FORMER NAVAL AUXILIARY AIR STATION QUILLAYUTE QUILLAYUTE, WASHINGTON

DERP-FUDS SITE NO. F10WA012102

VOLUME 1

REMEDIAL INVESTIGATION REPORT

CONTRACT NO. **W912DW-06-D-1003**
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PREPARED BY
SHANNON & WILSON, INC.

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EXECUTIVE SUMMARY

The former Naval Auxiliary Air Station Quillayute in Quillayute, Washington, was constructed by the Department of War in the early 1940s. The U.S. Army occupied the site in 1941 and developed it as an auxiliary air station that was jointly used as a training center and coastal patrol station by U.S. Army and U.S. Navy. Activities at the site during World War II included practice air missions (by B-24 bombers and P-38 fighters) and deployment of surveillance airships.

The facility was occupied by the U.S. government until 1946, after which portions of the property were subdivided and transferred to both public and private entities. The site was transferred to the General Services Administration for disposal without restriction in the early 1960s. Currently, the City of Forks owns much of the property including the air strips, and there are numerous private residences and vacant residential lots in the surrounding areas. Many of the structures that were present during the time of Government occupation have since been removed.

Limited environmental sampling conducted by the Washington State Department of Ecology in the late 1990s revealed the presence of both soil and groundwater contamination, primarily within the area where most of the military industrial facilities were concentrated. Areas that have been contaminated as a result of Department of Defense (DoD) activities are eligible for cleanup under the Defense Environmental Restoration Program for Formerly Used Defense Sites (FUDS). Accordingly, the U.S. Army Corps of Engineers initiated detailed environmental investigations under the FUDS program to characterize the nature and extent of site contamination and to evaluate the need for remedial action.

This Remedial Investigation (RI) was conducted to assess the potential for contamination in four areas of the former air base: the Administration and Operations Area, the Industrial Complex Area, and the East and West Parcels Areas. Early field sampling efforts confirmed that two additional areas initially included in the draft RI (the Army Cantonments/HOMOJA Housing Area and Runway Approach Zones) were not potential sources areas of contamination, and were removed from the RI.

The RI was accomplished in two main phases, Phase 1 (Phase 1A, Phase 1B1 and Phase 1B2) and Phase 2 (Phase 2 and Phase 2A) with each phase building on the results of previous investigations. The initial phase (Phase 1A) included a hydrogeologic assessment of groundwater conditions, sampling of residential water supply wells and monitoring wells throughout the entire site, and collection of near-surface soil samples in potential source areas in

the Industrial Complex Area and East Parcels Area. The sampling conducted during Phase 1B1 included the collection of subsurface soil and perched groundwater samples. Based on the initial analytical results of Phase 1A sampling, additional near surface step-out samples were collected during Phase 1B2 to better assess the lateral and vertical extent of areas where analytes exceeded regulatory or risk-based screening levels.

Based on the Phase 1 analytical results, additional sampling was conducted during Phase 2 and Phase 2A which included the collection of soil gas, ambient air, soil, and groundwater samples to further asses and evaluate areas of contamination identified in the Industrial Complex Area during Phase1. The combined Phase 1 results of the soil sampling and hydrogeologic assessment eliminated the following potential contaminant source areas from further consideration:

- A tetraethyl lead sludge disposal area and several of the buildings in the Industrial Complex Area.
- The alleged liquid disposal site and the cluster of borrow pits in the Administration and Operations Area.
- PCBs associated with the former buildings 7, 11, 41, 49 and 65, that housed transformers and electrical equipment.

Total carcinogenic polynuclear aromatic hydrocarbons were detected in near-surface samples collected around buildings in the Industrial Complex Area and the West Parcels at concentrations that exceeded regulatory screening criteria. Some of the detection appear to be spatially associated with asphalt pavement and/or oiled hardstands that surround some of these buildings. The exceedances appear to be artificially elevated as a result of association with the asphalt and/or oiled hardstands.

Subsurface sampling for volatile organic compounds (VOCs) in soil identified one location with elevated concentrations of chlorinated hydrocarbons. Specifically, tetrachloroethene (PCE), methylene chloride, and carbon tetrachloride were detected at elevated concentrations in one of several soil borings/geoprobes at Building 44, which housed a former laundry and dry cleaning operation in the Industrial Complex Area near the western end of the facility. Additional sampling (Phase 2 and 2a) of soil gas, ambient air, soil, and groundwater was conducted to further evaluate the vertical and lateral extent of this contamination and the potential exposure pathways associated with these VOCs. The objectives of the sampling at Building 44 were to determine whether the VOCs had leached to groundwater and to evaluate the potential for inhalation exposure as a result of soil gas migration up to the ground surface through the vadose zone.

Carbon tetrachloride has been detected consistently in one residential well (the Nielson Pumphouse well, a former military facility supply well adapted for domestic use) at concentrations at or slightly above the federal maximum contaminant level and at lower concentrations in four nearby monitoring wells. Although the RI focused explorations to locate a potential source and contaminant pathway for the carbon tetrachloride, neither a definitive contamination source nor migration pathway could be identified. PCE and carbon tetrachloride were both used in dry cleaning operations and in fire extinguishers (aircraft and land based) in World War II. However, the literature indicates that carbon tetrachloride in groundwater may be linked to household cleaning product mixtures that contain surfactants and bleach and are discharged into septic systems.

The following uncertainties regarding contaminant sources and exposure pathways remain upon completion of the RI.

- The source(s) of carbon tetrachloride detected in two residential water supply wells and four monitoring wells in the Industrial Complex Area.
- The potential for indoor air vapor intrusion to future site users due to VOCs in groundwater, subsurface soil, soil gas, and ambient air at the location of former Building 44.
- The presence or absence of soil contamination as a result of waste disposal during DoD use of the site in the borrow pits.
- Sources of low concentrations of trichlorethene and arsenic in the Administration and Operations Area groundwater.

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ABBREVIATIONS AND ACRONYMS

Army	U.S. Army
ASTs	aboveground storage tanks
ATL	Air Toxics Ltd.
BD/DR	Building Demolition/Debris Removal
bgs	below ground surface
CAS	Columbia Analytical Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COI	chemical of interest
CON/HTRW	containerized hazardous, toxic, and radioactive waste
cPAHs	carcinogenic polycyclic aromatic hydrocarbons
CSM	conceptual site model
DAF	Dilution Attenuation Factor
DERP-FUDS	Defense Environmental Restoration Program for Formerly Used Defense Sites
DNAPL	Dense Non Aqueous Phase Liquid
DNR	Department of Natural Resources
DoD	Department of Defense
DRO	diesel-range organics
Ecology	Washington State Department of Ecology
FSP	Field Sampling Plan
FUDS	Formerly Used Defense Sites
GSA	General Services Administration
HTRW	hazardous, toxic, and radioactive waste
LBP	lead-based paint
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Level of Detection
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MCL	maximum contaminant level
MMRP	Military Munitions Response Program
MS/MSD	matrix spike/matrix spike duplicate
MSL	mean sea level
MTBE	methyl *tert*-butyl ether
MTCA	Washington State Model Toxics Control Act
NAAS	Naval Auxiliary Air Station
Navy	U.S. Navy
NCP	National Contingency Plan
NOAA	National Oceanic Atmospheric Association

ABBREVIATIONS AND ACRONYMS (cont.)

NWTPH	Northwest Total Petroleum Hydrocarbons
ORO	oil-range organics
PAH	polycyclic aromatic hydrocarbon
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
POL	Petroleum, oil, or lubricant
PQL	Practical Quantitation Limit
PRGs	Preliminary Remediation Goals
QSM	Quality Systems Manual for Environmental Laboratories
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RIP	remedy-in-place
RPD	relative percent difference
RSL	regional screening level
SIM	selective ion monitoring
SVOCs	semi-volatile organic compounds
TCE	trichloroethene
TEE	Terrestrial Ecological Evaluation
TEF	Toxicity Equivalency Factor
TOC	total organic carbon
URS	URS Corporation
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USTs	underground storage tanks
VOCs	volatile organic compounds
WAC	Washington Administrative Code

REMEDIAL INVESTIGATION REPORT
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
NAVAL AUXILIARY AIR STATION QUILLAYUTE, QUILLAYUTE, WASHINGTON

1.0 INTRODUCTION

This Remedial Investigation (RI) report for the former Naval Auxiliary Air Station (NAAS) Quillayute, in Quillayute, Washington, has been prepared for the U.S. Army Corps of Engineers (USACE), Seattle District, by Shannon & Wilson, Inc. under Contract No. W912DW-06-D-1003, Delivery Order No. 0002, and Delivery Order No. 0006. The work was conducted for the USACE under the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS) to evaluate whether hazardous or toxic waste is present on the properties that were formerly owned, used, or controlled by the Department of Defense (DoD). The report was prepared following the U.S. Environmental Protection Agency (USEPA) "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (EPA 1988) along with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 Code of Federal Regulations (CFR) 300.430(d).

CERCLA (the Comprehensive Environmental Response, Compensation, and Liability Act) and the NCP apply to most DoD Defense Environmental Restoration Program (DERP) activities in accordance with § 9601-9675 of CERCLA. The FUDS program follows DERP guidance[1,2], CERCLA (42 USC § 9601 et seq., as amended by the 1986 Superfund Amendments and Reauthorization Act, and other regulatory authorities such as the Resource Conservation and Recovery Act (RCRA Subtitle I requirements of 40 CFR 280 and applicable state requirements).

DoD activities at FUDS sites follow the CERCLA framework for environmental restoration based on its DERP authorities. Releases of hazardous substances (defined in § 9620 of CERCLA) are addressed under DoD's CERCLA authorities.[3] Petroleum, oil, and lubricants (POL) are excluded from the above definition of hazardous substances under CERCLA, but may

[1] DoD 2012 (March 9). Environmental Restoration Program (DERP) Management. Manual 4715.20.

[2] DoD 2004. Engineer Regulation 200-1-3. Environmental Quality – Formerly Used Defense Sites (FUDS) Program Policy.

[3] Note also that when lead-based paint and asbestos-containing materials releases create an imminent and substantial endangerment to the public health or welfare or to the environment at FUDS sites, they may be addressed in certain situations, such as during building demolition and debris removal or as an incidental response to cleanup of hazardous substances.

constitute pollutants or contaminants, and would then be addressed as RCRA corrective actions under DERP's Containerized Hazardous, Toxic, and Radioactive Waste Projects (CON/HTRW) response actions.

1.1 Project Objectives

The purpose of this RI is to characterize the nature and extent of contamination that resulted from historical DoD activities at the former NAAS Quillayute property (Figure 1-1), and to assess if DoD or post-DoD activities on the site resulted in releases of carbon tetrachloride and tetrachloroethene to the site groundwater. The data collected have been used to characterize the site for the purpose of developing and evaluating effective remedial alternatives as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300.430(e) and, ultimately, to attain project closeout.

USACE's long-term objectives for the former NAAS Quillayute site are to:

- Assess whether former DoD occupation of the site resulted in contamination of groundwater, surface water, sediment, soil, and/or air at concentrations exceeding regulatory or risk-based criteria.
- Identify potential downgradient receptors that may be at risk of exposure.
- Support development of options to protect human health and the environment from hazards associated with the historical operations of the NAAS Quillayute, by acquiring data to evaluate the potential exposures and risks of current and future site activities, which will be used in the Feasibility Study.
- Attain project closeout, as measured by remedy-in-place (RIP) or response complete, by fiscal year 2020. RIP is defined as the end date of the construction portion of remedial action. RIP signifies that the construction is complete, all testing has been done, and that the remedy will function properly.
- Carry out project closeout activities using funding authorized under the FUDS appropriation.

Each potential contamination source area identified at NAAS Quillayute was evaluated for eligibility under the DERP-FUDS program. As defined in USACE Engineering Regulation 200-3-1, an eligible FUDS property is defined as "a real property that was under the jurisdiction of the DoD and owned by, leased by, or otherwise possessed by the U.S. where DoD activities took place at the property prior to October 17, 1986, which has the potential for causing DoD contamination and/or hazardous conditions to be present." For properties found to be eligible for

inclusion under FUDS, environmental response actions to be performed at those properties fall under one or more of the following FUDS programs:

- Installation Restoration (includes HTRW and CON/HTRW projects) Programs;
- Military Munitions Response Programs (MMRP); or
- Building Demolition/Debris Removal (BD/DR) Programs.

Only those areas that are eligible as an HTRW project are addressed in this investigation. HTRW projects may include environmental response actions to address a known or suspected release to the environment caused by DoD activities of one or more of the following:

- Hazardous substances, pollutants, or contaminants as defined by the USEPA's CERCLA.
- POL such that response actions will result in the correction of environmental damage posing imminent and substantial endangerment to the public health or welfare or to the environment, even though POL products are not included under CERCLA.
- DoD-unique materials.
- Hazardous wastes or hazardous waste constituents.
- Low-level radioactive materials or wastes.
- Explosive compounds released to soil, surface water, sediments, or groundwater as a result of ammunition or explosives production or manufacturing at ammunition plants.

The following categories of activities or materials at NAAS Quillayute are not eligible for inclusion in the FUDS HTRW project; thus, they are not evaluated further in this RI report:

- Underground storage tanks (USTs), aboveground storage tanks (ASTs), and their associated ancillary equipment. Although USTs, ASTs, and their ancillary equipment were present at NAAS Quillayute when it was operational, under the FUDS program, environmental response actions related to the closure, removal, or long-term corrective actions/monitoring requirements associated with these systems are addressed through a CON/HTRW project. A CON/HTRW project was completed at NAAS Quillayute in 2005, and regulatory concurrence has been obtained for a decision that no further DoD action is indicated.
- Munitions and pyrotechnics. Although munitions and pyrotechnics were stored at NAAS Quillayute during its operation, environmental response actions to address munitions and pyrotechnics in the FUDS program are carried out as an MMRP project rather than an HTRW project. An MMRP project would also address contamination resulting from activities associated with the former skeet range at

NAAS Quillayute. Prioritization for pursuing investigations under an MMRP project is accomplished through implementation of the Munitions Response Site Prioritization Protocol.

- Asbestos-containing building material and lead-based paint (LBP). While these materials may be present at NAAS Quillayute, the FUDS program provides for responding to concerns about these materials through a BD/DR project. An exception is allowed when their remediation or abatement is incidental to the completion of a remedial action for an approved project, such as an HTRW project.

Radioactive materials or wastes, while eligible for inclusion in a FUDS HTRW project, are not evaluated in this RI. However, it is noted that documentation available during the conduct of this RI includes no indications of the use, storage, handling, or disposal of radioactive materials or wastes at NAAS Quillayute.

1.2 Remedial Investigation (RI) Implementation

For the purpose of this RI, the former NAAS Quillayute property has been divided into the following six designated areas/subareas, based on their former use by DoD:

- Administration and Operations Area.
- Industrial Complex Area.
- West Parcels Area.
- East Parcels Area.
- Army Cantonments/HOMOJA Housing Area.
- Runway Approach Zones.

The locations of these areas are shown in Figure 1-2.

Historical research regarding DoD site use, previous environmental investigations, and area-specific Conceptual Site Models (CSMs) developed for each of these six areas did not identify evidence to indicate that the Army Cantonments/HOMOJA Housing Area and Runway Approach Zones contain potential source areas of contamination resulting from former DoD use. Thus, the RI is focused on potential environmental concerns identified at the Administration and Operations Area, Industrial Complex Area, West Parcels Area, and East Parcels Area.

The RI has been conducted in four main phases, building on the results of previous investigations. The initial Phase (Phase 1A) of work, which was conducted in April and May 2009, included a hydrogeologic assessment, monitoring of existing residential water supply wells and monitoring wells in the Administration and Operations Area and Industrial Complex Area, and near-surface soil sampling of potential contamination source areas in the Industrial Complex

Area and East Parcels Area. Based on the initial soil sampling results, additional step-out sampling of near-surface soils was conducted where the initial results identified the presence of contamination. Phase 1B initially consisted of additional sampling of near-surface soil in the Industrial Complex Area and a geoprobe investigation of subsurface soil and perched groundwater in the vicinity of potential contamination source areas was conducted in July and November 2009. The scope of Phase 1B was subsequently revised to include additional sampling in the Industrial Complex Area. This sampling included step-out soil sampling for lead, petroleum hydrocarbons and polynuclear aromatic hydrocarbons (PAHs) where elevated concentrations of these contaminants were detected; additional geoprobe sampling of subsurface soils to evaluate the potential for a vapor pathway for volatile organic compounds (VOCs); and water sampling from sumps, trenches, and the pond on the Nielson property.

