE004	N		SW8260B	SW5030	Acetone	2.7	J	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE005FD1	FD		SW8260B	SW5030	Acetone	4.2	J	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE007	N		SW8260B	SW5030	Acetone	3.6	J	10	R	1.9	10	ug/Kg	IC, CC
SS	NDE011	N		SW8260B	SW5030	Acetone	4.3	J	10	R	1.9	10	ug/Kg	IC, CC
SS	NDE013	N		SW8260B	SW5030	Acetone	2.8	J	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE023	N		SW8260B	SW5030	Acetone	10	=	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE026	N		SW8260B	SW5030	Acetone	4.2	J	10	R	1.7	10	ug/Kg	IC, CC
SS	NDE037	N		SW8260B	SW5030	Acetone	6.8	J	10	R	1.8	10	ug/Kg	IC, CC
SS	NDE177	N		SW8260B	SW5030	Acetone	5.2	J	10	R	1.9	10	ug/Kg	IC, CC
SS	NDE024FD1	FD		SW8260B	SW5030	Acetone	7.2	J	11	R	2	11	ug/Kg	IC, CC
SS	NDE028	N		SW8260B	SW5030	Acetone	4.4	J	11	R	2.2	11	ug/Kg	IC, CC
SS	NDE178	N		SW8260B	SW5030	Acetone	2.8	J	11	R	2.1	11	ug/Kg	IC, CC
SB	NDE006	N		SW8260B	SW5030	Acetone	11	J	12	R	2.2	12	ug/Kg	IC, CC
SB	NDE031	N		SW8260B	SW5030	Acetone	12	=	12	R	2.1	11	ug/Kg	IC, CC
SS	NDE179	N		SW8260B	SW5030	Acetone	4.9	J	12	R	2.3	12	ug/Kg	IC, CC
SB	NDE204	N		SW8260B	SW5030	Acetone	13	=	13	R	2.3	12	ug/Kg	IC, CC
SS	NDE009	N		SW8260B	SW5030	Acetone	3.5	J	15	R	2.8	15	ug/Kg	IC, CC
SS	NDE017	N		SW8260B	SW5030	Acetone	19	=	19	R	2	10	ug/Kg	IC, CC
SB	NDE019	N		SW8260B	SW5030	Acetone	20	=	20	R	2.3	12	ug/Kg	IC, CC
SS	NDE015	N		SW8260B	SW5030	Acetone	21	=	21	R	1.9	10	ug/Kg	IC, CC
SS	NDE021	N		SW8260B	SW5030	Acetone	21	=	21	R	2.5	13	ug/Kg	IC, CC
SB	NDE014	N		SW8260B	SW5030	Acetone	22	=	22	R	2	10	ug/Kg	IC, CC
SS	NDE032	N		SW8260B	SW5030	Acetone	30	=	30	R	2	10	ug/Kg	IC, CC
SS	NDE030	N		SW8260B	SW5030	Acetone	32	=	32	R	1.8	10	ug/Kg	IC, CC
SS	NDE034	N		SW8260B	SW5030	Acetone	38	=	38	R	1.9	10	ug/Kg	IC, CC
SB	NDE033	N		CLP_PEST	SW3550	Aldrin	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aldrin	1.9	U	1.9	UJ	0.52	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aldrin	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aldrin	1.9	U	1.9	UJ	0.52	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aldrin	2	U	2	UJ	0.53	2	ug/Kg	IC
SB	NDE008	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SB	NDE010	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.52	1.8	ug/Kg	IC
SB	NDE012	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SB	NDE014	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SS	NDE004	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.52	1.8	ug/Kg	IC
SS	NDE005FD1	FD		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.53	1.8	ug/Kg	IC
SS	NDE007	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.52	1.8	ug/Kg	IC
SS	NDE011	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.52	1.8	ug/Kg	IC
SS	NDE013	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SS	NDE015	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SS	NDE017	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.53	1.8	ug/Kg	IC
SS	NDE023	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.52	1.8	ug/Kg	IC
SS	NDE034	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SS	NDE037	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SS	NDE176	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.53	1.8	ug/Kg	IC
SS	NDE177	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.53	1.8	ug/Kg	IC
SS	NDE179	N		CLP_PEST	SW3550	alpha bhc	1.8	U	1.8	UJ	0.51	1.8	ug/Kg	IC
SB	NDE019	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.55	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.55	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SS	NDE021	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.55	1.9	ug/Kg	IC
SS	NDE026	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SS	NDE028	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.55	1.9	ug/Kg	IC
SS	NDE030	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SS	NDE178	N		CLP_PEST	SW3550	alpha bhc	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SB	NDE006	N		CLP_PEST	SW3550	alpha bhc	2	U	2	UJ	0.58	2	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	alpha bhc	2	U	2	UJ	0.56	2	ug/Kg	IC
SS	NDE009	N		CLP_PEST	SW3550	alpha bhc	2	U	2	UJ	0.56	2	ug/Kg	IC
SS	NDE024FD1	FD		CLP_PEST	SW3550	alpha bhc	2	U	2	UJ	0.56	2	ug/Kg	IC
SS	NDE032	N		CLP_PEST	SW3550	alpha bhc	2	U	2	UJ	0.57	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	alpha endosulfan	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	alpha endosulfan	1.9	U	1.9	UJ	0.52	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	alpha endosulfan	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	alpha endosulfan	1.9	U	1.9	UJ	0.52	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	alpha endosulfan	2	U	2	UJ	0.53	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	alpha-chlordane	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	alpha-chlordane	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	alpha-chlordane	1.9	U	1.9	UJ	0.54	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	alpha-chlordane	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	alpha-chlordane	2	U	2	UJ	0.55	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Aroclor-1016	37	U	37	UJ	14	37	ug/Kg	IC

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aroclor-1016	37	U	37	UJ	13	37	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aroclor-1016	37	U	37	UJ	14	37	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aroclor-1016	37	U	37	UJ	13	37	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aroclor-1016	38	U	38	UJ	14	38	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Aroclor-1221	75	U	75	UJ	22	75	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aroclor-1221	75	U	75	UJ	22	75	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aroclor-1221	75	U	75	UJ	22	75	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aroclor-1221	76	U	76	UJ	22	76	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aroclor-1221	77	U	77	UJ	23	77	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Aroclor-1232	37	U	37	UJ	30	37	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aroclor-1232	37	U	37	UJ	30	37	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aroclor-1232	37	U	37	UJ	30	37	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aroclor-1232	37	U	37	UJ	29	37	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aroclor-1232	38	U	38	UJ	30	38	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Aroclor-1242	37	U	37	UJ	22	37	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aroclor-1242	37	U	37	UJ	22	37	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aroclor-1242	37	U	37	UJ	22	37	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aroclor-1242	37	U	37	UJ	22	37	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aroclor-1242	38	U	38	UJ	23	38	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Aroclor-1248	37	U	37	UJ	19	37	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aroclor-1248	37	U	37	UJ	19	37	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aroclor-1248	37	U	37	UJ	19	37	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aroclor-1248	37	U	37	UJ	19	37	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aroclor-1248	38	U	38	UJ	20	38	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Aroclor-1260	37	U	37	UJ	10	37	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	Aroclor-1260	37	U	37	UJ	9.8	37	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Aroclor-1260	37	U	37	UJ	9.9	37	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	Aroclor-1260	37	U	37	UJ	9.8	37	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Aroclor-1260	38	U	38	UJ	10	38	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	beta bhc	1.9	U	1.9	UJ	0.5	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	beta bhc	1.9	U	1.9	UJ	0.5	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	beta bhc	1.9	U	1.9	UJ	0.5	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	beta bhc	1.9	U	1.9	UJ	0.5	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	beta bhc	2	U	2	UJ	0.51	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	beta endosulfan	3.7	U	3.7	UJ	0.33	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	beta endosulfan	3.7	U	3.7	UJ	0.33	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	beta endosulfan	3.7	U	3.7	UJ	0.33	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	beta endosulfan	3.7	U	3.7	UJ	0.33	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	beta endosulfan	3.8	U	3.8	UJ	0.34	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	delta bhc	1.9	U	1.9	UJ	0.48	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	delta bhc	1.9	U	1.9	UJ	0.48	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	delta bhc	1.9	U	1.9	UJ	0.48	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	delta bhc	1.9	U	1.9	UJ	0.47	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	delta bhc	2	U	2	UJ	0.49	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	Dieldrin	3.7	U	3.7	UJ	0.46	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	Dieldrin	3.7	U	3.7	UJ	0.46	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	Dieldrin	3.7	U	3.7	UJ	0.46	3.7	ug/Kg	IC

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE039FD1	FD		CLP_PEST	SW3550	Dieldrin	3.7	U	3.7	UJ	0.45	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	Dieldrin	3.8	U	3.8	UJ	0.47	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	endosulfan sulfate	3.7	U	3.7	UJ	0.44	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	endosulfan sulfate	3.7	U	3.7	UJ	0.43	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	endosulfan sulfate	3.7	U	3.7	UJ	0.44	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	endosulfan sulfate	3.7	U	3.7	UJ	0.43	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	endosulfan sulfate	3.8	U	3.8	UJ	0.44	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	endrin	3.7	U	3.7	UJ	0.45	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	endrin	3.7	U	3.7	UJ	0.44	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	endrin	3.7	U	3.7	UJ	0.45	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	endrin	3.7	U	3.7	UJ	0.44	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	endrin	3.8	U	3.8	UJ	0.45	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	endrin aldehyde	3.7	U	3.7	UJ	0.26	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	endrin aldehyde	3.7	U	3.7	UJ	0.25	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	endrin aldehyde	3.7	U	3.7	UJ	0.26	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	endrin aldehyde	3.7	U	3.7	UJ	0.25	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	endrin aldehyde	3.8	U	3.8	UJ	0.26	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	endrin ketone	3.7	U	3.7	UJ	0.24	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	endrin ketone	3.7	U	3.7	UJ	0.24	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	endrin ketone	3.7	U	3.7	UJ	0.24	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	endrin ketone	3.7	U	3.7	UJ	0.24	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	endrin ketone	3.8	U	3.8	UJ	0.25	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	gamma bhc (lindane)	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	gamma bhc (lindane)	1.9	U	1.9	UJ	0.52	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	gamma bhc (lindane)	1.9	U	1.9	UJ	0.53	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	gamma bhc (lindane)	1.9	U	1.9	UJ	0.52	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	gamma bhc (lindane)	2	U	2	UJ	0.53	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	gamma-chlordane	1.9	U	1.9	UJ	0.56	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	gamma-chlordane	1.9	U	1.9	UJ	0.56	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	gamma-chlordane	1.9	U	1.9	UJ	0.56	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	gamma-chlordane	1.9	U	1.9	UJ	0.55	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	gamma-chlordane	2	U	2	UJ	0.57	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	heptachlor	1.9	U	1.9	UJ	0.7	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	heptachlor	1.9	U	1.9	UJ	0.69	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	heptachlor	1.9	U	1.9	UJ	0.7	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	heptachlor	1.9	U	1.9	UJ	0.69	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	heptachlor	2	U	2	UJ	0.71	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	heptachlor epoxide	1.9	U	1.9	UJ	0.67	1.9	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	heptachlor epoxide	1.9	U	1.9	UJ	0.67	1.9	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	heptachlor epoxide	1.9	U	1.9	UJ	0.67	1.9	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	heptachlor epoxide	1.9	U	1.9	UJ	0.66	1.9	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	heptachlor epoxide	2	U	2	UJ	0.68	2	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	methoxychlor	19	U	19	UJ	0.32	19	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	methoxychlor	19	U	19	UJ	0.32	19	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	methoxychlor	19	U	19	UJ	0.32	19	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	methoxychlor	19	U	19	UJ	0.32	19	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	methoxychlor	20	U	20	UJ	0.33	20	ug/Kg	IC

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE033	N		CLP_PEST	SW3550	p,p'-DDD	3.7	U	3.7	UJ	0.26	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	p,p'-DDD	3.7	U	3.7	UJ	0.25	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	p,p'-DDD	3.7	U	3.7	UJ	0.26	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	p,p'-DDD	3.7	U	3.7	UJ	0.25	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	p,p'-DDD	3.8	U	3.8	UJ	0.26	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	p,p'-DDE	3.7	U	3.7	UJ	0.38	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	p,p'-DDE	3.7	U	3.7	UJ	0.37	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	p,p'-DDE	3.7	U	3.7	UJ	0.37	3.7	ug/Kg	IC, FD
SB	NDE035	N		CLP_PEST	SW3550	p,p'-DDE	3.8	U	3.8	UJ	0.38	3.8	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	p,p'-DDT	3.7	U	3.7	UJ	0.44	3.7	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	p,p'-DDT	3.7	U	3.7	UJ	0.43	3.7	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	p,p'-DDT	3.7	U	3.7	UJ	0.44	3.7	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	p,p'-DDT	3.7	U	3.7	UJ	0.43	3.7	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	p,p'-DDT	3.8	U	3.8	UJ	0.44	3.8	ug/Kg	IC
SB	NDE036FD1	FD		CLP_PEST	SW3550	toxaphene	191	U	191	UJ	18	191	ug/Kg	IC
SB	NDE039FD1	FD		CLP_PEST	SW3550	toxaphene	191	U	191	UJ	18	191	ug/Kg	IC
SB	NDE033	N		CLP_PEST	SW3550	toxaphene	193	U	193	UJ	18	193	ug/Kg	IC
SB	NDE038	N		CLP_PEST	SW3550	toxaphene	194	U	194	UJ	18	194	ug/Kg	IC
SB	NDE035	N		CLP_PEST	SW3550	toxaphene	196	U	196	UJ	18	196	ug/Kg	IC
WS	NDAHSW01-R01	N		SW8081	SW3510	alpha bhc	0.0099	U	0.0099	UJ	0.0012	0.0099	ug/L	IC
WS	NDAHSW02-R01	N		SW8081	SW3510	alpha bhc	0.0099	U	0.0099	UJ	0.0012	0.0099	ug/L	IC
WS	NDAHFD02P-R01	FD		SW8081	SW3510	alpha bhc	0.01	U	0.01	UJ	0.0012	0.01	ug/L	IC
WS	NDAHSW03-R01	N		SW8081	SW3510	alpha bhc	0.01	U	0.01	UJ	0.0012	0.01	ug/L	IC
WS	NDAHSW04-R01	N		SW8081	SW3510	alpha bhc	0.01	U	0.01	UJ	0.0012	0.01	ug/L	IC
SD	NDAHSD05-R01	N		SW8081	SW3550	alpha bhc	1.8	U	1.8	UJ	0.11	1.8	ug/Kg	IC
SD	NDAHSD01-R01	N		SW8081	SW3550	alpha bhc	2.2	U	2.2	UJ	0.14	2.2	ug/Kg	IC
SD	NDAHSD02-R01	N		SW8081	SW3550	alpha bhc	2.2	U	2.2	UJ	0.14	2.2	ug/Kg	IC
SD	NDAHSD03-R01	N		SW8081	SW3550	alpha bhc	2.3	U	2.3	UJ	0.15	2.3	ug/Kg	IC
SD	NDAHSD04-R01	N		SW8081	SW3550	alpha bhc	2.3	U	2.3	UJ	0.15	2.3	ug/Kg	IC
WS	NDAHSW01-R01	N		SW8081	SW3510	gamma bhc (lindane)	0.0099	U	0.0099	UJ	0.0019	0.0099	ug/L	IC
WS	NDAHSW02-R01	N		SW8081	SW3510	gamma bhc (lindane)	0.0099	U	0.0099	UJ	0.0019	0.0099	ug/L	IC
WS	NDAHFD02P-R01	FD		SW8081	SW3510	gamma bhc (lindane)	0.01	U	0.01	UJ	0.0019	0.01	ug/L	IC
WS	NDAHSW03-R01	N		SW8081	SW3510	gamma bhc (lindane)	0.01	U	0.01	UJ	0.0019	0.01	ug/L	IC
WS	NDAHSW04-R01	N		SW8081	SW3510	gamma bhc (lindane)	0.01	U	0.01	UJ	0.0019	0.01	ug/L	IC
SD	NDAHSD05-R01	N		SW8081	SW3550	gamma bhc (lindane)	1.8	U	1.8	UJ	0.11	1.8	ug/Kg	IC
SD	NDAHSD01-R01	N		SW8081	SW3550	gamma bhc (lindane)	2.2	U	2.2	UJ	0.14	2.2	ug/Kg	IC
SD	NDAHSD02-R01	N		SW8081	SW3550	gamma bhc (lindane)	2.2	U	2.2	UJ	0.14	2.2	ug/Kg	IC
SD	NDAHSD03-R01	N		SW8081	SW3550	gamma bhc (lindane)	2.3	U	2.3	UJ	0.15	2.3	ug/Kg	IC
SD	NDAHSD04-R01	N		SW8081	SW3550	gamma bhc (lindane)	2.3	U	2.3	UJ	0.15	2.3	ug/Kg	IC
SB	NDE006	N		E200.7	SW3050	Antimony	0.9	B	0.9	J	0.29	14	mg/Kg	MS
SB	NDE008	N		E200.7	SW3050	Antimony	0.25	U	0.25	UJ	0.25	13	mg/Kg	MS
SB	NDE010	N		E200.7	SW3050	Antimony	0.59	B	0.59	J	0.26	13	mg/Kg	MS
SB	NDE012	N		E200.7	SW3050	Antimony	0.44	B	0.44	J	0.25	13	mg/Kg	MS
SB	NDE014	N		E200.7	SW3050	Antimony	0.25	U	0.25	UJ	0.25	13	mg/Kg	MS
SB	NDE019	N		E200.7	SW3050	Antimony	0.36	B	0.36	J	0.26	13	mg/Kg	MS
SB	NDE016	N		E200.7	SW3050	Antimony	0.38	B	0.38	J	0.25	13	mg/Kg	MS
SB	NDE018	N		E200.7	SW3050	Antimony	0.44	B	0.44	J	0.25	13	mg/Kg	MS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE020	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SB	NDE022	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SB	NDE025	N		E200.7	SW3050	Antimony	0.28	U	0.28	UJ	0.28	14	mg/Kg	MS
SB	NDE027	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SB	NDE029	N		E200.7	SW3050	Antimony	0.28	U	0.28	UJ	0.28	14	mg/Kg	MS
SB	NDE031	N		E200.7	SW3050	Antimony	0.26	U	0.26	UJ	0.26	13	mg/Kg	MS
SB	NDE203	N		E200.7	SW3050	Antimony	0.44	B	0.44	J	0.28	14	mg/Kg	MS
SB	NDE204	N		E200.7	SW3050	Antimony	0.49	B	0.49	J	0.29	14	mg/Kg	MS
SB	NDE033	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SB	NDE035	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	14	mg/Kg	MS
SB	NDE036FD1	FD		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SB	NDE038	N		E200.7	SW3050	Antimony	0.44	B	0.44	J	0.27	13	mg/Kg	MS
SB	NDE039FD1	FD		E200.7	SW3050	Antimony	0.55	B	0.55	J	0.27	13	mg/Kg	MS
SS	NDE004	N		E200.7	SW3050	Antimony	1.6	B	1.6	J	0.26	13	mg/Kg	MS
SS	NDE005FD1	FD		E200.7	SW3050	Antimony	1.5	B	1.5	J	0.26	13	mg/Kg	MS
SS	NDE007	N		E200.7	SW3050	Antimony	0.86	B	0.86	J	0.26	13	mg/Kg	MS
SS	NDE009	N		E200.7	SW3050	Antimony	0.68	B	0.68	J	0.28	14	mg/Kg	MS
SS	NDE011	N		E200.7	SW3050	Antimony	0.77	B	0.77	J	0.26	13	mg/Kg	MS
SS	NDE013	N		E200.7	SW3050	Antimony	1.2	B	1.2	J	0.25	13	mg/Kg	MS
SS	NDE015	N		E200.7	SW3050	Antimony	2	B	2	J	0.25	13	mg/Kg	MS
SS	NDE017	N		E200.7	SW3050	Antimony	1.2	B	1.2	J	0.26	13	mg/Kg	MS
SS	NDE021	N		E200.7	SW3050	Antimony	0.77	B	0.77	J	0.27	14	mg/Kg	MS
SS	NDE023	N		E200.7	SW3050	Antimony	0.47	B	0.47	J	0.26	13	mg/Kg	MS
SS	NDE024FD1	FD		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	14	mg/Kg	MS
SS	NDE026	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SS	NDE028	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	14	mg/Kg	MS
SS	NDE030	N		E200.7	SW3050	Antimony	0.27	U	0.27	UJ	0.27	13	mg/Kg	MS
SS	NDE032	N		E200.7	SW3050	Antimony	0.28	U	0.28	UJ	0.28	14	mg/Kg	MS
SS	NDE034	N		E200.7	SW3050	Antimony	0.26	U	0.26	UJ	0.26	13	mg/Kg	MS
SS	NDE037	N		E200.7	SW3050	Antimony	0.25	U	0.25	UJ	0.25	13	mg/Kg	MS
SS	NDE176	N		E200.7	SW3050	Antimony	1	B	1	J	0.26	13	mg/Kg	MS
SS	NDE177	N		E200.7	SW3050	Antimony	0.26	U	0.26	UJ	0.26	13	mg/Kg	MS
SS	NDE178	N		E200.7	SW3050	Antimony	6.3	B	6.3	J	0.27	13	mg/Kg	MS
SS	NDE179	N		E200.7	SW3050	Antimony	0.61	B	0.61	J	0.25	13	mg/Kg	MS
SB	NDE204	N		E200.7	SW3050	Zinc	28	=	28	J	0.6	4.8	mg/Kg	MS
WG	NDE216FD1	FD		E200.7	FLDFLT	Aluminum	100	B	100	J	95	200	ug/L	MS
WG	NDE217	N		E200.7	FLDFLT	Aluminum	130	B	130	J	95	200	ug/L	MS
SB	NDAHSB17-R01	N		SW6010B	SW3050B	Antimony	0.218	B	0.218	J	0.0962	10.4	mg/Kg	MS
SB	NDAHSB18-R01	N		SW6010B	SW3050B	Antimony	0.253	B	0.253	J	0.107	11.5	mg/Kg	MS
SB	NDAHSB19-R01	N		SW6010B	SW3050B	Antimony	0.14	B	0.14	J	0.0954	10.3	mg/Kg	MS
SB	NDAHSB20-R01	N		SW6010B	SW3050B	Antimony	0.332	B	0.332	J	0.0948	10.2	mg/Kg	MS
SB	NDAHSB21-R01	N		SW6010B	SW3050B	Antimony	0.0889	U	0.0889	UJ	0.0889	9.61	mg/Kg	MS
SB	NDAHSB22-R01	N		SW6010B	SW3050B	Antimony	0.25	B	0.25	J	0.0942	10.2	mg/Kg	MS
SB	NDAHSB23-R01	N		SW6010B	SW3050B	Antimony	0.0927	U	0.0927	UJ	0.0927	10	mg/Kg	MS
SB	NDAHSB24-R01	N		SW6010B	SW3050B	Antimony	0.0955	U	0.0955	UJ	0.0955	10.3	mg/Kg	MS
SB	NDAHSB25-R01	N		SW6010B	SW3050B	Antimony	0.0958	U	0.0958	UJ	0.0958	10.4	mg/Kg	MS
SB	NDAHSB26-R01	N		SW6010B	SW3050B	Antimony	0.0987	U	0.0987	UJ	0.0987	10.7	mg/Kg	MS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDAHSB27-R01	N		SW6010B	SW3050B	Antimony	0.168	B	0.168	J	0.0918	9.92	mg/Kg	MS
SB	NDAHSB28-R01	N		SW6010B	SW3050B	Antimony	0.222	B	0.222	J	0.107	11.6	mg/Kg	MS
SB	NDAHSB29-R01	N		SW6010B	SW3050B	Antimony	0.412	B	0.412	J	0.0978	10.6	mg/Kg	MS
SB	NDAHFD05P-R01	FD		SW6010B	SW3050B	Antimony	0.199	B	0.199	J	0.0901	9.74	mg/Kg	MS
SD	NDAHFD03P-R01	FD		SW6010B	SW3050B	Antimony	0.369	B	0.369	J	0.082	8.87	mg/Kg	MS
SD	NDAHSD01-R01	N		SW6010B	SW3050B	Antimony	0.333	B	0.333	J	0.078	8.43	mg/Kg	MS
SD	NDAHSD02-R01	N		SW6010B	SW3050B	Antimony	0.0817	U	0.0817	UJ	0.0817	8.84	mg/Kg	MS
SD	NDAHSD03-R01	N		SW6010B	SW3050B	Antimony	0.107	B	0.107	J	0.0908	9.81	mg/Kg	MS
SD	NDAHSD04-R01	N		SW6010B	SW3050B	Antimony	0.0829	U	0.0829	UJ	0.0829	8.96	mg/Kg	MS
SD	NDAHSD05-R01	N		SW6010B	SW3050B	Antimony	0.183	B	0.183	J	0.0727	7.86	mg/Kg	MS
SS	NDAHSS17-R01	N		SW6010B	SW3050B	Antimony	0.394	B	0.394	J	0.104	11.3	mg/Kg	MS
SS	NDAHSS18-R01	N		SW6010B	SW3050B	Antimony	0.882	B	0.882	J	0.0931	10.1	mg/Kg	MS
SS	NDAHSS19-R01	N		SW6010B	SW3050B	Antimony	1.17	B	1.17	J	0.111	12	mg/Kg	MS
SS	NDAHSS20-R01	N		SW6010B	SW3050B	Antimony	0.393	B	0.393	J	0.095	10.3	mg/Kg	MS
SS	NDAHSS21-R01	N		SW6010B	SW3050B	Antimony	0.362	B	0.362	J	0.0999	10.8	mg/Kg	MS
SS	NDAHFD04P-R01	FD		SW6010B	SW3050B	Antimony	0.492	B	0.492	J	0.0877	9.48	mg/Kg	MS
SS	NDAHFD06P-R01	FD		SW6010B	SW3050B	Antimony	0.64	B	0.64	J	0.0915	9.9	mg/Kg	MS
SS	NDAHSS22-R01	N		SW6010B	SW3050B	Antimony	0.585	B	0.585	J	0.0992	10.7	mg/Kg	MS
SS	NDAHSS23-R01	N		SW6010B	SW3050B	Antimony	0.393	B	0.393	J	0.0985	10.6	mg/Kg	MS
SS	NDAHSS24-R01	N		SW6010B	SW3050B	Antimony	0.422	B	0.422	J	0.0926	10	mg/Kg	MS
SS	NDAHSS25-R01	N		SW6010B	SW3050B	Antimony	0.381	B	0.381	J	0.0957	10.3	mg/Kg	MS
SS	NDAHSS26-R01	N		SW6010B	SW3050B	Antimony	0.661	B	0.661	J	0.0957	10.3	mg/Kg	MS
SS	NDAHSS27-R01	N		SW6010B	SW3050B	Antimony	0.457	B	0.457	J	0.0976	10.5	mg/Kg	MS
SS	NDAHSS28-R01	N		SW6010B	SW3050B	Antimony	0.34	B	0.34	J	0.0964	10.4	mg/Kg	MS
SS	NDAHSS29-R01	N		SW6010B	SW3050B	Antimony	0.534	B	0.534	J	0.0884	9.56	mg/Kg	MS
SB	NDAHFD05P-R01	FD		SW6010B	SW3050B	Lead	5.2	=	5.2	J	0.179	0.487	mg/Kg	MS
SS	NDAHFD04P-R01	FD		SW6010B	SW3050B	Lead	20.8	=	20.8	J	0.175	0.474	mg/Kg	MS
SS	NDAHFD06P-R01	FD		SW6010B	SW3050B	Lead	13.5	=	13.5	J	0.182	0.495	mg/Kg	MS
SS	NDAHSS22-R01	N		SW6010B	SW3050B	Lead	23.7	=	23.7	J	0.197	0.536	mg/Kg	MS
SS	NDAHSS23-R01	N		SW6010B	SW3050B	Lead	18.3	=	18.3	J	0.196	0.532	mg/Kg	MS
SS	NDAHSS24-R01	N		SW6010B	SW3050B	Lead	25.4	=	25.4	J	0.184	0.5	mg/Kg	MS
SS	NDAHSS25-R01	N		SW6010B	SW3050B	Lead	58.9	=	58.9	J	0.19	0.517	mg/Kg	MS
SS	NDAHSS26-R01	N		SW6010B	SW3050B	Lead	44	=	44	J	0.19	0.517	mg/Kg	MS
SS	NDAHSS27-R01	N		SW6010B	SW3050B	Lead	14.6	=	14.6	J	0.194	0.527	mg/Kg	MS
SS	NDAHSS28-R01	N		SW6010B	SW3050B	Lead	4.43	=	4.43	J	0.192	0.521	mg/Kg	MS
SS	NDAHSS29-R01	N		SW6010B	SW3050B	Lead	8.68	=	8.68	J	0.176	0.478	mg/Kg	MS
SB	NDAHFD05P-R01	FD		SW6010B	SW3050B	Manganese	286	=	286	J	0.0194	2.44	mg/Kg	MS
SS	NDAHFD04P-R01	FD		SW6010B	SW3050B	Manganese	336	=	336	J	0.0189	2.37	mg/Kg	MS
SS	NDAHFD06P-R01	FD		SW6010B	SW3050B	Manganese	325	=	325	J	0.0197	2.47	mg/Kg	MS
SS	NDAHSS22-R01	N		SW6010B	SW3050B	Manganese	325	=	325	J	0.0214	2.68	mg/Kg	MS
SS	NDAHSS23-R01	N		SW6010B	SW3050B	Manganese	352	=	352	J	0.0212	2.66	mg/Kg	MS
SS	NDAHSS24-R01	N		SW6010B	SW3050B	Manganese	375	=	375	J	0.0199	2.5	mg/Kg	MS
SS	NDAHSS25-R01	N		SW6010B	SW3050B	Manganese	309	=	309	J	0.0206	2.59	mg/Kg	MS
SS	NDAHSS26-R01	N		SW6010B	SW3050B	Manganese	404	=	404	J	0.0206	2.59	mg/Kg	MS
SS	NDAHSS27-R01	N		SW6010B	SW3050B	Manganese	359	=	359	J	0.021	2.64	mg/Kg	MS
SS	NDAHSS28-R01	N		SW6010B	SW3050B	Manganese	182	=	182	J	0.0208	2.6	mg/Kg	MS
SS	NDAHSS29-R01	N		SW6010B	SW3050B	Manganese	384	=	384	J	0.019	2.39	mg/Kg	MS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE006	N		E200.7	SW3050	Barium	44	B	44	J	0.01	48	mg/Kg	MS, MD
SB	NDE008	N		E200.7	SW3050	Barium	26	B	26	J	0.01	42	mg/Kg	MS, MD
SB	NDE010	N		E200.7	SW3050	Barium	87	=	87	J	0.01	43	mg/Kg	MS, MD
SB	NDE012	N		E200.7	SW3050	Barium	160	=	160	J	0.01	42	mg/Kg	MS, MD
SB	NDE014	N		E200.7	SW3050	Barium	23	B	23	J	0.01	42	mg/Kg	MS, MD
SB	NDE019	N		E200.7	SW3050	Barium	110	=	110	J	0.01	44	mg/Kg	MS, MD
SS	NDE004	N		E200.7	SW3050	Barium	60	=	60	J	0.01	44	mg/Kg	MS, MD
SS	NDE005FD1	FD		E200.7	SW3050	Barium	51	=	51	J	0.01	43	mg/Kg	MS, MD
SS	NDE007	N		E200.7	SW3050	Barium	54	=	54	J	0.01	43	mg/Kg	MS, MD
SS	NDE009	N		E200.7	SW3050	Barium	130	=	130	J	0.01	47	mg/Kg	MS, MD
SS	NDE011	N		E200.7	SW3050	Barium	130	=	130	J	0.01	44	mg/Kg	MS, MD
SS	NDE013	N		E200.7	SW3050	Barium	140	=	140	J	0.01	42	mg/Kg	MS, MD
SS	NDE015	N		E200.7	SW3050	Barium	50	=	50	J	0.01	42	mg/Kg	MS, MD
SS	NDE017	N		E200.7	SW3050	Barium	110	=	110	J	0.01	44	mg/Kg	MS, MD
SS	NDE021	N		E200.7	SW3050	Barium	76	=	76	J	0.01	45	mg/Kg	MS, MD
SS	NDE023	N		E200.7	SW3050	Barium	290	=	290	J	0.01	43	mg/Kg	MS, MD
SB	NDE006	N		E200.7	SW3050	Chromium, total	16	=	16	J	0.1	2.4	mg/Kg	MS, MD
SB	NDE008	N		E200.7	SW3050	Chromium, total	3.6	=	3.6	J	0.09	2.1	mg/Kg	MS, MD
SB	NDE010	N		E200.7	SW3050	Chromium, total	10	=	10	J	0.09	2.1	mg/Kg	MS, MD
SB	NDE012	N		E200.7	SW3050	Chromium, total	5.3	=	5.3	J	0.09	2.1	mg/Kg	MS, MD
SB	NDE014	N		E200.7	SW3050	Chromium, total	3.6	=	3.6	J	0.09	2.1	mg/Kg	MS, MD
SB	NDE019	N		E200.7	SW3050	Chromium, total	7.9	=	7.9	J	0.09	2.2	mg/Kg	MS, MD
SS	NDE004	N		E200.7	SW3050	Chromium, total	20	=	20	J	0.09	2.2	mg/Kg	MS, MD
SS	NDE005FD1	FD		E200.7	SW3050	Chromium, total	20	=	20	J	0.09	2.2	mg/Kg	MS, MD
SS	NDE007	N		E200.7	SW3050	Chromium, total	20	=	20	J	0.09	2.2	mg/Kg	MS, MD
SS	NDE009	N		E200.7	SW3050	Chromium, total	10	=	10	J	0.1	2.3	mg/Kg	MS, MD
SS	NDE011	N		E200.7	SW3050	Chromium, total	18	=	18	J	0.09	2.2	mg/Kg	MS, MD
SS	NDE013	N		E200.7	SW3050	Chromium, total	14	=	14	J	0.09	2.1	mg/Kg	MS, MD
SS	NDE015	N		E200.7	SW3050	Chromium, total	36	=	36	J	0.09	2.1	mg/Kg	MS, MD
SS	NDE017	N		E200.7	SW3050	Chromium, total	20	=	20	J	0.09	2.2	mg/Kg	MS, MD
SS	NDE021	N		E200.7	SW3050	Chromium, total	17	=	17	J	0.09	2.3	mg/Kg	MS, MD
SS	NDE023	N		E200.7	SW3050	Chromium, total	16	=	16	J	0.09	2.2	mg/Kg	MS, MD
SS	NDAHSS27-R01	N		SW6010B	SW3050B	Arsenic	2.79	=	2.79	J	0.142	1.76	mg/Kg	OT (CRDL)
SB	NDAHSB17-R01	N		SW6010B	SW3050B	Iron	13900	=	13900	J	1.16	17.3	mg/Kg	OT (CRDL)
SB	NDAHSB18-R01	N		SW6010B	SW3050B	Iron	15400	=	15400	J	1.29	19.2	mg/Kg	OT (CRDL)
SB	NDAHSB19-R01	N		SW6010B	SW3050B	Iron	9420	=	9420	J	1.15	17.2	mg/Kg	OT (CRDL)
SB	NDAHSB20-R01	N		SW6010B	SW3050B	Iron	12400	=	12400	J	1.14	17.1	mg/Kg	OT (CRDL)
SB	NDAHSB21-R01	N		SW6010B	SW3050B	Iron	7810	=	7810	J	1.07	16	mg/Kg	OT (CRDL)
SB	NDAHSB23-R01	N		SW6010B	SW3050B	Iron	8360	=	8360	J	1.12	16.7	mg/Kg	OT (CRDL)
SB	NDAHSB24-R01	N		SW6010B	SW3050B	Iron	9070	=	9070	J	1.15	17.2	mg/Kg	OT (CRDL)
SB	NDAHSB25-R01	N		SW6010B	SW3050B	Iron	6660	=	6660	J	1.16	17.2	mg/Kg	OT (CRDL)
SB	NDAHSB26-R01	N		SW6010B	SW3050B	Iron	14000	=	14000	J	1.19	17.8	mg/Kg	OT (CRDL)
SB	NDAHSB27-R01	N		SW6010B	SW3050B	Iron	15400	=	15400	J	1.11	16.5	mg/Kg	OT (CRDL)
SB	NDAHSB28-R01	N		SW6010B	SW3050B	Iron	13200	=	13200	J	1.29	19.3	mg/Kg	OT (CRDL)
SB	NDAHSB29-R01	N		SW6010B	SW3050B	Iron	15800	=	15800	J	1.18	17.6	mg/Kg	OT (CRDL)
SS	NDAHSS17-R01	N		SW6010B	SW3050B	Iron	18100	=	18100	J	1.26	18.8	mg/Kg	OT (CRDL)
SS	NDAHSS18-R01	N		SW6010B	SW3050B	Iron	22400	=	22400	J	1.12	16.8	mg/Kg	OT (CRDL)

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDAHSS19-R01	N		SW6010B	SW3050B	Iron	20600	=	20600	J	1.34	20	mg/Kg	OT (CRDL)
SS	NDAHSS20-R01	N		SW6010B	SW3050B	Iron	17100	=	17100	J	1.15	17.1	mg/Kg	OT (CRDL)
SS	NDAHSS21-R01	N		SW6010B	SW3050B	Iron	14600	=	14600	J	1.21	18	mg/Kg	OT (CRDL)
SB	NDAHSB22-R01	N		SW6010B	SW3050B	Lead	2.29	=	2.29	J	0.188	0.509	mg/Kg	OT (CRDL)
WG	NDAHGW07-R01	N		SW6010B	SW3010A	Potassium	283000	=	283000	J	115	50000	ug/L	OT (CRDL)
WG	NDAHGW01-R01	N		SW6010B	SW3010A	Potassium	4300	B	4300	J	11.5	5000	ug/L	OT (CRDL)
WG	NDAHGW06-R01	N		SW6010B	SW3010A	Potassium	1870	B	1870	J	11.5	5000	ug/L	OT (CRDL)
WG	NDAHGWFD01	FD		SW6010B	SW3010A	Potassium	4320	B	4320	J	11.5	5000	ug/L	OT (CRDL)
WG	NDAHGW02-R01	N		SW7470A	FLDFLT	Mercury	0.0162	U	0.0162	UJ	0.0162	0.2	ug/L	OT (CRDL)
WG	NDAHGW05-R01	N		SW7470A	FLDFLT	Mercury	0.0162	U	0.0162	UJ	0.0162	0.2	ug/L	OT (CRDL)
WG	NDAHGW07-R01	N		SW7470A	FLDFLT	Mercury	0.0194	B	0.0194	J	0.0162	0.2	ug/L	OT (CRDL)
WS	NDAHFD02P-R01	FD		SW7470A	FLDFLT	Mercury	0.0239	B	0.0239	J	0.0162	0.2	ug/L	OT (CRDL)
WS	NDAHSW04-R01	N		SW7470A	FLDFLT	Mercury	0.0224	B	0.0224	J	0.0162	0.2	ug/L	OT (CRDL)
WG	NDAHGW02-R01	N		SW7470A	METHOD	Mercury	0.0165	B	0.0165	J	0.0162	0.2	ug/L	OT (CRDL)
WG	NDAHGW05-R01	N		SW7470A	METHOD	Mercury	0.0162	U	0.0162	UJ	0.0162	0.2	ug/L	OT (CRDL)
WG	NDAHGW07-R01	N		SW7470A	METHOD	Mercury	0.024	B	0.024	J	0.0162	0.2	ug/L	OT (CRDL)
SB	NDAHSB17-R01	N		SW7471A	METHOD	Mercury	0.0706	=	0.0706	J	0.00168	0.032	mg/Kg	OT (CRDL)
SB	NDAHSB18-R01	N		SW7471A	METHOD	Mercury	0.0719	=	0.0719	J	0.00169	0.032	mg/Kg	OT (CRDL)
SB	NDAHSB19-R01	N		SW7471A	METHOD	Mercury	0.00506	B	0.00506	J	0.00144	0.0274	mg/Kg	OT (CRDL)
SB	NDAHSB20-R01	N		SW7471A	METHOD	Mercury	0.0146	B	0.0146	J	0.00158	0.03	mg/Kg	OT (CRDL)
SB	NDAHSB21-R01	N		SW7471A	METHOD	Mercury	0.00429	B	0.00429	J	0.00124	0.0234	mg/Kg	OT (CRDL)
SB	NDAHSB28-R01	N		SW7471A	METHOD	Mercury	0.0109	B	0.0109	J	0.00202	0.0384	mg/Kg	OT (CRDL)
SB	NDAHSB29-R01	N		SW7471A	METHOD	Mercury	0.0195	B	0.0195	J	0.00163	0.0309	mg/Kg	OT (CRDL)
SS	NDAHSS17-R01	N		SW7471A	METHOD	Mercury	0.0308	=	0.0308	J	0.00145	0.0275	mg/Kg	OT (CRDL)
SS	NDAHSS18-R01	N		SW7471A	METHOD	Mercury	0.00904	B	0.00904	J	0.00174	0.033	mg/Kg	OT (CRDL)
SS	NDAHSS19-R01	N		SW7471A	METHOD	Mercury	0.0227	B	0.0227	J	0.0018	0.0342	mg/Kg	OT (CRDL)
SS	NDAHSS20-R01	N		SW7471A	METHOD	Mercury	0.0231	B	0.0231	J	0.00166	0.0315	mg/Kg	OT (CRDL)
SS	NDAHSS21-R01	N		SW7471A	METHOD	Mercury	0.0367	=	0.0367	J	0.00171	0.0324	mg/Kg	OT (CRDL)
SS	NDE024FD1	FD		E200.7	SW3050	Aluminum	7700	=	7700	J	11	46	mg/Kg	SD
SS	NDE026	N		E200.7	SW3050	Aluminum	8100	=	8100	J	11	45	mg/Kg	SD
SS	NDE028	N		E200.7	SW3050	Aluminum	7100	=	7100	J	11	46	mg/Kg	SD
SS	NDE030	N		E200.7	SW3050	Aluminum	6700	=	6700	J	11	45	mg/Kg	SD
SS	NDE032	N		E200.7	SW3050	Aluminum	5900	=	5900	J	11	47	mg/Kg	SD
SS	NDE034	N		E200.7	SW3050	Aluminum	6200	=	6200	J	10	43	mg/Kg	SD
SS	NDE037	N		E200.7	SW3050	Aluminum	7300	=	7300	J	10	42	mg/Kg	SD
SS	NDE176	N		E200.7	SW3050	Aluminum	11000	=	11000	J	10	43	mg/Kg	SD
SS	NDE177	N		E200.7	SW3050	Aluminum	5600	=	5600	J	10	43	mg/Kg	SD
SS	NDE178	N		E200.7	SW3050	Aluminum	4600	=	4600	J	11	45	mg/Kg	SD
SS	NDE179	N		E200.7	SW3050	Aluminum	3400	=	3400	J	10	42	mg/Kg	SD
SB	NDE033	N		E200.7	SW3050	Calcium	6200	=	6200	J	3.1	1120	mg/Kg	SD
SB	NDE035	N		E200.7	SW3050	Calcium	4100	=	4100	J	3.2	1140	mg/Kg	SD
SB	NDE036FD1	FD		E200.7	SW3050	Calcium	5200	=	5200	J	3.1	1110	mg/Kg	SD
SB	NDE038	N		E200.7	SW3050	Calcium	3300	=	3300	J	3.1	1120	mg/Kg	SD
SB	NDE039FD1	FD		E200.7	SW3050	Calcium	2900	=	2900	J	3.1	1110	mg/Kg	SD
SB	NDE033	N		E200.7	SW3050	Chromium, total	8.9	=	8.9	J	0.09	2.2	mg/Kg	SD
SB	NDE035	N		E200.7	SW3050	Chromium, total	11	=	11	J	0.09	2.3	mg/Kg	SD
SB	NDE036FD1	FD		E200.7	SW3050	Chromium, total	9.5	=	9.5	J	0.09	2.2	mg/Kg	SD

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE038	N		E200.7	SW3050	Chromium, total	10	=	10	J	0.09	2.2	mg/Kg	SD
SB	NDE039FD1	FD		E200.7	SW3050	Chromium, total	10	=	10	J	0.09	2.2	mg/Kg	SD
SB	NDAHSB17-R01	N		SW6010B	SW3050B	Cobalt	5.79	B	5.79	J	0.0333	8.66	mg/Kg	SD
SB	NDAHSB18-R01	N		SW6010B	SW3050B	Cobalt	5.74	B	5.74	J	0.037	9.62	mg/Kg	SD
SB	NDAHSB19-R01	N		SW6010B	SW3050B	Cobalt	3.24	B	3.24	J	0.033	8.6	mg/Kg	SD
SB	NDAHSB20-R01	N		SW6010B	SW3050B	Cobalt	4.49	B	4.49	J	0.0328	8.54	mg/Kg	SD
SB	NDAHSB21-R01	N		SW6010B	SW3050B	Cobalt	2.93	B	2.93	J	0.0308	8.01	mg/Kg	SD
SB	NDAHSB22-R01	N		SW6010B	SW3050B	Cobalt	2.48	B	2.48	J	0.0326	8.49	mg/Kg	SD
SB	NDAHSB23-R01	N		SW6010B	SW3050B	Cobalt	2.58	B	2.58	J	0.0321	8.35	mg/Kg	SD
SB	NDAHSB24-R01	N		SW6010B	SW3050B	Cobalt	3.87	B	3.87	J	0.033	8.6	mg/Kg	SD
SB	NDAHSB25-R01	N		SW6010B	SW3050B	Cobalt	3.14	B	3.14	J	0.0331	8.63	mg/Kg	SD
SB	NDAHSB26-R01	N		SW6010B	SW3050B	Cobalt	5.08	B	5.08	J	0.0341	8.89	mg/Kg	SD
SB	NDAHSB27-R01	N		SW6010B	SW3050B	Cobalt	5.65	B	5.65	J	0.0317	8.27	mg/Kg	SD
SB	NDAHSB28-R01	N		SW6010B	SW3050B	Cobalt	6.25	B	6.25	J	0.037	9.65	mg/Kg	SD
SB	NDAHSB29-R01	N		SW6010B	SW3050B	Cobalt	6.8	B	6.8	J	0.0338	8.81	mg/Kg	SD
SS	NDAHSS17-R01	N		SW6010B	SW3050B	Cobalt	7.72	B	7.72	J	0.036	9.39	mg/Kg	SD
SS	NDAHSS18-R01	N		SW6010B	SW3050B	Cobalt	8.42	=	8.42	J	0.0322	8.39	mg/Kg	SD
SS	NDAHSS19-R01	N		SW6010B	SW3050B	Cobalt	10.2	=	10.2	J	0.0385	10	mg/Kg	SD
SS	NDAHSS20-R01	N		SW6010B	SW3050B	Cobalt	7.99	B	7.99	J	0.0329	8.56	mg/Kg	SD
SS	NDAHSS21-R01	N		SW6010B	SW3050B	Cobalt	5.16	B	5.16	J	0.0346	9	mg/Kg	SD
WS	NDAHFD02P-R01	FD		SW6010B	FLDFLT	Manganese	268	B	268	J	3.34	300	ug/L	SD
WS	NDAHSW01-R01	N		SW6010B	FLDFLT	Manganese	91.7	B	91.7	J	3.34	300	ug/L	SD
WS	NDAHSW02-R01	N		SW6010B	FLDFLT	Manganese	70	B	70	J	3.34	300	ug/L	SD
WS	NDAHSW03-R01	N		SW6010B	FLDFLT	Manganese	234	B	234	J	3.34	300	ug/L	SD
WS	NDAHSW04-R01	N		SW6010B	FLDFLT	Manganese	419	=	419	J	3.34	300	ug/L	SD
SS	NDE024FD1	FD		E200.7	SW3050	Potassium	1500	=	1500	J	3.4	1140	mg/Kg	SD
SS	NDE026	N		E200.7	SW3050	Potassium	1500	=	1500	J	3.4	1120	mg/Kg	SD
SS	NDE028	N		E200.7	SW3050	Potassium	1200	=	1200	J	3.4	1140	mg/Kg	SD
SS	NDE030	N		E200.7	SW3050	Potassium	1200	=	1200	J	3.4	1120	mg/Kg	SD
SS	NDE032	N		E200.7	SW3050	Potassium	1200	=	1200	J	3.5	1180	mg/Kg	SD
SS	NDE034	N		E200.7	SW3050	Potassium	1300	=	1300	J	3.2	1070	mg/Kg	SD
SS	NDE037	N		E200.7	SW3050	Potassium	1300	=	1300	J	3.1	1050	mg/Kg	SD
SS	NDE176	N		E200.7	SW3050	Potassium	2000	=	2000	J	3.3	1080	mg/Kg	SD
SS	NDE177	N		E200.7	SW3050	Potassium	1400	=	1400	J	3.3	1090	mg/Kg	SD
SS	NDE178	N		E200.7	SW3050	Potassium	1100	B	1100	J	3.4	1120	mg/Kg	SD
SS	NDE179	N		E200.7	SW3050	Potassium	860	B	860	J	3.1	1050	mg/Kg	SD
WG	NDE213	N		E200.7	FLDFLT	Potassium	4100	B	4100	J	30	5000	ug/L	SD
WG	NDE214	N		E200.7	FLDFLT	Potassium	56000	=	56000	J	30	5000	ug/L	SD
WG	NDE215	N		E200.7	FLDFLT	Potassium	12000	=	12000	J	30	5000	ug/L	SD
WG	NDE216FD1	FD		E200.7	FLDFLT	Potassium	12000	=	12000	J	30	5000	ug/L	SD
WG	NDE217	N		E200.7	FLDFLT	Potassium	12000	=	12000	J	30	5000	ug/L	SD
WG	NDE213	N		E200.7	SW3050	Potassium	4600	B	4600	J	30	5000	ug/L	SD
WG	NDE214	N		E200.7	SW3050	Potassium	54000	=	54000	J	30	5000	ug/L	SD
WG	NDE215	N		E200.7	SW3050	Potassium	13000	=	13000	J	30	5000	ug/L	SD
WG	NDE216FD1	FD		E200.7	SW3050	Potassium	12000	=	12000	J	30	5000	ug/L	SD
WG	NDE217	N		E200.7	SW3050	Potassium	12000	=	12000	J	30	5000	ug/L	SD
WG	NDAHGW02-R01	N		SW6010B	FLDFLT	Potassium	203000	=	203000	J	115	50000	ug/L	SD

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
WG	NDAHGW05-R01	N		SW6010B	FLDFLT	Potassium	183000	=	183000	J	115	50000	ug/L	SD
WG	NDAHGW07-R01	N		SW6010B	FLDFLT	Potassium	294000	=	294000	J	115	50000	ug/L	SD
WG	NDAHGW01-R01	N		SW6010B	FLDFLT	Potassium	4430	B	4430	J	11.5	5000	ug/L	SD
WG	NDAHGW06-R01	N		SW6010B	FLDFLT	Potassium	2170	B	2170	J	11.5	5000	ug/L	SD
WG	NDAHGWFD01	FD		SW6010B	FLDFLT	Potassium	4430	B	4430	J	11.5	5000	ug/L	SD
WG	NDAHGW02-R01	N		SW6010B	SW3010A	Potassium	240000	=	240000	J	115	50000	ug/L	SD
WG	NDAHGW05-R01	N		SW6010B	SW3010A	Potassium	221000	=	221000	J	115	50000	ug/L	SD
WS	NDAHFD02P-R01	FD		SW6010B	SW3010A	Potassium	482000	=	482000	J	230	100000	ug/L	SD
WS	NDAHSW01-R01	N		SW6010B	SW3010A	Potassium	481000	=	481000	J	230	100000	ug/L	SD
WS	NDAHSW02-R01	N		SW6010B	SW3010A	Potassium	473000	=	473000	J	230	100000	ug/L	SD
WS	NDAHSW03-R01	N		SW6010B	SW3010A	Potassium	482000	=	482000	J	230	100000	ug/L	SD
WS	NDAHSW04-R01	N		SW6010B	SW3010A	Potassium	470000	=	470000	J	230	100000	ug/L	SD
SB	NDAHSB17-R01	N		SW6010B	SW3050B	Zinc	59.8	=	59.8	J	0.0653	3.46	mg/Kg	SD
SB	NDAHSB18-R01	N		SW6010B	SW3050B	Zinc	155	=	155	J	0.0726	3.85	mg/Kg	SD
SB	NDAHSB19-R01	N		SW6010B	SW3050B	Zinc	13.3	=	13.3	J	0.0648	3.44	mg/Kg	SD
SB	NDAHSB20-R01	N		SW6010B	SW3050B	Zinc	54.1	=	54.1	J	0.0644	3.42	mg/Kg	SD
SB	NDAHSB21-R01	N		SW6010B	SW3050B	Zinc	10.2	=	10.2	J	0.0604	3.2	mg/Kg	SD
SB	NDAHSB22-R01	N		SW6010B	SW3050B	Zinc	17.5	=	17.5	J	0.064	3.39	mg/Kg	SD
SB	NDAHSB23-R01	N		SW6010B	SW3050B	Zinc	12.3	=	12.3	J	0.063	3.34	mg/Kg	SD
SB	NDAHSB24-R01	N		SW6010B	SW3050B	Zinc	15	=	15	J	0.0648	3.44	mg/Kg	SD
SB	NDAHSB25-R01	N		SW6010B	SW3050B	Zinc	9.07	=	9.07	J	0.065	3.45	mg/Kg	SD
SB	NDAHSB26-R01	N		SW6010B	SW3050B	Zinc	18.8	=	18.8	J	0.067	3.56	mg/Kg	SD
SB	NDAHSB27-R01	N		SW6010B	SW3050B	Zinc	31	=	31	J	0.0623	3.31	mg/Kg	SD
SB	NDAHSB28-R01	N		SW6010B	SW3050B	Zinc	22.2	=	22.2	J	0.0728	3.86	mg/Kg	SD
SB	NDAHSB29-R01	N		SW6010B	SW3050B	Zinc	26.8	=	26.8	J	0.0664	3.52	mg/Kg	SD
SS	NDAHSS17-R01	N		SW6010B	SW3050B	Zinc	61.8	=	61.8	J	0.0708	3.75	mg/Kg	SD
SS	NDAHSS18-R01	N		SW6010B	SW3050B	Zinc	59.1	=	59.1	J	0.0632	3.36	mg/Kg	SD
SS	NDAHSS19-R01	N		SW6010B	SW3050B	Zinc	86.3	=	86.3	J	0.0755	4.01	mg/Kg	SD
SS	NDAHSS20-R01	N		SW6010B	SW3050B	Zinc	65.1	=	65.1	J	0.0646	3.42	mg/Kg	SD
SS	NDAHSS21-R01	N		SW6010B	SW3050B	Zinc	87.3	=	87.3	J	0.0679	3.6	mg/Kg	SD
WG	NDE214	N		CLP_PEST_L	SW3510	p,p'-DDD	0.42	=	0.42	J	0.023	0.023	ug/L	SS, 2C
WG	NDE214	N		CLP_PEST_L	SW3510	p,p'-DDE	0.022	J	0.022	J	0.012	0.023	ug/L	SS, 2C
WG	NDE217	N		CLP_PEST_L	SW3510	p,p'-DDT	0.028	=	0.028	J	0.021	0.021	ug/L	SS
SB	NDAHSB18-R01	N		SW8081	SW3550	p,p'-DDE	0.2	J	0.2	J	0.064	3.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	p,p'-DDE	3.2	J	3.2	J	0.057	3.5	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	p,p'-DDT	0.82	J	0.82	J	0.2	3.5	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,1-Dichloroethene	0.78	J	0.78	J	0.55	13	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,1-Dichloroethene	0.45	J	0.45	J	0.43	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Methylene chloride	0.58	J	0.58	J	0.34	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Tetrachloroethene (PCE)	1.6	J	1.6	J	0.23	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Toluene	0.4	J	0.4	J	0.2	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Trichloroethene (TCE)	0.34	J	0.34	J	0.27	10	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	Aldrin	1.9	U	1.9	R	0.11	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	Aldrin	1.8	U	1.8	R	0.11	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	Aldrin	2.2	U	2.2	R	0.13	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	Aldrin	1.8	U	1.8	R	0.11	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	alpha bhc	1.9	U	1.9	R	0.12	1.9	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDAHSB29-R01	N		SW8081	SW3550	alpha bhc	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	alpha bhc	2.2	U	2.2	R	0.14	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	alpha bhc	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	alpha endosulfan	1.9	U	1.9	R	0.078	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	alpha endosulfan	1.8	U	1.8	R	0.073	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	alpha endosulfan	2.2	U	2.2	R	0.091	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	alpha endosulfan	1.8	U	1.8	R	0.074	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	alpha-chlordane	1.9	U	1.9	R	0.12	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	alpha-chlordane	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	alpha-chlordane	2.2	U	2.2	R	0.14	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	alpha-chlordane	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	beta bhc	1.9	U	1.9	R	0.068	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	beta bhc	1.8	U	1.8	R	0.064	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	beta bhc	2.2	U	2.2	R	0.079	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	beta bhc	1.8	U	1.8	R	0.064	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	beta endosulfan	3.7	U	3.7	R	0.053	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	beta endosulfan	3.5	U	3.5	R	0.05	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	beta endosulfan	4.4	U	4.4	R	0.062	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	beta endosulfan	0.073	JP	0.073	R	0.05	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	delta bhc	1.9	U	1.9	R	0.081	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	delta bhc	1.8	U	1.8	R	0.076	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	delta bhc	2.2	U	2.2	R	0.095	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	delta bhc	1.8	U	1.8	R	0.077	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	Dieldrin	3.7	U	3.7	R	0.041	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	Dieldrin	3.5	U	3.5	R	0.038	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	Dieldrin	4.4	U	4.4	R	0.047	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	Dieldrin	3.5	U	3.5	R	0.039	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	endosulfan sulfate	3.7	U	3.7	R	0.28	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	endosulfan sulfate	3.5	U	3.5	R	0.26	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	endosulfan sulfate	4.4	U	4.4	R	0.33	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	endosulfan sulfate	3.5	U	3.5	R	0.27	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	endrin	3.7	U	3.7	R	0.099	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	endrin	3.5	U	3.5	R	0.093	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	endrin	4.4	U	4.4	R	0.12	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	endrin	3.5	U	3.5	R	0.094	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	endrin aldehyde	3.7	U	3.7	R	0.2	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	endrin aldehyde	3.5	U	3.5	R	0.19	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	endrin aldehyde	4.4	U	4.4	R	0.24	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	endrin aldehyde	3.5	U	3.5	R	0.19	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	endrin ketone	3.7	U	3.7	R	0.21	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	endrin ketone	3.5	U	3.5	R	0.2	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	endrin ketone	4.4	U	4.4	R	0.25	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	endrin ketone	3.5	U	3.5	R	0.2	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	gamma bhc (lindane)	1.9	U	1.9	R	0.12	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	gamma bhc (lindane)	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	gamma bhc (lindane)	2.2	U	2.2	R	0.14	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	gamma bhc (lindane)	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDAHSB27-R01	N		SW8081	SW3550	gamma-chlordane	1.9	U	1.9	R	0.12	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	gamma-chlordane	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	gamma-chlordane	2.2	U	2.2	R	0.14	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	gamma-chlordane	1.8	U	1.8	R	0.12	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	heptachlor	1.9	U	1.9	R	0.11	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	heptachlor	1.8	U	1.8	R	0.11	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	heptachlor	2.2	U	2.2	R	0.13	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	heptachlor	1.8	U	1.8	R	0.11	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	heptachlor epoxide	1.9	U	1.9	R	0.088	1.9	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	heptachlor epoxide	1.8	U	1.8	R	0.083	1.8	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	heptachlor epoxide	2.2	U	2.2	R	0.1	2.2	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	heptachlor epoxide	1.8	U	1.8	R	0.084	1.8	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	methoxychlor	19	U	19	R	0.29	19	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	methoxychlor	18	U	18	R	0.28	18	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	methoxychlor	22	U	22	R	0.34	22	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	methoxychlor	18	U	18	R	0.28	18	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	p,p'-DDD	13	E	13	R	0.15	3.7	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	p,p'-DDD	3.5	U	3.5	R	0.14	3.5	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	p,p'-DDD	4.4	U	4.4	R	0.17	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	p,p'-DDD	3.5	U	3.5	R	0.14	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	p,p'-DDE	1.7	JP	1.7	R	0.061	3.7	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	p,p'-DDE	4.4	U	4.4	R	0.071	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	p,p'-DDE	3.5	U	3.5	R	0.058	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	p,p'-DDT	3.7	U	3.7	R	0.21	3.7	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	p,p'-DDT	4.4	U	4.4	R	0.25	4.4	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	p,p'-DDT	3.5	U	3.5	R	0.2	3.5	ug/Kg	SS
SB	NDAHSB27-R01	N		SW8081	SW3550	toxaphene	190	U	190	R	0.63	190	ug/Kg	SS
SB	NDAHSB29-R01	N		SW8081	SW3550	toxaphene	180	U	180	R	0.59	180	ug/Kg	SS
SD	NDAHFD03P-R01	FD		SW8081	SW3550	toxaphene	220	U	220	R	0.74	220	ug/Kg	SS
SS	NDAHSS20-R01	N		SW8081	SW3550	toxaphene	1.5	JP	1.5	R	0.6	180	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,4,5-Trichlorophenol	1220	U	1220	R	34.6	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,4,6-Trichlorophenol	408	U	408	R	48.3	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,4-Dichlorophenol	408	U	408	R	44.6	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,4-Dimethylphenol	408	U	408	R	33.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,4-Dinitrophenol	1220	U	1220	R	58.2	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,4-Dinitrotoluene	408	U	408	R	43.3	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2,6-Dinitrotoluene	408	U	408	R	104	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2-Chloronaphthalene	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2-Chlorophenol	408	U	408	R	33.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2-Methylnaphthalene	408	U	408	R	33.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2-Methylphenol (o-Cresol)	408	U	408	R	40.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2-Nitroaniline	1220	U	1220	R	23.5	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	2-Nitrophenol	408	U	408	R	29.7	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	3,3'-Dichlorobenzidine	829	U	829	R	50.7	829	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	3-Nitroaniline	1220	U	1220	R	30.9	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4,6-Dinitro-2-methylphenol	1220	U	1220	R	644	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Bromophenyl phenyl ether	408	U	408	R	34.6	408	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Chloro-3-methylphenol	408	U	408	R	38.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Chloroaniline	408	U	408	R	30.9	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Chlorophenyl phenyl ether	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Methylphenol (p-Cresol)	408	U	408	R	39.6	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Nitroaniline	1220	U	1220	R	22.3	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	4-Nitrophenol	1220	U	1220	R	95.3	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Acenaphthene	408	U	408	R	23.5	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Acenaphthylene	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Acetophenone	408	U	408	R	38.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Anthracene	408	U	408	R	26	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Atrazine	408	U	408	R	45.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzaldehyde	408	U	408	R	59.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzo(a)anthracene	408	U	408	R	32.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzo(a)pyrene	408	U	408	R	26	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzo(b)fluoranthene	408	U	408	R	19.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzo(g,h,i)perylene	408	U	408	R	23.5	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzo(k)fluoranthene	408	U	408	R	21	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Benzyl butyl phthalate	408	U	408	R	32.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	biphenyl (diphenyl)	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Bis(2-Chloroethoxy) methane	408	U	408	R	32.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	bis(2-Chloroethyl) ether	408	U	408	R	40.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	bis(2-Chloroisopropyl) ether	408	U	408	R	40.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	bis(2-Ethylhexyl) phthalate	408	U	408	R	38.4	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	caprolactam	408	U	408	R	136	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Carbazole	408	U	408	R	37.1	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Chrysene	408	U	408	R	24.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Dibenz(a,h)anthracene	408	U	408	R	35.9	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Dibenzofuran	408	U	408	R	24.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Diethyl phthalate	408	U	408	R	24.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Dimethyl phthalate	408	U	408	R	24.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Di-n-butyl phthalate	408	U	408	R	21	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Di-n-octylphthalate	408	U	408	R	21	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Fluoranthene	408	U	408	R	22.3	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Fluorene	408	U	408	R	22.3	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Hexachlorobenzene	408	U	408	R	35.9	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Hexachlorobutadiene	408	U	408	R	40.8	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Hexachlorocyclopentadiene	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Hexachloroethane	408	U	408	R	43.3	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Indeno(1,2,3-c,d)pyrene	408	U	408	R	42.1	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Isophorone	408	U	408	R	35.9	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Naphthalene	408	U	408	R	35.9	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Nitrobenzene	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	n-Nitrosodi-n-propylamine	408	U	408	R	27.2	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	n-Nitrosodiphenylamine	408	U	408	R	30.9	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Pentachlorophenol	1220	U	1220	R	38.4	1220	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Phenanthrene	408	U	408	R	21	408	ug/Kg	SS
SS	NDAHSS19-R01	N		SW8270C	SW3550	Phenol	408	U	408	R	38.4	408	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDAHSS19-R01	N		SW8270C	SW3550	Pyrene	408	U	408	R	27.2	408	ug/Kg	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aldrin	0.012	U	0.012	UJ	0.012	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aldrin	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aldrin	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aldrin	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	alpha bhc	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	alpha bhc	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	alpha bhc	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	alpha bhc	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	alpha endosulfan	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	alpha endosulfan	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	alpha endosulfan	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	alpha endosulfan	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	alpha-chlordane	0.012	U	0.012	UJ	0.012	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	alpha-chlordane	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	alpha-chlordane	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	alpha-chlordane	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1016	0.233	U	0.233	UJ	0.093	0.233	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1016	0.214	U	0.214	UJ	0.086	0.214	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1016	0.215	U	0.215	UJ	0.086	0.215	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1016	0.211	U	0.211	UJ	0.084	0.211	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1221	0.465	U	0.465	UJ	0.128	0.465	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1221	0.428	U	0.428	UJ	0.118	0.428	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1221	0.43	U	0.43	UJ	0.118	0.43	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1221	0.421	U	0.421	UJ	0.116	0.421	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1232	0.233	U	0.233	UJ	0.093	0.233	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1232	0.214	U	0.214	UJ	0.086	0.214	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1232	0.215	U	0.215	UJ	0.086	0.215	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1232	0.211	U	0.211	UJ	0.084	0.211	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1242	0.233	U	0.233	UJ	0.07	0.233	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1242	0.214	U	0.214	UJ	0.064	0.214	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1242	0.215	U	0.215	UJ	0.065	0.215	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1242	0.211	U	0.211	UJ	0.063	0.211	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1248	0.233	U	0.233	UJ	0.14	0.233	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1248	0.214	U	0.214	UJ	0.128	0.214	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1248	0.215	U	0.215	UJ	0.129	0.215	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1248	0.211	U	0.211	UJ	0.126	0.211	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1254	0.233	U	0.233	UJ	0.163	0.233	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1254	0.214	U	0.214	UJ	0.15	0.214	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1254	0.215	U	0.215	UJ	0.151	0.215	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1254	0.211	U	0.211	UJ	0.147	0.211	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Aroclor-1260	0.233	U	0.233	UJ	0.116	0.233	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Aroclor-1260	0.214	U	0.214	UJ	0.107	0.214	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Aroclor-1260	0.215	U	0.215	UJ	0.108	0.215	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Aroclor-1260	0.211	U	0.211	UJ	0.105	0.211	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	beta bhc	0.012	U	0.012	UJ	0.006	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	beta bhc	0.011	U	0.011	UJ	0.005	0.011	ug/L	SS

EXHIBIT 4
Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)
AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	beta bhc	0.011	U	0.011	UJ	0.005	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	beta bhc	0.011	U	0.011	UJ	0.005	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	beta endosulfan	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	beta endosulfan	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	beta endosulfan	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	beta endosulfan	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	delta bhc	0.012	U	0.012	UJ	0.008	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	delta bhc	0.011	U	0.011	UJ	0.007	0.011	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	delta bhc	0.011	U	0.011	UJ	0.008	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	delta bhc	0.011	U	0.011	UJ	0.007	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	Dieldrin	0.023	U	0.023	UJ	0.006	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	Dieldrin	0.021	U	0.021	UJ	0.005	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	Dieldrin	0.022	U	0.022	UJ	0.005	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	Dieldrin	0.021	U	0.021	UJ	0.005	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	endosulfan sulfate	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	endosulfan sulfate	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	endosulfan sulfate	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	endosulfan sulfate	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	endrin	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	endrin	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	endrin	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	endrin	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	endrin aldehyde	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	endrin aldehyde	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	endrin aldehyde	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	endrin aldehyde	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	endrin ketone	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	endrin ketone	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	endrin ketone	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	endrin ketone	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	gamma bhc (lindane)	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	gamma bhc (lindane)	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	gamma bhc (lindane)	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	gamma bhc (lindane)	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	gamma-chlordane	0.012	U	0.012	UJ	0.012	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	gamma-chlordane	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	gamma-chlordane	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	gamma-chlordane	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	heptachlor	0.012	U	0.012	UJ	0.006	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	heptachlor	0.011	U	0.011	UJ	0.005	0.011	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	heptachlor	0.011	U	0.011	UJ	0.005	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	heptachlor	0.011	U	0.011	UJ	0.005	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	heptachlor epoxide	0.012	U	0.012	UJ	0.012	0.012	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	heptachlor epoxide	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	heptachlor epoxide	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	heptachlor epoxide	0.011	U	0.011	UJ	0.011	0.011	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	methoxychlor	0.116	U	0.116	UJ	0.023	0.116	ug/L	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
WG	NDE215	N		CLP_PEST_L	SW3510	methoxychlor	0.107	U	0.107	UJ	0.021	0.107	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	methoxychlor	0.108	U	0.108	UJ	0.022	0.108	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	methoxychlor	0.105	U	0.105	UJ	0.021	0.105	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	p,p'-DDD	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	p,p'-DDD	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	p,p'-DDD	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	p,p'-DDE	0.021	U	0.021	UJ	0.011	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	p,p'-DDE	0.022	U	0.022	UJ	0.011	0.022	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	p,p'-DDE	0.021	U	0.021	UJ	0.011	0.021	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	p,p'-DDT	0.023	U	0.023	UJ	0.023	0.023	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	p,p'-DDT	0.021	U	0.021	UJ	0.021	0.021	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	p,p'-DDT	0.022	U	0.022	UJ	0.022	0.022	ug/L	SS
WG	NDE214	N		CLP_PEST_L	SW3510	toxaphene	1.2	U	1.2	UJ	0.454	1.2	ug/L	SS
WG	NDE215	N		CLP_PEST_L	SW3510	toxaphene	1.1	U	1.1	UJ	0.417	1.1	ug/L	SS
WG	NDE216FD1	FD		CLP_PEST_L	SW3510	toxaphene	1.1	U	1.1	UJ	0.419	1.1	ug/L	SS
WG	NDE217	N		CLP_PEST_L	SW3510	toxaphene	1.1	U	1.1	UJ	0.411	1.1	ug/L	SS
SB	NDE010	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,1,1-Trichloroethane	12	U	12	UJ	0.29	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,1,1-Trichloroethane	13	U	13	UJ	0.32	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,1,1-Trichloroethane	12	U	12	UJ	0.28	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.25	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,1,1-Trichloroethane	12	U	12	UJ	0.29	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,1,1-Trichloroethane	15	U	15	UJ	0.36	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,1,1-Trichloroethane	11	U	11	UJ	0.26	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	1,1,1-Trichloroethane	11	U	11	UJ	0.27	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,1,1-Trichloroethane	11	U	11	UJ	0.27	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,1,1-Trichloroethane	12	U	12	UJ	0.29	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,1,1-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	12	U	12	UJ	0.18	12	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE022	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.13	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	13	U	13	UJ	0.2	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	12	U	12	UJ	0.17	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	12	U	12	UJ	0.18	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	15	U	15	UJ	0.22	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	11	U	11	UJ	0.16	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.13	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	11	U	11	UJ	0.17	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.14	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	11	U	11	UJ	0.17	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	12	U	12	UJ	0.18	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,1,2,2-Tetrachloroethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,1,2-Trichloroethane	12	U	12	UJ	0.28	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,1,2-Trichloroethane	13	U	13	UJ	0.31	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,1,2-Trichloroethane	12	U	12	UJ	0.26	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,1,2-Trichloroethane	12	U	12	UJ	0.28	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,1,2-Trichloroethane	15	U	15	UJ	0.34	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,1,2-Trichloroethane	11	U	11	UJ	0.25	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.2	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE028	N		SW8260B	SW5030	1,1,2-Trichloroethane	11	U	11	UJ	0.26	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,1,2-Trichloroethane	11	U	11	UJ	0.25	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,1,2-Trichloroethane	12	U	12	UJ	0.28	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,1,2-Trichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.47	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,1-Dichloroethane	12	U	12	UJ	0.56	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.41	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.45	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.49	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,1-Dichloroethane	13	U	13	UJ	0.63	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,1-Dichloroethane	12	U	12	UJ	0.54	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.44	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.47	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.49	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.44	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.46	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,1-Dichloroethane	12	U	12	UJ	0.57	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.45	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.48	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,1-Dichloroethane	15	U	15	UJ	0.7	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.47	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.45	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,1-Dichloroethane	11	U	11	UJ	0.5	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.42	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	1,1-Dichloroethane	11	U	11	UJ	0.53	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.45	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.49	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.47	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.44	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.46	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,1-Dichloroethane	11	U	11	UJ	0.52	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,1-Dichloroethane	12	U	12	UJ	0.56	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,1-Dichloroethane	10	U	10	UJ	0.48	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.41	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,1-Dichloroethene	12	U	12	UJ	0.49	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.36	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.39	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.43	10	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,1-Dichloroethene	12	U	12	UJ	0.47	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.38	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.41	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.38	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE029	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.4	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,1-Dichloroethene	12	U	12	UJ	0.5	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.39	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.42	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,1-Dichloroethene	15	U	15	UJ	0.61	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.41	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.39	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,1-Dichloroethene	11	U	11	UJ	0.44	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.36	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	1,1-Dichloroethene	11	U	11	UJ	0.47	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.39	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.43	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.41	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.39	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.4	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,1-Dichloroethene	11	U	11	UJ	0.45	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,1-Dichloroethene	12	U	12	UJ	0.49	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,1-Dichloroethene	10	U	10	UJ	0.42	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,2-Dichloroethane	0.27	J	12	UJ	0.26	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	1,2-Dichloroethane	0.2	J	10	UJ	0.19	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,2-Dichloroethane	0.26	J	10	UJ	0.23	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,2-Dichloroethane	13	U	13	UJ	0.29	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,2-Dichloroethane	12	U	12	UJ	0.25	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,2-Dichloroethane	12	U	12	UJ	0.27	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,2-Dichloroethane	15	U	15	UJ	0.33	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,2-Dichloroethane	11	U	11	UJ	0.24	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	1,2-Dichloroethane	11	U	11	UJ	0.25	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,2-Dichloroethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,2-Dichloroethane	11	U	11	UJ	0.24	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,2-Dichloroethane	12	U	12	UJ	0.26	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,2-Dichloroethane	0.25	J	10	UJ	0.22	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE010	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	1,2-Dichloropropane	12	U	12	UJ	0.14	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.1	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.13	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	1,2-Dichloropropane	13	U	13	UJ	0.16	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	1,2-Dichloropropane	12	U	12	UJ	0.14	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.11	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.11	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	1,2-Dichloropropane	12	U	12	UJ	0.15	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.11	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	1,2-Dichloropropane	15	U	15	UJ	0.18	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	1,2-Dichloropropane	11	U	11	UJ	0.13	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.11	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	1,2-Dichloropropane	11	U	11	UJ	0.14	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.11	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	1,2-Dichloropropane	11	U	11	UJ	0.13	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	1,2-Dichloropropane	12	U	12	UJ	0.14	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	1,2-Dichloropropane	10	U	10	UJ	0.12	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.56	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	2-Hexanone	12	U	12	UJ	0.67	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.49	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.54	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.58	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	2-Hexanone	13	U	13	UJ	0.75	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	2-Hexanone	12	U	12	UJ	0.64	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.52	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.56	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.58	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.52	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.55	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	2-Hexanone	12	U	12	UJ	0.68	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.57	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	2-Hexanone	15	U	15	UJ	0.83	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.56	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.54	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE024FD1	FD		SW8260B	SW5030	2-Hexanone	11	U	11	UJ	0.6	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.5	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	2-Hexanone	11	U	11	UJ	0.64	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.54	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.58	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.56	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.55	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	2-Hexanone	11	U	11	UJ	0.62	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	2-Hexanone	12	U	12	UJ	0.67	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	2-Hexanone	10	U	10	UJ	0.57	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.77	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	12	U	12	UJ	0.92	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.67	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.74	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.8	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	13	U	13	UJ	1	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	12	U	12	UJ	0.88	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.72	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.77	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.8	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.72	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.75	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	12	U	12	UJ	0.94	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.73	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.78	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	15	U	15	UJ	1.1	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.77	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.74	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	11	U	11	UJ	0.83	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.68	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	11	U	11	UJ	0.87	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.74	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.8	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.77	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.73	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.75	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	11	U	11	UJ	0.85	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	12	U	12	UJ	0.93	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	4-methyl-2-pentanone (MIBK)	10	U	10	UJ	0.78	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Benzene	12	U	12	UJ	0.23	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Benzene	13	U	13	UJ	0.25	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Benzene	12	U	12	UJ	0.22	12	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE008	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Benzene	12	U	12	UJ	0.23	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Benzene	15	U	15	UJ	0.28	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Benzene	11	U	11	UJ	0.2	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Benzene	11	U	11	UJ	0.22	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Benzene	11	U	11	UJ	0.21	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Benzene	12	U	12	UJ	0.23	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Benzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Bromodichloromethane	12	U	12	UJ	0.2	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Bromodichloromethane	13	U	13	UJ	0.23	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Bromodichloromethane	12	U	12	UJ	0.19	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Bromodichloromethane	12	U	12	UJ	0.21	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Bromodichloromethane	15	U	15	UJ	0.25	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Bromodichloromethane	11	U	11	UJ	0.18	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.15	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Bromodichloromethane	11	U	11	UJ	0.19	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.16	10	ug/Kg	SS

EXHIBIT 4
Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)
AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE177	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Bromodichloromethane	11	U	11	UJ	0.19	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Bromodichloromethane	12	U	12	UJ	0.2	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Bromodichloromethane	10	U	10	UJ	0.17	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Bromoform	12	U	12	UJ	0.25	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Bromoform	13	U	13	UJ	0.28	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Bromoform	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Bromoform	12	U	12	UJ	0.26	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Bromoform	15	U	15	UJ	0.31	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Bromoform	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Bromoform	11	U	11	UJ	0.24	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Bromoform	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Bromoform	12	U	12	UJ	0.25	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Bromoform	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.83	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Bromomethane	12	U	12	UJ	0.99	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.72	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.8	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.87	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Bromomethane	13	U	13	UJ	1.1	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Bromomethane	12	U	12	UJ	0.95	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.77	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.83	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.86	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.77	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.81	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Bromomethane	12	U	12	UJ	1	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.79	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE007	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.84	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Bromomethane	15	U	15	UJ	1.2	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.83	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.8	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Bromomethane	11	U	11	UJ	0.89	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.74	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Bromomethane	11	U	11	UJ	0.94	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.8	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.86	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.83	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.79	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.81	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Bromomethane	11	U	11	UJ	0.92	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Bromomethane	12	U	12	UJ	1	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Bromomethane	10	U	10	UJ	0.84	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.56	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Carbon disulfide	12	U	12	UJ	0.67	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.49	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.54	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.58	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Carbon disulfide	13	U	13	UJ	0.75	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Carbon disulfide	12	U	12	UJ	0.64	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.52	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.56	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.58	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.52	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.55	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Carbon disulfide	12	U	12	UJ	0.68	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.57	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Carbon disulfide	15	U	15	UJ	0.83	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.56	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.54	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Carbon disulfide	11	U	11	UJ	0.6	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.5	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Carbon disulfide	11	U	11	UJ	0.64	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.54	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.58	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.56	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.55	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Carbon disulfide	11	U	11	UJ	0.62	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Carbon disulfide	12	U	12	UJ	0.67	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Carbon disulfide	10	U	10	UJ	0.57	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Carbon tetrachloride	12	U	12	UJ	0.41	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.3	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE004	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.36	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Carbon tetrachloride	13	U	13	UJ	0.45	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Carbon tetrachloride	12	U	12	UJ	0.39	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.35	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.33	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Carbon tetrachloride	12	U	12	UJ	0.41	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.35	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Carbon tetrachloride	15	U	15	UJ	0.5	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Carbon tetrachloride	11	U	11	UJ	0.36	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.3	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Carbon tetrachloride	11	U	11	UJ	0.39	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.35	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Carbon tetrachloride	11	U	11	UJ	0.38	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Carbon tetrachloride	12	U	12	UJ	0.41	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Carbon tetrachloride	10	U	10	UJ	0.35	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Chlorobenzene	12	U	12	UJ	0.25	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Chlorobenzene	13	U	13	UJ	0.28	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Chlorobenzene	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Chlorobenzene	12	U	12	UJ	0.26	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Chlorobenzene	15	U	15	UJ	0.31	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Chlorobenzene	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Chlorobenzene	11	U	11	UJ	0.24	11	ug/Kg	SS