Based on the analytical results of the Phase 1 subsurface soil investigation, additional explorations were conducted in two phases (Phase 2 and 2A). Phase 2 sampling was conducted in November and December 2010, and Phase 2A sampling was conducted in December 2011. These additional phases included collection of soil gas and ambient air samples along with soil and groundwater samples to further delineate the extent of VOCs (including carbon tetrachloride, methylene chloride, and tetrachloroethene [PCE]) detected in subsurface soil in the vicinity of Building 44, and installation and sampling of four new monitoring wells to evaluate whether the groundwater contamination at Building 44 could be a source for the contamination in the central Industrial Complex Area wells.

An additional groundwater sample was collected from a new residential drinking water well (the new Nielson well), installed in January 2011 on the Nielson property between MW-17 and the Nielson residence. The sample was collected during the Phase 2 sampling event to characterize the groundwater in this well.

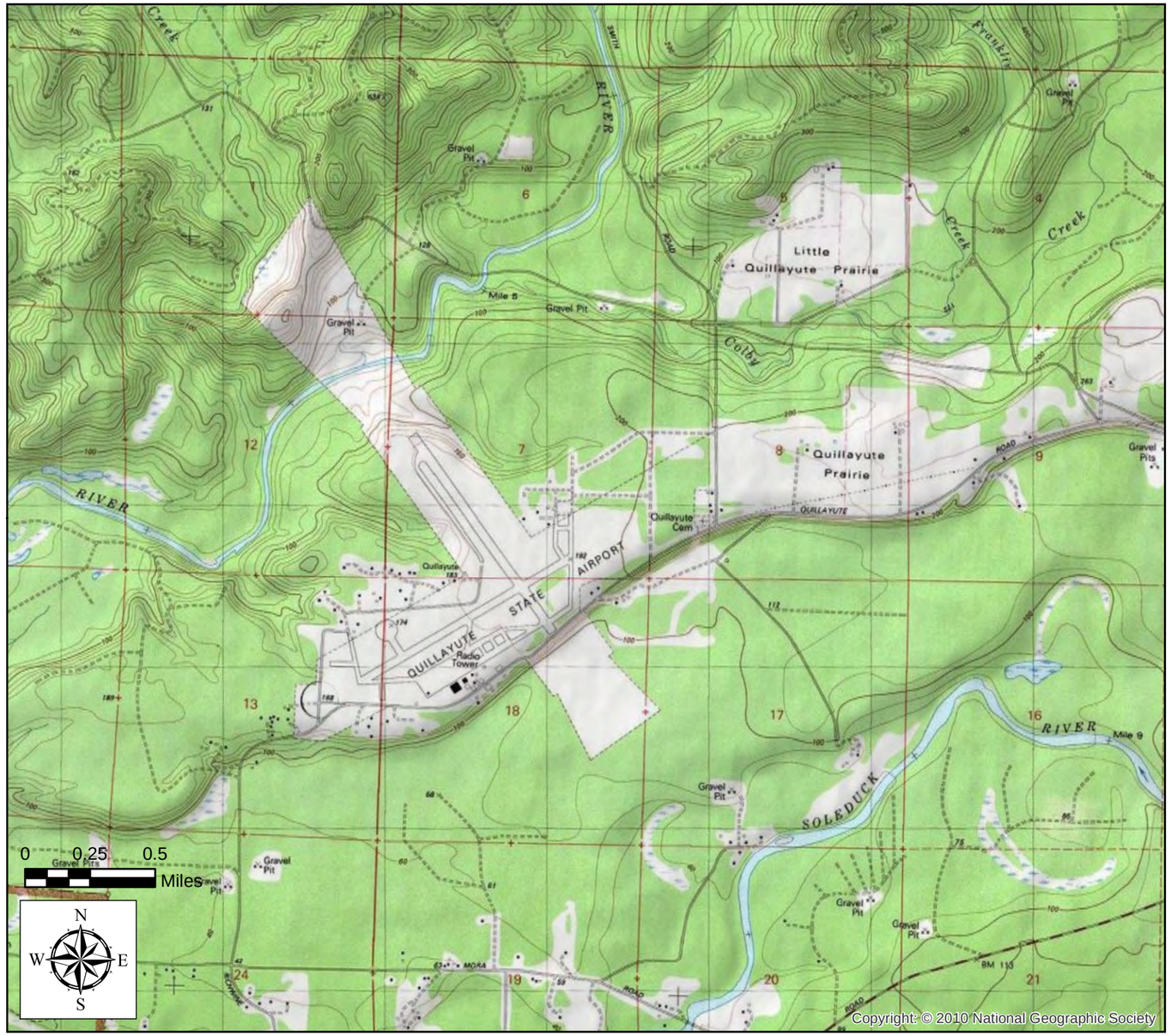
A detailed chronology of the sampling events is presented in Section 5.0.

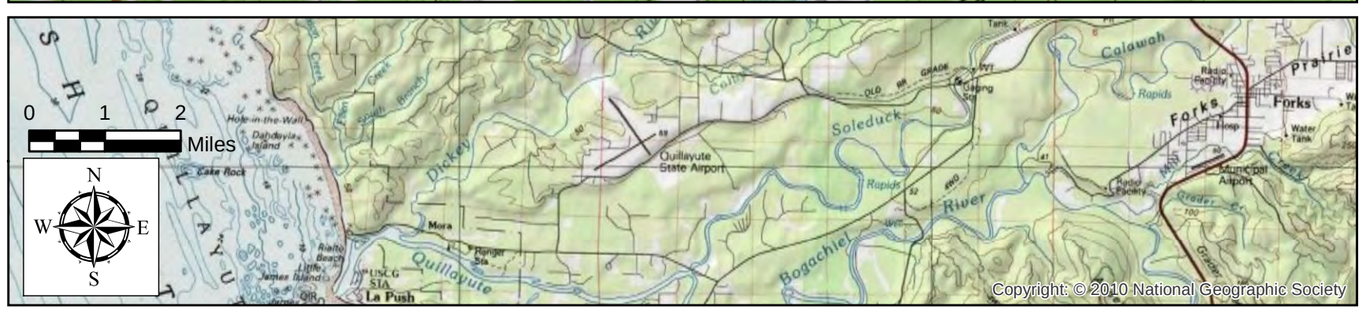
1.3 Report Organization

The RI Report is organized into the following nine sections and a companion set of appendices that contain supporting technical memoranda, field and analytical data, and site photographic documentation:

- Section 1 – Introduction. This section describes the project objectives, an overview of the RI implementation, and the organization of the document.

- Section 2 – Site Background. This section describes the site, its historic use by DoD, a discussion of potential waste streams and associated contaminants that could have resulted from DoD use, and the current use and ownership of the property.
- Section 3 – Physical Characteristics of the Study Area. This section presents a description of the environmental setting of the site.
- Section 4 – Previous Investigations. This section summarizes the results of Preliminary Assessments and Site Investigations that have been performed by USACE at the site.
- Section 5 – Remedial Investigation Activities. This section describes the RI activities conducted for each area and subarea, including ecological and hydrogeologic characterization, and selection of screening criteria for identified contaminants.
- Section 6 – Nature and Extent of Contamination. This section presents the results of the site explorations and chemical analyses of soil, groundwater, and surface water, and discusses the nature and extent of contamination that was detected at concentrations in excess of regulatory and risk-based screening levels.
- Section 7 – Chemical Fate and Transport. This section addresses the fate and transport of identified contaminants within the site environment.
- Section 8 – Conceptual Site Model. This section provides a conceptual understanding of the site and identifies potential or suspected sources of hazardous substances, potentially contaminated media, and actual or potential exposure pathways and receptors.
- Section 9 – References. This section provides references for previous investigations, project technical memoranda, and published and unpublished references cited in the RI.





US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

SITE LOCATION

September 2012 | 21-1-16506-006

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FIG. 1-1

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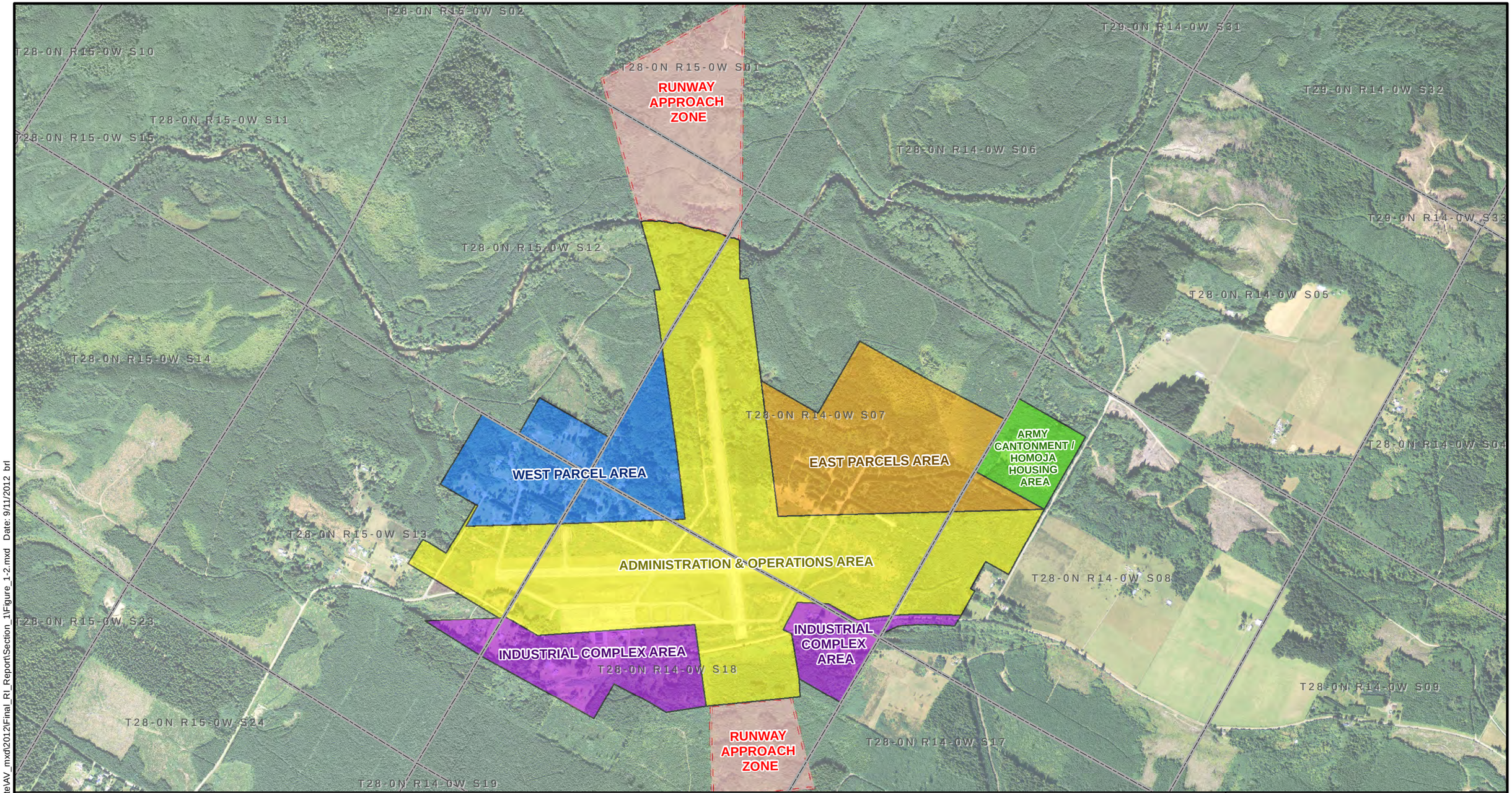

LEGEND

- PLSS Sections
- Runway Approach Zone

NAAS AREAS

- Administration & Operations Area
- Army Cantonment / Homoja Housing Area
- East Parcels Area
- Industrial Complex Area
- West Parcels Area

NOTES

1. Map generalized from GIS Figure 3, "660468" provided by U.S. Army Corps of Engineers, dated 03/14/06.
2. Locations of NAAS Areas should be considered approximate.

N W E S

0 1,500 3,000 Feet

US Army Corps of Engineers
Naval Auxillary Air Station, Quillayute
Quillayute, Washington

PARCEL AREAS

September 2012 21-1-16506-006

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FIG. 1-2

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2.0 SITE BACKGROUND

2.1 Description

The former NAAS Quillayute is located in the Quillayute Prairie, about 3 miles inland from the Pacific Ocean. The site is located on Quillayute Road approximately 15 miles from the City of Forks, Washington, in Sections 7,12, 13 and 18, Township 28 North, Ranges 14 and 15 West, Willamette Meridian (Figure 1-1). The facility was developed by the War Department in the early 1940s. The U.S. Army (Army) occupied the site in 1941, at which time they began to develop it as an auxiliary air station for joint use by the Army and U.S. Navy (Navy). Although, the station was formerly owned and operated by the Navy, the Army constructed the base infrastructure.

2.1.1 Site History

NAAS Quillayute was used as a training center and coastal patrol station during World War II. Activities at the facility during the war included practice B-24 bombing missions, P-38 fighter aircraft missions, and deployment of surveillance blimps. Full jurisdiction and ownership of the site was transferred to the Navy in 1944, and the facility was officially commissioned as NAAS Quillayute at that time. The *Final Historical Records Research Technical Memorandum, Revision 1* (Shannon & Wilson, 2007a) includes a figure showing the infrastructure as it was in 1946. Many of the structures that were present during the time of Navy occupation have since been removed, are inaccessible due to an overgrowth of vegetation, or are identifiable only from remnants of their concrete foundations.

The Navy declared NAAS Quillayute as excess on June 28, 1946. A 1947 appraisal report and a real property classification report prepared by the Real Property Appraisal Division of the War Assets Administration is included in the *Final Historical Records Research Technical Memorandum, Revision 1* (Shannon & Wilson, 2007a**)**. The appraisal report describes several of the former structures that were located on the site. Based on these reports, approximately 110 of the former structures located on site during occupation by the Navy were declared as surplus inventory by the War Assets Administration, and were deemed non-essential to the continued operation of the facility as an airfield. These non-essential structures were classified for off-site use by other agencies or were sold to private entities.

The site was transferred to the General Services Administration for disposal without restriction in the early 1960s. Most of the property was acquired by the State of Washington in

1962 for use as an emergency landing field. The remaining portions of the property were conveyed or sold to the Quillayute Prairie School District or to private individuals. From 1964 to 1975, the site was used as a clubhouse and campsite for a flying club. Runway No. 1 was closed in 1977. Clallam County Assessor records indicate that the property was transferred to City of Forks in March 1999.

2.1.2 Current Status

Clallam County Assessor's parcel records and current site use and ownership information were reviewed for the six designated areas of the site. Copies of available parcel records, along with property ownership information, are available in *the Final Historical Records Research Technical Memorandum, Revision 1* (Shannon & Wilson, 2007a). The Administration and Operations Area, portions of the Industrial Complex Area north of Quillayute Road, and the Runway Approach Zones are currently owned by the City of Forks (the City). The Quillayute Airport, which is owned and operated by the City of Forks, is used primarily by recreational fliers. During 2002, the City of Forks upgraded and rehabilitated Runway No. 2 and its associated taxiways and apron for public use to comply with Federal Aviation Administration regulations. Runway 1 is not in use. The City of Forks leases the hangar (Building 20) to a private party. In recent years a fire burned a portion of the hangar, leaving asbestos and other potentially hazardous material scattered around the building. As of 2009, the portion of Building 20 destroyed in the fire had been renovated. The National Oceanic and Atmospheric Administration (NOAA) occupies two additional buildings in the Industrial Complex Area (Buildings 12 and 14), which they use for weather observation.

A chain-link fence and concrete block barriers surround portions of the Industrial Complex Area north of Quillayute Road and the Administration and Operations Area to limit access to the facility. Dense vegetation separates the airport from Quillayute Road. Signs are posted at the main entrance off Quillayute Road to inform anyone wanting to enter the airport that prior authorization must be obtained from the Airport Manager. A locked gate at the airport entrance on Delta Wing Road also limits access to the airport.

The portion of the former Industrial Complex Area south of Quillayute Road has been subdivided into residential lots and home sites. In this area there are 22 individually owned parcels, seven of which are developed and occupied by residential dwellings. Potable water for these parcels is provided by multi-residence water supply wells and individual water wells.

The West Parcels Area has been subdivided into 27 individually owned residential home sites. Potable water for these parcels is provided by four multi-residence water supply wells and up to eight individual water wells.

The East Parcels Area has been subdivided into 25 undeveloped lots according to the Clallam County Assessor's website (www.clallam.net/map). Development of individual parcels adjacent to Taxiway Nos. 4 and 5 was underway in 2004; the current number of residences and individual water supply wells is unknown.

According to the Clallam County Critical Areas and Parcel Information website, the former Army Cantonment/HOMOJA Housing Area is undeveloped land owned by Rayonier Timber Company.

Based on a review of water well logs available on the Washington State Department of Ecology (Ecology) website (www.ecy.wa.gov), approximately 20 water supply wells are within 1 mile of the site, and roughly 40 wells are within 2 miles of the site.

The future use of the West Parcels Area and portions of the Industrial Complex Area south of Quillayute Road is not expected to change from the current residential use. Future use of the East Parcels Area is expected to be residential, whereas future use of the Administration and Operations Area, the Cantonment/HOMOJA Housing Area, and the Runway Approach Zones is unknown.

2.2 Former Department of Defense (DoD) Operations and Potential Contaminant Sources

2.2.1 Administration and Operations Area

The Administration and Operations Area was the largest active area of NAAS Quillayute. This area contained the two runways (one 4,700 feet long and one 5,000 feet long), parking aprons, and taxiways. Fueling pits and associated piping were located east of the warming apron between Taxiway Nos. 1 and 2, and west of the warming apron along Taxiway No. 2, adjacent to Aircraft Tie-down Area Nos. 2 and 3. USTs and associated piping and pits were removed in 2004 (Cherokee General Corporation, 2005). Four borrow pits were also located in the Administration and Operations Area on the east and west sides of Runway No. 1 (Figure 2-1). Portions of three of these borrow pits extend into the West Parcels Area.

A potable water supply well, which was installed by the military, is located adjacent to the intersection of Taxiway No. 1 and Runway No. 1. This well, referred to as the Airport well or the Parcel S well in previous reports, supplies water to Buildings 12 and 14, which are located in the Industrial Complex Area and are currently occupied by a weather observation station operated by NOAA.

Currently, there are also five residential wells located north of Runway 2 and four monitoring wells that were installed around the borrow pits and near the southwest end of Runway 2.

Two areas within the Administration and Operations Area were identified during the Preliminary Assessment as locations where contaminants may have been released during the DoD occupation of the site. The first of these areas is a cluster of four borrow pits located to the north of Runway 2. Although no documentation has been found to indicate the borrow pits were used for refuse disposal during active military operations, it is possible that one or more of them could have been used for disposal of materials and waste from the operations of the facility.

The second area identified in the Preliminary Assessment is an alleged liquid disposal area at the southwestern end of Runway 2. This potential contamination source area was identified based on information obtained from an anonymous caller who indicated that liquid wastes from aircraft were disposed of to the ground surface in an area off the southwest end of Runway 2. Investigation of this area during the Preliminary Assessment did not reveal any physical evidence of the liquid disposal area, although the investigations was limited to those areas that were readily accessible for visual inspection and not heavily overgrown with vegetation.

2.2.2 Industrial Complex Area

DoD facilities that were located within the Industrial Complex Area included hangars, administrative and supply buildings, housing, recreation space, utility and public works structures, ASTs and USTs (Figure 2-2). Most of the structures were of a temporary nature and have been demolished and/or were removed for off-site use by other agencies or private entities. USTs and associated piping and pits were removed or closed in place in 2004 in the Industrial Complex Area (Cherokee General Corporation, 2005).

During DoD occupation, some of these facilities and structures potentially stored, handled, and/or disposed of hazardous substances. Other buildings were known to have housed

and/or stored generators, transformers and other electrical equipment that may have used polychlorinated biphenyl (PCB) -containing dielectric fluids.

Previous investigations of the Industrial Complex Area detected carbon tetrachloride in groundwater in the vicinity of the former Pumphouse No. 1 well (Building 21), shown in Figure 2-2**.** This well was the DoD's primary water supply well and is currently being used as residential water well (referenced in this report as the Nielson Pumphouse well). The carbon tetrachloride concentrations detected were slightly above both the USEPA's Maximum Contaminant Level (MCL) of 5 micrograms per liter (μg/l) and Ecology's Model Toxics Control Act (MTCA) Method B carcinogen value of 0.337 μg/l in effect at that time. No clear source of the contamination was established, although the *Final Preliminary Site Assessment Report* (Hart Crowser, 2002) indicated that hand-held fire extinguishers containing carbon tetrachloride were used at NAAS Quillayute.

Potential sources of contamination resulting from DoD use of the site, including the carbon tetrachloride detected in groundwater, include the following buildings and areas:

- Four paint shops, Building 18, 19, 119 and 119A, located on the north and south sides of Quillayute Road, east of former Pumphouse No. 1 well. There is a potential for paint-related wastes to have been disposed of in the wood grated pit that is either located outside Building 19 or 119A.
- Two fire stations that were in operation during DoD occupation. One fire station identified as E-120 was located approximately 100 to 200 feet west of the former Pumphouse No. 1 well. The other was at Building 6, which is still present, approximately 300 feet east of the well. Utility trenches in the central part of the Industrial Complex Area may provide preferential migration pathways.
- A former blacksmith shop and public works shop (Buildings 9 and 4, respectively) located approximately 200 feet east of Building 6 (fire station) and may have been used for storage, handling, or disposal of hazardous wastes/chemicals.
- Several areas located directly north of former Pumphouse No. 1 well that may have been used for storage, handling, or disposal of hazardous chemicals/wastes, including a transportation maintenance building (Building 5), a Class C overhaul shop (Building 12), a wash rack (Building 17), aircraft hangar (Building 20), and a Gunnery Training Building with trenches and floor drains that drain directly to the ground surface south of the building foundation (Building 10).
- The former dry cleaner at Building 44. Only the building's concrete foundation remains; however, according to the 1945 and 1946 site maps, the building was located approximately 700 to 1,000 feet west of the former Pumphouse No. 1 well. Carbon tetrachloride along with other cleaning solvents, including PCE and

trichloroethene (TCE), were commonly used for dry cleaning during the time when DoD occupied NAAS Quillayute and may have been used at Building 44.

- A photography laboratory (Building 29) that likely used, stored, and handled developing solutions known to contain hazardous chemicals.
- Buildings 7, 11, 41, 49, and 65, which housed stored generators, transformers, and other electrical equipment that may have used PCB-containing dielectric fluids. Dielectric fluids may have leaked, spilled, or been released to the soil adjacent to the buildings.
- Two auxiliary generator buildings (Buildings 49 and 65), a boiler and generator building (Building 41), other generator/transformer buildings (Buildings 7 and 11) that housed electrical equipment that may have used PCB-containing dielectric fluids.

According to the *Final Preliminary Site Assessment Report* (Hart Crowser, 2002), U.S. Oil and Refining Company, under contract to the General Services Administration (GSA), removed two 100,000-gallon ASTs from the east end of the Industrial Complex Area in 1963. Based on written communication between the U.S. Oil and Refining Company and GSA, tetraethyl lead sludge from the tanks was removed and spread on the ground on the south side of the easternmost AST, where it was burned and buried.

2.2.3 West Parcels Area

The West Parcels Area is adjacent to the Administration and Operations Area. It contained aircraft tie-down areas; storage magazines for explosives, pyrotechnics, and small arms; a skeet shooting range including several support structures; historical gravel borrow areas (one small borrow pit and portions of two borrow pits located on the west side of Runway No. 1); and fueling systems (USTs, piping, and fueling pits). The aboveground structures used for military operations were demolished prior to transfer to private ownership. USTs and associated piping and pits were removed in 2004 (Cherokee General Corporation, 2005).

Three borrow areas located on the west side of Runway No. 1 (Figure 2-1) may have been used for disposal of refuse and waste disposal from DoD facilities. However, no documentation has been found to indicate that the borrow pits were used by DoD for refuse disposal.

2.2.4 East Parcels Area

The East Parcels Area is adjacent to the Administration and Operations Area. It contained taxiways, aircraft tie-down areas, a radio building (Building 101) and radio generator

building (Building 102), and fueling systems (USTs, piping, and fueling pits). The aboveground structures associated with the military operations were demolished prior to transfer to private ownership.

During DoD occupation, Building 101 was used for radio communications and Building 102 housed a generator that supplied power to Building 101. These buildings, which were located between Taxiways 15 and 16, were reportedly removed from the site in the 1960s.

LEGEND

- Approximate Location: Residential Groundwater Supply Well
- Approximate Location: Monitoring Well
- Approximate Location: Former DOD Supply Well
- Approximate Location: Test Pits
- Approximate Location: Structures
- Approximate Location: Borrow Pits

NOTE

Locations of structures should be considered approximate and are for visualization purposes only.

0 400 800 Feet

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Quillayute, Washington

FEATURES IN THE ADMINISTRATION AND OPERATIONS AND EAST PARCEL AREAS

September 2012 21-1-16506-006

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FIG. 2-1

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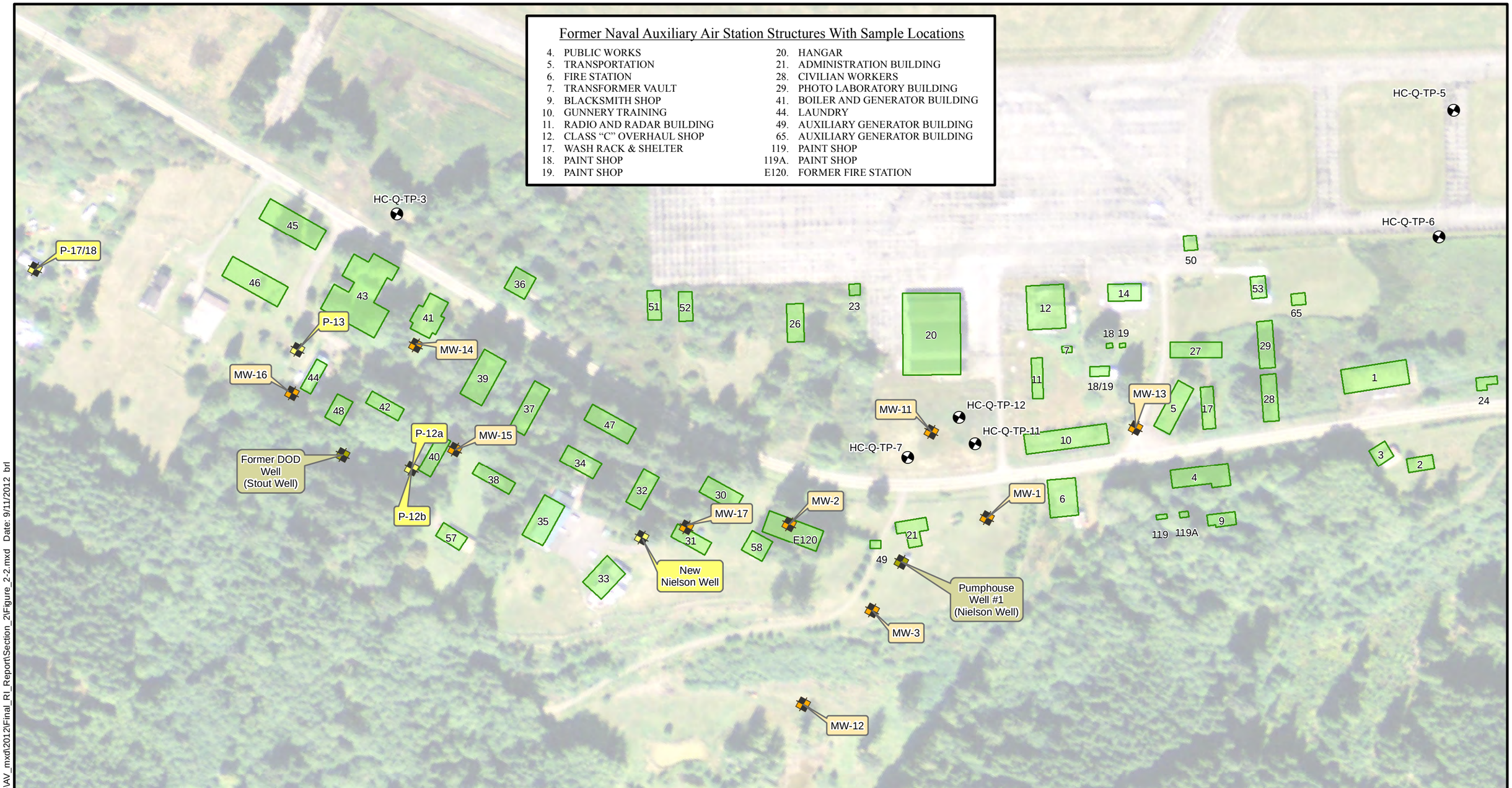

LEGEND

- Approximate Location: Residential Groundwater Supply Well
- Approximate Location: Monitoring Well
- Approximate Location: Former DOD Supply Well
- Approximate Location: Test Pits
- Approximate Location: Structures
- Approximate Location: Borrow Pits

NOTE

Locations of structures should be considered approximate and are for visualization purposes only.

0 200 400 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

FEATURES IN THE INDUSTRIAL COMPLEX AREA

September 2012 21-1-16506-006

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FIG. 2-2

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3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

3.1 Geographic Setting and Surface Water Hydrology

The former NAAS Quillayute is located in the Quillayute Prairie about 3 miles east of the Pacific Ocean. The site is situated within the Hoh-Quillayute watershed, which occupies a low-lying plain between the Olympic Mountains and the Pacific Ocean. This region receives 85 to 120 inches of rainfall per year, resulting in lush vegetation with many rivers and palustrine wetlands.

The site is approximately 1 mile north-northwest of the confluence of the Bogachiel and Sol Duc Rivers, which merge to form the Quillayute River. Dickey River cuts through the runway approach zone on the north end of the property, approximately ¼ to ½ mile north of the end of the runway. Dickey River receives water from Colby and Coal Creeks and eventually joins the Quillayute River to the southwest, which discharges to the Pacific Ocean approximately 3 miles downstream from the site.

Although Dickey River is located near NAAS Quillayute, there is no known surface drainage from potentially contaminated areas of the site to the river, nor is there evidence that the river receives stormwater runoff from the site. The undulating topography between the end of the runway and Dickey River likely precludes surface water overland flow from NAAS Quillayute to the Dickey River. Although stormwater drainage diversions from Runway 1 drain toward Dickey River, reports from others indicate that no surface water flow or channels have been observed in this area, even during times of heavy rainfall.

There is likely a hydraulic connection between the local aquifers and the streams because of the thick sand, gravel lenses, and permeable glacial outwash found throughout the area (Golder Associates, 2005).

3.2 Geology

NAAS Quillayute is located in the Quillayute Prairie, a broad lowland underlain by a thick sequence of unconsolidated sediments overlying marine sedimentary bedrock. The unconsolidated sediments that underlie the Quillayute Prairie are typically 100 to 200 feet thick (Golder Associates, 2005). North of the Dickey River, these sediments are generally thinner and bedrock is locally exposed. Within the study area, the primary unconsolidated strata include alluvium, glacial till, and glacial drift. Glacial outwash and alpine-glacial sediments have also

been mapped nearby but have not been identified within the study area. Boring logs obtained from Ecology files for water wells drilled in the area indicate that the top of bedrock is between about 100 to 200 feet deep in the vicinity of NAAS Quillayute.

Alluvial sands and gravels with varying amounts of silt underlie the stream and river channels, whereas a thick till deposit with sand and gravel stringers underlies the upland area north of the Quillayute River. Based on water well logs obtained from Ecology files, this till overlies older lacustrine clay at depths ranging from about 90 to 140 feet below ground surface (bgs). The sand and gravel lenses within the till range from less than a foot to about 20 feet thick. They do not appear to be laterally continuous based on observations of the till sequence in nearby surface exposures (URS Corporation [URS], 2006) and the lack of stratigraphic continuity between relatively closely spaced geoprobes advanced during this investigation and between boreholes drilled by URS in 2006 for monitoring well installations.

3.3 Hydrogeology

The primary water-bearing strata within the study area appear to be confined sand and gravel lenses, typically between 5 and 20 feet thick, within thick till deposits. These water-bearing lenses serve as a source of residential water supply for home owners in the area. Water well logs indicate that these water-bearing zones are typically between 90 and 140 feet bgs. Water-bearing zones may also be present within deeper alluvium and outwash soils; most of the wells terminate in a clay layer that may serve as an aquitard between the overlying till and any underlying water-bearing sediments. It is not known if water-bearing sands and gravels within the study area comprise continuous aquifers.