EXHIBIT 4
Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)
AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE030	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Chlorobenzene	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Chlorobenzene	12	U	12	UJ	0.25	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Chlorobenzene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.55	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Chloroethane	12	U	12	UJ	0.66	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.48	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.57	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Chloroethane	13	U	13	UJ	0.73	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Chloroethane	12	U	12	UJ	0.63	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.51	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.55	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.57	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.51	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.54	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Chloroethane	12	U	12	UJ	0.67	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.52	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.56	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Chloroethane	15	U	15	UJ	0.81	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.55	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Chloroethane	11	U	11	UJ	0.59	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.49	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Chloroethane	11	U	11	UJ	0.63	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.53	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.57	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.55	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.52	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.54	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Chloroethane	11	U	11	UJ	0.61	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Chloroethane	12	U	12	UJ	0.66	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Chloroethane	10	U	10	UJ	0.56	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.26	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Chloroform	12	U	12	UJ	0.31	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.27	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Chloroform	13	U	13	UJ	0.35	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Chloroform	12	U	12	UJ	0.3	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.26	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.27	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE027	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Chloroform	12	U	12	UJ	0.32	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.26	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Chloroform	15	U	15	UJ	0.38	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.26	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Chloroform	11	U	11	UJ	0.28	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Chloroform	11	U	11	UJ	0.3	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.27	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.26	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Chloroform	11	U	11	UJ	0.29	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Chloroform	12	U	12	UJ	0.31	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Chloroform	10	U	10	UJ	0.26	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.79	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Chloromethane	12	U	12	UJ	0.95	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.69	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.76	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.83	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Chloromethane	13	U	13	UJ	1.1	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Chloromethane	12	U	12	UJ	0.91	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.74	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.79	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.82	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.73	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.77	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Chloromethane	12	U	12	UJ	0.96	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.75	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.8	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Chloromethane	15	U	15	UJ	1.2	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.79	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.76	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Chloromethane	11	U	11	UJ	0.85	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.7	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Chloromethane	11	U	11	UJ	0.9	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.76	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.82	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.79	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.75	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.77	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Chloromethane	11	U	11	UJ	0.87	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Chloromethane	12	U	12	UJ	0.95	12	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE015	N		SW8260B	SW5030	Chloromethane	10	U	10	UJ	0.8	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	cis-1,3-Dichloropropene	12	U	12	UJ	0.29	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	cis-1,3-Dichloropropene	13	U	13	UJ	0.32	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	cis-1,3-Dichloropropene	12	U	12	UJ	0.28	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.25	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	cis-1,3-Dichloropropene	12	U	12	UJ	0.29	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	cis-1,3-Dichloropropene	15	U	15	UJ	0.36	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	cis-1,3-Dichloropropene	11	U	11	UJ	0.26	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	cis-1,3-Dichloropropene	11	U	11	UJ	0.27	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	cis-1,3-Dichloropropene	11	U	11	UJ	0.27	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	cis-1,3-Dichloropropene	12	U	12	UJ	0.29	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	cis-1,3-Dichloropropene	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Dibromochloromethane	12	U	12	UJ	0.25	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Dibromochloromethane	13	U	13	UJ	0.28	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Dibromochloromethane	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Dibromochloromethane	12	U	12	UJ	0.26	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Dibromochloromethane	15	U	15	UJ	0.31	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE013	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Dibromochloromethane	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Dibromochloromethane	11	U	11	UJ	0.24	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Dibromochloromethane	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Dibromochloromethane	12	U	12	UJ	0.25	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Dibromochloromethane	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.32	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Ethylbenzene	12	U	12	UJ	0.38	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.31	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Ethylbenzene	13	U	13	UJ	0.43	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Ethylbenzene	12	U	12	UJ	0.37	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.3	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.32	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.33	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.3	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.31	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Ethylbenzene	12	U	12	UJ	0.39	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.3	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Ethylbenzene	15	U	15	UJ	0.47	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.31	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Ethylbenzene	11	U	11	UJ	0.34	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Ethylbenzene	11	U	11	UJ	0.36	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.31	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.33	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.3	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.31	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Ethylbenzene	11	U	11	UJ	0.35	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Ethylbenzene	12	U	12	UJ	0.38	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Ethylbenzene	10	U	10	UJ	0.33	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	13	U	13	UJ	0.27	13	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE006	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	12	U	12	UJ	0.23	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	12	U	12	UJ	0.24	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	15	U	15	UJ	0.3	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	m,p-Xylene (sum of isomers)	11	U	11	UJ	0.21	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	11	U	11	UJ	0.22	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	12	U	12	UJ	0.24	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	m,p-Xylene (sum of isomers)	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Methylene chloride	0.44	J	10	UJ	0.33	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Methylene chloride	12	U	12	UJ	0.4	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.29	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Methylene chloride	13	U	13	UJ	0.44	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Methylene chloride	12	U	12	UJ	0.38	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Methylene chloride	0.41	J	10	UJ	0.31	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.33	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Methylene chloride	0.4	J	10	UJ	0.31	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Methylene chloride	0.71	J	15	UJ	0.49	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Methylene chloride	0.46	J	10	UJ	0.33	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Methylene chloride	11	U	11	UJ	0.35	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.29	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Methylene chloride	0.44	J	11	UJ	0.38	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Methylene chloride	0.57	J	10	UJ	0.33	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.31	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.32	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Methylene chloride	11	U	11	UJ	0.36	11	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE179	N		SW8260B	SW5030	Methylene chloride	12	U	12	UJ	0.4	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Methylene chloride	10	U	10	UJ	0.34	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	12	U	12	UJ	0.23	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	13	U	13	UJ	0.25	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	12	U	12	UJ	0.22	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	12	U	12	UJ	0.23	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	15	U	15	UJ	0.28	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	11	U	11	UJ	0.2	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	11	U	11	UJ	0.22	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	11	U	11	UJ	0.21	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	12	U	12	UJ	0.23	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	o-Xylene (1,2-Dimethylbenzene)	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Styrene	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Styrene	13	U	13	UJ	0.27	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Styrene	12	U	12	UJ	0.23	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Styrene	12	U	12	UJ	0.24	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Styrene	15	U	15	UJ	0.3	15	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE011	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Styrene	11	U	11	UJ	0.21	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Styrene	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Styrene	11	U	11	UJ	0.22	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Styrene	12	U	12	UJ	0.24	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Styrene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Tetrachloroethene (PCE)	12	U	12	UJ	0.28	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Tetrachloroethene (PCE)	13	U	13	UJ	0.31	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Tetrachloroethene (PCE)	12	U	12	UJ	0.26	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.24	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Tetrachloroethene (PCE)	12	U	12	UJ	0.28	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Tetrachloroethene (PCE)	15	U	15	UJ	0.34	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Tetrachloroethene (PCE)	11	U	11	UJ	0.25	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Tetrachloroethene (PCE)	11	U	11	UJ	0.26	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.24	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.23	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Tetrachloroethene (PCE)	11	U	11	UJ	0.25	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Tetrachloroethene (PCE)	12	U	12	UJ	0.28	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Tetrachloroethene (PCE)	10	U	10	UJ	0.23	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Toluene	12	U	12	UJ	0.25	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Toluene	13	U	13	UJ	0.28	13	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SB	NDE006	N		SW8260B	SW5030	Toluene	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.22	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Toluene	12	U	12	UJ	0.26	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Toluene	15	U	15	UJ	0.31	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Toluene	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Toluene	11	U	11	UJ	0.24	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.22	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Toluene	0.46	J	10	UJ	0.21	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Toluene	0.24	J	11	UJ	0.23	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Toluene	12	U	12	UJ	0.25	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Toluene	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	trans-1,3-Dichloropropene	12	U	12	UJ	0.23	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	trans-1,3-Dichloropropene	13	U	13	UJ	0.25	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	trans-1,3-Dichloropropene	12	U	12	UJ	0.22	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	trans-1,3-Dichloropropene	12	U	12	UJ	0.23	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	trans-1,3-Dichloropropene	15	U	15	UJ	0.28	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	trans-1,3-Dichloropropene	11	U	11	UJ	0.2	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	trans-1,3-Dichloropropene	11	U	11	UJ	0.22	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.18	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE177	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	trans-1,3-Dichloropropene	11	U	11	UJ	0.21	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	trans-1,3-Dichloropropene	12	U	12	UJ	0.23	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	trans-1,3-Dichloropropene	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.29	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Trichloroethene (TCE)	12	U	12	UJ	0.35	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.25	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.3	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Trichloroethene (TCE)	13	U	13	UJ	0.39	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Trichloroethene (TCE)	12	U	12	UJ	0.33	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.27	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.29	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.3	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.28	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Trichloroethene (TCE)	12	U	12	UJ	0.35	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.29	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Trichloroethene (TCE)	15	U	15	UJ	0.43	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.29	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Trichloroethene (TCE)	11	U	11	UJ	0.31	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.26	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Trichloroethene (TCE)	11	U	11	UJ	0.33	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.3	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.29	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.27	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.28	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Trichloroethene (TCE)	11	U	11	UJ	0.32	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Trichloroethene (TCE)	12	U	12	UJ	0.35	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Trichloroethene (TCE)	10	U	10	UJ	0.3	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.48	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Vinyl chloride	12	U	12	UJ	0.57	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.42	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.46	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.5	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Vinyl chloride	13	U	13	UJ	0.64	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Vinyl chloride	12	U	12	UJ	0.55	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.45	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.48	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.5	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.45	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.47	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Vinyl chloride	12	U	12	UJ	0.58	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.46	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.49	10	ug/Kg	SS

EXHIBIT 4

Change in Qualifier Through the Data Validation Process (All Records Including Data Re-analysis)

AOC H, Former NASD, Vieques, Puerto Rico

Matrix	Sample ID	Sample Type	LR Type	Analytical Method	Prep Method	Parameter	Lab Result	Lab Qual	Final Result	Final Qual	DL	RL	Units	DV Notes
SS	NDE009	N		SW8260B	SW5030	Vinyl chloride	15	U	15	UJ	0.71	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.48	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.46	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Vinyl chloride	11	U	11	UJ	0.51	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.43	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Vinyl chloride	11	U	11	UJ	0.55	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.46	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.5	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.48	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.45	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.47	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Vinyl chloride	11	U	11	UJ	0.53	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Vinyl chloride	12	U	12	UJ	0.58	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Vinyl chloride	10	U	10	UJ	0.49	10	ug/Kg	SS
SB	NDE010	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE019	N		SW8260B	SW5030	Xylenes, total	12	U	12	UJ	0.24	12	ug/Kg	SS
SB	NDE022	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.17	10	ug/Kg	SS
SS	NDE004	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE017	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE021	N		SW8260B	SW5030	Xylenes, total	13	U	13	UJ	0.27	13	ug/Kg	SS
SB	NDE006	N		SW8260B	SW5030	Xylenes, total	12	U	12	UJ	0.23	12	ug/Kg	SS
SB	NDE008	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE012	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE016	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.21	10	ug/Kg	SS
SB	NDE027	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SB	NDE029	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS
SB	NDE204	N		SW8260B	SW5030	Xylenes, total	12	U	12	UJ	0.24	12	ug/Kg	SS
SS	NDE005FD1	FD		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE007	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE009	N		SW8260B	SW5030	Xylenes, total	15	U	15	UJ	0.3	15	ug/Kg	SS
SS	NDE011	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE013	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE024FD1	FD		SW8260B	SW5030	Xylenes, total	11	U	11	UJ	0.21	11	ug/Kg	SS
SS	NDE026	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.18	10	ug/Kg	SS
SS	NDE028	N		SW8260B	SW5030	Xylenes, total	11	U	11	UJ	0.23	11	ug/Kg	SS
SS	NDE030	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE032	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.21	10	ug/Kg	SS
SS	NDE034	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS
SS	NDE037	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE177	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.19	10	ug/Kg	SS
SS	NDE178	N		SW8260B	SW5030	Xylenes, total	11	U	11	UJ	0.22	11	ug/Kg	SS
SS	NDE179	N		SW8260B	SW5030	Xylenes, total	12	U	12	UJ	0.24	12	ug/Kg	SS
SS	NDE015	N		SW8260B	SW5030	Xylenes, total	10	U	10	UJ	0.2	10	ug/Kg	SS

Vieques 4 RIFS
CH2M HILL
Chain of Custody Form

2308-243 cm

Project Site	AOC H											Project No. 171119
Project Manager	Marty Clasen											Lab Batch/SDG ID
Contact Tel No.	813-874-6522											
Contact Address	4350 W. Cypress Street, Suite 600, Tampa, FL 33607											Lab Tel No./Fax No.
Lab Name	PEL Laboratories, Inc.											813-247-2805 / 813-248-1537
Lab Contact	Eric Battista											
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619											

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_W	CPEST_W_L	CSVOL_W_L	DISSMET_W	EXP_W	PERC_W	Comments
1	NDAHGW01-R01	NDAHMW01	WG	09/08/2003 9:20	6	X	X	X	X	X	X	01
2	NDAHGW06-R01	NDAHMW06	WG	09/09/2003 9:30	6	X	X	X	X	X	X	02
3	NDAHGWFD01	NDAHMWFD01	WG	9/9/03 9:20	6	X	X	X	X	X	X	03

Sampled By: Isaac Lynch | Date/Time: 09/09/03 8:30 | Custody Seal: Y N | Relinquished By: Isaac Lynch | Date/Time: 09/09/03 14:00

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use):

Received By: [signature] | Date/Time: 9/10/03 12:45 | Custody Seal: Y / N | Relinquished By: | Date/Time:

Received By: | Date/Time: | Custody Seal: Y / N | Relinquished By: | Date/Time:

Remarks: TEMP@ARRIVAL 6.5, 7.1
pH<2

PEL Laboratories, Inc.
4420 Pendola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

230-006 ch

Company: CH2M HILL
Project Name/Number: VIEQUES AOC H
Address:
Project Manager: MARTY CLASEN
Phone: Fax:
Purchase Order:
Print Names(s) / Affiliation
Sampler(s) Signature(s)

Page of
DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:

Preservatives (see codes)

Analyses Requested

REQUESTED DUE DATE 10 / 22 / 03

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	OMET_SD	CPEST_SD	CSVOL_SD	EXP_SD	PERC_SD				Remarks	Lab. No.
	NDAHSD01-R01	9/~~30~~ 29/03	14:40		S	3	X	X	X	X	X					01
	NDAHSD02-R01	9/29/03	15:00		S	3	X	X	X	X	X					02
	NDAHSD03-R01	9/29/03	15:30		S	3	X	X	X	X	X					03
	NDAH SD04-R01	9/29/03	15:50		S	3	X	X	X	X	X					04
	NDAHSD05-R01	9/~~29~~ 30/03	9:50		S	3	X	X	X	X	X					05
	NDAHSD05R01MS	9/30/03	9:50		S	3	X	X	X	X	X					06
	NDAHSD05-R01MSD	9/30/03	9:50		S	3	X	X	X	X	X					07
	NDAHFD03P-R01	9/29/03	14:40		S	3	X	X	X	X	X					08

Shipment Method | 24 ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.					[signature] / PEL	10/01/03	10:40
Additional Comments:								
TEMP @ ARRIVAL 4.4, 4.8c								

Cooler No. (s) / Temperature(s) (C) | Sampling Kit No. | Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

Vieques 4 RIFS
CH2M HILL
Chain of Custody Form

2310 - 003 ar

Project Site	AOC H
Project Manager	Marty Clasen
Contact Tel No.	813-874-6522
Contact Address	4350 W. Cypress Street, Suite 600, Tampa, FL 33607
Lab Name	PEL Laboratories, Inc.
Lab Contact	Eric Battista
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619
Project No.	171119
Lab Batch/SDG ID	
Lab Tel No./Fax No.	813-247-2805 / 813-248-1537

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_W	CPEST_W_L	CSVOL_W	DISSMET_W	EXP_W	PERC_W	CMET_SD	CPEST_SD	CSVOL_SD	EXP_SD	PERC_SD		Comments
1	NDAHSW01-R01	NDAHSW01	WS	9/30/03 1200	18	X	X	X	X	X	X							Use Extra Samples for MS/MSD 01, 02, 03
2	NDAHSW02-R01	NDAHSW02	WS	9/30/03 1135	6	X	X	X	X	X	X							Conductivity for all water samples is 40 04
3	NDAHSW03-R01	NDAHSW03	WS	9/30/03 1110	6	X	X	X	X	X	X							mS/cm. 05
4	NDAHSW04-R01	NDAHSW04	WS	9/30/03 1040	6	X	X	X	X	X	X							06
* 5	NDAHSD05-R01	NDAHSD05	SD	9/30/03 0950	9							X	X	X	X	X		Use Extra Samples for MS/MSD
6	NDAHFD02P-R01	NDAHSW03	WS	9/30/03 1200	6	X	X	X	X	X	X							07
7	NDW06SWAB01-03	FIELDQC	WQ	9/30/03 0915	6	X	X	X	X	X	X							SEE ATTACHED FOR ADDITIONAL ANALYSIS 08
8	NDW06SWEB~~01~~02-03	FIELDQC	WQ	9/30/03 0845	6	X	X	X	X	X	X							" " 09
9	02 AW																	
10	10.2.03																	
11																		

Sampled By: Rick Gorsira/Isaac Lynch | Date/Time: 9/30/03 1330 | Custody Seal: Y/N | Relinquished By: [signature] | Date/Time: 9/30/03 1300

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use): TEMP@ ARRIVAL 4.4, 4.4, 4.8, 5.0, 5.1C pH<2 (6010, 8260)

Received By: [signature] | Date/Time: 10/01/03 10:40 | Custody Seal: Y / N | Relinquished By: | Date/Time:

Received By: | Date/Time: | Custody Seal: Y / N | Relinquished By: | Date/Time:

Remarks: NDAHSD05 IS ACTUALLY A SURFACE SOIL SAMPLE. No water present in canal ditch south of the bridge.

* Sample NDAHSD05-RØ1 reported on SDG Z310-ØØ6. BD

PEL Laboratories, Inc.

4420 P[illegible]ola Point Road
Tampa, Florida 33619
(813) 247-2805 • Fax: (813) 248-1537
E-Mail: login@Pelab.com

Chain of Custody Record
Record/Work Request

2310-003

Company: CH2M HILL	Project Name/Number: VIEQUES AOC H
Address: MARTY CLASEN	Project Manager:
Phone: Fax:	Purchase Order:

Page of

DEP Form #: 62-770.900(2)
Form Title: Chain of Custody Record
Effective Date: September 23, 1997
FDEP Facility No.
Project Name:
Sampling CompQAP No:
Approval Date:
REQUESTED DUE DATE 10 / 22 / 03

Print Names(s) / Affiliation

Sampler(s) Signature(s)

Preservatives (see codes) / Analyses Requested

Item No.	Field ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number of Containers	301 ALK	310.1 DISS ALK	375.4, 325.2, 353.2, 354.1, 365.2 (...)	DISSOLVED WET CHEM	8260	PCB			Remarks	Lab. No.
	NDW06SWEB02-R0	09/30/03	0945		W	13	X	X	X	X	X	X				09
	NDW06SWAB01-R01	09/30/03	0915		W	11		X		X	X	X				08

Shipment Method | 24 | ← Total Number of Containers

Out: / /	Via:	Item Nos.	Relinquished by / Affiliations	Date	Time	Accepted by / Affiliation	Date	Time
Returned: / /	Via.					[illegible signature] / PEL	10/01/03	10:40

Additional Comments:
pH<2
TEMP@ARRIVAL 4.6, 5.1C

Cooler No. (s) / Temperature(s) (C)	Sampling Kit No.	Equipment ID No.

MATRIX CODES: A = Air GW = Groundwater SE = Sediment SO = Soil SW = Surface Water W = Water (Blanks) O = Other (specify)

PRESERVATION CODES: H-Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

1 of 3

Vieques 4 RIFS

CH2M HILL

Chain of Custody Form

2308-098 CM

Project Site	AOC H	Project No.	171119
Project Manager	Marty Clasen	Lab Batch/SDG ID	
Contact Tel No.	813-874-6522		
Contact Address	4350 W. Cypress Street, Suite 600, Tampa, FL 33607	Lab Tel No./Fax No.	
Lab Name	PEL Laboratories, Inc.		813-247-2805 / 813-248-1537
Lab Contact	Eric Battista		
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619		

Analysis Requested

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_SO	CPEST_SO	CSVOL_SO, EXP_SO	PERC_SO	CMET_W	CPEST_W	CSVOL_W	EXP_W	PERC_W				Comments	
1	NDAHSB17-R01	NDAHSB17	SB	8/26/03 @ 1010	3	X	X	X	X										01
2	NDAHSB18-R01	NDAHSB18	SB	1025	3	X	X	X	X										02
3	NDAHSB19-R01	NDAHSB19	SB	1035	3	X	X	X	X										03
4	NDAHSB20-R01	NDAHSB20	SB	0915	9	X	X	X	X									Use Extra Samples for MS/M	04
5	NDAHSB21-R01	NDAHSB21	SB	0910	3	X	X	X	X										05
6	NDAHSB22-R01	NDAHSB22	SB	0900	3	X	X	X	X										06
7	NDAHSB23-R01	NDAHSB23	SB	0855	3	X	X	X	X										07
8	NDAHSB24-R01	NDAHSB24	SB	0840	3	X	X	X	X										08
9	NDAHSB25-R01	NDAHSB25	SB	0830	3	X	X	X	X										09
10	NDAHSB26-R01	NDAHSB26	SB	0815	3	X	X	X	X										10
11	NDAHSB27-R01	NDAHSB27	SB	0930	3	X	X	X	X										11

Sampled By: Rick Garsira Date/Time: 8/26/03 @ 1410 Custody Seal: Y/N Relinquished By: 8/26/03 Rick [illegible] Date/Time: 15

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use): TEMP @ ARRIVAL 2.6, 2.8, 3.5, 4.2, 4.2C

Received By: Aaron M[illegible] Date/Time: 8/27/03 11:00 Custody Seal: Y / N Relinquished By: Date/Time:

Received By: Date/Time: Custody Seal: Y / N Relinquished By: Date/Time:

Remarks: MS/MSD NOTED BUT NOT REC'D FOR SAMPLE 04.

Vieques 4 RIFS
CH2M HILL
Chain of Custody Form

2308098cm

Project Site	AOC H
Project Manager	Marty Clasen
Contact Tel No.	813-874-6522
Contact Address	33607
Lab Name	PEL Laboratories, Inc.
Lab Contact	Eric Battista
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619
Project No.	171119
Lab Batch/SDG ID	
Lab Tel No./Fax No.	813-247-2805 / 813-248-1537

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_SO	CPEST_SO	CSVOL_SO, EXP_SO	PERC_SO	CMET_W	CPEST_W	CSVOL_W	EXP_W	PERC_W				Comments
1	NDAHSB28-R01	NDAHSB28	SB	8/26/03@0945	9	X	X	X	X									Use Extra Samples for MS/MS 12,13,14
2	NDAHSB29-R01	NDAHSB29	SB	1000	3	X	X	X	X									15
3	NDAHSS17-R01	NDAHSS17	SS	1000	3	X	X	X	X									16
4	NDAHSS18-R01	NDAHSS18	SS	1015	3	X	X	X	X									17
5	NDAHSS19-R01	NDAHSS19	SS	1020	3	X	X	X	X									18
6	NDAHSS20-R01	NDAHSS20	SS	0900	3	X	X	X	X									19
7	NDAHSS21-R01	NDAHSS21	SS	0855	3	X	X	X	X									20
8	NDAHSS22-R01	NDAHSS22	SS	0835	3	X	X	X	X									
9	NDAHSS23-R01	NDAHSS23	SS	0845	3	X	X	X	X									
10	NDAHSS24-R01	NDAHSS24	SS	0830	3	X	X	X	X									
11	NDAHSS25-R01	NDAHSS25	SS	0820	3	X	X	X	X									

Sampled By: Rick Gorsira Date/Time: 8/26/03@1410 Custody Seal: Y / N Relinquished By: Rick Gorsira Date/Time: 8/26/03

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use):

Received By: [signature] Date/Time: 8/27/03 11:00 Custody Seal: Y / N Relinquished By: Date/Time:

Received By: Date/Time: Custody Seal: Y / N Relinquished By: Date/Time:

Remarks:

Vieques 4 RIFS

CH2M HILL

Chain of Custody Form

2308-098cm

Project Site	AOC H
Project Manager	Marty Clasen
Contact Tel No.	813-874-6522
Contact Address	33607
Lab Name	PEL Laboratories, Inc.
Lab Contact	Eric Battista
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619

Project No.	171119
Lab Batch/SDG ID	
Lab Tel No./Fax No.	813-247-2805 / 813-248-1537

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_SO	CPEST_SO	CSVOL_SO, EXP_SO	PERC_SO	CMET_W	CPEST_W	CSVOL_W	EXP_W	PERC_W				Comments
1	NDAHSS26-R01	NDAHSS26	SS	8/26/03@0815	3	X	X	X	X									
2	NDAHSS27-R01	NDAHSS27	SS	0910	3	X	X	X	X									
3	NDAHSS28-R01	NDAHSS28	SS	0915	9	X	X	X	X									Use Extra Samples for MS/M
4	NDAHSS29-R01	NDAHSS29	SS	0950	3	X	X	X	X									
5	NDAHFD04P-R01	NDAHSS20	SS	0900	3	X	X	X	X									
6	NDAHFD05P-R01	NDAHSB20	SB	0915	3	X	X	X	X									
7	NDAHFD06P-R01	NDAHSS27	SS	0910	3	X	X	X	X									
8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]					X	X	X	X	X				
9	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]					X	X	X	X	X				
10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]					X	X	X	X	X				
11																		

Sampled By: Rick Gorsira | Date/Time: 8/26/03 @ [illegible] | Custody Seal: Y / N | Relinquished By: Rick Gorsira | Date/Time: 8/26/03

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use):

Received By: [illegible signature] | Date/Time: 8/27/03 11:00 | Custody Seal: Y / N | Relinquished By: | Date/Time:

Received By: | Date/Time: | Custody Seal: Y / N | Relinquished By: | Date/Time:

Remarks:

3

Vieques 4 RIFS

CH2M HILL

Chain of Custody Form 2308-099cr

Project Site	AOC H
Project Manager	Marty Clasen
Contact Tel No.	813-874-6522
Contact Address	33607
Lab Name	PEL Laboratories, Inc.
Lab Contact	Eric Battista
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619

Project No. 171119

Lab Batch/SDG ID

Lab Tel No./Fax No. 813-247-2805 / 813-248-1537

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_SO	CPEST_SO	CSVOL_SO, EXP_SO	PERC_SO	CMET_W	CPEST_W	CSVOL_W	EXP_W	PERC_W				Comments	
1	NDAHSB28-R01	NDAHSB28	SB	8/26/03@0945	9	X	X	X	X									Use Extra Samples for MS/MS	
2	NDAHSB29-R01	NDAHSB29	SB	1000 ~~[illegible]~~	3	X	X	X	X										
3	NDAHSS17-R01	NDAHSS17	SS	1000 ~~[illegible]~~	3	X	X	X	X										
4	NDAHSS18-R01	NDAHSS18	SS	1015	3	X	X	X	X										
5	NDAHSS19-R01	NDAHSS19	SS	1020	3	X	X	X	X										
6	NDAHSS20-R01	NDAHSS20	SS	0900	3	X	X	X	X										
7	NDAHSS21-R01	NDAHSS21	SS	0855	3	X	X	X	X										
8	NDAHSS22-R01	NDAHSS22	SS	0835	3	X	X	X	X										01
9	NDAHSS23-R01	NDAHSS23	SS	0845	3	X	X	X	X										02
10	NDAHSS24-R01	NDAHSS24	SS	0830	3	X	X	X	X										03
11	NDAHSS25-R01	NDAHSS25	SS	0820	3	X	X	X	X										04

Sampled By: Rick Gasira Date/Time: 8/26/03@1100 Custody Seal: Y / N Relinquished By: Rick Gasira Date/Time: 8/26/03

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use):

Received By: [signature] Date/Time: 8/27/03 11:00 Custody Seal: Y / N Relinquished By: Date/Time:

Received By: Date/Time: Custody Seal: Y / N Relinquished By: Date/Time:

Remarks:

F3

Vieques 4 RIFS

CH2M HILL

Chain of Custody Form

2308-099cm

Project Site	AOC H	Project No.	171119
Project Manager	Marty Clasen	Lab Batch/SDG ID	
Contact Tel No.	813-874-6522		
Contact Address	33607	Lab Tel No./Fax No.	
Lab Name	PEL Laboratories, Inc.	813-247-2805 / 813-248-1537	
Lab Contact	Eric Battista		
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619		

Analysis Requested

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_SO	CPEST_SO	CSVOL_SO, EXP_SO	PERC_SO	CMET_W	CPEST_W	CSVOL_W	EXP_W	PERC_W				Comments	
1	NDAHSS26-R01	NDAHSS26	SS	8/26/03@0815	3	X	X	X	X										05
2	NDAHSS27-R01	NDAHSS27	SS	0910	3	X	X	X	X										06
3	NDAHSS28-R01	NDAHSS28	SS	0915	9	X	X	X	X									Use Extra Samples for MS/MSD	07,08,09
4	NDAHSS29-R01	NDAHSS29	SS	0950	3	X	X	X	X										10
5	NDAHFD04P-R01	NDAHSS20	SS	0900	3	X	X	X	X										11
6	NDAHFD05P-R01	NDAHSB20	SB	0915	3	X	X	X	X										12
7	NDAHFD06P-R01	NDAHSS27	SS	0910	3	X	X	X	X										13
8	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]					X	X	X	X	X					
9	[redacted]	[redacted]	[redacted]	[redacted]						X	X	X	X	X					
10	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]					X	X	X	X	X					
11																			

Sampled By: Rick Gorsira | Date/Time: 8/26/03@1600 | Custody Seal: (Y)/N | Relinquished By: Rick Gorsira | Date/Time: 8/26/03

Shipped Via: UPS (FedEx) Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use):

Received By: Cameron Alexandris | Date/Time: 8/27/03 11:00 | Custody Seal: Y / N | Relinquished By: | Date/Time:

Received By: | Date/Time: | Custody Seal: Y / N | Relinquished By: | Date/Time:

Remarks:

Vieques 4 RIFS
CH2M HILL
Chain of Custody Form

2308-099

Project Site	AOC H
Project Manager	Marty Clasen
Contact Tel No.	813-874-6522
Contact Address	4350 W. Cypress Street, Suite 600, Tampa, FL 33607
Lab Name	PEL Laboratories, Inc.
Lab Contact	Eric Battista
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619

Project No. 171119

Lab Batch/SDG ID

Lab Tel No./Fax No. 813-247-2805 / 813-248-1537

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_SO	CPEST_SO	CSVOL_SO, EXP_SO	PERC_SO	CMET_W	CPEST_W	CSVOL_W	EXP_W	PERC_W				Comments
1	NDAHSB17-R01	NDAHSB17	SB	8/26/03 @ 1010	3	X	X	X	X									
2	NDAHSB18-R01	NDAHSB18	SB	1025	3	X	X	X	X									
3	NDAHSB19-R01	NDAHSB19	SB	1035	3	X	X	X	X									
4	NDAHSB20-R01	NDAHSB20	SB	0915	9	X	X	X	X									Use Extra Samples for MS/M
5	NDAHSB21-R01	NDAHSB21	SB	0910	3	X	X	X	X									
6	NDAHSB22-R01	NDAHSB22	SB	0900	3	X	X	X	X									
7	NDAHSB23-R01	NDAHSB23	SB	0855	3	X	X	X	X									
8	NDAHSB24-R01	NDAHSB24	SB	0840	3	X	X	X	X									
9	NDAHSB25-R01	NDAHSB25	SB	0830	3	X	X	X	X									
10	NDAHSB26-R01	NDAHSB26	SB	0815	3	X	X	X	X									
11	NDAHSB27-R01	NDAHSB27	SB	0930	3	X	X	X	X									

Sampled By: Rick Gasiria | Date/Time: 8/26/03 @1415 | Custody Seal: Y N | Relinquished By: 8/26/03 Rick Cook | Date/Time: 15

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use): TEMP @ ARRIVAL 2.6, 2.8, 3.5, 4.2, 4.2C

Received By: Aaron Markovic | Date/Time: 8/27/03 11:00 | Custody Seal: Y / N | Relinquished By: | Date/Time:

Received By: | Date/Time: | Custody Seal: Y / N | Relinquished By: | Date/Time:

Remarks:

Vieques 4 RIFS

CH2M HILL

Chain of Custody Form

2308-230cm

Project Site	AOC H	Project No.	171119
Project Manager	Marty Clasen	Lab Batch/SDG ID	
Contact Tel No.	813-874-6522		
Contact Address	4350 W. Cypress Street, Suite 600, Tampa, FL 33607		
Lab Name	PEL Laboratories, Inc.	Lab Tel No./Fax No.	
Lab Contact	Eric Battista	813-247-2805 / 813-248-1537	
Lab Address	4420 Pendola Point Rd. Tampa, FL 33619		

Analysis Requested

Item	Sample ID	Station ID	Matrix	Date & Time Collected	Number of Containers	CMET_W	CPEST_W_L	CSVOL_W_L	DISSMET_W	EXP_W	PERC_W	PCB	VOC	Comments
~~1~~	~~NDAHGW01-R01~~	~~NDAHMW01~~	~~WG~~		~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	FS		
2	NDAHGW02-R01	NDAHMW02	WG	9-8-03 12:50	6	X	X	X	X	X	X			01
3	NDAHGW05-R01	NDAHMW05	WG	9-8-03 11:05	6	X	X	X	X	X	X			02
~~4~~	~~NDAHGW06-R01~~	~~NDAHMW06~~	~~WG~~		~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	FS		
5	NDAHGW07-R01	NDAHMW07	WG	09/07/2003 16:50	18	X	X	X	X	X	X			Use Extra Samples for MS/MSD 03,04,05
~~6~~	~~NDAHFD01P-R01~~	~~NDAHMW01~~	~~WG~~		~~6~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			FS
7	NADHGWTB01-03	FIELDQC	WQ	09/08/2003	3								X	06
8	NADHGWEB01	FIELDQC	WQ	09/08/2003 7:30	10	X	X	X	X	X	X	X	X	07
9	NADHGWAB01	FIELDQC	WQ	09/08/2003 7:35	10	X	X	X	X	X	X	X	X	08
10														
11														

Sampled By: ISAAC LYNCH | Date/Time: 9/8/03 9:30 | Custody Seal: Y / N | Relinquished By: ISAAC LYNCH | Date/Time: 9/8/03 14:00

Shipped Via: UPS FedEx Hand Other (Please specify):

Samples Temperature and Condition Upon Receipt (for lab's use): Temp@ Arrival 2.5, 2.8, 2.8, 2.6, 3.1, 3.5, 3.5, 3.7, 4.0, 4.6 pH<2

Received By: Athelan Meynadié | Date/Time: 9/9/03 10:45 | Custody Seal: Y / N | Relinquished By: | Date/Time:

Received By: | ~~Date/Time:~~ | ~~Custody Seal: Y / N~~ | ~~Relinquished By:~~ | Date/Time:

Remarks: Equipment and Ambient Blanks taken in AOCH should also be used as blanks for all sites tested [redacted](These sites Include SWMU7 and AOCE) SWM6 + AOCE FS.

Sample Method 3.2 (Ground H2O)

Headspace > 5mm (Sample 6, 3, 8)

APPENDIX H ADDENDUM
Internal Email, STL Inc.
Former NASD, Vieques, Puerto Rico

-----Original Message-----
From: lpenfold@stl-inc.com [mailto:lpenfold@stl-inc.com]
Sent: Tuesday, December 30, 2003 3:46 PM
To: cknudsen@stl-inc.com; rburrows@stl-inc.com; Walker, Deborah D
Cc: rfrederici@stl-inc.com; ccarter@stl-inc.com
Subject: Perchlorate in Lab Detergents

We have tested two different lots of Alconox, one supplied by USACE/CX and one from a box that we had in the lab. We also tested a brand of liquid lab detergent that we use more frequently these days called NeuTrad (made by Decon Laboratories).

<u>STL's Alconox Detergent</u>
We tested the supply from our own lab by IC/UV (314.0) and LC/MS/MS). We prepared the sample by dissolving 10g of powdered Alconox in 100 mL, with subsequent dilutions as needed. The effective final dilution for the Alconox analyzed by LC/MS/MS was 5,000x. The final perchlorate result was 2.5 mg/kg, which is orders of magnitude above our reporting limit.

<u>USACE Alconox Detergent</u>
The Alconox sample provided by CX was tested by LC/MS/MS alone. We reported the final result as "ND", i.e, non-detect, but there may have been some perchlorate there. It produced a tiny peak below our long-term MDL. The tiny peak had all the requisite ions (mass 99 transition to 83 and mass 101 transition to 85), but the quantitiation was too unreliable to accurately calculate ion ratios (part of the qualitative control of our procedure).

<u>STL's NeuTrad Detergent</u>
We analyzed a sample of this material by LC/MS/MS at the same time that the USACE Alconox was tested. The NeuTrad detergent produced a confirmed postive result just a bit lower than our Alconox sample (approximately 1.5 mg/kg if I remember correctly).

All of the mass spectrometer qualitative criteria were met. There were no apparent interfences. All associated QC was excellent. There is no doubt in my mind that there is perchlorate in some lab detergents. Apparently the perchlorate concentrations can vary by orders of magnitude. Here at STL Denver, this did not lead to any changes in our procedures. We never were using labware washed in soap and water, instead we use disposable bottles for sample collection and disposable tubes for storing dilutions and standards. However, it might be something to assess at other labs. Please feel free to share this information.

APPENDIX I

Criteria Tables

APPENDIX I

Ecological Screening Values for Surface Soil

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
1,2,4-Trichlorobenzene	20	mg/kg	Efroymson, 1997a
1,2-Dichloroethane	4	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
1,2-Dichloropropane	700	mg/kg	Efroymson, 1997a
1,4-Dichlorobenzene	20	mg/kg	Efroymson, 1997a
2,4,5-Trichlorophenol	4	mg/kg	Efroymson, 1997b
2,4,6-Trichlorophenol	10	mg/kg	Efroymson, 1997a
2,4-Dinitrophenol	20	mg/kg	Efroymson, 1997b
3-Chloropropene (Allyl chloride)	7	mg/kg	Efroymson, 1997b
4,4`-DDD	0.0025	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
4,4`-DDE	0.0025	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
4,4`-DDT	0.0025	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
4-Nitrophenol	7	mg/kg	Efroymson, 1997a
Acenaphthene	20	mg/kg	Efroymson, 1997b
Acrylonitrile	1000	mg/kg	Efroymson, 1997a
Aldrin	0.0025	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
alpha-BHC	0.0025	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Aluminum	50	mg/kg	Efroymson, 1997b
Anthracene	0.1	mg/kg	Beyer, 1990
Antimony	5	mg/kg	Efroymson, 1997b
Aroclor-1016	40	mg/kg	Efroymson, 1997b
Aroclor-1221	40	mg/kg	Efroymson, 1997b
Aroclor-1232	40	mg/kg	Efroymson, 1997b
Aroclor-1242	40	mg/kg	Efroymson, 1997b
Aroclor-1248	40	mg/kg	Efroymson, 1997b
Aroclor-1254	40	mg/kg	Efroymson, 1997b
Aroclor-1260	40	mg/kg	Efroymson, 1997b
Aroclor-1268	40	mg/kg	Efroymson, 1997b
Arsenic	10	mg/kg	Efroymson, 1997b
Atrazine	0.00005	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Barium	500	mg/kg	Efroymson, 1997b
Benzene	0.05	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Benzo(a)pyrene	0.1	mg/kg	Beyer, 1990
Benzo(g,h,i)perylene	1	mg/kg	Beyer, 1990
Beryllium	10	mg/kg	Efroymson, 1997b

APPENDIX I
Ecological Screening Values for Surface Soil
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
beta-BHC	0.001	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Cadmium	4	mg/kg	Efroymson, 1997b
Carbon tetrachloride	1000	mg/kg	Efroymson, 1997a
Chlorobenzene	40	mg/kg	Efroymson, 1997a
Chromium	0.4	mg/kg	Efroymson, 1997a
Chromium, hexavalent	0.4	mg/kg	Efroymson, 1997a
Cobalt	20	mg/kg	Efroymson, 1997b
Copper	50	mg/kg	Efroymson, 1997a
Cyclohexane	0.1	mg/kg	Beyer, 1990
Dieldrin	0.0005	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Diethylphthalate	100	mg/kg	Efroymson, 1997b
Dimethylphthalate	200	mg/kg	Efroymson, 1997a
Di-n-butylphthalate	200	mg/kg	Efroymson, 1997b
Endrin	0.001	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Endrin aldehyde	0.1	mg/kg	Beyer, 1990
Endrin ketone	0.1	mg/kg	Beyer, 1990
Ethylbenzene	0.05	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Fluoranthene	0.1	mg/kg	Beyer, 1990
Fluorene	30	mg/kg	Efroymson, 1997a
gamma-BHC (Lindane)	0.00005	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Hexachlorobenzene	1000	mg/kg	Efroymson, 1997a
Hexachlorocyclopentadiene	10	mg/kg	Efroymson, 1997b
Iron	200	mg/kg	Efroymson, 1997a
Lead	50	mg/kg	Efroymson, 1997b
Manganese	100	mg/kg	Efroymson, 1997a
Mercury	0.1	mg/kg	Efroymson, 1997a
Naphthalene	0.1	mg/kg	Beyer, 1990
Nickel	30	mg/kg	Efroymson, 1997b
Nitrobenzene	40	mg/kg	Efroymson, 1997a
N-Nitrosodiphenylamine	20	mg/kg	Efroymson, 1997a
Pentachlorobenzene	20	mg/kg	Efroymson, 1997a
Pentachlorophenol	3	mg/kg	Efroymson, 1997b
Phenanthrene	0.1	mg/kg	Beyer, 1990
Phenol	30	mg/kg	Efroymson, 1997a

APPENDIX I

Ecological Screening Values for Surface Soil

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
Pyrene	0.1	mg/kg	Beyer, 1990
Pyridine	0.1	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Selenium	1	mg/kg	Efroymson, 1997b
Silver	2	mg/kg	Efroymson, 1997b
Styrene	300	mg/kg	Efroymson, 1997b
Tetrachloroethene	0.01	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Thallium	1	mg/kg	Efroymson, 1997b
Tin	50	mg/kg	Efroymson, 1997b
Titanium	1000	mg/kg	Efroymson, 1997a
Toluene	200	mg/kg	Efroymson, 1997b
trans-1,4-Dichloro-2-butene	1000	mg/kg	Efroymson, 1997a
Trichloroethene	0.001	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Vanadium	2	mg/kg	Efroymson, 1997b
Vinyl chloride	0.1	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Xylene (total)	0.05	mg/kg	Ministry of Housing, Spatial Planning and Environment, 1994
Zinc	50	mg/kg	Efroymson, 1997b

APPENDIX I

Ecological Screening Values for Surface Water

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
1,1,1-Trichloroethane	200	ug/L	Puerto Rico Water Quality Standard, 2003
1,1,2,2-Tetrachloroethane	1.7	ug/L	Puerto Rico Water Quality Standard, 2003
1,1,2-Trichloroethane	6	ug/L	Puerto Rico Water Quality Standard, 2003
1,1-Dichloroethene	0.57	ug/L	Puerto Rico Water Quality Standard, 2003
1,2,4-Trichlorobenzene	260	ug/L	Puerto Rico Water Quality Standard, 2003
1,2-Dichlorobenzene	2700	ug/L	Puerto Rico Water Quality Standard, 2003
1,2-Dichloroethane	3.8	ug/L	Puerto Rico Water Quality Standard, 2003
1,2-Dichloroethene (total)	700	ug/L	Puerto Rico Water Quality Standard, 2003
1,2-Dichloropropane	5.2	ug/L	Puerto Rico Water Quality Standard, 2003
1,2-Diphenylhydrazine	0.4	ug/L	Puerto Rico Water Quality Standard, 2003
1,3-Dichlorobenzene	400	ug/L	Puerto Rico Water Quality Standard, 2003
1,4-Dichlorobenzene	400	ug/L	Puerto Rico Water Quality Standard, 2003
2,4,6-Trichlorophenol	21	ug/L	Puerto Rico Water Quality Standard, 2003
2,4-Dichlorophenol	93	ug/L	Puerto Rico Water Quality Standard, 2003
2,4-Dimethylphenol	540	ug/L	Puerto Rico Water Quality Standard, 2003
2,4-Dinitrophenol	70	ug/L	Puerto Rico Water Quality Standard, 2003
2,4-Dinitrotoluene	0.11	ug/L	Puerto Rico Water Quality Standard, 2003
2-Chloronaphthalene	1700	ug/L	Puerto Rico Water Quality Standard, 2003
2-Chlorophenol	120	ug/L	Puerto Rico Water Quality Standard, 2003
3,3`-Dichlorobenzidine	0.4	ug/L	Puerto Rico Water Quality Standard, 2003
4,4`-DDT	0.001	ug/L	National Recommended Water Quality Criteria, EPA 2002
4,4'-DDT, Dissolved	0.001	ug/L	National Recommended Water Quality Criteria, EPA 2002
Acenaphthene	1200	ug/L	Puerto Rico Water Quality Standard, 2003
Acrolein	320	ug/L	Puerto Rico Water Quality Standard, 2003
Acrylonitrile	0.59	ug/L	Puerto Rico Water Quality Standard, 2003
Aldrin	0.0014	ug/L	Puerto Rico Water Quality Standard, 2003
Anthracene	9600	ug/L	Puerto Rico Water Quality Standard, 2003
Antimony	4300	ug/L	Puerto Rico Water Quality Standard, 2003
Antimony, Dissolved	4300	ug/L	Puerto Rico Water Quality Standard, 2003
Aroclor-1016	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1016, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1221	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1221, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1232	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1232, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1242	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1242, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1248	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1248, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1254	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1254, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1260	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1260, Dissolved	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Aroclor-1268	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Arsenic	1.4	ug/L	Puerto Rico Water Quality Standard, 2003
Arsenic, Dissolved	1.4	ug/L	Puerto Rico Water Quality Standard, 2003
Azinphos methyl (Guthion)	0.01	ug/L	Puerto Rico Water Quality Standard, 2003
Benzene	12	ug/L	Puerto Rico Water Quality Standard, 2003

APPENDIX I
Ecological Screening Values for Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
Benzidine	0.0012	ug/L	Puerto Rico Water Quality Standard, 2003
Benzo(a)anthracene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
Benzo(a)pyrene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
Benzo(b)fluoranthene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
Benzo(k)fluoranthene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
bis(2-Chloroethyl)ether	0.31	ug/L	Puerto Rico Water Quality Standard, 2003
bis(2-Ethylhexyl)phthalate	18	ug/L	Puerto Rico Water Quality Standard, 2003
Bromoform	43	ug/L	Puerto Rico Water Quality Standard, 2003
Butylbenzylphthalate	3000	ug/L	Puerto Rico Water Quality Standard, 2003
Cadmium	9.3	ug/L	Puerto Rico Water Quality Standard, 2003
Cadmium, Dissolved	9.3	ug/L	Puerto Rico Water Quality Standard, 2003
Carbon tetrachloride	2.5	ug/L	Puerto Rico Water Quality Standard, 2003
Chlordane	0.004	ug/L	National Recommended Water Quality Criteria, EPA 2002
Chlorobenzene	680	ug/L	Puerto Rico Water Quality Standard, 2003
Chloroform	57	ug/L	Puerto Rico Water Quality Standard, 2003
Chlorpyrifos (Dursban)	0.0056	ug/L	National Recommended Water Quality Criteria, EPA 2002
Chromium	50.4	ug/L	National Recommended Water Quality Criteria, EPA 2002
Chromium, Dissolved	50	ug/L	National Recommended Water Quality Criteria, EPA 2002
Chromium, hexavalent	50	ug/L	National Recommended Water Quality Criteria, EPA 2002
Chrysene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
Copper	3.7	ug/L	National Recommended Water Quality Criteria, EPA 2002
Copper, Dissolved	3.1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Coumaphos	0.01	ug/L	Puerto Rico Water Quality Standard, 2003
Cyanide	1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Cyanide, Total	1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Demeton O	0.1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Demeton O & S	0.1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Demeton S	0.1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Dibenz(a,h)anthracene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
Dibromochloromethane	5.6	ug/L	Puerto Rico Water Quality Standard, 2003
Dieldrin	0.0014	ug/L	Puerto Rico Water Quality Standard, 2003
Dieldrin, Dissolved	0.0014	ug/L	Puerto Rico Water Quality Standard, 2003
Diethylphthalate	23000	ug/L	Puerto Rico Water Quality Standard, 2003
Dimethylphthalate	313000	ug/L	Puerto Rico Water Quality Standard, 2003
Di-n-butylphthalate	2700	ug/L	Puerto Rico Water Quality Standard, 2003
Endosulfan I	0.056	ug/L	National Recommended Water Quality Criteria, EPA 2002
Endosulfan II	0.056	ug/L	National Recommended Water Quality Criteria, EPA 2002
Endrin	0.0023	ug/L	National Recommended Water Quality Criteria, EPA 2002
Ethylbenzene	3100	ug/L	Puerto Rico Water Quality Standard, 2003
Fenthion	40	ug/L	Puerto Rico Water Quality Standard, 2003
Fluoranthene	300	ug/L	Puerto Rico Water Quality Standard, 2003
Fluorene	1300	ug/L	Puerto Rico Water Quality Standard, 2003
gamma-BHC (Lindane)	0.16	ug/L	Puerto Rico Water Quality Standard, 2003
Heptachlor	0.0021	ug/L	Puerto Rico Water Quality Standard, 2003
Heptachlor epoxide	0.0036	ug/L	National Recommended Water Quality Criteria, EPA 2002
Hexachlorobenzene	0.0075	ug/L	Puerto Rico Water Quality Standard, 2003
Hexachlorobutadiene	4.4	ug/L	Puerto Rico Water Quality Standard, 2003
Hexachlorocyclopentadiene	240	ug/L	Puerto Rico Water Quality Standard, 2003

APPENDIX I
Ecological Screening Values for Surface Water
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
Hexachloroethane	19	ug/L	Puerto Rico Water Quality Standard, 2003
Indeno(1,2,3-cd)pyrene	0.044	ug/L	Puerto Rico Water Quality Standard, 2003
Isophorone	360	ug/L	Puerto Rico Water Quality Standard, 2003
Lead	8.1	ug/L	Puerto Rico Water Quality Standard, 2003
Lead, Dissolved	8.1	ug/L	Puerto Rico Water Quality Standard, 2003
Malathion	0.1	ug/L	National Recommended Water Quality Criteria, EPA 2002
Mercury	0.051	ug/L	Puerto Rico Water Quality Standard, 2003
Mercury, Dissolved	0.051	ug/L	Puerto Rico Water Quality Standard, 2003
Methoxychlor	0.03	ug/L	National Recommended Water Quality Criteria, EPA 2002
Methylene chloride	470	ug/L	Puerto Rico Water Quality Standard, 2003
Mirex	0.001	ug/L	National Recommended Water Quality Criteria, EPA 2002
Nickel	8.2	ug/L	Puerto Rico Water Quality Standard, 2003
Nickel, Dissolved	8.2	ug/L	Puerto Rico Water Quality Standard, 2003
Nitrobenzene	17	ug/L	Puerto Rico Water Quality Standard, 2003
Nitrogen	5000	ug/L	Puerto Rico Water Quality Standard, 2003
N-Nitrosodimethylamine	0.0069	ug/L	Puerto Rico Water Quality Standard, 2003
N-Nitroso-di-n-propylamine	0.05	ug/L	Puerto Rico Water Quality Standard, 2003
N-Nitrosodiphenylamine	50	ug/L	Puerto Rico Water Quality Standard, 2003
Pentachlorophenol	7.9	ug/L	Puerto Rico Water Quality Standard, 2003
Phenol	21000	ug/L	Puerto Rico Water Quality Standard, 2003
Pyrene	960	ug/L	Puerto Rico Water Quality Standard, 2003
Selenium	71	ug/L	National Recommended Water Quality Criteria, EPA 2002
Selenium, Dissolved	71	ug/L	National Recommended Water Quality Criteria, EPA 2002
Silver	1.9	ug/L	Puerto Rico Water Quality Standard, 2003
Silver, Dissolved	1.9	ug/L	Puerto Rico Water Quality Standard, 2003
Sulfide	2	ug/L	Puerto Rico Water Quality Standard, 2003
Tetrachloroethene	8	ug/L	Puerto Rico Water Quality Standard, 2003
Toluene	6800	ug/L	Puerto Rico Water Quality Standard, 2003
Toxaphene	0.0002	ug/L	National Recommended Water Quality Criteria, EPA 2002
Trichloroethene	27	ug/L	Puerto Rico Water Quality Standard, 2003
Vinyl chloride	2	ug/L	Puerto Rico Water Quality Standard, 2003
Zinc	81	ug/L	Puerto Rico Water Quality Standard, 2003
Zinc, Dissolved	81	ug/L	Puerto Rico Water Quality Standard, 2003

APPENDIX I

Ecological Screening Values for Sediment

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Screening Value	Units	Reference
1,1,1-Trichloroethane	0.17	mg/kg	EPA 1996
1,1,2,2-Tetrachloroethane	0.94	mg/kg	EPA 1996
1,2,4-Trichlorobenzene	9.2	mg/kg	EPA 1996
1,2-Dichlorobenzene	0.34	mg/kg	EPA 1996
1,3-Dichlorobenzene	1.7	mg/kg	EPA 1996
1,4-Dichlorobenzene	0.35	mg/kg	EPA 1996
2-Methylnaphthalene	0.33	mg/kg	EPA 1995
4,4`-DDD	0.0033	mg/kg	EPA 1995
4,4`-DDE	0.0033	mg/kg	EPA 1995
4,4`-DDT	0.0033	mg/kg	EPA 1995
Acenaphthene	0.016	mg/kg	Long et. al. 1995
Acenaphthylene	0.33	mg/kg	EPA 1995
Anthracene	0.33	mg/kg	EPA 1995
Antimony	12	mg/kg	EPA 1995
Aroclor-1016	0.033	mg/kg	EPA 1995
Aroclor-1221	0.033	mg/kg	EPA 1995
Aroclor-1232	0.033	mg/kg	EPA 1995
Aroclor-1242	0.033	mg/kg	EPA 1995
Aroclor-1248	0.033	mg/kg	EPA 1995
Aroclor-1254	0.033	mg/kg	EPA 1995
Aroclor-1260	0.033	mg/kg	EPA 1995
Arsenic	7.24	mg/kg	MacDonald 1994
Benzo(a)anthracene	0.33	mg/kg	EPA 1995
Benzo(a)pyrene	0.33	mg/kg	EPA 1995
Benzo(b)fluoranthene	0.33	mg/kg	EPA 1995
Benzo(g,h,i)perylene	0.655	mg/kg	MacDonald 1994
Benzo(k)fluoranthene	0.33	mg/kg	EPA 1995
bis(2-Ethylhexyl)phthalate	0.182	mg/kg	MacDonald 1994
Cadmium	0.676	mg/kg	MacDonald 1994
Chlordane	0.0017	mg/kg	EPA 1995
Chromium	52.3	mg/kg	MacDonald 1994
Chrysene	0.33	mg/kg	EPA 1995
Copper	18.7	mg/kg	MacDonald 1994
Dibenz(a,h)anthracene	0.33	mg/kg	EPA 1995
Dieldrin	0.0033	mg/kg	EPA 1995
Endrin	0.0033	mg/kg	EPA 1995
Fluoranthene	0.33	mg/kg	EPA 1995
Fluorene	0.33	mg/kg	EPA 1995
gamma-BHC (Lindane)	0.0033	mg/kg	EPA 1995
Indeno(1,2,3-cd)pyrene	0.665	mg/kg	MacDonald 1994
Lead	30.2	mg/kg	MacDonald 1994
Mercury	0.13	mg/kg	MacDonald 1994
Naphthalene	0.33	mg/kg	EPA 1995
Nickel	15.9	mg/kg	MacDonald 1994
Phenanthrene	0.33	mg/kg	EPA 1995
Pyrene	0.33	mg/kg	EPA 1995
Silver	0.73	mg/kg	MacDonald 1994
Zinc	124	mg/kg	MacDonald 1994

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
8.7E-03	i	4.0E-03	i	8.7E-03	r	4.0E-03	r	0	0.10	30560-19-1	Acephate	5.6E+01	ca**	2.0E+02	ca*	7.7E-01	ca*	7.7E+00	ca*		
				7.7E-03	i	2.6E-03	i	1		75-07-0	Acetaldehyde	1.1E+01	ca**	2.3E+01	ca**	8.7E-01	ca*	1.7E+00	ca		
		2.0E-02	i			2.0E-02	r	0	0.10	34256-82-1	Acetochlor	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	1		67-64-1	Acetone	1.6E+03	nc	6.0E+03	nc	3.7E+02	nc	6.1E+02	nc	1.6E+01	8.0E-01
		8.0E-04	h			8.0E-04	r	0	0.10	75-86-5	Acetone cyanohydrin	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
		1.7E-02	r			1.7E-02	i	1		75-05-8	**Acetonitrile**	4.2E+02	nc	1.8E+03	nc	6.2E+01	nc	1.0E+02	nc		
		2.0E-02	h			5.7E-06	i	1		107-02-8	Acrolein	1.0E-01	nc	3.4E-01	nc	2.1E-02	nc	4.2E-02	nc		
4.5E+00	i	2.0E-04	i	4.5E+00	i	2.0E-04	r	0	0.10	79-06-1	Acrylamide	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca		
		5.0E-01	i			2.9E-04	i	0	0.10	79-10-7	Acrylic acid	2.9E+04	nc	1.0E+05	max	1.0E+00	nc	1.8E+04	nc		
5.4E-01	i	1.0E-03	h	2.4E-01	i	5.7E-04	i	1		107-13-1	Acrylonitrile	2.1E-01	ca*	4.9E-01	ca*	2.8E-02	ca*	3.9E-02	ca*		
8.1E-02	h	1.0E-02	i	8.0E-02	r	1.0E-02	r	0	0.10	15972-60-8	Alachlor	6.0E+00	ca	2.1E+01	ca	8.4E-02	ca	8.4E-01	ca		
		1.5E-01	i			1.5E-01	r	0	0.10	1596-84-5	Alar	9.2E+03	nc	9.2E+04	nc	5.5E+02	nc	5.5E+03	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	116-06-3	Aldicarb	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	1646-88-4	Aldicarb sulfone	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
1.7E+01	i	3.0E-05	i	1.7E+01	i	3.0E-05	r	0	0.10	309-00-2	Aldrin	2.9E-02	ca*	1.0E-01	ca	3.9E-04	ca	4.0E-03	ca	5.0E-01	2.0E-02
		2.5E-01	i			2.5E-01	r	0	0.10	74223-64-6	Ally	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	107-18-6	Allyl alcohol	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		5.0E-02	h			2.9E-04	i	0	0.10	107-05-1	Allyl chloride	3.0E+03	nc	3.0E+04	nc	1.0E+00	nc	1.8E+03	nc		
		1.0E+00	n			1.4E-03	n	0		7429-90-5	Aluminum	7.6E+04	nc	1.0E+05	max	5.1E+00	nc	3.6E+04	nc		
		4.0E-04	i					0		20859-73-8	Aluminum phosphide	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	67485-29-4	Amdro	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		9.0E-03	i			9.0E-03	r	0	0.10	834-12-8	Ametryn	5.5E+02	nc	5.5E+03	nc	3.3E+01	nc	3.3E+02	nc		
		7.0E-02	h			7.0E-02	r	0	0.10	591-27-5	m-Aminophenol	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.10	504-24-5	4-Aminopyridine	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		2.5E-03	i			2.5E-03	r	0	0.10	33089-61-1	Amitraz	1.5E+02	nc	1.5E+03	nc	9.1E+00	nc	9.1E+01	nc		
						2.9E-02	i			7664-41-7	Ammonia					1.0E+02	nc				
		2.0E-01	i					0	0.10	7773-06-0	Ammonium sulfamate	1.2E+04	nc	1.0E+05	max			7.3E+03	nc		
5.7E-03	i	7.0E-03	n	5.7E-03	r	2.9E-04	i	0	0.10	62-53-3	Aniline	8.5E+01	ca**	3.0E+02	ca*	1.0E+00	nc	1.2E+01	ca*		
		4.0E-04	i					0		7440-36-0	Antimony and compounds	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc	5.0E+00	3.0E-01
		5.0E-04	h					0		1314-60-9	Antimony pentoxide	3.9E+01	nc	5.1E+02	nc			1.8E+01	nc		
		9.0E-04	h					0		28300-74-5	Antimony potassium tartrate	7.0E+01	nc	9.2E+02	nc			3.3E+01	nc		
		4.0E-04	h					0		1332-81-6	Antimony tetroxide	3.1E+01	nc	4.1E+02	nc			1.5E+01	nc		
		4.0E-04	h			5.7E-05	i	0		1309-64-4	Antimony trioxide	3.1E+01	nc	4.1E+02	nc	2.1E-01	nc	1.5E+01	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	74115-24-5	Apollo	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
2.5E-02	i	5.0E-02	h	2.5E-02	i	5.0E-02	r	0	0.10	140-57-8	Aramite	1.9E+01	ca	6.9E+01	ca	2.7E-01	ca	2.7E+00	ca		
		3.0E-04	i					0	0.03	7440-38-2	Arsenic (noncancer endpoint)	2.2E+01	nc	2.6E+02	nc						

Key : SFo,i=Cancer Slope Factor oral, inhalation RfDo,i=Reference Dose oral, inhalation i=IRIS h=HEAST n=NCEA x=Withdrawn o=Other EPA Source r=Route-extrapolation ca=Cancer PRG nc=Noncancer PRG ca* (where: nc < 100X ca) ca**(where: nc < 10X ca)
+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
1.5E+00	i	3.0E-04	i	1.5E+01	i			0	0.03	7440-38-2	Arsenic (cancer endpoint)	3.9E-01	ca*	1.6E+00	ca	4.5E-04	ca	4.5E-02	ca	2.9E+01	1.0E+00
						1.4E-05	i	0		7784-42-1	Arsine (see arsenic for cancer endpoint)					5.2E-02	nc				
		9.0E-03	i			9.0E-03	r		0.10	76578-12-6	Assure	5.5E+02	nc	5.5E+03	nc	3.3E+01	nc	3.3E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	3337-71-1	Asulam	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
2.2E-01	h	3.5E-02	h	2.2E-01	r	3.5E-02	r	0	0.10	1912-24-9	Atrazine	2.2E+00	ca	7.8E+00	ca	3.1E-02	ca	3.0E-01	ca		
		4.0E-04	i			4.0E-04	r	0	0.10	71751-41-2	Avermectin B1	2.4E+01	nc	2.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
1.1E-01	i			1.1E-01	i			0	0.10	103-33-3	Azobenzene	4.4E+00	ca	1.6E+01	ca	6.2E-02	ca	6.1E-01	ca		
		7.0E-02	i			1.4E-04	h	0		7440-39-3	Barium and compounds	5.4E+03	nc	6.7E+04	nc	5.2E-01	nc	2.6E+03	nc	1.6E+03	8.2E+01
		4.0E-03	i			4.0E-03	r	0	0.10	114-26-1	Baygon	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	43121-43-3	Bayleton	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	68359-37-5	Baythroid	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-01	i			3.0E-01	r	0	0.10	1861-40-1	Benefin	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	17804-35-2	Benomyl	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	25057-89-0	Bentazon	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	100-52-7	Benzaldehyde	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
5.5E-02	i	3.0E-03	n	2.9E-02	i	1.7E-03	n	1		71-43-2	Benzene	6.0E-01	ca*	1.3E+00	ca*	2.3E-01	ca*	3.4E-01	ca*	3.0E-02	2.0E-03
2.3E+02	i	3.0E-03	i	2.3E+02	i	3.0E-03	r	0	0.10	92-87-5	Benzidine	2.1E-03	ca	7.5E-03	ca	2.9E-05	ca	2.9E-04	ca		
		4.0E+00	i			4.0E+00	r	0	0.10	65-85-0	Benzoic acid	1.0E+05	max	1.0E+05	max	1.5E+04	nc	1.5E+05	nc	4.0E+02	2.0E+01
1.3E+01	i			1.3E+01	r			0	0.10	98-07-7	Benzotrichloride	3.7E-02	ca	1.3E-01	ca	5.2E-04	ca	5.2E-03	ca		
		3.0E-01	h			3.0E-01	r	0	0.10	100-51-6	Benzyl alcohol	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
1.7E-01	i	2.9E-03	r	1.7E-01	r	2.9E-03	n	1		100-44-7	**Benzyl chloride**	8.9E-01	ca*	2.2E+00	ca	4.0E-02	ca	6.6E-02	ca		
		2.0E-03	i	8.4E+00	i	5.7E-06	i	0		7440-41-7	Beryllium and compounds	1.5E+02	nc	1.9E+03	ca**	8.0E-04	ca*	7.3E+01	nc	6.3E+01	3.0E+00
		1.0E-04	i			1.0E-04	r	0	0.10	141-66-2	Bidrin	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
		1.5E-02	i			1.5E-02	r	0	0.10	82657-04-3	Biphenthrin (Talstar)	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
		5.0E-02	i			5.0E-02	r	1		92-52-4	1,1-Biphenyl	3.5E+02	sat	3.5E+02	sat	1.8E+02	nc	3.0E+02	nc		
1.1E+00	i			1.2E+00	i			1		111-44-4	Bis(2-chloroethyl)ether	2.1E-01	ca	5.5E-01	ca	5.8E-03	ca	9.8E-03	ca	4.0E-04	2.0E-05
7.0E-02	x	4.0E-02	i	3.5E-02	x	4.0E-02	r	1		39638-32-9	Bis(2-chloroisopropyl)ether	2.9E+00	ca	7.4E+00	ca	1.9E-01	ca	2.7E-01	ca		
2.2E+02	i			2.2E+02	i			1		542-88-1	Bis(chloromethyl)ether	1.9E-04	ca	4.3E-04	ca	3.1E-05	ca	5.2E-05	ca		
7.0E-02	x	4.0E-02	i	3.5E-02	x	4.0E-02	r	1		108-60-1	Bis(2-chloro-1-methylethyl)ether	2.9E+00	ca	7.4E+00	ca	1.9E-01	ca	2.7E-01	ca		
1.4E-02	i	2.0E-02	i	1.4E-02	r	2.2E-02	r	0	0.10	117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	3.5E+01	ca*	1.2E+02	ca	4.8E-01	ca	4.8E+00	ca		
		5.0E-02	i			5.0E-02	r	0	0.10	80-05-7	Bisphenol A	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.0E-01	i			5.7E-03	x	0		7440-42-8	**Boron**	1.6E+04	nc	1.0E+05	max	2.1E+01	nc	7.3E+03	nc		
						2.0E-04	h	0		7637-07-2	Boron trifluoride					7.3E-01	nc				
		4.00E-03	i							15541-45-4	**Bromate**	3.1E+02	nc	4.1E+03	nc	0.0E+00		1.5E+02	nc		
		2.0E-02	n			2.9E-03	n	1		108-86-1	Bromobenzene	2.8E+01	nc	9.2E+01	nc	1.0E+01	nc	2.0E+01	nc		
6.2E-02	i	2.0E-02	i	6.2E-02	r	2.0E-02	r	1		75-27-4	Bromodichloromethane	8.2E-01	ca	1.8E+00	ca	1.1E-01	ca	1.8E-01	ca	6.0E-01	3.0E-02

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SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
7.9E-03	i	2.0E-02	i	3.9E-03	i	2.0E-02	r	0	0.10	75-25-2	Bromoform (tribromomethane)	6.2E+01	ca*	2.2E+02	ca*	1.7E+00	ca*	8.5E+00	ca*	8.0E-01	4.0E-02
		1.4E-03	i			1.4E-03	i	1		74-83-9	Bromomethane (Methyl bromide)	3.9E+00	nc	1.3E+01	nc	5.2E+00	nc	8.7E+00	nc	2.0E-01	1.0E-02
		5.0E-03	h			5.0E-03	r	0	0.10	2104-96-3	Bromophos	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	1689-84-5	Bromoxynil	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	1689-99-2	Bromoxynil octanoate	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
9.8E-01	r			9.8E-01	i			1		106-99-0	**1,3-Butadiene**	6.5E-03	ca	1.4E-02	ca	6.9E-03	ca	1.1E-02	ca		
		1.0E-01	i			2.6E-03	n	0	0.10	71-36-3	**1-Butanol**	6.1E+03	nc	6.1E+04	nc	9.5E+00	nc	3.6E+03	nc	1.7E+01	9.0E-01
		5.0E-02	i			5.0E-02	r	0	0.10	2008-41-5	Butylate	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.00E-02	n			4.00E-02	r	1		104-51-8	**n-Butylbenzene**	2.4E+02	sat	2.4E+02	sat	1.5E+02	nc	2.4E+02	nc		
		4.00E-02	n			4.00E-02	r	1		135-9-88	**sec-Butylbenzene**	2.2E+02	sat	2.2E+02	sat	1.5E+02	nc	2.4E+02	nc		
		4.00E-02	n			4.00E-02	r	1		98-06-6	**tert-Butylbenzene**	3.9E+02	sat	3.9E+02	sat	1.5E+02	nc	2.4E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	85-68-7	Butyl benzyl phthalate	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc	9.3E+02	8.1E+02
		1.0E+00	i			1.0E+00	r	0	0.10	85-70-1	Butylphthalyl butylglycolate	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
2.5E-01	h	3.0E-04	h	2.5E-01	r	3.0E-04	r	0	0.10	75-60-5	**Cacodylic acid**	1.9E+00	ca**	6.9E+00	ca*	2.7E-02	ca*	2.7E-01	ca*		
		5.0E-04	i	6.3E+00	i			0	0.001	7440-43-9	Cadmium and compounds	3.7E+01	nc	4.5E+02	nc	1.1E-03	ca	1.8E+01	nc	8.0E+00	4.0E-01
		5.0E-01	i			5.0E-01	r	0	0.10	105-60-2	Caprolactam	3.1E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc		
8.6E-03	h	2.0E-03	i	8.6E-03	r	2.0E-03	r	0	0.10	2425-06-1	Captafol	5.7E+01	ca**	2.0E+02	ca**	7.8E-01	ca**	7.8E+00	ca**		
3.5E-03	h	1.3E-01	i	3.5E-03	r	1.3E-01	r	0	0.10	133-06-2	Captan	1.4E+02	ca*	4.9E+02	ca	1.9E+00	ca	1.9E+01	ca		
		1.0E-01	i			1.1E-01	r	0	0.10	63-25-2	Carbaryl	6.1E+03	nc	6.2E+04	nc	4.0E+02	nc	3.6E+03	nc		
2.0E-02	h			2.0E-02	r			0	0.10	86-74-8	Carbazole	2.4E+01	ca	8.6E+01	ca	3.4E-01	ca	3.4E+00	ca	6.0E-01	3.0E-02
		5.0E-03	i			5.0E-03	r	0	0.10	1563-66-2	Carbofuran	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		1.0E-01	i			2.0E-01	i	1		75-15-0	Carbon disulfide	3.6E+02	nc	7.2E+02	sat	7.3E+02	nc	1.0E+03	nc	3.2E+01	2.0E+00
1.3E-01	i	7.0E-04	i	5.3E-02	i	7.0E-04	r	1		56-23-5	Carbon tetrachloride	2.5E-01	ca**	5.5E-01	ca*	1.3E-01	ca*	1.7E-01	ca*	7.0E-02	3.0E-03
		1.0E-02	i			1.0E-02	r	0	0.10	55285-14-8	Carbosulfan	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	5234-68-4	Carboxin	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		1.5E-02	i			1.5E-02	r	0	0.10	133-90-4	Chloramben	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
4.0E-01	h			4.0E-01	r			0	0.10	118-75-2	Chloranil	1.2E+00	ca	4.3E+00	ca	1.7E-02	ca	1.7E-01	ca		
3.5E-01	i	5.0E-04	i	3.5E-01	i	2.0E-04	i	0	0.04	12789-03-6	Chlordane	1.6E+00	ca*	6.5E+00	ca*	1.9E-02	ca*	1.9E-01	ca*	1.0E+01	5.0E-01
		2.0E-02	i			2.0E-02	r	0	0.10	90982-32-4	Chlorimuron-ethyl	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			5.71E-05	n			7782-50-5	Chlorine					2.1E-01	nc				
						5.7E-05	i			10049-04-4	Chlorine dioxide					2.1E-01	nc				
		2.0E-03	h			2.0E-03	r	0	0.10	79-11-8	Chloroacetic acid	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		8.6E-06	r			8.6E-06	i	1		532-27-4	2-Chloroacetophenone	3.3E-02	nc	1.1E-01	nc	3.1E-02	nc	5.2E-02	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	106-47-8	4-Chloroaniline	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc	7.0E-01	3.0E-02
		2.0E-02	i			1.7E-02	n	1		108-90-7	Chlorobenzene	1.5E+02	nc	5.3E+02	nc	6.2E+01	nc	1.1E+02	nc	1.0E+00	7.0E-02