Water levels in wells located within the upland areas in the vicinity of NAAS Quillayute are typically between about 75 and 90 feet bgs, corresponding roughly to an elevation between 85

and 100 feet mean sea level (MSL). Historically, water levels have been measured as deep as 130 feet bgs (URS, 2007). Other reports indicate that water levels range between sea level and 175 feet above MSL within the Quillayute Prairie (Golder Associates, 2005). Figure 2 of Appendix B shows groundwater elevations from November 6, 2009 for the Administration and Operations and East Parcels Areas, whereas the groundwater elevations shown for the Industrial Complex Area were measured on December 13, 2011. Because water levels have not been measured in the Administration and Operations Area wells since the newer wells were installed in the Industrial Complex Area, these two dates were selected to provide a general understanding of the relative groundwater elevations. The water levels in the older Industrial Complex Area

wells MW-2, MW-3 , and MW-13 were similar on November 6, 2009 to what they were on January 13, 2011, so although the water levels at these two times are not directly comparable, they do provide a general basis for comparison between the areas.

In addition to the deep aquifer used for water supply, intermittent shallow, perched groundwater is locally present within upper fill, shallow alluvium, and in sand stringers within the till. Perched groundwater was noted on several boring logs of monitoring wells installed during previous investigations (see Appendix H). Notably, perched water was observed during drilling of MW-2 at about 16 and 110 feet bgs, in MW-3 at 83 feet bgs in gravelly soils, and in MW-11 from 14 to 22 feet bgs. It is not known whether any of the perched zones are continuous between borings. The presence, thickness, and lateral extent of perched groundwater likely vary seasonally, with increasing thickness and lateral continuity during the wet season (generally from October through May).

The regional groundwater flow direction beneath the site is presumably southwestward toward the Quillayute River. However, site-specific investigations at NAAS Quillayute have identified a variety of local flow directions at the site that are not consistent with expectations based on geomorphology. In the *Final Addendum of the Site Investigation Report* (URS, 2007), URS concluded that the direction of groundwater flow beneath the Industrial Complex Area is toward the northeast, whereas flow in the vicinity of the borrow pits is toward the southwest. These flow directions have been confirmed by hydrogeologic monitoring during the RI and by new wells that were installed in the western and central parts of the Industrial Complex Area (see Appendix B). However, there is an apparent slight gradient reversal in the westernmost part of the Industrial Complex Area, where groundwater appears to flow both northeastward and southeastward (in the vicinity of MW-14 and MW-15). This slight gradient reversal may be a seasonal occurrence resulting from groundwater mounding below an intermittent stream that flows between the two wells. Based on the groundwater monitoring, it is apparent that groundwater flow below the site can vary appreciably over relatively short distances, and is likely strongly influenced by proximity to recharge areas and seasonal precipitation.

The flow direction, lateral continuity, and extent of shallow perched groundwater are not known. The direction of flow is likely a function of seasonal precipitation, topography, and the nature and distribution of shallow soil at layers underlying the site. Boring logs and reports from Ecology on-line well database indicate that the deeper water-bearing zones may provide well yields of about 4 and 70 gallons per minute, resulting in an estimated transmissivity between about 30 and 8,000 square feet per day. The hydraulic conductivity of the water-bearing zones

was estimated during previous investigations from slug testing of monitoring wells, with resulting values ranging from 0.001 to 0.7 centimeters per second (URS, 2007).

3.4 Ecology and Sensitive Ecosystems

The site is located in the Quillayute Prairie area of the Sitka spruce ecoregion of western Washington. The local vegetation includes the Sitka spruce/sword fern (*Picea sitchensis*/ *Polystichum munitum*) and western hemlock (*Tsuga heterophylla)/*sword fern *(Polystichum munitum)* forests, considered by the State of Washington to be high-quality terrestrial ecosystems (Department of Natural Resources [DNR], 2010). Diverse understory, riparian habitat, and prairie clearings that support many wildlife species are located in the site vicinity; however, wildlife habitat at the site has been disturbed by historical clearing of forests and conversion of prairie habitat to lawns. No rare plants or ecosystems are mapped in the site vicinity (DNR, 2010).

The diverse ecosystems in the site vicinity provide refuge for many aquatic and terrestrial species. Mammals known to be in the area include voles (*Microtus pennsylvanicus*), moles (*Scapanus orarius*), woodrats (*Neotoma cinerea*), black-tailed deer (*Odocoileus hemionus columbianus*), squirrels (*Tamiasciurus douglasii, Glaucomys sabrinus*), raccoons (*Procyon lotor*), black bear (*Ursus americanus*), and Roosevelt elk (*Cervus elaphus roosevelti*).

A wide variety of birds have been identified in the area, including northern spotted owl (*Strix occidentalis caurina*) and marbled murrelet *(Brachyramphus marmoratus),* which are federally listed threatened species. Northern spotted owl and marbled murrelet prefer old-growth forests. No old-growth forests are present on the site although designated critical habitat for these species is within flying range east of the site (DFW, 2006). Bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), and northern goshawk (*Accipiter gentilis*) may also be present and are federally listed species of concern.

Priority butterfly species in Clallam County that may be at or near the site include Taylor's checkerspot (*Euphydryas editha taylori*), valley silverspot (*Speyeria zerene bremnerii*), and Queen Charlotte's copper (*Lycaena mariposa charlottensis*), formerly Makah's copper. However, since the site no longer contains prairie habitat, it is unlikely that a sustainable population is located at the site.

The streams in the site vicinity provide key habitat for at-risk salmonid species. The priority anadromous and resident fish species include Chinook salmon (*Oncorhynchus tshawytscha*), Chum salmon (*Oncorhynchus keta*), Coho salmon (*Oncorhynchus kisutch*), Steelhead salmon

(*Oncorhynchus mykiss*), Sockeye salmon (*Oncorhynchus nerka*), Cutthroat trout (*Oncorhynchus clarki*), Bull trout (*Salvelinus confluentus*), and Rainbow trout (*Oncorhnchus mykiss*) (DFW, 2006). Chinook salmon, Steelhead salmon, and Bull trout are federally listed as threatened under Endangered Species Act.

Sediment-dwelling (benthic) species, such as worms, clams, mussels, crustaceans, and insects in the river sediment, play an important role in supporting priority fish and, indirectly, the species that rely on these fish. Contaminated sediments, if present, may decrease the quality and number of benthic species, affecting species higher in the food chain, even if bioaccumulation is not realized (MacDonald and Ingersoll, 2002).

4.0 PREVIOUS INVESTIGATIONS

Several environmental investigations have been performed at NAAS Quillayute since 1992, to evaluate the potential for DoD activities at the site to have resulted in releases of hazardous or toxic wastes that could pose a human health or ecological risk. The information presented in this section was obtained from reports prepared by others. These documents are listed in Section 9, References. For a point of reference, groundwater quality data from these prior sampling events are compared to USEPA Regional Screening Levels and Ecology MTCA cleanup levels in effect at the time the studies were conducted. The results of this comparison do not indicate that active cleanup is required nor do they indicate what appropriate remediation levels would be for the site if active remediation were required.

4.1 Preliminary Site Assessments

The Seattle District USACE conducted a site inspection at the former NAAS Quillayute in 1992 to determine if potential hazardous waste that would be eligible for cleanup under DERP-FUDS was present at the site. The results of the site inspection indicated that no potential existed for the presence of hazardous waste and no further investigation was warranted (USACE, 1992).

Ecology conducted an initial investigation at the site in 1999, to determine if soil contamination was present (Ecology, 1999). They determined that lead, total petroleum hydrocarbons, and PAHs were present and that additional investigation was warranted.

In May 2000, the City of Forks collected a water sample from a faucet located 280 feet west of the former DoD Pumphouse No. 1 well (Building 21), which had since been connected and used for domestic water supply (Hart Crowser, 2002). The report did not indicate whether this faucet was located indoors, or to which source of water it was connected. Subsequent discussions between USACE and the City of Forks identified the Pumphouse No. 1 well as the water source for the faucet. The sample was analyzed for inorganic compounds, VOCs, and coliform bacteria. Carbon tetrachloride was detected at a concentration of 5.4 µg/L. Lead also was detected at a concentration of 3.0 µg/L. Coliform bacteria were present in the initial sample collected from the well, but were not detected in a subsequent sample (Hart Crowser, 2002).

In December 2000, USACE conducted a preliminary site investigation (Hart Crowser, 2001) to follow up on Ecology's findings and to determine if additional investigation was warranted. Soil samples were collected from the ground surface and from test pits (Figures 2-1 and 2-2). The results of this investigation indicated that PAHs were locally present in surface soil at concentrations exceeding screening levels. Petroleum hydrocarbons and lead also were detected

in surface soil samples, but at concentrations below screening values. Groundwater samples were collected from the Pumphouse No. 1 well and from a second former military water well located near the City of Forks Runway No. 1 (Figure 2-1, also referred to as the Airport well and Parcel S well). Carbon tetrachloride (3.6 µg/L) and chloroform (13 µg/L) were detected in the Pumphouse No. 1 well at concentrations that exceeded USEPA risk-based screening criteria for residential water. Bromodichloromethane (0.38 µg/L) and metals were detected at concentrations less than the EPA screening criteria and the MTCA Method B levels. No analytes were detected above the laboratory reporting limits in the sample collected from the Airport well.

In 2002, USACE conducted a preliminary assessment to evaluate the potential for a release of hazardous substances to the soil, water, and air as a result of military operations conducted at former NAAS Quillayute (Hart Crowser, 2002). The assessment included interviews, literature and agency record searches, and a site reconnaissance. Areas that included potential sources of contamination were identified, such as burning and dumping areas, storage tanks and fueling pits, transformer buildings, small arms magazines, and other buildings. The assessment report recommended additional soil and groundwater investigation of a sludge burning area (southeast of two 100,000-gallon ASTs), a liquid waste dumping area at the southwest end of Runway No. 2, fuel storage areas, the borrow pit sites, and the Pumphouse No. 1 well (Figures 2-1 and 2-2).

4.2 Site Investigation

A limited site investigation was conducted by URS in 2004 (URS, 2004b) to evaluate water quality in drinking water wells installed on the site by the military in the mid-1940s. That investigation consisted of collecting water samples from the Airport well and the Pumphouse No. 1 well (Nielson Well) to determine whether contaminants were present in the water at concentrations exceeding EPA MCLs and/or Ecology MTCA Method A or B cleanup levels. A third former military well (also referred to as the Stout well) was not sampled because it could not be accessed at the time of the investigation.

The Pumphouse No. 1 well was being used as a drinking water source for the private residence. The USACE arranged for a water treatment system to be installed at the well house to treat the water before it enters the potable water system.

The Airport well is located on City-owned property adjacent to the south end of Runway No. 1. This well was developed by the Navy as a secondary water source for the Industrial Complex and Administration and Operations Areas, but subsequently was used to supply water to the

Cantonment/HOMOJA housing area. Currently, the well supplies water for the adjacent NOAA weather station and its support facilities.

The Stout well is located west of the former Pumphouse No. 1 well on private residential property. This well was not sampled during the 2004 site investigation because it was inactive and inaccessible.

Carbon tetrachloride was detected in the Pumphouse No. 1 well but not in the Airport well during the 2004 sampling event. Based on these results, in October 2004, URS installed three monitoring wells on the private residential property where the Pumphouse No. 1 well is located to evaluate the extent and concentration of carbon tetrachloride in the groundwater. The findings from the October 2004 investigation confirmed the presence of carbon tetrachloride in the groundwater, at concentrations ranging from 0.8 to 5.4 μg/l (URS, 2005).

4.3 2006 Groundwater Investigation

In 2006, URS conducted an expanded groundwater investigation of the Industrial Complex Area, the former borrow pit areas adjacent to Runway No. 1, and a suspected liquid waste dump area at the southwest end of Runway No. 2. They also collected water samples from several residential wells located within the former footprint of NAAS Quillayute. The expanded investigation included installation, development, sampling, and slug testing of eight monitoring wells (MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, and MW-13) and groundwater sampling from three existing monitoring wells and seven residential water supply wells in the vicinity of the former NAAS Quillayute.

The results of chemical analyses obtained during the 2006 investigation (URS, 2007) are summarized below and provided in Appendix F. Detections were compared to the available screening levels at the time of the 2006 investigation, which included MTCA Method A and B Cleanup Levels, Region 9 Preliminary Remediation Goals (PRGs) for tap water, and USEPA drinking water MCLs.

Carbon tetrachloride was detected in four wells within the Industrial Complex Area; the Pumphouse No. 1 well, and in monitoring wells MW-1, MW-2, and MW-3, which are located in the immediate vicinity of the Pumphouse No. 1 well. Carbon tetrachloride was detected at 3.4 μg/L at the Pumphouse No. 1 (Nielson Well) well, at 1 μg/L in MW-1, 1.2 μg/L at MW-2, and 3.6 μg/L in MW-3. These concentrations all exceeded the MTCA Method B (0.34 μg/L) and the USEPA Region 9 PRGs (0.17 μg /L) criteria, but did not exceed the EPA MCL of

5.0 μg/L. Carbon tetrachloride was not detected in any of the other monitoring wells or residential water wells sampled as part of the 2006 investigation. The only other VOC detected was methylene chloride in monitoring well MW-8 in the East Parcels Area**.** The methylene chloride was detected at a concentration of 0.3 μg /L, which is below the USEPA MCL, the PRG and Ecology criteria of 5.0, 4.3, and 5.8 μg /L, respectively.

Semi-volatile organic compounds (SVOCs) detected included low concentrations of acenaphthene, fluorene, and phenanthrene in the Airport well, and bis(2-ethylhexyl) phthalate in monitoring wells MW-8 and MW-10 and in the residential water well located on Parcel N in the West Parcels Area. All concentrations were below EPA PRGs and Ecology screening levels with the exception of bis(2-ethylhexyl) phthalate at 36 μg/L in MW-8, which exceeds both USEPA and Ecology screening levels. No other SVOCs were detected in any of the other groundwater samples.

Petroleum hydrocarbons were not detected in any of the monitoring wells or residential water wells sampled during the 2006 investigation. One explosive compound, 1,3-dinitrobenzene, was detected at 0.2 μg/L in monitoring well MW-01. This concentration was below the EPA PRGs and Ecology screening levels of 3.6 and 1.6 μg/L, respectively.

Metals were detected at or below the established regulatory screening levels in all of the wells. Total arsenic was detected in monitoring wells MW-8 and MW-10 at concentrations of 0.0006 and 0.0002 milligram per liter (mg/L), respectively, which are below the MCL and MTCA Method A criteria of 0.01 and 0.005 mg/L, respectively, but above the MTCA Method B and EPA PRG criteria of 0.000058 and 0.000045 mg/L, respectively.

No other potential contaminants were detected in the residential or monitoring wells during the 2006 investigation. However, the laboratory reporting limits for several analytes, including some VOCs, SVOCs, and explosive compounds, were above the established USEPA and/or Ecology screening levels.

5.0 REMEDIAL INVESTIGATION ACTIVITIES

This RI was conducted to evaluate the known and potential sources of contamination and exposure pathways in soil, soil gas and groundwater associated with former DoD activities at the site. Investigations were conducted in four of the six areas identified at the site. The four areas include:

- Administration and Operations Area
- Industrial Complex Area
- West Parcels Area
- East Parcels Area

The activities conducted during the investigation included soil, groundwater, soil gas, and ambient air sampling along with a hydrogeologic assessment.

The investigation was conducted in two phases, Phase 1 and Phase 2. Phase 1 activities were completed in three sub-phases (Phase 1A, Phase 1B1, and Phase 1B2) during April, May, July, and November of 2009 and April 2010. The Phase 1 activities were conducted under the RI Work Plan prepared for the project (Shannon & Wilson, 2009). The RI Work Plan includes the Sampling and Analysis Plan, the Field Sampling Plan, the Quality Assurance Project Plan, the Accident Prevention Plan, and the Site Safety and Health Plan, which collectively constitute the RI Management Plan.

Phase 2 activities were completed in two sub-phases: Phase 2 in November and December 2010 and January 2011, and Phase 2A in December 2011. These activities were conducted under the two subsequent RI Management Plan Addenda (Shannon & Wilson, 2010 and 2011).

A synopsis of the sampling conducted during each phase is summarized as follows:

Phase of Investigation	Sampling Areas	Date	No. of Environmental Samples Collected				
			Near-Surface Soil Sampling	Subsurface Soil Sampling	Water Sampling	Soil Gas Sampling	Ambient Air Sampling
Phase 1A *	AO	April and May 2009			8		
	EP		9		1		
	IC		134		12		
	WP				2		
Phase 1B1*	AO	July and November 2009		32	1		
	IC			155	2		
Phase 1B2 *	AO	November 2009 and April 2010			2		
	IC		100	1	6		
Phase 2 **	IC	November 2010 through January 2011		23	9	7	1
Phase 2A***	IC	December 2011		9	6	2	3

Notes:
* = Remedial Investigation Management Plan (Shannon & Wilson, 2009)
** = Remedial Investigation Management Plan Addendum - Phase 2 (Shannon & Wilson, 2010)
*** = Remedial Investigation Revised Management Plan Addendum - Phase 2A (Shannon & Wilson, 2010)
AO = Administration and Operations
EP = East Parcel
IC = Industrial Complex
WP = West Parcel

Activities conducted during Phase 1 and Phase 2 are discussed in more detail below.