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2.7E-01	h	2.0E-02	i	2.7E-01	h	2.0E-02	r	0	0.10	510-15-6	Chlorobenzilate	1.8E+00	ca	6.4E+00	ca	2.5E-02	ca	2.5E-01	ca		
		2.0E-01	h			2.0E-01	r	0	0.10	74-11-3	p-Chlorobenzoic acid	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		2.0E-02	h			2.0E-02	r	0	0.10	98-56-6	4-Chlorobenzotrifluoride	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	h			2.0E-03	h	1		126-99-8	2-Chloro-1,3-butadiene	3.6E+00	nc	1.2E+01	nc	7.3E+00	nc	1.4E+01	nc		
		4.0E-01	h			4.0E-01	r	1		109-69-3	1-Chlorobutane	4.8E+02	sat	4.8E+02	sat	1.5E+03	nc	2.4E+03	nc		
		1.4E+01	r			1.4E+01	i	1		75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	3.4E+02	sat	3.4E+02	sat	5.2E+04	nc	8.7E+04	nc		
		1.4E+01	r			1.4E+01	i	1		75-45-6	Chlorodifluoromethane	3.4E+02	sat	3.4E+02	sat	5.1E+04	nc	8.5E+04	nc		
2.9E-03	n	4.0E-01	n	2.9E-03	r	2.9E+00	i	1		75-00-3	Chloroethane	3.0E+00	ca	6.5E+00	ca	2.3E+00	ca	4.6E+00	ca		
		1.0E-02	i			8.6E-04	n	1		67-66-3	**Chloroform**	3.6E+00	ca/nc	1.2E+01	ca/nc	3.1E+00	ca/nc	6.2E+00	ca/nc	6.0E-01	3.0E-02
3.1E-02				1.9E-02				1			**Chloroform "CAL-Modified PRG"**	9.4E-01	ca	2.0E+00	ca	3.5E-01	ca	5.3E-01	ca		
1.3E-02	h			6.3E-03	h	8.6E-02	n	1		74-87-3	Chloromethane	1.2E+00	ca	2.6E+00	ca	1.1E+00	ca	1.5E+00	ca		
5.8E-01	h			5.8E-01	r			0	0.10	95-69-2	4-Chloro-2-methylaniline	8.4E-01	ca	3.0E+00	ca	1.2E-02	ca	1.2E-01	ca		
4.6E-01	h			4.6E-01	r			0	0.10	3165-93-3	4-Chloro-2-methylaniline hydrochloride	1.1E+00	ca	3.7E+00	ca	1.5E-02	ca	1.5E-01	ca		
		8.0E-02	i			8.0E-02	r	1		91-58-7	beta-Chloronaphthalene	4.9E+03	nc	2.3E+04	nc	2.9E+02	nc	4.9E+02	nc		
9.7E-03	h	1.0E-03	h	9.7E-03	r	2.0E-05	h	1		88-73-3	**o-Chloronitrobenzene**	1.4E+00	nc**	4.5E+00	nc**	7.3E-02	nc**	1.5E-01	nc**		
6.7E-03	h	1.0E-03	h	6.7E-03	r	1.7E-04	h	1		100-00-5	**p-Chloronitrobenzene**	1.0E+01	nc**	3.7E+01	nc**	6.2E-01	nc**	1.2E+00	nc**		
		5.0E-03	i			5.0E-03	r	1		95-57-8	2-Chlorophenol	6.3E+01	nc	2.4E+02	nc	1.8E+01	nc	3.0E+01	nc	4.0E+00	2.0E-01
		2.9E-02	r			2.9E-02	h	1		75-29-6	2-Chloropropane	1.7E+02	nc	5.9E+02	nc	1.0E+02	nc	1.7E+02	nc		
1.1E-02	h	1.5E-02	i	1.1E-02	r	1.5E-02	r	0	0.10	1897-45-6	Chlorothalonil	4.4E+01	ca*	1.6E+02	ca*	6.1E-01	ca*	6.1E+00	ca*		
		2.0E-02	i			2.0E-02	r	1		95-49-8	o-Chlorotoluene	1.6E+02	nc	5.6E+02	nc	7.3E+01	nc	1.2E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	101-21-3	Chlorpropham	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	2921-88-2	Chlorpyrifos	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		1.0E-02	h			1.0E-02	r	0	0.10	5598-13-0	Chlorpyrifos-methyl	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	64902-72-3	Chlorsulfuron	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		8.0E-04	h			8.0E-04	r	0	0.10	60238-56-4	Chlorthiophos	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
				4.2E+01	i			0			Total Chromium (1:6 ratio Cr VI:Cr III)+++	2.1E+02	ca	4.5E+02	ca	1.6E-04	ca			3.8E+01	2.0E+00
		1.5E+00	i							16065-83-1	Chromium III	1.0E+05	max	1.0E+05	max	0.0E+00		5.5E+04	nc		
		3.0E-03	i	2.9E+02	i	2.2E-06	i	0		18540-29-9	Chromium VI+++	3.0E+01	ca**	6.4E+01	ca	2.3E-05	ca	1.1E+02	nc	3.8E+01	2.0E+00
		2.00E-02	n	9.8E+00	n	5.7E-06	n			7440-48-4	**Cobalt**	9.0E+02	ca**	1.9E+03	ca*	6.9E-04	ca*	7.3E+02	nc		
				2.2E+00	i			0		8007-45-2	Coke Oven Emissions					3.1E-03	ca				
		4.00E-02	h					0		7440-50-8	Copper and compounds	3.1E+03	nc	4.1E+04	nc			1.5E+03	nc		
1.9E+00	h			1.9E+00	r			1		123-73-9	Crotonaldehyde	5.3E-03	ca	1.1E-02	ca	3.5E-03	ca	5.9E-03	ca		
		1.0E-01	i			1.1E-01	i	1		98-82-8	Cumene (isopropylbenzene)	5.7E+02	nc	2.0E+03	nc	4.0E+02	nc	6.6E+02	nc		
8.4E-01	h	2.0E-03	h	8.4E-01	r	2.0E-03	r	0	0.10	21725-46-2	Cyanazine	5.8E-01	ca	2.1E+00	ca	8.0E-03	ca	8.0E-02	ca		
		2.0E-02	i					0	0.10	57-12-5	Cyanide (free)	1.2E+03	nc	1.2E+04	nc			7.3E+02	nc		
		2.0E-02	i			8.6E-04	i	1		74-90-8	Cyanide (hydrogen)	1.1E+01	nc	3.5E+01	nc	3.1E+00	nc	6.2E+00	nc		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		4.0E-02	i			4.0E-02	r	1		460-19-5	Cyanogen	1.3E+02	nc	4.3E+02	nc	1.5E+02	nc	2.4E+02	nc		
		9.0E-02	i			9.0E-02	r	1		506-68-3	Cyanogen bromide	2.9E+02	nc	9.7E+02	nc	3.3E+02	nc	5.5E+02	nc		
		5.0E-02	i			5.0E-02	r	1		506-77-4	Cyanogen chloride	1.6E+02	nc	5.4E+02	nc	1.8E+02	nc	3.0E+02	nc		
		5.7E+00	r			5.7E+00	n	1		110-82-7	Cyclohexane	1.4E+02	sat	1.4E+02	sat	2.1E+04	nc	3.5E+04	nc		
		5.0E+00	i			5.0E+00	r	0	0.10	108-94-1	Cyclohexanone	1.0E+05	max	1.0E+05	max	1.8E+04	nc	1.8E+05	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	108-91-8	Cyclohexylamine	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	68085-85-8	Cyhalothrin/Karate	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	52315-07-8	Cypermethrin	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		7.5E-03	i			7.5E-03	r	0	0.10	66215-27-8	Cyromazine	4.6E+02	nc	4.6E+03	nc	2.7E+01	nc	2.7E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	1861-32-1	Dacthal	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	75-99-0	Dalapon	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	39515-41-8	Danitol	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
2.4E-01	i			2.4E-01	r			0	0.03	72-54-8	DDD	2.4E+00	ca	1.0E+01	ca	2.8E-02	ca	2.8E-01	ca	1.6E+01	8.0E-01
3.4E-01	i			3.4E-01	r			0	0.03	72-55-9	DDE	1.7E+00	ca	7.0E+00	ca	2.0E-02	ca	2.0E-01	ca	5.4E+01	3.0E+00
3.4E-01	i	5.0E-04	i	3.4E-01	i	5.0E-04	r	0	0.03	50-29-3	DDT	1.7E+00	ca*	7.0E+00	ca*	2.0E-02	ca*	2.0E-01	ca*	3.2E+01	2.0E+00
		1.0E-02	i			1.0E-02	r	0	0.10	1163-19-5	Decabromodiphenyl ether	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		4.0E-05	i			4.0E-05	r	0	0.10	8065-48-3	Demeton	2.4E+00	nc	2.5E+01	nc	1.5E-01	nc	1.5E+00	nc		
6.1E-02	h			6.1E-02	r			0	0.10	2303-16-4	Diallate	8.0E+00	ca	2.8E+01	ca	1.1E-01	ca	1.1E+00	ca		
		9.0E-04	h			9.0E-04	r	0	0.10	333-41-5	Diazinon	5.5E+01	nc	5.5E+02	nc	3.3E+00	nc	3.3E+01	nc		
		4.0E-03	n			4.0E-03	r	1		132-64-9	Dibenzofuran	2.9E+02	nc	3.1E+03	nc	1.5E+01	nc	2.4E+01	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	106-37-6	1,4-Dibromobenzene	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
8.4E-02	i	2.0E-02	i	8.4E-02	r	2.0E-02	r	1		124-48-1	Dibromochloromethane	1.1E+00	ca	2.6E+00	ca	8.0E-02	ca	1.3E-01	ca	4.0E-01	2.0E-02
1.4E+00	h	5.7E-05	r	2.4E-03	x	5.7E-05	i	1		96-12-8	1,2-Dibromo-3-chloropropane	4.5E-01	ca**	2.0E+00	ca**	2.1E-01	nc	4.8E-02	ca**		
7.0E+00				7.0E+00				1		96-12-8	**"CAL-Modified PRG"**	1.9E-02	ca	4.6E-02	ca	9.6E-04	ca	1.6E-03	ca		
8.5E+01	i	5.7E-05	r	7.7E-01	i	5.7E-05	h	1		106-93-4	1,2-Dibromoethane	6.9E-03	ca	2.8E-02	ca*	8.7E-03	ca*	7.6E-04	ca		
		1.0E-01	i			1.0E-01	r	0	0.10	84-74-2	Dibutyl phthalate	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc	2.3E+03	2.7E+02
		3.0E-02	i			3.0E-02	r	0	0.10	1918-00-9	Dicamba	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		9.0E-02	i			5.7E-02	h	1		95-50-1	1,2-Dichlorobenzene	3.7E+02	sat	3.7E+02	sat	2.1E+02	nc	3.7E+02	nc	1.7E+01	9.0E-01
		9.00E-04	n			9.00E-04	r	1		541-73-1	1,3-Dichlorobenzene	1.6E+01	nc	6.3E+01	nc	3.3E+00	nc	5.5E+00	nc		
2.4E-02	h	3.00E-02	n	2.2E-02	n	3.00E-02	i	1		106-46-7	1,4-Dichlorobenzene	3.4E+00	ca	7.9E+00	ca	3.1E-01	ca	5.0E-01	ca	2.0E+00	1.0E-01
4.5E-01	i			4.5E-01	r			0	0.10	91-94-1	3,3-Dichlorobenzidine	1.1E+00	ca	3.8E+00	ca	1.5E-02	ca	1.5E-01	ca	7.0E-03	3.0E-04
		3.00E-02	n			3.00E-02	r		0.10	90-98-2	4,4'-Dichlorobenzophenone	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
9.3E+00	r			9.3E+00	h			1		764-41-0	1,4-Dichloro-2-butene	7.9E-03	ca	1.8E-02	ca	7.2E-04	ca	1.2E-03	ca		
		2.0E-01	i			5.7E-02	h	1		75-71-8	Dichlorodifluoromethane	9.4E+01	nc	3.1E+02	nc	2.1E+02	nc	3.9E+02	nc		
		1.0E-01	h			1.4E-01	h	1		75-34-3	1,1-Dichloroethane	5.1E+02	nc	1.7E+03	nc	5.2E+02	nc	8.1E+02	nc	2.3E+01	1.0E+00
5.7E-03				5.7E-03				1			"CAL-Modified PRG"	2.8E+00	ca	6.0E+00	ca	1.2E+00	ca	2.0E+00	ca		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
9.1E-02	i	3.0E-02	n	9.1E-02	i	1.4E-03	n	1		107-06-2	1,2-Dichloroethane (EDC)	2.8E-01	ca*	6.0E-01	ca*	7.4E-02	ca*	1.2E-01	ca*	2.0E-02	1.0E-03
		5.0E-02	i			5.7E-02	i	1		75-35-4	**1,1-Dichloroethylene**	1.2E+02	nc	4.1E+02	nc	2.1E+02	nc	3.4E+02	nc	6.0E-02	3.0E-03
		1.0E-02	h			1.0E-02	r	1		156-59-2	1,2-Dichloroethylene (cis)	4.3E+01	nc	1.5E+02	nc	3.7E+01	nc	6.1E+01	nc	4.0E-01	2.0E-02
		2.0E-02	i			2.0E-02	r	1		156-60-5	1,2-Dichloroethylene (trans)	6.9E+01	nc	2.3E+02	nc	7.3E+01	nc	1.2E+02	nc	7.0E-01	3.0E-02
		3.0E-03	i			3.0E-03	r	0	0.10	120-83-2	2,4-Dichlorophenol	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc	1.0E+00	5.0E-02
		8.0E-03	i			8.0E-03	r	0	0.10	94-82-6	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	4.9E+02	nc	4.9E+03	nc	2.9E+01	nc	2.9E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.05	94-75-7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	6.9E+02	nc	7.7E+03	nc	3.7E+01	nc	3.6E+02	nc		
6.8E-02	h	1.1E-03	r	6.8E-02	r	1.1E-03	i	1		78-87-5	1,2-Dichloropropane	3.4E-01	ca*	7.4E-01	ca*	9.9E-02	ca*	1.6E-01	ca*	3.0E-02	1.0E-03
1.0E-01	i	3.00E-02	i	1.4E-02	i	5.7E-03	i	1		542-75-6	1,3-Dichloropropene	7.8E-01	ca	1.8E+00	ca	4.8E-01	ca	4.0E-01	ca	4.0E-03	2.0E-04
		3.0E-03	i			3.0E-03	r	0	0.10	616-23-9	2,3-Dichloropropanol	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
2.9E-01	i	5.0E-04	i	2.9E-01	r	1.4E-04	i	0	0.10	62-73-7	Dichlorvos	1.7E+00	ca*	5.9E+00	ca*	2.3E-02	ca*	2.3E-01	ca*		
4.4E-01	x			4.4E-01	r			0	0.10	115-32-2	Dicofol	1.1E+00	ca	3.9E+00	ca	1.5E-02	ca	1.5E-01	ca		
		3.0E-02	h			5.7E-05	x	1		77-73-6	Dicyclopentadiene	5.4E-01	nc	1.8E+00	nc	2.1E-01	nc	4.2E-01	nc		
1.6E+01	i	5.0E-05	i	1.6E+01	i	5.0E-05	r	0	0.10	60-57-1	Dieldrin	3.0E-02	ca	1.1E-01	ca	4.2E-04	ca	4.2E-03	ca	4.0E-03	2.0E-04
		1.0E-02	h			5.7E-03	h	0	0.10	112-34-5	**Diethylene glycol, monobutyl ether**	6.1E+02	nc	6.2E+03	nc	2.1E+01	nc	3.6E+02	nc		
		6.0E-02	h			8.6E-04	h	0	0.10	111-90-0	**Diethylene glycol, monomethyl ether**	3.7E+03	nc	3.7E+04	nc	3.1E+00	nc	2.2E+03	nc		
		4.0E-03	h			4.0E-03	r	0	0.10	617-84-5	**Diethylformamide**	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
1.2E-03	i	6.0E-01	i	1.2E-03	r	6.0E-01	r	0	0.10	103-23-1	Di(2-ethylhexyl)adipate	4.1E+02	ca	1.4E+03	ca	5.6E+00	ca	5.6E+01	ca		
		8.0E-01	i			8.0E-01	r	0	0.10	84-66-2	Diethyl phthalate	4.9E+04	nc	1.0E+05	max	2.9E+03	nc	2.9E+04	nc		
4.7E+03	h			4.7E+03	r			0	0.10	56-53-1	Diethylstilbestrol	1.0E-04	ca	3.7E-04	ca	1.4E-06	ca	1.4E-05	ca		
		8.0E-02	i			8.0E-02	r	0	0.10	43222-48-6	Difenzoquat (Avenge)	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	35367-38-5	Diflubenzuron	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.1E+01	r			1.1E+01	i	1		75-37-6	1,1-Difluoroethane					4.2E+04	nc	6.9E+04	nc		
		2.00E-02	n			2.00E-02	r		0.10	28553-12-0	Diisononyl phthalate	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		8.0E-02	i			8.0E-02	r	0	0.10	1445-75-6	Diisopropyl methylphosphonate	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	55290-64-7	Dimethipin	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-04	i			2.0E-04	r	0	0.10	60-51-5	Dimethoate	1.2E+01	nc	1.2E+02	nc	7.3E-01	nc	7.3E+00	nc		
1.4E-02	h			1.4E-02	r			0	0.10	119-90-4	3,3'-Dimethoxybenzidine	3.5E+01	ca	1.2E+02	ca	4.8E-01	ca	4.8E+00	ca		
		5.7E-06	r			5.7E-06	x	1		124-40-3	Dimethylamine	6.7E-02	nc	2.5E-01	nc	2.1E-02	nc	3.5E-02	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	121-69-7	N-N-Dimethylaniline	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
7.5E-01	h			7.5E-01	r			0	0.10	95-68-1	2,4-Dimethylaniline	6.5E-01	ca	2.3E+00	ca	9.0E-03	ca	9.0E-02	ca		
5.8E-01	h			5.8E-01	r			0	0.10	21436-96-4	2,4-Dimethylaniline hydrochloride	8.4E-01	ca	3.0E+00	ca	1.2E-02	ca	1.2E-01	ca		
9.2E+00	h			9.2E+00	r			0	0.10	119-93-7	3,3'-Dimethylbenzidine	5.3E-02	ca	1.9E-01	ca	7.3E-04	ca	7.3E-03	ca		
		1.0E-01	h			8.6E-03	i	0	0.10	68-12-2	N,N-Dimethylformamide	6.1E+03	nc	6.2E+04	nc	3.1E+01	nc	3.6E+03	nc		
		1.0E-03	n			1.0E-03	r	0	0.10	122-09-8	Dimethylphenethylamine	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	105-67-9	2,4-Dimethylphenol	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc	9.0E+00	4.0E-01

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		V O C	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		6.0E-04	i			6.0E-04	r	0	0.10	576-26-1	2,6-Dimethylphenol	3.7E+01	nc	3.7E+02	nc	2.2E+00	nc	2.2E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	95-65-8	3,4-Dimethylphenol	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E+01	h			1.0E+01	r	0	0.10	131-11-3	Dimethyl phthalate	1.0E+05	max	1.0E+05	max	3.7E+04	nc	3.6E+05	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	120-61-6	Dimethyl terephthalate	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	131-89-5	4,6-Dinitro-o-cyclohexyl phenol	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		1.0E-04	h			1.0E-04	r	0	0.10	528-29-0	**1,2-Dinitrobenzene**	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
		1.0E-04	i			1.0E-04	r	0	0.10	99-65-0	1,3-Dinitrobenzene	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
		1.0E-04	h			1.0E-04	r	0	0.10	100-25-4	**1,4-Dinitrobenzene**	6.1E+00	nc	6.2E+01	nc	3.7E-01	nc	3.6E+00	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	51-28-5	2,4-Dinitrophenol	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc	3.0E-01	1.0E-02
6.8E-01	i			6.8E-01	r			0	0.10	25321-14-6	Dinitrotoluene mixture	7.2E-01	ca	2.5E+00	ca	9.9E-03	ca	9.9E-02	ca	8.0E-04	4.0E-05
		2.0E-03	i			2.0E-03	r	0	0.10	121-14-2	2,4-Dinitrotoluene (see DNT mixture for "ca")	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc	8.0E-04	4.0E-05
		1.0E-03	h			1.0E-03	r	0	0.10	606-20-2	2,6-Dinitrotoluene (see DNT mixture for "ca")	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc	7.0E-04	3.0E-05
		1.0E-03	i			1.0E-03	r	0	0.10	88-85-7	Dinoseb	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		4.0E-02	h			4.0E-02	r	0	0.10	117-84-0	**di-n-Octyl phthalate**	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc	1.0E+04	1.0E+04
1.1E-02	i			1.1E-02	r			0	0.10	123-91-1	1,4-Dioxane	4.4E+01	ca	1.6E+02	ca	6.1E-01	ca	6.1E+00	ca		
1.5E+05	h			1.5E+05	h			0	0.03	1746-01-6	Dioxin (2,3,7,8-TCDD)	3.9E-06	ca	1.6E-05	ca	4.5E-08	ca	4.5E-07	ca		
		3.0E-02	i			3.0E-02	r	0	0.10	957-51-7	Diphenamid	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	122-39-4	Diphenylamine	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.00E-04	n			3.00E-04	r		0.10	74-31-7	N,N-Diphenyl-1,4 benzenediamine (DPPD)	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
8.0E-01	i			7.7E-01	i			0	0.10	122-66-7	1,2-Diphenylhydrazine	6.1E-01	ca	2.2E+00	ca	8.7E-03	ca	8.4E-02	ca		
		3.0E-03	n			3.0E-03	r	0	0.10	127-63-9	**Diphenyl sulfone**	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		2.2E-03	i			2.2E-03	r	0	0.10	85-00-7	Diquat	1.3E+02	nc	1.4E+03	nc	8.0E+00	nc	8.0E+01	nc		
8.6E+00	h			8.6E+00	r			0	0.10	1937-37-7	Direct black 38	5.7E-02	ca	2.0E-01	ca	7.8E-04	ca	7.8E-03	ca		
8.1E+00	h			8.1E+00	r			0	0.10	2602-46-2	Direct blue 6	6.0E-02	ca	2.1E-01	ca	8.3E-04	ca	8.3E-03	ca		
9.3E+00	h			9.3E+00	r			0	0.10	16071-86-6	Direct brown 95	5.2E-02	ca	1.9E-01	ca	7.2E-04	ca	7.2E-03	ca		
		4.0E-05	i			4.0E-05	r	0	0.10	298-04-4	Disulfoton	2.4E+00	nc	2.5E+01	nc	1.5E-01	nc	1.5E+00	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	505-29-3	1,4-Dithiane	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	330-54-1	Diuron	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	2439-10-3	Dodine	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		2.0E-01	n							7429-91-6	Dysprosium	1.6E+04	nc	1.0E+05	max			7.3E+03	nc		
		6.0E-03	i			6.0E-03	r	0	0.10	115-29-7	Endosulfan	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc	1.8E+01	9.0E-01
		2.0E-02	i			2.0E-02	r	0	0.10	145-73-3	Endothall	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	72-20-8	Endrin	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc	1.0E+00	5.0E-02
9.9E-03	i	2.0E-03	h	4.2E-03	h	2.9E-04	i	1		106-89-8	Epichlorohydrin	7.6E+00	nc	2.6E+01	nc	1.0E+00	nc	2.0E+00	nc		
		5.7E-03	r			5.7E-03	i	0	0.10	106-88-7	1,2-Epoxybutane	3.5E+02	nc	3.5E+03	nc	2.1E+01	nc	2.1E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	759-94-4	EPTC (S-Ethyl dipropylthiocarbamate)	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-03	i			5.0E-03	r	0	0.10	16672-87-0	Ethephon (2-chloroethyl phosphonic acid)	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		5.0E-04	i			5.0E-04	r	0	0.10	563-12-2	Ethion	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
		4.0E-01	h			5.7E-02	i	0	0.10	110-80-5	2-Ethoxyethanol	2.4E+04	nc	1.0E+05	max	2.1E+02	nc	1.5E+04	nc		
		3.0E-01	h			3.0E-01	r	0	0.10	111-15-9	2-Ethoxyethanol acetate	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		9.0E-01	i			9.0E-01	r	1		141-78-6	Ethyl acetate	1.9E+04	nc	3.7E+04	sat	3.3E+03	nc	5.5E+03	nc		
4.8E-02	h			4.8E-02	r			1		140-88-5	Ethyl acrylate	2.1E-01	ca	4.5E-01	ca	1.4E-01	ca	2.3E-01	ca		
3.85E-03	r	1.0E-01	i	3.85E-03	n	2.9E-01	i	1		100-41-4	**Ethylbenzene**	8.9E+00	ca	2.0E+01	ca	1.7E+00	ca	2.9E+00	ca	1.3E+01	7.0E-01
2.9E-03	n	4.0E-01	n	2.9E-03	r	2.9E+00	i	1		75-00-3	Ethyl chloride	3.0E+00	ca	6.5E+00	ca	2.3E+00	ca	4.6E+00	ca		
		3.0E-01	h			3.0E-01	r	0	0.10	109-78-4	Ethylene cyanohydrin	1.8E+04	nc	1.0E+05	max	1.1E+03	nc	1.1E+04	nc		
		2.0E-02	h			2.0E-02	r	0	0.10	107-15-3	Ethylene diamine	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E+00	i			2.0E+00	r	0	0.10	107-21-1	Ethylene glycol	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		5.0E-01	i			3.7E+00	i	0	0.10	111-76-2	Ethylene glycol, monobutyl ether	3.1E+04	nc	1.0E+05	max	1.4E+04	nc	1.8E+04	nc		
1.0E+00	h			3.5E-01	h			1		75-21-8	Ethylene oxide	1.4E-01	ca	3.4E-01	ca	1.9E-02	ca	2.4E-02	ca		
1.1E-01	h	8.0E-05	i	1.1E-01	r	8.0E-05	r	0	0.10	96-45-7	Ethylene thiourea (ETU)	4.4E+00	ca**	1.6E+01	ca**	6.1E-02	ca**	6.1E-01	ca**		
		2.0E-01	i			2.0E-01	r	1		60-29-7	Ethyl ether	1.8E+03	sat	1.8E+03	sat	7.3E+02	nc	1.2E+03	nc		
		9.0E-02	h			9.0E-02	r	1		97-63-2	Ethyl methacrylate	1.4E+02	sat	1.4E+02	sat	3.3E+02	nc	5.5E+02	nc		
		1.0E-05	i			1.0E-05	r	0	0.10	2104-64-5	Ethyl p-nitrophenyl phenylphosphorothioate	6.1E-01	nc	6.2E+00	nc	3.7E-02	nc	3.6E-01	nc		
		3.0E+00	i			3.0E+00	r	0	0.10	84-72-0	Ethylphthalyl ethyl glycolate	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
		8.0E-03	i			8.0E-03	r	0	0.10	101200-48-0	Express	4.9E+02	nc	4.9E+03	nc	2.9E+01	nc	2.9E+02	nc		
		2.5E-04	i			2.5E-04	r	0	0.10	22224-92-6	Fenamiphos	1.5E+01	nc	1.5E+02	nc	9.1E-01	nc	9.1E+00	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	2164-17-2	Fluometuron	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		6.0E-02	i					0	0.10	16984-48-8	Flouride	3.7E+03	nc	3.7E+04	nc			2.2E+03	nc		
		8.0E-02	i			8.0E-02	r	0	0.10	59756-60-4	Fluoridone	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	56425-91-3	Flurprimidol	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		6.0E-02	i			6.0E-02	r	0	0.10	66332-96-5	Flutolanil	3.7E+03	nc	3.7E+04	nc	2.2E+02	nc	2.2E+03	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	69409-94-5	Fluvalinate	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
3.5E-03	i	1.0E-01	i	3.5E-03	r	1.0E-01	r	0	0.10	133-07-3	Folpet	1.4E+02	ca*	4.9E+02	ca	1.9E+00	ca	1.9E+01	ca		
1.9E-01	i			1.9E-01	r			0	0.10	72178-02-0	Fomesafen	2.6E+00	ca	9.1E+00	ca	3.5E-02	ca	3.5E-01	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	944-22-9	Fonofos	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		1.5E-01	i	4.6E-02	i			0	0.10	50-00-0	Formaldehyde	9.2E+03	nc	1.0E+05	nc	1.5E-01	ca	5.5E+03	nc		
		2.0E+00	h			2.0E+00	r	0	0.10	64-18-6	Formic Acid	1.0E+05	max	1.0E+05	max	7.3E+03	nc	7.3E+04	nc		
		3.0E+00	i			3.0E+00	r	0	0.10	39148-24-8	Fosetyl-al	1.0E+05	max	1.0E+05	max	1.1E+04	nc	1.1E+05	nc		
		3.0E+01	i			8.6E+00	h	1		76-13-1	Freon 113	5.6E+03	sat	5.6E+03	sat	3.1E+04	nc	5.9E+04	nc		
		1.0E-03	i			1.0E-03	r	1		110-00-9	Furan	2.5E+00	nc	8.5E+00	nc	3.7E+00	nc	6.1E+00	nc		
3.8E+00	h			3.8E+00	r			0	0.10	67-45-8	Furazolidone	1.3E-01	ca	4.5E-01	ca	1.8E-03	ca	1.8E-02	ca		
		3.0E-03	i			1.4E-02	h	0	0.10	98-01-1	Furfural	1.8E+02	nc	1.8E+03	nc	5.2E+01	nc	1.1E+02	nc		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
5.0E+01	h			5.0E+01	r			0	0.10	531-82-8	Furium	9.7E-03	ca	3.4E-02	ca	1.3E-04	ca	1.3E-03	ca		
3.0E-02	i			3.0E-02	r			0	0.10	60568-05-0	Furmecyclox	1.6E+01	ca	5.7E+01	ca	2.2E-01	ca	2.2E+00	ca		
		4.0E-04	i			4.0E-04	r	0	0.10	77182-82-2	Glufosinate-ammonium	2.4E+01	nc	2.5E+02	nc	1.5E+00	nc	1.5E+01	nc		
		4.0E-04	i			2.9E-04	h	0	0.10	765-34-4	Glycidaldehyde	2.4E+01	nc	2.5E+02	nc	1.0E+00	nc	1.5E+01	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	1071-83-6	Glyphosate	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		5.0E-05	i			5.0E-05	r	0	0.10	69806-40-2	Haloxyfop-methyl	3.1E+00	nc	3.1E+01	nc	1.8E-01	nc	1.8E+00	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	79277-27-3	Harmony	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
4.5E+00	i	5.0E-04	i	4.6E+00	i	5.0E-04	r	0	0.10	76-44-8	Heptachlor	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca	2.3E+01	1.0E+00
9.1E+00	i	1.3E-05	i	9.1E+00	i	1.3E-05	r	0	0.10	1024-57-3	Heptachlor epoxide	5.3E-02	ca*	1.9E-01	ca*	7.4E-04	ca*	7.4E-03	ca*	7.0E-01	3.0E-02
		2.0E-03	i			2.0E-03	r	0	0.10	87-82-1	Hexabromobenzene	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
1.6E+00	i	8.0E-04	i	1.6E+00	i	8.0E-04	r	0	0.10	118-74-1	Hexachlorobenzene	3.0E-01	ca	1.1E+00	ca	4.2E-03	ca	4.2E-02	ca	2.0E+00	1.0E-01
7.8E-02	i	3.00E-04	n	7.8E-02	i	3.00E-04	r	0	0.10	87-68-3	Hexachlorobutadiene	6.2E+00	ca**	2.2E+01	ca**	8.6E-02	ca*	8.6E-01	ca*	2.0E+00	1.0E-01
6.3E+00	i	5.0E-04	n	6.3E+00	i	5.0E-04	r	0	0.04	319-84-6	**HCH (alpha)**	9.0E-02	ca	3.6E-01	ca	1.1E-03	ca	1.1E-02	ca	5.0E-04	3.0E-05
1.8E+00	i	2.0E-04	n	1.8E+00	i	2.0E-04	r	0	0.04	319-85-7	**HCH (beta)**	3.2E-01	ca	1.3E+00	ca	3.7E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
1.3E+00	h	3.0E-04	i	1.3E+00	r	3.0E-04	r	0	0.04	58-89-9	HCH (gamma) Lindane	4.4E-01	ca*	1.7E+00	ca	5.2E-03	ca	5.2E-02	ca	9.0E-03	5.0E-04
1.8E+00	i			1.8E+00	i			0	0.04	608-73-1	HCH-technical	3.2E-01	ca	1.3E+00	ca	3.8E-03	ca	3.7E-02	ca	3.0E-03	1.0E-04
		6.0E-03	i			5.7E-05	i	0	0.10	77-47-4	**Hexachlorocyclopentadiene**	3.7E+02	nc	3.7E+03	nc	2.1E-01	nc	2.2E+02	nc	4.0E+02	2.0E+01
1.4E-02	i	1.0E-03	i	1.4E-02	i	1.0E-03	r	0	0.10	67-72-1	Hexachloroethane	3.5E+01	ca**	1.2E+02	ca**	4.8E-01	ca**	4.8E+00	ca**	5.0E-01	2.0E-02
		3.0E-04	i			3.0E-04	r	0	0.10	70-30-4	Hexachlorophene	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.10	121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	4.4E+00	ca*	1.6E+01	ca	6.1E-02	ca	6.1E-01	ca		
		2.9E-06	r			2.9E-06	i	0	0.10	822-06-0	1,6-Hexamethylene diisocyanate	1.7E-01	nc	1.8E+00	nc	1.0E-02	nc	1.0E-01	nc		
		6.0E-02	h			5.7E-02	i	1		110-54-3	n-Hexane	1.1E+02	sat	1.1E+02	sat	2.1E+02	nc	3.5E+02	nc		
		3.3E-02	i			3.3E-02	r	0	0.10	51235-04-2	Hexazinone	2.0E+03	nc	2.0E+04	nc	1.2E+02	nc	1.2E+03	nc		
3.0E+00	i			1.7E+01	i			0	0.10	302-01-2	Hydrazine, hydrazine sulfate	1.6E-01	ca	5.7E-01	ca	3.9E-04	ca	2.2E-02	ca		
3.0E+00	n			1.7E+01	n				0.10	60-34-4	Hydrazine, monomethyl	1.6E-01	ca	5.7E-01	ca	4.0E-04	ca	2.2E-02	ca		
3.0E+00	n			1.7E+01	n				0.10	57-14-7	Hydrazine, dimethyl	1.6E-01	ca	5.7E-01	ca	4.0E-04	ca	2.2E-02	ca		
						5.7E-03	i			7647-01-0	Hydrogen chloride					2.1E+01	nc				
		2.0E-02	i			8.6E-04	i	1		74-90-8	Hydrogen cyanide	1.1E+01	nc	3.5E+01	nc	3.1E+00	nc	6.2E+00	nc		
		3.0E-03	i			2.9E-04	i			7783-06-4	Hydrogen sulfide					1.0E+00	nc	1.1E+02	nc		
		4.0E-02	h			4.0E-02	r	0	0.10	123-31-9	p-Hydroquinone	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	35554-44-0	Imazalil	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		2.5E-01	i			2.5E-01	r	0	0.10	81335-37-7	Imazaquin	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		4.0E-02	i			4.0E-02	r	0	0.10	36734-19-7	Iprodione	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		3.0E-01	n					0		7439-89-6	Iron	2.3E+04	nc	1.0E+05	max			1.1E+04	nc		
		3.0E-01	i			3.0E-01	r	1		78-83-1	Isobutanol	1.3E+04	nc	4.0E+04	sat	1.1E+03	nc	1.8E+03	nc		
9.5E-04	i	2.0E-01	i	9.5E-04	r	2.0E-01	r	0	0.10	78-59-1	Isophorone	5.1E+02	ca*	1.8E+03	ca*	7.1E+00	ca	7.1E+01	ca	5.0E-01	3.0E-02

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+++=Non-Standard Method Applied (See Section 2.3 of the "Region 9 PRGs Table User's Guide") sat=Soil Saturation (See Section 4.5) max=Ceiling limit (See Section 2.1) DAF=Dilution Attenuation Factor (See Section 2.5) CAS=Chemical Abstract Services

TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.5E-02	i			1.5E-02	r	0	0.10	33820-53-0	Isopropalin	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
		1.0E-01	i			1.1E-01	r	0	0.10	1832-54-8	Isopropyl methyl phosphonic acid	6.1E+03	nc	6.2E+04	nc	4.0E+02	nc	3.6E+03	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	82558-50-7	Isoxaben	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
8.0E+00	n	3.0E-04	n	8.0E+00	r	3.0E-04	r	0	0.10	143-50-0	**Kepone**	6.1E-02	ca	2.2E-01	ca	8.4E-04	ca	8.4E-03	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	77501-63-4	Lactofen	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
For info see: www.epa.gov/oerrpage/superfund/programs/lead/prods.htm#guidance										7439-92-1	Lead+++	4.0E+02	nc	7.5E+02	nc						
For info see: www.dtsc.ca.gov/ScienceTechnology/ledspred.html											**Lead "CAL-Modified PRG"+++**	1.5E+02									
		1.0E-07	i					0	0.10	78-00-2	Lead (tetraethyl)	6.1E-03	nc	6.2E-02	nc			3.6E-03	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	330-55-2	Linuron	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		2.0E-02	x					0		7439-93-2	Lithium	1.6E+03	nc	2.0E+04	nc			7.3E+02	nc		
		2.0E-01	i			2.0E-01	r	0	0.10	83055-99-6	Londax	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	121-75-5	Malathion	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	108-31-6	Maleic anhydride	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		5.0E-01	i			5.0E-01	r	1		123-33-1	Maleic hydrazide	1.7E+03	nc	2.4E+03	sat	1.8E+03	nc	3.0E+03	nc		
		2.0E-05	h			2.0E-05	r	0	0.10	109-77-3	Malononitrile	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		3.0E-02	h			3.0E-02	r	0	0.10	8018-01-7	Mancozeb	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
6.0E-02	o	5.0E-03	i	6.0E-02	r	5.0E-03	r	0	0.10	12427-38-2	Maneb	8.1E+00	ca*	2.9E+01	ca	1.1E-01	ca	1.1E+00	ca		
		2.4E-02	i			1.4E-05	i	0		7439-96-5	Manganese and compounds+++	1.8E+03	nc	1.9E+04	nc	5.1E-02	nc	8.8E+02	nc		
		9.0E-05	h			9.0E-05	r	0	0.10	950-10-7	Mephosfolan	5.5E+00	nc	5.5E+01	nc	3.3E-01	nc	3.3E+00	nc		
		3.0E-02	i			3.0E-02	r	0	0.10	24307-26-4	Mepiquat chloride	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
2.9E-02	n	1.0E-01	n	2.9E-02	r	1.0E-01	r	0	0.10	149-30-4	2-Mercaptobenzothiazole	1.7E+01	ca	5.9E+01	ca	2.3E-01	ca	2.3E+00	ca		
		3.0E-04	i					0		7487-94-7	Mercury and compounds	2.3E+01	nc	3.1E+02	nc			1.1E+01	nc		
						8.6E-05	i			7439-97-6	Mercury (elemental)					3.1E-01	nc				
		1.0E-04	i					0	0.10	22967-92-6	Mercury (methyl)	6.1E+00	nc	6.2E+01	nc			3.6E+00	nc		
		3.0E-05	i			3.0E-05	r	0	0.10	150-50-5	Merphos	1.8E+00	nc	1.8E+01	nc	1.1E-01	nc	1.1E+00	nc		
		3.0E-05	i			3.0E-05	r	0	0.10	78-48-8	Merphos oxide	1.8E+00	nc	1.8E+01	nc	1.1E-01	nc	1.1E+00	nc		
		6.0E-02	i			6.0E-02	r	0	0.10	57837-19-1	Metalaxyl	3.7E+03	nc	3.7E+04	nc	2.2E+02	nc	2.2E+03	nc		
		1.0E-04	i			2.0E-04	h	1		126-98-7	Methacrylonitrile	2.1E+00	nc	8.4E+00	nc	7.3E-01	nc	1.0E+00	nc		
		5.0E-05	i			5.0E-05	r	0	0.10	10265-92-6	Methamidophos	3.1E+00	nc	3.1E+01	nc	1.8E-01	nc	1.8E+00	nc		
		5.0E-01	i			5.0E-01	r	0	0.10	67-56-1	Methanol	3.1E+04	nc	1.0E+05	max	1.8E+03	nc	1.8E+04	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	950-37-8	Methidathion	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	1		16752-77-5	Methomyl	4.4E+01	nc	1.5E+02	nc	9.1E+01	nc	1.5E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	72-43-5	Methoxychlor	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc	1.6E+02	8.0E+00
		1.0E-03	h			5.7E-03	i	0	0.10	109-86-4	2-Methoxyethanol	6.1E+01	nc	6.2E+02	nc	2.1E+01	nc	3.6E+01	nc		
		2.0E-03	h			2.0E-03	r	0	0.10	110-49-6	2-Methoxyethanol acetate	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
4.6E-02	h			4.6E-02	r			0	0.10	99-59-2	2-Methoxy-5-nitroaniline	1.1E+01	ca	3.7E+01	ca	1.5E-01	ca	1.5E+00	ca		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.0E+00	h			1.0E+00	r	1		79-20-9	Methyl acetate	2.2E+04	nc	9.2E+04	nc	3.7E+03	nc	6.1E+03	nc		
		3.0E-02	h			3.0E-02	r	1		96-33-3	Methyl acrylate	7.0E+01	nc	2.3E+02	nc	1.1E+02	nc	1.8E+02	nc		
2.4E-01	h			2.4E-01	r			0	0.10	95-53-4	2-Methylaniline (o-toluidine)	2.0E+00	ca	7.2E+00	ca	2.8E-02	ca	2.8E-01	ca		
1.8E-01	h			1.8E-01	r			0	0.10	636-21-5	2-Methylaniline hydrochloride	2.7E+00	ca	9.6E+00	ca	3.7E-02	ca	3.7E-01	ca		
		5.0E-04	i			5.0E-04	r	0	0.10	94-74-6	2-Methyl-4-chlorophenoxyacetic acid	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	94-81-5	4-(2-Methyl-4-chlorophenoxy) butyric acid	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	93-65-2	2-(2-Methyl-4-chlorophenoxy) propionic acid	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	16484-77-8	2-(2-Methyl-1,4-chlorophenoxy) propionic acid	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		8.6E-01	r			8.6E-01	h	1		108-87-2	Methylcyclohexane	2.6E+03	nc	8.7E+03	nc	3.1E+03	nc	5.2E+03	nc		
2.5E-01	h			2.5E-01	r			0	0.10	101-77-9	4,4'-Methylenebisbenzeneamine	1.9E+00	ca	6.9E+00	ca	2.7E-02	ca	2.7E-01	ca		
1.3E-01	h	7.0E-04	h	1.3E-01	h	7.0E-04	r	0	0.10	101-14-4	4,4'-Methylene bis(2-chloroaniline)	3.7E+00	ca*	1.3E+01	ca*	5.2E-02	ca*	5.2E-01	ca*		
4.6E-02	i			4.6E-02	r			0	0.10	101-61-1	4,4'-Methylene bis(N,N'-dimethyl)aniline	1.1E+01	ca	3.7E+01	ca	1.5E-01	ca	1.5E+00	ca		
		1.0E-02	h			1.0E-02	r	1		74-95-3	Methylene bromide	6.7E+01	nc	2.3E+02	nc	3.7E+01	nc	6.1E+01	nc		
7.5E-03	i	6.0E-02	i	1.6E-03	i	8.6E-01	h	1		75-09-2	Methylene chloride	9.1E+00	ca	2.1E+01	ca	4.1E+00	ca	4.3E+00	ca	2.0E-02	1.0E-03
		1.7E-04	r			1.7E-04	i	0	0.10	101-68-8	4,4'-Methylene diphenyl diisocyanate	1.0E+01	nc	1.0E+02	nc	6.2E-01	nc	6.2E+00	nc		
		6.0E-01	i			2.9E-01	i	1		78-93-3	Methyl ethyl ketone	7.3E+03	nc	2.7E+04	nc	1.0E+03	nc	1.9E+03	nc		
		8.0E-02	h			2.3E-02	h	1		108-10-1	Methyl isobutyl ketone	7.9E+02	nc	2.8E+03	nc	8.3E+01	nc	1.6E+02	nc		
		5.7E-04	r			5.7E-04	n	0	0.10	74-93-1	Methyl Mercaptan	3.5E+01	nc	3.5E+02	nc	2.1E+00	nc	2.1E+01	nc		
		1.4E+00	i			2.0E-01	i	1		80-62-6	Methyl methacrylate	2.2E+03	nc	2.7E+03	sat	7.3E+02	nc	1.4E+03	nc		
3.3E-02	h			3.3E-02	r			0	0.10	99-55-8	2-Methyl-5-nitroaniline	1.5E+01	ca	5.2E+01	ca	2.0E-01	ca	2.0E+00	ca		
		2.5E-04	i			2.5E-04	r	0	0.10	298-00-0	Methyl parathion	1.5E+01	nc	1.5E+02	nc	9.1E-01	nc	9.1E+00	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	95-48-7	2-Methylphenol	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc	1.5E+01	8.0E-01
		5.0E-02	i			5.0E-02	r	0	0.10	108-39-4	3-Methylphenol	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		5.0E-03	h			5.0E-03	r	0	0.10	106-44-5	4-Methylphenol	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	n			2.0E-02	r	0	0.10	993-13-5	Methyl phosphonic acid	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		6.0E-03	h			1.1E-02	h	1		25013-15-4	Methyl styrene (mixture)	1.3E+02	nc	5.4E+02	nc	4.2E+01	nc	6.0E+01	nc		
		7.0E-02	h			7.0E-02	r	1		98-83-9	Methyl styrene (alpha)	6.8E+02	sat	6.8E+02	sat	2.6E+02	nc	4.3E+02	nc		
3.3E-03	n	8.6E-01	r	3.5E-04	n	8.6E-01	i	1		1634-04-4	**Methyl tertbutyl ether (MTBE)**	6.2E+01	ca*	1.6E+02	ca	1.9E+01	ca	1.3E+01	ca		
1.8E-03				1.8E-03				1			"CAL-Modified PRG"	1.7E+01	ca	3.6E+01	ca	3.7E+00	ca	6.2E+00	ca		
		1.5E-01	i			1.5E-01	r	0	0.10	51218-45-2	Metolaclor (Dual)	9.2E+03	nc	9.2E+04	nc	5.5E+02	nc	5.5E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	21087-64-9	Metribuzin	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.8E+00	x	2.0E-04	i	1.8E+00	r	2.0E-04	r	0	0.10	2385-85-5	Mirex	2.7E-01	ca*	9.6E-01	ca	3.7E-03	ca	3.7E-02	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	2212-67-1	Molinate	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		5.0E-03	i					0		7439-98-7	Molybdenum	3.9E+02	nc	5.1E+03	nc			1.8E+02	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	10599-90-3	Monochloramine	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	300-76-5	Naled	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		1.0E-01	i			1.0E-01	r	0	0.10	15299-99-7	Napropamide	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
		2.0E-02	i					0		7440-02-0	Nickel (soluble salts)	1.6E+03	nc	2.0E+04	nc			7.3E+02	nc	1.3E+02	7.0E+00
				8.4E-01	i			0			Nickel refinery dust					8.0E-03	ca				
				1.7E+00	i			0		12035-72-2	Nickel subsulfide			1.1E+04	ca	4.0E-03	ca				
Tap Water PRG Based on Infant NOAEL (see IRIS)										14797-55-8	Nitrate+++							1.0E+04	nc		
Tap Water PRG Based on Infant NOAEL (see IRIS)										14797-65-0	Nitrite+++							1.0E+03	nc		
		2.86E-05	r			2.86E-05	h	0	0.10	88-74-4	**2-Nitroaniline**	1.7E+00	nc	1.8E+01	nc	1.0E-01	nc	1.0E+00	nc		
		5.0E-04	i			5.7E-04	h	1		98-95-3	Nitrobenzene	2.0E+01	nc	1.0E+02	nc	2.1E+00	nc	3.4E+00	nc	1.0E-01	7.0E-03
		7.0E-02	h			7.0E-02	r	0	0.10	67-20-9	Nitrofurantoin	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
1.5E+00	h			1.5E+00	r			0	0.10	59-87-0	Nitrofurazone	3.2E-01	ca	1.1E+00	ca	4.5E-03	ca	4.5E-02	ca		
1.4E-02	n			1.4E-02	r			0	0.10	55-63-0	Nitroglycerin	3.5E+01	ca	1.2E+02	ca	4.8E-01	ca	4.8E+00	ca		
		1.0E-01	i			1.0E-01	r	0	0.10	556-88-7	Nitroguanidine	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc		
9.4E+00	r	5.7E-03	r	9.4E+00	h	5.7E-03	i	1		79-46-9	2-Nitropropane					7.2E-04	ca	1.2E-03	ca		
5.4E+00	i			5.6E+00	i			1		924-16-3	N-Nitrosodi-n-butylamine	2.4E-02	ca	5.8E-02	ca	1.2E-03	ca	2.0E-03	ca		
2.8E+00	i			2.8E+00	r			0	0.10	1116-54-7	N-Nitrosodiethanolamine	1.7E-01	ca	6.2E-01	ca	2.4E-03	ca	2.4E-02	ca		
1.5E+02	i			1.5E+02	i			0	0.10	55-18-5	N-Nitrosodiethylamine	3.2E-03	ca	1.1E-02	ca	4.5E-05	ca	4.5E-04	ca		
5.1E+01	i			4.9E+01	i			0	0.10	62-75-9	N-Nitrosodimethylamine	9.5E-03	ca	3.4E-02	ca	1.4E-04	ca	1.3E-03	ca		
4.9E-03	i			4.9E-03	r			0	0.10	86-30-6	N-Nitrosodiphenylamine	9.9E+01	ca	3.5E+02	ca	1.4E+00	ca	1.4E+01	ca	1.0E+00	6.0E-02
7.0E+00	i			7.0E+00	r			0	0.10	621-64-7	N-Nitroso di-n-propylamine	6.9E-02	ca	2.5E-01	ca	9.6E-04	ca	9.6E-03	ca	5.0E-05	2.0E-06
2.2E+01	i			2.2E+01	r			0	0.10	10595-95-6	N-Nitroso-N-methylethylamine	2.2E-02	ca	7.8E-02	ca	3.1E-04	ca	3.1E-03	ca		
2.1E+00	i			2.1E+00	i			0	0.10	930-55-2	N-Nitrosopyrrolidine	2.3E-01	ca	8.2E-01	ca	3.1E-03	ca	3.2E-02	ca		
		1.0E-02	h			1.0E-02	r	1		99-08-1	m-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	h			1.0E-02	r	1		99-08-1	o-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		1.0E-02	h			1.0E-02	r	1		99-99-0	p-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
		4.0E-02	i			4.0E-02	r	0	0.10	27314-13-2	Norflurazon	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
		7.0E-04	i			7.0E-04	r	0	0.10	85509-19-9	NuStar	4.3E+01	nc	4.3E+02	nc	2.6E+00	nc	2.6E+01	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	32536-52-0	Octabromodiphenyl ether	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	2691-41-0	Octahydro-1357-tetranitro-1357- tetrazocine (HMX)	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.0E-03	h			2.0E-03	r	0	0.10	152-16-9	Octamethylpyrophosphoramide	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	19044-88-3	Oryzalin	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	19666-30-9	Oxadiazon	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	23135-22-0	Oxamyl	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	42874-03-3	Oxyfluorfen	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	76738-62-0	Paclobutrazol	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		4.5E-03	i			4.5E-03	r	0	0.10	4685-14-7	Paraquat	2.7E+02	nc	2.8E+03	nc	1.6E+01	nc	1.6E+02	nc		
		6.0E-03	h			6.0E-03	r	0	0.10	56-38-2	Parathion	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-02	h			5.0E-02	r	0	0.10	1114-71-2	Pebulate	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.0E-02	i			4.0E-02	r	0	0.10	40487-42-1	Pendimethalin	2.4E+03	nc	2.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
2.3E-02	h			2.3E-02	r			0	0.10	87-84-3	Pentabromo-6-chloro cyclohexane	2.1E+01	ca	7.5E+01	ca	2.9E-01	ca	2.9E+00	ca		
		2.0E-03	i			2.0E-03	r	0	0.10	32534-81-9	Pentabromodiphenyl ether	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		8.0E-04	i			8.0E-04	r	0	0.10	608-93-5	Pentachlorobenzene	4.9E+01	nc	4.9E+02	nc	2.9E+00	nc	2.9E+01	nc		
2.6E-01	h	3.0E-03	i	2.6E-01	r	3.0E-03	r	0	0.10	82-68-8	Pentachloronitrobenzene	1.9E+00	ca*	6.6E+00	ca	2.6E-02	ca	2.6E-01	ca		
1.2E-01	i	3.0E-02	i	1.2E-01	r	3.0E-02	r	0	0.25	87-86-5	Pentachlorophenol	3.0E+00	ca	9.0E+00	ca	5.6E-02	ca	5.6E-01	ca	3.0E-02	1.0E-03
		1.00E-04	x					0		7601-90-3	Perchlorate	7.8E+00	ca/nc	1.0E+02	ca/nc			3.6E+00	ca/nc		
		5.0E-02	i			5.0E-02	r	0	0.10	52645-53-1	Permethrin	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		2.5E-01	i			2.5E-01	r	0	0.10	13684-63-4	Phenmedipham	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		6.0E-01	i			6.0E-01	r	0	0.10	108-95-2	Phenol	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc	1.0E+02	5.0E+00
		2.0E-03	n			2.0E-03	r	0	0.10	92-84-2	Phenothiazine	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		6.0E-03	i			6.0E-03	r	0	0.10	108-45-2	m-Phenylenediamine	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc		
		1.9E-01	h			1.9E-01	r	0	0.10	106-50-3	p-Phenylenediamine	1.2E+04	nc	1.0E+05	max	6.9E+02	nc	6.9E+03	nc		
		8.0E-05	i			8.0E-05	r	0	0.10	62-38-4	Phenylmercuric acetate	4.9E+00	nc	4.9E+01	nc	2.9E-01	nc	2.9E+00	nc		
1.9E-03	h			1.9E-03	r			0	0.10	90-43-7	2-Phenylphenol	2.5E+02	ca	8.9E+02	ca	3.5E+00	ca	3.5E+01	ca		
		2.0E-04	h			2.0E-04	r	0	0.10	298-02-2	Phorate	1.2E+01	nc	1.2E+02	nc	7.3E-01	nc	7.3E+00	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	732-11-6	Phosmet	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		3.0E-04	i			8.6E-05	i	0	0.10	7803-51-2	Phosphine	1.8E+01	nc	1.8E+02	nc	3.1E-01	nc	1.1E+01	nc		
						2.9E-03	i			7664-38-2	Phosphoric acid					1.0E+01	nc				
		2.0E-05	i					0		7723-14-0	Phosphorus (white)	1.6E+00	nc	2.0E+01	nc			7.3E-01	nc		
		1.0E+00	h			1.0E+00	r	0	0.10	100-21-0	p-Phthalic acid	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
		2.0E+00	i			3.4E-02	h	0	0.10	85-44-9	Phthalic anhydride	1.0E+05	max	1.0E+05	max	1.2E+02	nc	7.3E+04	nc		
		7.0E-02	i			7.0E-02	r	0	0.10	1918-02-1	Picloram	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	29232-93-7	Pirimiphos-methyl	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
8.9E+00	h	7.0E-06	h	8.9E+00	r	7.0E-06	r	0	0.10		Polybrominated biphenyls	5.5E-02	ca**	1.9E-01	ca*	7.6E-04	ca*	7.6E-03	ca*		
2.0E+00	i			2.0E+00	i			0	0.14	1336-36-3	Polychlorinated biphenyls (PCBs)	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
7.0E-02	i	7.0E-05	i	7.0E-02	i	7.0E-05	r	0	0.14	12674-11-2	Aroclor 1016	3.9E+00	nc	2.1E+01	ca**	9.6E-02	ca**	9.6E-01	ca**		
2.0E+00	i			2.0E+00	i			0	0.14	11104-28-2	Aroclor 1221	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i			2.0E+00	i			0	0.14	11141-16-5	Aroclor 1232	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i			2.0E+00	i			0	0.14	53469-21-9	Aroclor 1242	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i			2.0E+00	i			0	0.14	12672-29-6	Aroclor 1248	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		
2.0E+00	i	2.0E-05	i	2.0E+00	i	2.0E-05	r	0	0.14	11097-69-1	Aroclor 1254	2.2E-01	ca**	7.4E-01	ca*	3.4E-03	ca*	3.4E-02	ca*		
2.0E+00	i			2.0E+00	i			0	0.14	11096-82-5	Aroclor 1260	2.2E-01	ca	7.4E-01	ca	3.4E-03	ca	3.4E-02	ca		

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SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
4.5E+00	n			4.5E+00	r				0.10	61788-33-8	**Polychlorinated terphenyls**	1.1E-01	ca	3.8E-01	ca	1.5E-03	ca	1.5E-02	ca		
									0.13		Polynuclear aromatic hydrocarbons (PAHs)										
		6.0E-02	i			6.0E-02	r	1		83-32-9	Acenaphthene	3.7E+03	nc	2.9E+04	nc	2.2E+02	nc	3.7E+02	nc	5.7E+02	2.9E+01
		3.0E-01	i			3.0E-01	r	1		120-12-7	Anthracene	2.2E+04	nc	1.0E+05	max	1.1E+03	nc	1.8E+03	nc	1.2E+04	5.9E+02
7.3E-01	n			7.3E-01	r			0	0.13	56-55-3	**Benz[a]anthracene**	6.2E-01	ca	2.1E+00	ca	9.2E-03	ca	9.2E-02	ca	2.0E+00	8.0E-02
7.3E-01	n			7.3E-01	r			0	0.13	205-99-2	**Benzo[b]fluoranthene**	6.2E-01	ca	2.1E+00	ca	9.2E-03	ca	9.2E-02	ca	5.0E+00	2.0E-01
7.3E-02	n			7.3E-02	r			0	0.13	207-08-9	**Benzo[k]fluoranthene**	6.2E+00	ca	2.1E+01	ca	9.2E-02	ca	9.2E-01	ca	4.9E+01	2.0E+00
1.2E+00				3.9E-01					0.13	207-08-9	**"CAL-Modified PRG"**	3.8E-01	ca	1.3E+00	ca	1.7E-02	ca	5.6E-02	ca		
7.3E+00	i			7.3E+00	r			0	0.13	50-32-8	**Benzo[a]pyrene**	6.2E-02	ca	2.1E-01	ca	9.2E-04	ca	9.2E-03	ca	8.0E+00	4.0E-01
7.3E-03	n			7.3E-03	r			0	0.13	218-01-9	**Chrysene**	6.2E+01	ca	2.1E+02	ca	9.2E-01	ca	9.2E+00	ca	1.6E+02	8.0E+00
1.2E-01				3.9E-02					0.13		**"CAL-Modified PRG"**	3.8E+00	ca	1.3E+01	ca	1.7E-01	ca	5.6E-01	ca		
7.3E+00	n			7.3E+00	r			0	0.13	53-70-3	**Dibenz[ah]anthracene**	6.2E-02	ca	2.1E-01	ca	9.2E-04	ca	9.2E-03	ca	2.0E+00	8.0E-02
		4.0E-02	i			4.0E-02	r	0	0.13	206-44-0	Fluoranthene	2.3E+03	nc	2.2E+04	nc	1.5E+02	nc	1.5E+03	nc	4.3E+03	2.1E+02
		4.0E-02	i			4.0E-02	r	1		86-73-7	Fluorene	2.7E+03	nc	2.6E+04	nc	1.5E+02	nc	2.4E+02	nc	5.6E+02	2.8E+01
7.3E-01	n			7.3E-01	r			0	0.13	193-39-5	**Indeno[1,2,3-cd]pyrene**	6.2E-01	ca	2.1E+00	ca	9.2E-03	ca	9.2E-02	ca	1.4E+01	7.0E-01
		2.0E-02	i			8.6E-04	i	1		91-20-3	Naphthalene	5.6E+01	nc	1.9E+02	nc	3.1E+00	nc	6.2E+00	nc	8.4E+01	4.0E+00
		3.0E-02	i			3.0E-02	r	1		129-00-0	Pyrene	2.3E+03	nc	2.9E+04	nc	1.1E+02	nc	1.8E+02	nc	4.2E+03	2.1E+02
1.5E-01	i	9.0E-03	i	1.5E-01	r	9.0E-03	r	0	0.10	67747-09-5	Prochloraz	3.2E+00	ca	1.1E+01	ca	4.5E-02	ca	4.5E-01	ca		
		6.0E-03	h			6.0E-03	r	0	0.10	26399-36-0	Profluralin	3.7E+02	nc	3.7E+03	nc	2.2E+01	nc	2.2E+02	nc		
		1.5E-02	i			1.5E-02	r	0	0.10	1610-18-0	Prometon	9.2E+02	nc	9.2E+03	nc	5.5E+01	nc	5.5E+02	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	7287-19-6	Prometryn	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		7.5E-02	i			7.5E-02	r	0	0.10	23950-58-5	Pronamide	4.6E+03	nc	4.6E+04	nc	2.7E+02	nc	2.7E+03	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	1918-16-7	Propachlor	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	709-98-8	Propanil	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	2312-35-8	Propargite	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-03	i			2.0E-03	r	0	0.10	107-19-7	Propargyl alcohol	1.2E+02	nc	1.2E+03	nc	7.3E+00	nc	7.3E+01	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	139-40-2	Propazine	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		2.0E-02	i			2.0E-02	r	0	0.10	122-42-9	Propham	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	60207-90-1	Propiconazole	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		4.00E-02	n			4.00E-02	r	1		103-65-1	**n-Propylbenzene**	2.4E+02	sat	2.4E+02	sat	1.5E+02	nc	2.4E+02	nc		
		5.0E-01	h			8.6E-04	h	0	0.10	57-55-6	**Propylene glycol**	3.0E+04	nc	1.0E+05	max	3.1E+00	nc	1.8E+04	nc		
		7.0E-01	h			7.0E-01	r	0	0.10	52125-53-8	Propylene glycol, monoethyl ether	4.3E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc		
		7.0E-01	h			5.7E-01	i	0	0.10	107-98-2	Propylene glycol, monomethyl ether	4.3E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc		
2.4E-01	i	8.6E-03	r	1.3E-02	i	8.6E-03	i	1		75-56-9	Propylene oxide	1.9E+00	ca*	6.6E+00	ca*	5.2E-01	ca*	2.2E-01	ca		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		2.5E-01	i			2.5E-01	r	0	0.10	81335-77-5	Pursuit	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	51630-58-1	Pydrin	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	110-86-1	Pyridine	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		5.0E-04	i			5.0E-04	r	0	0.10	13593-03-8	Quinalphos	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
3.0E+00	i			3.0E+00	r			0	0.10	91-22-5	**Quinoline**	1.6E-01	ca	5.7E-01	ca	2.2E-03	ca	2.2E-02	ca		
1.1E-01	i	3.0E-03	i	1.1E-01	r	3.0E-03	r	0	0.10	121-82-4	RDX (Cyclonite)	4.4E+00	ca*	1.6E+01	ca	6.1E-02	ca	6.1E-01	ca		
		3.0E-02	i			3.0E-02	r	0	0.10	10453-86-8	Resmethrin	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		5.0E-02	h			5.0E-02	r	0	0.10	299-84-3	Ronnel	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		
		4.0E-03	i			4.0E-03	r	0	0.10	83-79-4	Rotenone	2.4E+02	nc	2.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	78587-05-0	Savey	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		5.0E-03	i					0	0.10	7783-00-8	Selenious Acid	3.1E+02	nc	3.1E+03	nc			1.8E+02	nc		
		5.0E-03	i					0		7782-49-2	Selenium	3.9E+02	nc	5.1E+03	nc			1.8E+02	nc	5.0E+00	3.0E-01
		5.0E-03	h					0	0.10	630-10-4	Selenourea	3.1E+02	nc	3.1E+03	nc			1.8E+02	nc		
		9.0E-02	i			9.0E-02	r	0	0.10	74051-80-2	Sethoxydim	5.5E+03	nc	5.5E+04	nc	3.3E+02	nc	3.3E+03	nc		
		5.0E-03	i					0		7440-22-4	Silver and compounds	3.9E+02	nc	5.1E+03	nc			1.8E+02	nc	3.4E+01	2.0E+00
1.2E-01	h	5.0E-03	i	1.2E-01	r	2.0E-03	r	0	0.10	122-34-9	Simazine	4.1E+00	ca*	1.4E+01	ca	5.6E-02	ca	5.6E-01	ca		
		4.0E-03	i							26628-22-8	Sodium azide										
2.7E-01	h	3.0E-02	i	2.7E-01	r	3.0E-02	r	0	0.10	148-18-5	Sodium diethyldithiocarbamate	1.8E+00	ca	6.4E+00	ca	2.5E-02	ca	2.5E-01	ca		
		2.0E-05	i			2.0E-05	r	0	0.10	62-74-8	Sodium fluoroacetate	1.2E+00	nc	1.2E+01	nc	7.3E-02	nc	7.3E-01	nc		
		1.0E-03	h			1.0E-03	r	0	0.10	13718-26-8	Sodium metavanadate	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		6.0E-01	i					0		7440-24-6	Strontium, stable	4.7E+04	nc	1.0E+05	max			2.2E+04	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	57-24-9	Strychnine	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		2.0E-01	i			2.9E-01	i	1		100-42-5	Styrene	1.7E+03	sat	1.7E+03	sat	1.1E+03	nc	1.6E+03	nc	4.0E+00	2.0E-01
		1.00E-03	n			1.00E-03	r			80-07-9	1,1'-Sulfonylbis (4-chlorobenzene)	7.8E+01	nc	1.0E+03	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	88671-89-0	Systhane	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
1.5E+05	h			1.5E+05	h			0	0.03	1746-01-6	2,3,7,8-TCDD (dioxin)	3.9E-06	ca	1.6E-05	ca	4.5E-08	ca	4.5E-07	ca		
		7.0E-02	i			7.0E-02	r	0	0.10	34014-18-1	Tebuthiuron	4.3E+03	nc	4.3E+04	nc	2.6E+02	nc	2.6E+03	nc		
		2.0E-02	h			2.0E-02	r	0	0.10	3383-96-8	Temephos	1.2E+03	nc	1.2E+04	nc	7.3E+01	nc	7.3E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	5902-51-2	Terbacil	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		2.5E-05	h			2.5E-05	r	0	0.10	13071-79-9	Terbufos	1.5E+00	nc	1.5E+01	nc	9.1E-02	nc	9.1E-01	nc		
		1.0E-03	i			1.0E-03	r	0	0.10	886-50-0	Terbutryn	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		3.0E-04	i			3.0E-04	r	0	0.10	95-94-3	1,2,4,5-Tetrachlorobenzene	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
2.6E-02	i	3.0E-02	i	2.6E-02	i	3.0E-02	r	1		630-20-6	1,1,1,2-Tetrachloroethane	3.2E+00	ca	7.3E+00	ca	2.6E-01	ca	4.3E-01	ca		
2.0E-01	i	6.00E-02	n	2.0E-01	i	6.00E-02	r	1		79-34-5	1,1,2,2-Tetrachloroethane	4.1E-01	ca	9.3E-01	ca	3.3E-02	ca	5.5E-02	ca	3.0E-03	2.0E-04
5.2E-02	n	1.0E-02	i	1.00E-02	n	1.7E-01	n	1		127-18-4	**Tetrachloroethylene (PCE)**	1.5E+00	ca*	3.4E+00	ca*	6.7E-01	ca	6.6E-01	ca	6.0E-02	3.0E-03
		3.0E-02	i			3.0E-02	r	0	0.10	58-90-2	2,3,4,6-Tetrachlorophenol	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		

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TOXICITY INFORMATION											CONTAMINANT	PRELIMINARY REMEDIAL GOALS (PRGs) "Direct Contact Exposure Pathways"								SOIL SCREENING LEVELS "Migration to Ground Water"	
SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
2.0E+01	h			2.0E+01	r			0	0.10	5216-25-1	p,a,a,a-Tetrachlorotoluene	2.4E-02	ca	8.6E-02	ca	3.4E-04	ca	3.4E-03	ca		
2.4E-02	h	3.0E-02	i	2.4E-02	r	3.0E-02	r	0	0.10	961-11-5	Tetrachlorovinphos	2.0E+01	ca*	7.2E+01	ca	2.8E-01	ca	2.8E+00	ca		
		5.0E-04	i			5.0E-04	r	0	0.10	3689-24-5	Tetraethyldithiopyrophosphate	3.1E+01	nc	3.1E+02	nc	1.8E+00	nc	1.8E+01	nc		
7.6E-03	n	2.1E-01	n	6.8E-03	n	8.6E-02	n	1		109-99-9	**Tetrahydrofuran**	9.4E+00	ca	2.1E+01	ca	9.9E-01	ca	1.6E+00	ca		
		6.6E-05	i					0		7440-28-0	Thallium and compounds+++	5.2E+00	nc	6.7E+01	nc			2.4E+00	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	28249-77-6	Thiobencarb	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-02	n			5.0E-02	r	0	0.10	N/A	**Thiocyanate**	3.1E+03	nc	1.0E+05	max	1.8E+02	nc	1.8E+03	nc		
		3.0E-04	h			3.0E-04	r	0	0.10	39196-18-4	Thiofanox	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		8.0E-02	i			8.0E-02	r	0	0.10	23564-05-8	Thiophanate-methyl	4.9E+03	nc	4.9E+04	nc	2.9E+02	nc	2.9E+03	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	137-26-8	Thiram	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		6.0E-01	h					0			Tin (inorganic, see tributyltin oxide for organic tin)	4.7E+04	nc	1.0E+05	max			2.2E+04	nc		
		2.0E-01	i			1.1E-01	i	1		108-88-3	Toluene	5.2E+02	sat	5.2E+02	sat	4.0E+02	nc	7.2E+02	nc	1.2E+01	6.0E-01
3.2E+00	h			3.2E+00	r			0	0.10	95-80-7	Toluene-2,4-diamine	1.5E-01	ca	5.4E-01	ca	2.1E-03	ca	2.1E-02	ca		
		6.0E-01	h			6.0E-01	r	0	0.10	95-70-5	Toluene-2,5-diamine	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc		
		2.0E-01	h			2.0E-01	r	0	0.10	823-40-5	Toluene-2,6-diamine	1.2E+04	nc	1.0E+05	max	7.3E+02	nc	7.3E+03	nc		
2E-01	i			2E-01	r			0	0.10	106-49-0	p-Toluidine	2.6E+00	ca	9.1E+00	ca	3.5E-02	ca	3.5E-01	ca		
1.1E+00	i			1.1E+00	i			0	0.10	8001-35-2	Toxaphene	4.4E-01	ca	1.6E+00	ca	6.0E-03	ca	6.1E-02	ca	3.1E+01	2.0E+00
		7.5E-03	i			7.5E-03	r	0	0.10	66841-25-6	Tralomethrin	4.6E+02	nc	4.6E+03	nc	2.7E+01	nc	2.7E+02	nc		
		1.3E-02	i			1.3E-02	r	0	0.10	2303-17-5	Triallate	7.9E+02	nc	8.0E+03	nc	4.7E+01	nc	4.7E+02	nc		
		1.0E-02	i			1.0E-02	r	0	0.10	82097-50-5	Triasulfuron	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		5.0E-03	i			5.0E-03	r	0	0.10	615-54-3	1,2,4-Tribromobenzene	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
		3.0E-04	i					0	0.10	56-35-9	Tributyltin oxide (TBTO)	1.8E+01	nc	1.8E+02	nc			1.1E+01	nc		
3.4E-02	h			3.4E-02	r			0	0.10	634-93-5	2,4,6-Trichloroaniline	1.4E+01	ca	5.1E+01	ca	2.0E-01	ca	2.0E+00	ca		
2.9E-02	h			2.9E-02	r			0	0.10	33663-50-2	2,4,6-Trichloroaniline hydrochloride	1.7E+01	ca	5.9E+01	ca	2.3E-01	ca	2.3E+00	ca		
		1.0E-02	i			5.7E-02	h	1		120-82-1	1,2,4-Trichlorobenzene	6.5E+02	nc	3.0E+03	sat	2.1E+02	nc	1.9E+02	nc	5.0E+00	3.0E-01
		2.8E-01	n			6.3E-01	n	1		71-55-6	**1,1,1-Trichloroethane**	1.2E+03	sat	1.2E+03	sat	2.3E+03	nc	3.2E+03	nc	2.0E+00	1.0E-01
5.7E-02	i	4.0E-03	i	5.6E-02	i	4.0E-03	r	1		79-00-5	1,1,2-Trichloroethane	7.3E-01	ca*	1.6E+00	ca*	1.2E-01	ca	2.0E-01	ca	2.0E-02	9.0E-04
4.00E-01	n	3.00E-04	n	4.00E-01	n	1.00E-02	n	1		79-01-6	**Trichloroethylene (TCE)**	5.3E-02	ca	1.1E-01	ca	1.7E-02	ca	2.8E-02	ca	6.0E-02	3.0E-03
		3.0E-01	i			2.0E-01	h	1		75-69-4	Trichlorofluoromethane	3.9E+02	nc	2.0E+03	sat	7.3E+02	nc	1.3E+03	nc		
		1.0E-01	i			1.0E-01	r	0	0.10	95-95-4	2,4,5-Trichlorophenol	6.1E+03	nc	6.2E+04	nc	3.7E+02	nc	3.6E+03	nc	2.7E+02	1.4E+01
1.1E-02	i	1.0E-04	n	1.1E-02	i	1.0E-04	r	0	0.10	88-06-2	**2,4,6-Trichlorophenol**	6.1E+00	nc**	6.2E+01	nc**	3.7E-01	nc**	3.6E+00	nc**	2.0E-01	8.0E-03
7.0E-02				7.0E-02					0.10	88-06-2	**"CAL-Modified PRG"**	6.9E+00	ca	2.5E+01	ca	9.6E-02	ca	9.6E-01	ca		
		1.0E-02	i			1.0E-02	r	0	0.10	93-76-5	2,4,5-Trichlorophenoxyacetic Acid	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
		8.0E-03	i			8.0E-03	r	0	0.10	93-72-1	2-(2,4,5-Trichlorophenoxy) propionic acid	4.9E+02	nc	4.9E+03	nc	2.9E+01	nc	2.9E+02	nc		
		5.0E-03	i			5.0E-03	r	1		598-77-6	1,1,2-Trichloropropane	1.5E+01	nc	5.1E+01	nc	1.8E+01	nc	3.0E+01	nc		
2.0E+00	n	6.0E-03	i	2.0E+00	r	1.4E-03	n	1		96-18-4	**1,2,3-Trichloropropane**	5.0E-03	ca	1.1E-02	ca	3.4E-03	ca	5.6E-03	ca		

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SFo 1/(mg/kg-d)		RfDo (mg/kg-d)		SFi 1/(mg/kg-d)		RfDi (mg/kg-d)		VOC	skin abs. soils	CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
		5.0E-03	h			5.0E-03	r	1		96-19-5	1,2,3-Trichloropropene	1.2E+01	nc	3.8E+01	nc	1.8E+01	nc	3.0E+01	nc		
		3.0E-03	i			3.0E-03	r	0	0.10	58138-08-2	Tridiphane	1.8E+02	nc	1.8E+03	nc	1.1E+01	nc	1.1E+02	nc		
		2.0E-03	r			2.0E-03	i	1		121-44-8	Triethylamine	2.3E+01	nc	8.6E+01	nc	7.3E+00	nc	1.2E+01	nc		
7.7E-03	i	7.5E-03	i	7.7E-03	r	7.5E-03	r	0	0.10	1582-09-8	Trifluralin	6.3E+01	ca**	2.2E+02	ca*	8.7E-01	ca*	8.7E+00	ca*		
		1.400E-04	r			1.400E-04	n		0.10	552-30-7	Trimellitic Anhydride (TMAN)	8.6E+00	nc	8.6E+01	nc	5.1E-01	nc	5.1E+00			
		5.0E-02	n			1.7E-03	n	1		95-63-6	1,2,4-Trimethylbenzene	5.2E+01	nc	1.7E+02	nc	6.2E+00	nc	1.2E+01	nc		
		5.0E-02	n			1.7E-03	n	1		108-67-8	1,3,5-Trimethylbenzene	2.1E+01	nc	7.0E+01	nc	6.2E+00	nc	1.2E+01	nc		
3.7E-02	h			3.7E-02	r			0	0.10	512-56-1	Trimethyl phosphate	1.3E+01	ca	4.7E+01	ca	1.8E-01	ca	1.8E+00	ca		
		3.0E-02	i			3.0E-02	r	0	0.10	99-35-4	1,3,5-Trinitrobenzene	1.8E+03	nc	1.8E+04	nc	1.1E+02	nc	1.1E+03	nc		
		1.0E-02	h			1.0E-02	r	0	0.10	479-45-8	Trinitrophenylmethylnitramine	6.1E+02	nc	6.2E+03	nc	3.7E+01	nc	3.6E+02	nc		
3E-02	i	5.0E-04	i	3E-02	r	5.0E-04	r	0	0.10	118-96-7	2,4,6-Trinitrotoluene	1.6E+01	ca**	5.7E+01	ca**	2.2E-01	ca**	2.2E+00	ca**		
		5.00E-03	n			5.00E-03	r		0.10	791-28-6	**Triphenylphosphine oxide**	3.1E+02	nc	3.1E+03	nc	1.8E+01	nc	1.8E+02	nc		
3.2E-03	n	1.1E-01	n	3.2E-03	r	1.1E-01	r		0.10	115-96-8	**Tris(2-chloroethyl) phosphate**	1.5E+02	ca*	5.4E+02	ca	2.1E+00	ca	2.1E+01	ca		
		2.00E-04	n							7440-61-0	Uranium (chemical toxicity only)	1.6E+01	nc	2.0E+02	nc			7.3E+00	nc		
		7.0E-03	h					0		7440-62-2	Vanadium and compounds	5.5E+02	nc	7.2E+03	nc			2.6E+02	nc	6.0E+03	3.0E+02
		1.0E-03	i			1.0E-03	r	0	0.10	1929-77-7	Vernam	6.1E+01	nc	6.2E+02	nc	3.7E+00	nc	3.6E+01	nc		
		2.5E-02	i			2.5E-02	r	0	0.10	50471-44-8	Vinclozolin	1.5E+03	nc	1.5E+04	nc	9.1E+01	nc	9.1E+02	nc		
		1.0E+00	h			5.7E-02	i	1		108-05-4	Vinyl acetate	4.3E+02	nc	1.4E+03	nc	2.1E+02	nc	4.1E+02	nc	1.7E+02	8.0E+00
1.1E-01	r	8.6E-04	r	1.1E-01	h	8.6E-04	i	1		593-60-2	Vinyl bromide (bromoethene)	1.9E-01	ca*	4.2E-01	ca*	6.1E-02	ca*	1.0E-01	ca*		
1.5E+00	i	3.00E-03	i	3.1E-02	i	2.86E-02	i	1		75-01-4	**Vinyl chloride (child/adult)+++**	7.9E-02	ca			1.1E-01	ca	2.0E-02	ca	1.0E-02	7.0E-04
7.5E-01	i	3.00E-03	i	1.6E-02	i	2.86E-02	i	1		75-01-4	Vinyl chloride (adult)			7.5E-01	ca						
		3.0E-04	i			3.0E-04	r	0	0.10	81-81-2	Warfarin	1.8E+01	nc	1.8E+02	nc	1.1E+00	nc	1.1E+01	nc		
		7.0E-01	i			2.9E-02	i	1	0.10	1330-20-7	**Xylenes**	2.7E+02	nc	4.2E+02	sat	1.1E+02	nc	2.1E+02	nc	2.1E+02	1.0E+01
		3.0E-01	i					0		7440-66-6	Zinc	2.3E+04	nc	1.0E+05	max			1.1E+04	nc	1.2E+04	6.2E+02
		3.0E-04	i					0		1314-84-7	Zinc phosphide	2.3E+01	nc	3.1E+02	nc			1.1E+01	nc		
		5.0E-02	i			5.0E-02	r	0	0.10	12122-67-7	Zineb	3.1E+03	nc	3.1E+04	nc	1.8E+02	nc	1.8E+03	nc		

APPENDIX J

Risk Assessment

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current/Future	Surface Soil	Surface Soil	AOC H Surface Soil	Recreational	Adult	Dermal Absorption	On-site	Quant	Nearby residents may trespass on site and contact surface soil.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact surface soil.
					Youth	Dermal Absorption	On-site	Quant	Nearby residents may trespass on site and contact surface soil.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact surface soil.
					Child	Dermal Absorption	On-site	Quant	Nearby residents may trespass on site and contact surface soil.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact surface soil.
		Air	Emissions from AOC H Surface Soil	Recreational	Adult	Inhalation	On-site	Quant	Nearby residents may trespass on site and inhale dust from surface soil.
					Youth	Inhalation	On-site	Quant	Nearby residents may trespass on site and inhale dust from surface soil.
					Child	Inhalation	On-site	Quant	Nearby residents may trespass on site and inhale dust from surface soil.
Current/Future	Sediment	Sediment	Water-filled Ditch	Recreational	Adult	Dermal	On-site	Quant	Nearby residents may trespass on site and contact sediment.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact sediment.
					Youth	Dermal Absorption	On-site	Quant	Nearby residents may trespass on site and contact sediment.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact sediment.
					Child	Dermal	On-site	Quant	Nearby residents may trespass on site and contact sediment.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact sediment.
Current/Future	Surface Water	Surface Water	Water-filled Ditch	Recreational	Adult	Dermal	On-site	Quant	Nearby residents may trespass on site and contact surface water.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact surface water.
					Youth	Dermal Absorption	On-site	Quant	Nearby residents may trespass on site and contact surface water.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact surface water.
					Child	Dermal	On-site	Quant	Nearby residents may trespass on site and contact surface water.
						Ingestion	On-site	Quant	Nearby residents may trespass on site and contact surface water.

TABLE 1

SELECTION OF EXPOSURE PATHWAYS

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Surface Soil	AOC H Surface Soil	Residential	Adult	Dermal Absorption	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
						Ingestion	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
					Child	Dermal Absorption	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
						Ingestion	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
				Maintenance Worker	Adult	Dermal	On-site	Quant	The site is located on steep slope and wooded and is assumed to have some maintenance activity.
						Ingestion	On-site	Quant	The site is located on steep slope and wooded and is assumed to have some maintenance activity.
				Industrial Worker	Adult	Dermal	On-site	Quant	Industrial workers may be present at this site in the future and contact surface soil.
						Ingestion	On-site	Quant	Industrial workers may be present at this site in the future and contact surface soil.
		Air	Emissions from AOC H Surface Soil	Residential	Adult	Inhalation	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
					Child	Inhalation	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
				Maintenance Worker	Adult	Inhalation	On-site	Quant	The site is located on steep slope and wooded and is assumed to have some maintenance activity. Workers may inhale dust from surface soil.
				Industrial Worker	Adult	Inhalation	On-site	Quant	Industrial workers may be present at this site in the future and may inhale vapors or fugitive dust from soil.
Future	Subsurface Soil	Subsurface Soil	AOC H Subsurface Soil	Residential	Adult	Dermal Absorption	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
						Ingestion	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
					Child	Dermal Absorption	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
						Ingestion	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
		Air	Emissions from AOC H Subsurface Soil	Residential	Adult	Inhalation	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
					Child	Inhalation	On-site	Quant	The site is not expected to be developed for residential use; however, the residential scenario is conservatively included in this evaluation.
Future	Total Soil (0-6 ft)	Total Soil (0-6 ft)	AOC H Total Soil (0-6 ft)	Construction Worker	Adult	Dermal	On-site	Quant	Construction workers could contact soil to a depth of 6 ft while performing activities at the site.
						Ingestion	On-site	Quant	Construction workers could contact soil to a depth of 6 ft while performing activities at the site.
			Emissions from AOC H Total Soil (0-6 ft)	Construction Worker	Adult	Inhalation	On-site	Quant	Construction workers could inhale dust from soil to a depth of 6 ft.

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Groundwater	Groundwater	Tap Water	Residential	Adult	Ingestion	On-site	Quant	Although unlikely, groundwater may be used as future potable water supply.
						Dermal Absorption	On-site	Quant	Although unlikely, groundwater may be used as future potable water supply. The adult is assumed to shower, and the child is assumed to bathe.
						Inhalation	On-site	Quant	VOCs were not detected in site groundwater. Therefore inhalation pathway is incomplete.
					Child	Ingestion	On-site	Quant	Although unlikely, groundwater may be used as future potable water supply.
						Dermal Absorption	On-site	Quant	Although unlikely, groundwater may be used as future potable water supply.
						Inhalation	On-site	Quant	VOCs were not detected in site groundwater. Therefore inhalation pathway is incomplete.
				Industrial Worker	Adult	Dermal	On-site	Quant	Industrial workers may be present at this site in the future and contact groundwater.
						Ingestion	On-site	Quant	Industrial workers may be present at this site in the future and contact groundwater.
						Inhalation	On-site	Quant	VOCs were not detected in site groundwater. Therefore inhalation pathway is incomplete.
			Groundwater (Excavation)	Construction Worker	Adult	Dermal Absorption	On-site	Quant	Construction workers may contact shallow groundwater in excavations.

Table 2.1

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Surface Soil	75-35-4	1,1-DICHLOROETHENE	7.80E-04 J	7.80E-04 J	MG/KG	AOCHSB009	1/19	0.00032 - 0.036	7.80E-04	NA	1.24E+01 NC	3.00E-02	SSL	NO	BSL
	108-38-3/106-42	M,P-XYLENE (SUM OF ISOMERS)	5.80E-02 J	5.80E-02 J	MG/KG	AOCHSS001	1/19	0.00016 - 0.018	5.80E-02	NA	2.75E+01 NC	1.00E+02	SSL	NO	BSL
	95-47-6	O-XYLENE (1,2-DIMETHYLBENZENE)	2.40E-02 J	2.40E-02 J	MG/KG	AOCHSS001	1/19	0.00015 - 0.017	2.40E-02	NA	2.75E+01 NC	1.00E+02	SSL	NO	BSL
	1330-20-7	XYLENES, TOTAL	8.20E-02 J	8.20E-02 J	MG/KG	AOCHSS001	1/19	0.00016 - 0.018	8.20E-02	NA	2.75E+01 NC	1.00E+02	SSL	NO	BSL
	606-20-2	2,6-DINITROTOLUENE	1.21E+00	1.23E+00	MG/KG	AOCHSB013	2/45	0.023 - 1.53	1.23E+00	NA	6.11E+00 NC	3.00E-04	SSL	NO	BSL
	91-57-6	2-METHYLNAPHTHALENE	2.80E-02 J	1.90E-01 J	MG/KG	AOCHSB009	5/31	0.023 - 1.53	1.90E-01	NA	6.99E+01 NC	NA	NA	NO	BSL
	99-09-2	3-NITROANILINE	4.80E-02 J	4.80E-02 J	MG/KG	AOCHSB013	1/32	0.018 - 1.22	4.80E-02	NA	1.75E-01 NC	NA	NA	NO	BSL
	101-55-3	4-BROMOPHENYL PHENYL ETHER	2.17E-01 J	2.67E-01 J	MG/KG	AOCHSB013	3/32	0.024 - 1.56	2.67E-01	NA	NA	NA	NA	NO	BSL
	56-55-3	BENZO(a)ANTHRACENE	2.90E-02 J	1.12E-01 J	MG/KG	AOCHSB004	9/32	0.02 - 1.35	1.12E-01	NA	6.21E-01 CA	8.00E-01	SSL	NO	BSL
	50-32-8	BENZO(a)PYRENE	2.57E-02 J	1.20E-01 J	MG/KG	AOCHSB004	14/32	0.0222 - 1.74	1.20E-01	NA	6.21E-02 CA	4.00E+00	SSL	YES	ASL
	205-99-2	BENZO(b)FLUORANTHENE	1.87E-02 J	1.33E-01 J	MG/KG	AOCHSB004	18/32	0.0169 - 1.53	1.33E-01	NA	6.21E-01 CA	2.00E+00	SSL	NO	BSL
	191-24-2	BENZO(g,h,i)PERYLENE	2.17E-02 J	6.00E-02 J	MG/KG	AOCHSS002	10/32	0.02 - 1.56	6.00E-02	NA	2.32E+02 NC	2.10E+03	SSL	NO	BSL
	207-08-9	BENZO(k)FLUORANTHENE	1.96E-02 J	1.24E-01 J	MG/KG	AOCHSB004	15/32	0.0179 - 1.84	1.24E-01	NA	6.21E+00 CA	2.00E+01	SSL	NO	BSL
	117-81-7	bis(2-ETHYLHEXYL) PHTHALATE	7.29E-02 J	1.17E-01 J	MG/KG	NDAHSS24	8/32	0.029 - 1.95	1.17E-01	NA	3.47E+01 CA*	0.00E+00	SSL	NO	BSL
	218-01-9	CHRYSENE	2.25E-02 J	1.55E-01 J	MG/KG	AOCHSB004	17/32	0.0211 - 1.48	1.55E-01	NA	6.21E+01 CA	8.00E+01	SSL	NO	BSL
	132-64-9	DIBENZOFURAN	2.94E-02 J	3.80E-02 J	MG/KG	AOCHSB009	2/32	0.02 - 1.35	3.80E-02	NA	2.91E+01 NC	NA	NA	NO	BSL
	206-44-0	FLUORANTHENE	2.46E-02 J	1.87E-01 J	MG/KG	AOCHSB004	15/32	0.019 - 1.61	1.87E-01	NA	2.29E+02 NC	2.10E+03	SSL	NO	BSL
	193-39-5	INDENO(1,2,3-c,d)PYRENE	2.60E-02 J	8.48E-02 J	MG/KG	NDAHSS24	8/32	0.02 - 1.35	8.48E-02	NA	6.21E-01 CA	7.00E+00	SSL	NO	BSL
	78-59-1	ISOPHORONE	1.06E-01 J	1.12E-01 J	MG/KG	AOCHSB012	2/32	0.014 - 0.934	1.12E-01	NA	5.12E+02 CA*	3.00E-01	SSL	NO	BSL
	621-64-7	N-NITROSODI-n-PROPYLAMINE	5.62E-01 J	7.17E-01	MG/KG	AOCHSB013	3/32	0.0232 - 1.84	7.17E-01	NA	6.95E-02 CA	2.00E-05	SSL	YES	ASL
	91-20-3	NAPHTHALENE	4.24E-02 J	6.90E-02 J	MG/KG	AOCHSB009	2/31	0.029 - 1.92	6.90E-02	NA	5.59E+00 NC	4.00E+01	SSL	NO	BSL
	85-01-8	PHENANTHRENE	2.11E-02 J	9.20E-02 J	MG/KG	AOCHSB009	7/32	0.0179 - 1.5	9.20E-02	NA	2.32E+02 NC	2.10E+03	SSL	NO	BSL
	129-00-0	PYRENE	2.82E-02 J	1.90E+00 J	MG/KG	AOCHSS001	16/32	0.022 - 1.45	1.90E+00	NA	2.32E+02 NC	2.10E+03	SSL	NO	BSL
	72-43-5	METHOXYCHLOR	7.40E-04 J	7.40E-04 J	MG/KG	NDAHSS19	1/31	0.00028 - 0.00032	7.40E-04	NA	3.06E+01 NC	8.00E+01	SSL	NO	BSL
	72-54-8	p,p'-DDD	5.20E-04 J	1.00E-02 J	MG/KG	NDAHSS22	12/30	0.00014 - 0.0071	1.00E-02	NA	2.44E+00 CA	8.00E+00	SSL	NO	BSL
	72-55-9	p,p'-DDE	1.40E-03 J	3.99E+00 J	MG/KG	AOCHSB001	21/31	0.000058 - 0.168	3.99E+00	NA	1.72E+00 CA	3.00E+01	SSL	YES	ASL
	50-29-3	p,p'-DDT	1.30E-03 J	1.94E+00 J	MG/KG	AOCHSB001	19/31	0.0002 - 0.039	1.94E+00	NA	1.72E+00 CA*	2.00E+01	SSL	YES	ASL
	7429-90-5	ALUMINUM	3.40E+03 J	1.10E+04 J	MG/KG	AOCHSS001, AOCHSB006	32/32	1.37 - 9.5	1.10E+04	NA	7.61E+03 NC	NA	NA	YES	ASL
	7440-36-0	ANTIMONY	3.40E-01 J	6.30E+00 J	MG/KG	AOCHSS003	25/32	0.0877 - 0.24	6.30E+00	NA	3.13E+00 NC	3.00E+00	SSL	YES	ASL
	7440-38-2	ARSENIC	4.35E-01 J	6.70E+01	MG/KG	AOCHSB010	32/32	0.128 - 0.29	6.70E+01	NA	3.90E-01 CA*	NA	NA	YES	ASL
	7440-39-3	BARIUM	2.30E+01 J	2.90E+02 J	MG/KG	AOCHSB010	32/32	0.00846 - 0.0107	2.90E+02	NA	5.37E+02 NC	8.20E+02	SSL	NO	BSL
	7440-41-7	BERYLLIUM	7.99E-02 J	2.60E-01 J	MG/KG	AOCHSB010	21/32	0.0134 - 0.03	2.60E-01	NA	1.54E+01 NC	3.00E+01	SSL	NO	BSL
	7440-43-9	CADMIUM	4.54E-02 J	2.91E-01 J	MG/KG	NDAHSS26	13/32	0.0117 - 0.02	2.91E-01	NA	3.70E+00 NC	4.00E+00	SSL	NO	BSL
	7440-70-2	CALCIUM	4.46E+03	3.40E+04	MG/KG	AOCHSS004	32/32	2.59 - 3.29	3.40E+04	NA	NA	NA	NA	NO	NUT
	7440-47-3	CHROMIUM, TOTAL	7.83E+00	5.00E+01	MG/KG	AOCHSS001	32/32	0.0375 - 0.08	5.00E+01	NA	3.01E+01 CA**	2.00E+01	SSL	YES	ASL
	7440-48-4	COBALT	3.20E+00 J	1.02E+01 J	MG/KG	NDAHSS19	32/32	0.0303 - 0.04	1.02E+01	NA	9.03E+02 CA**	NA	NA	NO	BSL
	7440-50-8	COPPER	1.11E+01	1.00E+02	MG/KG	AOCHSB003	32/32	0.0595 - 0.08	1.00E+02	NA	3.13E+02 NC	NA	NA	NO	BSL
	7439-89-6	IRON	7.70E+03	3.90E+04	MG/KG	AOCHSS003	32/32	1.06 - 2.5	3.90E+04	NA	2.35E+03 NC	NA	NA	YES	ASL
	7439-92-1	LEAD	4.43E+00 J	6.30E+01	MG/KG	AOCHSB009	32/32	0.16 - 0.221	6.30E+01	NA	4.00E+02 NC	NA	NA	NO	BSL

Table 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-95-4	MAGNESIUM	1.63E+03	8.40E+03	MG/KG	AOCHSB003	32/32	0.13 - 1.32	8.40E+03	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE	1.40E+02	7.20E+02	MG/KG	AOCHSB010	32/32	0.0189 - 0.0479	7.20E+02	NA	1.76E+02 NC	NA	NA	YES	ASL
	7439-97-6	MERCURY	4.90E-03 J	6.25E-02	MG/KG	NDAHSS25	32/32	0.00135 - 0.0025	6.25E-02	NA	6.11E-01 NC	NA	NA	NO	BSL
	7440-02-0	NICKEL	3.26E+00 J	2.60E+01	MG/KG	AOCHSS003	32/32	0.0516 - 0.09	2.60E+01	NA	1.56E+02 NC	7.00E+01	SSL	NO	BSL
	7440-09-7	POTASSIUM	7.21E+02 J	3.40E+03	MG/KG	AOCHSB003	32/32	2.56 - 3.25	3.40E+03	NA	NA	NA	NA	NO	NUT
	7782-49-2	SELENIUM	2.34E-01 J	1.40E+00	MG/KG	AOCHSB005	22/32	0.183 - 0.46	1.40E+00	NA	3.91E+01 NC	3.00E+00	SSL	NO	BSL
	7440-22-4	SILVER	3.46E-02 J	1.70E-01 J	MG/KG	AOCHSB007	12/32	0.0222 - 0.05	1.70E-01	NA	3.91E+01 NC	2.00E+01	SSL	NO	BSL
	7440-23-5	SODIUM	1.10E+02 J	5.90E+02 J	MG/KG	AOCHSB003	32/32	1.45 - 20	5.90E+02	NA	NA	NA	NA	NO	NUT
	7440-28-0	THALLIUM	2.87E-01 J	1.16E+00 J	MG/KG	NDAHSS18	13/32	0.112 - 0.34	1.16E+00	NA	5.16E-01 NC	NA	NA	YES	ASL
	7440-62-2	VANADIUM	2.10E+01	6.30E+01	MG/KG	AOCHSS001	32/32	0.0335 - 0.07	6.30E+01	NA	5.47E+01 NC	3.00E+03	SSL	YES	ASL
	7440-66-6	ZINC	3.15E+01	2.60E+02	MG/KG	AOCHSS003	32/32	0.0596 - 0.5	2.60E+02	NA	2.35E+03 NC	6.20E+03	SSL	NO	BSL

[1] Minimum/Maximum detected concentrations.
[2] Maximum concentration is used for screening.
[3] Background values not available.
[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.
PRG value for xylenes used as surrogate for m,p-xylene and o-xylene.
PRG value for 2-methylnaphthalene calculated using provisional reference dose and methods described in Region 9 PRGs Table Users Guide/Technical Background Document, October 1, 2002, U.S. EPA Region 9.
PRG value for 2-nitroaniline used as surrogate for 3-nitroaniline.
PRG value for pyrene used as surrogate for benzo(g,h,i)perylene and phenanthrene.
PRG value for chromium VI used for total chromium.
PRG value for mercury chloride used as surrogate for mercury.
Lead screening toxicity value is 400 mg/kg, the EPA residential soil screening level for lead.
[5] Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SSL = Soil Screening Level; Dilution Attenuation Factor = 10 (USEPA, October 2002)
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
CA = Carcinogenic
NC = Noncarcinogenic
CA* (where: NC < 100X CA)
CA**(where: NC < 10X CA)

Table 2.2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Subsurface Soil	75-35-4	1,1-DICHLOROETHENE	4.50E-04 J	7.80E-04 J	MG/KG	AOCHSB009	5/19	0.00032 - 0.00045	7.80E-04	NA	4.13E+01 NC	3.00E-02	SSL	NO	BSL
	107-06-2	1,2-DICHLOROETHANE	2.00E-03 J	2.00E-03 J	MG/KG	AOCHSB015	1/19	0.00017 - 0.00024	2.00E-03	NA	6.03E-01 CA*	1.00E-02	SSL	NO	BSL
	75-09-2	METHYLENE CHLORIDE	5.80E-04 J	5.80E-04 J	MG/KG	AOCHSB006	1/19	0.00026 - 0.00036	5.80E-04	NA	2.05E+01 CA	1.00E-02	SSL	NO	BSL
	127-18-4	TETRACHLOROETHYLENE(PCE)	3.10E-04 J	1.60E-03 J	MG/KG	AOCHSB003	2/19	0.00018 - 0.00025	1.60E-03	NA	3.42E+00 CA*	3.00E-02	SSL	NO	BSL
	108-88-3	TOLUENE	4.00E-04 J	4.00E-04 J	MG/KG	AOCHSB011	1/19	0.00016 - 0.00023	4.00E-04	NA	5.20E+02 SAT	6.00E+00	SSL	NO	BSL
	79-01-6	TRICHLOROETHYLENE (TCE)	3.40E-04 J	3.40E-04 J	MG/KG	AOCHSB011	1/19	0.00023 - 0.00032	3.40E-04	NA	1.15E-01 CA	3.00E-02	SSL	NO	BSL
	91-57-6	2-METHYLNAPHTHALENE	1.76E-01 J	1.76E-01 J	MG/KG	AOCHSB008	1/32	0.023 - 0.153	1.76E-01	NA				NO	BSL
	56-55-3	BENZO(a)ANTHRACENE	6.80E-02 J	6.80E-02 J	MG/KG	AOCHSB008	1/32	0.02 - 0.135	6.80E-02	NA	2.11E+00 CA	8.00E-01	SSL	NO	BSL
	50-32-8	BENZO(a)PYRENE	7.10E-02 J	7.10E-02 J	MG/KG	AOCHSB008	1/32	0.0215 - 0.174	7.10E-02	NA	2.11E-01 CA	4.00E+00	SSL	NO	BSL
	205-99-2	BENZO(b)FLUORANTHENE	1.04E-01 J	1.04E-01 J	MG/KG	AOCHSB008	1/32	0.0164 - 0.153	1.04E-01	NA	2.11E+00 CA	2.00E+00	SSL	NO	BSL
	207-08-9	BENZO(k)FLUORANTHENE	8.80E-02 J	8.80E-02 J	MG/KG	AOCHSB008	1/32	0.0174 - 0.185	8.80E-02	NA	2.11E+01 CA	2.00E+01	SSL	NO	BSL
	218-01-9	CHRYSENE	1.21E-01 J	1.21E-01 J	MG/KG	AOCHSB008	1/32	0.0205 - 0.148	1.21E-01	NA	2.11E+02 CA	8.00E+01	SSL	NO	BSL
	132-64-9	DIBENZOFURAN	5.10E-02 J	5.10E-02 J	MG/KG	AOCHSB008	1/32	0.02 - 0.135	5.10E-02	NA	3.13E+02 NC	NA	NA	NO	BSL
	206-44-0	FLUORANTHENE	8.90E-02 J	8.90E-02 J	MG/KG	AOCHSB008	1/32	0.0184 - 0.161	8.90E-02	NA	2.20E+03 NC	2.10E+03	SSL	NO	BSL
	91-20-3	NAPHTHALENE	9.00E-02 J	9.00E-02 J	MG/KG	AOCHSB008	1/32	0.028 - 0.192	9.00E-02	NA	1.88E+01 NC	4.00E+01	SSL	NO	BSL
	85-01-8	PHENANTHRENE	1.44E-01 J	1.44E-01 J	MG/KG	AOCHSB008	1/32	0.0174 - 0.151	1.44E-01	NA	2.91E+03 NC	2.10E+03	SSL	NO	BSL
	129-00-0	PYRENE	9.70E-02 J	9.70E-02 J	MG/KG	AOCHSB008	1/32	0.022 - 0.146	9.70E-02	NA	2.91E+03 NC	2.10E+03	SSL	NO	BSL
	72-54-8	p,p'-DDD	1.90E-04 J	1.30E-02	MG/KG	AOCHSB012	6/31	0.00013 - 0.0015	1.30E-02	NA	9.95E+00 CA	8.00E+00	SSL	NO	BSL
	72-55-9	p,p'-DDE	1.40E-04 J	7.64E-01 J	MG/KG	AOCHSB001	18/32	0.000055 - 0.034	7.64E-01	NA	7.02E+00 CA	3.00E+01	SSL	NO	BSL
	50-29-3	p,p'-DDT	4.80E-04 J	9.28E-01 J	MG/KG	AOCHSB001	8/32	0.0002 - 0.039	9.28E-01	NA	7.02E+00 CA*	2.00E+01	SSL	NO	BSL
	7429-90-5	ALUMINUM	2.11E+03	1.10E+04	MG/KG	AOCHSB009	32/32	1.38 - 9.5	1.10E+04	NA	1.00E+05 MAX	NA	NA	NO	BSL
	7440-36-0	ANTIMONY	1.40E-01 J	9.00E-01 J	MG/KG	AOCHSB001	17/32	0.0889 - 0.24	9.00E-01	NA	4.09E+01 NC	3.00E+00	SSL	NO	BSL
	7440-38-2	ARSENIC	1.61E-01 J	2.40E+01	MG/KG	AOCHSB001	22/32	0.13 - 0.29	2.40E+01	NA	1.59E+00 CA	NA	NA	YES	ASL
	7440-39-3	BARIUM	2.00E+01 J	2.00E+02	MG/KG	AOCHSB007	32/32	0.00857 - 0.0103	2.00E+02	NA	6.66E+03 NC	8.20E+02	SSL	NO	BSL
	7440-41-7	BERYLLIUM	4.79E-02 J	4.80E-01 J	MG/KG	AOCHSB009	26/32	0.0135 - 0.03	4.80E-01	NA	1.94E+03 CA**	3.00E+01	SSL	NO	BSL
	7440-43-9	CADMIUM	3.67E-02 J	2.19E-01 J	MG/KG	NDAHSB18	3/32	0.0118 - 0.02	2.19E-01	NA	4.51E+01 NC	4.00E+00	SSL	NO	BSL
	7440-70-2	CALCIUM	1.07E+03	3.40E+04	MG/KG	AOCHSB008	32/32	2.63 - 3.16	3.40E+04	NA	NA	NA	NA	NO	NUT
	7440-47-3	CHROMIUM, TOTAL	3.28E+00	2.70E+01	MG/KG	AOCHSB009	32/32	0.038 - 0.08	2.70E+01	NA	6.40E+01 CA	2.00E+01	SSL	NO	BSL
	7440-48-4	COBALT	2.20E+00 J	1.60E+01	MG/KG	AOCHSB007	32/32	0.0308 - 0.04	1.60E+01	NA	1.92E+03 CA*	NA	NA	NO	BSL
	7440-50-8	COPPER	7.00E+00	5.00E+01	MG/KG	AOCHSB008	32/32	0.0603 - 0.08	5.00E+01	NA	4.09E+03 NC	NA	NA	NO	BSL
	7439-89-6	IRON	6.66E+03 J	2.80E+04	MG/KG	AOCHSB009	32/32	1.07 - 2.5	2.80E+04	NA	1.00E+05 MAX	NA	NA	NO	BSL
	7439-92-1	LEAD	7.50E-01	4.80E+01	MG/KG	AOCHSB008	32/32	0.16 - 0.213	4.80E+01	NA	7.50E+02 NC	NA	NA	NO	BSL
	7439-95-4	MAGNESIUM	7.48E+02 J	4.20E+03	MG/KG	AOCHSB009	32/32	0.13 - 1.27	4.20E+03	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE	8.04E+01	1.00E+03	MG/KG	AOCHSB007	32/32	0.0191 - 0.0461	1.00E+03	NA	1.95E+03 NC	NA	NA	NO	BSL
	7439-97-6	MERCURY	3.18E-03 J	7.19E-02 J	MG/KG	NDAHSB18	24/32	0.00124 - 0.0025	7.19E-02	NA	6.16E+00 NC	NA	NA	NO	BSL
	7440-02-0	NICKEL	1.13E+00 J	9.20E+00 J	MG/KG	AOCHSB009	32/32	0.0523 - 0.09	9.20E+00	NA	2.04E+03 NC	7.00E+01	SSL	NO	BSL
	7440-09-7	POTASSIUM	4.40E+02 J	2.70E+03	MG/KG	AOCHSB003	32/32	2.59 - 3.13	2.70E+03	NA	NA	NA	NA	NO	NUT
	7782-49-2	SELENIUM	1.99E-01 J	1.30E+00	MG/KG	AOCHSB003	25/32	0.186 - 0.46	1.30E+00	NA	5.11E+02 NC	3.00E+00	SSL	NO	BSL
	7440-22-4	SILVER	2.42E-02 J	4.37E-02 J	MG/KG	NDAHSB17	4/32	0.0225 - 0.05	4.37E-02	NA	5.11E+02 NC	2.00E+01	SSL	NO	BSL

Table 2.2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-23-5	SODIUM	4.30E+01 J	8.50E+02 J	MG/KG	AOCHSB009	32/32	1.47 - 20	8.50E+02	NA	NA	NA	NA	NO	NUT
	7440-28-0	THALLIUM	2.40E-01 J	9.54E-01 J	MG/KG	NDAHSB29	14/32	0.114 - 0.34	9.54E-01	NA	6.75E+00 NC	NA	NA	NO	BSL
	7440-62-2	VANADIUM	1.90E+01	7.90E+01	MG/KG	AOCHSB009	32/32	0.034 - 0.07	7.90E+01	NA	7.15E+02 NC	3.00E+03	SSL	NO	BSL
	7440-66-6	ZINC	8.80E+00	1.55E+02 J	MG/KG	NDAHSB18	32/32	0.0604 - 0.5	1.55E+02	NA	1.00E+05 MAX	6.20E+03	SSL	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.

PRG value for xylenes used as surrogate for m,p-xylene and o-xylene.

PRG value for 2-methylnaphthalene calculated using provisional reference dose and methods described in Region 9 PRGs Table Users Guide/Technical Background Document, October 1, 2002, U.S. EPA Region 9.

PRG value for 2-nitroaniline used as surrogate for 3-nitroaniline.

PRG value for pyrene used as surrogate for phenanthrene.

PRG value for chromium VI used for total chromium.

PRG value for mercury chloride used as surrogate for mercury.

Lead screening toxicity value is 750 mg/kg, the EPA industrial soil screening level for lead.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)

Essential Nutrient (NUT)

Below Screening Level (BSL)

SSL = Soil Screening Level; Dilution Attenuation Factor = 10 (USEPA, October 2002)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

J = Estimated Value

CA = Carcinogenic

NC = Noncarcinogenic

CA* (where: NC < 100X CA)

CA**(where: NC < 10X CA)

MAX = Ceiling Limit

Table 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Groundwater	108-88-3	TOLUENE	1.00E+00	1.30E+00	µg/L	AOC-H-MW01, AOC-H-MW02	4/4	0.28 - 0.28	1.30E+00	NA	7.23E+01 NC	1.00E+03	MCL	NO	BSL
	106-47-8	4-CHLOROANILINE	9.90E+00	9.90E+00	µg/L	NDAHMW05	1/9	0.35 - 0.4	9.90E+00	NA	1.46E+01 NC	NA	NA	NO	BSL
	105-60-2	CAPROLACTAM	6.00E+00 J	6.20E+00 J	µg/L	NDAHMW01	2/2	0.3 - 0.3	6.20E+00	NA	1.82E+03 NC	NA	NA	NO	BSL
	72-54-8	p,p'-DDD	3.90E-01	4.20E-01 J	µg/L	AOC-H-MW02	3/9	0.004 - 0.028	4.20E-01	NA	2.80E-01 CA	NA	NA	YES	ASL
	72-55-9	p,p'-DDE	1.80E-02 J	2.20E-02 J	µg/L	AOC-H-MW02	2/9	0.0056 - 0.014	2.20E-02	NA	1.98E-01 CA	NA	NA	NO	BSL
	50-29-3	p,p'-DDT	2.80E-02 J	2.80E-02 J	µg/L	AOC-H-MW04	1/9	0.0044 - 0.028	2.80E-02	NA	1.98E-01 CA*	NA	NA	NO	BSL
	7429-90-5	ALUMINUM	1.12E+02 J	9.10E+03	µg/L	AOC-H-MW02	9/9	35 - 350	9.10E+03	NA	3.65E+03 NC	5.00E+01	NSDWS	YES	ASL
	7440-36-0	ANTIMONY	2.62E+00 J	5.40E+00 J	µg/L	AOC-H-MW04	2/9	2.4 - 25	5.40E+00	NA	1.46E+00 NC	6.00E+00	MCL	YES	ASL
	7440-38-2	ARSENIC	6.30E+00 J	6.30E+00 J	µg/L	AOC-H-MW02	1/9	2.04 - 20.4	6.30E+00	NA	4.48E-02 CA	1.00E+01	MCL	YES	ASL
	7440-39-3	BARIUM	6.31E+01 J	4.90E+02	µg/L	AOC-H-MW02	9/9	0.13 - 4.91	4.90E+02	NA	2.55E+02 NC	2.00E+03	MCL	YES	ASL
	7440-43-9	CADMIUM	4.08E-01 J	4.46E+00 J	µg/L	NDAHMW07	3/9	0.27 - 3.56	4.46E+00	NA	1.82E+00 NC	5.00E+00	MCL	YES	ASL
	7440-70-2	CALCIUM	1.68E+04	7.19E+05	µg/L	NDAHMW05	9/9	28 - 325	7.19E+05	NA	NA	NA	NA	NO	NUT
	7440-47-3	CHROMIUM, TOTAL	5.20E+00 J	1.50E+01	µg/L	AOC-H-MW02	5/9	0.57 - 5.7	1.50E+01	NA	1.09E+01 NC	1.00E+02	MCL	YES	ASL
	7440-48-4	COBALT	5.10E+00 J	3.33E+01 J	µg/L	NDAHMW07	7/9	0.43 - 5.69	3.33E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-50-8	COPPER	1.41E+01 J	2.50E+01	µg/L	AOC-H-MW02	4/9	0.8 - 11.7	2.50E+01	NA	1.46E+02 NC	1.30E+03	AL	NO	BSL
	7439-89-6	IRON	8.30E+01 J	1.10E+04	µg/L	AOC-H-MW02	7/9	16.7 - 167	1.10E+04	NA	1.09E+03 NC	3.00E+02	NSDWS	YES	ASL
	7439-95-4	MAGNESIUM	1.29E+04	9.63E+05	µg/L	NDAHMW07	9/9	5.23 - 52.3	9.63E+05	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE	2.50E+02	1.48E+04	µg/L	NDAHMW05	9/9	0.167 - 1.67	1.48E+04	NA	8.76E+01 NC	5.00E+01	NSDWS	YES	ASL
	7439-97-6	MERCURY	1.65E-02 J	2.40E-02 J	µg/L	NDAHMW07	2/9	0.0162 - 0.025	2.40E-02	NA	3.65E-01 NC	2.00E+00	MCL	NO	BSL
	7440-02-0	NICKEL	1.47E+00 J	5.90E+01	µg/L	AOC-H-MW02	8/9	0.93 - 9.97	5.90E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-09-7	POTASSIUM	1.87E+03 J	2.83E+05 J	µg/L	NDAHMW07	9/9	11.5 - 115	2.83E+05	NA	NA	NA	NA	NO	NUT
	7440-22-4	SILVER	5.27E-01 J	4.90E+00 J	µg/L	NDAHMW07	2/9	0.472 - 4.72	4.90E+00	NA	1.82E+01 NC	1.00E+02	NSDWS	NO	BSL
	7440-23-5	SODIUM	1.63E+05	6.95E+06	µg/L	NDAHMW07	9/9	22.7 - 227	6.95E+06	NA	NA	NA	NA	NO	NUT
	7440-28-0	THALLIUM	3.28E+00 J	4.42E+01 J	µg/L	NDAHMW07	6/9	2.54 - 25.4	4.42E+01	NA	2.41E-01 NC	2.00E+00	MCL	YES	ASL
	7440-62-2	VANADIUM	6.00E+00 J	7.00E+01	µg/L	AOC-H-MW02	7/9	0.447 - 4.47	7.00E+01	NA	2.55E+01 NC	NA	NA	YES	ASL
	7440-66-6	ZINC	8.08E-01 J	3.30E+01	µg/L	AOC-H-MW02	5/9	0.409 - 5	3.30E+01	NA	1.09E+03 NC	5.00E+03	NSDWS	NO	BSL
	7429-90-5	ALUMINUM, DISSOLVED	4.77E+01 J	4.38E+02 J	µg/L	NDAHMW07	4/9	35 - 350	4.38E+02	NA	3.65E+03 NC	2.00E+02	NSDWS	NO	BSL
	7440-36-0	ANTIMONY, DISSOLVED	5.40E+00 J	5.40E+00 J	µg/L	AOC-H-MW04	1/9	2.4 - 25	5.40E+00	NA	1.46E+00 NC	6.00E+00	MCL	YES	ASL
	7440-39-3	BARIUM, DISSOLVED	5.10E+01 J	4.60E+02	µg/L	AOC-H-MW02	9/9	0.13 - 4.91	4.60E+02	NA	2.55E+02 NC	2.00E+03	MCL	YES	ASL
	7440-43-9	CADMIUM, DISSOLVED	4.99E+00 J	6.30E+00 J	µg/L	NDAHMW05	3/9	0.27 - 3.56	6.30E+00	NA	1.82E+00 NC	5.00E+00	MCL	YES	ASL
	7440-70-2	CALCIUM, DISSOLVED	1.51E+04	7.12E+05	µg/L	NDAHMW05	9/9	28 - 325	7.12E+05	NA	NA	NA	NA	NO	NUT
	7440-47-3	CHROMIUM, DISSOLVED	8.10E-01 J	7.91E+00 J	µg/L	NDAHMW02	3/9	0.57 - 5.7	7.91E+00	NA	1.09E+01 NC	1.00E+02	MCL	NO	BSL
	7440-48-4	COBALT, DISSOLVED	6.26E-01 J	4.04E+01 J	µg/L	NDAHMW07	4/9	0.43 - 5.69	4.04E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-50-8	COPPER, DISSOLVED	4.58E+00 J	4.58E+00 J	µg/L	NDAHMW01	1/9	0.8 - 11.7	4.58E+00	NA	1.46E+02 NC	1.30E+03	AL	NO	BSL
	7439-89-6	IRON, DISSOLVED	1.69E+01 J	4.18E+03	µg/L	NDAHMW05	4/9	16.7 - 167	4.18E+03	NA	1.09E+03 NC	3.00E+02	NSDWS	YES	ASL
	7439-92-1	LEAD, DISSOLVED	1.78E+00 J	1.78E+00 J	µg/L	NDAHMW01	1/9	1.6 - 17.6	1.78E+00	NA	NA	1.50E+01	AL	NO	BSL
	7439-95-4	MAGNESIUM, DISSOLVED	1.03E+04	1.02E+06	µg/L	NDAHMW07	9/9	5.23 - 52.3	1.02E+06	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE, DISSOLVED	4.11E+01	1.54E+04	µg/L	NDAHMW05	9/9	0.167 - 1.67	1.54E+04	NA	8.76E+01 NC	5.00E+00	NSDWS	YES	ASL
	7439-97-6	MERCURY, DISSOLVED	1.94E-02 J	1.94E-02 J	µg/L	NDAHMW07	1/9	0.0162 - 0.025	1.94E-02	NA	3.65E-01 NC	2.00E+00	MCL	NO	BSL

Table 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-02-0	NICKEL, DISSOLVED	7.70E+00 J	1.76E+01 J	µg/L	NDAHMW02	3/9	0.93 - 9.97	1.76E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-09-7	POTASSIUM, DISSOLVED	2.17E+03 J	2.94E+05 J	µg/L	NDAHMW07	9/9	11.5 - 115	2.94E+05	NA	NA	NA	NA	NO	NUT
	7782-49-2	SELENIUM, DISSOLVED	3.56E+00 J	3.73E+00 J	µg/L	NDAHMW01	2/9	2.1 - 21	3.73E+00	NA	1.82E+01 NC	5.00E+01	MCL	NO	BSL
	7440-22-4	SILVER, DISSOLVED	7.15E+00 J	7.15E+00 J	µg/L	NDAHMW07	1/9	0.472 - 4.72	7.15E+00	NA	1.82E+01 NC	1.00E+02	NSDWS	NO	BSL
	7440-23-5	SODIUM, DISSOLVED	1.63E+05	7.20E+06	µg/L	NDAHMW07	9/9	22.7 - 227	7.20E+06	NA	NA	NA	NA	NO	NUT
	7440-28-0	THALLIUM, DISSOLVED	9.00E+00 J	2.62E+01 J	µg/L	NDAHMW05	2/9	2.54 - 25.4	2.62E+01	NA	2.41E-01 NC	2.00E+00	MCL	YES	ASL
	7440-62-2	VANADIUM, DISSOLVED	2.80E+00 J	2.00E+01 J	µg/L	AOC-H-MW01	6/9	0.447 - 4.47	2.00E+01	NA	2.55E+01 NC	NA	NA	NO	BSL
	7440-66-6	ZINC, DISSOLVED	4.89E-01 J	1.66E+00 J	µg/L	NDAHMW01	2/9	0.409 - 5	1.66E+00	NA	1.09E+03 NC	5.00E+03	NSDWS	NO	BSL

[1] Minimum/Maximum detected concentrations.
[2] Maximum concentration is used for screening.
[3] Background values not available.
[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.
PRG value for chromium VI used for total chromium.
PRG value for mercury chloride used as surrogate for mercury.
Lead action level is 15 µg/L.
[5] Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards
The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
NSDWS = National Secondary Drinking Water Standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.
AL = Action Level
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
CA = Carcinogenic
NC = Noncarcinogenic
CA* (where: NC < 100X CA)

Table 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Sediment	72-55-9	p,p'-DDE	1.20E-04 J	1.20E-04 J	MG/KG	NDAHSD04	1/4	0.00007 - 0.000073	1.20E-04	NA	1.72E+00 CA	3.00E+01	SSL	NO	BSL
	7429-90-5	ALUMINUM	1.88E+03 =	3.32E+03 =	MG/KG	NDAHSD01	4/4	1.22 - 1.41	3.32E+03	NA	7.61E+03 NC	NA	NA	NO	BSL
	7440-36-0	ANTIMONY	1.07E-01 J	3.33E-01 J	MG/KG	NDAHSD01	2/4	0.078 - 0.0908	3.33E-01	NA	3.13E+00 NC	3.00E+00	SSL	NO	BSL
	7440-38-2	ARSENIC	2.02E-01 J	8.82E-01 J	MG/KG	NDAHSD01	3/4	0.114 - 0.132	8.82E-01	NA	3.90E-01 CA*	1.00E+01	SSL	YES	BSL
	7440-39-3	BARIUM	6.00E+00 J	5.72E+01 =	MG/KG	NDAHSD02	4/4	0.00752 - 0.00875	5.72E+01	NA	5.37E+02 NC	8.20E+02	SSL	NO	BSL
	7440-41-7	BERYLLIUM	3.79E-02 J	6.47E-02 J	MG/KG	NDAHSD02	4/4	0.0119 - 0.0138	6.47E-02	NA	1.54E+01 NC	3.00E+01	SSL	NO	BSL
	7440-70-2	CALCIUM	8.90E+02 =	2.66E+03 =	MG/KG	NDAHSD02	4/4	2.42 - 12.1	2.66E+03	NA	NA	NA	NA	NO	NUT
	7440-47-3	CHROMIUM, TOTAL	3.11E+00 =	1.34E+01 J	MG/KG	NDAHSD01	4/4	0.0334 - 0.0388	1.34E+01	NA	3.01E+01 CA**	2.00E+01	SSL	NO	BSL
	7440-48-4	COBALT	2.31E+00 J	4.27E+00 J	MG/KG	NDAHSD04	4/4	0.027 - 0.0314	4.27E+00	NA	9.03E+02 CA**	NA	NA	NO	BSL
	7440-50-8	COPPER	6.15E+00 =	9.76E+00 =	MG/KG	NDAHSD02	4/4	0.0529 - 0.0616	9.76E+00	NA	3.13E+02 NC	NA	NA	NO	BSL
	7439-89-6	IRON	6.04E+03 =	8.62E+03 =	MG/KG	NDAHSD04	4/4	0.942 - 1.1	8.62E+03	NA	2.35E+03 NC	NA	NA	YES	BSL
	7439-92-1	LEAD	8.53E-01 =	1.49E+00 =	MG/KG	NDAHSD02	4/4	0.155 - 0.181	1.49E+00	NA	4.00E+02 NC	NA	NA	NO	BSL
	7439-95-4	MAGNESIUM	1.14E+03 =	3.43E+03 =	MG/KG	NDAHSD01	4/4	0.928 - 1.08	3.43E+03	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE	6.21E+01 =	1.09E+02 =	MG/KG	NDAHSD02	4/4	0.0168 - 0.0195	1.09E+02	NA	1.76E+02 NC	NA	NA	NO	BSL
	7439-97-6	MERCURY	1.81E-03 J	1.27E-02 J	MG/KG	NDAHSD02	3/4	0.00108 - 0.00139	1.27E-02	NA	6.11E-01 NC	NA	NA	NO	BSL
	7440-02-0	NICKEL	1.28E+00 J	4.39E+00 J	MG/KG	NDAHSD01	4/4	0.0459 - 0.0534	4.39E+00	NA	1.56E+02 NC	7.00E+01	SSL	NO	BSL
	7440-09-7	POTASSIUM	7.16E+02 J	1.09E+03 =	MG/KG	NDAHSD04	4/4	2.28 - 2.65	1.09E+03	NA	NA	NA	NA	NO	NUT
	7440-22-4	SILVER	2.68E-02 J	2.68E-02 J	MG/KG	NDAHSD04	1/4	0.0197 - 0.023	2.68E-02	NA	3.91E+01 NC	2.00E+01	SSL	NO	BSL
	7440-23-5	SODIUM	2.34E+03 =	3.29E+03 =	MG/KG	NDAHSD01	4/4	1.29 - 1.5	3.29E+03	NA	NA	NA	NA	NO	NUT
	7440-28-0	THALLIUM	4.22E-01 J	4.94E-01 J	MG/KG	NDAHSD02	3/4	0.0998 - 0.116	4.94E-01	NA	5.16E-01 NC	NA	NA	YES	BSL
	7440-62-2	VANADIUM	1.73E+01 =	2.69E+01 =	MG/KG	NDAHSD02	4/4	0.0298 - 0.0347	2.69E+01	NA	5.47E+01 NC	3.00E+03	SSL	NO	BSL
	7440-66-6	ZINC	7.31E+00 =	1.36E+01 =	MG/KG	NDAHSD04	4/4	0.053 - 0.0616	1.36E+01	NA	2.35E+03 NC	6.20E+03	SSL	NO	BSL

[1] Minimum/Maximum detected concentrations.
[2] Maximum concentration is used for screening.
[3] Background values not available.
[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.
PRG value for chromium VI used for total chromium.
PRG value for mercury chloride used as surrogate for mercury.
Lead screening toxicity value is 400 mg/kg, the EPA residential soil screening level for lead.
[5] Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SSL = Soil Screening Level; Dilution Attenuation Factor = 10 (USEPA, October 2002)
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/
To Be Considered
J = Estimated Value
NC = Noncarcinogenic
CA = Carcinogenic
CA**(where: NC < 10X CA)

Table 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection

Table 2.5

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Surface Water	105-60-2	CAPROLACTAM	5.20E-01 J	5.20E-01 J	µg/L	NDAHSW01	1/1	0.3 - 0.3	5.20E-01	NA	1.82E+03 NC	NA	NA	NO	BSL
	7429-90-5	ALUMINUM	1.74E+03 J	1.74E+03 J	µg/L	NDAHSW02	1/4	700 - 700	1.74E+03	NA	3.65E+03 NC	NA	NA	NO	BSL
	7440-38-2	ARSENIC	4.71E+01 J	4.71E+01 J	µg/L	NDAHSW02	1/4	40.8 - 40.8	4.71E+01	NA	4.48E-02 CA	NA	NA	YES	ASL
	7440-39-3	BARIUM	1.46E+02 J	1.62E+02 J	µg/L	NDAHSW02	4/4	9.82 - 9.82	1.62E+02	NA	2.55E+02 NC	NA	NA	NO	BSL
	7440-43-9	CADMIUM	7.70E+00 J	7.70E+00 J	µg/L	NDAHSW02	1/4	7.12 - 7.12	7.70E+00	NA	1.82E+00 NC	NA	NA	YES	ASL
	7440-70-2	CALCIUM	3.55E+05	3.83E+05	µg/L	NDAHSW03	4/4	650 - 650	3.83E+05	NA	NA	NA	NA	NO	NUT
	7440-47-3	CHROMIUM, TOTAL	1.62E+01 J	1.62E+01 J	µg/L	NDAHSW02	1/4	11.4 - 11.4	1.62E+01	NA	1.09E+01 NC	NA	NA	YES	ASL
	7440-48-4	COBALT	1.96E+01 J	1.96E+01 J	µg/L	NDAHSW02	1/4	11.4 - 11.4	1.96E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7439-95-4	MAGNESIUM	9.61E+05	1.05E+06	µg/L	NDAHSW03	4/4	105 - 105	1.05E+06	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE	3.85E+02	6.54E+02	µg/L	NDAHSW03	4/4	3.34 - 3.34	6.54E+02	NA	8.76E+01 NC	NA	NA	YES	ASL
	7439-97-6	MERCURY	2.25E-02 J	4.30E-02 J	µg/L	NDAHSW03	4/4	0.0162 - 0.0162	4.30E-02	NA	3.65E-01 NC	NA	NA	NO	BSL
	7440-09-7	POTASSIUM	4.70E+05 J	4.82E+05 J	µg/L	NDAHSW03	4/4	230 - 230	4.82E+05	NA	NA	NA	NA	NO	NUT
	7782-49-2	SELENIUM	6.39E+01 J	6.39E+01 J	µg/L	NDAHSW02	1/4	42 - 42	6.39E+01	NA	1.82E+01 NC	NA	NA	YES	ASL
	7440-23-5	SODIUM	7.48E+06	7.74E+06	µg/L	NDAHSW03	4/4	454 - 454	7.74E+06	NA	NA	NA	NA	NO	NUT
	7440-39-3	BARIUM, DISSOLVED	1.42E+02 J	1.63E+02 J	µg/L	NDAHSW02	4/4	9.82 - 9.82	1.63E+02	NA	2.55E+02 NC	NA	NA	NO	BSL
	7440-70-2	CALCIUM, DISSOLVED	3.35E+05	3.46E+05	µg/L	NDAHSW01	4/4	650 - 650	3.46E+05	NA	NA	NA	NA	NO	NUT
	7439-95-4	MAGNESIUM, DISSOLVED	7.40E+06	7.75E+06	µg/L	NDAHSW01	4/4	454 - 454	7.75E+06	NA	NA	NA	NA	NO	NUT
	7439-96-5	MANGANESE, DISSOLVED	9.02E+05	9.39E+05	µg/L	NDAHSW01	4/4	105 - 105	9.39E+05	NA	8.76E+01 NC	NA	NA	YES	ASL
	7439-97-6	MERCURY, DISSOLVED	7.00E+01 J	4.19E+02 J	µg/L	NDAHSW04	4/4	3.34 - 3.34	4.19E+02	NA	3.65E-01 NC	NA	NA	YES	ASL
	7440-09-7	POTASSIUM, DISSOLVED	2.24E-02 J	3.03E-02 J	µg/L	NDAHSW03	2/4	0.0162 - 0.0162	3.03E-02	NA	NA	NA	NA	NO	NUT
	7782-49-2	SELENIUM, DISSOLVED	4.60E+05	4.86E+05	µg/L	NDAHSW01	4/4	230 - 230	4.86E+05	NA	1.82E+01 NC	NA	NA	YES	ASL
	7440-23-5	SODIUM, DISSOLVED	6.79E+01 J	6.79E+01 J	µg/L	NDAHSW01	1/4	42 - 42	6.79E+01	NA	NA	NA	NA	NO	NUT

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.
PRG value for chromium VI used for total chromium.
PRG value for mercuric chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/
To Be Considered
J = Estimated Value
CA = Carcinogenic
NC = Noncarcinogenic
CA* (where: NC < 100X CA)
CA**(where: NC < 10X CA)

Table 2.6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Total Soil (0-6 ft)
Exposure Medium: Total Soil (0-6 ft)

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Total Soil	72-54-8	p,p'-DDD	1.90E-04 J	1.30E-02	MG/KG	AOCHSB012	17 / 59	3.40E-03 - 1.80E-01	1.30E-02	NA	9.95E+00 CA	8.00E+00	SSL	NO	BSL
(0-6 ft)	72-55-9	p,p'-DDE	1.40E-04 J	3.99E+00 J	MG/KG	AOCHSB001	39 / 61	3.40E-03 - 1.77E+00	3.99E+00	NA	7.02E+00 CA	3.00E+01	SSL	NO	BSL
	50-29-3	p,p'-DDT	4.80E-04 J	1.94E+00 J	MG/KG	AOCHSB001	27 / 61	3.40E-03 - 3.92E-01	1.94E+00	NA	7.02E+00 CA*	2.00E+01	SSL	NO	BSL
	72-43-5	Methoxychlor	7.40E-04 J	7.40E-04 J	MG/KG	NDAHSS19	1 / 60	1.70E-02 - 1.90E-01	7.40E-04	NA	3.08E+02 NC	8.00E+01	SSL	NO	BSL
	606-20-2	2,6-Dinitrotoluene	1.21E+00	1.23E+00	MG/KG	AOCHSB013	2 / 88	1.27E-01 - 2.82E+01	1.23E+00	NA	6.16E+01 NC	3.00E-04	SSL	NO	BSL
	91-57-6	2-Methylnaphthalene	2.80E-02 J	1.90E-01 J	MG/KG	AOCHSB009	6 / 61	3.38E-01 - 2.82E+01	1.90E-01	NA	3.82E+02 CA	NA	NA	NO	BSL
	99-09-2	3-Nitroaniline	4.80E-02 J	4.80E-02 J	MG/KG	AOCHSB013	1 / 62	1.01E+00 - 8.45E+01	4.80E-02	NA	1.76E+00 NC	NA	NA	NO	BSL
	101-55-3	4-Bromophenyl-phenylether	2.17E-01 J	2.67E-01 J	MG/KG	AOCHSB013	3 / 62	3.38E-01 - 2.82E+01	2.67E-01	NA	7.35E+00 CA	NA	NA	NO	BSL
	56-55-3	Benzo(a)anthracene	2.90E-02 J	1.12E-01 J	MG/KG	AOCHSB004	10 / 62	3.38E-01 - 2.82E+01	1.12E-01	NA	2.11E+00 CA	8.00E-01	SSL	NO	BSL
	50-32-8	Benzo(a)pyrene	2.57E-02 J	1.20E-01 J	MG/KG	AOCHSB004	15 / 62	3.38E-01 - 2.82E+01	1.20E-01	NA	2.11E-01 CA	4.00E+00	SSL	NO	BSL
	205-99-2	Benzo(b)fluoranthene	1.87E-02 J	1.33E-01 J	MG/KG	AOCHSB004	19 / 62	3.38E-01 - 2.82E+01	1.33E-01	NA	2.11E+00 CA	2.00E+00	SSL	NO	BSL
	191-24-2	Benzo(g,h,i)perylene	2.17E-02 J	6.00E-02 J	MG/KG	AOCHSS002	10 / 62	3.38E-01 - 2.82E+01	6.00E-02	NA	2.91E+02 NC	2.10E+03	SSL	NO	BSL
	207-08-9	Benzo(k)fluoranthene	1.96E-02 J	1.24E-01 J	MG/KG	AOCHSB004	16 / 62	3.38E-01 - 2.82E+01	1.24E-01	NA	2.11E+01 CA	2.00E+01	SSL	NO	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	7.29E-02 J	1.17E-01 J	MG/KG	NDAHSS24	8 / 62	3.38E-01 - 2.82E+01	1.17E-01	NA	1.23E+02 CA	NA	NA	NO	BSL
	218-01-9	Chrysene	2.25E-02 J	1.55E-01 J	MG/KG	AOCHSB004	18 / 62	3.38E-01 - 2.82E+01	1.55E-01	NA	2.11E+02 CA	8.00E+01	SSL	NO	BSL
	132-64-9	Dibenzofuran	2.94E-02 J	5.10E-02 J	MG/KG	AOCHSB008	3 / 62	3.38E-01 - 2.82E+01	5.10E-02	NA	3.13E+02 NC	NA	NA	NO	BSL
	206-44-0	Fluoranthene	2.46E-02 J	1.87E-01 J	MG/KG	AOCHSB004	16 / 62	3.38E-01 - 2.82E+01	1.87E-01	NA	2.20E+03 NC	2.10E+03	SSL	NO	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	2.60E-02 J	8.48E-02 J	MG/KG	NDAHSS24	8 / 62	3.38E-01 - 2.82E+01	8.48E-02	NA	2.11E+00 CA	7.00E+00	SSL	NO	BSL
	78-59-1	Isophorone	1.06E-01 J	1.12E-01 J	MG/KG	AOCHSB012	2 / 62	3.38E-01 - 2.82E+01	1.12E-01	NA	1.81E+03 CA*	3.00E-01	SSL	NO	BSL
	91-20-3	Naphthalene	4.24E-02 J	9.00E-02 J	MG/KG	AOCHSB008	3 / 61	3.38E-01 - 2.82E+01	9.00E-02	NA	1.88E+01 NC	4.00E+01	SSL	NO	BSL
	621-64-7	N-Nitroso-di-n-propylamine	5.62E-01 J	7.17E-01	MG/KG	AOCHSB013	3 / 62	3.38E-01 - 2.82E+01	7.17E-01	NA	2.46E-01 CA	2.00E-05	SSL	YES	ASL
	85-01-8	Phenanthrene	2.11E-02 J	1.44E-01 J	MG/KG	AOCHSB008	8 / 62	3.38E-01 - 2.82E+01	1.44E-01	NA	2.91E+03 NC	2.10E+03	SSL	NO	BSL
	129-00-0	Pyrene	2.82E-02 J	1.90E+00 J	MG/KG	AOCHSS001	17 / 62	3.38E-01 - 2.82E+01	1.90E+00	NA	2.91E+03 NC	2.10E+03	SSL	NO	BSL
	75-35-4	1,1-Dichloroethene	4.50E-04 J	7.80E-04 J	MG/KG	AOCHSB009	5 / 36	1.00E-02 - 9.48E-01	7.80E-04	NA	4.13E+01 NC	3.00E-02	SSL	NO	BSL
	107-06-2	1,2-Dichloroethane	2.00E-03 J	2.00E-03 J	MG/KG	AOCHSB015	1 / 36	1.00E-02 - 9.48E-01	2.00E-03	NA	6.03E-01 CA*	1.00E-02	SSL	NO	BSL
	m&pXYLENE	m,p-Xylene	5.80E-02 J	5.80E-02 J	MG/KG	AOCHSS001	1 / 36	1.00E-02 - 9.48E-01	5.80E-02	NA	4.20E+02 SAT	1.00E+02	SSL	NO	BSL
	75-09-2	Methylene chloride	5.80E-04 J	5.80E-04 J	MG/KG	AOCHSB006	1 / 36	1.00E-02 - 9.48E-01	5.80E-04	NA	2.05E+01 CA	1.00E-02	SSL	NO	BSL
	95-47-6	o-Xylene	2.40E-02 J	2.40E-02 J	MG/KG	AOCHSS001	1 / 36	1.00E-02 - 9.48E-01	2.40E-02	NA	4.20E+02 SAT	1.00E+02	SSL	NO	BSL
	127-18-4	Tetrachloroethene	3.10E-04 J	1.60E-03 J	MG/KG	AOCHSB003	2 / 36	1.00E-02 - 9.48E-01	1.60E-03	NA	3.42E+00 CA*	3.00E-02	SSL	NO	BSL
	108-88-3	Toluene	4.00E-04 J	4.00E-04 J	MG/KG	AOCHSB011	1 / 36	1.00E-02 - 9.48E-01	4.00E-04	NA	5.20E+02 SAT	6.00E+00	SSL	NO	BSL
	79-01-6	Trichloroethene	3.40E-04 J	3.40E-04 J	MG/KG	AOCHSB011	1 / 36	1.00E-02 - 9.48E-01	3.40E-04	NA	1.15E-01 CA	3.00E-02	SSL	NO	BSL
	1330-20-7	Xylene (total)	8.20E-02 J	8.20E-02 J	MG/KG	AOCHSS001	1 / 36	1.00E-02 - 9.48E-01	8.20E-02	NA	4.20E+02 SAT	1.00E+02	SSL	NO	BSL
	7429-90-5	Aluminum	2.11E+03	1.10E+04 J	MG/KG	AOCHSB006, AOCHSS001	62 / 62	3.19E+01 - 4.80E+01	1.10E+04	NA	1.00E+05 MAX	NA	NA	NO	BSL
	7440-36-0	Antimony	1.40E-01 J	6.30E+00 J	MG/KG	AOCHSS003	40 / 62	9.56E+00 - 1.40E+01	6.30E+00	NA	4.09E+01 NC	3.00E+00	SSL	NO	BSL
	7440-38-2	Arsenic	1.61E-01 J	6.70E+01	MG/KG	AOCHSB010	53 / 62	1.59E+00 - 2.40E+00	6.70E+01	NA	1.59E+00 CA	NA	NA	YES	ASL
	7440-39-3	Barium	2.00E+01 J	2.90E+02 J	MG/KG	AOCHSB010	62 / 62	3.19E+01 - 4.80E+01	2.90E+02	NA	6.66E+03 NC	8.20E+02	SSL	NO	BSL
	7440-41-7	Beryllium	4.79E-02 J	2.60E-01 J	MG/KG	AOCHSB010, AOCHSB016	45 / 62	7.97E-01 - 1.20E+00	2.60E-01	NA	1.94E+03 CA**	3.00E+01	SSL	NO	BSL
	7440-43-9	Cadmium	3.67E-02 J	2.91E-01 J	MG/KG	NDAHSS26	16 / 62	7.97E-01 - 1.20E+00	2.91E-01	NA	4.51E+01 NC	4.00E+00	SSL	NO	BSL
	7440-70-2	Calcium	1.07E+03	3.40E+04	MG/KG	AOCHSB008, AOCHSS004	62 / 62	7.97E+02 - 1.20E+03	3.40E+04	NA	NA	NA	NA	NO	NUT

Table 2.6

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Total Soil (0-6 ft)
Exposure Medium: Total Soil (0-6 ft)

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-47-3	Chromium	3.28E+00	5.00E+01	MG/KG	AOCHSS001	62 / 62	1.59E+00 - 2.40E+00	5.00E+01	NA	6.40E+01 CA	2.00E+01	SSL	NO	BSL
	7440-48-4	Cobalt	2.20E+00 J	1.60E+01	MG/KG	AOCHSB007	62 / 62	7.97E+00 - 1.20E+01	1.60E+01	NA	1.92E+03 CA*	NA	NA	NO	BSL
	7440-50-8	Copper	7.00E+00	1.00E+02	MG/KG	AOCHSB003	62 / 62	3.98E+00 - 6.00E+00	1.00E+02	NA	4.09E+03 NC	NA	NA	NO	BSL
	7439-89-6	Iron	6.66E+03 J	3.90E+04	MG/KG	AOCHSS003	62 / 62	1.59E+01 - 2.40E+01	3.90E+04	NA	1.00E+05 MAX	NA	NA	NO	BSL
	7439-92-1	Lead	7.50E-01	6.30E+01	MG/KG	AOCHSB009	62 / 62	4.78E-01 - 7.20E-01	6.30E+01	NA	7.50E+02 NC	NA	NA	NO	BSL
	7439-95-4	Magnesium	7.48E+02 J	8.40E+03	MG/KG	AOCHSB003	62 / 62	7.97E+02 - 1.20E+03	8.40E+03	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	8.04E+01	1.00E+03	MG/KG	AOCHSB007	62 / 62	2.39E+00 - 6.01E+00	1.00E+03	NA	1.95E+03 NC	NA	NA	NO	BSL
	7439-97-6	Mercury	3.18E-03 J	7.19E-02 J	MG/KG	NDAHSB18	56 / 62	2.34E-02 - 4.00E-02	7.19E-02	NA	6.16E+00 NC	NA	NA	NO	BSL
	7440-02-0	Nickel	1.13E+00 J	2.60E+01	MG/KG	AOCHSS003	62 / 62	6.37E+00 - 9.60E+00	2.60E+01	NA	2.04E+03 NC	7.00E+01	SSL	NO	BSL
	7440-09-7	Potassium	4.40E+02 J	3.40E+03	MG/KG	AOCHSB003	62 / 62	7.97E+02 - 1.20E+03	3.40E+03	NA	NA	NA	NA	NO	NUT
	7782-49-2	Selenium	1.99E-01 J	1.40E+00	MG/KG	AOCHSB005	45 / 62	7.97E-01 - 1.20E+00	1.40E+00	NA	5.11E+02 NC	3.00E+00	SSL	NO	BSL
	7440-22-4	Silver	2.42E-02 J	1.70E-01 J	MG/KG	AOCHSB007	16 / 62	1.59E+00 - 2.40E+00	1.70E-01	NA	5.11E+02 NC	2.00E+01	SSL	NO	BSL
	7440-23-5	Sodium	4.30E+01 J	7.37E+02 J	MG/KG	NDAHSB27	62 / 62	7.97E+02 - 1.20E+03	7.37E+02	NA	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	2.40E-01 J	1.16E+00 J	MG/KG	NDAHSS18	26 / 62	1.59E+00 - 2.40E+00	1.16E+00	NA	6.75E+00 NC	NA	NA	NO	BSL
	7440-62-2	Vanadium	1.90E+01	6.50E+01	MG/KG	AOCHSB016	62 / 62	7.97E+00 - 1.20E+01	6.50E+01	NA	7.15E+02 NC	3.00E+03	SSL	NO	BSL
	7440-66-6	Zinc	8.80E+00	2.60E+02	MG/KG	AOCHSS003	62 / 62	3.19E+00 - 4.80E+00	2.60E+02	NA	1.00E+05 MAX	6.20E+03	SSL	NO	BSL

[1] Minimum/Maximum detected concentrations.

[2] Maximum concentration is used for screening.

[3] Background values not available.

[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.

PRG value for xylenes used as surrogate for m,p-xylene and o-xylene.

PRG value for 2-methylnaphthalene calculated using provisional reference dose and methods described in Region 9 PRGs Table Users Guide/Technical Background Document, October 1, 2002, U.S. EPA Region 9.

PRG value for 2-nitroaniline used as surrogate for 3-nitroaniline.

PRG value for Bis(2-chloroisopropyl) ether used as surrogate for 4-bromophenyl-phenylether.

PRG value for pyrene used as surrogate for benzo(ghi)perylene.

PRG value for pyrene used as surrogate for phenanthrene.

PRG value for chromium VI used for total chromium.

PRG value for mercury chloride used as surrogate for mercury.

[5] Rationale Codes

Selection Reason: Above Screening Levels (ASL)

Deletion Reason: Essential Nutrient (NUT)

Below Screening Level (BSL)

SSL = Soil Screening Level; Dilution Attenuation Factor = 10 (USEPA, October 2002)

COPC = Chemical of Potential Concern

ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered

J = Estimated Value

CA = Carcinogenic

NC = Noncarcinogenic

CA* (where: NC < 100X CA)

CA**(where: NC < 10X CA)

MAX = Ceiling Limit

Table 2.7

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Groundwater in Excavations	108-88-3	Toluene	4.30E-01 J	1.30E+00	UG/L	AOC-H-MW01, AOC-H-MW02	4 / 4	1.00E+00 - 1.00E+00	1.30E+00	NA	7.23E+01 NC	1.00E+03	MCL	NO	BSL
	106-47-8	4-Chloroaniline	9.90E+00	9.90E+00	UG/L	NDAHMW05	1 / 8	5.00E+00 - 5.40E+00	9.90E+00	NA	1.46E+01 NC	NA	NA	NO	BSL
	105-60-2	Caprolactam	3.00E+00 J	6.00E+00 J	UG/L	NDAHMW05	2 / 2	5.00E+00 - 5.10E+00	6.00E+00	NA	1.82E+03 NC	NA	NA	NO	BSL
	72-54-8	4,4-DDD	3.90E-01	4.20E-01 J	UG/L	AOC-H-MW02	3 / 8	2.00E-02 - 1.00E-01	4.20E-01	NA	2.80E-01 CA	NA	NA	YES	ASL
	72-55-9	4,4-DDE	1.80E-02 J	2.20E-02 J	UG/L	AOC-H-MW02	2 / 8	2.00E-02 - 2.80E-02	2.20E-02	NA	1.98E-01 CA	NA	NA	NO	BSL
	50-29-3	4,4-DDT	2.80E-02 J	2.80E-02 J	UG/L	AOC-H-MW04	1 / 8	2.00E-02 - 2.80E-02	2.80E-02	NA	1.98E-01 CA*	NA	NA	NO	BSL
	7429-90-5	Aluminum	1.30E+02 J	9.10E+03	UG/L	AOC-H-MW02	8 / 8	2.00E+02 - 2.00E+03	9.10E+03	NA	3.65E+03 NC	5.00E+01	NSDWS	YES	ASL
	7440-36-0	Antimony	5.40E+00 J	5.40E+00 J	UG/L	AOC-H-MW04	1 / 8	6.00E+01 - 6.00E+02	5.40E+00	NA	1.46E+00 NC	6.00E+00	MCL	YES	ASL
	7440-38-2	Arsenic	6.30E+00 J	6.30E+00 J	UG/L	AOC-H-MW02	1 / 8	1.00E+01 - 1.00E+02	6.30E+00	NA	4.48E-02 CA	1.00E+01	MCL	YES	ASL
	7440-39-3	Barium	8.60E+01 J	4.90E+02	UG/L	AOC-H-MW02	8 / 8	2.00E+02 - 2.00E+03	4.90E+02	NA	2.55E+02 NC	2.00E+03	MCL	YES	ASL
	7440-43-9	Cadmium	4.35E-01 J	4.46E+00 J	UG/L	NDAHMW07	2 / 8	5.00E+00 - 5.00E+01	4.46E+00	NA	1.82E+00 NC	5.00E+00	MCL	YES	ASL
	7440-70-2	Calcium	1.65E+04	7.19E+05	UG/L	NDAHMW05	8 / 8	5.00E+03 - 5.00E+04	7.19E+05	NA	NA	NA	NA	NO	NUT
	7440-47-3	Chromium	5.20E+00 J	1.50E+01	UG/L	AOC-H-MW02	5 / 8	1.00E+01 - 1.00E+02	1.50E+01	NA	1.09E+01 NC	1.00E+02	MCL	YES	ASL
	7440-48-4	Cobalt	4.68E+00 J	3.33E+01 J	UG/L	NDAHMW07	7 / 8	5.00E+01 - 5.00E+02	3.33E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-50-8	Copper	1.26E+01 J	2.50E+01	UG/L	AOC-H-MW02	4 / 8	2.50E+01 - 2.50E+02	2.50E+01	NA	1.46E+02 NC	1.30E+03	AL	NO	BSL
	7439-89-6	Iron	4.50E+03	1.10E+04	UG/L	AOC-H-MW02	6 / 8	1.00E+02 - 1.00E+03	1.10E+04	NA	1.09E+03 NC	3.00E+02	NSDWS	YES	ASL
	7439-95-4	Magnesium	1.27E+04	9.63E+05	UG/L	NDAHMW07	8 / 8	5.00E+03 - 5.00E+04	9.63E+05	NA	NA	NA	NA	NO	NUT
	7439-96-5	Manganese	2.50E+02	1.48E+04	UG/L	NDAHMW05	8 / 8	1.50E+01 - 1.50E+02	1.48E+04	NA	8.76E+01 NC	5.00E+01	NSDWS	YES	ASL
	7439-97-6	Mercury	1.65E-02 J	2.40E-02 J	UG/L	NDAHMW07	2 / 8	2.00E-01 - 2.00E-01	2.40E-02	NA	3.65E-01 NC	2.00E+00	MCL	NO	BSL
	7440-02-0	Nickel	7.55E+00 J	5.90E+01	UG/L	AOC-H-MW02	7 / 8	4.00E+01 - 4.00E+02	5.90E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-09-7	Potassium	4.30E+03 J	2.83E+05 J	UG/L	NDAHMW07	8 / 8	5.00E+03 - 5.00E+04	2.83E+05	NA	NA	NA	NA	NO	NUT
	7440-22-4	Silver	4.90E+00 J	4.90E+00 J	UG/L	NDAHMW07	1 / 8	1.00E+01 - 1.00E+02	4.90E+00	NA	1.82E+01 NC	1.00E+02	NSDWS	NO	BSL
	7440-23-5	Sodium	2.66E+05	6.95E+06	UG/L	NDAHMW07	8 / 8	5.00E+03 - 5.00E+04	6.95E+06	NA	NA	NA	NA	NO	NUT
	7440-28-0	Thallium	3.28E+00 J	4.42E+01 J	UG/L	NDAHMW07	6 / 8	1.00E+01 - 1.00E+02	4.42E+01	NA	2.41E-01 NC	2.00E+00	MCL	YES	ASL
	7440-62-2	Vanadium	6.00E+00 J	7.00E+01	UG/L	AOC-H-MW02	6 / 8	5.00E+01 - 5.00E+02	7.00E+01	NA	2.55E+01 NC	NA	NA	YES	ASL
	7440-66-6	Zinc	1.28E+01 J	3.30E+01	UG/L	AOC-H-MW02	4 / 8	2.00E+01 - 2.00E+02	3.30E+01	NA	1.09E+03 NC	5.00E+03	NSDWS	NO	BSL
	7429-90-5_D	Aluminum, Dissolved	1.30E+02 J	4.38E+02 J	UG/L	NDAHMW07	2 / 8	2.00E+02 - 2.00E+03	4.38E+02	NA	3.65E+03 NC	2.00E+02	NSDWS	NO	BSL
	7440-36-0_D	Antimony, Dissolved	5.40E+00 J	5.40E+00 J	UG/L	AOC-H-MW04	1 / 8	6.00E+01 - 6.00E+02	5.40E+00	NA	1.46E+00 NC	6.00E+00	MCL	YES	ASL
	7440-39-3_D	Barium, Dissolved	5.10E+01 J	4.60E+02	UG/L	AOC-H-MW02	8 / 8	2.00E+02 - 2.00E+03	4.60E+02	NA	2.55E+02 NC	2.00E+03	MCL	YES	ASL
	7440-43-9_D	Cadmium, Dissolved	4.99E+00 J	6.30E+00 J	UG/L	NDAHMW05	3 / 8	5.00E+00 - 5.00E+01	6.30E+00	NA	1.82E+00 NC	5.00E+00	MCL	YES	ASL
	7440-70-2_D	Calcium, Dissolved	1.51E+04	7.12E+05	UG/L	NDAHMW05	8 / 8	5.00E+03 - 5.00E+04	7.12E+05	NA	NA	NA	NA	NO	NUT
	7440-47-3_D	Chromium, Dissolved	5.71E+00 J	7.91E+00 J	UG/L	NDAHMW02	2 / 8	1.00E+01 - 1.00E+02	7.91E+00	NA	1.09E+01 NC	1.00E+02	MCL	NO	BSL
	7440-48-4_D	Cobalt, Dissolved	2.42E+01 J	4.04E+01 J	UG/L	NDAHMW07	3 / 8	5.00E+01 - 5.00E+02	4.04E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-50-8_D	Copper, Dissolved	1.21E+00 J	1.21E+00 J	UG/L	NDAHMW01	1 / 8	2.50E+01 - 2.50E+02	1.21E+00	NA	1.46E+02 NC	1.30E+03	AL	NO	BSL
	7439-89-6_D	Iron (Dissolved)	1.20E+02	4.18E+03	UG/L	NDAHMW05	3 / 8	1.00E+02 - 1.00E+03	4.18E+03	NA	1.09E+03 NC	3.00E+02	NSDWS	YES	ASL
	7439-95-4_D	Magnesium, Dissolved	1.03E+04	1.02E+06	UG/L	NDAHMW07	8 / 8	5.00E+03 - 5.00E+04	1.02E+06	NA	NA	NA	NA	NO	NUT
	7439-96-5_D	Manganese, Dissolved	3.95E+01	1.54E+04	UG/L	NDAHMW05	8 / 8	1.50E+01 - 1.50E+02	1.54E+04	NA	8.76E+01 NC	5.00E+00	NSDWS	YES	ASL
	7439-97-6_D	Mercury, Dissolved	1.94E-02 J	1.94E-02 J	UG/L	NDAHMW07	1 / 8	2.00E-01 - 2.00E-01	1.94E-02	NA	3.65E-01 NC	2.00E+00	MCL	NO	BSL
	7440-02-0_D	Nickel, Dissolved	7.70E+00 J	1.76E+01 J	UG/L	NDAHMW02	3 / 8	4.00E+01 - 4.00E+02	1.76E+01	NA	7.30E+01 NC	NA	NA	NO	BSL
	7440-09-7_D	Potassium, Dissolved	4.10E+03 J	2.94E+05 J	UG/L	NDAHMW07	8 / 8	5.00E+03 - 5.00E+04	2.94E+05	NA	NA	NA	NA	NO	NUT
	7782-49-2_D	Selenium, Dissolved	2.21E+00 J	2.21E+00 J	UG/L	NDAHMW01	1 / 8	5.00E+00 - 5.00E+01	2.21E+00	NA	1.82E+01 NC	5.00E+01	MCL	NO	BSL

Table 2.7

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7440-22-4_D	Silver, Dissolved	7.15E+00 J	7.15E+00 J	UG/L	NDAHMW07	1 / 8	1.00E+01 - 1.00E+02	7.15E+00	NA	1.82E+01 NC	1.00E+02	NSDWS	NO	BSL
	7440-23-5_D	Sodium, Dissolved	2.73E+05	7.20E+06	UG/L	NDAHMW07	8 / 8	5.00E+03 - 5.00E+04	7.20E+06	NA	NA	NA	NA	NO	NUT
	7440-28-0_D	Thallium, Dissolved	9.00E+00 J	2.62E+01 J	UG/L	NDAHMW05	2 / 8	1.00E+01 - 1.00E+02	2.62E+01	NA	2.41E-01 NC	2.00E+00	MCL	YES	ASL
	7440-62-2_D	Vanadium, Dissolved	2.80E+00 J	2.00E+01 J	UG/L	AOC-H-MW01	5 / 8	5.00E+01 - 5.00E+02	2.00E+01	NA	2.55E+01 NC	NA	NA	NO	BSL
	7440-66-6_D	Zinc, Dissolved	1.66E+00 J	1.66E+00 J	UG/L	NDAHMW01	1 / 8	2.00E+01 - 2.00E+02	1.66E+00	NA	1.09E+03 NC	5.00E+03	NSDWS	NO	BSL

[1] Minimum/Maximum detected concentrations.
[2] Maximum concentration is used for screening.
[3] Background values not available.
[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.
PRG value for chromium VI used for total chromium.
PRG value for mercury chloride used as surrogate for mercury.
[5] Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: Essential Nutrient (NUT)
Below Screening Level (BSL)

MCL = Maximum Contaminant Level from EPA's National Primary Drinking Water Standards
The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.
NSDWS = National Secondary Drinking Water Standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water.
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
CA = Carcinogenic
NC = Noncarcinogenic
CA* (where: NC < 100X CA)

Table 3.1.RME

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
AOC H Surface Soil									
	BENZO(a)PYRENE	MG/KG	7.68E-01	5.39E+00 (NP)	1.12E-01 J	1.12E-01	MG/KG	Max	(5)
	N-NITROSODI-n-PROPYLAMINE	MG/KG	8.71E-01	2.88E+00 (NP)	7.17E-01	7.17E-01	MG/KG	Max	(5)
	p,p'-DDE	MG/KG	2.41E-01	1.75E+00 (NP)	3.99E+00 J	1.75E+00	MG/KG	99% Cheb-m	(3)
	p,p'-DDT	MG/KG	1.12E-01	5.51E-01 (NP)	1.94E+00 J	5.51E-01	MG/KG	97.5% Cheb-m	(3)
	ALUMINUM	MG/KG	7.65E+03	8.26E+03 (N)	1.10E+04 J	8.26E+03	MG/KG	95% UCL-N	(4)
	ANTIMONY	MG/KG	7.93E-01	1.13E+00 (T)	6.30E+00 J	1.13E+00	MG/KG	95% UCL-T	(1)
	ARSENIC	MG/KG	4.99E+00	1.90E+01 (NP)	6.70E+01	1.90E+01	MG/KG	97.5% Cheb-m	(3)
	CHROMIUM, TOTAL	MG/KG	1.74E+01	2.01E+01 (T)	5.00E+01	2.01E+01	MG/KG	95% UCL-T	(1)
	IRON	MG/KG	1.74E+04	2.13E+04 (NP)	3.90E+04	2.13E+04	MG/KG	95% Cheb-m	(3)
	MANGANESE	MG/KG	3.96E+02	4.84E+02 (NP)	7.20E+02	4.84E+02	MG/KG	95% Cheb-m	(3)
	THALLIUM	MG/KG	3.93E-01	6.18E-01 (NP)	1.16E+00 J	6.18E-01	MG/KG	95% Cheb-m	(3)
	VANADIUM	MG/KG	4.49E+01	4.78E+01 (N)	6.30E+01	4.78E+01	MG/KG	95% UCL-N	(2)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum value was used in the calculation.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); Mean of Normal Data (Mean-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Log-transformed Data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilk W Test indicates data are normally distributed.

(3) Shapiro-Wilk W Test indicates data neither log-normally or normally distributed. Select distribution with higher W Test result.

(4) Shapiro-Wilk W Test indicates data fit both log-normal and normal distribution. Select distribution with higher W Test result.

(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal

T = Log-Transformed

NP = Non-Parametric

J = Estimated Value

Table 3.2.RME
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
AOC H Subsurface Soil	ARSENIC	MG/KG	1.68E+00	6.56E+00 (NP)	2.40E+01	6.56E+00	MG/KG	97.5% Cheb-m	(3)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum value was used in the calculation.
ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); Mean of Normal Data (Mean-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Log-transformed Data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test indicates data are normally distributed.
(3) Shapiro-Wilk W Test indicates data neither log-normally or normally distributed. Select distribution with higher W Test result.
(4) Shapiro-Wilk W Test indicates data fit both log-normal and normal distribution. Select distribution with higher W Test result.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Log-Transformed
NP = Non-Parametric

J = Estimated Value

Table 3.3.RME

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Tap Water									
	p,p'-DDD	UG/L	1.42E-01	5.51E-01 (NP)	4.20E-01 J	4.20E-01	UG/L	Max	(5)
	ALUMINUM	UG/L	2.99E+03	2.44E+04 (T)	9.10E+03	9.10E+03	UG/L	Max	(5)
	ANTIMONY	UG/L	5.60E+00	1.67E+01 (NP)	5.40E+00 J	5.40E+00	UG/L	Max	(5)
	ARSENIC	UG/L	4.81E+00	1.39E+01 (NP)	6.30E+00 J	6.30E+00	UG/L	Max	(5)
	BARIUM	UG/L	2.58E+02	3.47E+02 (N)	4.90E+02	3.47E+02	UG/L	95% UCL-N	(4)
	CADMIUM	UG/L	1.04E+00	2.99E+00 (T)	4.46E+00 J	2.99E+00	UG/L	95% Cheb	(1)
	CHROMIUM, TOTAL	UG/L	6.49E+00	2.66E+01 (T)	1.50E+01	1.50E+01	UG/L	Max	(5)
	IRON	UG/L	4.58E+03	7.03E+03 (N)	1.10E+04	7.03E+03	UG/L	95% UCL-N	(2)
	MANGANESE	UG/L	6.09E+03	4.39E+04 (T)	1.48E+04	1.48E+04	UG/L	Max	(5)
	THALLIUM	UG/L	1.32E+01	7.55E+01 (T)	4.42E+01 J	4.42E+01	UG/L	Max	(5)
	VANADIUM	UG/L	2.37E+01	1.76E+02 (T)	7.00E+01	7.00E+01	UG/L	Max	(5)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum value was used in the calculation.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); Mean of Normal Data (Mean-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Log-transformed Data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.

(2) Shapiro-Wilk W Test indicates data are normally distributed.

(3) Shapiro-Wilk W Test indicates data neither log-normally or normally distributed. Select distribution with higher W Test result.

(4) Shapiro-Wilk W Test indicates data fit both log-normal and normal distribution. Select distribution with higher W Test result.

(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal

T = Log-Transformed

NP = Non-Parametric

J = Estimated Value

Table 3.4.RME

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution) (1)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Water-filled Ditch									
	ARSENIC	MG/KG	3.34E-01	NA	8.82E-01 J	8.82E-01	MG/KG	Max	(1)
	IRON	MG/KG	9.32E+03	NA	8.62E+03	8.62E+03	MG/KG	Max	(1)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum value was used in the calculation.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); Mean of Normal Data (Mean-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Log-transformed Data (Mean-T).

(1) Less than 5 samples available, therefore, used maximum detected concentration as exposure point concentration.

N = Normal
T = Log-Transformed
NP = Non-Parametric

J = Estimated Value

Table 3.5.RME

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future Medium: Surface Water Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Water-filled Ditch									
	ARSENIC	UG/L	2.71E+01	5.62E+01 (NP)	4.71E+01 J	4.71E+01	UG/L	Max	(5)
	CADMIUM	UG/L	4.59E+00	9.11E+00 (NP)	7.70E+00 J	7.70E+00	UG/L	Max	(5)
	CHROMIUM, TOTAL	UG/L	8.32E+00	1.98E+01 (NP)	1.62E+01 J	1.62E+01	UG/L	Max	(5)
	MANGANESE	UG/L	5.31E+02	8.43E+02 (T)	6.54E+02	6.54E+02	UG/L	Max	(5)
	SELENIUM	UG/L	3.17E+01	7.85E+01 (NP)	6.39E+01 J	6.39E+01	UG/L	Max	(5)

For non-detects, 1/2 sample quantitation limit was used as a proxy concentration; for duplicate sample results, the maximum value was used in the calculation.