5.1 Phase 1 Activities

Activities conducted during Phase 1of the RI included near-surface and subsurface soil sampling, at the Administration and Operations and Industrial Complex Areas, as well groundwater sampling at various locations across the site. The samples were collected to evaluate the presence and extent of potential contamination related to activities conducted at the former NAAS. The Phase 1A sampling event consisted of near-surface (3 to 6 inches) soil sampling in the Industrial Complex and East Parcels areas and groundwater sampling across the entire site in April and May of 2009. Phase 1B1sampling consisted of subsurface soil and perched groundwater sampling and was initiated in July 2009; however, based on the lack of perched groundwater in the summertime, much of the sampling was deferred until November 2009.

Based on the initial analytical results of the Phase 1A sampling event, along with observations made during a site visit at the beginning of the Phase 1B1 event in November 2009, the Management Plan was amended to include the collection of additional near-surface soil samples and grab water samples. Phase 1B2 sampling was conducted in conjunction with the Phase 1B1 sampling event in November 2009. The additional sampling included re-sampling near-surface soil locations at a depth of 6 to 9 inches and collecting additional step-out samples to evaluate the extent of contamination and verify several results of the Phase 1A sampling event.

5.1.1 Near-surface Soil Sampling

Near-surface soil samples were collected at 16 sites within the Industrial Complex Area and at one site in the East Parcels Area. A total of 244 near-surface soil samples, including step-out samples, were collected around Buildings 4, 5, 7, 9, 10, 11, 12, 17, 18, 19, 20, 29, 41, 44, 49, 65, 119, and 119A in the Industrial Complex Area and Buildings 101 and 102 in East Parcels Area. Near-surface soil samples were collected to evaluate whether contamination associated with former operations of these building was released to the near-surface soils.

Soil samples were collected at a depth of approximately 3 to 6 inches bgs from each sampling location, as described in the Field Sampling Plan (FSP). The sample locations at each building were chosen based on the former operations and the former and/or current building configuration. The number and distribution of the samples was based on approximate 30-foot spacing around the perimeter of the existing and/or former building foundations. Samples were first collected in front of presumed doorway locations, with the remaining samples evenly spaced around the perimeter of the building footprint. Locations of the near-surface soil samples are shown in Figures 5-1 through 5-7.

Soil samples collected in the Industrial Complex Area were analyzed for petroleum hydrocarbons, SVOCs (including PAHs), lead, and silver. The analytical suite was chosen based on the former operations of each building and the contaminants likely associated with that operation.

Samples collected around Buildings 7, 11, 41, 49, and 65 in the Industrial Complex Area and samples collected around Building 101 and 102 in the East Parcels Area were also analyzed for PCBs. Historical records indicated that these buildings likely housed transformers or generators containing dielectric fluids that possibly contained PCBs. Samples were randomly collected within 5 feet of the structure foundations on each side of the building. A list of the analytes and the number of samples collected around each building is shown in Table 5-1.

5.1.2 Subsurface Soil Sampling

During the Phase 1B1 sampling event, a total of 187 subsurface soil samples were collected from 11 areas in the Industrial Complex Area and in the Administration and Operations Area. The sampling locations in the Industrial Complex Area included Buildings 6, 12, 18, 19, 20, 29, 44, 119, 119A, and E-120; the Tetraethyl Lead Disposal Area; and three locations in the vicinity of the Nielson Pumphouse well. The Liquid Disposal Area was the only location in the Administration and Operations Area where subsurface samples were collected

Borings at each location were advanced to approximately 25 feet bgs. Subsurface soil samples were collected using a direct push drilling method (geoprobe) in accordance with procedures outlined in the FSP. Based upon analytical results and the soil types encountered during the July sampling event, the Management Plan was amended to include collection of one additional sample per location. Samples were collected from each boring at depths of 7.5 feet bgs and at the bottom of the boring. However, in the Tetraethyl Lead Disposal Area and the Liquid Disposal Area, soil samples were collected at 5-foot intervals for the total depth of the borings. Perched groundwater was encountered in only one boring, and is discussed in the following section. Locations of each subsurface sample are shown in Figures 5-1 through 5-9.

Subsurface soil samples collected in the Industrial Complex Area were analyzed for VOCs. The buildings selected for sampling, based on historical records, were former paint shops, laundry and maintenance facilities, and fire stations. These building may have contained paints, solvents, dry cleaning fluids, other cleaning materials, and fire extinguishers. Samples collected in the Tetraethyl Lead Disposal Area and the Liquid Disposal Area were analyzed for petroleum hydrocarbons and gasoline, VOCs, SVOCs (including PAHs), lead, and silver. The *Preliminary Assessment* report (Hart Crowser, 2002) indicated that sludge from large ASTs in the Tetraethyl Lead Disposal Area was burned and buried during the removal of the tanks in the 1960s. Reports from residents indicated that dumping took place at the Liquid Disposal Area, located at the southwest end of Runway # 2. A list of the analytes and the number of samples collected around each building and in each area is presented in Table 5-1.

5.1.3 Groundwater Sampling

Groundwater sampling was conducted at existing wells across the site during Phase 1A. Residential water wells, existing monitoring wells, and former DoD wells l in the Administration and Operations Area, Industrial Complex Area, and West and East Parcels Areas, were sampled to:

- Evaluate the direction of groundwater flow beneath the site and whether additional wells were necessary to complete the hydrogeologic conceptual model for the site.
- Assess whether the previously sampled residential wells and monitoring wells are located downgradient of the potential source areas.
- Collect groundwater samples from previously sampled monitoring and residential wells and from additional residential wells that are downgradient of potential source areas.
- Analyze water samples for contamination based on the known or assumed historical use of the site, to evaluate whether former DoD activities impacted water quality, and to establish baseline concentrations of contaminants for the residential and monitoring wells.

All of the wells sampled during the investigation are located either on private property or the City of Forks property. Rights-of-entry forms were obtained from the private property owners and the City of Forks prior to sampling. Groundwater level measurements were taken from all monitoring wells prior to sampling following protocols outlined in the FSP.

5.1.4 Administration and Operations and West and East Parcels Areas

Groundwater samples were collected from residential and monitoring wells and one former DoD well located in the Administration and Operations, West Parcel Areas, and East Parcel Areas to determine whether former DoD activities at the borrow pits have impacted groundwater quality. Five residential wells, five monitoring wells, and one DoD well were sampled during the investigation (Figure 5-10). Because the residential and DoD wellheads were not accessible, samples were collected from spigots or faucets connected to the wells. The monitoring wells were sampled using low-flow procedures following purging. All of the wells were sampled following procedures outlined in the FSP.

Groundwater samples collected from monitoring wells MW-7, MW-10, and B-21 in the Administration and Operations Area, and MW-6 and B-24 in the West Parcels Area were analyzed for VOCs, SVOCs (including PAHs), RCRA metals (including total iron and manganese), and total organic carbon (TOC). Groundwater samples collected from MW-9, B-14 and the Airport Well in the Administration and Operations Area and MW-8 in the East Parcels Area were analyzed for VOCs, SVOCs (including PAHs), lead, silver, and TOC. A list of the residential and monitoring well sampled, along with their associated analytical tests, is presented in Table 5-2. A table with groundwater field parameters (conductivity, pH, temperature, dissolved oxygen, and turbidity) and groundwater level measurements collected during sampling is presented in Appendix A.

5.1.5 Industrial Complex Area

Residential, monitoring, and former DoD wells were sampled in the Industrial Complex Area to evaluate the presence of contaminants (including carbon tetrachloride) in groundwater and to assess whether contamination has impacted the drinking water in downgradient wells. Groundwater samples collected during previous investigations detected carbon tetrachloride in one residential and three monitoring wells. During the Phase 1A activities groundwater samples were collected from three residential wells, six monitoring wells, and one former DoD well (Figure 5-11). The wells were sampled as described above. Groundwater samples were analyzed for VOCs, SVOCs (including PAHs), RCRA metals (including lead and silver), and TOC. A list of the residential and monitoring wells sampled along with their associated analytical tests is presented in Table 5-2.

5.2 Phase 2 Activities

Based on the Phase 1 analytical sampling results, the work plan was amended in November 2010 to evaluate the vertical extent of VOCs (including carbon tetrachloride, methylene chloride, and PCE) detected in subsurface soil adjacent to the south end of Building 44 in the Industrial Complex Area. Soil data collected during Phase 1 activities indicated that detected levels of some VOCs have the potential to impact groundwater and/or pose a vapor intrusion exposure risk to current and future site users. As part of the Phase 2 activities soil, soil gas, groundwater, and ambient air sampling was conducted in two sub-phases, Phase 2 and Phase 2A.

In November 2010, the Phase 2 sampling event consisted of installing and sampling of six soil gas probes adjacent to Building 44 to evaluate the potential for soil vapor intrusion, and the installation and sampling of four new monitoring wells (MW-14, MW-15, MW-16, and MW-17) at specific locations in the Industrial Complex Area. The wells were installed to further characterize the subsurface geologic conditions of the site, collect soil and groundwater samples for field screening and chemical analysis, and evaluate the potential for subsurface pathways along which contaminants could migrate from the potential source area near Building 44 to the accessible environment or groundwater. Additional groundwater samples were also collected from the Nielson Pumphouse well and monitoring wells MW-1, MW-2, and MW-3. The four new monitoring wells were also used to refine the evaluation of groundwater flow direction within the Industrial Complex Area. The locations of the four new monitoring wells are shown in Figure 2-2.

The Phase 2 sampling at Building 44 detected VOCs in subsurface soil gas (PCE and carbon tetrachloride) and groundwater (PCE) adjacent to Building 44 at levels that exceeded both MTCA Method B Screening levels and USEPA Regional Screening levels. PCE and carbon tetrachloride were detected at depths of 6, 13, and 18 feet bgs in the subsurface soil gas samples at concentrations that exceeded the MTCA Method B Soil Gas Screening Level and the USEPA Regional Screening Level. PCE was detected in groundwater in MW-16 at concentrations that exceeded both the MTCA Method B Groundwater Screening Level for drinking consumption and the USEPA Regional Screening Level.

Analytical results of the groundwater samples collected from the existing Nielson well indicate that carbon tetrachloride concentrations exceed both the MTCA Method B screening levels for both drinking consumption and vapor intrusion potential, with lower concentrations at the three surrounding monitoring wells (MW-1, MW-2, and MW-3) on the property. However, carbon tetrachloride was not detected in a groundwater sample collected from monitoring wells MW-14 and MW-15 located in between Building 44 and the Nielson well. Based on groundwater elevation data collected during the Phase 2 sampling event, MW-14 and MW-15 are located upgradient of the existing Nielson well and Nielson property.

Carbon tetrachloride was also detected in monitoring well MW-17 at a concentration that exceeded the MTCA Method B groundwater screening level for vapor intrusion potential. MW-17 is installed closest to the Nielson residence, between the Stout property and the existing Nielson well.

Based on the Phase 2 analytical results, the Management Plan was revised again in November 2011 to further evaluate the potential for vapor intrusion in the Industrial Complex Area. As part of the Phase 2A sampling event, additional soil gas samples, soil samples, and ambient air samples were collected at Building 44. The ambient air samples were collected to evaluate volatile concentrations in the air space below and adjacent to the mobile home located on the former concrete pad for Building 44. Sampling was not conducted inside the mobile home given the combined request of the resident/owner and the determination that the air flow between the existing trailer and concrete pad precludes a complete indoor air vapor intrusion pathway into the residence. Rather, ambient air sampling in an open space below the trailer was performed to evaluate the ambient air pathway.

In January 2011, a new residential drinking water was installed on the Nielson parcel (referenced in this report as the new Nielson well). As part of the Phase 2A sampling, permission was obtained to also collect and analyze a water sample from the new residential well.

5.2.1 Soil Gas and Ambient Air Sampling

Soil gas and ambient air samples were collected during Phase 2 and Phase 2A in November of 2010 and December of 2011 to evaluate the potential for vapor intrusion of chlorinated solvents detected in subsurface soil at Building 44. Similarly, during Phase 2A, soil gas samples were also collected in the vicinity of the Nielson residence where carbon tetrachloride has been detected in groundwater from residential and monitoring wells. Soil gas and ambient air samples were collected following procedures outlined in the Management Plan Addendum and the Revised Management Plan Addendum submitted in November 2010 and November 2011 (Shannon & Wilson 2010, 2011).

Six soil gas samples and one ambient air sample were collected on November 12 and November 13, 2010, adjacent to the Building 44 concrete pad. The sample locations were chosen based on the analytical results from subsurface soil samples collected during the Phase 1B1 sampling, which detected carbon tetrachloride, methylene chloride, and PCE in the subsurface soil.

Soil gas samples were collected from gas probe clusters SV-1 and SV-2, the locations of which are shown in Figure 5-12. Each cluster consisted of a series of three adjacent temporary gas sample points. The gas sample points were installed using direct-push drilling methods to depths of 6, 13, and 18 feet bgs following methods prescribed in the Draft Guidance for Evaluating Soil Vapor Intrusion in Washington State (Ecology, 2009) A gas point was initially proposed in the Management Plan to be set at 12 feet bgs. However, because a clayey soil was encountered at 12 feet bgs, the gas point was set at 13 feet bgs to allow for a more representative soil gas sample.

Soil gas samples were collected following the protocols outlined in the Management Plan, which included conducting a gas point leak test and shut-in test. A single gas sample was collected from each sample point using a 6-liter Summa canister. One replicate sample was also collected from gas point SV-1 at 13 feet bgs. One ambient air sample, B44:AM:420, was collected during the sampling on November 12, 2010, in the vicinity of both soil gas clusters SV-1 and SV-2 adjacent to the Building 44 concrete pad. Upon collection, the samples were packed and shipped under chain-of-custody procedures to an offsite laboratory for analysis.

Prior to and during sample collection, laboratory-grade helium gas was used as a tracer gas to assess the potential for leaks in the sample train and gas sample point annulus. Tedlar

bags were used to test ambient air within the sample train for the presence of helium. Helium was not detected in any of the Tedlar bag samples or in laboratory analysis of the gas sample.

Moisture was detected within the tubing during gas sampling at the 18-foot depth. Sampling was stopped and the water was evacuated from the sampling tubing. Readings collected during the sampling event were recorded on field forms and are provided in Appendix A.

Based on the November 2010 soil gas analytical results, two ambient air samples and one duplicate sample were collected at Building 44 in December 2011, in accordance with the Revised Management Plan Addendum (Shannon &Wilson, 2011). Samples B44:UT-1:487 and B44:UT-1:488 (duplicate) were collected under the mobile home situated on the concrete pad from Building 44, and sample B44:AM-1: 489 was collected on the concrete pad adjacent to the trailer. Samples were collected over a 24-hour time period using 6-liter Summa canisters with 24-hour regulators. Regulator pressure gauge readings were collected during the course of sampling. The samples were packed and shipped under chain-of-custody procedures to an offsite laboratory for analysis. Readings collected during the sampling event were recorded on field forms provided in Appendix A.

A temporary soil gas probe was installed and sampled in December 2011 within 15 feet of the Nielson residence (NR:SV-1); a second probe was installed at the same time within 15 feet of the Nielson Pumphouse well (NI:SV-1). These gas sample points were installed using direct-push drilling methods to depths of 6 feet bgs. Soil gas samples were collected in accordance with procedures as described above and detailed in the Revised Management Plan Addendum (Shannon & Wilson, 2011). Prior to and during sample collection, laboratory-grade helium gas was used as a tracer gas to assess the potential for leaks in the sample train and gas sample point annulus. For quality control, Tedlar bags were used to test ambient air within the sample train for the presence of helium prior to sample collection. Readings collected during the sampling event were recorded on field forms which are provided in Appendix A.

The soil gas and ambient air samples were analyzed for a suite of VOCs using the USEPA Method TO-15 selective ion monitoring (SIM), as summarized in Table 5-3. The full list of analytes is provided in Table 5-7. In addition to the VOCs, the gas samples were analyzed for helium using Modified ASTM International (ASTM) D-1946 method. One ambient air (B44:AM) sample was analyzed for the full list of VOCs using the EPA Method TO-15.