ProUCL, Version 2.1 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. February 2003. ProUCL, Version 2.1. Prepared by Lockheed Martin Environmental Services).

Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); Mean of Normal Data (Mean-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Log-transformed Data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test indicates data are normally distributed.
(3) Shapiro-Wilk W Test indicates data neither log-normally or normally distributed. Select distribution with higher W Test result.
(4) Shapiro-Wilk W Test indicates data fit both log-normal and normal distribution. Select distribution with higher W Test result.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Log-Transformed
NP = Non-Parametric

J = Estimated Value

Table 3.6.RME
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Total Soil (0-6 ft)
Exposure Medium: Total Soil (0-6 ft)

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
AOC H Total Soil	ARSENIC	MG/KG	3.42E+00	3.97E+00 (T)	6.70E+01	3.97E+00	MG/KG	95% UCL-T	(1)
	N-NITROSO-DI-N-PROPYLAMINE	MG/KG	3.29E+01	1.44E+02 (NP)	7.17E-01	7.17E-01	MG/KG	Max	(5)

Full statistics for data included in Appendix M.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
Unusually high non-detected values excluded from quantitative risk assessment. Removed non-detects that were one order of magnitude greater than the maximum detected value for each analyte (RAGS Part A, Chapter 5, Dec. 1989).
ProUCL, Version 3.00.02 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. April 2004. ProUCL, Version 3.0. Prepared by Lockheed Martin Environmental Services).
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); Mean of Normal Data (Mean-N); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T);
95% Chebyshev (MVUE) UCL (95% Cheb); 99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m);
97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m); 99% Chebyshev (mean,std) UCL (99% Cheb-m); Mean of Log-transformed Data (Mean-T).

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test indicates data are normally distributed.
(3) Shapiro-Wilk W Test indicates data neither log-normally or normally distributed. Select distribution with higher W Test result.
(4) Shapiro-Wilk W Test indicates data fit both log-normal and normal distribution. Select distribution with higher W Test result.
(5) 95% UCL exceeds maximum detected concentration. Therefore, maximum concentration used for EPC.

N = Normal
T = Log-Transformed
NP = Non-Parametric

J = Estimated Value

Table 3.7.RME
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (N/T/NP/G)		Maximum Concentration (Qualifier)		Exposure Point Concentration			
								Value	Units	Statistic	Rationale
Groundwater (In Excavations)	4,4-DDD	UG/L	1.6E-01	8.7E-01	NP	4.2E-01	J	4.2E-01	UG/L	Max	(6)
	Aluminum	UG/L	3.4E+03	5.7E+03	N	9.1E+03		5.7E+03	UG/L	95% Stud-t	(2)
	Antimony	UG/L	6.0E+00	2.6E+01	NP	5.4E+00	J	5.4E+00	UG/L	Max	(6)
	Arsenic	UG/L	5.3E+00	2.1E+01	NP	6.3E+00	J	6.3E+00	UG/L	Max	(6)
	Barium	UG/L	2.8E+02	3.7E+02	N	4.9E+02		3.7E+02	UG/L	95% Stud-t	(2)
	Cadmium	UG/L	1.1E+00	6.5E+00	NP	4.5E+00	J	4.5E+00	UG/L	Max	(6)
	Chromium	UG/L	7.3E+00	1.1E+01	N	1.5E+01		1.1E+01	UG/L	95% Stud-t	(2)
	Iron	UG/L	5.1E+03	7.7E+03	N	1.1E+04		7.7E+03	UG/L	95% Stud-t	(2)
	Manganese	UG/L	6.8E+03	1.8E+04	G	1.5E+04		1.5E+04	UG/L	Max	(6)
	Thallium	UG/L	1.5E+01	2.4E+01	N	4.4E+01	J	2.4E+01	UG/L	95% Stud-t	(2)
	Vanadium	UG/L	2.5E+01	4.1E+01	N	7.0E+01		4.1E+01	UG/L	95% Stud-t	(2)

Full statistics for data included in Appendix M.
For non-detects, 1/2 sample quantitation limit was used as a proxy concentration.
Unusually high non-detected values excluded from quantitative risk assessment. Removed non-detects that were one order of magnitude greater than the maximum detected value for each analyte (RAGS Part A, Chapter 5, Dec. 1989).
ProUCL, Version 3.00.02 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. April 2004. ProUCL, Version 3.0. Prepared by Lockheed Martin Environmental Services).
Statistics: Maximum Detected Value (Max); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb);
99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m);
99% Chebyshev (mean,std) UCL (99% Cheb-m); 95% modified-t UCL adjusted for skewness (95% Mod-t); 95% Student's-T test UCL (95% Stud-t);
95% Hall's Bootstrap UCL (95% Hall); 95% Approximate Gamma (App. Gamma); 95% Adjusted Gamma (Adj. Gamma);
Mean of Log-transformed Data using the Minimum Variance Unbiased Estimate (MVUE) method (Mean-T)

Table 3.7.RME
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (N/T/NP/G)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) The maximum detected concentration was used as the UCL because the value recommended by ProUCL 3.0 was higher than the Max.
(7) The maximum detected concentration was used as the UCL because the sample size was less than 8.
G = Gamma distribution.
N = Normal distribution.
T = Log-normal distribution.
NP = Non-Parametric distribution.

J - analyte was detected below the reporting limit in the sample

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	(2)	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,400	cm^2	EPA, 2001, (4)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	EPA, 2001, (5)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	(2)	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,400	cm^2	EPA, 2001, (4)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	EPA, 2001, (5)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	9	years	(2)	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3,285	days	EPA, 1989	

TABLE 4.1.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Child	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

Notes:

(1) Professional judgement assuming 2 days per week for 52 weeks at SWMU 7 for nearby residents trespassing on-site.

(2) Professional judgement assuming adolescents from 9 to 18 years of age.

(3) Body weight is average of the mean values for boys and girls for the ages 9 through 18.

(4) SA is the total of the forearms, hands, lower legs, and feet for the 7 through 18 year old.

(5) SSAF is the 95th percentile for soil adherence for Soccer Players # 1 (teens).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational	Adult	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	10	years	(2)	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (3)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.2.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Recreational	Child	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	15	m^3/day	EPA, 1997	
				EF	Exposure Frequency	104	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Professional judgement assuming 2 days per week for 52 weeks at SWMU 7 for nearby residents trespassing on-site.

(2) Professional judgement assuming adolescents from 9 to 18 years of age.

(3) Body weight is average of the mean values for boys and girls for the ages 9 through 18; based on Table 7-3 (Body Weights of Children) in the EPA Exposure Factors Handbook (EPA, 1997).

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational	Adult	Water-filled Ditch	Csed	Chemical Concentration in Sediment	See Table 3.3.RME	mg/kg	See Table 3.3.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	CSed x IR-Sed x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	Water-filled Ditch	Csed	Chemical Concentration in Sediment	See Table 3.3.RME	mg/kg	See Table 3.3.RME	CDI (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	50	mg/day	(1)	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	10	years	(3)	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	51	kg	EPA, 1991, (4)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	Water-filled Ditch	Csed	Chemical Concentration in Sediment	See Table 3.3.RME	mg/kg	See Table 3.3.RME	CDI (mg/kg-day) =
				IR-Sed	Ingestion Rate of Sediment	100	mg/day	(1)	CS x IR-S x EF x ED x CF x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Adult	Water-filled Ditch	Csed	Chemical Concentration in Sediment	See Table 3.3.RME	mg/kg	See Table 3.3.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,170	cm^2	EPA, 1997, (5)	CSed x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.36	mg/cm^2-day	EPA, 1997, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	24	years	(2)	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	Water-filled Ditch	Csed	Chemical Concentration in Sediment	See Table 3.3.RME	mg/kg	See Table 3.3.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	4,000	cm^2	EPA, 1997, (7)	CSed x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.36	mg/cm^2-day	EPA, 1997, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	10	years	(3)	
				BW	Body Weight	51	kg	EPA, 1991, (4)	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.3.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Child	Water-filled Ditch	Csed	Chemical Concentration in Sediment	See Table 3.3.RME	mg/kg	See Table 3.3.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,000	cm^2	EPA, 1997, (8)	CSed x SA x SSAF x DABS x CF x EF x
				SSAF	Soil to Skin Adherence Factor	0.36	mg/cm^2-day	EPA, 1997, (6)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Professional judgement assuming 1/2 the default value for the residential soil scenario.

(2) Professional judgement assuming 1 day per week for 52 weeks per year.

(3) Professional Judgement assuming adolescents from 6 to 19 years of age.

(4) Body weight is average value for the 6 year old and 18 year old male body weight; based on Table 7-3 (Body Weights of Children) in the EPA Exposure Factors Handbook (EPA, 1997).

(5) SA is the sum of the mean surface areas (for a male) of the hands, forearms, feet, and lower legs.

(6) SSAF is soil adherence to legs for Rugby No. 1 from EPA, 1997, Table 6-12.

(7) Skin surface area (SA) presented for a youth is the surface area for forearms, hands, lower legs, and feet for 7 to 18 year age-group from Exhibit C-1, EPA RAGS Part E guidance.

(8) Skin surface area (SA) presented for a child is the surface area for forearms, hands, lower legs, and feet for 1 to 6 year age-group estimated at 1811 cm^2, rounded to 2000 cm^2 from Exhibit C-1, EPA RAGS Part E guidance.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Recreational	Adult	Water-filled Ditch	CSW	Chemical Concentration in Surface Water	See Table 3.4.RME	µg/l	See Table 3.4.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.025	l/hour	EPA, 1989, (1)	CSW x IR-SW x ET x EF x ED x CF1 x
				ET	Exposure Time	2.6	hr/day	EPA, 1989	1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Youth	Water-filled Ditch	CSW	Chemical Concentration in Surface Water	See Table 3.4.RME	µg/l	See Table 3.4.RME	CDI (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.025	l/hour	EPA, 1989, (1)	CSW x IR-SW x ET x EF x ED x CF1 x
				ET	Exposure Time	2.6	hr/day	EPA, 1989	1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	10	years	(3)	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	51	kg	EPA, 1997, (4)	
				AT-N	Averaging Time (Non-Cancer)	3,650	EPA, 1989	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	EPA, 1989	EPA, 1989	
		Child	Water-filled Ditch	CSW	Chemical Concentration in Surface Water	See Table 3.4.RME	µg/l	See Table 3.4.RME	CDI (mg/kg-day) =
				IR-SW	Ingestion Rate of Surface Water	0.025	l/hour	EPA, 1989, (1)	CSW x IR-SW x ET x EF x ED x CF1 x
				ET	Exposure Time	2.6	hr/day	EPA, 1989	1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	EPA, 1989	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	EPA, 1989	EPA, 1989	

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Adult	Water-filled Ditch	CSW	Chemical Concentration in Surface Water	See Table 3.4.RME	µg/l	See Table 3.4.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	2.6	hr/event	EPA, 1989	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	5,170	cm^2	EPA, 1997, (5)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	24	years	EPA, 1991	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	((1 + 3B + 3B^2)/(1+B)^2)) x CF1 x CF2
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Youth	Water-filled Ditch	CSW	Chemical Concentration in Surface Water	See Table 3.4.RME	µg/l	See Table 3.4.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	2.6	hr/event	EPA, 1989	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	4,000	cm^2	EPA, 1997, (6)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	10	years	(3)	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	51	kg	EPA, 1997, (4)	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	3,650	EPA, 1989	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-C	Averaging Time (Cancer)	25,550	EPA, 1989	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

TABLE 4.4.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Recreational	Child	Water-filled Ditch	CSW	Chemical Concentration in Surface Water	See Table 3.4.RME	µg/l	See Table 3.4.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF1 x CF2
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	2.6	hr/event	EPA, 1989	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	2,000	cm^2	EPA, 1997, (7)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π))
				EV	Event Frequency	1	events/day	EPA, 2001	x CF1 x CF2
				EF	Exposure Frequency	52	days/year	(2)	
				ED	Exposure Duration	6	years	EPA, 1991	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-N	Averaging Time (Non-Cancer)	2,190	EPA, 1989	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF1 x CF2
				AT-C	Averaging Time (Cancer)	25,550	EPA, 1989	EPA, 1989	
				CF1	Conversion Factor 1	0.001	mg/µg	- -	
				CF2	Conversion Factor 2	0.001	l/cm^3	- -	

Notes:

(1) Professional Judgment assuming one half of the ingestion rate specified for swimming.

(2) Professional Judgement assuming 1 day per week for 52 weeks per year.

(3) Professional Judgement assuming adolescents from 6 to 19 years of age.

(4) Body weight is average value for the 6 year old and 18 year old male body weight.

(5) SA is the sum of the mean surface areas (for a male) of the hands, forearms, feet, and lower legs.

(6) Surface area is 25% of total surface area (95 percentile) for 6 to 18 year old children.

(7) Surface area is 25% of total surface area (95 percentile) for 0 to 6 year old children.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residential	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	Maintenance Worker	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	25	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
Dermal	Residential	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

TABLE 4.5.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Maintenance Worker	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2001, (2)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001, (3)	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
	Industrial Worker	Adult	AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2001, (2)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	

Notes:

(1) Conservative assumption based on potential maintenance activities (i.e., lawn mowing) at the site, 2 days per week for 26 weeks.

(2) Worker assumed to wear a short-sleeved shirt, long pants, and shoes therefore, the exposed surface area is face, hands and forearms.

(3) SSAF based on maximum adherence factor for utility workers.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.6.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residential	Adult	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	15	m^3/day	EPA, 1997	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.6.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Maintenance Worker	Adult	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	52	days/year	(1)	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	Industrial Worker	Adult	Emissions from AOC H Surface Soil	CS	Chemical Concentration in Soil	See Table 3.1.RME	mg/kg	See Table 3.1.RME	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Conservative assumption based on potential maintenance activities (i.e., lawn mowing) at the site, once a week throughout the year, for 25 years.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residential	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.2.RME	mg/L	See Table 3.2.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-W	Ingestion Rate of Water	2	liters/day	EPA, 1991	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	Tap Water	CW	Chemical Concentration in Water	See Table 3.2.RME	mg/L	See Table 3.2.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	liters/day	EPA, 1991	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	Industrial Worker	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.2.RME	mg/L	See Table 3.2.RME	CDI (mg/kg-day) =
				IR-W	Ingestion Rate of Water	1	liters/day	EPA, 1991	CW x IR-W x EF x ED x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Resident	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.2.RME	mg/L	See Table 3.2.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	0.58	hr/event	EPA, 2001	$t_{event}<t^*$: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	18,000	cm^2	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π)) x CF
				EV	Event Frequency	1	events/day	EPA, 2001	
				EF	Exposure Frequency	350	days/year	EPA, 2001	
				ED	Exposure Duration	24	years	EPA, 2001	$t_{event}>t^*$: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	l/cm^3	- -	
				CF2	Conversion Factor 2	0.001	mg/ug	- -	
		Child	Tap Water	CW	Chemical Concentration in Water	See Table 3.2.RME	mg/L	See Table 3.2.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	1	hr/event		$t_{event}<t^*$: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	6,600	cm^2	EPA, 2001	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π)) x CF
				EV	Event Frequency	1	events/day	EPA, 2001	
				EF	Exposure Frequency	350	days/year	EPA, 2001	
				ED	Exposure Duration	6	years	EPA, 2001	$t_{event}>t^*$: DAevent (mg/cm^2-event) =
				BW	Body Weight	15	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF
				AT-N	Averaging Time (Non-Cancer)	2190	days	EPA, 1989	

TABLE 4.7.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
				CF1	Conversion Factor 1	0.001	l/cm^3	- -	
				CF2	Conversion Factor 2	0.001	mg/ug	- -	
Dermal	Industrial Worker	Adult	Tap Water	CW	Chemical Concentration in Water	See Table 3.2.RME	mg/L	See Table 3.2.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	0.05	hr/day	(1)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π)) x CF
				EV	Event Frequency	5	events/day	(1)	
				EF	Exposure Frequency	250	days/year	EPA, 1991	
				ED	Exposure Duration	25	years	EPA, 1991	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	((1 + 3B + $3B^2$)/$(1+B)^2$)) x CF
				AT-N	Averaging Time (Non-Cancer)	9,125	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	l/cm^3	- -	
				CF2	Conversion Factor 2	0.001	mg/ug	- -	
Dermal	Construction Worker	Adult	Groundwater (Excavation)	CW	Chemical Concentration in Water	See Table 3.7.RME	mg/L	See Table 3.7.RME	CDI (mg/kg-day) =
				DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm^2-event	calculated	DAevent x SA x EV x EF x ED x 1/BW x 1/AT
				FA	Fraction absorbed water	Chemical Specific	dimensionless	EPA, 2001	
				Kp	Permeability Coefficient	Chemical Specific	cm/hr	EPA, 2001	Inorganics: DAevent (mg/cm^2-event) =
				τ	Lag Time	Chemical Specific	hr/event	EPA, 2001	Kp x CW x t_{event} x CF
				t*	Time to Reach Steady-state	Chemical Specific	hours	EPA, 2001	
				B	Ratio of Permeability of Stratum Corneum to Epidermis	Chemical Specific	dimensionless	EPA, 2001	Organics :
				t_{event}	Event Time	8	hr/day	(3)	t_{event}<t*: DAevent (mg/cm^2-event) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2001 (2)	2 x FA x Kp x CW x (sqrt((6 x τ x t_{event})/π)) x CF
				EV	Event Frequency	1	event/day	(3)	
				EF	Exposure Frequency	250	days/year	EPA, 1989	
				ED	Exposure Duration	0.5	years	(3)	t_{event}>t*: DAevent (mg/cm^2-event) =
				BW	Body Weight	70	kg	EPA, 1991	FA x Kp x CW x (t_{event}/(1+B) + 2 x τ x

TABLE 4.7.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	$((1 + 3B + 3B^2)/(1+B)^2)) \times CF$
				AT-N	Averaging Time (Non-Cancer)	183	days	EPA, 1989	
				CF1	Conversion Factor 1	0.001	l/cm^3	- -	
				CF2	Conversion Factor 2	0.001	mg/ug	- -	

(1) Professional judgement, assumed to be equivalent to dermal event duration for residential adult as recommended by EPA Region II (five 3-minute events).

(2) Worker assumed to wear a short-sleeved shirt, long pants, and shoes therefore, the exposed surface area is face, hands and forearms.

(3) Professional judgement.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Subsurface Soil or Total Soil
Exposure Medium: Subsurface Soil or Total Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residential	Adult	AOC H Subsurface Soil	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	See Table 3.2.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	100	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	AOC H Subsurface Soil	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	See Table 3.2.RME	CDI (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	200	mg/day	EPA, 1991	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
	Construction Worker	Adult	AOC H Total Soil	CS	Chemical Concentration in Soil	See Table 3.6.RME	mg/kg	See Table 3.6.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				IR-S	Ingestion Rate of Soil	330	mg/day	EPA, 2002	CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	250	days/year	EPA, 1989	
				ED	Exposure Duration	0.5	years	(1)	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	183	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Subsurface Soil or Total Soil
Exposure Medium: Subsurface Soil or Total Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal	Residential	Adult	AOC H Subsurface Soil	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	See Table 3.2.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	5,700	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	AOC H Subsurface Soil	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	See Table 3.2.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	2,800	cm^2	EPA, 2001	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm^2-day	EPA, 2001	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF	Conversion Factor	0.000001	kg/mg	- -	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	

TABLE 4.8.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Subsurface Soil or Total Soil
Exposure Medium: Subsurface Soil or Total Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Construction Worker	Adult	AOC H Total Soil	CS	Chemical Concentration in Soil	See Table 3.6.RME	mg/kg	See Table 3.6.RME	CDI (mg/kg-day) =
				SA	Skin Surface Area Available for Contact	3,300	cm^2	EPA, 2001 (2)	CS x SA x SSAF x DABS x CF1 x EF x
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm^2-day	EPA, 2002	ED x 1/BW x 1/AT
				DABS	Dermal Absorption Factor Solids	Chemical Specific	--	EPA, 2001	
				CF1	Conversion Factor 1	0.000001	kg/mg	- -	
				EF	Exposure Frequency	250	days/year	EPA, 1989	
				ED	Exposure Duration	0.5	years	(1)	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	183	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Recommended by EPA Region II.

(2) Worker assumed to wear a short-sleeved shirt, long pants, and shoes therefore, the exposed surface area is face, hands and forearms.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

TABLE 4.9.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Subsurface Soil or Total Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Residential	Adult	Emissions from AOC H Subsurface Soil	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	See Table 3.2.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	24	years	EPA, 1991	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	
		Child	Emissions from AOC H Subsurface Soil	CS	Chemical Concentration in Soil	See Table 3.2.RME	mg/kg	See Table 3.2.RME	CDI (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	Calculated	m^3/kg	EPA, 2002	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	15	m^3/day	EPA, 1997	
				EF	Exposure Frequency	350	days/year	EPA, 1991	
				ED	Exposure Duration	6	years	EPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	- -	
				BW	Body Weight	15	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

TABLE 4.9.RME

VALUES USED FOR DAILY INTAKE CALCULATIONS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Subsurface Soil or Total Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation (cont.)	Construction Worker	Adult	Emissions from AOC H Total Soil	CS	Chemical Concentration in Soil	See Table 3.6.RME	mg/kg	See Table 3.6.RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				CA	Chemical Concentration in Air	Calculated	mg/m^3	EPA, 2002	CA x IN x EF x ED x 1/BW x 1/AT
				PEF	Particulate Emission Factor	1.36E+09	m^3/kg	EPA, 2002	
				VF	Volatilization Factor for volatile constituents	--	--	--	CA (mg/m^3) = CS (1/PEF + 1/VF)
				IN	Inhalation Rate	20	m^3/day	EPA, 1991	
				EF	Exposure Frequency	250	days/year	EPA, 1989	
				ED	Exposure Duration	0.5	years	(1)	
				BW	Body Weight	70	kg	EPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	183	days	EPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	EPA, 1989	

Notes:

(1) Recommended by EPA Region II.

(2) Worker assumed to wear a short-sleeved shirt, long pants, and shoes therefore, the exposed surface area is face, hands and forearms.

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December, 2002.

Table 4.9 RME Supplement
Particulate Emission Factor - Construction Worker
AOC H
Former NASD, Vieques, Puerto Rico

PEF Equations:

$$Q/C_{Sr} = A \times \exp\left[\frac{(\ln A_{site} - B)^2}{C}\right]$$

Equation 5-6 (EPA, 2002)

$$PEF_{SC} = Q/C_{Sr} \times \frac{1}{F_D}\frac{T \times A_R}{556 \times \left(W/3\right)^{0.4} \times \left(\frac{365\ d/yr - p}{365\,d/yr}\right)^3 \times \sum VKT}$$

Equation 5-5 (EPA, 2002)

$$F_D = 0.1852 + \frac{5.3537}{t_c} + \frac{-9.6318}{t_c^{\ 2}}$$

Equation E-16 (EPA, 2002)

PEF and Box Model Input Parameters

Parameter	Definition	Value	Units	Source
Q/C_{Sr}	inverse ratio of the geometric mean air concentration to the emission flux at the center of a square source	**18.4**	m	calculated
A	Constant	12.935	unitless	default (Eqn. 5-6)
B	Constant	5.738	unitless	default (Eqn. 5-6)
C	Constant	71.771	unitless	default (Eqn. 5-6)
A_{site}	Areal extent of site contamination	2	acres	site-specific
PEF_{SC}	subchronic road particulate emission factor	**1.33E+07**	m^3/kg	calculated
F_D	Dispersion correction factor	0.188	unitless	calculated
t_c	duration of construction (250 days for 8 hr/day)	2,000	hr	assumed
T	total time over which construction occurs (t_c x 3600 s/hr)	7,200,000	s	assumed
A_R	surface area of contaminated road segment	274.21	m^2	default (Eqn. 5-5)
W	mean weight of vehicle [(1 car @ 2 tons/car) + (2 trucks @ 20 tons/truck)] / 3 vehicles)	14	tons	assumed
p	number of days with at least 0.01 inches of precipitation (based on measured 2005 data)	92	days/yr	site-specific
VKT	sum of fleet vehicle kilometers traveled during the exposure duration (assumed 3 vehicles x 0.045 km/day x 250 days)	33.8	km	assumed

Source:

EPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, EPA Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Aluminum	Chronic	1.0E+00	mg/kg-day	NA	1.0E+00	mg/kg-day	CNS	100/3	NCEA (3)	07/26/2001
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000	IRIS	11/07/2003
	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	Blood	1000	HEAST	07/01/1997
Arsenic	Chronic	3.0E-04	mg/kg-day	0.95	3.0E-04	mg/kg-day	Skin, Vascular	3/1	IRIS	11/07/2003
	Subchronic	3.0E-04	mg/kg-day	0.95	3.0E-04	mg/kg-day	Skin, Vascular	3	HEAST	07/01/1997
Barium	Chronic	7.0E-02	mg/kg-day	0.07	4.9E-03	mg/kg-day	NOAEL	3	IRIS	11/07/2003
	Subchronic	7.0E-02	mg/kg-day	0.07	4.9E-03	mg/kg-day	Cardiovascular	3	HEAST	07/01/1997
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (Food)	Chronic	1.0E-03	mg/kg-day	0.025	2.5E-05	mg/kg-day	Kidney	10	IRIS	11/07/2003
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (Water)	Chronic	5.0E-04	mg/kg-day	0.025	1.3E-05	mg/kg-day	Kidney	10	IRIS	11/07/2003
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (hexavalent)	Chronic	3.0E-03	mg/kg-day	0.025	7.5E-05	mg/kg-day	NOAEL	300/3	IRIS	11/07/2003
	Subchronic	2.0E-02	mg/kg-day	0.025	5.0E-04	mg/kg-day	NOAEL	100	HEAST	07/01/1997
Iron	Chronic	3.0E-01	mg/kg-day	1	3.0E-01	mg/kg-day	Blood, Gastrointestinal, Liver	1	NCEA (3)	06/21/2001
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (nonfood)	Chronic	2.0E-02	mg/kg-day	0.04	8.0E-04	mg/kg-day	CNS	1	IRIS	11/07/2003
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (food)	Chronic	1.4E-01	mg/kg-day	0.04	5.6E-03	mg/kg-day	CNS	1/1	IRIS	11/07/2003
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
N-Nitrosodi-n-propylamine	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDT	Chronic	5.0E-04	mg/kg-day	0.7 - 0.9	5.0E-04	mg/kg-day	Liver	100/1	IRIS	01/05/2004
	Subchronic	5.0E-04	mg/kg-day	0.7 - 0.9	5.0E-04	mg/kg-day	Liver	100	HEAST	07/01/1997
Selenium	Chronic	5.0E-03	mg/kg-day	30-80%	5.0E-03	mg/kg-day	Whole Body	3/1	IRIS	01/05/2004
	Subchronic	5.0E-03	mg/kg-day	30-80%	5.0E-03	mg/kg-day	Whole Body	3/1	HEAST	07/01/1997
Thallium	Chronic	8.0E-05	mg/kg-day	1	8.0E-05	mg/kg-day	Liver, Blood, Hair	3000/1	IRIS	01/05/2004
	Subchronic	8.0E-04	mg/kg-day	1	8.0E-04	mg/kg-day	Liver, Blood, Hair	300	HEAST	07/01/1997
Vanadium	Chronic	1.0E-03	mg/kg-day	0.026	2.6E-05	mg/kg-day	Kidney	100	NCEA	05/01/2000
	Subchronic	7.0E-03	mg/kg-day	0.026	1.8E-04	mg/kg-day	Lifetime	100	HEAST	07/01/1997

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evalution Manual (Part E, Supplemetnal Guidance for Dermal Risk Assessment (Interim). Section 4.2 and Exhibit 4-1. USEPA recommends that the oral RfD should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

(2) See Risk Assessment text for the derivation of the "Absorbed RfD for Dermal"

(3) As of 2007, the toxicity values have been withdrawn by NCEA, but were available at the time the original risk assessment was prepared.

Definitions:
NA = Not Available
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
CNS = Central Nervous System
NOAEL = No Observed Adverse Effects Level

TABLE 5-2

NON-CANCER TOXICITY DATA -- INHALATION

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (MM/DD/YY)
Aluminum	Chronic	5.0E-03	mg/m^3	1.4E-03	mg/kg-day	CNS	300	NCEA (2)	07/26/2001
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	Chronic	5.0E-04	mg/m^3	1.4E-04	mg/kg-day	Fetotoxicity	1000	HEAST	07/01/1997
	Subchronic	5.0E-03	mg/m^3	1.4E-03	mg/kg-day	Fetotoxicity	100	HEAST	07/01/1997
Benzo(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	Chronic	2.0E-04	mg/m^3	5.7E-05	mg/kg-day	Kidney	10	NCEA	06/14/1998
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (hexavalent)	Chronic	1.1E-04	mg/m^3	3.0E-05	mg/kg-day	Respiratory System	300/1	IRIS	11/07/2003
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m^3	1.4E-05	mg/kg-day	CNS	1000/1	IRIS	11/07/2003
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
p,p'-DDD	Chronic	N/A	NA	NA	NA	NA	NA	NA	NA
	Subchronic	N/A	NA	NA	NA	NA	NA	NA	NA
p,p'-DDE	Chronic	N/A	NA	NA	NA	NA	NA	NA	NA
	Subchronic	N/A	NA	NA	NA	NA	NA	NA	NA

TABLE 5-2

NON-CANCER TOXICITY DATA -- INHALATION

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD: Target Organ	Dates (MM/DD/YY)
p,p'-DDT	Chronic	N/A	NA	NA	NA	NA	NA	NA	NA
	Subchronic	N/A	NA	NA	NA	NA	NA	NA	NA
Selenium	Chronic	N/A	NA	NA	NA	NA	NA	NA	NA
	Subchronic	N/A	NA	NA	NA	NA	NA	NA	NA
Thallium	Chronic	N/A	NA	NA	NA	NA	NA	NA	NA
	Subchronic	N/A	NA	NA	NA	NA	NA	NA	NA
Vanadium	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA

(1) See Risk Assessment text for the derivation of the "Extrapolated RfD".

(2) As of 2007, the toxicity values have been withdrawn by NCEA, but were available at the time the original risk assessment was prepared.

Definitions:
NA = Not Available
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
CNS = Central Nervous System
ATSDR = Agency for Toxic Substances and Disease Registry
HEAST = Health Effects Assessment Summary Tables

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor	Adjusted Dermal Cancer Slope Factor (1)	Units	EPA Carcinogen Group	Source	Date (2) (MM/DD/YY)
Aluminum	NA	NA	NA	NA	D	NCEA	07/26/2001
Antimony	NA	NA	NA	NA	NA	IRIS	11/07/2003
Arsenic	1.5E+00	0.95	1.5E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	11/07/2003
Barium	NA	NA	NA	NA	NA	IRIS	11/07/2003
Benzo(a)anthracene	7.3E-01	0.58 - 0.89	7.3E-01	$(mg/kg\text{-}day)^{-1}$	B2	NCEA	07/01/1993
Cadmium	NA	NA	NA	NA	B1	IRIS	11/07/2003
Chromium (hexavalent)	NA	NA	NA	NA	D	IRIS	11/07/2003
Iron	NA	NA	NA	NA	NA	NCEA	07/23/1996
Manganese (nonfood)	NA	NA	NA	NA	D	IRIS	11/07/2003
N-Nitrosodi-n-propylamine	7.0E+00	1	7.0E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/2004
p,p'-DDD	2.4E-01	0.7 - 0.9	2.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/2004
p,p'-DDE	3.4E-01	0.7 - 0.9	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/2004
p,p'-DDT	3.4E-01	0.7 - 0.9	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/2004
Selenium	NA	NA	NA	NA	D	IRIS	01/05/2004
Thallium	NA	NA	NA	NA	D	IRIS	01/05/2004
Vanadium	NA	NA	NA	NA	NA	HEAST	07/01/1997

Definitions:

(1) Source: Risk Assessment Guidance for Superfund. Volume 1: Human Health Evalution Manual (Part E, Supplemetnal Guidance for Dermal Risk Assessment (Interim). Section 4.2 and Exhibit 4-1. USEPA recommends that the oral CSF should not be adjusted to estimate the absorbed dose for compounds when the absorption efficiency is greater than 50%. Constituents that do not have oral absorption efficiencies reported on this table were assumed to have an oral absorption efficiency of 100%.

NA = Not Available
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
HEAST= Health Effects Assessment Summary Tables

Weight of Evidence definitions:

Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.
Group E chemicals (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Chemical of Potential Concern	Unit Risk	Units	Adjustment (1)	Inhalation Cancer Slope Factor	Units	Weight of Evidence/ Cancer Guidance Description	Source	Date (2) (MM/DD/YY)
Aluminum	NA	NA	NA	NA	NA	D	NCEA	07/26/2001
Antimony	NA	NA	NA	NA	NA	NA	IRIS	11/07/2003
Arsenic	4.0E-03	$(ug/m^3)^{-1}$	3500	1.5E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	11/07/2003
Barium	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	7.3E-01	$(mg/kg\text{-}day)^{-1}$	NA	NCEA - r	07/01/1993
Cadmium	1.8E-03	$(ug/m^3)^{-1}$	3500	6.3E+00	$(mg/kg\text{-}day)^{-1}$	B1	IRIS	11/07/2003
Chromium (hexavalent)	1.2E-02	$(ug/m^3)^{-1}$	3500	4.2E+01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	01/05/2004
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	N/A	NA	NA	NA	NA	B2	IRIS	01/05/2004
p,p'-DDD	NA	NA	NA	NA	NA	B2	IRIS	01/05/2004
p,p'-DDE	NA	NA	NA	NA	NA	B2	IRIS	01/05/2004
p,p'-DDT	9.7E-05	$(ug/m^3)^{-1}$	3500	3.4E-01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	01/05/2004
Selenium	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	N/A	NA	NA	NA	NA	D	IRIS	01/05/2004
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA

Definitions: NA = Not Available
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
r = route-to-route extrapolation

Weight of Evidence definitions:
Group A chemicals (known human carcinogens) are agents for which there is sufficient evidence to support the causal association between exposure to the agents in humans and cancer.
Group B1 chemicals (probable human carcinogens) are agents for which there is limited evidence of possible carcinogenicity in humans.
Group B2 chemicals (probable human carcinogens) are agents for which there is sufficient evidence of carcinogenicity in animals but inadequate or a lack of evidence in humans.
Group C chemicals (possible human carcinogens) are agents for which there is limited evidence of carcinogenicity in animals and inadequate or a lack of human data.
Group D chemicals (not classifiable as to human carcinogenicity) are agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.
Group E chemicals (evidence of noncarcinogenicity in humans) are agents for which there is no evidence of carcinogenicity from human or animal studies, or both.

TABLE 7.5.RME
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	AOC H Surface Soil	Ingestion													
				BENZO(a)ANTHRACENE	1.1E-01	MG/KG	1.2E-07	mg/kg/day	7.3E-01	1/(mg/kg-day)	9.0E-08	1.4E-06	mg/kg/day	NA	NA	NA
				N-NITROSODI-n-PROPYLAMINE	7.2E-01	MG/KG	7.9E-07	mg/kg/day	7.0E+00	1/(mg/kg-day)	5.5E-06	9.2E-06	mg/kg/day	NA	NA	NA
				p,p'-DDE	1.7E+00	MG/KG	1.9E-06	mg/kg/day	3.4E-01	1/(mg/kg-day)	6.5E-07	2.2E-05	mg/kg/day	NA	NA	NA
				p,p'-DDT	5.5E-01	MG/KG	6.0E-07	mg/kg/day	3.4E-01	1/(mg/kg-day)	2.1E-07	7.0E-06	mg/kg/day	5.0E-04	mg/kg/day	1.4E-02
				ALUMINUM	8.3E+03	MG/KG	9.1E-03	mg/kg/day	NA	NA	NA	1.1E-01	mg/kg/day	1.0E+00	mg/kg/day	1.1E-01
				ANTIMONY	1.1E+00	MG/KG	1.2E-06	mg/kg/day	NA	NA	NA	1.4E-05	mg/kg/day	4.0E-04	mg/kg/day	3.6E-02
				ARSENIC	1.9E+01	MG/KG	2.1E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.1E-05	2.4E-04	mg/kg/day	3.0E-04	mg/kg/day	8.1E-01
				CHROMIUM, TOTAL	2.0E+01	MG/KG	2.2E-05	mg/kg/day	NA	NA	NA	2.6E-04	mg/kg/day	3.0E-03	mg/kg/day	8.6E-02
				IRON	2.1E+04	MG/KG	2.3E-02	mg/kg/day	NA	NA	NA	2.7E-01	mg/kg/day	3.0E-01	mg/kg/day	9.1E-01
				MANGANESE	4.8E+02	MG/KG	5.3E-04	mg/kg/day	NA	NA	NA	6.2E-03	mg/kg/day	1.4E-01	mg/kg/day	4.4E-02
				THALLIUM	6.2E-01	MG/KG	6.8E-07	mg/kg/day	NA	NA	NA	7.9E-06	mg/kg/day	8.0E-05	mg/kg/day	9.9E-02
				VANADIUM	4.8E+01	MG/KG	5.2E-05	mg/kg/day	NA	NA	NA	6.1E-04	mg/kg/day	1.0E-03	mg/kg/day	6.1E-01
			Exp. Route Total								3.8E-05					2.7E+00
			Dermal													
				BENZO(a)ANTHRACENE	1.1E-01	MG/KG	4.5E-08	mg/kg/day	7.3E-01	1/(mg/kg-day)	3.3E-08	5.2E-07	mg/kg/day	NA	NA	NA
				N-NITROSODI-n-PROPYLAMINE	7.2E-01	MG/KG	2.2E-07	mg/kg/day	7.0E+00	1/(mg/kg-day)	1.5E-06	2.6E-06	mg/kg/day	NA	NA	NA
				p,p'-DDE	1.7E+00	MG/KG	1.6E-07	mg/kg/day	3.4E-01	1/(mg/kg-day)	5.5E-08	1.9E-06	mg/kg/day	NA	NA	NA
				p,p'-DDT	5.5E-01	MG/KG	5.1E-08	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.7E-08	5.9E-07	mg/kg/day	5.0E-04	mg/kg/day	1.2E-03
				ALUMINUM	8.3E+03	MG/KG	2.5E-04	mg/kg/day	NA	NA	NA	3.0E-03	mg/kg/day	1.0E+00	mg/kg/day	3.0E-03
				ANTIMONY	1.1E+00	MG/KG	3.5E-08	mg/kg/day	NA	NA	NA	4.1E-07	mg/kg/day	6.0E-05	mg/kg/day	6.8E-03
				ARSENIC	1.9E+01	MG/KG	1.7E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	2.6E-06	2.0E-05	mg/kg/day	3.0E-04	mg/kg/day	6.8E-02
				CHROMIUM, TOTAL	2.0E+01	MG/KG	6.2E-07	mg/kg/day	NA	NA	NA	7.2E-06	mg/kg/day	7.5E-05	mg/kg/day	9.6E-02
				IRON	2.1E+04	MG/KG	6.5E-04	mg/kg/day	NA	NA	NA	7.6E-03	mg/kg/day	3.0E-01	mg/kg/day	2.5E-02
				MANGANESE	4.8E+02	MG/KG	1.5E-05	mg/kg/day	NA	NA	NA	1.7E-04	mg/kg/day	5.6E-03	mg/kg/day	3.1E-02
				THALLIUM	6.2E-01	MG/KG	1.9E-08	mg/kg/day	NA	NA	NA	2.2E-07	mg/kg/day	8.0E-05	mg/kg/day	2.8E-03
				VANADIUM	4.8E+01	MG/KG	1.5E-06	mg/kg/day	NA	NA	NA	1.7E-05	mg/kg/day	2.6E-05	mg/kg/day	6.6E-01
			Exp. Route Total								4.3E-06					8.9E-01
			Inhalation													
				BENZO(a)ANTHRACENE	1.1E-01	MG/KG	7.9E-11	mg/kg/day	7.3E-01	1/(mg/kg-day)	5.8E-11	7.9E-11	mg/kg/day	NA	NA	NA
				N-NITROSODI-n-PROPYLAMINE	7.2E-01	MG/KG	5.1E-10	mg/kg/day	NA	NA	NA	5.1E-10	mg/kg/day	NA	NA	NA
				p,p'-DDE	1.7E+00	MG/KG	1.2E-09	mg/kg/day	NA	NA	NA	1.2E-09	mg/kg/day	NA	NA	NA
				p,p'-DDT	5.5E-01	MG/KG	3.9E-10	mg/kg/day	3.4E-01	1/(mg/kg-day)	1.3E-10	3.9E-10	mg/kg/day	NA	NA	NA
				ALUMINUM	8.3E+03	MG/KG	5.8E-06	mg/kg/day	NA	NA	NA	5.8E-06	mg/kg/day	1.4E-03	mg/kg/day	4.1E-03
				ANTIMONY	1.1E+00	MG/KG	8.0E-10	mg/kg/day	NA	NA	NA	8.0E-10	mg/kg/day	NA	NA	NA
				ARSENIC	1.9E+01	MG/KG	1.3E-08	mg/kg/day	1.5E+01	1/(mg/kg-day)	2.0E-07	1.3E-08	mg/kg/day	NA	NA	NA
				CHROMIUM, TOTAL	2.0E+01	MG/KG	1.4E-08	mg/kg/day	4.2E+01	1/(mg/kg-day)	6.0E-07	1.4E-08	mg/kg/day	3.0E-05	mg/kg/day	4.7E-04
				IRON	2.1E+04	MG/KG	1.5E-05	mg/kg/day	NA	NA	NA	1.5E-05	mg/kg/day	NA	NA	NA
				MANGANESE	4.8E+02	MG/KG	3.4E-07	mg/kg/day	NA	NA	NA	3.4E-07	mg/kg/day	1.4E-05	mg/kg/day	2.4E-02
				THALLIUM	6.2E-01	MG/KG	4.4E-10	mg/kg/day	NA	NA	NA	4.4E-10	mg/kg/day	NA	NA	NA
				VANADIUM	4.8E+01	MG/KG	3.4E-08	mg/kg/day	NA	NA	NA	3.4E-08	mg/kg/day	NA	NA	NA
			Exp. Route Total								8.0E-07					2.8E-02
		Exposure Point Total									4.3E-05					3.6E+00
	Exposure Medium Total										4.3E-05					3.6E+00

TABLE 7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Subsurface Soil	Subsurface Soil	AOC H Subsurface Soil	Ingestion	ARSENIC	6.6E+00	MG/KG	7.2E-06	mg/kg/day	1.5E+00	1/(mg/kg-day)	1.1E-05	8.4E-05	mg/kg/day	3.0E-04	mg/kg/day	2.8E-01
			Exp. Route Total								1.1E-05					2.8E-01
			Dermal	ARSENIC	6.6E+00	MG/KG	6.0E-07	mg/kg/day	1.5E+00	1/(mg/kg-day)	9.1E-07	7.0E-06	mg/kg/day	3.0E-04	mg/kg/day	2.3E-02
			Exp. Route Total								9.1E-07					2.3E-02
			Inhalation	ARSENIC	6.6E+00	MG/KG	4.6E-09	mg/kg/day	0.0E+00	1/(mg/kg-day)	0.0E+00	4.6E-09	mg/kg/day	NA	NA	NA
			Exp. Route Total								0.0E+00					0.0E+00
		Exposure Point Total									1.2E-05					3.0E-01
	Exposure Medium Total										1.2E-05					3.0E-01
Surface Soil Total											5.4E-05					3.9E+00
Groundwater	Groundwater	Tap Water	Ingestion	p,p'-DDD	4.2E-01	UG/L	2.3E-06	mg/kg/day	2.4E-01	1/(mg/kg-day)	5.5E-07	2.7E-05	mg/kg/day	NA	NA	NA
				ALUMINUM	9.1E+03	UG/L	5.0E-02	mg/kg/day	NA	NA	NA	5.8E-01	mg/kg/day	1.0E+00	mg/kg/day	5.8E-01
				ANTIMONY	5.4E+00	UG/L	3.0E-05	mg/kg/day	NA	NA	NA	3.5E-04	mg/kg/day	4.0E-04	mg/kg/day	8.6E-01
				ARSENIC	6.3E+00	UG/L	3.5E-05	mg/kg/day	1.5E+00	1/(mg/kg-day)	5.2E-05	4.0E-04	mg/kg/day	3.0E-04	mg/kg/day	1.3E+00
				BARIUM	3.5E+02	UG/L	1.9E-03	mg/kg/day	NA	NA	NA	2.2E-02	mg/kg/day	7.0E-02	mg/kg/day	3.2E-01
				CADMIUM	3.0E+00	UG/L	1.6E-05	mg/kg/day	NA	NA	NA	1.9E-04	mg/kg/day	5.0E-04	mg/kg/day	3.8E-01
				CHROMIUM, TOTAL	1.5E+01	UG/L	8.2E-05	mg/kg/day	NA	NA	NA	9.6E-04	mg/kg/day	3.0E-03	mg/kg/day	3.2E-01
				IRON	7.0E+03	UG/L	3.8E-02	mg/kg/day	NA	NA	NA	4.5E-01	mg/kg/day	2.0E-02	mg/kg/day	2.2E+01
				MANGANESE	1.5E+04	UG/L	8.1E-02	mg/kg/day	NA	NA	NA	9.5E-01	mg/kg/day	1.4E-01	mg/kg/day	6.8E+00
				THALLIUM	4.4E+01	UG/L	2.4E-04	mg/kg/day	NA	NA	NA	2.8E-03	mg/kg/day	8.0E-05	mg/kg/day	3.5E+01
				VANADIUM	7.0E+01	UG/L	3.8E-04	mg/kg/day	NA	NA	NA	4.5E-03	mg/kg/day	1.0E-03	mg/kg/day	4.5E+00
			Exp. Route Total								5.2E-05					7.3E+01
			Dermal	p,p'-DDD	4.2E-01	UG/L	1.6E-11	mg/kg/day	2.4E-01	1/(mg/kg-day)	3.7E-12	1.8E-10	mg/kg/day	NA	NA	NA
				ALUMINUM	9.1E+03	UG/L	3.3E-10	mg/kg/day	NA	NA	NA	3.8E-09	mg/kg/day	1.0E+00	mg/kg/day	3.8E-09
				ANTIMONY	5.4E+00	UG/L	2.0E-13	mg/kg/day	NA	NA	NA	2.3E-12	mg/kg/day	6.0E-05	mg/kg/day	3.8E-08
				ARSENIC	6.3E+00	UG/L	2.3E-13	mg/kg/day	1.5E+00	1/(mg/kg-day)	3.4E-13	2.7E-12	mg/kg/day	3.0E-04	mg/kg/day	8.9E-09
				BARIUM	3.5E+02	UG/L	1.3E-11	mg/kg/day	NA	NA	NA	1.5E-10	mg/kg/day	4.9E-03	mg/kg/day	3.0E-08
				CADMIUM	3.0E+00	UG/L	1.1E-13	mg/kg/day	NA	NA	NA	1.3E-12	mg/kg/day	1.3E-05	mg/kg/day	1.0E-07
				CHROMIUM, TOTAL	1.5E+01	UG/L	1.1E-12	mg/kg/day	NA	NA	NA	1.3E-11	mg/kg/day	7.5E-05	mg/kg/day	1.7E-07
				IRON	7.0E+03	UG/L	2.5E-10	mg/kg/day	NA	NA	NA	3.0E-09	mg/kg/day	8.0E-04	mg/kg/day	3.7E-06
				MANGANESE	1.5E+04	UG/L	5.4E-10	mg/kg/day	NA	NA	NA	6.2E-09	mg/kg/day	5.6E-03	mg/kg/day	1.1E-06
				THALLIUM	4.4E+01	UG/L	1.6E-12	mg/kg/day	NA	NA	NA	1.9E-11	mg/kg/day	8.0E-05	mg/kg/day	2.3E-07
				VANADIUM	7.0E+01	UG/L	2.5E-12	mg/kg/day	NA	NA	NA	3.0E-11	mg/kg/day	2.6E-05	mg/kg/day	1.1E-06
			Exp. Route Total								4.1E-12					6.5E-06
		Exposure Point Total									5.2E-05					7.3E+01
Groundwater Total											5.2E-05					7.3E+01
							Total of Receptor Risks Across All Media				1.1E-04	Total of Receptor Hazards Across All Media				7.7E+01

NA = Not applicable.

As of 2007, the toxicity values for aluminum and iron have been withdrawn by NCEA, but were available at the time the original risk assessment was prepared.

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			BENZO(a)ANTHRACENE	1.1E-08	NA	1.7E-08	2.8E-08	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	7.0E-07	NA	8.0E-07	1.5E-06	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	8.3E-08	NA	2.8E-08	1.1E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	2.6E-08	3.8E-12	8.9E-09	3.5E-08	Liver	4.5E-04	NA	1.5E-04	6.0E-04
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	3.4E-03	3.5E-04	3.8E-04	4.1E-03
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	1.2E-03	NA	8.8E-04	2.0E-03
			ARSENIC	4.0E-06	5.9E-09	1.4E-06	5.3E-06	Skin, Vascular	2.6E-02	NA	8.8E-03	3.5E-02
			CHROMIUM, TOTAL	NA	1.7E-08	NA	1.7E-08	NOAEL	2.7E-03	4.0E-05	1.2E-02	1.5E-02
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.9E-02	NA	3.3E-03	3.2E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	1.4E-03	2.0E-03	4.0E-03	7.4E-03
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	3.1E-03	NA	3.6E-04	3.5E-03
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	1.9E-02	NA	8.5E-02	1.0E-01
Chemical Total				4.8E-06	2.3E-08	2.2E-06	7.0E-06		8.6E-02	2.4E-03	1.2E-01	2.0E-01
Medium Total							7.0E-06					2.0E-01
Sediment	Sediment	Water-filled Ditch										
			ARSENIC	4.6E-08	NA	5.2E-08	9.8E-08	Skin, Vascular	3.0E-04	NA	3.3E-04	6.3E-04
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.9E-03	NA	1.1E-03	4.0E-03
Chemical Total				4.6E-08	0.0E+00	5.2E-08	9.8E-08		3.2E-03	0.0E+00	1.4E-03	4.6E-03
Medium Total							9.8E-08					4.6E-03
Surface Water	Surface Water	Water-filled Ditch										
			ARSENIC	3.2E-06	NA	6.6E-07	3.9E-06	Skin, Vascular	2.1E-02	NA	4.3E-03	2.5E-02
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	1.0E-03	NA	8.4E-03	9.4E-03
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	7.1E-04	NA	1.2E-02	1.3E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	6.2E-04	NA	3.2E-03	3.8E-03
			SELENIUM	NA	NA	NA	0.0E+00	Whole Body	1.7E-03	NA	3.5E-04	2.0E-03
Chemical Total				3.2E-06	0.0E+00	6.6E-07	3.9E-06		2.5E-02	NA	2.8E-02	5.3E-02
Medium Total							3.9E-06					5.3E-02
Receptor Total							1.1E-05				Receptor HI Total	2.6E-01

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	1.5E-02
Total Skin HI Across All Media =	6.0E-02
Total Vascular HI Across All Media =	6.0E-02
Total Kidney HI Across All Media =	1.1E-01
Total NOAEL HI Across All Media =	2.8E-02
Total Gastrointestinal HI Across All Media =	1.9E-02
Total Blood HI Across All Media =	4.2E-02
Total Liver HI Across All Media =	4.0E-02
Total Hair HI Across All Media =	3.5E-03
Total Whole Body HI Across All Media =	2.0E-03

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Youth

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			BENZO(a)ANTHRACENE	6.5E-09	NA	1.1E-08	1.8E-08	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	4.0E-07	NA	5.3E-07	9.3E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	4.7E-08	NA	1.9E-08	6.6E-08	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	1.5E-08	2.2E-12	5.9E-09	2.1E-08	Liver	6.2E-04	NA	2.4E-04	8.6E-04
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	4.6E-03	4.8E-04	6.1E-04	5.7E-03
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	1.6E-03	NA	1.4E-03	3.0E-03
			ARSENIC	2.3E-06	3.4E-09	9.0E-07	3.2E-06	Skin, Vascular	3.5E-02	NA	1.4E-02	4.9E-02
			CHROMIUM, TOTAL	NA	9.9E-09	NA	9.9E-09	NOAEL	3.7E-03	5.5E-05	2.0E-02	2.4E-02
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	4.0E-02	NA	5.2E-03	4.5E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	1.9E-03	2.8E-03	6.4E-03	1.1E-02
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	4.3E-03	NA	5.7E-04	4.9E-03
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	2.7E-02	NA	1.4E-01	1.6E-01
Chemical Total				2.7E-06	1.3E-08	1.5E-06	4.2E-06		1.2E-01	3.3E-03	1.8E-01	3.1E-01
Medium Total							4.2E-06					3.1E-01
Sediment	Sediment	Water-filled Ditch										
			ARSENIC	2.6E-08	NA	2.9E-08	5.6E-08	Skin, Vascular	4.1E-04	NA	4.6E-04	8.7E-04
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	4.0E-03	NA	1.5E-03	5.5E-03
Chemical Total				2.6E-08	0.0E+00	2.9E-08	5.6E-08		4.4E-03	0.0E+00	2.0E-03	6.4E-03
Medium Total							5.6E-08					6.4E-03
Surface Water	Surface Water	Water-filled Ditch										
			ARSENIC	1.8E-06	NA	2.9E-07	2.1E-06	Skin, Vascular	2.9E-02	NA	4.6E-03	3.3E-02
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	1.4E-03	NA	8.9E-03	1.0E-02
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	9.8E-04	NA	1.3E-02	1.4E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	8.5E-04	NA	3.4E-03	4.2E-03
			SELENIUM	NA	NA	NA	0.0E+00	Whole Body	7.9E-03	NA	6.3E-04	8.5E-03
Chemical Total				1.8E-06	0.0E+00	2.9E-07	2.1E-06		4.0E-02	NA	3.0E-02	7.0E-02
Medium Total							2.1E-06					7.0E-02
Receptor Total							8.5E-06				Receptor HI Total	3.8E-01

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	2.1E-02
Total Skin HI Across All Media =	8.3E-02
Total Vascular HI Across All Media =	8.3E-02
Total Kidney HI Across All Media =	1.7E-01
Total NOAEL HI Across All Media =	3.7E-02
Total Gastrointestinal HI Across All Media =	2.9E-02
Total Blood HI Across All Media =	5.8E-02
Total Liver HI Across All Media =	5.6E-02
Total Hair HI Across All Media =	4.9E-03
Total Whole Body HI Across All Media =	8.5E-03

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			BENZO(a)ANTHRACENE	2.7E-08	NA	9.7E-09	3.6E-08	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	1.6E-06	NA	4.6E-07	2.1E-06	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	1.9E-07	NA	1.6E-08	2.1E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	6.1E-08	3.4E-12	5.1E-09	6.6E-08	Liver	4.2E-03	NA	3.5E-04	4.5E-03
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	3.1E-02	1.2E-03	8.8E-04	3.3E-02
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	1.1E-02	NA	2.0E-03	1.3E-02
			ARSENIC	9.3E-06	5.1E-09	7.8E-07	1.0E-05	Skin, Vascular	2.4E-01	NA	2.0E-02	2.6E-01
			CHROMIUM, TOTAL	NA	1.5E-08	NA	1.5E-08	NOAEL	2.5E-02	1.4E-04	2.9E-02	5.4E-02
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.7E-01	NA	7.6E-03	2.8E-01
			MANGANESE	NA	NA	NA	0.0E+00	CNS	1.3E-02	7.1E-03	9.2E-03	2.9E-02
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	2.9E-02	NA	8.2E-04	3.0E-02
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	1.8E-01	NA	2.0E-01	3.8E-01
Chemical Total				1.1E-05	2.0E-08	1.3E-06	1.2E-05		8.1E-01	8.4E-03	2.6E-01	1.1E+00
Medium Total							1.2E-05					1.1E+00
Sediment	Sediment	Water-filled Ditch										
			ARSENIC	1.1E-07	NA	2.3E-08	1.3E-07	Skin, Vascular	2.8E-03	NA	6.0E-04	3.4E-03
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.7E-02	NA	2.0E-03	2.9E-02
Chemical Total				1.1E-07	0.0E+00	2.3E-08	1.3E-07		3.0E-02	0.0E+00	2.6E-03	3.3E-02
Medium Total							1.3E-07					3.3E-02
Surface Water	Surface Water	Water-filled Ditch										
			ARSENIC	3.7E-06	NA	3.0E-07	4.0E-06	Skin, Vascular	9.7E-02	NA	7.8E-03	1.0E-01
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	4.8E-03	NA	1.5E-02	2.0E-02
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	3.3E-03	NA	2.1E-02	2.5E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	2.9E-03	NA	5.8E-03	8.7E-03
			SELENIUM	NA	NA	NA	0.0E+00	Whole Body	7.9E-03	NA	6.3E-04	8.5E-03
Chemical Total				3.7E-06	0.0E+00	3.0E-07	4.0E-06		1.2E-01	NA	5.1E-02	1.7E-01
Medium Total							4.0E-06					1.7E-01
Receptor Total							1.7E-05				Receptor HI Total	1.3E+00

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	7.2E-02
Total Skin HI Across All Media =	3.7E-01
Total Vascular HI Across All Media =	3.7E-01
Total Kidney HI Across All Media =	4.0E-01
Total NOAEL HI Across All Media =	7.9E-02
Total Gastrointestinal HI Across All Media =	8.3E-02
Total Blood HI Across All Media =	3.5E-01
Total Liver HI Across All Media =	3.4E-01
Total Hair HI Across All Media =	3.0E-02
Total Whole Body HI Across All Media =	8.5E-03

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil	BENZO(a)ANTHRACENE	3.8E-08	NA	2.0E-08	5.8E-08	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	2.4E-06	NA	9.4E-07	3.3E-06	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	2.8E-07	NA	3.3E-08	3.1E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	8.8E-08	1.3E-11	1.1E-08	9.9E-08	Liver	1.5E-03	NA	1.8E-04	1.7E-03
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	1.1E-02	1.2E-03	4.5E-04	1.3E-02
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	3.9E-03	NA	1.0E-03	4.9E-03
			ARSENIC	1.3E-05	2.0E-08	1.6E-06	1.5E-05	Skin, Vascular	8.7E-02	NA	1.0E-02	9.7E-02
			CHROMIUM, TOTAL	NA	5.8E-08	NA	5.8E-08	NOAEL	9.2E-03	1.3E-04	1.5E-02	2.4E-02
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	9.7E-02	NA	3.9E-03	1.0E-01
			MANGANESE	NA	NA	NA	0.0E+00	CNS	4.7E-03	6.8E-03	4.7E-03	1.6E-02
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.1E-02	NA	4.2E-04	1.1E-02
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	6.5E-02	NA	1.0E-01	1.7E-01
Chemical Total				1.6E-05	7.8E-08	2.6E-06	1.9E-05		2.9E-01	8.1E-03	1.4E-01	4.3E-01
Subsurface Soil	Subsurface Soil	AOC H Subsurface Soil	ARSENIC	4.6E-06	NA	5.5E-07	5.2E-06	Skin, Vascular	3.0E-02	NA	3.6E-03	3.4E-02
Chemical Total				4.6E-06	0.0E+00	5.5E-07	5.2E-06		3.0E-02	0.0E+00	3.6E-03	3.4E-02
Medium Total							2.4E-05					4.7E-01
Groundwater	Groundwater	Tap Water	p,p'-DDD	9.5E-07	NA	3.9E-12	9.5E-07	NA	NA	NA	NA	0.0E+00
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	2.5E-01	NA	1.3E-09	2.5E-01
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	3.7E-01	NA	1.3E-08	3.7E-01
			ARSENIC	8.9E-05	NA	2.7E-13	8.9E-05	Skin, Vascular	5.8E-01	NA	3.0E-09	5.8E-01
			BARIUM	NA	NA	NA	0.0E+00	NOAEL	1.4E-01	NA	1.0E-08	1.4E-01
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	1.6E-01	NA	3.4E-08	1.6E-01
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	1.4E-01	NA	5.3E-08	1.4E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	9.6E+00	NA	1.3E-06	9.6E+00
			MANGANESE	NA	NA	NA	0.0E+00	CNS	2.9E+00	NA	3.8E-07	2.9E+00
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.5E+01	NA	7.9E-08	1.5E+01
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	1.9E+00	NA	3.9E-07	1.9E+00
Chemical Total				9.0E-05	0.0E+00	4.1E-12	9.0E-05		3.1E+01	NA	2.2E-06	3.1E+01
Medium Total							9.0E-05					3.1E+01
Receptor Total							1.3E-04	Receptor HI Total				3.2E+01

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	3.2E+00
Total Skin HI Across All Media =	7.1E-01
Total Vascular HI Across All Media =	7.1E-01
Total Kidney HI Across All Media =	2.2E+00
Total NOAEL HI Across All Media =	3.0E-01
Total Gastrointestinal HI Across All Media =	9.7E+00
Total Blood HI Across All Media =	2.5E+01
Total Liver HI Across All Media =	2.5E+01
Total Hair HI Across All Media =	1.5E+01

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			BENZO(a)ANTHRACENE	9.0E-08	NA	3.3E-08	1.2E-07	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	5.5E-06	NA	1.5E-06	7.0E-06	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	6.5E-07	NA	5.5E-08	7.1E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	2.1E-07	1.3E-10	1.7E-08	2.2E-07	Liver	1.4E-02	NA	1.2E-03	1.5E-02
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	1.1E-01	4.1E-03	3.0E-03	1.1E-01
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	3.6E-02	NA	6.8E-03	4.3E-02
			ARSENIC	3.1E-05	2.0E-07	2.6E-06	3.4E-05	Skin, Vascular	8.1E-01	NA	6.8E-02	8.8E-01
			CHROMIUM, TOTAL	NA	6.0E-07	NA	6.0E-07	NOAEL	8.6E-02	4.7E-04	9.6E-02	1.8E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	9.1E-01	NA	2.5E-02	9.3E-01
			MANGANESE	NA	NA	NA	0.0E+00	CNS	4.4E-02	2.4E-02	3.1E-02	9.9E-02
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	9.9E-02	NA	2.8E-03	1.0E-01
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	6.1E-01	NA	6.6E-01	1.3E+00
Chemical Total				3.8E-05	8.0E-07	4.3E-06	4.3E-05		2.7E+00	2.8E-02	8.9E-01	3.6E+00
Subsurface Soil	Subsurface Soil	AOC H Subsurface Soil	ARSENIC	1.1E-05	NA	9.1E-07	1.2E-05	Skin, Vascular	2.8E-01	NA	2.3E-02	3.0E-01
Chemical Total				1.1E-05	0.0E+00	9.1E-07	1.2E-05		2.8E-01	0.0E+00	2.3E-02	3.0E-01
Medium Total							5.4E-05					3.9E+00
Groundwater	Groundwater	Tap Water										
			p,p'-DDD	5.5E-07	NA	3.7E-12	5.5E-07	NA	NA	NA	NA	0.0E+00
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	5.8E-01	NA	3.8E-09	5.8E-01
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	8.6E-01	NA	3.8E-08	8.6E-01
			ARSENIC	5.2E-05	NA	3.4E-13	5.2E-05	Skin, Vascular	1.3E+00	NA	8.9E-09	1.3E+00
			BARIUM	NA	NA	NA	0.0E+00	NOAEL	3.2E-01	NA	3.0E-08	3.2E-01
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	3.8E-01	NA	1.0E-07	3.8E-01
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	3.2E-01	NA	1.7E-07	3.2E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.2E+01	NA	3.7E-06	2.2E+01
			MANGANESE	NA	NA	NA	0.0E+00	CNS	6.8E+00	NA	1.1E-06	6.8E+00
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	3.5E+01	NA	2.3E-07	3.5E+01
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	4.5E+00	NA	1.1E-06	4.5E+00
Chemical Total				5.2E-05	0.0E+00	4.1E-12	5.2E-05		7.3E+01	NA	6.5E-06	7.3E+01
Medium Total							5.2E-05					7.3E+01
Receptor Total							1.5E-04				Receptor HI Total	8.0E+01

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	7.6E+00
Total Skin HI Across All Media =	2.5E+00
Total Vascular HI Across All Media =	2.5E+00
Total Kidney HI Across All Media =	6.1E+00
Total NOAEL HI Across All Media =	8.2E-01
Total Gastrointestinal HI Across All Media =	2.3E+01
Total Blood HI Across All Media =	6.0E+01
Total Liver HI Across All Media =	5.9E+01
Total Hair HI Across All Media =	3.5E+01

TABLE 9.5.RME SUPPLEMENT
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child + Adult

Medium	ELCR	Receptor Age	HI
Soil Total	5E-05	Child	4
	2E-05	Adult	0.5
Groundwater Total	5E-05	Child	73
	9E-05	Adult	31
Resident Total	**2E-04**		**108**

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	11
Total Skin HI Across All Media =	3
Total Vascular HI Across All Media =	3
Total Kidney HI Across All Media =	8
Total NOAEL HI Across All Media =	1
Total Gastrointestinal HI Across All Media =	33
Total Blood HI Across All Media =	85
Total Liver HI Across All Media =	84
Total Hair HI Across All Media =	50

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			BENZO(a)ANTHRACENE	2.9E-08	NA	2.5E-08	5.3E-08	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	1.8E-06	NA	1.2E-06	2.9E-06	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	2.1E-07	NA	4.1E-08	2.5E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	6.5E-08	9.6E-12	1.3E-08	7.8E-08	Liver	1.1E-03	NA	2.1E-04	1.3E-03
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	8.1E-03	8.3E-04	5.3E-04	9.4E-03
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	2.8E-03	NA	1.2E-03	4.0E-03
			ARSENIC	9.9E-06	1.5E-08	2.0E-06	1.2E-05	Skin, Vascular	6.2E-02	NA	1.2E-02	7.4E-02
			CHROMIUM, TOTAL	NA	4.3E-08	NA	4.3E-08	NOAEL	6.6E-03	9.6E-05	1.7E-02	2.4E-02
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	7.0E-02	NA	4.6E-03	7.4E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	3.4E-03	4.9E-03	5.6E-03	1.4E-02
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	7.6E-03	NA	5.0E-04	8.1E-03
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	4.7E-02	NA	1.2E-01	1.7E-01
Chemical Total				1.2E-05	5.8E-08	3.2E-06	1.5E-05		2.1E-01	5.8E-03	1.6E-01	3.7E-01
Medium Total							1.5E-05					3.7E-01
Groundwater	Groundwater	Tap Water										
			p,p'-DDD	3.5E-07	NA	3.7E-12	3.5E-07	NA	NA	NA	NA	0.0E+00
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	8.9E-02	NA	7.3E-11	8.9E-02
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	1.3E-01	NA	7.3E-10	1.3E-01
			ARSENIC	3.3E-05	NA	3.4E-13	3.3E-05	Skin, Vascular	2.1E-01	NA	1.7E-10	2.1E-01
			BARIUM	NA	NA	NA	0.0E+00	NOAEL	4.9E-02	NA	5.7E-10	4.9E-02
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	5.9E-02	NA	1.9E-09	5.9E-02
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	4.9E-02	NA	3.2E-09	4.9E-02
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	3.4E+00	NA	7.1E-08	3.4E+00
			MANGANESE	NA	NA	NA	0.0E+00	CNS	1.0E+00	NA	2.1E-08	1.0E+00
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	5.4E+00	NA	4.5E-09	5.4E+00
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	6.8E-01	NA	2.2E-08	6.8E-01
Chemical Total				3.3E-05	0.0E+00	4.1E-12	3.3E-05		1.1E+01	NA	1.3E-07	1.1E+01
Medium Total							3.3E-05					1.1E+01
Receptor Total							4.9E-05				Receptor HI Total	1.2E+01

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	1.1E+00
Total Skin HI Across All Media =	2.8E-01
Total Vascular HI Across All Media =	2.8E-01
Total Kidney HI Across All Media =	9.1E-01
Total NOAEL HI Across All Media =	1.2E-01
Total Gastrointestinal HI Across All Media =	3.5E+00
Total Blood HI Across All Media =	9.1E+00
Total Liver HI Across All Media =	8.9E+00
Total Hair HI Across All Media =	5.4E+00

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			BENZO(a)ANTHRACENE	5.9E-09	NA	5.1E-09	1.1E-08	NA	NA	NA	NA	0.0E+00
			N-NITROSODI-n-PROPYLAMINE	3.6E-07	NA	2.4E-07	6.1E-07	NA	NA	NA	NA	0.0E+00
			p,p'-DDE	4.3E-08	NA	8.5E-09	5.2E-08	NA	NA	NA	NA	0.0E+00
			p,p'-DDT	1.4E-08	2.0E-12	2.7E-09	1.6E-08	Liver	2.2E-04	NA	4.4E-05	2.7E-04
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	1.7E-03	1.7E-04	1.1E-04	2.0E-03
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	5.8E-04	NA	2.5E-04	8.3E-04
			ARSENIC	2.1E-06	3.1E-09	4.1E-07	2.5E-06	Skin, Vascular	1.3E-02	NA	2.5E-03	1.5E-02
			CHROMIUM, TOTAL	NA	9.0E-09	NA	9.0E-09	NOAEL	1.4E-03	2.0E-05	3.6E-03	5.0E-03
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	1.4E-02	NA	9.5E-04	1.5E-02
			MANGANESE	NA	NA	NA	0.0E+00	CNS	7.0E-04	1.0E-03	1.2E-03	2.9E-03
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	1.6E-03	NA	1.0E-04	1.7E-03
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	9.7E-03	NA	2.5E-02	3.4E-02
Chemical Total				2.5E-06	1.2E-08	6.7E-07	3.2E-06		4.3E-02	1.2E-03	3.3E-02	7.8E-02
Medium Total							3.2E-06					7.8E-02
Receptor Total							3.2E-06				Receptor HI Total	7.8E-02

HI - Hazard Index
CNS - Central Nervous System
NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	4.8E-03
Total Vascular HI Across All Media =	1.5E-02
Total Kidney HI Across All Media =	3.4E-02
Total NOAEL HI Across All Media =	5.0E-03
Total Gastrointestinal HI Across All Media =	5.0E-03
Total Blood HI Across All Media =	1.8E-02
Total Liver HI Across All Media =	1.7E-02
Total Hair HI Across All Media =	1.7E-03

TABLE 9.8.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Total Soil	AOC H Total Soil	ARSENIC	1E-07	NA	1E-08	1E-07	Skin, Vascular	4E-02	NA	4E-03	5E-02
			N-NITROSODI-n-PROPYLAMINE	1E-07	NA	3E-08	2E-07	NA	NA	NA	NA	NA
		Exposure Point Total		3E-07	NA	5E-08	3E-07		4E-02	NA	4E-03	5E-02
	Exposure Medium Total			3E-07	NA	5E-08	3E-07		4E-02	NA	4E-03	5E-02
	Total Soil	AOC H Total Soil	ARSENIC	NA	6E-09	NA	6E-09	NA	NA	NA	NA	NA
			N-NITROSODI-n-PROPYLAMINE	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Exposure Point Total		NA	6E-09	NA	6E-09		NA	0E+00	NA	0E+00
	Exposure Medium Total			NA	6E-09	NA	6E-09		NA	0E+00	NA	0E+00
Medium Total				3E-07	6E-09	5E-08	3E-07		4E-02	0E+00	4E-03	5E-02
Groundwater	Groundwater	Groundwater (In Excavations)	p,p'-DDD	NA	NA	7E-08	7E-08	NA	NA	NA	NA	NA
			ALUMINUM	NA	NA	NA	NA	CNS	NA	NA	1E-03	1E-03
			ANTIMONY	NA	NA	NA	NA	Blood	NA	NA	2E-02	2E-02
			ARSENIC	NA	NA	2E-08	2E-08	Skin, Vascular	NA	NA	5E-03	5E-03
			BARIUM	NA	NA	NA	NA	NOAEL	NA	NA	2E-02	2E-02
			CADMIUM	NA	NA	NA	NA	Kidney	NA	NA	9E-02	9E-02
			CHROMIUM, TOTAL	NA	NA	NA	NA	NOAEL	NA	NA	7E-02	7E-02
			IRON	NA	NA	NA	NA	Blood, Gastrointestinal, Liver	NA	NA	7E-03	7E-03
			MANGANESE	NA	NA	NA	NA	CNS	NA	NA	5E+00	5E+00
			THALLIUM	NA	NA	NA	NA	Liver, Blood, Hair	NA	NA	8E-02	8E-02
			VANADIUM	NA	NA	NA	NA	Kidney	NA	NA	4E-01	4E-01
		Exposure Point Total		NA	NA	8E-08	8E-08		NA	NA	5E+00	5E+00
	Exposure Medium Total			NA	NA	8E-08	8E-08		NA	NA	5E+00	5E+00
Medium Total				NA	NA	8E-08	8E-08		NA	NA	5E+00	5E+00
Receptor Total				3E-07	6E-09	1E-07	4E-07		4E-02	0E+00	5E+00	6E+00

Toxicity values for aluminum were available at the time the original HHRA was prepared, but have since been withdrawn.

Total Blood HI Across Media =	1E-01
Total CNS HI Across Media =	**5E+00**
Total Gastrointestinal HI Across Media =	7E-03
Total Vascular HI Across Media =	5E-02
Total Kidney HI Across Media =	5E-01
Total Liver HI Across Media =	9E-02
Total Hair HI Across Media =	8E-02
Total Skin HI Across Media =	5E-02

TABLE 10.1.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Current/Future
Receptor Population: Recreational
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			ARSENIC	9.3E-06	5.1E-09	7.8E-07	1.0E-05	Skin, Vascular	2.4E-01	NA	2.0E-02	2.6E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.7E-01	NA	7.6E-03	2.8E-01
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	1.8E-01	NA	2.0E-01	3.8E-01
Chemical Total				9.3E-06	5.1E-09	7.8E-07	1.0E-05		6.9E-01	0.0E+00	2.2E-01	9.1E-01
Medium Total							1.0E-05					9.1E-01
Surface Water	Surface Water	Water-filled Ditch	ARSENIC	3.7E-06	NA	3.0E-07	4.0E-06	Skin, Vascular	9.7E-02	NA	7.8E-03	1.0E-01
Chemical Total				3.7E-06	0.0E+00	3.0E-07	4.0E-06		9.7E-02	NA	7.8E-03	1.0E-01
Medium Total							4.0E-06					1.0E-01
Receptor Total							2.4E+01				Receptor HI Total	2.5E+01

HI - Hazard Index

CNS - Central Nervous System

NOAEL = No Observed Adverse Effects Level

Total Skin HI Across All Media =	3.7E-01
Total Vascular HI Across All Media =	3.7E-01
Total Kidney HI Across All Media =	3.8E-01
Total Blood HI Across All Media =	2.8E-01
Total Liver HI Across All Media =	2.8E-01

TABLE 10.2.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			ARSENIC	1.3E-05	2.0E-08	1.6E-06	1.5E-05	Skin, Vascular	8.7E-02	NA	1.0E-02	9.7E-02
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	6.5E-02	NA	1.0E-01	1.7E-01
Chemical Total				1.3E-05	2.0E-08	1.6E-06	1.5E-05		1.5E-01	0.0E+00	1.1E-01	2.6E-01
Groundwater	Groundwater	Tap Water										
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	2.5E-01	NA	1.3E-09	2.5E-01
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	3.7E-01	NA	1.3E-08	3.7E-01
			ARSENIC	8.9E-05	NA	2.7E-13	8.9E-05	Skin, Vascular	5.8E-01	NA	3.0E-09	5.8E-01
			BARIUM	NA	NA	NA	0.0E+00	NOAEL	1.4E-01	NA	1.0E-08	1.4E-01
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	1.6E-01	NA	3.4E-08	1.6E-01
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	1.4E-01	NA	5.3E-08	1.4E-01
Chemical Total				8.9E-05	0.0E+00	2.7E-13	8.9E-05		1.6E+00	NA	1.1E-07	1.6E+00
Medium Total							8.9E-05					1.6E+00
Receptor Total							1.0E-04				Receptor HI Total	1.9E+00

HI - Hazard Index

CNS - Central Nervous System

NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	2.5E-01
Total Skin HI Across All Media =	6.7E-01
Total Vascular HI Across All Media =	6.7E-01
Total Kidney HI Across All Media =	3.3E-01
Total NOAEL HI Across All Media =	2.7E-01
Total Blood HI Across All Media =	3.7E-01

TABLE 10.3.RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Residential
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil										
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	1.1E-01	4.1E-03	3.0E-03	1.1E-01
			ARSENIC	3.1E-05	2.0E-07	2.6E-06	3.4E-05	Skin, Vascular	8.1E-01	NA	6.8E-02	8.8E-01
			CHROMIUM, TOTAL	NA	6.0E-07	NA	6.0E-07	NOAEL	8.6E-02	4.7E-04	9.6E-02	1.8E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	9.1E-01	NA	2.5E-02	9.3E-01
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	9.9E-02	NA	2.8E-03	1.0E-01
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	6.1E-01	NA	6.6E-01	1.3E+00
Chemical Total				3.1E-05	8.0E-07	2.6E-06	3.5E-05		2.6E+00	4.5E-03	8.5E-01	3.5E+00
Subsurface Soil	Subsurface Soil	AOC H Subsurface Soil	ARSENIC	1.1E-05	NA	9.1E-07	1.2E-05	Skin, Vascular	2.8E-01	NA	2.3E-02	3.0E-01
Chemical Total				1.1E-05	0.0E+00	9.1E-07	1.2E-05		2.8E-01	0.0E+00	2.3E-02	3.0E-01
Medium Total							4.6E-05					3.8E+00
Groundwater	Groundwater	Tap Water										
			ALUMINUM	NA	NA	NA	0.0E+00	CNS	5.8E-01	NA	3.8E-09	5.8E-01
			ANTIMONY	NA	NA	NA	0.0E+00	Blood	8.6E-01	NA	3.8E-08	8.6E-01
			ARSENIC	5.2E-05	NA	3.4E-13	5.2E-05	Skin, Vascular	1.3E+00	NA	8.9E-09	1.3E+00
			BARIUM	NA	NA	NA	0.0E+00	NOAEL	3.2E-01	NA	3.0E-08	3.2E-01
			CADMIUM	NA	NA	NA	0.0E+00	Kidney	3.8E-01	NA	1.0E-07	3.8E-01
			CHROMIUM, TOTAL	NA	NA	NA	0.0E+00	NOAEL	3.2E-01	NA	1.7E-07	3.2E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	2.2E+01	NA	3.7E-06	2.2E+01
			MANGANESE	NA	NA	NA	0.0E+00	CNS	6.8E+00	NA	1.1E-06	6.8E+00
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	3.5E+01	NA	2.3E-07	3.5E+01
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	4.5E+00	NA	1.1E-06	4.5E+00
Chemical Total				5.2E-05	0.0E+00	3.4E-13	5.2E-05		7.3E+01	NA	6.5E-06	7.3E+01
Medium Total							5.2E-05					7.3E+01
Receptor Total							1.3E-04				Receptor HI Total	8.0E+01

HI - Hazard Index

CNS - Central Nervous System

NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	7.5E+00
Total Skin HI Across All Media =	2.5E+00
Total Vascular HI Across All Media =	2.5E+00
Total Kidney HI Across All Media =	6.1E+00
Total NOAEL HI Across All Media =	8.2E-01
Total Gastrointestinal HI Across All Media =	2.3E+01
Total Blood HI Across All Media =	6.0E+01
Total Liver HI Across All Media =	5.9E+01
Total Hair HI Across All Media =	3.5E+01

TABLE 10.4RME

RISK SUMMARY

REASONABLE MAXIMUM EXPOSURE

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	AOC H Surface Soil	VANADIUM	NA	NA	NA	0.0E+00	Kidney	4.7E-02	NA	1.2E-01	1.7E-01
Chemical Total				0.0E+00	0.0E+00	0.0E+00	0.0E+00		4.7E-02	0.0E+00	1.2E-01	1.7E-01
Medium Total							0.0E+00					1.7E-01
Groundwater	Groundwater	Tap Water	ANTIMONY	NA	NA	NA	0.0E+00	Blood	1.3E-01	NA	7.3E-10	1.3E-01
			ARSENIC	3.3E-05	NA	3.4E-13	3.3E-05	Skin, Vascular	2.1E-01	NA	1.7E-10	2.1E-01
			IRON	NA	NA	NA	0.0E+00	Blood, Gastrointestinal, Liver	3.4E+00	NA	7.1E-08	3.4E+00
			MANGANESE	NA	NA	NA	0.0E+00	CNS	1.0E+00	NA	2.1E-08	1.0E+00
			THALLIUM	NA	NA	NA	0.0E+00	Liver, Blood, Hair	5.4E+00	NA	4.5E-09	5.4E+00
			VANADIUM	NA	NA	NA	0.0E+00	Kidney	6.8E-01	NA	2.2E-08	6.8E-01
Chemical Total				3.3E-05	0.0E+00	3.4E-13	3.3E-05		1.1E+01	NA	1.2E-07	1.1E+01
Medium Total							3.3E-05					1.1E+01
Receptor Total							3.3E-05				Receptor HI Total	1.1E+01

HI - Hazard Index

CNS - Central Nervous System

NOAEL = No Observed Adverse Effects Level

Total CNS HI Across All Media =	1.0E+00
Total Skin HI Across All Media =	2.1E-01
Total Vascular HI Across All Media =	2.1E-01
Total Kidney HI Across All Media =	8.5E-01
Total Gastrointestinal HI Across All Media =	3.4E+00
Total Blood HI Across All Media =	9.0E+00
Total Liver HI Across All Media =	8.8E+00
Total Hair HI Across All Media =	5.4E+00

TABLE 10.5.RME
RISK SUMMARY
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Groundwater (In Excavations)	MANGANESE					CNS	NA	NA	5E+00	5E+00
		Exposure Point Total		NA	NA	0E+00	0E+00		NA	NA	5E+00	5E+00
	Exposure Medium Total			NA	NA	0E+00	0E+00		NA	NA	5E+00	5E+00
Medium Total				NA	NA	0E+00	0E+00		NA	NA	5E+00	5E+00
Receptor Total				0E+00	0E+00	0E+00	0E+00		0E+00	0E+00	5E+00	5E+00

Total CNS HI Across Media = **5E+00**

TABLE J-1
Summary of Norway Rat Exposure Doses - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics											
Arsenic	67.00	0.925	61.975	9.074	607.958	0.047	64.462	0.252	1.26	255.8	51.2
Cadmium	0.291	190.000	55.290	22.879	6.658	0.008	0.707	1	10	0.7	0.1
Chromium	50.00	11.416	570.800	0.480	24.000	0.016	2.652	3.28	16.4	0.8	0.2
Copper	100.0	5.492	549.200	7.400	740.000	0.023	78.491	78	104	1.01	0.8
Lead	63.00	228.261	14380.443	10.601	667.863	0.035	70.785	8	80	8.85	0.9
Mercury	0.063	33.000	2.063	12.230	0.764	0.00004	0.081	0.032	0.16	2.53	0.5
Nickel	26.00	7.802	202.852	22.214	577.564	0.020	61.150	40	80	1.53	0.8
Selenium	1.400	13.733	19.226	77.000	107.800	0.064	11.425	0.2	0.33	57.1	34.6
Silver	0.170	19.500	3.315	0.040	0.007	0.009	0.004	9.06	45.3	0.0	0.0
Zinc	260.0	49.510	12872.600	34.286	8914.360	0.008	943.409	160	320	5.90	2.95
Pesticides/PCBs											
4,4'-DDD	0.010	2.000	0.020	0.015	0.0002	0.00002	0.00004	0.8	4	0.0	0.0
4,4'-DDE	3.990	10.60	42.294	0.022	0.0861	0.00002	0.018	0.8	4	0.0	0.0
4,4'-DDT	1.940	0.700	1.358	0.024	0.0459	0.00002	0.009	0.8	4	0.0	0.0
Aldrin	0.002	3.300	0.007	0.043	0.0001	0.00001	0.00002	0.2	1	0.0	0.0
alpha-BHC	0.002	1.000	0.002	0.263	0.0006	0.00001	0.0001	1.6	3.2	0.0	0.0
alpha-Chlordane	0.002	4.000	0.008	0.017	0.0000	0.00001	0.00001	4.58	9.16	0.0	0.0
Aroclor-1016	0.039	65.200	2.543	0.022	0.0009	0.0	0.0002	0.136	0.68	0.0	0.0
Aroclor-1221	0.079	65.200	5.151	0.074	0.0059	0.0	0.001	0.136	0.68	0.0	0.0
Aroclor-1232	0.039	65.200	2.543	0.044	0.0017	0.0	0.0003	0.136	0.68	0.0	0.0
Aroclor-1242	0.039	65.200	2.543	0.022	0.0009	0.0	0.0002	0.136	0.68	0.0	0.0
Aroclor-1248	0.039	65.200	2.543	0.010	0.0004	0.0	0.0001	0.136	0.68	0.0	0.0
Aroclor-1254	0.039	65.200	2.543	0.007	0.0003	0.0	0.0001	0.136	0.68	0.0	0.0
Aroclor-1260	0.039	65.200	2.543	0.005	0.0002	0.00	0.0001	0.14	0.69	0.0	0.0
beta-BHC	0.002	1.000	0.002	0.263	0.0006	0.00001	0.0001	1.6	3.2	0.0	0.0
delta-BHC	0.002	1.000	0.002	0.165	0.0003	0.00001	0.00004	1.6	3.2	0.0	0.0
Dieldrin	0.004	8.000	0.033	0.309	0.0013	0.00002	0.0001	0.04	0.2	0.0	0.0
Endosulfan I	0.002	1.000	0.002	0.344	0.0007	0.00001	0.0001	1.5	7.5	0.0	0.0
Endosulfan II	0.004	1.000	0.004	0.313	0.0013	0.00002	0.0002	1.5	7.5	0.0	0.0
Endrin	0.004	3.600	0.015	0.795	0.0033	0.00002	0.0004	0.184	0.92	0.0	0.0
gamma-BHC (Lindane)	0.002	1.000	0.002	0.317	0.0007	0.00001	0.0001	8	40	0.0	0.0
gamma-Chlordane	0.002	4.000	0.008	0.017	0.0000	0.00001	0.00001	4.58	9.16	0.0	0.0
Heptachlor	0.002	3.000	0.006	0.055	0.0001	0.00001	0.00002	0.325	1.625	0.0	0.0
Heptachlor epoxide	0.002	8.390	0.018	0.367	0.0008	0.00001	0.0001	0.325	1.625	0.0	0.0
Methoxychlor	0.001	1.000	0.001	0.145	0.0001	0.00010	0.00005	4	8	0.0	0.0
Toxaphene	0.210	1.000	0.210	0.122	0.0256	0.00005	0.003	8	40	0.0	0.0
Semivolatile Organics											
1,2,4-Trichlorobenzene	28.200	0.560	15.792	0.219	6.164	0.0	0.713	53	106	0.0	0.0
1,2-Dichlorobenzene	28.200	1.000	28.200	0.548	15.440	0.0	1.694	85.7	428.5	0.0	0.0
1,3-Dichlorobenzene	28.200	1.000	28.200	0.367	10.357	0.0	1.156	85.7	428.5	0.0	0.0

TABLE J-1

Summary of Norway Rat Exposure Doses - Step 2

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
1,4-Dichlorobenzene	28.200	1.000	28.200	0.505	14.255	0.0	1.569	250	500	0.0	0.0
4-Bromophenyl-phenylether	0.267	1.000	0.267	0.058	0.015	0.0	0.002	NA	NA	--	--
4-Chlorophenyl-phenylether	28.200	1.000	28.200	0.170	4.786	0.0	0.567	NA	NA	--	--
Acenaphthene	28.200	0.300	8.460	0.256	7.231	0.005	0.827	350	700	0.0	0.0
Acenaphthylene	28.200	0.220	6.204	0.165	4.661	0.005	0.555	350	700	0.0	0.0
Anthracene	28.200	0.320	9.024	0.105	2.964	0.005	0.376	1000	5000	0.0	0.0
Benzo(a)anthracene	0.112	0.270	0.030	0.022	0.002	0.005	0.002	2	10	0.0	0.0
Benzo(a)pyrene	0.120	0.340	0.041	0.014	0.002	0.005	0.002	2	10	0.0	0.0
Benzo(b)fluoranthene	0.133	0.210	0.028	0.017	0.002	0.005	0.002	2	10	0.0	0.0
Benzo(g,h,i)perylene	0.060	0.150	0.009	0.006	0.000	0.005	0.002	2	10	0.0	0.0
Benzo(k)fluoranthene	0.124	0.210	0.026	0.011	0.001	0.005	0.002	2	10	0.0	0.0
Chrysene	0.155	0.440	0.068	0.029	0.004	0.005	0.002	2	10	0.0	0.0
Dibenz(a,h)anthracene	28.200	0.490	13.818	0.007	0.191	0.005	0.083	2	10	0.0	0.0
Fluoranthene	0.187	0.370	0.069	0.062	0.012	0.005	0.003	500	2500	0.0	0.0
Fluorene	28.200	0.200	5.640	0.179	5.048	0.005	0.596	500	2500	0.0	0.0
Hexachlorobenzene	28.200	1.690	47.658	0.037	1.036	0.005	0.172	1	2	0.2	0.1
Hexachlorobutadiene	28.200	1.000	28.200	0.071	1.989	0.005	0.273	2	20	0.1	0.0
Hexachlorocyclopentadiene	28.200	1.000	28.200	0.047	1.316	0.005	0.202	75	375	0.0	0.0
Hexachloroethane	28.200	1.000	28.200	0.240	6.765	0.005	0.778	100	500	0.0	0.0
Indeno(1,2,3-cd)pyrene	0.085	0.410	0.035	0.006	0.001	0.005	0.002	2	10	0.0	0.0
Pentachlorophenol	84.500	8.000	676.000	0.049	4.160	0.021	0.629	5	25	0.1	0.0
Phenanthrene	0.144	0.280	0.040	0.115	0.017	0.005	0.004	500	2500	0.0	0.0
Pyrene	1.900	0.390	0.741	0.069	0.130	0.005	0.020	2	10	0.0	0.0
Volatile Organics											
1,1,2,2-Tetrachloroethane	0.948	1.000	0.948	1.790	1.697	0.0	0.182	76	380	0.0	0.0

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.026981381 = Food ingestion rate (kg/day dry weight, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis, from Table 7-8)
PDFi = 0 = Proportion of diet composed of food item (soil invertebrates, dry weight basis, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis, from Table 7-8)
PDFi = 0.98 = Proportion of diet composed of food item (terrestrial plants, dry weight basis, from Table 7-8)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.02 = Proportion of diet composed of soil (dry weight basis, from Table 7-8)
WIR = 0.080987162 = Water ingestion rate (L/day, from Table 7-8)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.25 = Body weight (kg wet weight, from Table 7-8)

TABLE J-1a

Summary of Norway Rat Exposure Doses - Step 3a

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics											
Arsenic	4.880	0.258	1.259	0.037	0.181	0.027	0.038	0.252	1.26	0.15	0.03
Cadmium	0.057	7.660	0.438	0.514	0.029	0.005	0.011	1	10	0.01	0.001
Chromium	17.100	0.320	5.474	0.048	0.813	0.008	0.151	3.28	16.4	0.05	0.01
Copper	31.800	0.468	14.887	0.123	3.914	0.012	0.433	78	104	0.01	0.004
Lead	26.400	0.307	8.104	0.038	0.995	0.018	0.221	8	80	0.03	0.003
Mercury	0.032	1.186	0.038	0.344	0.011	0.00003	0.001	0.032	0.16	0.03	0.01
Nickel	7.960	1.656	13.182	0.034	0.272	0.010	0.297	40	80	0.01	0.004
Selenium	0.507	0.982	0.498	0.567	0.288	0.032	0.021	0.2	0.33	0.10	0.06
Zinc	96.400	2.482	239.249	0.358	34.484	0.004	5.970	160	320	0.04	0.02
Pesticides/PCBs											
4,4'-DDE	0.234	10.60	2.480	0.0048	0.001	0.00001	0.054	0.8	4	0.07	0.01

$$DI = \frac{[AFF[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.019196986 = Food ingestion rate (kg/day dry weight, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis, from Table 7-18)
PDFi = 0.49 = Proportion of diet composed of food item (soil invertebrates, dry weight basis, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis, from Table 7-18)
PDFi = 0.49 = Proportion of diet composed of food item (terrestrial plants, dry weight basis, from Table 7-18)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.02 = Proportion of diet composed of soil (dry weight basis, from Table 7-18)
WIR = 0.047045214 = Water ingestion rate (L/day, from Table 7-18)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.4375 = Body weight (kg wet weight, from Table 7-18)
AFF = 1 = Area foraging factor (Site Size/Home Range; Max. is 1.0; from Table 7-18)

TABLE J-2
Summary of Indian Mongoose Exposure Doses - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics													
Arsenic	67.00	0.925	61.975	9.074	607.958	0.071	4.757	0.047	10.061	1.2	6	8.38	1.68
Cadmium	0.291	190.000	55.290	22.879	6.658	1.705	0.496	0.008	7.727	0.75	3.75	10.3	2.06
Chromium	50.00	11.416	570.800	0.480	24.000	0.800	40.000	0.016	80.737	3.28	16.4	24.6	4.92
Copper	100.0	5.492	549.200	7.400	740.000	0.867	86.700	0.023	78.766	11.7	15.14	6.7	5.20
Lead	63.00	228.261	14380.443	10.601	667.863	0.995	62.685	0.035	2008.998	8	80	251	25.1
Mercury	0.063	33.000	2.063	12.230	0.764	0.192	0.012	0.00004	0.289	0.15	0.25	1.93	1.16
Nickel	26.00	7.802	202.852	22.214	577.564	0.800	20.800	0.020	28.867	25	62.5	1.15	0.46
Selenium	1.400	13.733	19.226	77.000	107.800	1.754	2.456	0.064	2.728	0.2	0.33	13.6	8.27
Silver	0.170	19.500	3.315	0.040	0.007	0.810	0.138	0.009	0.468	9.06	45.3	0.05	0.01
Zinc	260.0	49.510	12872.600	34.286	8914.360	5.850	1521.000	0.008	1802.590	20.8	104	86.7	17.3
Pesticides/PCBs													
4,4'-DDD	0.010	2.000	0.020	0.015	0.0002	see footnote	0.003	0.00002	0.003	1	5	0.00	0.00
4,4'-DDE	3.990	10.60	42.294	0.022	0.0861	see footnote	7.031	0.00002	5.988	1	5	5.99	1.20
4,4'-DDT	1.940	0.700	1.358	0.024	0.0459	see footnote	0.245	0.00002	0.230	1	5	0.23	0.05
Aldrin	0.002	3.300	0.007	0.043	0.0001	see footnote	0.001	0.00001	0.001	0.2	1	0.01	0.00
alpha-BHC	0.002	1.000	0.002	0.263	0.0006	see footnote	0.000	0.00001	0.0003	1.6	3.2	0.00	0.00
alpha-Chlordane	0.002	4.000	0.008	0.017	0.0000	see footnote	0.001	0.00001	0.001	4.58	9.16	0.00	0.00
Aroclor-1016	0.039	65.200	2.543	0.022	0.0009	see footnote	0.103	0.0	0.356	1.37	3.43	0.26	0.10
Aroclor-1221	0.079	65.200	5.151	0.074	0.0059	see footnote	0.209	0.0	0.721	0.138	0.69	5.22	1.04
Aroclor-1232	0.039	65.200	2.543	0.044	0.0017	see footnote	0.103	0.0	0.356	0.138	0.69	2.58	0.52
Aroclor-1242	0.039	65.200	2.543	0.022	0.0009	see footnote	0.103	0.0	0.356	0.138	0.69	2.58	0.52
Aroclor-1248	0.039	65.200	2.543	0.010	0.0004	see footnote	0.103	0.0	0.356	0.14	0.69	2.54	0.52
Aroclor-1254	0.039	65.200	2.543	0.007	0.0003	see footnote	0.103	0.0	0.356	0.14	0.69	2.54	0.52
Aroclor-1260	0.039	65.2	2.543	0.005	0.0002	see footnote	0.103	0.0	0.356	0.14	0.69	2.54	0.52
beta-BHC	0.002	1.000	0.002	0.263	0.0006	see footnote	0.0005	0.00001	0.0003	1.6	3.2	0.0002	0.0001
delta-BHC	0.002	1.000	0.002	0.165	0.0003	see footnote	0.0004	0.00001	0.0003	1.6	3.2	0.0002	0.0001
Dieldrin	0.004	8.000	0.033	0.309	0.0013	see footnote	0.006	0.00002	0.005	0.028	0.14	0.17	0.03
Endosulfan I	0.002	1.000	0.002	0.344	0.0007	see footnote	0.0005	0.00001	0.0003	1	5	0.0003	0.0001
Endosulfan II	0.004	1.000	0.004	0.313	0.0013	see footnote	0.001	0.00002	0.001	1	5	0.001	0.0001
Endrin	0.004	3.600	0.015	0.795	0.0033	see footnote	0.003	0.00002	0.002	0.184	0.92	0.01	0.002
gamma-BHC (Lindane)	0.002	1.000	0.002	0.317	0.0007	see footnote	0.000	0.00001	0.0003	8	40	0.00004	0.00001
gamma-Chlordane	0.002	4.000	0.008	0.017	0.0000	see footnote	0.001	0.00001	0.001	4.58	9.16	0.0003	0.0001
Heptachlor	0.002	3.000	0.006	0.055	0.0001	see footnote	0.001	0.00001	0.001	0.2	1	0.005	0.001
Heptachlor epoxide	0.002	8.390	0.018	0.367	0.0008	see footnote	0.003	0.00001	0.003	0.2	1	0.01	0.003
Methoxychlor	0.001	1.000	0.001	0.145	0.0001	see footnote	0.0002	0.00010	0.0001	4	8	0.00004	0.00002
Toxaphene	0.210	1.000	0.210	0.122	0.0256	see footnote	0.040	0.00005	0.034	8	40	0.004	0.001
Semivolatile Organics													
1,2,4-Trichlorobenzene	28.200	0.560	15.792	0.219	6.164	see footnote	3.819	0.00	2.793	53	106	0.05	0.03
1,2-Dichlorobenzene	28.200	1.000	28.200	0.548	15.440	see footnote	7.402	0.00	4.525	85.7	428.5	0.05	0.01

TABLE J-2

Summary of Indian Mongoose Exposure Doses - Step 2

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
1,3-Dichlorobenzene	28.200	1.000	28.200	0.367	10.357	see footnote	6.562	0.00	4.525	85.7	428.5	0.05	0.01
1,4-Dichlorobenzene	28.200	1.000	28.200	0.505	14.255	see footnote	7.206	0.00	4.525	250	500	0.02	0.01
4-Bromophenyl-phenylether	0.267	1.000	0.267	0.058	0.015	see footnote	0.012	0.00	0.043	NA	NA	--	--
4-Chlorophenyl-phenylether	28.200	1.000	28.200	0.170	4.786	see footnote	1.777	0.00	4.525	NA	NA	--	--
Acenaphthene	28.200	0.300	8.460	0.256	7.231	see footnote	2.788	0.005	1.771	350	700	0.005	0.003
Acenaphthylene	28.200	0.220	6.204	0.165	4.661	see footnote	1.991	0.005	1.456	350	700	0.004	0.002
Anthracene	28.200	0.320	9.024	0.105	2.964	see footnote	2.177	0.005	1.849	1000	5000	0.002	0.0004
Benzo(a)anthracene	0.112	0.270	0.030	0.022	0.002	see footnote	0.011	0.005	0.008	2	10	0.004	0.001
Benzo(a)pyrene	0.120	0.340	0.041	0.014	0.002	see footnote	0.013	0.005	0.009	2	10	0.005	0.001
Benzo(b)fluoranthene	0.133	0.210	0.028	0.017	0.002	see footnote	0.011	0.005	0.008	2	10	0.004	0.001
Benzo(g,h,i)perylene	0.060	0.150	0.009	0.006	0.000	see footnote	0.007	0.005	0.004	2	10	0.002	0.0004
Benzo(k)fluoranthene	0.124	0.210	0.026	0.011	0.001	see footnote	0.011	0.005	0.007	2	10	0.004	0.001
Chrysene	0.155	0.440	0.068	0.029	0.004	see footnote	0.018	0.005	0.014	2	10	0.01	0.001
Dibenz(a,h)anthracene	28.200	0.490	13.818	0.007	0.191	see footnote	2.511	0.005	2.519	2	10	1.26	0.25
Fluoranthene	0.187	0.370	0.069	0.062	0.012	see footnote	0.020	0.005	0.015	500	2500	0.00003	0.00001
Fluorene	28.200	0.200	5.640	0.179	5.048	see footnote	1.962	0.005	1.377	500	2500	0.003	0.001
Hexachlorobenzene	28.200	1.690	47.658	0.037	1.036	see footnote	8.243	0.005	7.243	1.2	12	6.04	0.60
Hexachlorobutadiene	28.200	1.000	28.200	0.071	1.989	see footnote	5.184	0.005	4.526	2	20	2.26	0.23
Hexachlorocyclopentadiene	28.200	1.000	28.200	0.047	1.316	see footnote	5.073	0.005	4.526	75	375	0.06	0.01
Hexachloroethane	28.200	1.000	28.200	0.240	6.765	see footnote	5.974	0.005	4.526	100	500	0.05	0.01
Indeno(1,2,3-cd)pyrene	0.085	0.410	0.035	0.006	0.001	see footnote	0.012	0.005	0.008	2	10	0.004	0.001
Pentachlorophenol	84.500	8.000	676.000	0.049	4.160	see footnote	112.995	0.021	96.145	5	25	19.2	3.85
Phenanthrene	0.144	0.280	0.040	0.115	0.017	see footnote	0.016	0.005	0.010	500	2500	0.00002	0.000004
Pyrene	1.900	0.390	0.741	0.069	0.130	see footnote	0.162	0.005	0.144	2	10	0.07	0.01
Volatile Organics													
1,1,2,2-Tetrachloroethane	0.948	1.000	0.948	1.790	1.697	see footnote	0.443	0.0	0.152	76	380	0.002	0.0004

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF (wet-weight basis) of 1.0 was assumed.

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.048944287 = Food ingestion rate (kg/day dry weight, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis, from Table 7-8)
PDFi = 0.87 = Proportion of diet composed of food item (soil invertebrates, dry weight basis, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis, from Table 7-8)
PDFi = 0.00 = Proportion of diet composed of food item (terrestrial plants, dry weight basis, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis, from Table 7-8)
PDFi = 0.000 = Proportion of diet composed of food item (small mammals, dry weight basis, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (benthic invertebrates, dry weight basis, from Table 7-8)
PDFi = 0.000 = Proportion of diet composed of food item (benthic invertebrates, dry weight basis, from Table 7-8)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.13 = Proportion of diet composed of soil (dry weight basis, from Table 7-8)
WIR = 0.068297905 = Water ingestion rate (L/day, from Table 7-8)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.305 = Body weight (kg wet weight, from Table 7-8)

TABLE J-2a

Summary of Indian Mongoose Exposure Doses - Step 3a

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics													
Arsenic	4.880	0.258	1.259	0.037	0.181	0.003	0.016	0.027	0.015	1.2	6	0.01	0.002
Cadmium	0.057	7.660	0.438	0.514	0.029	0.144	0.008	0.005	0.003	0.75	3.75	0.004	0.001
Chromium	17.100	0.320	5.474	0.048	0.813	0.092	1.574	0.008	0.059	3.28	16.4	0.02	0.004
Copper	31.800	0.468	14.887	0.123	3.914	0.111	3.520	0.012	0.141	11.7	15.14	0.01	0.01
Lead	26.400	0.307	8.104	0.038	0.995	0.055	1.448	0.018	0.087	8	80	0.01	0.001
Mercury	0.032	1.186	0.038	0.344	0.011	0.054	0.002	0.00003	0.0003	0.15	0.25	0.002	0.001
Nickel	7.960	1.656	13.182	0.034	0.272	0.168	1.340	0.010	0.093	25	62.5	0.004	0.001
Selenium	0.507	0.982	0.498	0.567	0.288	0.258	0.131	0.032	0.005	0.2	0.33	0.02	0.01
Zinc	96.400	2.482	239.249	0.358	34.484	0.509	49.090	0.004	1.692	20.8	104	0.08	0.02
Pesticides/PCBs													
4,4'-DDE	0.234	10.60	2.480	0.0048	0.001	see footnote	0.171	0.000	0.016	1	5	0.02	0.003

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF (wet-weight basis) of 1.0 was assumed.

$$DI = \frac{[AFF[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.034591811 = Food ingestion rate (kg/day dry weight, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis, from Table 7-18)
PDFi = 0.61 = Proportion of diet composed of food item (soil invertebrates, dry weight basis, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis, from Table 7-18)
PDFi = 0.10 = Proportion of diet composed of food item (terrestrial plants, dry weight basis, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis, from Table 7-18)
PDFi = 0.163 = Proportion of diet composed of food item (small mammals, dry weight basis, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (benthic invertebrates, dry weight basis, from Table 7-18)
PDS = 0.13 = Proportion of diet composed of soil (dry weight basis, from Table 7-18)
WIR = 0.046706352 = Water ingestion rate (L/day, from Table 7-18)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.434 = Body weight (kg wet weight, from Table 7-18)
AFF = 0.125 = Area foraging factor (Site Size/Home Range; Max. is 1.0; from Table 7-18)

TABLE J-3

Summary of Pearly-eyed Thrasher Exposure Doses - Step 2

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics											
Arsenic	67.00	0.925	61.975	9.074	607.958	0.047	8.574	2.46	7.38	3.49	1.16
Cadmium	0.291	190.000	55.290	22.879	6.658	0.008	7.267	1.45	20	5.01	0.36
Chromium	50.00	11.416	570.800	0.480	24.000	0.016	75.316	1	5	75.32	15.06
Copper	100.0	5.492	549.200	7.400	740.000	0.023	72.796	47	61.7	1.55	1.18
Lead	63.00	228.261	14380.443	10.601	667.863	0.035	1889.844	3.85	19.25	490.87	98.17
Mercury	0.063	33.000	2.063	12.230	0.764	0.000	0.271	0.49	1.2	0.55	0.23
Nickel	26.00	7.802	202.852	22.214	577.564	0.020	26.820	77.4	107	0.35	0.25
Selenium	1.400	13.733	19.226	77.000	107.800	0.064	2.544	0.44	1.5	5.78	1.70
Silver	0.170	19.500	3.315	0.040	0.007	0.009	0.438	7	35	0.06	0.01
Zinc	260.0	49.510	12872.600	34.286	8914.360	0.008	1692.974	14.5	131	116.76	12.92
Pesticides/PCBs											
4,4'-DDD	0.010	2.000	0.020	0.015	0.0002	0.00002	0.003	0.5	5	0.01	0.00
4,4'-DDE	3.990	10.60	42.294	0.022	0.0861	0.00002	5.582	0.5	5	11.16	1.12
4,4'-DDT	1.940	0.700	1.358	0.024	0.0459	0.00002	0.191	0.5	5	0.38	0.04
Aldrin	0.002	3.300	0.007	0.043	0.0001	0.00001	0.001	0.0701	0.3505	0.01	0.003
alpha-BHC	0.002	1.000	0.002	0.263	0.0006	0.00001	0.000	0.56	2.25	0.001	0.0001
alpha-Chlordane	0.002	4.000	0.008	0.017	0.0000	0.00001	0.001	2.14	10.7	0.001	0.0001
Aroclor-1016	0.039	65.200	2.543	0.022	0.0009	0.0	0.334	0.41	2.05	0.82	0.16
Aroclor-1221	0.079	65.200	5.151	0.074	0.0059	0.0	0.677	0.41	2.05	1.65	0.33
Aroclor-1232	0.039	65.200	2.543	0.044	0.0017	0.0	0.334	0.41	2.05	0.82	0.16
Aroclor-1242	0.039	65.200	2.543	0.022	0.0009	0.0	0.334	0.41	2.05	0.82	0.16
Aroclor-1248	0.039	65.200	2.543	0.010	0.0004	0.0	0.334	0.41	2.05	0.82	0.16
Aroclor-1254	0.039	65.200	2.543	0.007	0.0003	0.0	0.334	0.41	2.05	0.82	0.16
Aroclor-1260	0.039	65.2	2.543	0.005	0.0002	0.0	0.334	0.41	2.05	0.82	0.16
beta-BHC	0.002	1.000	0.002	0.263	0.0006	0.00001	0.000	0.56	2.25	0.001	0.0001
delta-BHC	0.002	1.000	0.002	0.165	0.0003	0.00001	0.000	0.56	2.25	0.001	0.0001
Dieldrin	0.004	8.000	0.033	0.309	0.0013	0.00002	0.004	0.077	0.385	0.06	0.01
Endosulfan I	0.002	1.000	0.002	0.344	0.0007	0.00001	0.000	10	50	0.00003	0.00001
Endosulfan II	0.004	1.000	0.004	0.313	0.0013	0.00002	0.001	10	50	0.0001	0.00001
Endrin	0.004	3.600	0.015	0.795	0.0033	0.00002	0.002	0.02	0.1	0.10	0.02
gamma-BHC (Lindane)	0.002	1.000	0.002	0.317	0.0007	0.00001	0.000	4	20	0.0001	0.00001
gamma-Chlordane	0.002	4.000	0.008	0.017	0.0000	0.00001	0.001	2.14	10.7	0.001	0.0001
Heptachlor	0.002	3.000	0.006	0.055	0.0001	0.00001	0.001	0.2753	1.3765	0.003	0.001
Heptachlor epoxide	0.002	8.390	0.018	0.367	0.0008	0.00001	0.002	0.2753	1.3765	0.01	0.002
Methoxychlor	0.001	1.000	0.001	0.145	0.0001	0.00010	0.000	355	1775	0.0000003	0.0000001
Toxaphene	0.210	1.000	0.210	0.122	0.0256	0.00005	0.029	1	5	0.03	0.01
Semivolatile Organics											
1,2,4-Trichlorobenzene	28.200	0.560	15.792	0.219	6.164	0.0	2.254	32.16	160.8	0.07	0.01
1,2-Dichlorobenzene	28.200	1.000	28.200	0.548	15.440	0.0	3.884	32.16	160.8	0.12	0.02
1,3-Dichlorobenzene	28.200	1.000	28.200	0.367	10.357	0.0	3.884	32.16	160.8	0.12	0.02

TABLE J-3

Summary of Pearly-eyed Thrasher Exposure Doses - Step 2

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
1,4-Dichlorobenzene	28.200	1.000	28.200	0.505	14.255	0.0	3.884	32.16	160.8	0.12	0.02
4-Bromophenyl-phenylether	0.267	1.000	0.267	1.505	0.402	1.000	0.170	NA	NA	--	--
4-Chlorophenyl-phenylether	28.200	1.000	28.200	2.505	70.655	2.000	4.151	NA	NA	--	--
Acenaphthene	28.200	0.300	8.460	0.256	7.231	0.005	1.291	7.1	35.5	0.18	0.04
Acenaphthylene	28.200	0.220	6.204	0.165	4.661	0.005	0.994	7.1	35.5	0.14	0.03
Anthracene	28.200	0.320	9.024	0.105	2.964	0.005	1.365	7.1	35.5	0.19	0.04
Benzo(a)anthracene	0.112	0.270	0.030	0.022	0.002	0.005	0.005	7.1	35.5	0.001	0.0002
Benzo(a)pyrene	0.120	0.340	0.041	0.014	0.002	0.005	0.007	7.1	35.5	0.001	0.0002
Benzo(b)fluoranthene	0.133	0.210	0.028	0.017	0.002	0.005	0.005	7.1	35.5	0.001	0.0001
Benzo(g,h,i)perylene	0.060	0.150	0.009	0.006	0.000	0.005	0.002	7.1	35.5	0.0003	0.0001
Benzo(k)fluoranthene	0.124	0.210	0.026	0.011	0.001	0.005	0.005	7.1	35.5	0.001	0.0001
Chrysene	0.155	0.440	0.068	0.029	0.004	0.005	0.011	7.1	35.5	0.001	0.0003
Dibenz(a,h)anthracene	28.200	0.490	13.818	0.007	0.191	0.005	1.995	7.1	35.5	0.28	0.06
Fluoranthene	0.187	0.370	0.069	0.062	0.012	0.005	0.011	7.1	35.5	0.002	0.0003
Fluorene	28.200	0.200	5.640	0.179	5.048	0.005	0.920	7.1	35.5	0.13	0.03
Hexachlorobenzene	28.200	1.690	47.658	0.037	1.036	0.005	6.441	0.113	0.565	57.00	11.40
Hexachlorobutadiene	28.200	1.000	28.200	0.071	1.989	0.005	3.885	3.39	16.95	1.15	0.23
Hexachlorocyclopentadiene	28.200	1.000	28.200	0.047	1.316	0.005	3.885	NA	NA	--	--
Hexachloroethane	28.200	1.000	28.200	0.240	6.765	0.005	3.885	NA	NA	--	--
Indeno(1,2,3-cd)pyrene	0.085	0.410	0.035	0.006	0.001	0.005	0.006	7.1	35.5	0.001	0.0002
Pentachlorophenol	84.500	8.000	676.000	0.049	4.160	0.021	89.357	4.26	8.52	21.0	10.5
Phenanthrene	0.144	0.280	0.040	0.115	0.017	0.005	0.007	7.1	35.5	0.001	0.0002
Pyrene	1.900	0.390	0.741	0.069	0.130	0.005	0.110	7.1	35.5	0.02	0.003
Volatile Organics											
1,1,2,2-Tetrachloroethane	0.948	1.000	0.948	1.790	1.697	0.0	0.131	NA	NA	--	--

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.013083869 = Food ingestion rate (kg/day dry weight, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis, from Table 7-8)
PDFi = 0.954 = Proportion of diet composed of food item (soil invertebrates, dry weight basis, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis, from Table 7-8)
PDFi = 0 = Proportion of diet composed of food item (terrestrial plants, dry weight basis, from Table 7-8)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.046 = Proportion of diet composed of soil (dry weight basis, from Table 7-8)
WIR = 0.012698351 = Water ingestion rate (L/day, from Table 7-8)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.095 = Body weight (kg wet weight, from Table 7-8)

TABLE J-3a

Summary of Pearly-eyed Thrasher Exposure Doses - Step 3a

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Worm BAF	Terrestrial Invertebrate Concentration (mg/kg dw)	Soil-Plant BAF	Terrestrial Plant Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics											
Arsenic	4.880	0.258	1.259	0.037	0.181	0.027	0.163	2.46	7.38	0.07	0.02
Cadmium	0.057	7.660	0.438	0.514	0.029	0.005	0.045	1.45	20	0.03	0.00
Chromium	17.100	0.320	5.474	0.048	0.813	0.008	0.671	1	5	0.67	0.13
Copper	31.800	0.468	14.887	0.123	3.914	0.012	1.778	47	61.7	0.04	0.03
Lead	26.400	0.307	8.104	0.038	0.995	0.018	0.994	3.85	19.25	0.26	0.05
Mercury	0.032	1.186	0.038	0.344	0.011	0.00003	0.004	0.49	1.2	0.01	0.004
Nickel	7.960	1.656	13.182	0.034	0.272	0.010	1.367	77.4	107	0.02	0.01
Selenium	0.507	0.982	0.498	0.567	0.288	0.032	0.064	0.44	1.5	0.15	0.04
Zinc	96.400	2.482	239.249	0.358	34.484	0.004	25.281	14.5	131	1.74	0.19
Pesticides/PCBs											
4,4'-DDE	0.234	10.60	2.480	0.0048	0.001	0.000	0.248	0.5	5	0.50	0.05

$$DI = \frac{[AFF[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.01265848 = Food ingestion rate (kg/day dry weight, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (soil invertebrates, dry weight basis, from Table 7-18)
PDFi = 0.754 = Proportion of diet composed of food item (soil invertebrates, dry weight basis, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (terrestrial plants, dry weight basis, from Table 7-18)
PDFi = 0.2 = Proportion of diet composed of food item (terrestrial plants, dry weight basis, from Table 7-18)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0.046 = Proportion of diet composed of soil (dry weight basis, from Table 7-18)
WIR = 0.01227365 = Water ingestion rate (L/day, from Table 7-18)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.096 = Body weight (kg wet weight, from Table 7-18)
AFF = 1 = Area foraging factor (Site Size/Home Range; Max. is 1.0; from Table 7-18)

TABLE J-4
Summary of Green Heron Exposure Doses - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment Concentration (mg/kg)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics									
Arsenic	0.882	0.126	0.111	0.047	0.039	5.14	12.84	0.01	0.003
Cadmium	0.012	0.164	0.002	0.008	0.00168	1.45	20	0.001	0.0001
Chromium	13.400	0.038	0.509	0.016	0.150	1	5	0.15	0.03
Copper	9.760	0.100	0.976	0.023	0.286	47	61.7	0.01	0.005
Lead	1.490	0.070	0.104	0.035	0.035	3.85	19.25	0.01	0.002
Mercury	0.013	4.580	0.058	0.000	0.017	0.026	0.078	0.65	0.22
Nickel	4.390	1.000	4.390	0.020	1.276	77.4	107	0.02	0.01
Selenium	0.190	1.000	0.190	0.064	0.064	1.8	9	0.04	0.01
Silver	0.027	1.000	0.027	0.009	0.009	35.6	178	0.0003	0.0001
Zinc	13.600	0.147	1.999	0.008	0.581	14.5	131	0.04	0.004
Pesticides/PCBs									
4,4'-DDD	0.005	2.250	0.010	0.000020	0.003	0.3	3	0.01	0.001
4,4'-DDE	0.000	26.200	0.003	0.000020	0.001	0.3	3	0.003	0.0003
4,4'-DDT	0.005	8.800	0.040	0.000020	0.011	0.3	3	0.04	0.004
Aldrin	0.002	1.000	0.002	0.000010	0.001	0.155	0.775	0.004	0.001
alpha-BHC	0.002	1.000	0.002	0.000010	0.001	0.56	2.25	0.001	0.0003
alpha-Chlordane	0.002	1.000	0.002	0.000010	0.001	0.8	4	0.001	0.0002
beta-BHC	0.002	1.000	0.002	0.000010	0.001	0.56	2.25	0.001	0.0003
delta-BHC	0.002	1.000	0.002	0.000010	0.001	0.56	2.25	0.001	0.0003
Dieldrin	0.005	1.000	0.005	0.000020	0.001	0.077	0.385	0.02	0.003
Endosulfan I	0.002	1.000	0.002	0.000010	0.001	10	50	0.0001	0.00001
Endosulfan II	0.005	1.000	0.005	0.000020	0.001	10	50	0.0001	0.00003
Endrin	0.005	1.000	0.005	0.000020	0.001	0.3	1.5	0.004	0.001
gamma-BHC (Lindane)	0.002	6.200	0.014	0.000010	0.004	4	20	0.001	0.0002
gamma-Chlordane	0.002	1.000	0.002	0.000010	0.001	0.8	4	0.001	0.0002
Heptachlor	0.002	1.000	0.002	0.000010	0.001	0.48	2.4	0.001	0.0003
Heptachlor epoxide	0.002	1.000	0.002	0.000010	0.001	0.48	2.4	0.001	0.0003
Methoxychlor	0.023	1.000	0.023	0.000100	0.007	355	1775	0.00002	0.0000
Toxaphene	0.230	1.000	0.230	0.000051	0.067	1	5	0.07	0.01
Semivolatile Organics									
4-Bromophenyl-phenylether	0.445	1.000	0.445	0.0001	0.129	NA	NA	--	--
4-Chlorophenyl-phenylether	0.445	1.000	0.445	0.0001	0.129	NA	NA	--	--
Acenaphthene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Acenaphthylene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Anthracene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004

TABLE J-4

Summary of Green Heron Exposure Doses - Step 2

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment Concentration (mg/kg)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Benzo(a)anthracene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Benzo(a)pyrene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Benzo(b)fluoranthene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Benzo(g,h,i)perylene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Benzo(k)fluoranthene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Chrysene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Dibenz(a,h)anthracene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Fluoranthene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Fluorene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Hexachlorobenzene	0.445	0.940	0.418	0.0051	0.122	0.113	0.565	1.08	0.22
Hexachlorobutadiene	0.000	0.384	0.000	0.0051	0.001	3.39	16.95	0.0002	0.00004
Hexachlorocyclopentadiene	0.445	1.000	0.445	0.0051	0.130	NA	NA	--	--
Hexachloroethane	0.000	1.000	0.000	0.0051	0.001	NA	NA	--	--
Indeno(1,2,3-cd)pyrene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Pentachlorophenol	1.330	1.000	1.330	0.0205	0.389	4.26	8.52	0.09	0.05
Phenanthrene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004
Pyrene	0.445	1.000	0.445	0.0051	0.130	7.1	35.5	0.02	0.004

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.045817191 = Food ingestion rate (kg/day dry weight, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis, from Table 7-8)
PDFi = 1.000 = Proportion of diet composed of food item (fish, dry weight basis, from Table 7-8)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0 = Proportion of diet composed of sediment (dry weight basis, from Table 7-8)
WIR = 0.022740679 = Water ingestion rate (L/day, from Table 7-8)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.158 = Body weight (kg wet weight, from Table 7-8)

TABLE J-4a

Summary of Green Heron Exposure Doses - Step 3a

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment Concentration (mg/kg)	Sediment-Benthic Invertebrate BAF	Benthic Invertebrate Concentration (mg/kg dw)	Sediment-Fish BAF	Fish Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics											
Chromium	7.100	0.083	0.589	0.038	0.270	0.008	0.070	1	5	0.07	0.01
Copper	8.110	0.919	7.457	0.100	0.811	0.012	0.524	47	61.7	0.01	0.01
Zinc	11.200	0.954	10.686	0.147	1.646	0.004	0.815	14.5	131	0.06	0.01

$$DI = \frac{[AFF[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.040479994 = Food ingestion rate (kg/day dry weight, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (fish, dry weight basis, from Table 7-18)
PDFi = 0.710 = Proportion of diet composed of food item (fish, dry weight basis, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (benthic invertebrates, dry weight basis, from Table 7-18)
PDFi = 0.290 = Proportion of diet composed of food item (benthic invertebrates, dry weight basis, from Table 7-18)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0 = Proportion of diet composed of sediment (dry weight basis, from Table 7-18)
WIR = 0.020868779 = Water ingestion rate (L/day, from Table 7-18)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.212 = Body weight (kg wet weight, from Table 7-18)
AFF = 1 = Area foraging factor (Site Size/Home Range; Max. is 1.0; from Table 7-18)

TABLE J-5

Summary of Red-tailed Hawk Doses - Step 2

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics									
Arsenic	67.00	0.071	4.757	0.047	0.200	2.46	7.38	0.08	0.03
Cadmium	0.291	1.705	0.496	0.008	0.021	1.45	20	0.01	0.001
Chromium	50.00	0.800	40.000	0.016	1.653	1	5	1.65	0.33
Copper	100.0	0.867	86.700	0.023	3.582	47	61.7	0.08	0.06
Lead	63.00	0.995	62.685	0.035	2.591	3.85	19.25	0.67	0.13
Mercury	0.063	0.192	0.012	0.000	0.000	0.49	1.2	0.001	0.0004
Nickel	26.00	0.800	20.800	0.020	0.860	77.4	107	0.01	0.01
Selenium	1.400	1.754	2.456	0.064	0.106	0.44	1.5	0.24	0.07
Silver	0.170	0.810	0.138	0.009	0.006	7	35	0.001	0.00
Zinc	260.0	5.850	1521.000	0.008	62.811	14.5	131	4.33	0.48
Pesticides/PCBs									
4,4'-DDD	0.010	see footnote	0.003	0.000020	0.00014	0.08	0.4	0.002	0.0004
4,4'-DDE	3.990	see footnote	7.031	0.000020	0.29034	0.08	0.4	3.63	0.73
4,4'-DDT	1.940	see footnote	0.245	0.000020	0.01012	0.08	0.4	0.13	0.03
Aldrin	0.002	see footnote	0.001	0.000010	0.00005	0.0701	0.3505	0.001	0.0001
alpha-BHC	0.002	see footnote	0.000	0.000010	0.00002	0.56	2.25	0.00004	0.00001
alpha-Chlordane	0.002	see footnote	0.001	0.000010	0.00006	2.14	10.7	0.00003	0.00001
Aroclor-1016	0.039	see footnote	0.103	0.0	0.00425	0.41	2.05	0.01	0.002
Aroclor-1221	0.079	see footnote	0.209	0.0	0.00864	0.41	2.05	0.02	0.004
Aroclor-1232	0.039	see footnote	0.103	0.0	0.00426	0.41	2.05	0.01	0.002
Aroclor-1242	0.039	see footnote	0.103	0.0	0.00425	0.41	2.05	0.01	0.002
Aroclor-1248	0.039	see footnote	0.103	0.0	0.00425	0.41	2.05	0.01	0.002
Aroclor-1254	0.039	see footnote	0.103	0.0	0.00425	0.41	2.05	0.01	0.002
Aroclor-1260	0.039	see footnote	0.103	0.0	0.00425	0.41	2.05	0.01	0.002
beta-BHC	0.002	see footnote	0.000	0.000010	0.00002	0.56	2.25	0.00004	0.00001
delta-BHC	0.002	see footnote	0.000	0.000010	0.00002	0.56	2.25	0.00003	0.00001
Dieldrin	0.004	see footnote	0.006	0.000020	0.00024	0.077	0.385	0.003	0.001
Endosulfan I	0.002	see footnote	0.000	0.000010	0.00002	10	50	0.000002	0.0000004
Endosulfan II	0.004	see footnote	0.001	0.000020	0.00004	10	50	0.000004	0.000001
Endrin	0.004	see footnote	0.003	0.000020	0.00013	0.02	0.1	0.01	0.001
gamma-BHC (Lindane)	0.002	see footnote	0.000	0.000010	0.00002	4	20	0.00001	0.000001
gamma-Chlordane	0.002	see footnote	0.001	0.000010	0.00006	2.14	10.7	0.00003	0.00001
Heptachlor	0.002	see footnote	0.001	0.000010	0.00005	0.2753	1.3765	0.0002	0.00003
Heptachlor epoxide	0.002	see footnote	0.003	0.000010	0.00013	0.2753	1.3765	0.0005	0.0001
Methoxychlor	0.001	see footnote	0.000	0.000100	0.00002	355	1775	0.00000005	0.00000001
Toxaphene	0.210	see footnote	0.040	0.000051	0.00167	1	5	0.002	0.0003
Semivolatile Organics									
1,2,4-Trichlorobenzene	28.200	see footnote	3.819	0.0	0.158	32.16	160.8	0.005	0.001
1,2-Dichlorobenzene	28.200	see footnote	7.402	0.0	0.306	32.16	160.8	0.01	0.002
1,3-Dichlorobenzene	28.200	see footnote	6.562	0.0	0.271	32.16	160.8	0.01	0.002

TABLE J-5
Summary of Red-tailed Hawk Doses - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
1,4-Dichlorobenzene	28.200	see footnote	7.206	0.0	0.298	32.16	160.8	0.01	0.002
4-Bromophenyl-phenylether	0.267	see footnote	0.012	0.0	0.000	NA	NA	--	--
4-Chlorophenyl-phenylether	28.200	see footnote	1.777	0.0	0.073	NA	NA	--	--
Acenaphthene	28.200	see footnote	2.788	0.005	0.116	7.1	35.5	0.02	0.003
Acenaphthylene	28.200	see footnote	1.991	0.005	0.083	7.1	35.5	0.01	0.002
Anthracene	28.200	see footnote	2.177	0.005	0.090	7.1	35.5	0.01	0.003
Benzo(a)anthracene	0.112	see footnote	0.011	0.005	0.001	7.1	35.5	0.0001	0.00002
Benzo(a)pyrene	0.120	see footnote	0.013	0.005	0.001	7.1	35.5	0.0001	0.00003
Benzo(b)fluoranthene	0.133	see footnote	0.011	0.005	0.001	7.1	35.5	0.0001	0.00002
Benzo(g,h,i)perylene	0.060	see footnote	0.007	0.005	0.001	7.1	35.5	0.0001	0.00002
Benzo(k)fluoranthene	0.124	see footnote	0.011	0.005	0.001	7.1	35.5	0.0001	0.00002
Chrysene	0.155	see footnote	0.018	0.005	0.001	7.1	35.5	0.0002	0.00003
Dibenz(a,h)anthracene	28.200	see footnote	2.511	0.005	0.104	7.1	35.5	0.01	0.003
Fluoranthene	0.187	see footnote	0.020	0.005	0.001	7.1	35.5	0.0002	0.00003
Fluorene	28.200	see footnote	1.962	0.005	0.081	7.1	35.5	0.01	0.002
Hexachlorobenzene	28.200	see footnote	8.243	0.005	0.341	0.113	0.565	3.02	0.60
Hexachlorobutadiene	28.200	see footnote	5.184	0.005	0.214	3.39	16.95	0.06	0.01
Hexachlorocyclopentadiene	28.200	see footnote	5.073	0.005	0.210	NA	NA	--	--
Hexachloroethane	28.200	see footnote	5.974	0.005	0.247	NA	NA	--	--
Indeno(1,2,3-cd)pyrene	0.085	see footnote	0.012	0.005	0.001	7.1	35.5	0.0001	0.00002
Pentachlorophenol	84.500	see footnote	112.995	0.021	4.668	4.26	8.52	1.10	0.55
Phenanthrene	0.144	see footnote	0.016	0.005	0.001	7.1	35.5	0.0001	0.00003
Pyrene	1.900	see footnote	0.162	0.005	0.007	7.1	35.5	0.001	0.0002
Volatile Organics									
1,1,2,2-Tetrachloroethane	0.948	see footnote	0.443	0.0	0.018	NA	NA	--	--

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF (wet-weight basis) of 1.0 was assumed.

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.03952 = Food ingestion rate (kg/day dry weight, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis, from Table 7-8)
PDFi = 1.000 = Proportion of diet composed of food item (small mammals, dry weight basis, from Table 7-8)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0 = Proportion of diet composed of soil (dry weight basis, from Table 7-8)
WIR = 0.067962426 = Water ingestion rate (L/day, from Table 7-8)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.957 = Body weight (kg wet weight, from Table 7-8)

TABLE J-5a

Summary of Red-tailed Hawk Doses - Step 3a

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Surface Soil Concentration (mg/kg)	Soil-Mammal BAF	Small Mammal Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics									
Arsenic	4.880	0.003	0.016	0.027	0.000004	2.46	7.38	0.000001	0.0000005
Cadmium	0.057	0.144	0.008	0.005	0.000001	1.45	20	0.000001	0.00000004
Chromium	17.100	0.092	1.574	0.008	0.000087	1	5	0.00009	0.00002
Copper	31.800	0.111	3.520	0.012	0.000195	47	61.7	0.000004	0.000003
Lead	26.400	0.055	1.448	0.018	0.000081	3.85	19.25	0.00002	0.000004
Mercury	0.032	0.054	0.002	0.00003	0.0000001	0.49	1.2	0.0000002	0.0000001
Nickel	7.960	0.168	1.340	0.010	0.000075	77.4	107	0.000001	0.000001
Selenium	0.507	0.258	0.131	0.032	0.000010	0.44	1.5	0.00002	0.00001
Zinc	96.400	0.509	49.090	0.004	0.002697	14.5	131	0.0002	0.00002
Pesticides/PCBs									
4,4'-DDE	0.234	see footnote	0.171	0.00001	0.000009	0.08	0.4	0.0001	0.00002

It was assumed that the concentration of each chemical in the small mammal's tissues was equal to the chemical concentration in its diet, that is, a diet to whole-body BAF (wet-weight basis) of 1.0 was assumed.

$$DI = \frac{[AFF[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.036032 = Food ingestion rate (kg/day dry weight, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (small mammals, dry weight basis, from Table 7-18)
PDFi = 1.000 = Proportion of diet composed of food item (small mammals, dry weight basis, from Table 7-18)
SCx = Chemical-specific = Concentration of chemical in soil (mg/kg, dry weight)
PDS = 0 = Proportion of diet composed of soil (dry weight basis, from Table 7-18)
WIR = 0.063882622 = Water ingestion rate (L/day, from Table 7-18)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 1.126 = Body weight (kg wet weight, from Table 7-18)
AFF = 0.001716738 = Area foraging factor (Site Size/Home Range; Max. is 1.0; from Table 7-18)

TABLE J-6
Summary of Spotted Sandpiper Doses - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment Concentration (mg/kg)	Sediment-Benthic Invertebrate BAF	Benthic Invertebrate Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics									
Arsenic	0.882	4.330	3.819	0.047	1.055	5.14	12.84	0.21	0.08
Cadmium	0.012	4.878	0.059	0.008	0.018	1.45	20	0.01	0.001
Chromium	13.400	0.190	2.546	0.016	1.429	1	5	1.43	0.29
Copper	9.760	23.870	232.971	0.023	61.003	47	61.7	1.30	0.99
Lead	1.490	0.503	0.749	0.035	0.290	3.85	19.25	0.08	0.02
Mercury	0.013	3.981	0.051	0.000	0.014	0.026	0.078	0.53	0.18
Nickel	4.390	0.237	1.040	0.020	0.526	77.4	107	0.01	0.005
Selenium	0.190	1.000	0.190	0.064	0.080	0.4	0.8	0.20	0.10
Silver	0.027	0.180	0.005	0.009	0.006	35.6	178	0.0002	0.00003
Zinc	13.600	8.479	115.314	0.008	30.693	14.5	131	2.11676697	0.23
Pesticides/PCBs									
4,4'-DDD	0.005	0.350	0.002	0.00002	0.0007	0.12	0.6	0.01	0.001
4,4'-DDE	0.000	3.360	0.000	0.00002	0.0001	0.12	0.6	0.001	0.0002
4,4'-DDT	0.005	2.280	0.010	0.00002	0.0029	0.6	1.5	0.005	0.002
Aldrin	0.002	1.000	0.002	0.00001	0.0007	0.155	0.775	0.005	0.001
alpha-BHC	0.002	1.000	0.002	0.00001	0.0007	0.56	2.25	0.001	0.0003
alpha-Chlordane	0.002	1.000	0.002	0.00001	0.0007	0.8	4	0.001	0.0002
beta-BHC	0.002	1.000	0.002	0.00001	0.0007	0.56	2.25	0.001	0.0003
delta-BHC	0.002	1.000	0.002	0.00001	0.0007	0.56	2.25	0.001	0.0003
Dieldrin	0.005	4.520	0.020	0.00002	0.0055	0.077	0.385	0.07	0.01
Endosulfan I	0.002	1.000	0.002	0.00001	0.0007	10	50	0.0001	0.00001
Endosulfan II	0.005	1.000	0.005	0.00002	0.0014	10	50	0.0001	0.00003
Endrin	0.005	1.000	0.005	0.00002	0.0014	0.3	1.5	0.005	0.001
gamma-BHC (Lindane)	0.002	1.000	0.002	0.00001	0.0007	4	20	0.0002	0.00004
gamma-Chlordane	0.002	1.000	0.002	0.00001	0.0007	0.8	4	0.001	0.0002
Heptachlor	0.002	1.000	0.002	0.00001	0.0007	0.48	2.4	0.002	0.0003
Heptachlor epoxide	0.002	1.000	0.002	0.00001	0.0007	0.48	2.4	0.002	0.0003
Methoxychlor	0.023	1.000	0.023	0.00010	0.0073	355	1775	0.00002	0.000004
Toxaphene	0.230	1.000	0.230	0.00005	0.0728	1	5	0.07	0.01
Semivolatile Organics									
4-Bromophenyl-phenylether	0.445	1.000	0.445	0.0001	0.141	NA	NA	--	--
4-Chlorophenyl-phenylether	0.445	1.000	0.445	0.0001	0.141	NA	NA	--	--
Acenaphthene	0.445	2.040	0.908	0.0051	0.262	7.1	35.5	0.04	0.01

TABLE J-6
Summary of Spotted Sandpiper Doses - Step 2
AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment Concentration (mg/kg)	Sediment-Benthic Invertebrate BAF	Benthic Invertebrate Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Acenaphthylene	0.445	2.040	0.908	0.0051	0.262	7.1	35.5	0.04	0.01
Anthracene	0.445	0.271	0.121	0.0051	0.058	7.1	35.5	0.01	0.002
Benzo(a)anthracene	0.445	1.400	0.623	0.0051	0.189	7.1	35.5	0.03	0.005
Benzo(a)pyrene	0.445	0.191	0.085	0.0051	0.049	7.1	35.5	0.01	0.001
Benzo(b)fluoranthene	0.445	0.160	0.071	0.0051	0.045	7.1	35.5	0.01	0.001
Benzo(g,h,i)perylene	0.445	0.295	0.131	0.0051	0.061	7.1	35.5	0.01	0.002
Benzo(k)fluoranthene	0.445	0.421	0.187	0.0051	0.075	7.1	35.5	0.01	0.002
Chrysene	0.445	0.335	0.149	0.0051	0.066	7.1	35.5	0.01	0.002
Dibenz(a,h)anthracene	0.445	0.271	0.121	0.0051	0.058	7.1	35.5	0.01	0.002
Fluoranthene	0.445	0.312	0.139	0.0051	0.063	7.1	35.5	0.01	0.002
Fluorene	0.445	1.130	0.503	0.0051	0.157	7.1	35.5	0.02	0.004
Hexachlorobenzene	0.445	0.860	0.383	0.0051	0.126	0.113	0.565	1.12	0.22
Hexachlorobutadiene	0.000	0.610	0.000	0.0051	0.002	3.39	16.95	0.0005	0.0001
Hexachlorocyclopentadiene	0.445	1.000	0.445	0.0051	0.142	NA	NA	--	--
Hexachloroethane	0.000	1.000	0.000	0.0051	0.002	NA	NA	--	--
Indeno(1,2,3-cd)pyrene	0.445	0.355	0.158	0.0051	0.068	7.1	35.5	0.01	0.002
Pentachlorophenol	1.330	1.000	1.330	0.0205	0.427	4.26	8.52	0.10	0.05
Phenanthrene	0.445	0.652	0.290	0.0051	0.102	7.1	35.5	0.01	0.003
Pyrene	0.445	0.803	0.357	0.0051	0.120	7.1	35.5	0.02	0.003

$$DI_x = \frac{[[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)] + [(WIR)(WC_x)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.009301553 = Food ingestion rate (kg/day dry weight, from Table 7-8)
FCxi = Chemical-specific = Concentration of chemical in food item (benthic invertebrates, dry weight basis, from
PDFi = 0.820 = Proportion of diet composed of food item (benthic invertebrates, dry weight basis, frc
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.18 = Proportion of diet composed of sediment (dry weight basis, from Table 7-8)
WIR = 0.00893803 = Water ingestion rate (L/day, from Table 7-8)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0294 = Body weight (kg wet weight, from Table 7-8)

TABLE J-6a

Summary of Spotted Sandpiper Doses - Step 3a

AOC H, Former NASD, Vieques, Puerto Rico

Chemical	Sediment Concentration (mg/kg)	Sediment-Benthic Invertebrate BAF	Benthic Invertebrate Concentration (mg/kg dw)	Surface Water Concentration (mg/L)	Dietary Intake (mg/kg/day)	NOAEL TRV (mg/kg/d)	LOAEL TRV (mg/kg/d)	NOAEL HQ	LOAEL HQ
Inorganics									
Chromium	7.100	0.083	0.589	0.008	0.316	1	5	0.32	0.06
Copper	8.110	0.919	7.457	0.012	1.353	47	61.7	0.03	0.02
Zinc	11.200	0.954	10.686	0.004	1.923	14.5	131	0.13	0.01

$$DI = \frac{[AFF[\sum_i (FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]]}{BW}$$

DI = Chemical-specific = Dietary intake for chemical (mg chemical/kg body weight/day)
FIR = 0.007205718 = Food ingestion rate (kg/day dry weight, from Table 7-18)
FCxi = Chemical-specific = Concentration of chemical in food item (benthic invertebrates, dry weight basis, from Table 7-18)
PDFi = 0.820 = Proportion of diet composed of food item (benthic invertebrates, dry weight basis, from Table 7-18)
SCx = Chemical-specific = Concentration of chemical in sediment (mg/kg, dry weight)
PDS = 0.18 = Proportion of diet composed of sediment (dry weight basis, from Table 7-18)
WIR = 0.006872702 = Water ingestion rate (L/day, from Table 7-18)
WC = Chemical-specific = Concentration of chemical in water (mg/L)
BW = 0.0404 = Body weight (kg wet weight, from Table 7-18)
AFF = 1 = Area foraging factor (Site Size/Home Range; Max. is 1.0; from Table 7-18)

APPENDIX K

HHRA Supporting Data

Table K-1

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
AOC H Soil (0-6 ft)	75-35-4	1,1-Dichloroethene	0.00045 J	0.00078 J	MG/KG	AOCHSB009	6 / 38	.01 - .948	0.00078	NA	1.24E+01 NC	3.00E-02	SSL	No	BSL
	107-06-2	1,2-Dichloroethane	0.002 J	0.002 J	MG/KG	AOCHSB015	1 / 38	.01 - .948	0.002	NA	6.03E-01 CA*	1.00E-02	SSL	No	BSL
	108-38-3/106-42-3	m- and p-Xylene	0.058 J	0.058 J	MG/KG	AOCHSS001	1 / 38	.01 - .948	0.058	NA	2.75E+01 NC	1.00E+02	SSL	No	BSL
	75-09-2	Methylene chloride	0.00058 J	0.00058 J	MG/KG	AOCHSB006	1 / 38	.01 - .948	0.00058	NA	2.05E+01 CA	1.00E-02	SSL	No	BSL
	95-47-6	o-Xylene	0.024 J	0.024 J	MG/KG	AOCHSS001	1 / 38	.01 - .948	0.024	NA	2.75E+01 NC	1.00E+02	SSL	No	BSL
	127-18-4	Tetrachloroethene	0.00031 J	0.0016 J	MG/KG	AOCHSB003	2 / 38	.01 - .948	0.0016	NA	3.42E+00 CA*	3.00E-02	SSL	No	BSL
	108-88-3	Toluene	0.0004 J	0.0004 J	MG/KG	AOCHSB011	1 / 38	.01 - .948	0.0004	NA	5.20E+02 SAT	6.00E+00	SSL	No	BSL
	79-01-6	Trichloroethene	0.00034 J	0.00034 J	MG/KG	AOCHSB011	1 / 38	.01 - .948	0.00034	NA	1.15E-01 CA	3.00E-02	SSL	No	BSL
	1330-20-7	Xylene, total	0.082 J	0.082 J	MG/KG	AOCHSS001	1 / 38	.01 - .948	0.082	NA	2.75E+01 NC	1.00E+02	SSL	No	BSL
	606-20-2	2,6-Dinitrotoluene	1.21	1.23	MG/KG	AOCHSB013	2 / 64	.127 - 28.2	1.23	NA	6.11E+00 NC	3.00E-04	SSL	No	BSL
	91-57-6	2-Methylnaphthalene	0.028 J	0.19 J	MG/KG	AOCHSB009	6 / 64	.338 - 28.2	0.19	NA	6.99E+01 NC	NA	NA	No	BSL
	99-09-2	3-Nitroaniline	0.048 J	0.048 J	MG/KG	AOCHSB013	1 / 64	1.01 - 84.5	0.048	NA	1.75E-01 NC	NA	NA	No	BSL
	101-55-3	4-Bromophenyl-phenylether	0.217 J	0.267 J	MG/KG	AOCHSB013	3 / 64	.338 - 28.2	0.267	NA	NA	NA	NA	No	NTX
	56-55-3	Benzo(a)anthracene	0.029 J	0.112 J	MG/KG	AOCHSB004	10 / 64	.338 - 28.2	0.112	NA	6.21E-01 CA	8.00E-01	SSL	No	BSL
	50-32-8	Benzo(a)pyrene	0.0257 J	0.12 J	MG/KG	AOCHSB004	15 / 64	.338 - 28.2	0.12	NA	6.21E-02 CA	4.00E+00	SSL	Yes	ASL
	205-99-2	Benzo(b)fluoranthene	0.0187 J	0.133 J	MG/KG	AOCHSB004	19 / 64	.338 - 28.2	0.133	NA	6.21E-01 CA	2.00E+00	SSL	No	BSL
	191-24-2	Benzo(g,h,i)perylene	0.0217 J	0.06 J	MG/KG	AOCHSS002	10 / 64	.338 - 28.2	0.06	NA	2.32E+02 NC	2.10E+03	SSL	No	BSL
	207-08-9	Benzo(k)fluoranthene	0.0196 J	0.124 J	MG/KG	AOCHSB004	16 / 64	.338 - 28.2	0.124	NA	6.21E+00 CA	2.00E+01	SSL	No	BSL
	117-81-7	bis(2-Ethylhexyl)phthalate	0.0729 J	0.117 J	MG/KG	NDAHSS24	8 / 64	.338 - 28.2	0.117	NA	3.47E+01 CA*	0.00E+00	SSL	No	BSL
	218-01-9	Chrysene	0.0225 J	0.155 J	MG/KG	AOCHSB004	18 / 64	.338 - 28.2	0.155	NA	6.21E+01 CA	8.00E+01	SSL	No	BSL
	132-64-9	Dibenzofuran	0.0294 J	0.051 J	MG/KG	AOCHSB008	3 / 64	.338 - 28.2	0.051	NA	2.91E+01 NC	NA	NA	No	BSL
	206-44-0	Fluoranthene	0.0246 J	0.187 J	MG/KG	AOCHSB004	16 / 64	.338 - 28.2	0.187	NA	2.29E+02 NC	2.10E+03	SSL	No	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	0.026 J	0.0848 J	MG/KG	NDAHSS24	8 / 64	.338 - 28.2	0.0848	NA	6.21E-01 CA	7.00E+00	SSL	No	BSL
	78-59-1	Isophorone	0.106 J	0.112 J	MG/KG	AOCHSB012	2 / 64	.338 - 28.2	0.112	NA	5.12E+02 CA*	3.00E-01	SSL	No	BSL
	91-20-3	Naphthalene	0.0424 J	0.09 J	MG/KG	AOCHSB008	3 / 64	.338 - 28.2	0.09	NA	5.59E+00 NC	4.00E+01	SSL	No	BSL
	621-64-7	n-Nitroso-di-n-propylamine	0.562 J	0.717	MG/KG	AOCHSB013	3 / 64	.338 - 28.2	0.717	NA	6.95E-02 CA	2.00E-05	SSL	Yes	ASL
	85-01-8	Phenanthrene	0.0211 J	0.144 J	MG/KG	AOCHSB008	8 / 64	.338 - 28.2	0.144	NA	2.32E+02 NC	2.10E+03	SSL	No	BSL
	129-00-0	Pyrene	0.0282 J	1.9 J	MG/KG	AOCHSS001	17 / 64	.338 - 28.2	1.9	NA	2.32E+02 NC	2.10E+03	SSL	No	BSL
	72-54-8	4,4'-DDD	0.00019 J	0.013	MG/KG	AOCHSB012	17 / 64	.0034 - 1.77	0.013	NA	2.44E+00 CA	8.00E+00	SSL	No	BSL
	72-55-9	4,4'-DDE	0.00014 J	3.99 J	MG/KG	AOCHSB001	39 / 64	.0034 - 1.77	3.99	NA	1.72E+00 CA	3.00E+01	SSL	Yes	ASL
	50-29-3	4,4'-DDT	0.00048 J	1.94 J	MG/KG	AOCHSB001	27 / 64	.0034 - 1.77	1.94	NA	1.72E+00 CA*	2.00E+01	SSL	Yes	ASL
	72-43-5	Methoxychlor	0.00074 J	0.00074 J	MG/KG	NDAHSS19	1 / 64	.017 - 9.12	0.00074	NA	3.06E+01 NC	8.00E+01	SSL	No	BSL
	7429-90-5	Aluminum	2,110	11,000	MG/KG	AOCHSB006, AOCHSS001 AOCHSB009	64 / 64	31.9 - 48	11,000	NA	7.61E+03 NC	NA	NA	Yes	ASL
	7440-36-0	Antimony	0.14 J	6.30 J	MG/KG	AOCHSS003	42 / 64	9.56 - 14	6.30	NA	3.13E+00 NC	3.00E+00	SSL	Yes	ASL
	7440-38-2	Arsenic	0.161 J	67.0	MG/KG	AOCHSB010	54 / 64	1.59 - 2.4	67.0	NA	3.90E-01 CA*	NA	NA	Yes	ASL
	7440-39-3	Barium	20.0 J	290.0 J	MG/KG	AOCHSB010	64 / 64	31.9 - 48	290.0	NA	5.37E+02 NC	8.20E+02	SSL	No	BSL
	7440-41-7	Beryllium	0.0479 J	0.480 J	MG/KG	AOCHSB009	47 / 64	.797 - 1.2	0.480	NA	1.54E+01 NC	3.00E+01	SSL	No	BSL
	7440-43-9	Cadmium	0.0367 J	0.291 J	MG/KG	NDAHSS26	16 / 64	.797 - 1.2	0.291	NA	3.70E+00 NC	4.00E+00	SSL	No	BSL
	7440-70-2	Calcium	1,070	34,000	MG/KG	AOCHSB008, AOCHSS004	64 / 64	797 - 1200	34,000	NA	NA	NA	NA	No	NUT
	7440-47-3	Chromium	3.28	50.0	MG/KG	AOCHSS001	64 / 64	1.59 - 2.4	50.0	NA	3.01E+01 CA**	2.00E+01	SSL	Yes	ASL
	7440-48-4	Cobalt	2.20 J	16.0	MG/KG	AOCHSB007	64 / 64	7.97 - 12	16.0	NA	9.03E+02 CA**	NA	NA	No	BSL
	7440-50-8	Copper	7.0	100.0	MG/KG	AOCHSB003	64 / 64	3.89 - 6	100.0	NA	3.13E+02 NC	NA	NA	No	BSL
	7439-89-6	Iron	6,660 J	39,000	MG/KG	AOCHSS003	64 / 64	15.9 - 24	39,000	NA	2.35E+03 NC	NA	NA	Yes	ASL
	7439-92-1	Lead	0.75	63.0	MG/KG	AOCHSB009	64 / 64	.478 - .72	63.0	NA	4.00E+02 NC	NA	NA	No	BSL
	7439-95-4	Magnesium	748 J	8,400	MG/KG	AOCHSB003	64 / 64	797 - 1200	8,400	NA	NA	NA	NA	No	NUT

Table K-1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	CAS Number	Chemical	Minimum [1] Concentration Qualifier	Maximum [1] Concentration Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration [2] Used for Screening	Background [3] Value	Screening [4] Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for [5] Contaminant Deletion or Selection
	7439-96-5	Manganese	80.4	1,000	MG/KG	AOCHSB007	64 / 64	2.39 - 6.01	1,000	NA	1.76E+02 NC	NA	NA	Yes	ASL
	7439-97-6	Mercury	0.00260 J	0.0719 J	MG/KG	NDAHSB18	56 / 64	.0234 - .04	0.0719	NA	2.35E+00 NC	NA	NA	No	BSL
	7440-02-0	Nickel	1.13 J	26.0	MG/KG	AOCHSS003	64 / 64	6.37 - 9.6	26.0	NA	1.56E+02 NC	7.00E+01	SSL	No	BSL
	7440-09-7	Potassium	440 J	3,400	MG/KG	AOCHSB003	64 / 64	797 - 1200	3,400	NA	NA	NA	NA	No	NUT
	7782-49-2	Selenium	0.199 J	1.40	MG/KG	AOCHSB005	47 / 64	.797 - 1.2	1.40	NA	3.91E+01 NC	3.00E+00	SSL	No	BSL
	7440-22-4	Silver	0.0242 J	0.170 J	MG/KG	AOCHSB007	16 / 64	1.59 - 2.4	0.170	NA	3.91E+01 NC	2.00E+01	SSL	No	BSL
	7440-23-5	Sodium	46.0 J	850.0 J	MG/KG	AOCHSB009	64 / 64	797 - 1200	850.0	NA	NA	NA	NA	No	NUT
	7440-28-0	Thallium	0.240 J	1.16 J	MG/KG	NDAHSS18	27 / 64	1.59 - 2.4	1.16	NA	5.16E-01 NC	NA	NA	Yes	ASL
	7440-62-2	Vanadium	19.0	79.0	MG/KG	AOCHSB009	64 / 64	7.97 - 12	79.0	NA	5.47E+01 NC	3.00E+03	SSL	Yes	ASL
	7440-66-6	Zinc	9.07 J	260.0	MG/KG	AOCHSS003	64 / 64	3.19 - 4.8	260.0	NA	2.35E+03 NC	6.20E+03	SSL	No	BSL

[1] Minimum/Maximum detected concentrations.
[2] Maximum concentration is used for screening.
[3] Background values not available.
[4] EPA Region 9 PRGs Table, October 1, 2002, U.S. EPA Region 9.
PRG value for xylenes used as surrogate for m,p-xylene and o-xylene.
PRG value for 2-methylnaphthalene calculated using provisional reference dose and methods described in Region 9 PRGs Table Users Guide/Technical Background Document, October 1, 2002, U.S. EPA Region 9.
PRG value for 2-nitroaniline used as surrogate for 3-nitroaniline.
PRG value for pyrene used as surrogate for benzo(g,h,i)perylene and phenanthrene.
PRG value for chromium VI used for total chromium.
PRG value for mercury chloride used as surrogate for mercury.
Lead screening toxicity value is 400 mg/kg, the EPA residential soil screening level for lead.
[5] Rationale Codes
Selection Reason: Above Screening Levels (ASL)
Deletion Reason: No Toxicity Information (NTX)
Essential Nutrient (NUT)
Below Screening Level (BSL)

SSL = Soil Screening Level; Dilution Attenuation Factor = 10 (USEPA, October 2002)
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/ To Be Considered
J = Estimated Value
CA = Carcinogenic
NC = Noncarcinogenic
CA* (where: NC < 100X CA)
CA**(where: NC < 10X CA)

Table K-2
REASONABLE MAXIMUM EXPOSURE
AOC H - Old Power Plant/Fire Training Area Site
NASD, Vieques Island, Puerto Rico

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
AOC H Soil (0-6 ft)									
	Benzo(a)pyrene	MG/KG	5.32E-01	1.99E+00 NP	1.20E-01 J	1.20E-01	MG/KG	Max	(6)
	n-Nitroso-di-n-propylamine	MG/KG	5.86E-01	1.60E+00 NP	7.17E-01 =	7.17E-01	MG/KG	Max	(6)
	4,4'-DDE	MG/KG	1.41E-01	8.98E-01 NP	3.99E+00 J	8.98E-01	MG/KG	99% Cheb-m	(5)
	4,4'-DDT	MG/KG	7.13E-02	3.06E-01 NP	1.94E+00 J	3.06E-01	MG/KG	97.5% Cheb-m	(5)
	Aluminum	MG/KG	6.41E+03	6.93E+03 N	1.10E+04 =	6.93E+03	MG/KG	95% Stud-t	(2)
	Antimony	MG/KG	5.22E-01	9.74E-01 NP	6.30E+00 J	9.74E-01	MG/KG	95% Cheb-m	(5)
	Arsenic	MG/KG	3.33E+00	3.81E+00 T	6.70E+01 =	3.81E+00	MG/KG	95% UCL-t	(1)
	Chromium	MG/KG	1.28E+01	1.46E+01 G	5.00E+01 =	1.46E+01	MG/KG	App. Gamma	(3,4)
	Iron	MG/KG	1.57E+04	1.68E+04 N	3.90E+04 =	1.68E+04	MG/KG	95% Stud-t	(2)
	Manganese	MG/KG	3.88E+02	4.88E+02 NP	1.00E+03 =	4.88E+02	MG/KG	95% Cheb-m	(5)
	Thallium	MG/KG	3.74E-01	5.15E-01 NP	1.16E+00 J	5.15E-01	MG/KG	95% Cheb-m	(5)
	Vanadium	MG/KG	4.24E+01	4.50E+01 N	7.90E+01 =	4.50E+01	MG/KG	95% Stud-t	(2)

For non-detects, 1/2 reporting limit (RL) was used as a proxy concentration.

ProUCL, Version 3.00.02 used to determine distribution of data using the Shapiro-Wilk W Test. ProUCL used to calculate RME EPC, following recommendations based on distribution and standard deviation in users guide (USEPA. April 2004. ProUCL, Version 3.0. Prepared by Lockheed Martin Environmental Services).

Statistics: Maximum Detected Value (Max); 95% UCL of Log-transformed Data, H-Statistic (95% UCL-T); 95% Chebyshev (MVUE) UCL (95% Cheb);
99% Chebyshev (MVUE) UCL (99% Cheb); 95% Chebyshev (mean,std) UCL (95% Cheb-m); 97.5% Chebyshev (mean,std) UCL (97.5% Cheb-m);
99% Chebyshev (mean,std) UCL (99% Cheb-m); 95% modified-t UCL adjusted for skewness (95% Mod-t); 95% Student's-T test UCL (95% Stud-t);
95% Hall's Bootstrap UCL (95% Hall); 95% Approximate Gamma (App. Gamma); 95% Adjusted Gamma (Adj. Gamma);
Mean of Log-transformed Data using the Minimum Variance Unbiased Estimate (MVUE) method (Mean-T)

(1) Shapiro-Wilk W Test indicates data are log-normally distributed.
(2) Shapiro-Wilk W Test indicates data are normally distributed.
(3) Anderson-Darling Test indicates data are gamma distributed.
(4) Kolmogorov-Smirnov Test indicates data are gamma distributed.
(5) Distribution tests are inconclusive (data are not normal, log-normal, or gamma-distributed).
(6) The maximum detected concentration was used as the UCL because the value recommended by ProUCL 3.0 was higher than the Max.

G = Gamma distribution.
N = Normal distribution.
T = Log-normal distribution.
NP = Non-Parametric distribution.