5.2.2 Monitoring Well Installation and Sampling

Monitoring wells MW-14, MW-15, MW-16, and MW-17 were installed in the Industrial Complex Area during Phase 2. Monitoring well MW-16 was installed near former Building 44 to evaluate the vertical extent of known VOC contamination. Monitoring wells MW-14, MW-15, and MW-17 were installed northeast of Building 44 in the vicinity of former Buildings 41, 40, and BE-120/31, respectively. These three monitoring wells were installed to evaluate whether groundwater contamination has migrated northeastward from Building 44, and to evaluate whether the carbon tetrachloride contamination in the subsurface at Building 44 could be a source for the groundwater contamination in the Nielson Pumphouse well.

5.2.3 Soil Sampling

In November and December 2010, soil borings B41:RS-1 (MW-14), B40:RS-2 (MW-15), B44:RS-3 (MW-16) and BE120:RS-4 (MW-17) were advanced using Rotosonic drilling techniques and completed as monitoring wells. The locations of these wells are shown in Figure 5-11.

Soil samples were collected during drilling in accordance with procedures described in the RI Management Plan. A total of 17 soil samples were collected from the borings during drilling. Three soil samples each were collected from MW-14, MW-15, and MW-17. These samples were collected from the near surface (ranging from 6 to 10 feet), at potential perched water zones, or at observed perched water zones ranging from 17 to 25 feet, and in the saturated zone at depths ranging from 90 to 109 feet. Depths of soil samples were selected based on field conditions and field screening results. Six soil samples were collected from MW-16; at 6, 12, and 18 feet; at a potential perched water zone at 25 feet; between the perched water zone and the saturated zone at 70 feet; and in the saturated zone at 90 feet.

The monitoring wells were installed and screened 20 feet into the aquifer that is used by the nearby residential water supply wells. MW-14 was drilled to a depth of 131 feet (bgs) and screened from 99 to 129 feet, with groundwater encountered at approximately 109 feet. MW-15 was drilled to 125 feet bgs and screened from 105 to 125 feet, with groundwater encountered at approximately 105 feet. MW-16 was drilled to 110 feet bgs and screened from 80 to 110 feet, with groundwater encountered at approximately 91 feet. MW-17 was drilled to 119.5 feet bgs and screened from 99 to 119 feet, with groundwater encountered at approximately 97 feet. The drilling and monitoring well installations were completed by Cascade Drilling of Woodinville, Washington, in accordance with procedures described in the Management Plan. Approximately

24 hours after completion, the monitoring wells were developed in accordance with procedures outlined in the Management Plan.

The soil samples collected during the installation of monitoring wells MW-14, MW-15, and MW-17 were analyzed for VOCs, SVOCs, RCRA metals, iron (Fe), and manganese (Mn), and the samples collected from MW-16 were analyzed for VOCs, TOC, and grain size. Based on field observations during drilling, soil samples collected from MW-14 and MW-15 were also analyzed for petroleum hydrocarbons.

5.2.4 Groundwater Sampling

Groundwater sampling was conducted in December 2010 and in January 2011, in accordance with procedures in the RI Management Plan during the Phase 2 sampling event. The groundwater samples were collected at least 48 hours after well development was completed. In addition to sampling the four new monitoring wells (MW-14, MW-15, MW-16, and MW-17 monitoring wells MW-1, MW-2, MW-3 and the Nielson Pumphouse well were re-sampled for VOCs only.

As part of the Phase 2A sampling event, the new Nielson residential drinking water well (NNW), located adjacent to the Nielson residence and installed in January 2011, was sampled. Groundwater sampling was conducted in accordance with procedures outlined in the revised RI Management Plan. The sample was collected in December 2011.

Upon completion of the groundwater sampling, samples were packed and shipped under chain-of-custody procedures to an offsite laboratory for analysis. The groundwater samples from the four new wells and the new Nielson well were analyzed for VOCs, SVOCs, diesel-range organics (DRO), oil-range organics (ORO), RCRA metals (total), iron (total) and manganese (total).

5.3 Laboratory Analysis

All soil and groundwater samples were shipped to Columbia Analytical Services (CAS) laboratories in Kelso, Washington, for analytical testing. CAS is compliant with the most recently published version of the DoD Quality Systems Manual and holds both the Environmental Laboratory Accreditation Program and the National Environmental Laboratory Accreditation Program accreditation for the analytes being tested under this program.

The soil and water samples collected were analyzed for one or more of the following:

- Northwest Total Petroleum Hydrocarbons (NWTPH) Analytical Methods for Soil and Water, as described in the Ecology Publication "Guidance for Remediation of Petroleum Contaminated Soils" (April 1994). Two variations were included: NWTPH-G, a quantitative method to determine volatile hydrocarbons (gasoline), and NWTPH-D extended, a quantitative method to determine semi-volatile petroleum hydrocarbons beyond the diesel/jet fuel range to cover the range typically covered by Method 418.1 (motor oil and lube oils).
- PCBs by Method SW846-8082.
- SVOCs by USEPA Method SW846-8270C. The method was updated to 8270D in 2011.
- PAHs by USEPA Method SW846-8270C (Selective Ion Method) (SIM). The method was updated to 8270D in 2011.
- VOCs by USEPA Method SW846-8260B. Soil samples were collected and extracted following EPA Method 5035A procedures for VOCs. Water samples were prepared using Method 5030. The method was updated to 8260C in 2011.
- RCRA metals in soil by USEPA Method SW846-6020 and RCRA metals in water by EPA Method 200.8 and mercury by EPA Method 7470A and 7471A. At the request of reviewers, groundwater samples in 2011 were analyzed by Method 6010B and 6020; mercury was analyzed 245.1 in 2011.
- TOC by USEPA Methods 415.1 for water and ASTM D4129-82M for soil. The ASTM D4129-82M is a modified method of the D4129-82 because there is no method for solids. This is a water matrix method that has been modified to work with a soil sample. The sample is dried, acidified to remove inorganic carbon, then combusted to convert organic carbon to CO_2.

The soil gas and ambient air samples were shipped to Air Toxics Ltd. (ATL) in Folsom, California for analysis. ATL is compliant with the most recently published version of the DoD Quality Systems Manual, and holds both the Environmental Laboratory Accreditation Program and the National Environmental Laboratory Accreditation Program accreditation for the analytes being tested under this program.

The soil gas and ambient air samples were analyzed for the following:

- VOCs by USEPA Method TO-15 SIM

Copies of the laboratory data sheets are provided on a CD in Appendix E.

5.4 Data Validation

Environmental samples from soil, groundwater, and soil gas were collected at the locations and frequency identified in the Management Plan and subsequent addenda to the Management Plan November 2010 and November 2011. Samples were collected using the same or comparable methods during each phase of sampling. Field duplicate samples and equipment rinse samples were each collected at rates of 6 to 7 percent greater than 5 percent specified in the tables summarizing the sampling approach. More than 75 percent of analytes detected in rinsate samples were qualified by the laboratory as estimated results because they were detected at concentrations less than the practical quantitation limit, but greater than the detection limit. Consequently, less than 40 results were qualified only because the analyte was also detected in the rinsate sample.

None of the target analytes were detected in equipment blanks. A review of data from these samples did not identify any systematic quality assurance issues. Levels of DRO and ORO were present in six samples at concentrations that resulted in qualifying associated environmental samples. Individual analytes were qualified if the results exceeded the control limits. In 2010, groundwater samples were tested for SVOCs, rather than SVOCs-SIM. Samples were recollected from these wells in 2011 and analyzed to achieve the lower reporting limits.

At the request of reviewers, groundwater samples collected in 2011 were analyzed in accordance with the DoD Quality Systems Manual for Environmental Laboratories (QSM), Version 4.2 (DoD, 2010) that specifies different, but not necessarily more stringent, control limits for the analytical methods specified in the Management Plan. In accordance with the manual, results were reported at the level of detection (LOD). Theoretically, the LOD should be lower than the practical quantitation limit (PQL); however, for these results the LOD was essentially equivalent to the PQL. Manganese and iron were measured by USEPA Methods 6010B and 6020, respectively, rather than 200.8, also based on reviewer comments.

Upon receipt of the analytical data from CAS, a data validation and quality assurance review of the soil and groundwater data was conducted by EcoChem, Inc. (EcoChem) of Seattle, Washington, under subcontract to Shannon & Wilson. Data were qualified in accordance with Measurement Quality Objectives. The Data Validation Report prepared by EcoChem summarizes data quality review by matrix and method for each sampling event, and is included in Appendix D. Precision, accuracy, representativeness, comparability, and completeness parameters were evaluated for each method.

As presented in the Overall Assessment discussion in each Data Validation Report, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, matrix spike/matrix spike duplicate (MS/MSD), and Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD) percent recovery values, with the exception noted in each method review. Precision was also acceptable as demonstrated by the MS/MSD, LCS/LCSD, and field duplicate relative percent difference (RPD) values, except as noted in the review.

Data were qualified as estimated values because the holding time was exceeded, continuing calibration relative response factor (RRF) and percent difference outliers, LCS recovery outliers, and RPD outliers for field and laboratory duplicates, and contract required detection limit standard recovery outliers. Data were also qualified as not detected based on contamination in the associated laboratory and field blanks.

Data were rejected because of initial and continuing calibration RRF outliers for seven of the 65 VOCs evaluated by USEPA Method SW 8260B. More than 75 percent of the rejected data were for the VOC 1,4-dioxane, which USEPA has identified as a poor performer when prepared by Methods 5030/5035 and analyzed by Method 8260B. Preparation Methods 5030 and 5035 are recommended for soil and water matrices. Furthermore 1,4- dioxane is not included in DoD's list of analytes for the method as described in the DoD QSM (2010). Data were also rejected for very low LCS/LCSD recovery outliers in SVOCs in groundwater. In soil, SVOCs were rejected because of very low or not recoverable LCS/LCSD and MS/MSD recovery outlier data. Data that have been rejected are not useable for any purpose. None of the compounds that were rejected are considered target compounds for this project.

As presented in the tabular summary of data qualifiers (Table 5-4A), only results for VOCs and SVOCs were less than 100 percent complete. The data sets were 99 percent complete. An additional 7 percent of VOC results were qualified as estimated values. Results of water analysis were also less than 100 percent complete for VOCs and SVOCs analysis. Low-level SVOC results were 88 percent complete, attributed primarily to poor surrogate recovery. The more sensitive analysis of PAHs was 100 percent complete. Rejected analytes and an explanation of the reasons for rejection are presented in Table 5-4B.

5.5 Hydrogeologic Characterization

Groundwater pressure transducers were installed in six of the monitoring wells to evaluate the hydraulic gradient and seasonal groundwater flow direction across the site. The transducers were

installed in wells MW-2, 3, 6, 7, 10, and 13 after the initial RI groundwater sampling was completed, and were programmed to record groundwater levels at 15-minute intervals for one year. After a year of readings, the transducers were removed from the wells and the data were evaluated. Groundwater levels were also measured during each groundwater sampling event to better determine seasonal variations in groundwater depth and flow directions. The results of the hydrogeologic characterization are provided in the Groundwater Technical Memorandum in Appendix B.

5.6 Terrestrial Ecological Evaluation (TEE)

A preliminary TEE Memorandum for the site was prepared as part of the RI by Integral Consulting, Inc. (Integral) of Seattle, Washington, under contract to Shannon & Wilson, Inc. The TEE was conducted to determine if hazardous chemicals are present in the soil that could be considered a threat to the terrestrial environment. The preliminary TEE completed for this investigation is limited to a screening level comparison of site soil data, in accordance with the RI work scope, and does not include more detailed TEE components outlined in the Ecology MTCA TEE guidance.

Based on the results of the TEE screening, lead was the only chemical identified that had maximum site values that exceeded plant and wildlife ecological indicator soil concentration (EIC) screening levels. The TEE memorandum along with a map of site habitats is presented in Appendix C.

5.7 Identification of Chemicals of Interest (COI) via Comparison of Sample Results to Regulatory and Risk-based Screening Criteria

Chemicals of Interest (COI) were identified by comparing sample results for the various media (soil, soil vapor, and groundwater) to the lowest numerical standards published by regulatory agencies, thus providing a conservative screening process. In the context of this investigation, COI are defined as those chemicals for which detected concentrations exceeded screening criteria. These well-established screening criteria were originally presented in the Quality Assurance Project Plan appendix of the Remedial Investigation Work Plan (Shannon & Wilson, 2009) updated during the RI as appropriate, and applied in the RI as follows:

- USEPA Regional Screening Levels (RSLs), (USEPA, 2011)
- USEPA National Primary Drinking Water Regulations, Maximum Contaminant Levels (MCLs) (USEPA, 2008)

- Ecology MTCA cleanup levels (Shannon & Wilson, 2009; Ecology, 2008)
  - Method A soil cleanup levels for unrestricted land use
  - Method B soil cleanup levels, carcinogen and non-carcinogen
  - Method B groundwater cleanup levels, carcinogen and non-carcinogen
- Natural Background Soil Metals Concentrations in Washington State (San Juan, 1994)
- Soil gas screening levels from draft guidance for evaluating soil vapor intrusion in Washington State (Ecology, 2009)

Carcinogenic PAHs (cPAHs) results in soil were evaluated in accordance with the MTCA toxicity equivalency factor (TEF) methodology in WAC 173-340-708(8), with the sum of the TEF calculations reported as total cPAHs and compared to the MTCA Method A cleanup level for total cPAHs. For TEF calculation, non-detections are assigned a concentration of one-half the reporting limit. Individual PAHs (non-carcinogenic) with published screening criteria for soil were compared to those values.

Concentrations of individual cPAH compounds detected in groundwater were compared with the lowest available published screening criteria, rather than the calculated MTCA Method A TEF cleanup level. This methodology was selected for groundwater to be consistent with the conservative screening criteria approach described at the beginning of this section.

PCBs were evaluated as a single hazardous substance in accordance with MTCA Cleanup Regulation (WAC 173-340-708(8)). The generic Method B value is based on a cancer risk level of one in one million (10^{-6}). The entire PCB mixture is assumed to be equitoxic, and the results for individual PCB Aroclors are summed, with non-detects assigned a “0” value. MTCA Method A and Method B criteria for total PCB mixtures are available for soil and groundwater. The USEPA RSLs are available for individual compounds, but not for total PCB mixtures. The total PCB summations were compared only to the MTCA Method A and Method B values for total PCB mixtures.

These criteria are shown in Tables 5-5 and 5-6 (soil and groundwater, respectively), Table 5-7 (soil gas and ambient air), and Table 5-8 (ambient air with full VOC list). RI screening levels for these media were established by selecting the lowest criterion for each chemical. The results of this comparison of RI sample data and RI screening levels do not indicate that active cleanup is required nor do they indicate what appropriate remediation levels would be for the site if active remediation were required. Based on the results of the RI soil and groundwater sampling,

chemicals of interest have been identified that exceed these regulatory and risk-based screening criteria.

The COI identified in soil include:

- cPAHs,
- Lead,
- Methylene chloride,
- PCE
- Pentachlorophenol, and
- Naphthalene.

The COI identified in groundwater include:

- Arsenic
- Carbon tetrachloride,
- Iron,
- PCE and
- TCE.

Additional follow-on soil gas and ambient air sampling also identified contaminants that exceed regulatory and risk-based screening criteria. The contaminants detected include: 1,1,2,2-tetrachloroethane; 1,1-dichloroethene; 1,2-dichloroethane; carbon tetrachloride; benzene; PCE, TCE, and vinyl chloride.

An extended list of the detected analytes along, with their minimum and maximum concentrations and frequency of detections, is provided in Tables 5-3 and 5-4 for soil and groundwater, respectively. Tables 5-5 and 5-6 also contain the regulatory and risk-based screening criteria used in the RI for soil and groundwater.

An extended list of detected analytes in soil gas and ambient air, along with their minimum and maximum concentrations and frequency of detection, is provided in Table 5-7. Table 5-10 and 5-11 contains the regulatory and risk-based screening criteria for soil gas and ambient air used for the RI.

Soil and groundwater analytical results are compared to the USEPA RSLs. Depending upon the concentration and the type of contaminant, the analyte was also compared to State of Washington MTCA regulatory criteria for soil and groundwater. Groundwater samples were also compared to the federal groundwater MCLs.

Soil gas and ambient air analytical results are compared to the USEPA RSLs and State of Washington Indoor Air and Soil Gas Screening Levels. Note that the November 2011 RSLs for ambient air incorporate vapor attenuation factor adjustments in accordance with the California Department of Toxic Substances Control, which differs from the same vapor attenuation factor used in the Ecology draft soil vapor guidance (Ecology, 2009).

Petroleum hydrocarbons data were not compared to screening levels, because POL are excluded from the definition of hazardous substances under CERCLA (see Section 1.1).