J = Estimated Value

Table K-3

Comparison of 0-2 Ft Soil Risk Estimates to 0-6 Ft Soil Risk Estimates for Residential Scenario

AOC H - Old Power Plant/Fire Training Area Site

NASD, Vieques Island, Puerto Rico

Child Resident - Soil Exposure Pathways

	Surface Soil - 0-2 Ft			Soil - 0-6 Ft		
COPC	**EPC (mg/kg)**	**ELCR**	**Screening HI**	**EPC (mg/kg)**	**ELCR**	**Screening HI**
Benzo(a)pyrene	1.12E-01	1.2E-07	NA	1.20E-01	1.3E-07	NA
n-Nitroso-di-n-propylamine	7.17E-01	7.0E-06	NA	7.17E-01	7.0E-06	NA
4,4'-DDE	1.75E+00	7.1E-07	NA	8.98E-01	3.6E-07	NA
4,4'-DDT	5.51E-01	2.2E-07	1.5E-02	3.06E-01	1.2E-07	8.5E-03
Aluminum	8.26E+03	NA	1.1E-01	6.93E+03	NA	9.3E-02
Antimony	1.13E+00	NA	4.3E-02	9.74E-01	NA	3.7E-02
Arsenic	1.90E+01	3.4E-05	8.8E-01	3.81E+00	6.8E-06	1.8E-01
Chromium	2.01E+01	4.0E-07	1.8E-01	1.46E+01	2.9E-07	1.3E-01
Iron	2.13E+04	NA	9.3E-01	1.68E+04	NA	7.3E-01
Manganese	4.84E+02	NA	9.1E-02	4.88E+02	NA	9.2E-02
Thallium	6.18E-01	NA	1.0E-01	5.15E-01	NA	8.5E-02
Vanadium	4.78E+01	NA	1.3E+00	4.50E+01	NA	1.2E+00
	Total =	**4E-05**	**4**	**Total =**	**1E-05**	**3**

Adult Resident - Soil Exposure Pathways

	Surface Soil - 0-2 Ft			Soil - 0-6 Ft		
COPC	**EPC (mg/kg)**	**ELCR**	**Screening HI**	**EPC (mg/kg)**	**ELCR**	**Screening HI**
Benzo(a)pyrene	1.12E-01	5.8E-08	NA	1.20E-01	6.2E-08	NA
n-Nitroso-di-n-propylamine	7.17E-01	3.3E-06	NA	7.17E-01	3.3E-06	NA
4,4'-DDE	1.75E+00	3.1E-07	NA	8.98E-01	1.6E-07	NA
4,4'-DDT	5.51E-01	9.9E-08	1.7E-03	3.06E-01	5.5E-08	9.4E-04
Aluminum	8.26E+03	NA	1.3E-02	6.93E+03	NA	1.1E-02
Antimony	1.13E+00	NA	4.9E-03	9.74E-01	NA	4.2E-03
Arsenic	1.90E+01	1.5E-05	9.7E-02	3.81E+00	3.0E-06	1.9E-02
Chromium	2.01E+01	5.8E-08	2.4E-02	1.46E+01	4.2E-08	1.7E-02
Iron	2.13E+04	NA	1.0E-01	1.68E+04	NA	8.0E-02
Manganese	4.84E+02	NA	1.6E-02	4.88E+02	NA	1.6E-02
Thallium	6.18E-01	NA	1.1E-02	5.15E-01	NA	9.2E-03
Vanadium	4.78E+01	NA	1.7E-01	4.50E+01	NA	1.6E-01
	Total =	**2E-05**	**0.4**	**Total =**	**7E-06**	**0.3**

COPC - chemical of potential concern
EPC - exposure point concentration
ELCR - excess lifetime cancer risk
HI - hazard index

APPENDIX L

Response to Comments

EPA's Comments
Draft Remedial Investigation Report
Area of Concern (AOC) H
Former Naval Ammunition Support Detachment
Vieques, Puerto Rico
April 2004

1. **All detections of anthropogenic compounds need to be included on the summary tables, as well as displayed on a figure. This applies to all media and depth horizons.**

Navy Response: The Subcommittee concurred during the June 21, 2005 meeting that when discussing investigation results, everything detected was noted (and included in "detects" table(s) in the text), but that the discussion will focus on those constituents that exceed risk screening or other applicable criteria, such as PRGs, SSLs, ecological criteria, background, and MCLs. Based on this, Tables 4-1 through 4-5 have been added to Section 4 that summarize all detections. It could be potentially misleading to include all detections on figures. For example, there are approximately 20 inorganic detections in each soil sample. There were 64 surface and subsurface samples collected. Therefore, to show all inorganic detections, soil sample figures would display 64x20 = 1,280 results.

2. **Executive Summary, Nature and Extent of Chemical Distribution at AOC H, page ES-2: This discussion should include sediment and surface water data results.**

Navy Response: The following discussion on surface water and sediment was added to the Executive Summary after the third paragraph on page ES-2.

"Nature and Extent

The site surface water was sampled at four locations during the RI. The surface water analytical results indicated the presence of one inorganic chemical (arsenic) at a concentration above ecological screening criterion in one unfiltered sample. One SVOC (caprolactam) was detected in one surface water sample at AOC H. No screening criteria were available for this constituent for comparison. Pesticides, explosives, or perchlorate were not detected in any of the surface water samples.

Site sediment samples were collected at five locations during the RI. The sediment analytical results indicated the presence of 21 inorganic chemicals. Screening criteria were not available for twelve of the detected inorganics. No pesticides were detected above screening criteria in the sediment samples. No SVOCs, explosives, or perchlorate were detected in sediment samples"

The following text was added to the Fate and Transport, Human Health Risk Assessment, Ecological Risk Assessment Sections of the Executive Summary to be consistent with the revisions made to the Nature and Extent portion of the Executive Summary.

Fate and Transport Evaluation

"Arsenic was detected in downgradient sediment sample SD-1 and downgradient surface water sample SW-2 at concentrations that exceeded background levels or screening criteria. Arsenic was also detected at elevated levels in soil samples on the northern side of the building, but it was not detected at elevated levels adjacent to the ephemeral stream or within the ephemeral stream adjacent to this location. Most of the surface soil samples along the ditch have arsenic levels below background levels. In addition, all of the arsenic concentrations in the ephemeral stream sediment samples are below base-wide background sediment arsenic concentration. Therefore, the presence of arsenic in surface water and sediment at AOC H is most likely not related to site-activities."

Human Health Risk Assessment

In the Executive Summary, page ES-3, Paragraph 1, the following will be added to second sentence: "and only one inorganic chemical in sediment and surface water."

Ecological Risk Assessment

Surface Water

"Five inorganics (aluminum, arsenic, barium, cobalt, and manganese) were identified as COPCs due to screening value exceedance (arsenic only) or lack of screening values. Of these, aluminum, arsenic, and cobalt were detected only as total (unfiltered) inorganics. Because these inorganics were not detected in any of the filtered (dissolved) surface water samples, they are likely associated with suspended sediment particulates and not readily bioavailable to directly exposed aquatic organisms. As a result, these inorganics were not considered for further evaluation as COPCs."

Sediment Exposures

"Eight inorganics (aluminum, barium, beryllium, cobalt, iron, manganese, thallium, and vanadium) were identified as COPCs in sediment from AOC H. Onsite concentrations of these parameters were compared to concentrations in an upgradient sediment sample. Except for barium, all other inorganics were below background levels. Barium is not widely distributed, exceeded basewide background in only one sample, and does not have a literature screening value available; thus the potential for unacceptable risk is likely to be low, and therefore it was not considered further as a COPC."

Conclusions and Recommendations

"Overall human health risks are within the target limits for soils, groundwater, <u>sediment, and surface</u> water individually."

In addition, the following text was added to the Conclusions and Recommendations portion of the Executive Summary, which replaces the last sentence of the first paragraph in this section:

"There are no unacceptable risks to ecological receptors from direct exposure to surface water, sediment, or surface soil. No significant risks were identified for upper trophic level wildlife from potential food web exposures."

The above information to be included in the Executive Summary will also be included in the applicable sections of the report.

3. **Executive Summary, Ecological Risk Assessment, page ES-4: The potential risks associated with the surface water and sediment data should be included in this section, along with the discussion of soil contaminants.**

Navy Response: The following text was inserted following the second paragraph of the Ecological Risk Assessment subsection of the Executive Summary:

"The results of the ERA also indicate that chemicals detected in surface water and sediment do not pose unacceptable risks to directly exposed organisms. Many of the inorganics concentrations detected in sediment were generally comparable to background (upgradient samples). Average concentrations of the remaining inorganics and the few detected organic chemicals were either below screening ecotoxicity values or had a low magnitude of exceedance. Although some inorganics and a few organic chemicals were identified as COPCs, risks to lower trophic level receptors were negligible based on low magnitude of screening value exceedances and comparisons to background/upgradient data. No unacceptable risks were identified for upper trophic level wildlife from potential food web exposures."

4. **Section 1.1, Purpose and Scope, page 1-1: The description of work conducted at the site indicates that measurements were collected at a nearby stream to establish baseline static groundwater levels in the vicinity of AOC H. In Section 2.3.2 Topography (page 2-2) there is a description of a "creek." In order to avoid confusion, the same terminology should be used throughout the document. As agreed on previous documents, the drainage ditch should be called an ephemeral stream throughout the document. If the ephemeral stream and the creek are indeed different water bodies then it should be noted whether these areas were sampled for chemical contaminants.**

Navy Response: The water body located on the western side of the AOC H site, which is variously referred to as "creek," "stream," and "drainage ditch," was edited in the text to be consistently referred to as an "ephemeral stream" throughout the document.

5. **Section 2.1, Location, page 2-1: The RI notes the Site is located 500 feet of Vieques Passage (portion of Atlantic Ocean separating Vieques Island from Puerto Rico) but on Page 3-6, the RI notes that the northern border of AOC H is approximately only 100 feet from Vieques Passage. This discrepancy needs to be corrected.**

Navy Response: All references to the distance of the site to the Vieques Passage were changed to "approximately 200 feet." The distance was verified by GIS coordinates on aerial photographs.

6. **Section 2.3.5.1, Surface Water, page 2-3: It is noted that a water-filled ditch is located just west of the building and is mostly stagnant. However, during periods of heavy and prolonged rainfall the mouth of the stream opens to Vieques Passage to the north. Further, a tidal study indicted that water levels in the ditch are not influenced by tides (Section 3.2.8 Tidal Fluctuation Study, page 3-7), but rainfall events. This seems to be in conflict with the description provided in the executive summary which indicates that the ditch contains tidal water from Vieques Passage. This inconsistency should be corrected.**

Navy Response: Section 2.3.5.1 Surface Water, Second Paragraph has been edited to read: "One Surface water body is present at AOC H. An ephemeral stream is located just west of the building and is mostly stagnant. It is possible that during periods of heavy and prolonged rainfall or ocean surge, the mouth of the stream opens to Vieques Passage to the north and at these times the stream is subject to tidal influence. However, a tidal study (see Section 3.2) indicated that water levels in the ephemeral stream were not influenced by tides when the mouth of the stream is closed off to the Vieques Passage."

Section 3.2.8 Tidal Fluctuation Study, the first sentence of the last paragraph, has been edited to read: "A comparison of the surface water tidal fluctuations and the groundwater elevation data shown in Figure 3-5 shows that there is no significant tidal influence on the groundwater elevations at the AOC H monitoring wells or the ephemeral stream when the mouth of the ephemeral stream is closed off to the Vieques Passage."

The last sentence in first paragraph of the Executive Summary was revised to read, "An ephemeral stream is located to the west of the site."

7. **Section 2.3.5.2, Groundwater, page 2-4: At the western part of the site groundwater may flow locally to the west toward the water-filled ditch. This should be reflected in Figure 5-1 Conceptual Site Model; there should be a groundwater to surface water pathway.**

Navy Response: Figure 5-1 Conceptual Site Model has been edited to show a groundwater to surface water pathway and the secondary migration pathway box has been eliminated.

8. **Section 2.3.5.2, Groundwater, page 2-4: The text references Appendix D for gradient calculations, but theses are not included in the Appendix. Please resolve.**

Navy Response: In Section 2.3.5.2, the last sentence: "Gradient calculations are included in Appendix D." was deleted. The following gradient calculations were added to the end of Section 2.3.5.2
Northern Direction from MW-6 to MW-3

Gradient = (-1.09 ft – (-) 2.12 ft)/100 ft = 1.03 ft/100 ft = 0.01 ft/ft
Western Direction from MW-6 to MW-5
Gradient = (-1.09 ft – (-) 1.42 ft)/60 ft = 0.33 ft/60 ft = 0.006 ft/ft.

9. Figure 2-6, Groundwater Flow Map: The key wrongly indicates that the contour intervals are 1 and 10 feet. Please amend. Also, the stilling well should be shown on this map, hopefully with a water level collected with those from the monitoring wells.

Navy Response: Figure 2-6 Groundwater Flow Map was corrected to show the contour interval of 0.2 feet. The stilling well is not shown on this figure because its water level was not part of the site-wide elevation measurement event. The stilling well is shown in Figure 3-3. Section 3.2.8, Tidal Fluctuation Study, describes how the water levels varied between three wells and the stilling well. The Tidal Fluctuation Study was done in June 2003 and the three RI monitoring wells were installed in August 2003. Therefore, the round of groundwater elevations with all seven site wells did not include the stilling well, which was a temporary well used only for the tidal study in June 2003.

10. Section 3.2.1, Monitoring Well Installations, page 3-3: The report indicates that stratigraphy at monitoring well locations were logged from the drill cuttings. This is contrary to the work plan which indicated that split spoons would be collected. It seems likely that it is also part of the reason that MW-6 was drilled too deep, with the screen set below that of other wells. In the future, please follow the work plan. Drill logs for the wells are also missing from the referenced appendix and should be added.

Navy Response: Boring logs were developed in the field at monitoring well locations. Split spoon samples were taken, but not continuously to depth. The second sentence of the third paragraph on page 3-3 was edited to read: "During the drilling of the boreholes for these monitoring wells, the lithology was characterized by a combination of split spoon sampling and drill cutting observations." Boring logs for the monitoring wells were added to Appendix A. The screen interval of MW-06 is comparable to the other wells as shown in the revised Table 3-3.

11. Section 3.2.1, Monitoring Well Installations, page 3-3: Rather than indicating that drill cuttings and IDW were disposed of according to the Master Work Plan, indicate what was actually done with them. If any sampling of the cuttings took place, include those results.

Navy Response: The following information of the IDW disposal was added to Section 3.2.1. "Composite soil and water samples were collected on July 19 and 20, 2004 for the AOC H IDW. Samples were analyzed for full suite TCLP analysis by PEL Laboratories and results showed the soil and water were both non-hazardous. IDW drums were removed from the staging area on October 22, 2004 and February 3, 2005. All drums were transported by the contractor Caribe Hydroblasting Environmental Division to the BFI Ponce Landfill. Table 3-5 summarizes the analytical results from the IDW sampling." A summary table has been added and Section 3 Tables re-numbered accordingly.

12. Table 3-3, Summary of Well Construction Details: Well construction tables should include data from all of the wells at the site, not just the new ones. Please amend.

Navy Response: Table 3-3 has been amended to include Well Construction Details for monitoring wells MW-1, 2, 3, and 4.

13. Page 4-3, The text states that perchlorate was not detected in any of the groundwater samples collected at AOC H. However, the footnote on Page 6-31 states that perchlorate was detected once during the 2000 sampling event. Please verify the perchlorate results and revise the document accordingly.

Navy Response: Table 6-10 on Page 6-31 was edited to delete the footnote referencing perchlorate because it was incorrectly listed. Perchlorate was not detected in any groundwater samples from the 2000 or the 2003 sampling event.

14. Section 4.1.4, Regulatory, Health-Based, and Ecological Screening Levels, pages 4-4 - 4-5: The RI notes that sediment results were compared to screening values presented in either *Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments* (Long, 1995) or the *EPA memorandum Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities and Inclusion of Stakeholders* (USEPA, 2000). A copy of the latter document should be provided to us; it is unclear whether actual sediment screening criteria are provided in this document. In addition, there should be a discussion of screening criteria used for surface water samples. It should be noted that the lower of the *USEPA National Recommended Water Quality Criteria* (USEPA, 2002) and the *Puerto Rico Environmental Quality Board (EQB) Water Quality Standards* were used for surface water, as noted in Table 4-7 (Detected Chemicals Above Criteria and Background in Surface Water).

Navy Response: A copy of the requested document (USEPA, 2000) was submitted to regulatory agencies.

The following text was inserted as the fourth bullet on page 4-4 to describe the screening criteria for surface water:

"The surface water screening values used were the lower of the values from two sources, the Puerto Rico Water Quality Standards Regulation (EQB, 2003) and the U.S. National Recommended Water Quality Criteria (NRWQC) for the protection of aquatic life (USEPA, 2002). Surface water at AOC H is saline, as shown in Table 3-8, with salinity values from 25.75 ppt to 32.20 ppt. Saltwater has a salinity greater than 10 ppt; thus, the chronic NRWQC criteria for saltwater were used. Similarly, the Puerto Rico standards identified for coastal/estuarine waters were used in the assessment." Section 3 tables were re-numbered accordingly.

14A. Please reference the sediment values used, rather than the Region IV technical memorandum, which may not be appropriate for this Site.

Navy Response: References to the Region IV technical memorandum have been removed from the document, including in Section 4.1.4 (fourth bullet) and the reference section.

15. Section 4.1.4, Regulatory, Health-Based, and Ecological Screening Levels, pages 4-4: Soil screening for impact to groundwater should use the default DAF of 1. As stated in the SSL guidance, the use of a DAF 20 is generally not appropriate for sites where the water table is quite shallow. The DAF of 10 used for subsurface soils is suggested without any reasoning as to why this is appropriate. Site-specific numbers other than DAF 20 and DAF 1 are sometimes calculated; this does not appear to have been done here to arrive at the DAF 10 value. In the future, the Navy and the agencies should agree beforehand what criteria will be used.

Navy Response: Table G-2 has been revised to include SSL (DAF=1) screening. When the soil data are screened against the SSLs at a DAF=10, the following constituents exhibit exceedances:

Surface Soil

- Antimony
- Arsenic
- Chromium
- 2,6-DNT
- N-nitrosodi-n-propylamine

Subsurface Soil

- Arsenic
- Chromium

When the soil data are screened against the SSLs at a DAF=1, the following additional constituents exhibit exceedances:

Surface Soil

- Barium
- Nickel
- Selenium
- Benzo(a)anthracene
- Isophorone
- p,p′-DDE
- p,p′-DDT

Subsurface Soil

- Antimony
- Barium
- Nickel
- Selenium
- 1,2-dichloroethane (DCA)

Of all the metals whose soil concentrations exceed either the SSL at a DAF=10 and/or the SSL at a DAF=1 (i.e., antimony, arsenic, barium, chromium, nickel, and selenium), only antimony and arsenic were detected at concentrations above background soil concentrations. Antimony was detected in only one surface soil sample (NDAHSS03) at a concentration (6.3 mg/kg) above the background soil concentration (2.3 mg/kg). However, antimony was not detected in the subsurface soil at the same location or any other location above background. The well closest to surface soil sample NDAHSS03 (MW06) contained 2.6 μg/l of antimony, which is below the MCL (6 μg/l) and tap water PRG (15 μg/l). In fact, the highest concentration of antimony detected at the site (5.4 μg/l in well MW04) is below both the MCL and PRG.

Arsenic is the only other metal detected in soil above background. It was detected above background at 10 surface soil locations distributed across the site; however, it was detected at only two subsurface soil locations (NDAHSS01 and NDAHSS03) above background. Arsenic is the only constituent whose maximum site groundwater concentration (detected in only one well [MW02], at 6.3 ug/l) exceeds its tap water PRG (0.04 ug/l). However, the detected concentration is below the MCL (10 ug/l), on which the SSL is likely based. Further, the detected concentration was in the total form; dissolved arsenic was not detected in site groundwater. Additionally, although arsenic was not detected in the site-specific background well, it was detected at a similar concentration in the base-wide background groundwater (5.5 ug/l, dissolved).

Of the remaining seven soil constituents that exceed SSLs at a DAF=1 (which include those that exceed at a DAF=10), five of them (i.e., 2,6-DNT; N-nitrosodi-n-propylamine; benzo(a)anthracene; isophorone; and 1,2-DCA) were not detected in any site groundwater samples. The two remaining constituents, p,p'-DDE and p,p'-DDT, were detected in site groundwater. These two constituents were detected in one surface soil sample (NDAHSS01) above their respective SSLs at a DAF=1 only. p,p'-DDE was detected in only two wells (MW02 and MW05), the highest concentration (0.022 μg/l) in which is an order of magnitude below the tap water PRG of 0.2 μg/l (there is no MCL for p,p'-DDE). Similarly, p,p'-DDT was detected in only one well (MW04), where the detected concentration (0.028 μg/l) is an order of magnitude below the tap water PRG of 0.2 μg/l (there is no MCL for p,p'-DDT). Groundwater at AOC H may discharge to the drainage ditch located along the western site boundary. p,p'-DDE was detected in only one sediment sample (NDAHSD04) collected from the ditch adjacent to the site, but its concentration (0.00012 mg/kg) is more than an order of magnitude below the ecological screening criterion (0.0033 mg/kg). It should be noted that p,p'-DDE was detected at a concentration of 0.00007 mg/kg in sediment sample NDAHSD05, which was collected from the ditch upstream of the site.

The information above suggests that the SSLs at a DAF=1 and DAF=10 are overly conservative for the site (i.e., they underestimate the concentrations that can be present in soil at levels protective of groundwater). Further, the soil constituent concentrations are not uniformly distributed throughout the unsaturated soil column (i.e., the concentrations vary horizontally and generally decline with depth), but are assumed to be so in the generic SSL estimates (EPA 1996c and 2001c).

Leaching of soil constituents has occurred at the site for over 40 years (operations ceased in the 1960s), the groundwater is very shallow (approximately 7 feet), and the soil around the former power plan is clayey and silty (high binding ability). Therefore, the groundwater data collected from the wells are likely representative of any constituent concentrations attributable to leaching, and are a better representation than SSLs.

The soil discussions in Section 4.1.4 have been updated to include the SSL at a DAF=1 as screening criteria. In addition, the updated SSL screening information has been added to applicable portions of Sections 4 and 5.

16. **Section 4.2.1.4, Sediment, page 4-7: In general, it is recommended that a range of background samples be collected, rather than just one sample. The uncertainty of comparing site data to one background sample should be addressed in the uncertainty section.**

Navy Response: The single sample was collected in accordance with the regulatory approved RI/FS Work Plan dated July 2003. The following text was added to the ecological risk assessment uncertainty section (Section 7.4, page 7-23, second bullet):

"A single background sediment sample was collected for AOC H. This sample was collected from the stream in an area that was upgradient of potential influences from AOC H. It is appropriate to conclude that there is a range of concentrations attributable to background for any inorganic constituent, and that the datum for a particular constituent from a single background sample represents only one point in that range. Therefore, the single sediment sample collected upstream of AOC H represents a single point in the range of background sediment conditions for the site. The uncertainty associated with use of the single data point as representative of background is relatively low because the upgradient comparison was only used for two inorganics (beryllium and thallium), neither of which is likely site-related."

17. **Table 4-8, Detected Chemicals Above Criteria and Background in Sediment, page 4-30: The footnote indicates that the lower of the screening criteria for marine and estuarine sediments (Long, 1995) or the USEPA Guidance on Ecological Risk Assessment (USEPA, 2000) were used to screen sediment and presents a value of 20 mg/kg for barium. It is unclear where this value came from as there is no value for barium in Long, 1995 and Table 7-13 (Step 2 Screening Statistics and COPC Selection - AOC H -Sediment) indicates that there is no screening value available for barium. This discrepancy should be clarified.**

Navy Response: The 20 mg/kg sediment screening value listed for barium in Table 4-8 is incorrect. Tables 4-8 and 4-13 have been updated with the correct value of 48 mg/kg (Buchman, 1999), and the footnote changed to reflect the citation. No changes to the text are necessary because the conclusion that the maximum detected barium concentration (57.2 mg/kg) exceeds the ecological sediment screening value (48 mg/kg) is still true.

Although Table 7-13 (Section 7) does not indicate a screening value for barium, the 48 mg/kg screening value is referenced and discussed in the text of Section 7.3.2.3 as part of the Step 3A risk refinement. The screening value for barium was added to Table 7-22 (the Step 3A screening table).

18. Table 4-9, Summary of Surface Soil COPCs, page 4-31: Please indicate what the shaded boxes represent.

Navy Response: A footnote was added to Tables 4-9 through 4-13 to indicate the purpose of the shading. Footnote reads "Shading indicates the screening criterion was exceeded by the maximum detected concentration."

18A. Please indicate whether EPA ecological soil screening values were used (Table 4-9).

Navy Response: EPA eco-SSLs were used, where available. The references for each ecological soil screening value have been added to Tables 4-9 and 7-11.

19. Section 4 Figures: It would have been useful to indicate, perhaps with a different shading, which samples had ecological exceedances and which had human health exceedances.

Navy Response: Figures 4-1 through 4-9 have been edited to include a designation after the exceedance value that shows what screening criteria was exceeded. The screening criteria comprised PRG Region IX, Ecological, and SSL screening criteria.

20. Tables 5-1 and 5-2: These tables should be presented with the other site data. Table 5-2 should include all of the field parameters that were measured. A table of field parameters for the surface water sampling should also be included (or these could be added to Table 5-2).

Navy Response: Tables 3-6, 3-7, and 3-8 were added to Section 3 and include all field parameters collected. Table 5-1 was edited to show only ORP results because salinity results were incorrectly listed for groundwater.

21. Section 5.4.4.2, Soil to Groundwater Contaminant Migration, page 5-11: The second bullet states that turbidity and specific conductance were lower in the background well compared to the site wells. In fact, Table 5-2 shows that the well had the highest turbidity and that one site well had lower conductance. Furthermore, it is not clear how higher salinity (which is inferred for some wells) is tied to metals concentrations.

Navy Response: All field parameters for both the PA/SI and RI were inserted in Section 3 with other site data. The second and third bullets were modified as follows:

- "The tidal study conducted at AOC H indicated that the wells located adjacent to the ephemeral stream had measurable connectivity to the ephemeral stream. Wells located farther from the ephemeral stream did not show as much influence during the study. Because the wells along the western edge (NDAHMW02, NDAHMW05, and NDAHMW07) of the site are closer to the ephemeral stream, a higher salinity in water from these wells is expected and is reflected in the specific conductance measurements made in 2000. Saline water contains aluminum, calcium, iron, magnesium, potassium, chlorides and other inorganic chemicals (Stumm and Morgan, 1981). In areas with salt water intrusion, the redox conditions are favorable to producing higher dissolved inorganic chemical concentrations in groundwater."
- "The total dissolved solids (TDS) estimated based on specific conductance data indicated higher TDS measurements in wells closer to the ephemeral stream than in the wells farther away from the ephemeral stream. The most exceedances for inorganic chemicals above criteria were reported in downgradient monitoring wells located adjacent to the ephemeral stream."

22. Section 6.5.1, COPC Selection for Human Health Risk Assessment, Bullet 1, page 6-5: Please update the Region 9 PRG table values. The Region 9 table was updated most recently in October 2004.

Navy Response: The EPA Region 9 PRG values available at the time of report production were used at the time of the initial draft of the RI report. The Draft AOC H RI Report was submitted for regulatory agency review in April 2004; regulatory comments were received in October 2005. An update to the EPA Region 9 PRG values was released in October 2004 and remains the most current update. The minor changes made to constituents in the October 2004 does not warrant revising the nature and extent discussion and human health risk assessment because of the substantial effort required that would not alter the conclusions of either. To demonstrate that the revision is not efficient from a schedule or cost standpoint, Attachment A of these response to comments provides a comparison of PRG values between the 2002 and 2004 updates to the EPA Region 9 PRG tables. For the chemicals that were detected in soil at AOC H, the PRG values changed only for acetone, aluminum, dibenzofuran, methylene chloride, vanadium, and xylenes. None of these changes would alter the COPC selection, as described below:

- Acetone (changed from 157 mg/kg to 1,413 mg/kg) PRG increased, and it was not detected in site soil; thus, making this substitution would not change the previous findings.
- Aluminum (changed from 7,614 mg/kg to 7,610 mg/kg) was already selected as a COPC, and the 4 mg/kg change to PRG would have no effect on the evaluation.
- Dibenzofuran (changed from 29 mg/kg to 14.5 mg/kg) was not detected in site soil; thus, making this substitution would not change the previous findings.
- Methylene chloride (changed from 8.88 mg/kg to 9.11 mg/kg) PRG increased; thus, the substitution would not have an effect on the COPC selection.
- 3-nitroaniline (changed from no PRG value to 1.8 mg/kg), and site maximum detected concentration of 0.048 mg/kg, was previous compared against PRG value for 2-nitroaniline of 0.175 mg/kg. This chemical will not be identified as COPC because of the new PRG value. Thus will not have an effect on the COPC selection
- Vanadium (changed from 55 mg/kg to 7.88 mg/kg) PRG decreased. It was already selected as a COPC with previous higher criteria level; although substitution of this value may change the number of samples exceeding vanadium, vanadium's background level of 130 mg/kg is higher than either of the above screening values, so the overall conclusions for this chemical would not change.
- Xylenes (changed from 27.5 mg/kg to 27.1 mg/kg) PRG decreased, and the maximum detected concentration of 0.058 mg/kg is well below the PRG level. It was not a COPC previously; and the PRG change will not have an effect on the COPC selection.

23. Section 6.5.1, COPC Selection for Human Health Risk Assessment, Bullet 3, page 6-5: Considering the depth to groundwater is 7 ft in some areas, it may not be appropriate to use a DAF of 10 when evaluating the potential of contaminants for migration to groundwater. Please consult with a hydrogeologist to identify the most appropriate DAF.

Navy Response: Please refer to response to comment #15 above.

24. Sections 6.6.1, Potentially Exposed Populations, and Section 6.6.2, Exposure Route Factors: Exposure parameter information is presented in both sections. This information is somewhat confusing. Please revise these sections to more clearly identify the exposure parameters for each population and pathway.

Navy Response: Table 4s in Appendix J include a detailed listing of exposure factors, sources, and the rationale for their section. Therefore, exposure parameter value information was removed from Section 6.6.2.

25. Section 6.6.1, Potentially Exposed Populations, page 6-7: Please identify the age of the recreational youth receptor.

Navy Response: A youth is assumed to be 8 to 18 years of age; thus, an exposure duration (ED) of 10 years is assumed. This statement was added to Section 6.6.1.4.

26. Section 6.6.1.3, Industrial Workers, page 6-9: Please revise the soil ingestion rate for the industrial worker to 100 mg/day, which is the recommended value for workers who will be outside for a portion of their workday. The reference for this value is the "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites" (OSWER 9355.4-24).

Navy Response: Section 6.6.1.3, Industrial Workers, second paragraph, page 6-9, second sentence was edited to read: "The industrial worker assumptions include a soil IR of 100 mg/day and a groundwater IR of 1 liter (L)/day." The reference: "Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites" (OSWER 9355.4-24)" was added to Section 9, References.

27. Section 6.6.2.9, Surface and Subsurface Soil Inhalation, page 6-11: The PEF value used is the default value. Please calculate and use a site-specific PEF value that more closely represents the size of the site and the physical characteristics of the site. Also, please clarify if one PEF will be used for both surface soils and subsurface soils (for construction activities).

Navy Response: Section 6.6.2.9 Surface and Subsurface Soil Inhalation, the following text was added after last sentence of the Section: "The site is mostly overgrown with no clear space for mowing/maintenance. The remains of the former building are covered with vines and weeds. Thus, there is no exposed soil for generation of dust. The conservative assumptions used in the default PEF derivation by EPA were used because this pathway does not significantly contribute to overall intake from various pathways. Any calculation of site-specific PEF values would be for a hypothetical configuration of the exposed areas for dust generation, and thus will not be more pertinent to the site."

28. Section 6.6.3.2, Exposure Point Concentration, page 6-12: Please note that the latest version of the ProUCL tool is version 3.00.02 and is available at: http://www.epa.gov/nerlesd1/tsc/form.htm

Navy Response: The ProUCL version (v. 2.1) that was available at the time the RI Report was written was used to prepare the risk assessment and is therefore appropriately referenced. The table below presents a comparison of UCL estimates using ProUCL version 2.1 and version 3.00.02 for soil and groundwater COPCs in the risk assessment. ProUCL was not used to calculate EPCs for COPCs in surface water or sediment due to the small number of samples available (four from each medium). The table indicates that most of the UCLs remained similar or decreased (which would result in unchanged or decreased risk estimates). Only two surface soil EPCs (DDT and arsenic) were higher using ProUCL v. 3.00.02; EPCs for two surface soil COPCs (iron and manganese) were lower, and EPCs for the remaining eight surface soil COPCs remained the same. If surface soil risk estimates were revised based on EPCs calculated using ProUCL v. 3.00.02, they would be slightly higher than those based on ProUCL v. 2.1, but the overall conclusions for the receptors would remain the same (risk estimates would remain within the target risk range).

Only one subsurface soil COPC (arsenic) was identified in the risk assessment. The EPC of arsenic was slightly higher using ProUCL v. 3.00.02. Therefore, if subsurface soil risk estimates were revised based on EPCs calculated using ProUCL v. 3.00.02, they would be slightly higher than those based on ProUCL v. 2.1, but the overall conclusions for the receptor would remain the same (the risk estimate would remain within the target risk range).

The EPCs for the groundwater COPCs were the same for some COPCs and lower for other COPCs using ProUCL v. 3.00.02. Therefore, if groundwater risk estimates were revised based on EPCs calculated using ProUCL v. 3.00.02, they would be lower than those based on ProUCL v. 2.1.

Thus, using the most recent version of ProUCLwould result in slightly higher risk estimates for soil and lower risk estimates for groundwater, and the overall conclusions for each receptor would remain the same (i.e., within the target risk range). Therefore, revisions to the report are not necessary; this information can be added to the text of the report.

Table 1: Comparison of COPC UCL95% Values between ProUCL v. 2.1 and ProUCL v. 3.00.02

Medium	COPC	ProUCL v.2.1	ProUCL v. 3.00.02
Surface Soil	Benzo(a)pyrene	0.1	0.1
	n-nitroso-di-n-propylamine	0.7	0.7
	p,p'-DDE	1.7	1.7
	p,p'-DDT	0.6	0.8
	Aluminum	8259.6	8259.6
	Antimony	1.1	1.1
	Arsenic	19.0	27.3
	Chromium, total	20.1	20.2
	Iron	21318.2	18906.0
	Manganese	484.3	430.2
	Thallium	0.6	0.6
	Vanadium	47.8	47.8
Subsurface Soil	Arsenic	6.6	9.5
Groundwater	p,p'-DDD	0.42	0.4
	Aluminum	9100	8389.6
	Antimony	5.4	5.4
	Arsenic	6.3	6.3
	Bariun	347.45	347.5
	Cadmium	2.99	2.6
	Chromium, total	15	9.8
	Iron	7025	7025.3
	Manganese	14800	14800.0
	Thallium	44.2	28.4
	Vanadium	70.0	38.1

29. Section 6.7, Toxicity Assessment, page 6-12: A list of chemicals for which toxicity values are not available from the IRIS database was sent to EPA ORD/NCEA for review. The following chemicals now have updated recommendations:

- **A. Aluminum: The NCEA provisional value has been withdrawn pending further review; please address this chemical qualitatively.**
- **B. Iron: The NCEA provisional value has been withdrawn pending further review; please address this chemical qualitatively.**
- **C. Vanadium: Please use the chronic RfD recommended in the 1997 HEAST document.**
- **D. Benz[a]anthracene: Please use the same TEF scale for the inhalation unit risk values for b[a]a and benzo[a]pyrene as was used for the oral slope factor. The reference for this approach is NCEA.**

Navy Response: For aluminum and iron, in all the applicable tables in Appendix J (Table 5.2, and Tables 7 through 10), a footnote has been added for aluminum and iron that says the toxicity values have been withdrawn, but were available at the time of the risk assessment. Additionally, the following text has been added to the uncertainty discussion in Section 6.9.3:

"Additionally, aluminum and iron toxicity reference doses were provisional values from 2001 obtained from NCEA at the draft phase of this risk assessment. These values have been withdrawn since that time. Because future toxicity factors for these constituents, if/when developed, may be different from those used in this risk assessment, the actual hazards/toxicity may be higher or lower than those estimated in this risk assessment. However, the next section in this document compares these naturally occurring inorganic chemicals to their respective background levels. Aluminum concentrations did not exceed its background level, and the concentrations of iron were comparable to its background level, which indicate any toxicity associated with these constituents is likely attributable to background."

Vanadium toxicity criteria have been revised by EPA since the original draft of the risk assessment report. Although the revised toxicity criteria would result in an estimation of a higher HI value for vanadium, the maximum vanadium concentration in site soil of 63 mg/kg is less than the established background concentration of 130 mg/kg. Thus, revision to the risk assessment is not warranted because it will not change the existing findings that vanadium is not from site operations and is consistent with background concentrations. This information will be included in the uncertainty discussion in Section 6.9.3.

The following text has also been added to the uncertainty discussion in Section 6.9.3:

"As noted above, the toxicity reference doses for certain constituents utilized during preparation of the risk assessment were provisional values from 2001 obtained from NCEA. Since that time, the NCEA provisional values for aluminum, iron, and vanadium have been withdrawn. Although it is EPA's policy to utilize the most current toxicity values for published reports, for this site-specific situation, the calculations will not be redone with the most current toxicity values because the ultimate conclusions regarding aluminum, iron, and vanadium would remain the same because their site-specific concentrations are comparable to background levels."

The inhalation cancer slope factor for benzo(a)anthracene has been added to the risk assessment, as indicated in RAGS D Table 6.2, Tables 7.1 through 7.8, and 9.1 through 9.8, as appropriate.

30. Tables 6-1, 6-2, and 6-3: The repeated detections of Thallium at estimated concentrations suggest that a more sensitive analytical method should be considered. A more sensitive method would likely reduce the chance of false positives being reported.

Navy Response: The following text has been added to Section 6.9.1 as a new paragraph at the end of the Section "Past operations at AOC H do not indicate the potential for release of thallium. Also, the groundwater analytical results obtained using a method that is capable of detecting thallium below the PRG levels did not identify thallium as a final COC. Thus, its presence is not suspected to be the result of a release, it is not pervasive in site media, and it is within health protective levels. Therefore, the estimated concentrations detected will not alter the risk assessment conclusions."

31. Section 7.2.1.1, Environmental Setting, Exposure Pathways and Routes, page 7-4: It is noted that the ditch is supportive of aquatic plant (mangroves). However, Section 7.2.1.3 Preliminary Conceptual Model, Exposure Pathways and Routes, page 7-7, indicates that no fully aquatic plants were observed in the water-filled ditch. This statement should be clarified as it appears to be in conflict with previous descriptions of stream's vegetation.

<u>Navy Response</u>: The last full paragraph on page 7-7, last sentence, was re-stated as "No submergent aquatic plants were observed in the ephemeral stream west of the AOC H power house building."

32. Section 7.2.1.1, Environmental Setting, Fauna, page 7-5: The RI fails to discuss the fauna associated with the water-filled ditch. This information is needed to adequately evaluate the species selected for exposure modeling in the ERA.

<u>Navy Response</u>: This section describes the results of site-specific faunal surveys; however, no surveys of aquatic fauna associated with the ephemeral stream were conducted. Species selected for exposure modeling in the ERA were conservatively based on species known to occur on Vieques Island using similar aquatic habitats.

33. Section 7.2.1.1, Environmental Setting, Receptors, page 7-8: To better evaluate sediment contaminants, more appropriate receptors may be fiddler crabs, land crabs, and night herons. It should be noted that fiddler crabs were used at other SWMUs to evaluate the bioavailability of contaminants.

<u>Navy Response</u>: There is greater uncertainty regarding exposure of fiddler crabs and land crabs to site sediment than there is for benthic invertebrates (e.g., polychaetes, amphipods) that are more directly exposed to sediment contaminants, and for which more toxicological data are available. Thus, for this conservative screening ERA, protection of benthic invertebrates was considered more appropriate for evaluating risk posed by contaminants in sediment. Regarding night herons, the green heron was modeled in this ERA and is considered a comparable piscivore and potentially more sensitive given its smaller body size.

34. Section 7 Tables: A table should be added to Section 7 which identifies COCs for fish based on sediment and surface water values, and/or food web models, as appropriate.

<u>Navy Response</u>: The evaluation of the fish community assessment endpoint was performed using surface water screening values, which were the more stringent values from two sources, the Puerto Rico Water Quality Standards Regulation (EQB, 2003) and the U.S. National

Recommended Water Quality Criteria (NRWQC) for the protection of aquatic life (USEPA, 2002). Surface water screening values, such as NRWQC or equivalent values, are protective of all fish guilds. Please note that Table 7-4 was changed to reflect this evaluation as noted in the response to Comment 35. COPCs or COCs identified for surface water based on a comparison of surface water concentrations to screening values are therefore also COPCs or COCs for fish.

35. Table 7-4, Preliminary Assessment Endpoints, page 7-27: Using sediment screening values for protection of fish may not be appropriate as this does not take into consideration bioaccumulation of contaminants or the concentrations of contaminants in surface water. Further, there should be assessment endpoints for surface water.

Navy Response: The evaluation of the fish community assessment endpoint was incorrectly shown in Table 7-4 as having been performed using sediment screening values. In actuality, surface water screening values, which were the more stringent values from two sources, the Puerto Rico Water Quality Standards Regulation (EQB, 2003) and the U.S. National Recommended Water Quality Criteria (NRWQC) for the protection of aquatic life (USEPA, 2002), were used. Surface water screening values, such as NRWQC or equivalent values, are protective of all fish guilds, water-column invertebrates, and aquatic plants. The "Risk Hypothesis" and the "Measurement Endpoint" cells for the "Assessment Endpoint" cell labeled "Survival, growth, and reproduction of fish communities" in Table 7-4 were changed to the following:

Are site-related chemical concentrations in surface water sufficient to adversely affect fish communities?

Comparison of maximum chemical concentrations in surface water with medium-specific screening values.

In addition, the following Assessment Endpoints, Risk Hypotheses, and Measurement Endpoints were added:

Survival, growth, and reproduction of aquatic plant communities
Are site-related chemical concentrations in surface water and/or sediment sufficient to adversely affect aquatic plant communities?

Comparison of maximum chemical concentrations in surface water and sediment with medium-specific screening values.

Survival, growth, and reproduction of water-column invertebrate communities
Are site-related chemical concentrations in surface water sufficient to adversely affect water-column invertebrate communities?

Comparison of maximum chemical concentrations in surface water with medium-specific screening values.

36. Tables 7-14 & 7-23 *Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 2 & Summary of Hazard Quotients for Upper Trophic Level Receptors - Step 3*: The calculations used to determine the dietary ingestion values to support this table, should be provided in an Appendix or in Section 7.

Navy Response: The concentrations in each of the exposure dose dietary components and the total exposure dose for each upper trophic level receptor and chemical evaluated is provided in an appendix as a series of tables (A1 through A6a). These exposure doses are also compared to the ingestion screening values to calculate the hazard quotients. As a result of changes made to the dietary composition, as well as the COPCs included in analysis, changes were also made to the hazard quotients in Tables 7-14 and 7-23.

37. Section 8.1.2.1, Surface Soil, Organic Chemicals, page 8-2: The text references Table 4-4 for the concentrations of VOCs in surface soil. The table includes xylene, but the 1,1-DCE detection is not shown. Please correct.

Navy Response: 1,1-DCE was added to Table 4-4. Table 4-4 has been re-numbered accordingly.

38. Section 8.1.2.2, Subsurface Soil: The subsection on organic chemicals appears to be missing from this section.

Navy Response: A subsection has been added and entitled “Organic Chemicals,” and the following statement made: “No organic chemicals were detected above screening criteria.”

39. Appendix J: The RAGS D Table 2 Series is missing. Please include this series of tables.

Navy Response: The missing tables were added to the revised report.

40. Appendix J, Table 3 Series: Please note that the latest version of the ProUCL tool is version 3.00.02.

Navy Response: Comment noted. Please refer to response to Comment #28 above.

EQB's Technical Comments

Draft Remedial Investigation Report
Area of Concern (AOC) H
Former Naval Ammunition Support Detachment
Vieques Island, Puerto Rico
April 2004

I. INTRODUCTION

TRC has reviewed and provides the attached comments to the Draft Remedial Investigation Report for Area of Concern (AOC) H, dated April 2004.

The RI Report presents the results of the Remedial Investigation (RI) conducted for AOC H of the former Naval Ammunition Support Detachment (NASD) in the western portion of Vieques Island, Puerto Rico. The RI activities were detailed in the Final Remedial Investigation/Feasibility Study Work Plan for Solid Waste Management Unit (SWMU) 6, SWMU 7, Area of Concern (AOC) H, and AOC J, July 2003. TRC had provided to Puerto Rico Environmental Quality Board (EQB), on April 15, 2003, technical comments on the Draft Remedial Investigation/Feasibility Study Work Plan for Solid Waste Management Unit (SWMU) 6, SWMU 7, Area of Concern (AOC) H, and AOC J, Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico, dated February 21, 2003. The comments were provided by P.R. EQB to Naval Facilities Engineering Command on April 21, 2003 who finalized the RI Work Plan considering the comments.

The AOC H RI Report finds that the site conditions at AOC H do not pose an unacceptable risk to human health or ecological receptors based on an unrestricted land use. As a result, no remedial actions were recommended by the Navy for the site. This review notes a number of uncertainties, typographical errors, and other issues associated with the report.

Page-Specific Comments

1. **<u>Page ES-1, Paragraph 1</u> – The last sentence should be revised for consistency with the text. The last sentence indicates that the drainage ditch contains tidal water; however, text on Page 2-4, Paragraph 1 and Page 3-7, Paragraph 2, and Figure 3-5 all indicate there is no tidal influence.**

<u>Navy Response</u>: The Executive Summary, 1st Paragraph, last sentence was edited to read "An ephemeral stream is located to the west of the site."

2. **<u>Page ES-2, Paragraph 7</u> – Clarify if the total (unfiltered) metals samples were collected using United States Environmental Protection Agency (EPA) Region II low stress/low flow sampling procedures.**

Navy Response: Samples were collected using low flow sampling procedures but did not necessarily meet the EPA Region II low stress/low flow sampling procedure requirements. However, a minimum of three well volumes were removed from each well prior to sampling.

3. **Page 2-1, Paragraph 3 – The acronym "PWA" is not identified in the Acronyms and Abbreviations list on pages VII through XII. Provide a definition for the acronym.**

Navy Response: The Acronym list was updated to include "PWA - Public Works Area."

4. **Page 2-4, Paragraph 3 – Provide the gradient calculations as described in this paragraph. Appendix D, which was cited as the location of the gradient calculations, contains only the groundwater sampling data sheets.**

Navy Response: The last sentence in Section 2.3.5.2, which states "Gradient calculations are included in Appendix D." was deleted. The following gradient calculations were added to the end of Section 2.3.5.2:
Northern Direction from MW-6 to MW-3
Gradient = (-1.09 ft – (-) 2.12 ft)/100 ft = 1.03 ft/100 ft = 0.01 ft/ft
Western Direction from MW-6 to MW-5
Gradient = (-1.09 ft – (-) 1.42 ft)/60 ft = 0.33 ft/60 ft = 0.006 ft/ft.

5. **Page 2-5, Section 2.6 – Include the depths of surface and subsurface soil samples collected during the Expanded PA/SI since these samples were evaluated in the HHRA. The text should clarify the method/technique used to collect the four (4) surface soil samples inside the building**.

Navy Response: Page 2-5, Section 2.6, second paragraph reads: "The Expanded PA/SI report (2000) includes details of the previous investigations conducted at this site." Section 2 of this Remedial Investigation Report is just a brief summary of past activities at the site and is not intended to restate the sampling protocol of previous investigations. These types of details can be found in the referenced PA/SI Report.

6. **Pages 2-5 and 2-6, Section 2.6 –**
   a. **Clarify that the PRGs used are the Region 9 PRGs.**
   b. **Clarify what screening criteria were used to compare soil contaminant concentrations.**

Navy Response:

a. Section 2.6, first sentence of the sixth paragraph was edited to read "Groundwater analytical results indicated total inorganic exceedances above the Region IX tap-water preliminary remediation goals (PRGs) (HI at 0.1 for non-carcinogenic chemicals) for aluminum, antimony, arsenic, barium, iron, manganese, vanadium, and thallium."
b. Page 2-6, seventh paragraph was edited to read "Surface soil samples contained aluminum, antimony, arsenic, chromium (total), iron, lead, manganese, benzo(a)pyrene, n-nitrosodi-n-propylamine, p,p-DDE, p,p-DDT, and 2,6-dinitrotoluene above the USEPA Region IX residential PRGs, industrial PRGs, or leachability criteria.

7. Figure 2-2 – Typographic Error. Correct the spelling of "Puerto Rico Conservation Trust" in the legend of this figure.

Navy Response: The correction has been made.

8. Figure 2-6 – The orientation of the groundwater contours indicate that there is no groundwater data downgradient from the majority of the power plant building (i.e., along the west side of the building, between the building and the ditch). The RI Report must discuss this as a possible data gap. The report must propose corrective action to address this data gap (i.e., installation of more wells). The monitoring wells should be identified in Figure 2-6. The stilling well should be located in Figure 2-6 and the water elevation data displayed and incorporated into the contour lines.

Navy Response: Figure 2-6 does not indicate there are no groundwater data downgradient of the majority of the power plant. Figure 2-6 indicates that around the power plant building, there are northerly, northwesterly, and westerly components of groundwater flow. Further, the data collected from the existing wells suggest they adequately represent site groundwater conditions because constituents detected in site soils potentially attributable to historical site activities (e.g., pesticides, metals) were also detected in the site monitoring wells. However, the potential risk drivers identified for potable groundwater use were either comparable to background levels or were potentially attributable to turbidity and/or interaction with the ephemeral stream. Further, and most importantly, the groundwater at AOC H is not suitable for potable use due to its salinity.

In addition to the above information, surface water and sediment samples were collected in the ephemeral stream adjacent to where groundwater west of the power plant building likely discharges, based on the groundwater flow direction shown in Figure 2-6. Other than inorganics (which may have a natural origin) and DDE (which was also detected in the background sediment sample), none of the constituents detected in site soil or groundwater was detected in the surface water or sediment samples collected immediately west of the power plant building or the next closest downstream location. Further, both the human health and ecological risk assessments determined there were no unacceptable human health or ecological risks associated with exposure to surface water and sediment in the ephemeral stream. This suggests the existing groundwater conditions at the site do not represent a potential source of contamination to the ephemeral stream that results in unacceptable risks.

The above information suggests that even in the absence of a groundwater monitoring point on the west side of the power plant building, there are sufficient data, for both groundwater and other media, that collectively indicate the site has been sufficiently characterized and the risks adequately assessed. Existing data are sufficient to determine that AOC H groundwater does not pose an unacceptable risk to potential receptors, based on actual constituent concentrations, the non-potable nature of the groundwater, and that environmental media at its discharge location (i.e., the ephemeral stream) do no pose unacceptable risks to potential receptors. The information in this and the previous paragraph will be added to the Summary and Recommendations Section.

The stilling well location is shown with the other monitoring wells on Figure 3-3. Section 3.2.8 Tidal Fluctuation Study describes how the water levels varied between three wells and the stilling well. The Tidal Fluctuation Study was done in June 2003 and the three new monitoring wells were installed in August 2003. The full round of groundwater elevations did not include the stilling well which was a temporary well used only for the study.

9. Page 3-1 and 3-2, Section 3.1.2 - The text should discuss the depths at which subsurface soil samples were collected and the rationale for selecting those depths.

Navy Response: A sentence was added to Section 3.1.2 which states that "subsurface soil samples were collected at a depth of 4 to 6 feet bls." The rationale for selecting the locations and depths is included in the Final RI/FS Work Plan for SWMU 6, SWMU 7, AOC H, and AOC J, dated July 2003, in Section 4.3.3.3 Surface and Sub-surface Soil Sampling and Analysis.

10. Page 3-5, Paragraph 1 – Note that the range of purging rate exceeds the upper end of the flow rate recommended in the EPA Region II Groundwater Sampling Procedure, Low Stress (Low Flow) Purging and Sampling (GW Sampling SOP Final March 16, 1998). Explain why flow rates in excess of those recommended by EPA low stress (low flow) guidance were used. EPA Region II and the EQB prefer the low flow (low stress) purging and sampling procedure.

Navy Response: Please see response to comment 2. Low flow purging was done but not in strict accordance with the EPA Region II Groundwater Sampling Procedure, Low Stress (Low Flow) Purging and Sampling (GW Sampling SOP Final, March 16, 1998); however a minimum of three well volumes were removed at each well.

11. Figures 3-1 to 3-3 - The locations of former transformers, generators, and ASTs inside and outside the building provide information on areas where historical leaks or spills may have occurred. Also, the location of floor drains, if any, and exterior doors are also indications of where releases may have occurred. Provide this information on these figures and include a discussion in the text that identifies the location of these potential sources and the samples collected to determine if releases may have occurred. If this information is not available, that should be clarified in the report.

Navy Response:

Historical aerials do not show the items listed above. Because of the lack of historical information such as this, the surface and subsurface soil sampling completely circled the building and four surface soil samples were collected inside the building. A sentence was added to Section 2.2, as the last sentence of first paragraph, that states: "No historical aerial photographs or diagrams show the location of the former generators, ASTs, or transformers located at the site. There are three exterior doors in the building, one door on each of the north, south, and east sides of the building." In addition, the last sentence of the first paragraph in Section 3.1.2 was replaced with: "Because the exact locations of former generators, ASTs, or other potential sources of contamination are not known, surface and subsurface soil sampling was conducted around the perimeter of the building and surface soil sampling was conducted inside the building. The rationale for the selection of specific soil sampling locations is as follows:"

12. Page 4-2, Paragraph 1 - Typographical Error. Correct the reference "EPA, 1999" to read "EPA, 1999a" to be consistent with the reference citation in Section 9 (References).

Navy Response: Reference was changed to (EPA, 1999a).

13. Page 4-4, Section 4.1.4 – The text should include a consideration of the applicability of the following standards and criteria:

a. EPA has published interim final ecological soil screening levels (eco-SSLs) that should be used as the primary reference for ecological screening values, followed by the references provided in this section if an appropriate eco SSL value is not available.

b. Subsurface soils should be screened using residential PRGs to ensure that the residential exposure scenario for subsurface soil evaluated in the human health risk assessment (HHRA) includes all chemicals exceeding residential screening criteria. If the list of contaminants changes as a result of this screening, the risks to residential receptors should be reevaluated in the risk assessment and submitted for regulatory review and approval prior to finalizing this report.

c. MCLs, in some cases, are not risk-based. Therefore, risk-based PRGs should be calculated for those chemicals for which EPA Region 9 did not calculate a value rather than using the MCL as a screening value. EPA Region 9 provides the methodology and equations used to calculate PRGs in their technical memorandum, *Region 9 PRGs Table 2002 Update,* dated October 1, 2002.

Navy Response:

a. The current (2005) EPA Eco-SSLs (for plants and soil invertebrates) was incorporated as the primary reference, followed by the other references identified in the report. The following text changes were made to the report:

Section 4.1.4, Page 4-5, first bullet was replaced with the following:

- "Surface soil results were compared to the EPA (2002) Region 9 residential preliminary remediation goals (PRGs) adjusted to a hazard index (HI) of 0.1 for noncarcinogenic chemicals; the EPA (2002) Region 9 leachability criteria for soil (SSL based on a dilution attenuation factor [DAF] of 1 and 10); and appropriate ecological screening criteria. The ecological screening criteria were the lower of the plant and soil invertebrate ecological soil screening levels (eco-SSLs) from EPA (2005). If eco-SSLs were not available, the ecological screening criteria were the most conservative values derived from either *Toxicological benchmarks for screening contaminants of potential concern for effects on soil and litter invertebrates and heterotrophic process* (Efroymson et al., 1997a) or *Toxicological benchmarks for screening contaminants of potential concern for effects on terrestrial plants* (Efroymson et al., 1997b). In some instances when soil screening values were not available from these primary sources, three other references were consulted comprising the Canadian protocol for deriving environmental soil quality guidelines (SQGs; CCME, 1996), Dutch Soil Quality Standards (MHSPE, 1994), and U.S. Fish and Wildlife Service soil screening values presented by Beyer (1990). The lowest screening value from these three sources was then selected for screening."

Section 4.1.4, Page 4-6, second bullet, first paragraph was replaced with the following:

- "The ecological screening criteria were the lower of the plant and soil invertebrate ecological soil screening levels (eco-SSLs) from EPA (2005). If eco-SSLs were not available, ecologically-based toxicological benchmarks for screening contaminants of potential concern for effects to soil invertebrates and microbial processes were taken from Efroymson (1997a) and for terrestrial plants from Efroymson et al. (1997b)."

Section 4.1.4, Page 4-6, second bullet, third paragraph was replaced with the following:
"In the absence of eco-SSLs and Oak Ridge National Laboratory soil screening values, alternate screening values were selected from the following references:"

The second paragraph of Section 7.2.3.1, Page 7-13, was replaced with the following:
"The soil screening values used were the lower of the plant and soil invertebrate ecological soil screening levels (eco-SSLs) from EPA (2005). If eco-SSLs were not available, the soil screening values used were from the Oak Ridge National Laboratory, which has identified soil screening values specific to soil invertebrates and microbial processes (Efroymson et al., 1997a), and terrestrial plants (Efroymson et al., 1997b). Where screening values were available for multiple receptors in these ORNL references, the most conservative value was chosen. In some instances where soil screening values were not available from these three primary sources, three other references were consulted comprising the Canadian protocol for deriving environmental soil quality guidelines (SQGs; CCME, 1996), Dutch Soil Quality Standards (MHSPE, 1994), and U.S. Fish and Wildlife Service soil screening values presented by Beyer (1990). The lowest screening value from these three sources was then selected for screening."

Tables 7-11, 7-15, and 7-20 were updated to reflect changes in some of the screening values, hazard quotients, and COPCs. As a result, the text associated with Table 7-11 was updated as shown below; updates to Tables 7-15 and 7-20 did not require changes to the existing text.

Section 7.2.4.1, Page 7-15, second bullet, third paragraph was replaced with the following:

Surface Soil

"Maximum surface soil concentrations are compared to screening values in Table 7-11. Based upon this comparison, 10 metals (aluminum, arsenic, chromium, copper, iron, manganese, selenium, thallium, vanadium, and zinc), three pesticides (DDD, DDE, DDT), four PAHs (benzo(a)pyrene, fluoranthene, phenanthrene, and pyrene), total PAHs, and one VOC (total xylenes) had HQs equaling or exceeding 1.0, based upon detected concentrations, and were therefore identified as COPCs. In addition, one pesticide, 13 SVOCs, and 3 VOCs were retained as COPCs because screening values were not available for comparison to detected concentrations."

b. Although the screening methodology applied for subsurface soil evaluation in this risk assessment was consistent with what was used for other sites within west Vieques and in accordance EPA Region II policy, as documented in Appendix A of NFA report (CH2M HILL, 2003a), a revised procedure has since been adopted, as documented in the Master HHRA Protocol. However, for the AOC H risk assessment, subsurface soil concentrations (as compared to surface soil concentrations) were evaluated to determine whether conclusions that the site does not pose an unacceptable risk for the residential scenario remain valid for subsurface soil. Based on this evaluation, the following text has been added to the HHRA section of the report:

Section 6.9.2 – After the current last paragraph:

"In the HHRA, it was assumed that hypothetical future residents are exposed to soil in the 0-to-2-ft interval, and the EPCs used in the intake calculations were based on soil concentrations detected in this surface interval. This assumption is expected to represent the most reasonable exposure scenario for a hypothetical future resident. However, the impact of assuming a deeper soil exposure interval (0-to-6 ft) was evaluated to determine if residential exposures to subsurface soil yield higher EPCs and therefore higher risk estimates. Results of this evaluation are provided in Appendix K as Tables K-1, K-2, and K-3. The EPCs for the 0-to-6-ft interval are provided in Attachment A to Appendix K. As shown in Table K-3 of Appendix K, with the exception of benzo(a)pyrene and manganese, the calculated EPCs for the 0-to-6-ft interval are lower than the EPCs for the 0-to-2-ft interval. The EPCs for benzo(a)pyrene and manganese in the 0-to-6-ft interval are only slightly higher than the EPCs in the 0-to-2-ft interval. Therefore, use of an assumed soil exposure depth of 0-to-2 ft versus 0-to-6 ft is not expected to significantly affect the results of the HHRA. However, the impact of the assumed residential exposure interval on the soil risk estimates is discussed quantitatively in Section 6.9.4."

Section 6.9.4 – Add after the current last paragraph

"The risk estimates for the hypothetical future residents are based on an assumed soil exposure depth of 0-to-2 ft. However, the impact of assuming a deeper soil exposure interval (0-to-6 ft) was evaluated to determine if residential exposures to subsurface soil yield higher risk estimates. Results of this evaluation are provided in Appendix K as Tables K-1, K-2, and K-3. The EPCs for the 0-to-6-ft interval are provided in

Attachment A to Appendix K. As shown in Table K-3 of Appendix K and summarized below, the estimated ELCRs and screening HIs (all target organs combined) associated with soil exposures for both child and adult residents ***are lower*** for the 0-to-6-ft interval than for the 0-to-2-ft interval, as summarized below:

- Child Resident – Soil Exposure Scenarios
  - 0-2 ft soil interval – ELCR = $4x10^{-5}$, screening HI = 4
  - 0-6 ft soil interval – ELCR = $2x10^{-5}$, screening HI = 3
- Adult – Soil Exposure Scenarios
  - 0-2 ft soil interval – ELCR = $2x10^{-5}$, screening HI = 0.4
  - 0-6 ft soil interval – ELCR = $7x10^{-6}$, screening HI = 0.3

Therefore, use of a deeper soil exposure interval (0-to-6 ft) in the HHRA would lower the ELCR and HI estimates for future hypothetical child and adult residential receptors."

c. Lead was the only constituent in groundwater where a non-PRG was used as the risk-based screening criterion. Lead does not have a PRG; it has an action-level based MCL, which is risk-based. Therefore, the second sentence of the third bullet under Section 4.1.4 has been revised to state: "For lead, which does not have a PRG, its risk-based action-level MCL was used as its screening criterion**."**

14. <u>Page 4-4, Section 4.1.4, Bullet 1</u> - Typographical Error. Correct the reference "EPA (2002)" to read "EPA (2002d)" to be consistent with the reference citation in Section 9 (References).

<u>Navy Response</u>: Reference was changed to (EPA (2002d).

15. <u>Page 4-4, Section 4.1.4, Bullet 2</u> –

a) The use of industrial worker screening levels for subsurface soil is inconsistent with the site conceptual model presented in Figure 5-1, which contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil and does not identify industrial workers as potentially exposed receptors. Consequently, screening the subsurface soils with the less conservative industrial worker screening levels may not be sufficiently protective. Provide a justification for using the industrial PRGs that demonstrates that they are sufficiently protective for screening purposes given the receptors identified in the conceptual model, or use the residential PRGs for subsurface soil screening, which address dermal contact, ingestion, and inhalation of fugitive dust and should be protective of construction worker exposures.

b) Provide the rationale for using a DAF of 10 for the SSLs.

Navy Response:

a. Please see the response to EQB Comment 13b.

b. Please see the response to EPA Comment 15.

16. Page 4-4, Section 4.1.4, Bullet 4 – Correct the citation "Long, 1995" to "Long et al, 1995" to be consistent with the reference citation in Section 9 (References). The text should explain the rationale for not referencing the NOAA SQuiRT tables.

Navy Response: Reference was changed to (Long et al., 1995). The NOAA SQuiRT tables include a compilation of sediment screening values from several literature sources, including Long et al. (1995). The Long et al. (1995) values were used in this ERA because they are conservative and generally accepted. Other values, such as AETs that are provided in the NOAA SQuiRT tables, are much less conservative, and therefore less appropriate for this screening level ERA; thus, the more specific reference to Long et al. (1995) was used. The text of this bullet has been changed as follows:

- "Sediment results were primarily compared to screening values presented in *Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments* (Long et al., 1995). The NOAA SQuiRT tables (Buchman, 1999) include a compilation of sediment screening values from several literature sources, including Long et al. (1995). The Long et al. (1995) values were primarily used in this ERA because they are conservative and generally accepted. Other values, such as AETs that are provided in the NOAA SQuiRT tables, are much less conservative, and therefore less appropriate for this screening level ERA."

17. Page 4-5, Section 4.1.4 – Correct the citation "(EPA, 2000)" to "(EPA, 2000a)" to be consistent with the reference citation in Section 9 (References).

Navy Response: Reference was changed to (EPA, 2000a).

18. Page 4-5, Section 4.1.4, Bullet 1 - Typographic Error. Correct the reference "EPA (1991)" to read "EPA (1991a)" to be consistent with the reference citation in Section 9 (References).

Navy Response: Reference was changed to (EPA, 1991a).

19. Page 4-6, Section 4.2.1 – The text should discus the representativeness of the facility-wide background data used for comparison to site data for soil. Data should be used that has been collected from similar soils (e.g., same soil horizon and soil type).

Navy Response: The background study report includes the details of the background soil types characterized for this part of the island, and the statistical comparison of soil sample concentrations between different soil types and depths, which demonstrated that the there are no significant differences between various soil types. Further details can be found in *Final Soil,* *Groundwater, Surface Water, and Sediment Background Investigation Report. Former U.S. Naval Ammunition Support Detachment, Vieques Island, Puerto Rico.* CH2M HILL, October 2002. The fourth sentence of the first paragraph under Section 4.2.1 was revised to read: "The Navy and regulatory agencies concurred upon the use of the basewide soil background concentrations for site soil comparisons because evaluation of the background soil inorganic concentrations demonstrated statistical comparability among the various soil types on west Vieques."

20. <u>Page 4-7, Section 4.2.1.5, Paragraph 5</u> – Typographic Error. Correct the reference "(EPA, 1989)" to read "(EPA, 1989b)" to be consistent with the reference citation in Section 9 (References).

<u>Navy Response</u>: Change not necessary. EPA 1989a deleted based on other comments.

21. <u>Page 4-7, Section 4.2.1.4</u> – The text should present limitations based on the limited (one sample) sediment data set. The rationale for appropriateness of corrective actions should be discussed.

<u>Navy Response</u>: As discussed in Section 4.2.1, base-wide sediment samples were available from the background report. However, regulatory (EPA and EQB) review comments on the Work Plan recommended site-specific background surface water and sediment samples. There are site-specific conditions that limited the number of samples that could be collected for background. The ephemeral stream located next to AOC H is unique, where upstream locations are normally dry and are wet only during rain events, and where downstream locations are water-filled. Therefore, it was determined and documented in the regulatory approved Work Plan that one upstream sample would be collected from the ephemeral stream channel on the south side of the road. This was discussed among the Team during work planning stages. The sampling conducted was consistent with the approved work plan. That one background sediment sample was collected is not a significant contributor to uncertainties associated with conclusions drawn, as the risk assessment did not identify unacceptable risks or hazards from potential exposure to site sediment.

22. <u>Page 4-9, Paragraph 1</u> – Typographic Error. Correct the reference "(EPA, 1989)" to read "(EPA, 1989b)" to be consistent with the reference citation in Section 9 (References).

<u>Navy Response</u>: Reference Change not necessary. EPA 1989a deleted based on other comments.

23. <u>Page 4-9, Paragraphs 5 through 10</u> – Typographic Error. Correct the reference "(CH2M HILL, 2002)" to read "(CH2M HILL, 2002b)" to be consistent with the reference citation in Section 9 (References).

<u>Navy Response</u>: Reference was changed to (CH2M HILL, 2002b).

24. <u>Page 4-10, Section 4.2.2.1</u> – The text states that an SSL was not available for benzo(a)pyrene. However, Table 4-4 shows an SSL of 4 mg/kg for benzo(a)pyrene. Please clarify.

<u>Navy Response</u>: Text was corrected. The last sentence was changed from "An SSL was not available for benzo(a)pyrene" to "The detected benzo(a) pyrene concentrations did not exceed the SSL value of 4 mg/kg."

25. <u>Page 4-11, Section 4.2.2.1</u> – A discussion should be provided on the PCB Aroclor analyses performed on subsurface soils.

<u>Navy Response</u>: The text was edited to be consistent with other chemical group results discussion in Section 4.2.2.2. The following was added to the end of the section before the groundwater subsection:

Polychlorinated Biphenyls

PCBs were not detected in subsurface soil samples collected at AOC H."

26. <u>Page 4-10, Section 4.2.2.1, Page 4-11, Section 4.2.2.1, and Page 5-7, Section 5.4.2.4</u> – The text should be revised for consistency. Page 4-10 and Page 5-7 indicate that 2,6-DNT was detected in surface soil. Page 4-11 states that explosives were not detected in surface soil samples.

<u>Navy Response</u>: Page 4-11, Explosive paragraph. Text was replaced with the statement: "The explosive 2,6-dinitrotoluene was detected above its SSL in 2 of 33 surface soil samples as part of the SVOC analytical parameter group (8270C); however it was not detected in any soil sample by the explosives analytical method (8330). Neither detection is above its residential PRG. An ecological screening criterion is not available for 2,6-dinitrotoluene. No other explosives related chemicals were detected in surface soils at AOC H."

27. <u>Pages 4-11 and 4-12, Section 4.2.2.2</u> –

a) As previously discussed, the use of industrial worker screening levels for subsurface soil is inconsistent with the site conceptual model presented in Figure 5-1, which contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil and does not identify industrial workers as potentially exposed receptors. Screening the subsurface soils with the less conservative industrial worker screening levels may not be sufficiently protective. Justify the use of the industrial PRGs and demonstrate that they are sufficiently protective for screening purposes, or use the residential PRGs for subsurface soil screening, which should be conservatively protective of construction worker exposures.

b) If the residential PRGs are used for screening, additional compounds will be included in the discussion of the nature and extent of contamination, fate and transport, and human health risk assessment, such as lead, vanadium, DDD, and DDE.

Navy Response:

a. Please refer to responses to Comments 13b and 15a above.

b. As noted above, the use of industrial PRGs for the subsurface soil evaluation is in accordance with EPA policy and the regulatory approved Work Plan.

28. Page 4-11, Paragraphs 8 and 9 – Typographic Error. Correct the reference "(CH2M HILL, 2002)" to read "(CH2M HILL, 2002b)" to be consistent with the reference citation in Section 9 (References).

Navy Response: Reference was changed to (CH2M HILL, 2002b).

29. Page 4-12, Section 4.2.2.3 – It is unclear why only one filtered sample is presented in Table 4-6 for cadmium if three filtered samples exceed the PRG and background for cadmium, according to the text in this section.

Navy Response: The requested data were added to Table 4-6. However, the dissolved cadmium in the two additional samples had no total cadmium detected, and the reported dissolved cadmium concentrations for these two samples were near the reporting limit of 5 μg/L. Because the dissolved form of the cadmium typically represents a fraction of the total cadmium present in water at a site, the dissolved cadmium concentrations for the two samples that did not have any detectable total cadmium may be false positive detections.

30. Page 4-12, Paragraph 8 – Clarify that the PRG used for comparison was the tap water PRG for hexavalent chromium.

Navy Response: Confirmed. For clarification, the following sentence was added at the end of Paragraph 8 on page 4-12: "As a conservative measure, the PRG used for comparison of site chromium concentrations is the tap water PRG for hexavalent chromium."

31. Table 4-1 –

a) Explain the occurrence of toluene (1.3 μg/L) and caprolactam 3 J (μg/L) in background groundwater.

b) Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

c) The table has an incorrect spelling for Aroclor (the "h" should be deleted).

Navy Response:

a. Toluene and caprolactam were detected in the site-specific background well (MW01), but the concentrations are below risk-based levels and the well is immediately adjacent to Route 200. Although toluene and caprolactam were detected in MW01, its use for background comparisons with site groundwater samples is likely appropriate and, at a minimum, inconsequential to the findings and conclusions of the RI. All inorganic constituent concentrations in MW01 are lower than the base-wide background concentrations except for:

- aluminum (total and dissolved)
- chromium (total)
- copper (total and dissolved)
- iron (total)
- nickel (total)
- silver (total)
- selenium (dissolved)

However, for all "totals" results (and dissolved aluminum), the maximum detected site groundwater concentrations were greater than site-specific background, so they would not have been attributed to background concentrations. Further, dissolved copper was not detected in site groundwater. Therefore, the only one of these constituents detected at a lower concentration in site groundwater (3.6 ug/l) than in the site-specific background well (3.7 ug/l) is dissolved selenium, but the maximum detected concentration is more than an order of magnitude less than the MCL (50 ug/l) and tap water PRG (182 ug/l). This information has been added to Section 4.2.1.2.

b. The spelling was corrected in the footnote to read "indicates".
c. The spelling was corrected in the Table to read "AROCLOR".

32. Table 4-2 – Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

Navy Response: The spelling was corrected in the footnote of Table 4-2 to read "indicates".

33. Table 4-4 –

a. Typographic error. Correct the spelling of the word "factor" in footnote "3."
b. Typographic error. The footnote for "=" has an incorrect spelling for "indicates."
c. See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

Navy Response:
a. The spelling was corrected in the footnote of Table 4-4 to read "factor".
b. The spelling was corrected in the footnote of Table 4-4 to read "indicates".
c. Please refer to response to EPA Comment 15.

34. Table 4-4 - There are two concentrations listed for zinc at the same location both sampled in December 2000. Affected samples include NDAHSS01, NDAHSS02, and NDAHSS09. In addition, on Figure 4-1, the lower of the two results was reported for NDAHSS01 and NDAHSS02. Please clarify why there are two values reported on the same date collected and why the lower of the two values is included on Figure 4-1 for 2 of the 3 samples affected.

Navy Response: Surface soil samples collected inside the building were incorrectly labeled without their "A" designations as SS01, SS02, SS03, and SS04 on Table 4-4. An "A" was added to the appropriate sample designations in Table 4-4. There are not two concentrations for

NDAHSS09 in Table 4-4 as the comment states. Based on the above, Figure 4-1 is correct as presented. There are concentrations shown for the SS01, SS02, SS03, and SS04 samples and for the SS01A, SS02A, SS03A, and SS04A samples.

35. <u>Table 4-5</u> –

a) Typographic error. The footnote for "=" has an incorrect spelling for "indicates."
b) The SSL is not suitable as the sole basis for screening subsurface soil. The site conceptual model presented in Figure 5-1 contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil. Screening the subsurface soils with the less conservative SSLs may not be sufficiently protective. Justify the use of the SSL as the sole comparison criterion or include the residential PRGs for subsurface soil screening.
c) See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

<u>Navy Response</u>:

a. The spelling was corrected in the footnote of Table 4-5 to read "indicates".

b. Please refer to response to EPA Comment 15. As appropriate, the table has been revised to reflect applicable risk-based screening criteria.

c. Please refer to response to EPA Comment 15.

36. <u>Table 4-6</u> – Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

<u>Navy Response</u>: The spelling was corrected in the footnote of Table 4-6 to read "indicates".

37. <u>Table 4-7</u> - Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

<u>Navy Response</u>: The spelling was corrected in the footnote of Table 4-7 to read "indicates".

38. <u>Table 4-8</u> - Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

<u>Navy Response</u>: The spelling was corrected in the footnote of Table 4-8 to read "indicates".

<u>39. Table 4-9</u> –

a) Typographic error. Correct the spelling of the word "factor" in footnote "4."
b) See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

Navy Response:

a. The spelling was corrected in the footnote of Table 4-9 to read "factor".

b. Please refer to response to EPA Comment 15.

40. Table 4-10 –

a) Typographic error. Correct the spelling of the word "factor" in footnote "3."

b) The SSL is not suitable as the sole basis for screening subsurface soil. The site conceptual model presented in Figure 5-1 contemplates construction workers as the only potentially complete exposure pathway associated with subsurface soil. Screening the subsurface soils with the less conservative SSLs may not be sufficiently protective. Justify the use of the SSL as the sole comparison criterion or include the residential PRGs for subsurface soil screening.

c) See Comment to Page 4-4, Bullet 2 regarding the rationale for using a DAF of 10 for the SSL.

Navy Response:

a. The spelling was corrected in the footnote of Table 4-10 to read "factor".

b. Please see response to EPA Comment 15 and the response to Comment 35b, above.

c. Please see response to Comment 15b.

41. Table 4-11 - Clarify that the PRG used for comparison was the tap water PRG for hexavalent chromium.

Navy Response: See response to Comment 30**.**

42. Table 4-11 –

a. The site-specific background concentration for dissolved antimony should be ND (not 95 µg/L), according to Table 4-1.

b. The site-specific background concentrations for total and dissolved chromium should be reversed, according to Table 4-1.

c. The site-specific background concentration for p,p'-DDD should be ND not NA, as this compound was analyzed for in the background sample, according to Table 4-1.

Navy Response:

a. Table 4-11 does list dissolved antimony as ND, not 95 µg/L as the comment states.

b. The chromium levels were corrected in the revised report.

c. The organic chemicals were not expected in the background; thus, they were not used as background levels for comparison. Therefore, it was correctly indicated as 'not applicable' (NA).

43. Table 4-12 - Typographic error. The footnote for "=" has an incorrect spelling for "indicates."

Navy Response: The spelling was corrected in the footnote of Table 4-12 to read "indicates".

44. Figure 4-9 – All of the sediment locations should be labeled.

Navy Response: The figure has been edited to show all the sediment location names.

45. Page 5-2, Section 5.2, Paragraph 2 and Figure 2-6 – The depth of the ditch should be provided.

Navy Response: The approximate depth of the ephemeral stream is stated in Section 5.2, Page 5-2, Paragraph 2, fifth sentence, as having an average depth of 3 to 6 feet. The surface water elevation was not measured at the time the comprehensive round of groundwater level measurements was collected.

46. Page 5-2, Section 5.2, Paragraph 3 – The text should identify which screening criteria were exceeded for soil (i.e., industrial PRGs or SSLs).

Navy Response: Page 5-2, Section 5.2, Paragraph 3 (1st Paragraph on Page 5-2) - It should be noted that this paragraph is intended as a brief summary of the conceptual site model. Detailed discussions of screening criteria exceedances are contained throughout this report. However, to provide additional information, the sentence was edited to read: "Chemicals identified as exceeding Region IX PRGs, Ecological Screening Criteria, and/or SSLs in site soil comprise inorganics, VOCs, SVOCs, and pesticides."

47. Page 5-5, Section 5.4.2.1, Paragraph 2 – The "ATSDR, 1995" reference in this paragraph appears to be in error because it does not match those provided in the references (Section 9). The reference section includes ASTDR references from a number of dates, including 1995, which refers to a toxicological profile for polycyclic aromatic hydrocarbons (PAHs). The appropriate ATSDR profile for xylenes is not listed in the reference section.

Navy Response: The Reference Section was updated to insert "------. 1995. Toxicological profile for xylenes. August" In addition, the 1995 reference for PAHs was changed to 1995a, as will the reference provided in the text (page 5-6).

48. Page 5-6, Section 5.4.2.2, Paragraph 2 – Provide references, where appropriate, for the information concerning n-nitrosodi-n-propylamine origins, fate and transport properties, etc.

Navy Response: The appropriate reference is "ATSDR, December 1989 Toxicological properties for n-nitrosodi-n-propylamine." This reference was added to the revised report.

49. Page 5-6, Paragraph 5 – The citation "Howard, 1991" should be "Howard et al., 1991" to be consistent with the citation in Section 9 (References).

Navy Response: The reference in Section 5.4.2.2, Page 5-6, Paragraph 5 was edited to read: "(Howard et al., 1991)."

50. Page 5-6, Paragraph 6 and Page 5-7, Paragraph 1 – Provide references, where appropriate, for the information concerning PAH metabolism, etc., in these paragraphs.

Navy Response: The reference "(ATSDR, 1995a)" was added to at the end of the fourth paragraph of Section 5.4.2.2, Polycylclic Aromatic Hydrocarbons.

51. Page 5-7, Paragraph 3 – Provide references, where appropriate, for the information concerning the fate and transport characteristics of chlorinated pesticides.

Navy Response: The following reference was added at the end of Section 5.4.2.3 Chlorinated Pesticides: "(ATSDR 1993b, 1993c, 1993d, 1994b)."

52. Page 5-7, Paragraph 4 – Provide references, where appropriate, for the information concerning the fate and transport characteristics of 2,6-DNT.

Navy Response: The following reference was added to the end of Section 5.4.2.4 Explosives: (ATSDR, 1998b), and the following reference was added to Section 9 References "ATSDR, 1998b, Toxicological Profile for 2,4 and 2,6-Dinitrotoluene. December."

53. Page 5-7, Paragraph 5 – See Comment to Page 4-4, Bullet 2 regarding the suitability/protectiveness of the screening criteria applied to subsurface soil. Additional compounds may warrant discussion if other screening criteria are applied (e.g., residential soil PRGs).