TABLE 5-1
SOIL SAMPLING SUMMARY

Sampling Location	No. of Explorations - Surface and Subsurface	VOCs	Petroleum Hydrocarbons (NWTPH-Dx)	Gasoline (NWTPH-Gx)	SVOCs/PAHs	PCBs	RCRA Metals (As/Cd/Cr/Pb/Hg)	Lead	Silver	TOC
ADMINISTRATIVE AND OPERATIONS AREA										
Subsurface Soil Samples										
Liquid Disposal Area	6	x	x	x	x			x	x	
INDUSTRIAL COMPLEX AREA										
Building 4, Public Work Shop	38		x		x			x	x	x
Building 5, Transportation Maintenance	22		x		x			x	x	x
Building 6, Fire Station	6	x								
Building 9, Blacksmith	22		x		x			x	x	x
Building 10, Gunnery Training Building	14		x		x			x	x	x
Building 12, Class "C" Overhaul Shop	32	x	x		x			x	x	x
Building 17, Wash Rack and Shelter	16		x		x			x	x	x
Buildings 18 and 19, Paint Shop	19	x	x		x			x	x	x
Building 20, Hangar	8	x	x		x			x	x	x
Building 29, Photography Laboratory	18	x	x		x			x	x	x
Building 31, Barracks	1	x	x		x		x	x	x	x
Building 40, Barracks	1	x	x		x		x	x	x	x
Buidling 41, Boiler and Generator.*	1	x	x	x	x		x	x	x	x
Building 44, Laundry	9	x								
Building 119, Paint Shop	8	x	x		x			x	x	x
Building 119A, Paint Shop	8	x	x		x			x	x	x
Building E-120, Former Fire Station	10	x								
Vicinity of Nielson Well	6	x								
Tetraethyl Lead Disposal Area	4	x	x	x	x			x		x
Transformer/Generator Buildings (Bldgs 7, 11, 41, 49, and 65)			**Surface Soil Samples (depth of 3 to 6 inches)**							
Building 7, Transformer Vault	4		x		x	x				
Building 11, Radio and Radar Building	5		x		x	x				
Buidling 41, Boiler and Generator Building	32		x		x	x				
Building 49, Auxillary Generator Building	4		x		x	x				
Building 65, Auxillary Generator Building	4		x		x	x				
EAST PARCELS AREA										
Bldgs 101 and 102 (3 to 6 inches)	8		x		x	x				
Total No. Explorations	**306**									

Notes:

* Samples collected during monitoring well installation.

Transformer/generator buildings were analyzed for PAHs, NWTPH-Dx, and PCBs.

NWTPH = Northwest Total Petroleum Hydrocarbons

PCBs = polychlorinated biphenyls

RCRA metals = arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver.

SVOCs/PAHs = semi-volatile organic compounds/polycyclic aromatic hydrocarbons.

VOCs = volatile organic compounds

TABLE 5-2
WATER SAMPLING SUMMARY

Location	Monitoring Wells	Residential Wells	Former DoD Wells	VOCs	SVOCs/PAHs	RCRA Metals (As/Cd/Cr/Pb/Hg)	Lead	Silver	Total Iron	Manganese	TOC
Administrative and Operations Area											
	MW-7 and MW-10			x	x	x			x	x	x
		B-21		x	x	x			x	x	x
	MW-9			x	x		x	x			x
		B-26		x	x	x					
		B-14		x	x		x	x			x
			Airport	x	x		x	x			x
Industrial Complex Area											
	MW-1, MW-2, MW-3, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16 and MW-17			x	x		x	x			x
		P-12a, P-12b, P-13, and NNW		x	x		x	x			x
			Pumphouse #1(Nielsen) and Stout	x	x		x	x			x
West Parcels Area											
	MW-6			x	x	x			x	x	x
		B-24		x	x	x			x	x	x
East Parcels Area											
	MW-8			x	x		x	x			x
Other Wells											
		B-5, B-6, and P-17/18		x	x		x	x			x

Notes:
Residential and former Department of Defense wells were tested for total metals only.
All monitoring wells were tested for total and dissolved metals.
All wells were tested for water quality parameters including dissolved oxygen, pH, turbidity, temperature, conductivity and redox. Data are located in Appendix A.
PAHs = polycylic aromatic hydrocarbons
RCRA = Resource Conservation and Recovery Act
RCRA metals = arsenic, barium cadmium, chromium, lead, mercury, selenium, and silver.
SVOCs = semi-volatile organic compounds
TOC = total organic carbon
VOCs = volatile organic compounds

TABLE 5-3
SOIL GAS AND AMBIENT AIR SUMMARY

Table	VOCs (TO-15 SIM)	VOCs (TO-15)	Duplicate
INDUSTRIAL COMPLEX AREA			
Building 44, Geoprobe	X		X
Building 44, Ambient Air		X	
Nielson Well	X		
Nielson Residence	X		
Building 44, Air Sample	X		X
Building 44, Ambient Air	X		

Notes:
Table 5-3 refers to Phase 2 (November 2010) and Phase 2a (December 2011).
TO-15 SIM = Selective Ion Monitoring
VOCs = volatile organic compounds

TABLE 5-4A
QUALIFIED SUMMARY TABLE

Soil and Air		Summary of Unique Analytes - Qualified Data				
Test	**Total # Data Points for Method**	# Data Points Estimated (J/UJ)	%	# Data Points Estimated Rejected	%	% Complete
VOC (TO-15)- Air	62	5	8%	0	0%	100%
VOC (TO-15-SIM)- Air	228	0	0%	0	0%	100%
VOCs	13504	1052	8%	49	0.4%	99.6%
VOCs SIM	207	5	1%	0	0%	100%
SVOC	7532	552	6%	320	4%	96%
SVOC SIM	2863	42	1%	0	0%	100.0%
PCB	369	0	0%	0	0%	100%
NWTPH -DX	408	45	5%	0	0%	100%
NWTOH-GX	54	0	0%	0	0%	100%
Mercury (7471A)	10	0	0%	0	0%	100%
Metals (610B)	50	0	0%	0	0%	100%
Metals (6020)	403	69	0%	0	0%	100%
TOC (D4129-82M)	125	0	0%	0	0%	100%
TOTALS	11689					

Water		Summary of Unique Analytes- Qualified Data				
Test	**Total # Data Points for Method**	# Data Points Estimated (J/UJ)	%	# Data Points Estimated Rejected	%	% Complete
VOC	4961	857	17%	71	1%	97%
VOC SIM	58	1	2%	0	0%	100%
SVOC	2122	33	2%	46	1%	99%
SVOC SIM	700	0	0%	0	0%	100%
PCB	72	0	0%	0	0%	100%
NWTPH-DX	54	30	56%	0	0%	100%
NWTPH-GX	5	0	0%	0	0%	100%
TOC (415.1)	28	0	0%	0	0%	100%
Mercury (7470A)	11	0	0%	0	0%	100%
Mercuty (245.1)	6	0	0%	0	0%	100%
Metals (6010C)	2	2	100%	0	0%	100%
Metals (6020A)	8	0	0%	0	0%	100%
Metals (200.7)	32	0	0%	0	0%	100%
Metals (200.8)	196	4	2%	0	0%	100%
TOTALS						

TABLE 5-4B
REJECTED ANALYTICAL DATA

Analyte	Reason(s)
1,2-Dichlorobenzene	MS/MSD sample recoveries were outside of control limits, and laboratory control sample recoveries were outside of control limits (accuracy).
1,4-Dioxane	Initial and continuing calibrations were outside of control limits.
2,4,5-Trichlorophenol	Surrogate spike recoveries were outside of control limits (accuracy).
2,4,6-Trichlorophenol	Surrogate spike recoveries were outside of control limits (accuracy).
2,4-Dichlorophenol	Surrogate spike recoveries were outside of control limits (accuracy).
2,4-Dimethylphenol	Laboratory control sample recoveries were outside of control limits and/or surrogate spike recoveries were outside of control limits (accuracy).
2,4-Dimethylphenol	Surrogate spike recoveries were outside of control limits and RPD between duplicate samples was outside of control limits (precision).
2,4-Dinitrophenol	Laboratory control sample recoveries were outside of control limits (accuracy).
2,4-Dinitrophenol	Surrogate spike recoveries were outside of control limits (accuracy).
2-Butanone (MEK)	Continuing calibrations was outside of control limits.
2-Butanone (MEK)	Initial and continuing calibrations were outside of control limits.
2-Chlorophenol	Surrogate spike recoveries were outside of control limits (accuracy).
2-Methyl-4,6-dinitrophenol	Surrogate spike recoveries were outside of control limits (accuracy).
2-Methyl-4,6-dinitrophenol	Surrogate spike recoveries were outside of control limits (accuracy), and RPD between duplicate samples was outside of control limits (precision).
2-Methylphenol	Surrogate spike recoveries were outside of control limits (accuracy).
2-Nitrophenol	Surrogate spike recoveries were outside of control limits (accuracy).
3,3'-Dichlorobenzidine	Laboratory control sample recoveries were outside of control limits (accuracy).
4-Chloro-3-methylphenol	Surrogate spike recoveries were outside of control limits (accuracy).
4-Chloroaniline	Laboratory control sample recoveries were outside of control limits (accuracy).
4-Methyl-2-pentanone (MIBK)	Continuing calibrations was outside of control limits.
4-Methylphenol	Surrogate spike recoveries were outside of control limits (accuracy).
4-Nitrophenol	Surrogate spike recoveries were outside of control limits (accuracy).
Acetone	Continuing calibrations was outside of control limits.
Acrylonitrile	Initial and continuing calibrations was outside of control limits.

TABLE 5-4B
REJECTED ANALYTICAL DATA

Aniline	Laboratory control sample recoveries were outside of control limits (accuracy).
Benzoic Acid	Surrogate spike recoveries were outside of control limits (accuracy).
Benzoic Acid	Surrogate spike recoveries were outside of control limits and RPD between duplicate samples was outside of control limits (precision).
Benzoic Acid	RPD between duplicate samples were outside of control limits (MS/MSD and/or LCS/LCSD) (precision) and laboratory control sample recoveries were outside of control limits (accuracy).
Benzyl Alcohol	Surrogate spike recoveries were outside of control limits (accuracy).
Hexachlorocyclopentadiene	Laboratory control sample recoveries were outside of control limits (accuracy).
Naphthalene	RPD between duplicate samples was outside of control limits (precision), and matrix spike and MS/MSD recoveries were outside of control limits, and laboratory control sample recoveries were outside of control limits (accuracy).
Pentachlorophenol	Surrogate spike recoveries were outside of control limits (accuracy).
Phenol	Surrogate spike recoveries were outside of control limits (accuracy).
Pyridine	Laboratory control sample recoveries were outside of control limits (accuracy).

Notes:
Appendix B = Qualified Data Summary Table from "Revised April & May 2009 Data Validation Report.pdf"
Attachment B = Qualified Data Summary Table from "July 2009 Data Validation Report.pdf"
Appendix B = Qualified Data Summary Table from "November 2009 Data Validation Report.pdf"
Attachment B = Qualified Data Summary Table from "November 2010 Data Validation Report.pdf"
Attachment B = Qualified Data Summary Table from "December 2011 Data Validation Report.pdf"
LCS/LCSD = Laboratory Control Spikes/Duplicates
MS/MSD = matrix spike/matrix spike duplicate
RPD = relative percent difference

TABLE 5-5
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL

Analyte	Matrix	Method	MDL (soil) (mg/kg)	RL (soil) (mg/kg)	Soil Washington State Background Metals Concentrations (mg/kg)	Soil Washinginton Method A Unrestricted Land Use (mg/kg)	Soil Washinginton Method B-Carcinogen (mg/kg)	Soil Washinginton Method B-Non-Carcinogen (mg/kg)	Soil EPA Regional Screening Levels Carcinogenic Target Risk (TR) = 1E-06 (mg/kg)	Soil EPA Regional Screening Levels Noncancer Hazard Index (HI) = 1 (mg/kg)
Metals										
Arsenic	Soil	6020A	0.2	***0.5***	7	20	0.67	24	**0.39**	22
Barium	Soil	6020A	0.02	0.05	255					**15000**
Cadmium	Soil	6020A	0.009	0.02	1	**2**	NR	80	1800	70
Chromium	Soil	6020A	0.2	0.2	48	**2000**[1]	NR	NR		
Lead	Soil	6020A	0.05	0.05	24	**250**	NR	NR		400
Manganese	Soil	6020A	0.02	1.98	0.07		NR			
Mercury	Soil	7471A	0.002	0.02	0.78	**2**	NR	24		10
Selenium	Soil	6020A	0.4	1	0.61					**390**
Silver	Soil	6020A	0.02	0.02	58700					**390**
Iron	Soil	6010	NA	NA	1200		NR	NR		**55000**
Copper	Soil	6020A	0.1	0.2	36		NR	**3000**		**3100**
Volatile Organic Compounds (VOCs)										
1,1,1,2-Tetrachloroethane	Soil	8260B	0.000076	0.005			38	2400	**1.9**	2300
1,1,1-Trichloroethane	Soil	8260B	0.000066	0.005		**2**	NR	72000		8700
1,1,2,2-Tetrachloroethane	Soil	8260B	0.00011	0.005			5	NR	**0.56**	1600
1,1,2-Trichloroethane	Soil	8260B	0.00011	0.005			18	320	**1.1**	1.6
1,1-Dichloroethane	Soil	8260B	0.000068	0.005			NR	16,000	**3.3**	16,000
1,1-Dichloroethene	Soil	8260B	0.000057	0.005						**240**
1,1-Dichloropropene	Soil	8260B	0.000062	0.005						
1,2,3-Trichlorobenzene	Soil	8260B	0.00018	0.02						**49**
1,2,3-Trichloropropane	Soil	8260B	0.00029	0.005			0.14	480	**0.005**	5.2
1,2,4-Trichlorobenzene	Soil	8260B	0.00019	0.02					**22**	62
1,2,4-Trimethylbenzene	Soil	8260B	0.00007	0.02			NR	4,000		**62**
1,2-Dibromo-3-Chloropropane	Soil	8260B	0.00034	0.02			0.71	NR	**0.0054**	**4.9**
1,2-Dichlorobenzene	Soil	8260B	0.000065	0.005			NR	7,200		**1,900**
1,2-Dichloroethane	Soil	8260B	0.000057	0.005			11	1,600	**0.43**	33
1,2-Dichloropropane	Soil	8260B	0.000094	0.005			**15**	NR	0.94	17
1,3,5-Trimethylbenzene	Soil	8260B	0.000069	0.02			NR	4,000		**780**
1,3-Dichlorobenzene	Soil	8260B	0.000056	0.005			NR	NR		
1,3-Dichloropropane	Soil	8260B	0.000083	0.005						**1600**

TABLE 5-5
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL

Analyte	Matrix	Method	MDL (soil) (mg/kg)	RL (soil) (mg/kg)	Soil Washington State Background Metals Concentrations (mg/kg)	Soil Washinginton Method A Unrestricted Land Use (mg/kg)	Soil Washinginton Method B-Carcinogen (mg/kg)	Soil Washinginton Method B-Non-Carcinogen (mg/kg)	Soil EPA Regional Screening Levels Carcinogenic Target Risk (TR) = 1E-06 (mg/kg)	Soil EPA Regional Screening Levels Noncancer Hazard Index (HI) = 1 (mg/kg)
1,4-Dichlorobenzene	Soil	8260B	0.0001	0.005			42	NR	**2.4**	3500
1,4-Dioxane	Soil	8260B	0.013	0.25					**4.9**	**1800**
2,2-Dichloropropane	Soil	8260B	0.000088	0.005						
2-Chlorotoluene	Soil	8260B	0.000051	0.02						**1600**
4-Chlorotoluene	Soil	8260B	0.000082	0.02						**1600**
4-Isopropyltoluene	Soil	8260B	0.000066	0.02						
Acetone	Soil	8260B	0.0018	0.02			NR	**8,000**		61,000
Acrylonitrile	Soil	8260B	0.00046	0.02			1.9	80	**0.24**	17
Benzene	Soil	8260B	0.000079	0.005		**0.03**	18	320	1.1	86
Bromobenzene	Soil	8260B	0.00014	0.005						**300**
Bromoform	Soil	8260B	0.00019	0.005			130	1,600	**62**	1,200
Bromomethane	Soil	8260B	0.00051	0.005			NR	110		**7.3**
Carbon disulfide	Soil	8260B	0.000057	0.005			NR	8,000		**820**
Carbon tetrachloride	Soil	8260B	0.000072	0.005			7.7	56	**0.61**	110
Chlorobenzene	Soil	8260B	0.000051	0.005			NR	1,600		**290**
Chlorobromomethane	Soil	8260B	0.00011	0.005						
Chlorodibromomethane	Soil	8260B	0.000096	0.005						
Chloroethane	Soil	8260B	0.0024	0.005						**15,000**
Chloroform	Soil	8260B	0.000053	0.005			160	800	**0.29**	210
Chloromethane	Soil	8260B	0.00011	0.005			**77**	NR		120
cis-1,2-Dichloroethene	Soil	8260B	0.0001	0.005						**160**
Dibromomethane	Soil	8260B	0.00015	0.005						**25**
Dichlorobromomethane	Soil	8260B	0.00015	0.005			12	1,600	**0.27**	1,600
Ethylbenzene	Soil	8260B	0.000065	0.005		6	NR	8,000	**5.4**	3,500
Hexachlorobutadiene	Soil	8260B	0.00011	0.02			13	16	**6.2**	61
Isopropylbenzene	Soil	8260B	0.00005	0.02						**2,100**
Methyl Ethyl Ketone	Soil	8260B	0.0011	0.02						**28,000**
methyl isobutyl ketone	Soil	8260B	0.00002	0.02						**5,300**
Methyl tert-butyl ether	Soil	8260B	0.000064	0.005		**0.1**			43	17,000
Methylene Chloride	Soil	8260B	0.000014	0.01		**0.02**	130	4,800	11	1,700
m-Xylene & p-Xylene	Soil	8260B	0.00015	0.005		**9**	NR	160,000		590