Navy Response: Please refer to response to comment 13b and several others where this comment is repeated. The approach used is in accordance with EPA Region 2 policy for subsurface soil risk assessment approach and applied at other sites within Vieques (CH2M HILL, 2003a and 2003b).

54. Page 5-8, Paragraph 2 - Provide references, where appropriate, for the information concerning metals mobility, complexes, hard and soft electron fields, etc. in this paragraph.

Navy Response: References are included in Section 9 for the EPA 1996(d) guidance. Additionally, the references "(EPA 1996d)" and "(EPA 2004)" were added to Page 5-8, end of Paragraph 2. An additional reference was added to Section 9 References "EPA 2004 – *Framework for Metals Risk Assessment, Draft,* Risk Assessment Forum, U.S. Environmental Protection Agency. EPA/630/P-04/068a, July 2004."

55. Page 5-9, Paragraphs 4 and 5 - Provide references, where appropriate, for the information concerning the fate and transport characteristics of iron and manganese.

Navy Response: The reference "(ATSDR 2000)" was added to Section 5.4.2.5 Metals, Iron and Manganese. The reference "ATSDR, 2000 Toxicological profile for Manganese, September." was also added to the Section 9 References. The reference "(ATSDR 1992)" was added to Section 5.4.2.5 Metals, Thallium. The reference "ATSDR 1992 Toxicological profile for Thallium, July" was also added to Section 9 References. The reference "(ATSDR 1992b)" was added to Section 5.4.2.5 Metals, Arsenic and Vanadium. The reference "ATSDR, 1992b Toxicological profile for Vanadium, July" was also added to the Section 9 References. The reference "(EPA 2004)" was added to Section 5.4.2.5 Metals, Fate and Transport of Metals, at the end of the first paragraph on page 5-7. The reference "EPA 2004 – *Framework for Metals Risk Assessment, Draft*, Risk Assessment Forum, U.S. Environmental Protection Agency. EPA/630/P-04/068a, July 2004" was also added to the Section 9 References.

56. Page 5-9, Paragraph 6 - Provide references, where appropriate, for the information concerning the fate and transport characteristics of thallium.

Navy Response: Please refer to response to Comment #55 above.

57. Page 5-9, Paragraphs 7 and 8 - Provide references, where appropriate, for the information concerning the fate and transport characteristics of arsenic and vanadium.

Navy Response: Please refer to response to Comment #55 above.

58. Page 5-11, Last Sentence – The text indicating the occurrence of limited migration should be expanded to detail which constituents are migrating and the extent of migration.

Navy Response: The text immediately above the final sentence details all the various chemicals detected in the respective media, and whether they indicate a cross media transfer or downgradient migration. The findings discussed indicate that no soil to groundwater migration is occurring that produces unacceptable levels in groundwater. Therefore, the sentence was changed as follows, "Overall, the data suggest that soils at the site are not source of groundwater contamination through leaching, as detected inorganic chemicals are similar to background levels. The groundwater inorganic chemical levels are likely due to the saline water recharge from the ditch and other natural geochemical conditions that influence the suspended and dissolved inorganic chemical levels in the aqueous media in the area."

59. Table 5-4 –

a. The sources "d" (Spectrum Laboratory) and "e" (Mackay et al., 2000) are not used in this table and should be deleted.

b. The acronyms "VOC" and "SVOC" should be spelled out in the footnotes.

Navy Response:

a. The source superscripts were deleted.

b. The acronyms VOC and SVOC were spelled out in the footnotes.

<u>60. Figure 5-1</u> –

a. **EPA 2001 describes the Construction Worker as a short-term receptor who is exposed to soil contaminants during the workday for the duration of a single construction project (typically a year or less). The activities for this receptor typically involve substantial on-site exposures to surface and subsurface soils. The construction worker is expected to have a very high soil ingestion rate. EPA assumes the Construction Worker to be exposed to contaminants via the following direct and indirect pathways: incidental soil ingestion, dermal absorption, inhalation of volatiles outdoors, and inhalation of fugitive dust. Consequently, the Conceptual Site Model should identify the Construction Worker as a potential human receptor for surface soil.**

b. **The conceptual site model should include residential exposures to subsurface soil. Future residents could become exposed to subsurface soils through a variety of mechanisms, including excavations for residential building foundations.**

c. **The conceptual site model should evaluate the potential future residential exposure scenario. Therefore, remove "?" marks and the definition of this mark from Figure 5-1.**

d. **Figure 5-1 should be consistent with the CSM presented in the risk assessment reported in Appendix J. The CSM in Appendix J evaluates the potential future residential pathway for surface soil, and evaluates ingestion and dermal exposure for subsurface soil.**

e. **A resident could be exposed to surface water and sediment. Therefore, the risk assessment should evaluate ingestion and dermal contact with surface water and sediment as potentially complete exposure pathways.**

f. **For the future residential exposure scenario, clarify why root uptake of metals and subsequent ingestion in home-grown vegetables is not a pathway of concern for this site.**

g. **Dermal contact and incidental ingestion of groundwater is a complete exposure pathway for construction workers, as groundwater is located above development depth (i.e., 10 feet bgs).**

<u>Navy Response</u>:
a. and b. For the AOC H risk assessment, subsurface soil concentrations (as compared to surface soil concentrations) were evaluated to determine whether conclusions that the site does not pose an unacceptable risk for the residential scenario remain valid for subsurface soil. Please see the response to EQB Comment 13b. Additionally, construction worker exposures to both surface and subsurface soil (termed "total soil") were evaluated in the HHRA. As presented in Table 9.8 of Appendix J, exposures to total soil yield an estimated ELCR of 3E-7 and an estimated HI of 0.05. This is discussed in Section 6.8.
c. Comment incorporated.
d. Figure 5-1, as revised, is consistent with the exposure scenarios in the regulatory approved Work Plan and EPA Region II policy.
e. The recreational adult, youth, and child scenario evaluated represents a nearby resident visiting the ephemeral stream for recreational purpose. Both ingestion and dermal contact related

exposure was evaluated for these receptors, as presented in Tables 7.1, 7.2 and 7.3 of Appendix J.

f. The soil organic chemicals detected are not very soluble (ATSDR 1994b, and 1995), thus are not expected to be absorbed into plants. The inorganic chemical concentrations at the site are attributable to background soils, particularly for the inorganics identified to contribute to risks, as discussed in Section 6.10.1. Thus, bioaccumulation in plants grown in site soils will not pose a risk over that of background. The EPA guidance indicates a need for evaluation of secondary exposure pathways such as exposure through produce grown on residential properties, when site media, primarily surface soil indicate presence of relatively high levels of contamination that require corrective actions (EPA 1989b).

g. Dermal contact with groundwater was added to Figure 5-1 under the construction worker scenario. This scenario was evaluated for locations on-site where groundwater is within 6 ft of the site surface. The ELCR estimated for a construction worker is 4E-7 and the estimated HI is 5 due to manganese in groundwater. This is discussed in Section 6.10.2.3. However, the manganese detected in AOC H groundwater is attributable to background and, thus, no actions are recommended with respect to manganese in groundwater at AOC H.

<u>61. Page 6-1, Section 6.1, Paragraph 1</u> - The location of this site near a roadway and the presence of a building on-site also support the assumption that this site could be residential in the future. The statement that the residential exposure scenario is included simply for comparison is misleading. Unless it can be demonstrated that a residential exposure scenario is not a potential future use of this site, this statement along with the statement that the features at the site preclude residential use should be removed here and elsewhere in the report as appropriate.

<u>Navy Response</u>: The Navy disagrees with the comment. As described in Section 6.3 and presented in Figure 6.1, future land use for this area according to Puerto Rico Planning Board is as a special protected land/resource conservation area, thus development into residential area is not planned for the area where AOC H is located. As can be noted from the figures and photos, the site is close to the paved edge of the road, and likely within the right-of-way. The 'building' is the remains of the dilapidated concrete walls of the former power house. It is not inhabitable, and would need to be removed for any future development of the site. This small site that is located close to the major access road to this portion of the island may not be suitable for residential development. The exposure assessment land use discussion identified the potential uncertainty associated with assuming a residential land use for the site.

<u>62. Page 6-5, Section 6.5.1, Paragraph 2</u> - As stated previously, subsurface soils should be screened using residential PRGs. If additional contaminants are identified as contaminants of potential concern for the residential exposure scenario for the risk assessment, risks associated with exposure to contaminants in subsurface soil should be re-evaluated.

<u>Navy Response</u>: This comment has been repeated several times. Please refer to responses to comments 13, 15, 27, and others above.

63. Page 6-5, Section 6.5.1, Third Bullet - The second sentence is unclear. If the migration to groundwater SSLs were used to eliminate chemicals from evaluation in the risk assessment, then an additional screening should be done to confirm that the migration to groundwater SSL is more conservative than the residential PRG for each chemical that was screened out.

Navy Response: Migration to groundwater screening and COPC screening are two independent processes. No chemical exceeding a PRG was eliminated from risk assessment based on the SSLs, and there is no relationship between SSL value exceedence and the PRG exceedence. The sentence, "The leachability-based comparison results were discussed in Section 5.0, and were not included as COPCs in this section." was revised to read: "The leachability-based comparison results were discussed in Section 5.0."

64. Page 6-5, Section 6.5.1, Paragraph 7 - Provide further discussion in the text on the applicability of facility-wide background surface water data to site surface water. Include a discussion on the water chemistry of the surface water samples used for background and site surface water (e.g., specific conductance, pH, salinity, turbidity).

Navy Response: Section 6.5.1, Paragraph 7 does not have anything to do with facility wide background surface water data. Section 6.5.1 is the COPC selection process for human health risk assessment, which did not consider background data.

65. Page 6-7, Section 6.6.1, Paragraph 4 - Clarify whether the 1997 updated *Exposure Factors Handbook* or the 1991 version was used as a reference for exposure parameter data. The 1997 reference is listed in Section 6.1.

Navy Response: Both 1991 and 1997 Exposure Factors handbook references were used for exposure factors, as included in Appendix J, Table 4s. The Table 4s in Appendix J include a comprehensive list of the exposure factors and their source, which includes several other source references to the exposure factors guidance. The following full reference to the EPA's 1991 and 1997 guidance replace the EPA, 1989a reference in the first bullet:
"*EPA, 1991a: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03*."

"EPA, 1997b: *Exposure Factors Handbook*. EPA/600/P-95/002Fa."

66. Page 6-8, Section 6.6.1.2, First Paragraph - The second sentence states that subsurface soil samples were collected from 0.5 to 10 feet bgs. However, it appears that subsurface soil samples were consistently collected from 4 to 6 feet bgs. As requested earlier, provide further discussion on the depths at which subsurface soil samples were collected, the rationale for selecting that depth, and whether these soils are representative of subsurface conditions from 0.5 to 10 feet bgs.

Navy Response:
Page 6-8, Section 6.6.1.2, first paragraph, second sentence was edited to read: "The COPCs were selected by comparing detected concentrations in soil samples from the 0-6 ft interval against industrial PRGs." The sampling depth is discussed in Section 4.0; the rationale for sample depth and locations is discussed in the Work Plan. Subsurface soil samples were collected in accordance with the regulatory approved Work Plan.

67. Page 6-8, Section 6.6.1.2, Paragraph 2 - The assumption that inorganics do not have the potential to transfer through the skin is not consistent with current EPA guidance on evaluating dermal exposure (RAGS Part E). This guidance states that "...the skin has a limited capacity to reduce the transport rate of inorganic and/or highly ionized organic chemicals. In addition, the viable epidermis will contribute insignificantly as a barrier to these chemicals…" This guidance presents specific methodology for evaluating dermal exposure to inorganics in water. Therefore, the risks associated with this exposure pathway should be quantified for all applicable receptors.

Navy Response: The dermal exposures to receptors were evaluated for all the site exposure media (e.g., dermal exposures were evaluated for industrial workers, residential adult and child receptors, and construction workers for groundwater) for the complete exposure pathways identified. The CERCLA Technical Subcommittee has concurred that because basements are not installed in Puerto Rico, the construction worker scenario will be limited to the top 6 feet bgs.

68. Page 6-9, Section 6.6.1.4 - This paragraph states that the recreational receptor was assumed to visit the site both days of the weekend, 104 days per year. However, the risk assessment evaluates exposure to surface water and sediments for only 52 days per year. The risk assessment should be corrected to represent the number of days of exposure presented in the text.

68A. The rationale provided in the Response should be included in the revised document. The rationale for exposure parameters should be provided in the HHRA report or a reference provided to the specific section of the work plan that discusses the exposure parameter values, including the rationale for the site-specific exposure values to be used in the HHRA.

Navy Response: The text included in the RI Report on exposure factors is purposefully brief because the exposure factors were presented in RAGS Part D format with references and footnotes citing guidance from which exposure factors were selected, as well as providing rationale for the selected factors. A brief explanation was provided in the text of the RI Report for factors selected based on the site-specific conditions and best-professional judgment. The text of the revised report in the RI has been edited to include a rationale for the selected recreational visitor exposure frequency factors for the site visit, and exposure to sediment and surface water. An exposure frequency of 52 days per year was proposed for a recreational receptor in the Work Plan and the value used is consistent with the Work Plan (CH2M HILL 2003b). The following explanation has been incorporated into the revised report in Section 6.6.1.4, replacing the last two sentences: "The EF value of 52 days/year assumes one visit per week (i.e., each weekend) throughout the year. The ephemeral stream adjacent to the site is small, relatively narrow, overgrown, and surrounded by steep edges. It is not similar to a pool of water such as rivers, lakes, or oceans. The frequency of exposure is assumed to be half the time a recreational visitor is present at the site."

69. Page 6-11, Section 6.6.2.9 - The default PEF is not applicable to construction worker exposure to particulates. The same draft EPA guidance referenced in this section also provides the equation for calculating a PEF applicable to the construction worker exposure scenario.

Navy Response: A construction scenario-specific PEF value was calculated and included in the revised particulate inhalation pathway evaluation for the construction worker. A site-specific PEF of 1.33 x 10^7 m^3/kg was calculated using equations presented in EPA soil screening guidance (EPA, 2002). The calculated PEF is presented in Table 4.9 Supplement in Appendix J. Estimated risks associated with the ambient air exposures are acceptable (see Table 7.8 in Appendix J).

70. Page 6-13, Section 6.8 - As stated in EPA's Response to Comments on the National Contingency Plan (EPA, 1990), EPA's preference is to set cleanup levels at the more protective end of the risk range. However, site-specific or remedy-specific factors will enter into the determination of where within the risk range the cleanup standard for a given contaminant will be established. EPA further states that as risks increase above 10^{-6}, they become less desirable. Therefore, the third sentence is misleading and should be eliminated. It is inappropriate to have risk management opinions stated in this section of the HHRA. The second and third paragraphs should be moved to Section 6.10. Section 6.8 should describe the methodology used in developing risk estimates and present those risk estimates. Section 6.10 is dedicated to comparing site data to background.

70A. Please provide a specific section and paragraph of the EPA *Guidance on Risk Characterization for Risk Managers and Risk Assessors* where the EPA states that the acceptable risk range is 1E-06 to 1E-04 and no further action is required. Note that the memorandum requires that risk characterization and risk management be presented in separate parts of a report. The Risk Characterization section should present the estimates of cancer risk and hazard indices along with qualitative discussions of the risk assessment and uncertainties associated with the risk estimates for each receptor. All discussion of how EPA will use the results of the risk assessment or how EPA will make decisions based on the results of the risk assessment should be removed from the Risk Characterization section and moved to a separate section on Risk Management or be included in a Recommendations section.

Navy Response: Subsequent to the NCP guidance, EPA released a memorandum on the acceptable risk levels at CERCLA sites. This is included in EPA policy for acceptable risk ranges and remedial decisions, as stated in the *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*. OSWER Directive 9355.0-30, a memorandum from Don R. Clay, Assistant Administrator, to the EPA Directors in April 1991. This 11-page memorandum includes the description of acceptable risk criteria and conditions for selecting no remedial action at sites, using the results of risk assessments. Pages 1, 3, and 4 of the memorandum include specific language defining the acceptable risk ranges. In Section 6.8, first paragraph, the fourth sentence has been revised to read: "For the purposes of risk management decision making, the target risk range of 1E-4 to 1E-6 (1 to 100 in a million) was used for site risk estimations, in accordance with EPA guidance, which provides the acceptable risk range for site risk estimations and decision making." The second and third paragraphs were moved to Section 6.10 as recommended by the comment.

71. <u>Page 6-14, Section 6.8, current maintenance worker</u> - The risk estimate is within the risk range, not below the risk range. Correct the text here and elsewhere as appropriate. The risk to an overall residential receptor representing 30 years of exposure (i.e., the sum of the adult and child cumulative risk estimates) should be presented.

<u>Navy Response</u>: A sum of an adult and child scenario risks and HI was added to the revised risk summary in Appendix J, Table 7.5 RME Supplement and Table 9.5 Supplement. The total ELCR is 2x10-4 and the total HI is 108. However, the primary risk driver (arsenic) for these is not believed to be site related (see Section 6.10.2.1).

72. <u>Page 6-15, Section 6.9.1, Paragraph 1</u> - PREQB considers the evaluation of groundwater classified as a potable groundwater resource in the risk assessment appropriate. The Navy has identified exposure pathway specific risk estimates and has provided a discussion on background concentrations for metals. Therefore, including chemicals detected in groundwater in a risk assessment where groundwater is classified as a potable source is not a source of uncertainty. Not doing so would be a source of uncertainty.

<u>Navy Response</u>: The groundwater was evaluated as a potable source. However, estimated risks from groundwater potable use are associated with high uncertainty, because salinity makes it not feasible for use as a potable source.

73. <u>Page 6-16, Section 6.10</u> - As commented earlier, provide a discussion in the text on the soil characteristics of the facility soil samples used to calculate background concentrations as compared to site soils in which metals were detected.

<u>Navy Response</u>: The characteristics of the facility wide background soil are presented in the *Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report* (CH2M HILL, October 16, 2002). To assist the reader, the following sentences will be added at the end of the first paragraph under Section 6.10: "Background soil characteristics are discussed in the *Final Soil, Groundwater, Surface Water, and Sediment Background Investigation Report* (CH2M HILL, October 16, 2002b). The report notes that the soil inorganic concentrations from all soil types were statistically comparable."

<u>74. Page 6-17, Section 6.10.2</u> - Remove references to site-wide background concentrations for groundwater from this section. Concentrations of metals detected in on-site wells should be compared to site-specific background monitoring well data.

<u>Navy Response</u>: The concentration of metals detected in on-site wells was compared to site-specific background monitoring well data, as shown in Table 6-12. The site-specific data were additionally compared to base-wide background data. It was previously agreed with the reviewing agencies (EPA and EQB) that both site-specific and facility-wide background data can be used during site-specific RIs, as indicated in the background report (CH2M HILL, 2002b). The methodology used is consistent with what was agreed to by the Navy and the agencies (EPA and EQB).

<u>75. Page 6-19, Section 6.10.2.3, Paragraph 2</u> - Provide supporting documentation that shows that the ORP and/or pH are reflective of reducing conditions for each groundwater sample where filtered and unfiltered manganese concentrations are similar.

<u>Navy Response</u>: The text that the comment is referring to was only an explanation of the observed site conditions and interpretation of the possible reason. Although the pH data tend to support the observation, the ORP data do not support the supposition of reducing conditions (although poor instrument performance was suspected). To avoid confusion about the interpretation of the manganese results, and to avoid drawing conclusions based on the ORP data, the second paragraph of Section 6.10.2.3 was replaced with the following:

"The manganese concentrations detected in site surface and subsurface soil were comparable to base-wide background concentration. In addition, none of the site groundwater manganese concentrations (total or dissolved) exceeded the base-wide background concentrations. In addition, there is no known or suspected anthropogenic source of manganese at AOC H. Therefore, the manganese detected in AOC H soil and groundwater is attributable to background and, thus, no actions are recommended with respect to manganese in groundwater at AOC H."

<u>76. Page 6-19, Section 6.10.2.4</u> - Provide supporting documentation or a reference to a table on the turbidity or total suspended solids of the samples with elevated thallium detections referenced in this section.

<u>Navy Response</u>: The fact that there is no dissolved thallium associated with the total thallium for these wells is the supporting documentation. This is what the text states. Additionally Section 6.9.4 was revised to include the following new paragraph: "The hazard index estimated was above 1.0 based on potable use of the site groundwater under a future residential land use scenario due to the presence of inorganic chemicals in groundwater. The inorganic chemicals contributing to HI above 1.0 are thallium (HI=35), iron (HI=22), manganese (HI=6.8), vanadium (HI=4.5), and arsenic (HI=1.3). However, all these metals were detected in samples analyzed for total metal concentrations, but not detected in the dissolved metals analyses from the same wells (see Table 4-6). These HIs represent the potential hazards associated with the ingestion of unfiltered water as a potable drinking water supply. Based on the quantitative data presented,

that demonstrates that groundwater must be filtered prior to use as a potable drinking water supply, the HIs associated with actual exposure are likely to be lower."

77. Figure 6-2 – The locations of the four (4) surface soil samples collected within the building should be indicated and the appropriate arsenic concentrations presented.

Navy Response: Figure 6-2 has been edited to include the four surface soil samples collected inside the building.

78. Page 7-10, Section 7.2.2.1, Paragraph 3 - EPA guidance requires the use of the maximum bioaccumulation values for screening purposes (EPA, 1997). Therefore, 90th percentile BCFs should not be used. The screening should be evaluated to determine if the use of 90th percentile values resulted in the elimination of chemicals from further evaluation that should be included in the risk assessment.

Navy Response: Although the use of the maximum BAF is likely to be overly conservative in most cases, the maximum BAFs (rather than 90th percentile values) were used in the SERA (Step 2) portion of the ERA. These maximum values were replaced with more reasonable estimates in Step 3A. The following text changes were made:

Section 7.2.2.1:

"Dietary items for which tissue concentrations were modeled included aquatic invertebrates, fish, terrestrial plants, soil invertebrates, and small mammals. For the screening portion of the ERA, the uptake of chemicals from the abiotic media into these food items was based upon conservative (e.g., maximum) bioconcentration factors (BCFs) or bioaccumulation factors (BAFs) from the literature. Default factors of 1.0 were used only when data were unavailable for a chemical in the literature."

Section 7.2.4.1:

Food Web Exposures

"HQs based upon maximum exposure doses for each upper trophic level receptor are listed in Table 7-14. Based upon a comparison to NOAELs, nine metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc) and one pesticide (DDE) had HQs equaling or exceeding 1.0 for one or more upper trophic level receptors and were identified as COPCs. Six PCBs and four SVOCs had maximum reporting limits exceeded screening values; however, they were not detected in any sample and were therefore not retained as COPCs.

Ingestion screening values were not available for avian or mammalian receptors for two organic chemicals (4-bromophenyl-phenylether and 4-chlorophenyl-phenylether), and ingestion screening values were not available for avian receptors for three chemicals (1,1,2,2-tetrachloroethane, hexachlorocyclopentadiene, and hexachloroethane). Only 4-bromophenyl-phenylether was detected on the site and was retained as a COPC. The remaining chemicals were not detected and therefore were not identified as COPCs."

Section 7.3.1:

- "Risk estimates based upon maximum chemical concentrations in media were supplemented by risk estimates based upon average (arithmetic mean) chemical concentrations. In addition, BAFs and BCFs were based upon, or modeled from, central tendency estimates (e.g., median or mean) from the literature as opposed to the maximum estimates used in the SERA for many chemicals. Revised BAF/ BCF values used in Step 3A are provided in Tables 7-16 and 7-17."

In addition, Tables 7-6, 7-7, 7-14, 7-15, 7-16, 7-17, and 7-23 were also modified.

79. Page 7-13, Section 7.2.2.1, Dietary Intakes - Provide a discussion on the assumed dietary composition assumptions (i.e., PDFi) of the dietary intake equation provided in Table 7-8. EPA guidance requires a diet composed of 100% of the most contaminated food item. Therefore, the rationale for varying from the EPA guidance should be discussed in the text of the report.

Navy Response: The screening risk estimates were modified to be based upon exclusive diets. Table 7-8 has been updated to reflect these changes. Table 7-14 was also revised to reflect the changes to the HQs resulting from the changes to the dietary composition. Tables 7-15, 7-16, 7-17, and 7-23 have been modified to reflect changes in the COPCs from Step 2 (based upon the revised results in Table 7-14).

80. Page 7-13, Section 7.2.3.1, Paragraph 2 - EPA has developed ecological soil screening guidance and levels (Eco SSLs) that should be used to screen soils. The latest publication is a memo from the Office of Solid Waste and Emergency Response dated December 23, 2003 on the "*Release of Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs) and Eco-SSLs for Nine Contaminants*." This resource should be consulted first, followed by the resources identified in this section. If screening criteria for sediment are not available from these sources, screening criteria should be calculated using the equilibrium partitioning approach or by deriving a NOAEL-based screening criterion from laboratory studies. EPA's Ecotox database should be reviewed to determine if studies are available for chemicals for which NOAELs will be derived.

Navy Response: For soil, please see the response to Comment 13a. For sediment, there were no detected organic constituents that lacked available screening values.

81. Page 7-14, Section 7.2.3.1, Paragraph 3 - Provide salinity data in this section that shows that the water is saline.

Navy Response: Salinity data are provided in Section 3, Table 3-8, and were referenced in this section. The following sentence was inserted at the end of the first paragraph on page 7-14: "Table 3-8 (Section 3) summarizes the field surface water quality parameters for this site. Salinity values at the four surface water stations ranged from 25.8 to 32.2 parts per thousand, and therefore demonstrate that the on-site surface water body is saline."

82. Page 7-14, Section 7.2.3.2, Paragraph 2 - Several of the laboratory studies upon which NOAELs were derived are subchronic studies. Since an additional uncertainty factor of 10 should be used to convert subchronic studies to chronic studies, the text and tables of the report should clarify that this was done. If an additional uncertainty factor should be incorporated into the NOAEL, the screening level assessment and the baseline ERA should be evaluated to determine if the application of the uncertainty factor to subchronic studies results in unacceptable risks to the identified assessment endpoints.

Navy Response: The appropriate uncertainty factors were applied to all subchronic studies used, as indicated in Table 7-8a, which was added to the ERA. Tables 7-9 and 7-10 were also footnoted to indicate which uncertainty factors listed in Table 7-8a were applied to derive the values reported in these tables.

The second paragraph of Section 7.2.3.2 (page 7-14) was replaced with the following:
"Growth and reproduction were emphasized as assessment endpoints because they are the most relevant, ecologically, to maintaining viable populations and because they are generally the most studied chronic toxicological endpoints for ecological receptors. If several chronic toxicity studies were available from the literature, the most appropriate study was selected for each receptor species based upon study design, study methodology, study duration, study endpoint, and test species. Ingestion screening values were derived for both chronic No Observed Adverse Effect Level (NOAEL) and chronic Lowest Observed Effect Level (LOAEL) endpoints. The applicable uncertainty factors from Table 7-8a were applied to derive these screening values, where necessary. Ingestion screening values for mammals and birds are summarized in Tables 7-9 and 7-10, respectively."

83. Page 7-16, Section 7.3.1, Paragraph 2 - Provide a table of the area use factors used in the Step 3A calculations referred to in the last bullet of this paragraph.

Navy Response: Table 7-18 has been updated to replace the Home Range data column with the Area Use Factor values and the supporting data and references used to calculate these AUF values. This table was referenced in the last bullet of Section 7.3.1.

84. Page 7-18, Section 7.3.2.3 - As described in the NOAA SQuiRTs, Apparent Effects Thresholds are values above which adverse biological impacts would always be expected due to exposure to that contaminant alone. Adverse impacts are known to occur at levels below the Apparent Effects Threshold. Therefore, these values are not consistent with the screening criteria used for other environmental media or with this phase of the ERA. The EPA Ecotox database should be reviewed to determine if toxicity data is available that can be used to develop NOAEL-based screening criteria. If data does not exist to develop appropriate screening criteria, these chemicals should be retained as PCOCs. Also, Section 7.3.3.3 provides a list of metals retained as PCOCs that Section 7.3.2.3 indicates were not retained as PCOCs, and the list provided in Section 7.3.3.3 does not include the metals identified in Section 7.3.2.3 as

being retained as PCOCs (beryllium and thallium). Clarify this apparent discrepancy.

Navy Response: It is acknowledged that the AET-based values reported in the text (which are actually the lowest of several AET values from multiple taxa) are less conservative than the screening values used in the screening tables. For that reason, these AET-based values were not used in the Step 2 screening tables to conduct the screening. However, as AET-based values are sometimes used to derive clean-up criteria, a comparison to these values for chemicals that lack other, more conservative, screening values is useful to determine the likelihood for adverse effects in the Step 3A refined assessment.

Section 7.3.3.3 was revised to discuss only beryllium and thallium, which were the only sediment PCOCs retained, as described in Section 7.3.2.3. The following text replaced the existing text of Section 7.3.3.3:
"Beryllium and thallium were identified as PCOCs in sediment from AOC H. Onsite concentrations of these parameters were compared to concentrations in an upgradient sediment sample in Table 7-25. Ratios were developed for comparing maximum site concentrations with upgradient sediment concentrations. Maximum site concentrations of beryllium slightly exceeded the upgradient concentration (ratio of 1.02), while maximum site concentrations of thallium were below the upgradient concentration (ratio 0.4). Because these inorganics were comparable to or below background conditions, they are not likely to pose unacceptable risk to directly exposed aquatic organisms, and therefore they will not be considered further as PCOCs."
Table 7-25, as referenced in Section 7.3.3.3, was also updated to show only the comparison of beryllium and thallium to upgradient concentrations.

85. Page 7-18, Section 7.3.2.4 - It is not clear from this section that zinc was not retained as a PCOC. It is not until Section 7.3.3.4 that it is made clear that no chemicals associated with upper trophic level receptors were retained. Provide more detail why zinc was not carried forward as a PCOC.

Navy Response: The last sentence in Section 7.3.2.4, Page 7-18, was changed to the following: "However, the LOAEL was not exceeded for zinc (HQ of 0.19) and the site is small; therefore, the exposure dose for zinc is expected to be protective of the population, which is the assessment endpoint being evaluated. Because none of the LOAELs were exceeded, and NOAELs were not exceeded for any other terrestrial or aquatic receptor, no PCOCs for upper trophic level receptors were retained for further evaluation."

86. Page 7-20, Section 7.3.3.3 - The third sentence states that maximum site concentrations were compared to maximum upgradient sediment concentrations. However the previous sentence references the upgradient sediment sample as the background sample. Clarify in the text what is meant by the maximum background sediment concentration when only one sample was collected upgradient from the site. The last sentence states that barium does not have a literature screening value available and this contributes to the potential for unacceptable risks to be low. Screening values can be derived from studies as described in EPA's guidance *Process for Designing and Conducting Ecological Risk Assessment*, Interim Final.

Furthermore, sediment quality criteria can also be calculated from water quality criteria using the equilibrium partitioning approach.

Navy Response: : It is correct that a single upgradient sample was collected at this site. Therefore, the text (and Table 7-25) was modified to remove the word "maximum" when referring to background.

As described in the response to Comment 84, Section 7.3.3.3 was updated to describe only beryllium and thallium, which were the only retained PCOCs. Because barium will no longer be included in this section, the comment regarding development of a screening value for barium no longer applies.

87. Page 7-20, Section 7.3.3.4 - Provide further detail on exceedances of NOAELs. The discussion should include information on the magnitude of the difference between a NOAEL and a LOAEL used for screening and the basis for each LOAEL (i.e., endpoint for the study, such as an LD50).

Navy Response: Please see the response to Comment 85. The text of Section 7.3.3.4 has been changed to the following:

"The results of the food web exposure modeling identified no COCs. Based upon a comparison to LOAELs, no HQ exceeded one for any of the terrestrial or aquatic receptors. Only the HQ for zinc (pearly-eyed thrasher) exceeded one based upon the NOAEL (HQ of 1.73). The ingestion screening value for zinc used in the HQ calculation was based upon a 44-week chronic study with chickens; endpoints were based upon reproductive effects. The experiment-derived NOAEL (14.5 mg/kg/day) was about a factor of nine lower than the experiment-derived LOAEL (131 mg/kg/day). The actual threshold of an effect is somewhere between the NOAEL and LOAEL. This threshold is often estimated by calculating the geometric mean of the NOAEL and LOAEL. For zinc, this value (43.6 mg/kg/day) would not be exceeded by the calculated dose for the pearly-eyed thrasher, suggesting no unacceptable risk."

88. Pages 7-21 to 7-23, Section 7.4 - The uncertainty associated with the lack of screening criteria for sediment and/or water for specific contaminants should be discussed in this section. Each chemical and media should be identified as part of the discussion.

Navy Response: The following text was added to the second bullet in Section 7.4 (page 7-21): "For the Step 2 screen: (1) 1 pesticide, 12 SVOCs, and 3 VOCs detected in surface soil lacked screening values; (2) 4 inorganics and 1 SVOC detected in surface water lacked screening values; and (3) 8 inorganics detected in sediment lacked screening values. These chemicals were evaluated in Step 3 through a combination of background/upgradient comparisons and a comparison to toxicological information from the literature. Thus, the uncertainty associated with the lack of screening values for these detected chemicals is low because there were other, relevant data that allowed them to be evaluated."

89. Page 7-31, Table 7-6 - Provide a specific reference to Section 7.2.2.1 of the document which discusses the soil-rat BAF.

Navy Response: Table 7-6 has been updated to include a specific reference to Section 7.2.2.1.

90. Page 7-60, Table 7-18 - Provide a reference for the allometric equation used to calculate average water and food ingestion rates.

Navy Response: Table 7-18 has been updated to include references for the allometric equations.

91. Appendix J, Table 4.1 - Clarify why youths are defined as 9 through 18 for the purposes of determining body weight, but are defined as 8 through 18 for the purpose of determine skin surface area. An age group of 8 to 18 (i.e., data for ages 8<9 up to and including 17<18) is preferred.

Navy Response: The exposure duration used is for 10 years for a youth receptor. Therefore, the skin surface area for the age-group between 7 and 18 years old is approximately 4040 cm^2 (a value of 4000 cm^2 was used in the risk estimations). The RAGS Part E guidance provided this age group as one set of values (see Exhibit C-1 for further details), which was used in risk calculations. The body weight for the 8 to 18 year old is estimated at 50.98 kg (a value of 51 kg was used in the risk estimation). The EPA Exposure Factors Handbook, Table 7-3 in Chapter 7, includes the detailed listing of the body weights by age group. A calculated value using individual age groups between 8 and 18 years age for the same surface areas yields a surface area of 4300 cm^2, if implemented per the comment. The suggested change in this comment will only slightly alter the dermal intake compared to what is currently in the document for the youth receptors. Because the change will not significantly alter the overall findings of the risk assessment, it is proposed not to make the revision to this risk assessment, but to concur as a team what value will be used for future risk assessments prior to conducting the risk assessments. Note that the footnotes (7) in Tables 4s have been changed to indicate the skin surface area presented for a youth is the surface area for forearms, hands, lower legs, and feet for 7 to 18 year age-group.

92. Appendix J, Tables 4.2 and 4.3 - Footnote 3 describes the basis for the body weight for a youth, 51 kg, as the average of the mean values for boys and girls ages 9 through 18. However footnote 4 for Table 4.3 states that the basis for the same body weight (51 kg) is the average value for the 6 year old and 18 year old male body weight. Clarify which approach was used. The age groups represented by the youth receptor should be consistent across exposure pathways.

Navy Response: All the footnotes were corrected to reflect consistently and accurately the age group of the population used for the body weight. The approach used to calculate the body weight for a youth was taken from The U.S. EPA Exposure Factors Handbook (August 1997), Table 7-3: Body Weights of Children. Table 7-3 includes a column for the mean weight of boys and girls. The age range used for the body weight calculation was based on professional judgment of a youth that is 9 years to 18 years of age. The calculated body weight was 51 kg. Table 4-3 of Appendix J contains the edited footnote.

93. Appendix J, Table 4.3, Footnotes 7 and 8 - These footnotes state that 25% of the total surface area for either a 6 to 18 year old or 0 to 6 year old was used as the skin surface area exposed to sediments. It is unclear why lower body sizes have been incorporated into the skin surface area for a youth. Lower body size results in lower exposure. It is unclear why a percentage is used when EPA provides specific body part skin surface areas that can be summed to determine an average skin surface area for a particular age group. This approach was used for the adult receptor and should be used for the youth and child receptor as well. The age groups represented by the youth receptor should be consistent across exposure pathways.

Navy Response: The skin surface area included for exposure for recreational receptors is based on surface area of hands, forearms, lower legs, and feet as described in footnote 5 (above referenced footnote in the comment above). The age group used for the estimation of the surface area is based on the closest age-group provided in the EPA guidance. Please see response to Comment 92 above. The footnotes 7 and 8 have been modified as follows: Footnote 7 has been modified to "skin surface area (SA) presented for a youth is the surface area for forearms, hands, lower legs, and feet for 7 to 18 year age-group from Exhibit C-1, EPA RAGS Part E guidance."

The skin surface area for the <1 to 6 yr old age-group is estimated at approximately 1877 cm^2, and the risk calculations included a value of 2000 cm^2. The footnote 8 has been modified to "skin surface area (SA) presented for a child is the surface area for forearms, hands, lower legs, and feet for 1 to 6 year age-group estimated at 1811 cm^2, rounded to 2000 cm^2 from Exhibit C-1, EPA RAGS Part E guidance."

94. Appendix J, Table 4.4, Footnotes 6 and 7 - Refer to previous comment on Table 4.3, Footnotes 7 and 8 above. Also, surface water penetrates clothing; therefore, the skin surface area should include arms, hands, legs and feet for the appropriate age groups.

Navy Response: Please see response to Comment 93. Skin surface area used is noted in footnote 5, and includes arms, hands, feet and lower legs, and is comparable to the skin surface area values proposed in the work plan (CH2M HILL 2003b), however uses the surface area values from the latest guidance.

95. Appendix J, Table 4.5 - Due to weather conditions, it is not protective to assume that maintenance workers will be wearing long pants. It is more protective to assume that the legs will be exposed. The skin surface area exposure parameter value should be adjusted accordingly.

Navy Response: The exposure scenario used is consistent with EPA guidance, with other site risk assessments previously conducted (CH2M HILL 2003a), and with the Work Plan (CH2M HILL 2003b). Therefore, no changes are warranted.

96. Appendix J, Table 4.6 - Due to the tropical weather conditions, it is not protective to assume that a maintenance worker would only be on-site for 6 months each year. The exposure duration should be 2 days per week for 52 weeks per year.

Navy Response: This site-specific scenario was developed based on site-specific conditions such as size of the site, its relative accessibility, and best professional judgment, which is consistent with guidance. As indicated in text of Section 6.6.1.1, exposure frequency for a maintenance worker is based on the assumption that maintenance activity, such as cutting the grass at AOC H occurs once a week (52 days/year) throughout the year, with the workers spending the entire workday on the site. Considering AOC H is a small area around the abandoned building, this is a conservative assumption, especially because it would not likely take all of a work day to maintain the site. The footnote in Appendix J Table 4.6 has been changed to indicate once a week, throughout the year, for 25 years. Considering the small size of the site, this assumption is appropriately conservative.

97. Appendix J, Table 4.9 - Refer to comment to Page 6-11, Section 6.6.2.9 regarding appropriate construction worker PEF.

Navy Response: Please refer to response to Comment 69.

REFERENCES

EPA, 1987 *Compendium of Superfund Field Operations Methods*, United States Environmental Protection Agency, EPA/540/P-87/001, 1987.

EPA, 2001 *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites - Peer Review Draft*, United States Environmental Protection Agency, OSWER 9355.4-24, March 2001.

EPA, 2002 *Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers – Ground Water Forum Issue Paper*, United States Environmental Protection Agency, EPA 542-S-02-001. May 2002.

Attachment A

Comparison of the EPA Region 9 PRG Values from 2002 and 2004 Updates for Chemicals detected in AOC H Soils

		EPA Region 9 Preliminary Remediation Goals (PRGs)			
		Residential Land Use (HI=0.1 or Risk = 1E-6)		SSLs (DAF=20)	
Chemical	**Units**	**PRGs-2002**	**PRGs-2004**	**SSL-2002**	**SSL-2004**
Metals					
ALUMINUM	mg/kg	7614	7610	NA	NA
ANTIMONY	mg/kg	3.13	3.13	5	5
ARSENIC	mg/kg	0.39	0.39	29	29
BARIUM	mg/kg	537	537	1600	1600
BERYLLIUM	mg/kg	15.4	15.4	63	63
CADMIUM	mg/kg	3.7	3.7	8	8
CHROMIUM, TOTAL	mg/kg	211	211	38	38
COBALT	mg/kg	903	903	NA	NA
COPPER	mg/kg	313	313	NA	NA
IRON	mg/kg	2346	2346	NA	NA
MANGANESE	mg/kg	176	176	NA	NA
LEAD	mg/kg	400	400	NA	NA
MERCURY	mg/kg	2.35	2.35	NA	NA
NICKEL	mg/kg	156	156	130	130
SELENIUM	mg/kg	39.1	39.1	5	5
THALLIUM	mg/kg	0.52	0.52	NA	NA
VANADIUM	mg/kg	**55**	**7.8**	6000	6000
ZINC	mg/kg	2346	2346	12000	12000
Pesticides					
p,p'-DDD	mg/kg	2.44	2.44	16	16
p,p'-DDE	mg/kg	1.72	1.72	54	54
p,p'-DDT	mg/kg	1.72	1.72	32	32
Semi-Volatiles					
2,6-DINITROTOLUENE	mg/kg	0.72	0.72	0.0008	0.0008
DI-N-BUTYLPHTHALATE	mg/kg	NA	NA	NA	NA
BIS(2-ETHYLHEXYL) PHTHALATE	mg/kg	34.7	34.7	NA	NA
NAPHTHALENE	mg/kg	5.59	5.59	84	84
2-METHYLNAPHTHALENE*	mg/kg	31	31	NA	NA
3-NITROANILINE	mg/kg	NA	1.8	NA	NA
ACENAPHTHYLENE	mg/kg	NA	NA	NA	NA
ACENAPHTHENE	mg/kg	368	368	570	570
4-BROMOPHENYL PHENYL ETHER	mg/kg	NA	NA	NA	NA
DIBENZOFURAN	mg/kg	**29**	**14.5**	NA	NA
FLUORENE	mg/kg	275	275	560	560
PHENANTHRENE	mg/kg	NA	NA	NA	NA
ANTHRACENE	mg/kg	2190	2190	12000	12000
FLUORANTHENE	mg/kg	229	229	4300	43000
PYRENE	mg/kg	232	232	4200	4200
3,3'-DICHLOROBENZIDINE	mg/kg	1.08	1.08	0.007	0.007
BENZO(a)ANTHRACENE	mg/kg	0.62	0.62	2	2
CHRYSENE	mg/kg	3.8	3.8	160	160
BENZO(b)FLUORANTHENE	mg/kg	0.62	0.62	5	5
BENZO(k)FLUORANTHENE	mg/kg	6.2	6.2	49	49
BENZO(a)PYRENE	mg/kg	0.062	0.062	8	8
INDENO(1,2,3-c,d)PYRENE	mg/kg	0.62	0.62	14	14
DIBENZ(a,h)ANTHRACENE	mg/kg	0.062	0.062	2	2
BENZO(g,h,i)PERYLENE	mg/kg	NA	NA	NA	NA
CARBAZOLE	mg/kg	24.3	24.3	0.6	0.6
Volatiles					
1,1,2,2-TETRACHLOROETHANE	mg/kg	0.41	0.41	NA	NA
1,1-DICHLOROETHENE	mg/kg	12.4	12.4	0.06	0.06
ACETONE	mg/kg	**157**	**1413**	NA	NA
METHYLENE CHLORIDE	mg/kg	8.881	9.11	0.02	0.02
2-HEXANONE	mg/kg	NA	NA	NA	NA
CARBON DISULFIDE	mg/kg	24.3	24.3	NA	NA
XYLENES, TOTAL	mg/kg	**27.5**	**27.1**	210	210

Note:

* - value selected from EPA Region 3 RBC table, as Region 9 PRGs did not have a value for this chemical

NA - A value not available

APPENDIX M

ProUCL Output – Construction Worker

Appendix M - Groundwater (In Excavations)
ProUCL Output -4,4-DDD
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	4,4-DDD	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	6	
Minimum	1.00E-02	
Maximum	0.42	
Mean	0.158125	
Standard Deviation	0.20322	
Variance	0.041298	
Coefficient of Variation	1.285185	
Skewness	0.650191	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.663227	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	0.294249	
Gamma Statistics		
k hat	0.4836	
k star (bias corrected)	0.385583	
Theta hat	0.326975	
Theta star	0.410093	
nu hat	7.737602	
nu star	6.169335	
5% Approximate Chi Square Value	1.72649	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	1.199188	
Anderson-Darling Test Statistic	1.371848	
Anderson-Darling 5% Critical Value	0.765231	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.382405	
Kolmogrov-Smirnov 5% Critical Value	0.309643	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	0.565034	
95% Adjusted Gamma UCL	0.813489	
Lognormal Statistics		
Minimum of log data	-4.60517	
Maximum of log data	-0.867501	
Mean of log data	-3.16465	
Standard Deviation of log data	1.871473	
Variance of log data	3.50241	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.677445	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	0.243304	
MLE Standard Deviation	1.380529	
MLE Coefficient of Variation	5.674096	
MLE Skewness	199.7019	
MLE Median	0.042229	
MLE 80% Quantile	0.205306	
MLE 90% Quantile	0.467757	
MLE 95% Quantile	0.917523	
MLE 99% Quantile	3.281812	
MVU Estimate of Median	0.033736	
MVU Estimate of Mean	0.161026	
MVU Estimate of Standard Deviation	0.333195	

Appendix M - Groundwater (In Excavations)

ProUCL Output -4,4-DDD

NASD, Vieques Island, Puerto Rico

MVU Estimate of SE of Mean	0.103865	
95% H-UCL	16.05184	
95% Chebyshev (MVUE) UCL	0.613763	
97.5% Chebyshev (MVUE) UCL	0.809663	
99% Chebyshev (MVUE) UCL	1.194471	
Non-parametric Statisitics		
95% CLT UCL	0.276306	
95% Adjusted-CLT UCL	0.293954	
95% Modified-t UCL	0.297001	
95% Jackknife UCL	0.294249	
95% Chebyshev (Mean, Sd) UCL	0.471308	
97.5% Chebyshev (Mean, Sd) UCL	0.606822	
99% Chebyshev (Mean, Sd) UCL	0.873014	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	0.267602	
95% Bootstrap-t UCL	0.309128	
95% Hall's Bootstrap UCL	0.223266	
95% Percentile Bootstrap UCL	0.260625	
95% BCA Bootstrap UCL	0.261375	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	0.873014	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	YES	Cosider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Appendix M - Groundwater (In Excavations)
ProUCL Output -Aluminum
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Aluminum	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	8	
Minimum	130	
Maximum	9100	
Mean	3351.875	
Standard Deviation	3491.775	
Variance	12192494	
Coefficient of Variation	1.041738	
Skewness	0.58648	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.843764	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	5690.787	
Gamma Statistics		
k hat	0.699227	
k star (bias corrected)	0.52035	
Theta hat	4793.688	
Theta star	6441.577	
nu hat	11.18763	
nu star	8.325602	
5% Approximate Chi Square Value	2.924282	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	2.17756	
Anderson-Darling Test Statistic	0.608386	
Anderson-Darling 5% Critical Value	0.748631	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.288287	
Kolmogrov-Smirnov 5% Critical Value	0.305061	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	9542.984	
95% Adjusted Gamma UCL	12815.44	
Lognormal Statistics		
Minimum of log data	4.867534	
Maximum of log data	9.11603	
Mean of log data	7.252839	
Standard Deviation of log data	1.624641	
Variance of log data	2.639458	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.869758	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	5284.682	
MLE Standard Deviation	19058.3	
MLE Coefficient of Variation	3.60633	
MLE Skewness	5.77E+01	
MLE Median	1412.108	
MLE 80% Quantile	5572.84	
MLE 90% Quantile	11390.13	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Aluminum
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	20442.53	
MLE 99% Quantile	61805.85	
MVU Estimate of Median	1193.591	
MVU Estimate of Mean	3985.554	
MVU Estimate of Standard Deviation	7036	
MVU Estimate of SE of Mean	2283.827	
95% H-UCL	129678.1	
95% Chebyshev (MVUE) UCL	13940.52	
97.5% Chebyshev (MVUE) UCL	18248.05	
99% Chebyshev (MVUE) UCL	26709.34	
Non-parametric Statisitics		
95% CLT UCL	5382.494	
95% Adjusted-CLT UCL	5656.015	
95% Modified-t UCL	5733.451	
95% Jackknife UCL	5690.787	
95% Chebyshev (Mean, Sd) UCL	8733.062	
97.5% Chebyshev (Mean, Sd) UCL	11061.51	
99% Chebyshev (Mean, Sd) UCL	15635.28	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	5245.458	
95% Bootstrap-t UCL	6298.432	
95% Hall's Bootstrap UCL	5104.519	
95% Percentile Bootstrap UCL	5236.875	
95% BCA Bootstrap UCL	5503.375	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	5690.787	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Groundwater (In Excavations)

ProUCL Output -Antimony

NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Antimony	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	4	
Minimum	1.2	
Maximum	12.5	
Mean	5.96875	
Standard Deviation	5.590613	
Variance	31.25496	
Coefficient of Variation	0.936647	
Skewness	0.441729	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.727545	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	9.713536	
Gamma Statistics		
k hat	1.075319	
k star (bias corrected)	0.755408	
Theta hat	5.550677	
Theta star	7.90136	
nu hat	17.20511	
nu star	12.08653	
5% Approximate Chi Square Value	5.283063	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	4.202607	
Anderson-Darling Test Statistic	1.036324	
Anderson-Darling 5% Critical Value	0.734433	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.326457	
Kolmogrov-Smirnov 5% Critical Value	0.301074	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	13.65523	
95% Adjusted Gamma UCL	17.16588	
Lognormal Statistics		
Minimum of log data	0.182322	
Maximum of log data	2.525729	
Mean of log data	1.254212	
Standard Deviation of log data	1.167843	
Variance of log data	1.363857	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.735698	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	6.931943	
MLE Standard Deviation	11.82755	
MLE Coefficient of Variation	1.706239	
MLE Skewness	10.086	
MLE Median	3.505074	
MLE 80% Quantile	9.403095	
MLE 90% Quantile	15.71931	
MLE 95% Quantile	23.93431	
MLE 99% Quantile	53.01708	
MVU Estimate of Median	3.216025	
MVU Estimate of Mean	6.14846	
MVU Estimate of Standard Deviation	7.556496	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Antimony
NASD, Vieques Island, Puerto Rico

MVU Estimate of SE of Mean	2.589001	
95% H-UCL	39.46326	
95% Chebyshev (MVUE) UCL	17.43365	
97.5% Chebyshev (MVUE) UCL	22.31677	
99% Chebyshev (MVUE) UCL	31.9087	
Non-parametric Statisitics		
95% CLT UCL	9.219935	
95% Adjusted-CLT UCL	9.549777	
95% Modified-t UCL	9.764985	
95% Jackknife UCL	9.713536	
95% Chebyshev (Mean, Sd) UCL	14.58446	
97.5% Chebyshev (Mean, Sd) UCL	18.31249	
99% Chebyshev (Mean, Sd) UCL	25.63548	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	25.63548	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	YES	Cosider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Appendix M - Groundwater (In Excavations)
ProUCL Output -Arsenic
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Arsenic	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	4	
Minimum	1.02	
Maximum	10.2	
Mean	5.28375	
Standard Deviation	4.404767	
Variance	19.40197	
Coefficient of Variation	0.833644	
Skewness	0.24732	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.754295	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	8.234215	
Gamma Statistics		
k hat	1.327159	
k star (bias corrected)	0.912808	
Theta hat	3.981248	
Theta star	5.788458	
nu hat	21.23455	
nu star	14.60493	
5% Approximate Chi Square Value	6.986394	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	5.707803	
Anderson-Darling Test Statistic	0.955043	
Anderson-Darling 5% Critical Value	0.730867	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.319846	
Kolmogrov-Smirnov 5% Critical Value	0.299785	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	11.04558	
95% Adjusted Gamma UCL	13.51987	
Lognormal Statistics		
Minimum of log data	0.019803	
Maximum of log data	2.322388	
Mean of log data	1.242776	
Standard Deviation of log data	1.043806	
Variance of log data	1.089531	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.776282	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	5.974743	
MLE Standard Deviation	8.392076	
MLE Coefficient of Variation	1.404592	
MLE Skewness	6.984865	
MLE Median	3.465219	
MLE 80% Quantile	8.371154	
MLE 90% Quantile	13.25091	
MLE 95% Quantile	19.29482	
MLE 99% Quantile	39.27814	
MVU Estimate of Median	3.235412	
MVU Estimate of Mean	5.456211	
MVU Estimate of Standard Deviation	5.943369	

Appendix M - Groundwater (In Excavations)

ProUCL Output -Arsenic

NASD, Vieques Island, Puerto Rico

MVU Estimate of SE of Mean	2.056109	
95% H-UCL	24.84822	
95% Chebyshev (MVUE) UCL	14.41858	
97.5% Chebyshev (MVUE) UCL	18.29661	
99% Chebyshev (MVUE) UCL	25.91424	
Non-parametric Statisitics		
95% CLT UCL	7.845314	
95% Adjusted-CLT UCL	7.990817	
95% Modified-t UCL	8.256911	
95% Jackknife UCL	8.234215	
95% Chebyshev (Mean, Sd) UCL	12.07195	
97.5% Chebyshev (Mean, Sd) UCL	15.00921	
99% Chebyshev (Mean, Sd) UCL	20.77889	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	20.77889	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	YES	Cosider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Appendix M - Groundwater (In Excavations)
ProUCL Output -Barium
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Barium	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	8	
Minimum	86	
Maximum	490	
Mean	282.625	
Standard Deviation	132.5076	
Variance	1.76E+04	
Coefficient of Variation	0.468846	
Skewness	-0.089	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.956701	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	371.3832	
Gamma Statistics		
k hat	4.063799	
k star (bias corrected)	2.623208	
Theta hat	69.54699	
Theta star	107.7402	
nu hat	65.02079	
nu star	41.97133	
5% Approximate Chi Square Value	28.11812	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	25.28439	
Anderson-Darling Test Statistic	0.426553	
Anderson-Darling 5% Critical Value	0.718602	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.262457	
Kolmogrov-Smirnov 5% Critical Value	0.295324	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	421.8684	
95% Adjusted Gamma UCL	469.149	
Lognormal Statistics		
Minimum of log data	4.454347	
Maximum of log data	6.194405	
Mean of log data	5.516067	
Standard Deviation of log data	0.588338	
Variance of log data	0.346141	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.883677	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	295.6386	
MLE Standard Deviation	190.1309	
MLE Coefficient of Variation	0.643119	
MLE Skewness	2.195354	
MLE Median	248.6552	
MLE 80% Quantile	408.7944	
MLE 90% Quantile	529.5783	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Barium
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	654.5072	
MLE 99% Quantile	977.0528	
MVU Estimate of Median	243.3208	
MVU Estimate of Mean	288.601	
MVU Estimate of Standard Deviation	172.4617	
MVU Estimate of SE of Mean	60.80256	
95% H-UCL	521.0238	
95% Chebyshev (MVUE) UCL	553.6332	
97.5% Chebyshev (MVUE) UCL	668.3129	
99% Chebyshev (MVUE) UCL	893.5788	
Non-parametric Statisitics		
95% CLT UCL	359.684	
95% Adjusted-CLT UCL	358.1088	
95% Modified-t UCL	371.1375	
95% Jackknife UCL	371.3832	
95% Chebyshev (Mean, Sd) UCL	486.8329	
97.5% Chebyshev (Mean, Sd) UCL	575.1939	
99% Chebyshev (Mean, Sd) UCL	748.7619	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	354.7824	
95% Bootstrap-t UCL	368.4637	
95% Hall's Bootstrap UCL	369.5976	
95% Percentile Bootstrap UCL	357.625	
95% BCA Bootstrap UCL	352.625	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	371.3832	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Cadmium
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Cadmium	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	4	
Minimum	1.35E-01	
Maximum	4.46E+00	
Mean	1.12E+00	
Standard Deviation	1.53E+00	
Variance	2.339539	
Coefficient of Variation	1.36036	
Skewness	1.781863	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.723224	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	2.15E+00	
Gamma Statistics		
k hat	0.680597	
k star (bias corrected)	0.508706	
Theta hat	1.65E+00	
Theta star	2.21E+00	
nu hat	10.88955	
nu star	8.139301	
5% Approximate Chi Square Value	2.815257	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	2.086557	
Anderson-Darling Test Statistic	0.803702	
Anderson-Darling 5% Critical Value	0.749916	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.305562	
Kolmogrov-Smirnov 5% Critical Value	0.305429	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	3.25E+00	
95% Adjusted Gamma UCL	4.39E+00	
Lognormal Statistics		
Minimum of log data	-2.002481	
Maximum of log data	1.495149	
Mean of log data	-0.774244	
Standard Deviation of log data	1.455895	
Variance of log data	2.119631	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.80125	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	1.33E+00	
MLE Standard Deviation	3.60E+00	
MLE Coefficient of Variation	2.71E+00	
MLE Skewness	2.80E+01	
MLE Median	4.61E-01	
MLE 80% Quantile	1.58E+00	
MLE 90% Quantile	2.99E+00	
MLE 95% Quantile	5.06E+00	
MLE 99% Quantile	1.36E+01	
MVU Estimate of Median	4.03E-01	
MVU Estimate of Mean	1.08E+00	
MVU Estimate of Standard Deviation	1.68E+00	

Appendix M - Groundwater (In Excavations)

ProUCL Output -Cadmium

NASD, Vieques Island, Puerto Rico

MVU Estimate of SE of Mean	5.60E-01	
95% H-UCL	17.99934	
95% Chebyshev (MVUE) UCL	3.52E+00	
97.5% Chebyshev (MVUE) UCL	4.57E+00	
99% Chebyshev (MVUE) UCL	6.64E+00	
Non-parametric Statisitics		
95% CLT UCL	2.01E+00	
95% Adjusted-CLT UCL	2.377902	
95% Modified-t UCL	2.205704	
95% Jackknife UCL	2.15E+00	
95% Chebyshev (Mean, Sd) UCL	3.48E+00	
97.5% Chebyshev (Mean, Sd) UCL	4.50E+00	
99% Chebyshev (Mean, Sd) UCL	6.51E+00	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	N/R	Not enough distinct data warning
95% Bootstrap-t UCL	N/R	Not enough distinct data warning
95% Hall's Bootstrap UCL	N/R	Not enough distinct data warning
95% Percentile Bootstrap UCL	N/R	Not enough distinct data warning
95% BCA Bootstrap UCL	N/R	Not enough distinct data warning
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	6.51E+00	99% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	YES	Cosider using 95% or 97.5% Chebyshev (Mean, Sd) UCL

Appendix M - Groundwater (In Excavations)
ProUCL Output -Chromium
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Chromium	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	7	
Minimum	0.435	
Maximum	1.50E+01	
Mean	7.26E+00	
Standard Deviation	5.12E+00	
Variance	26.23217	
Coefficient of Variation	0.705291	
Skewness	0.11708	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.928575	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	1.07E+01	
Gamma Statistics		
k hat	1.406393	
k star (bias corrected)	0.962329	
Theta hat	5.163475	
Theta star	7.546146	
nu hat	22.50229	
nu star	15.39726	
5% Approximate Chi Square Value	7.537477	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	6.199836	
Anderson-Darling Test Statistic	0.418132	
Anderson-Darling 5% Critical Value	0.729745	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.245197	
Kolmogrov-Smirnov 5% Critical Value	0.299379	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	14.83427	
95% Adjusted Gamma UCL	18.03483	
Lognormal Statistics		
Minimum of log data	-0.83241	
Maximum of log data	2.70805	
Mean of log data	1.58676	
Standard Deviation of log data	1.164294	
Variance of log data	1.355581	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.849819	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	9.626797	
MLE Standard Deviation	16.33442	
MLE Coefficient of Variation	1.696765	
MLE Skewness	9.975305	
MLE Median	4.887888	
MLE 80% Quantile	13.07352	
MLE 90% Quantile	21.82112	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Chromium
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	33.18254	
MLE 99% Quantile	73.32548	
MVU Estimate of Median	4.487169	
MVU Estimate of Mean	8.546521	
MVU Estimate of Standard Deviation	10.46926	
MVU Estimate of SE of Mean	3.58807	
95% H-UCL	54.28777	
95% Chebyshev (MVUE) UCL	24.18656	
97.5% Chebyshev (MVUE) UCL	30.95401	
99% Chebyshev (MVUE) UCL	44.24737	
Non-parametric Statisitics		
95% CLT UCL	1.02E+01	
95% Adjusted-CLT UCL	10.32048	
95% Modified-t UCL	10.70508	
95% Jackknife UCL	1.07E+01	
95% Chebyshev (Mean, Sd) UCL	1.52E+01	
97.5% Chebyshev (Mean, Sd) UCL	1.86E+01	
99% Chebyshev (Mean, Sd) UCL	2.53E+01	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	1.01E+01	
95% Bootstrap-t UCL	10.74239	
95% Hall's Bootstrap UCL	9.83831	
95% Percentile Bootstrap UCL	1.00E+01	
95% BCA Bootstrap UCL	1.01E+01	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	1.07E+01	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Iron
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Iron	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	8	
Minimum	12.5	
Maximum	11000	
Mean	5138.25	
Standard Deviation	3819.931	
Variance	14591875	
Coefficient of Variation	0.74343	
Skewness	-0.06814	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.937211	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	7696.972	
Gamma Statistics		
k hat	0.568488	
k star (bias corrected)	0.438638	
Theta hat	9038.45	
Theta star	11714.09	
nu hat	9.095808	
nu star	7.018213	
5% Approximate Chi Square Value	2.179951	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	1.563315	
Anderson-Darling Test Statistic	1.014827	
Anderson-Darling 5% Critical Value	0.757647	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.387666	
Kolmogrov-Smirnov 5% Critical Value	0.307639	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	16542.27	
95% Adjusted Gamma UCL	23067.23	
Lognormal Statistics		
Minimum of log data	2.525729	
Maximum of log data	9.305651	
Mean of log data	7.448832	
Standard Deviation of log data	2.523349	
Variance of log data	6.367288	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.716666	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	41459.66	
MLE Standard Deviation	999750.6	
MLE Coefficient of Variation	24.11382	
MLE Skewness	14093.95	
MLE Median	1717.856	
MLE 80% Quantile	14487.79	
MLE 90% Quantile	43973.17	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Iron
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	109069.5	
MLE 99% Quantile	608128.2	
MVU Estimate of Median	1131.555	
MVU Estimate of Mean	16264.69	
MVU Estimate of Standard Deviation	47468.03	
MVU Estimate of SE of Mean	12919.45	
95% H-UCL	72952604	
95% Chebyshev (MVUE) UCL	72579.25	
97.5% Chebyshev (MVUE) UCL	96946.61	
99% Chebyshev (MVUE) UCL	144811.6	
Non-parametric Statisitics		
95% CLT UCL	7359.706	
95% Adjusted-CLT UCL	7324.941	
95% Modified-t UCL	7691.55	
95% Jackknife UCL	7696.972	
95% Chebyshev (Mean, Sd) UCL	11025.16	
97.5% Chebyshev (Mean, Sd) UCL	13572.43	
99% Chebyshev (Mean, Sd) UCL	18576.05	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	7233.989	
95% Bootstrap-t UCL	7589.501	
95% Hall's Bootstrap UCL	7479.272	
95% Percentile Bootstrap UCL	7198.75	
95% BCA Bootstrap UCL	7330.438	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	7696.972	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Manganese
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Manganese	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	7	
Minimum	250	
Maximum	14800	
Mean	6768.75	
Standard Deviation	6405.63	
Variance	41032098	
Coefficient of Variation	0.946353	
Skewness	0.261108	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.815581	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	11059.46	
Gamma Statistics		
k hat	0.803249	
k star (bias corrected)	0.585364	
Theta hat	8426.71	
Theta star	11563.31	
nu hat	12.85199	
nu star	9.365827	
5% Approximate Chi Square Value	3.548623	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	2.704134	
Anderson-Darling Test Statistic	0.577303	
Anderson-Darling 5% Critical Value	0.743079	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.217169	
Kolmogrov-Smirnov 5% Critical Value	0.303506	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	17864.66	
95% Adjusted Gamma UCL	23443.71	
Lognormal Statistics		
Minimum of log data	5.521461	
Maximum of log data	9.602382	
Mean of log data	8.081602	
Standard Deviation of log data	1.533608	
Variance of log data	2.351955	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.872013	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	10483.72	
MLE Standard Deviation	32323.35	
MLE Coefficient of Variation	3.083194	
MLE Skewness	38.55869	
MLE Median	3234.41	
MLE 80% Quantile	11819.44	
MLE 90% Quantile	23208.84	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Manganese
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	40311.32	
MLE 99% Quantile	114550.9	
MVU Estimate of Median	2785.309	
MVU Estimate of Mean	8229.448	
MVU Estimate of Standard Deviation	13626.17	
MVU Estimate of SE of Mean	4480.927	
95% H-UCL	185102.7	
95% Chebyshev (MVUE) UCL	27761.36	
97.5% Chebyshev (MVUE) UCL	36212.83	
99% Chebyshev (MVUE) UCL	52814.11	
Non-parametric Statisitics		
95% CLT UCL	10493.9	
95% Adjusted-CLT UCL	10717.3	
95% Modified-t UCL	11094.31	
95% Jackknife UCL	11059.46	
95% Chebyshev (Mean, Sd) UCL	16640.49	
97.5% Chebyshev (Mean, Sd) UCL	20912	
99% Chebyshev (Mean, Sd) UCL	29302.55	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	10226.09	
95% Bootstrap-t UCL	11480.13	
95% Hall's Bootstrap UCL	9374.795	
95% Percentile Bootstrap UCL	10500	
95% BCA Bootstrap UCL	10300	
Recommendations		
Human Inspection Recommended?	YES	
Appropriate Distribution	GAMMA	
1st Recommended UCL	17864.66	95% Approximate Gamma UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value	YES	Recommended UCL exceeds the maximum data value
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Thallium
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Thallium	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	7	
Minimum	1.7	
Maximum	44.2	
Mean	14.6475	
Standard Deviation	14.5378	
Variance	211.3478	
Coefficient of Variation	0.992511	
Skewness	1.501224	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.819859	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	24.38543	
Gamma Statistics		
k hat	1.259054	
k star (bias corrected)	0.870242	
Theta hat	11.63374	
Theta star	16.83153	
nu hat	20.14486	
nu star	13.92387	
5% Approximate Chi Square Value	6.518126	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	5.291477	
Anderson-Darling Test Statistic	0.256647	
Anderson-Darling 5% Critical Value	0.731832	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.19149	
Kolmogrov-Smirnov 5% Critical Value	0.300134	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	31.28965	
95% Adjusted Gamma UCL	38.5431	
Lognormal Statistics		
Minimum of log data	0.530628	
Maximum of log data	3.788725	
Mean of log data	2.237242	
Standard Deviation of log data	1.062227	
Variance of log data	1.128327	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.972989	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	16.46778	
MLE Standard Deviation	23.80993	
MLE Coefficient of Variation	1.44585	
MLE Skewness	7.360073	
MLE Median	9.367459	
MLE 80% Quantile	22.98459	
MLE 90% Quantile	36.67899	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Thallium
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	53.7641	
MLE 99% Quantile	110.8284	
MVU Estimate of Median	8.72471	
MVU Estimate of Mean	14.97878	
MVU Estimate of Standard Deviation	16.62457	
MVU Estimate of SE of Mean	5.743785	
95% H-UCL	71.59634	
95% Chebyshev (MVUE) UCL	40.01536	
97.5% Chebyshev (MVUE) UCL	50.84871	
99% Chebyshev (MVUE) UCL	72.12872	
Non-parametric Statisitics		
95% CLT UCL	23.10187	
95% Adjusted-CLT UCL	26.01684	
95% Modified-t UCL	24.8401	
95% Jackknife UCL	24.38543	
95% Chebyshev (Mean, Sd) UCL	37.05176	
97.5% Chebyshev (Mean, Sd) UCL	46.7461	
99% Chebyshev (Mean, Sd) UCL	65.78876	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	22.49921	
95% Bootstrap-t UCL	41.77681	
95% Hall's Bootstrap UCL	80.13413	
95% Percentile Bootstrap UCL	22.7225	
95% BCA Bootstrap UCL	24.66	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	24.38543	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Groundwater (In Excavations)

ProUCL Output -Vanadium

NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Vanadium	
Raw Statistics		
Number of Observations	8	
Number of Missing Data	0	
Number of Valid Observations	8	
Number of Distinct Observations	7	
Minimum	2.235	
Maximum	70	
Mean	24.98	
Standard Deviation	24.39747	
Variance	595.2363	
Coefficient of Variation	0.97668	
Skewness	0.86273	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.881115	
Shapiro-Wilk 5% Critical Value	0.818	
5% Normality Test Result	NORMAL	Data are normal at 5% significance level
95% Student's-t UCL	41.32227	
Gamma Statistics		
k hat	0.92121	
k star (bias corrected)	0.659089	
Theta hat	27.11652	
Theta star	37.90078	
nu hat	14.73935	
nu star	10.54543	
5% Approximate Chi Square Value	4.284586	
Adjusted Level of Significance	0.01946	
Adjusted Chi Square Value	3.334576	
Anderson-Darling Test Statistic	0.359503	
Anderson-Darling 5% Critical Value	0.738535	
Anderson-Darling 5% Gamma Test Result	AD GAMMA	Data follow gamma distribution at 5% signifcance level.
Kolmogrov-Smirnov Test Statistic	0.177402	
Kolmogrov-Smirnov 5% Critical Value	0.302279	
Kolmogrov-Smirnov 5% Gamma Test Result	KS GAMMA	Data follow gamma distribution at 5% signifcance level
5% Gamma Test Result	GAMMA	Data follow gamma distribution at 5% signifcance level
95% Approximate Gamma UCL	61.48197	
95% Adjusted Gamma UCL	78.99799	
Lognormal Statistics		
Minimum of log data	0.804241	
Maximum of log data	4.248495	
Mean of log data	2.585287	
Standard Deviation of log data	1.357695	
Variance of log data	1.843337	
Lilliefors Test Statisitic	N/R	Shapiro Wilk method yields a more accurate result
Lilliefors 5% Critical Value	N/R	Shapiro Wilk method yields a more accurate result
Shapiro-Wilk Test Statisitic	0.897233	
Shapiro-Wilk 5% Critical Value	0.818	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	33.34661	
MLE Standard Deviation	76.8969	
MLE Coefficient of Variation	2.305989	
MLE Skewness	19.18026	
MLE Median	13.2671	
MLE 80% Quantile	41.78511	
MLE 90% Quantile	75.93868	

Appendix M - Groundwater (In Excavations)
ProUCL Output -Vanadium
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	123.8036	
MLE 99% Quantile	312.0886	
MVU Estimate of Median	11.80545	
MVU Estimate of Mean	27.96338	
MVU Estimate of Standard Deviation	40.4852	
MVU Estimate of SE of Mean	13.61022	
95% H-UCL	328.7244	
95% Chebyshev (MVUE) UCL	87.28893	
97.5% Chebyshev (MVUE) UCL	112.9591	
99% Chebyshev (MVUE) UCL	163.3833	
Non-parametric Statisitics		
95% CLT UCL	39.16819	
95% Adjusted-CLT UCL	41.97951	
95% Modified-t UCL	41.76078	
95% Jackknife UCL	41.32227	
95% Chebyshev (Mean, Sd) UCL	62.57902	
97.5% Chebyshev (Mean, Sd) UCL	78.84814	
99% Chebyshev (Mean, Sd) UCL	110.8057	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	38.05908	
95% Bootstrap-t UCL	45.34568	
95% Hall's Bootstrap UCL	40.01945	
95% Percentile Bootstrap UCL	38.3425	
95% BCA Bootstrap UCL	39.02938	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NORMAL	
1st Recommended UCL	41.32227	95% Student's-t UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Total Soil (0-6 ft)
ProUCL Output -Arsenic (MG/KG)
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	Arsenic (MG/KG)	
Raw Statistics		
Number of Observations	62	
Number of Missing Data	0	
Number of Valid Observations	62	
Number of Distinct Observations	55	
Minimum	1.50E-01	
Maximum	67	
Mean	3.424935	
Standard Deviation	9.694218	
Variance	93.97785	
Coefficient of Variation	2.830482	
Skewness	5.410515	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	0.397078	
Lilliefors 5% Critical Value	0.112522	
Shapiro-Wilk Test Statisitic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	5.481254	
Gamma Statistics		
k hat	0.546982	
k star (bias corrected)	0.531268	
Theta hat	6.261517	
Theta star	6.446724	
nu hat	67.82574	
nu star	65.87718	
5% Approximate Chi Square Value	48.19691	
Adjusted Level of Significance	0.046129	
Adjusted Chi Square Value	47.83725	
Anderson-Darling Test Statistic	5.284964	
Anderson-Darling 5% Critical Value	0.811628	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.253367	
Kolmogrov-Smirnov 5% Critical Value	0.119214	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	4.681319	
95% Adjusted Gamma UCL	4.716515	
Lognormal Statistics		
Minimum of log data	-1.89712	
Maximum of log data	4.204693	
Mean of log data	0.085726	
Standard Deviation of log data	1.309596	
Variance of log data	1.715041	
Lilliefors Test Statisitic	0.11195	
Lilliefors 5% Critical Value	0.112522	
Shapiro-Wilk Test Statisitic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	LOGNORMAL	Data are lognormal at 5% significance level
MLE Mean	2.568305	
MLE Standard Deviation	5.482537	
MLE Coefficient of Variation	2.134691	
MLE Skewness	16.13165	
MLE Median	1.089507	
MLE 80% Quantile	3.294762	
MLE 90% Quantile	5.862383	

Appendix M - Total Soil (0-6 ft)
ProUCL Output -Arsenic (MG/KG)
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	9.393432	
MLE 99% Quantile	22.91623	
MVU Estimate of Median	1.074539	
MVU Estimate of Mean	2.505504	
MVU Estimate of Standard Deviation	4.855256	
MVU Estimate of SE of Mean	0.535801	
95% H-UCL	3.972498	
95% Chebyshev (MVUE) UCL	4.841006	
97.5% Chebyshev (MVUE) UCL	5.851579	
99% Chebyshev (MVUE) UCL	7.836655	
Non-parametric Statisitics		
95% CLT UCL	5.450025	
95% Adjusted-CLT UCL	6.353966	
95% Modified-t UCL	5.62225	
95% Jackknife UCL	5.481254	
95% Chebyshev (Mean, Sd) UCL	8.791467	
97.5% Chebyshev (Mean, Sd) UCL	11.11357	
99% Chebyshev (Mean, Sd) UCL	15.67489	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	5.487497	
95% Bootstrap-t UCL	9.146384	
95% Hall's Bootstrap UCL	11.19322	
95% Percentile Bootstrap UCL	5.798339	
95% BCA Bootstrap UCL	6.838161	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	LOGNORMAL	
1st Recommended UCL	3.972498	95% H-UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	

Appendix M - Total Soil (0-6 ft)
ProUCL Output -N-Nitroso-di-n-propylamine (MG/KG)
NASD, Vieques Island, Puerto Rico

Data File		
Variable:	N-Nitroso-di-n-propylamine (MG/KG)	
Raw Statistics		
Number of Observations	62	
Number of Missing Data	0	
Number of Valid Observations	62	
Number of Distinct Observations	55	
Minimum	0.075	
Maximum	717	
Mean	32.94325	
Standard Deviation	140.0952	
Variance	19626.65	
Coefficient of Variation	4.252621	
Skewness	4.377305	
Too Few Distinct Observations?	NO	
Normal Statistics		
Lilliefors Test Statisitic	0.482274	
Lilliefors 5% Critical Value	0.112522	
Shapiro-Wilk Test Statisitic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Normality Test Result	NOT NORMAL	Data not normal at 5% significance level
95% Student's-t UCL	62.65996	
Gamma Statistics		
k hat	0.198397	
k star (bias corrected)	0.19955	
Theta hat	166.0469	
Theta star	165.0876	
nu hat	24.60126	
nu star	24.74421	
5% Approximate Chi Square Value	14.41424	
Adjusted Level of Significance	0.046129	
Adjusted Chi Square Value	14.22607	
Anderson-Darling Test Statistic	13.77128	
Anderson-Darling 5% Critical Value	0.91109	
Anderson-Darling 5% Gamma Test Result	NOT AD GAMMA	Data not gamma distributed at 5% significance level
Kolmogrov-Smirnov Test Statistic	0.4014	
Kolmogrov-Smirnov 5% Critical Value	0.125373	
Kolmogrov-Smirnov 5% Gamma Test Result	NOT KS GAMMA	Data not gamma distributed at 5% significance level
5% Gamma Test Result	NOT GAMMA	Data not gamma distributed at 5% significance level
95% Approximate Gamma UCL	56.55203	
95% Adjusted Gamma UCL	57.30005	
Lognormal Statistics		
Minimum of log data	-2.59027	
Maximum of log data	6.575076	
Mean of log data	-0.2192	
Standard Deviation of log data	1.991972	
Variance of log data	3.967952	
Lilliefors Test Statisitic	0.21341	
Lilliefors 5% Critical Value	0.112522	
Shapiro-Wilk Test Statisitic	N/A	
Shapiro-Wilk 5% Critical Value	N/A	
5% Lognormality Test Result	NOT LOGNORMAL	Data not lognormal at 5% significance level
MLE Mean	5.84029	
MLE Standard Deviation	42.06473	
MLE Coefficient of Variation	7.202507	
MLE Skewness	3.95E+02	
MLE Median	0.803165	
MLE 80% Quantile	4.323308	
MLE 90% Quantile	10.38631	

Appendix M - Total Soil (0-6 ft)
ProUCL Output -N-Nitroso-di-n-propylamine (MG/KG)
NASD, Vieques Island, Puerto Rico

MLE 95% Quantile	21.2764	
MLE 99% Quantile	82.61003	
MVU Estimate of Median	0.777858	
MVU Estimate of Mean	5.34773	
MVU Estimate of Standard Deviation	26.9448	
MVU Estimate of SE of Mean	2.028512	
95% H-UCL	14.04421	
95% Chebyshev (MVUE) UCL	14.18981	
97.5% Chebyshev (MVUE) UCL	18.01579	
99% Chebyshev (MVUE) UCL	25.53117	
Non-parametric Statisitics		
95% CLT UCL	62.20865	
95% Adjusted-CLT UCL	72.77728	
95% Modified-t UCL	64.30845	
95% Jackknife UCL	62.65996	
95% Chebyshev (Mean, Sd) UCL	110.4972	
97.5% Chebyshev (Mean, Sd) UCL	144.0549	
99% Chebyshev (Mean, Sd) UCL	209.9724	
Bootstrap Statistics		
Number of Bootstrap Runs	2000	
95% Standard Bootstrap UCL	61.5964	
95% Bootstrap-t UCL	78.01272	
95% Hall's Bootstrap UCL	514.7043	
95% Percentile Bootstrap UCL	64.48848	
95% BCA Bootstrap UCL	76.5682	
Recommendations		
Human Inspection Recommended?	NO	
Appropriate Distribution	NON-PARAMETRIC	
1st Recommended UCL	144.0549	97.5% Chebyshev (Mean, Sd) UCL
2nd Recommended UCL		
3rd Recommended UCL		
Recommended UCL > Max Data Value		
Recommendation Warning!	NONE	
Alternative UCL	NONE	