TABLE 5-5
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL

Analyte	Matrix	Method	MDL (soil) (mg/kg)	RL (soil) (mg/kg)	Soil Washington State Background Metals Concentrations (mg/kg)	Soil Washinginton Method A Unrestricted Land Use (mg/kg)	Soil Washinginton Method B-Carcinogen (mg/kg)	Soil Washinginton Method B-Non-Carcinogen (mg/kg)	Soil EPA Regional Screening Levels Carcinogenic Target Risk (TR) = 1E-06 (mg/kg)	Soil EPA Regional Screening Levels Noncancer Hazard Index (HI) = 1 (mg/kg)
Naphthalene	Soil	8260B	0.00014	0.02		5	NR	1,600	**3.6**	140
n-Butylbenzene	Soil	8260B	0.00006	0.02			NR	NR		**3,900**
N-Propylbenzene	Soil	8260B	0.000054	0.02			NR	NR		**3,400**
o-Xylene	Soil	8260B	0.000057	0.005			NR	160,000		**690**
sec-Butylbenzene	Soil	8260B	0.000072	0.02			NR	NR		
Styrene	Soil	8260B	0.000067	0.005			**33**	16,000		6,300
tert-Butylbenzene	Soil	8260B	0.00007	0.02			NR	NR		
Tetrachloroethene	Soil	8260B	0.000076	0.005		**0.05**	1.9	800	0.55	370
Toluene	Soil	8260B	0.00013	0.005		**7**	NR	6,400		5,000
trans-1,2-Dichloroethene	Soil	8260B	0.000084	0.005						**150**
trans-1,3-Dichloropropene	Soil	8260B	0.000093	0.005					**1.7**	77
trans-1,4-Dichloro-2-butene	Soil	8260B	0.00041	***0.02***					**0.0069**	
Trichloroethene	Soil	8260B	0.00007	0.005		**0.03**	2.5	24	0.91	4.4
Trichlorofluoromethane	Soil	8260B	0.00011	0.005						**790**
Vinyl chloride	Soil	8260B	0.000094	0.005			0.67	240	**0.06**	74
Semi-volatile Organic Compounds (SVOCs) (8270C-low-level)										
Aniline	Soil	8270C	0.0015	0.02		RND	1,800	NR	**85**	430
1-Methylnaphthalene	Soil	8270C	0.0022	0.01		NR	NR	NR	**22**	5,500
2,4-Dichlorophenol	Soil	8270C	0.001	0.01		RND	NR	240		**180**
2,4-Dimethylphenol	Soil	8270C	0.0055	0.05		RND	NR	1,600		**1,200**
2,4-Dinitrophenol	Soil	8270C	0.0015	0.01		RND	NR	160		**120**
2-Chloronaphthalene	Soil	8270C	0.0016	0.01						**6,300**
2-Chlorophenol	Soil	8270C	0.002	0.01		RND	NR	400		**390**
2-Methylphenol	Soil	8270C	0.0015	0.01		RND	NR	4,000		**3,100**
2-Nitroaniline	Soil	8270C	0.0032	0.01		RND	NR	NR		**610**
2-Nitrophenol	Soil	8270C	0.0015	0.01						
3 & 4-Methylphenol	Soil	8270C	0.003	0.01						**3,100**
3,3'-Dichlorobenzidine	Soil	8270C	0.0037	0.1		RND	2.2	NR	**1.1**	
3-Nitroaniline	Soil	8270C	0.0032	0.02						
4,6-Dinitro-2-methylphenol	Soil	8270C	0.0014	0.1						**4.9**
4-Bromophenyl phenyl ether	Soil	8270C	0.0016	0.01						

TABLE 5-5
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL

Analyte	Matrix	Method	MDL (soil) (mg/kg)	RL (soil) (mg/kg)	Soil Washington State Background Metals Concentrations (mg/kg)	Soil Washinginton Method A Unrestricted Land Use (mg/kg)	Soil Washinginton Method B-Carcinogen (mg/kg)	Soil Washinginton Method B-Non-Carcinogen (mg/kg)	Soil EPA Regional Screening Levels Carcinogenic Target Risk (TR) = 1E-06 (mg/kg)	Soil EPA Regional Screening Levels Noncancer Hazard Index (HI) = 1 (mg/kg)
4-Chloro-3-methylphenol	Soil	8270C	0.0014	0.01						**6,100**
4-Chloroaniline	Soil	8270C	0.0019	0.01		RND	NR	320	**2.4**	240
4-Chlorophenyl phenyl ether	Soil	8270C	0.0014	0.01						
4-Nitroaniline	Soil	8270C	0.0018	0.02					**24**	240
4-Nitrophenol	Soil	8270C	0.00026	0.001						
Benzoic acid	Soil	8270C	0.096	0.2		RND	NR	320,000		**240,000**
Benzyl alcohol	Soil	8270C	0.0021	0.02		RND	NR	24,000		**6,100**
Bis(2-chloroethoxy)methane	Soil	8270C	0.000025	0.0001						**180**
Bis(2-chloroethyl)ether	Soil	8270C	0.0019	0.01		RND	0.91	NR	**0.21**	
Bis(2-ethylhexyl)phthalate	Soil	8270C	0.007	0.1		RND	71	1,600	**35**	1,200
Butyl benzyl phthalate	Soil	8270C	0.0032	0.01		RND	NR	16,000	**260**	12,000
Diethyl phthalate	Soil	8270C	0.0013	0.01		RND	NR	64,000		**49,000**
Dimethyl phthalate	Soil	8270C	0.001	0.01		RND	NR	**80,000**		
Di-n-butyl phthalate	Soil	8270C	0.0079	0.02						**6,100**
Di-n-octyl phthalate	Soil	8270C	0.0017	0.01		RND	NR	**1,600**		
Hexachlorobenzene	Soil	8270C	0.0012	0.01		RND	0.63	64	**0.3**	49
Hexachlorocyclo-pentadiene	Soil	8270C	0.029	0.05		RND	NR	480		**370**
Hexachloroethane	Soil	8270C	0.0031	0.01		RND	71	80	**12**	43
Isophorone	Soil	8270C	0.001	0.01		RND	1,100	16,000	**510**	12,000
Naphthalene	Soil	8270C	0.0023	0.01		5	NR	1,600	**3.6**	140
N-Nitroso-dimethylamine	Soil	8270C	0.0061	***0.05***		RND	0.02	NR	**0.0023**	0.49
N-Nitrosodi-n-propylamine	Soil	8270C	0.0024	***0.01***		RND	0.14	NR	**0.069**	
N-Nitrosodiphenylamine	Soil	8270C	0.0016	0.01		RND	200	NR	**99**	
Pentachlorophenol	Soil	8270C	0.02	0.1		RND	8.3	2,400	**0.89**	230
Phenol	Soil	8270C	0.002	0.03		RND	NR	48,000		**18,000**
Pyridine	Soil	8270C	0.05	0.05		RND	NR	80		**78**
1,2,4-Trichlorobenzene	Soil	8270C	0.0026	0.01		RND	NR	800	**22**	62
2,4,5-Trichlorophenol	Soil	8270C	0.0015	0.01		RND	NR	8,000		**6,100**
2,4,6-Trichlorophenol	Soil	8270C	0.0014	0.01		RND	91	NR	**44**	61

TABLE 5-5
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL

Analyte	Matrix	Method	MDL (soil) (mg/kg)	RL (soil) (mg/kg)	Soil Washington State Background Metals Concentrations (mg/kg)	Soil Washinginton Method A Unrestricted Land Use (mg/kg)	Soil Washinginton Method B-Carcinogen (mg/kg)	Soil Washinginton Method B-Non-Carcinogen (mg/kg)	Soil EPA Regional Screening Levels Carcinogenic Target Risk (TR) = 1E-06 (mg/kg)	Soil EPA Regional Screening Levels Noncancer Hazard Index (HI) = 1 (mg/kg)
Polynuclear Aromatic Hydrocarbons (PAHs)										
Acenaphthylene	Soil	8270C-SIM	0.0002	0.005			NR	**4,800**		
Acenaphthene	Soil	8270C-SIM	0.0002	0.005						**3,400**
Anthracene	Soil	8270C-SIM	0.0004	0.005			NR	24,000		**17,000**
Benzo(a)anthracene*	Soil	8270C-SIM	0.0005	0.005				NR	0.15	
Benzo(a)pyrene*	Soil	8270C-SIM	0.0001	0.005		0.1	0.14	NR	0.015	
Benzo(b)fluoranthene*	Soil	8270C-SIM	0.0002	0.005				NR	0.15	
Benzo(g,h,i)perylene	Soil	8270C-SIM	0.0006	0.005						
Benzo(k)fluoranthene*	Soil	8270C-SIM	0.0002	0.005				NR	1.5	
Chrysene*	Soil	8270C-SIM	0.0003	0.005				NR	15	
Dibenz(a,h)anthracene*	Soil	8270C-SIM	0.0003	0.005				NR	0.015	
Fluoranthene	Soil	8270C-SIM	0.0006	0.005			NR	3,200		**2,300**
Fluorene	Soil	8270C-SIM	0.0005	0.005			NR	3,200		**2,300**
Indeno(1,2,3-cd)pyrene*	Soil	8270C-SIM	0.0002	0.005				NR	0.15	
Pyrene	Soil	8270C-SIM	0.0004	0.005			NR	2,400		**1,700**
Total cPAHs (TEF adjusted)	Soil	8270C-SIM		0.005		**0.1** [4]				
Polychlorinated biphenyls (PCBs)										
Arochlor 1016	Soil	8082	0.02	0.1			NR	5.6	6.3	3.9
Arochlor 1221	Soil	8082	0.02	***0.2***					0.14	
Arochlor 1232	Soil	8082	0.02	0.1					0.14	
Arochlor 1242	Soil	8082	0.02	0.1					0.22	
Arochlor 1248	Soil	8082	0.02	0.1					0.22	
Arochlor 1254	Soil	8082	0.02	0.1			NR	1.6	0.22	1.1
Arochlor 1260	Soil	8082	0.02	0.1			NR	NR	0.22	
Arochlor 1262	Soil	8082	0.02	0.1						
Arochlor 1268	Soil	8082	0.02	0.1						
Total PCBs Aroclors	Soil	8082	0.02	0.1		1	**0.5** [5]			
Petroleum Hydrocarbons (NWTPH-										
Gasoline	Soil	NWTPH-Gx	1.5	5		**100**[2]				
Petroleum Hydrocarbons (NWTPH-										
C10-C24	Soil	NWTPH-Dx	2.6	25		**2000**[3]				
C12-C24	Soil	NWTPH-Dx	2.6	25		**2000**[3]				
Motor Oil	Soil	NWTPH-Dx	15	100		**2000**[3]				
Jet Fuel	Soil	NWTPH-Dx	6	25		**2000**[3]				
Mineral Oil	Soil	NWTPH-Dx	15	100		**2000**[3]				180,000

TABLE 5-5
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL

Analyte	Matrix	Method	MDL (soil) (mg/kg)	RL (soil) (mg/kg)	Soil Washington State Background Metals Concentrations (mg/kg)	Soil Washinginton Method A Unrestricted Land Use (mg/kg)	Soil Washinginton Method B-Carcinogen (mg/kg)	Soil Washinginton Method B-Non-Carcinogen (mg/kg)	Soil EPA Regional Screening Levels Carcinogenic Target Risk (TR) = 1E-06 (mg/kg)	Soil EPA Regional Screening Levels Noncancer Hazard Index (HI) = 1 (mg/kg)
Miscellaneous Parameters										
TOC	Soil	ASTM 4129	400	500						

Notes:

[1] Assume Chromium III, because no source of Chromium IV has been identified based on historical land use.

[2] MTCA Method A cleanup levels. If benzene is present, the screening value is 0.8 mg/L/30 mg/kg. If there is no detectable benzene, the screening value is 1.0 mg/L./100 mg/kg.

[3] Sum of all compounds (all types of diesel and oil range compounds) must be below 2,000 mg/kg.

[4] Sum of all cPAHs compounds (TEF adjusted values) must be below 0.1 mg/kg. Non-detects are assigned one-half the detection limit when summing the TEF ajdusted values for cPAHs.

[5] Sum of all Aroclors (PCB congener) must be below 0.5 mg/kg. Non-detects are assigned a "0" value. Individual PCB congeners were not evaluated.

* = requires application of toxicity equipvalent factor (TEF). A mixture of carcinogenic PAHs shall be considered a single hazardous substance with a cancer risk of 10-6.

Soil and migration to groundwater data from "PRG TABLE 2004.xls"

MTCA regulation WAC 173-340. Method A values are from Ecology Publication 94-06, amended. February 12, 2001.

Revised MTCA Method B value from Washington Department of Ecology website CLARC tables downloaded January 2008.

Method B values are from MTCA Cleanup Levels and Risk Calculations (CLARC) Version 3.0, Ecology Publication No. 94-145.

U.S. Environmental Protection Agency RSLs are from EPA Clearing House; values downloaded November 2011.

Background metals concentrations for soil taken from Natural Background Soil Metals Concentrations in Washington State, Toxics Cleanup Program Department of Ecology, October 1994 Publication #94-115

Bold Underline and italics indicates reporting limit exceeds screening level.

Bold values are the driving screening level for regulatory comparison for each compound.

cPAHs = carcinogenic polycyclic aromatic hydrocarbons: (benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno(1,2,3cd)pyrene.

For cPAHs individual compounds are not evaluated; only total cPAHs, adjusted for TEF is used as a comparison criteria.

Individual non-carcinogenic PAH compounds were evaluated using compound specific criteria.

MDL = method detection limit

MTCA = Model Toxics Control Act

NR = not researched

NWTPH = Northwest total petroleum hydrocarbons

RL= reporting limit

RND = researched - no data

TOC= total organic carbon

TABLE 5-6
SCREENING LIMITS AND REGULATORY CRITERIA FOR WATER

Analyte	Matrix	Method	MDL (µg/L)	RL (µg/L)	Ground-water Federal MCL (µg/L)	Washington Ground- water MTCA Method B Carcinogen (µg/L)	Washington Ground-water MTCA Method B Non-Carcinogen (µg/L)	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1 (µg/L)	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06 (µg/L)
Metals									
Arsenic	Water	200.8	0.2	***0.5***	10	0.058	4.8	4.7	**0.045**
Barium	Water	200.8	0.02	0.05				**2900**	
Cadmium	Water	200.8	0.02	0.02	**5**	NR	8	6.9	
Chromium	Water	200.8	0.05	0.2	**100**	NR	NR		
Lead	Water	200.8	0.006	0.02	**15**	NR	NR		
Manganese	Water	200.8	0.02	0.05	NR	NR	**0.23**	320	
Mercury	Water	245.2	0.05	0.2	2	NR	4.8	**0.63**	
Selenium	Water	200.8	0.5	1				**78**	
Silver	Water	200.8	0.009	0.02				**71**	
Iron	Water	200.8	5	20	NR	NR	NR	**11000**	
Copper	Water	200.8	0.03	0.1	1300	NR	**590**	620	
Volatile Organic Compounds (VOCs)									
1,1,1,2-Tetrachloroethane	Water	8260B	0.047	0.5	NR	1.7	240	370	**0.5**
1,1,1-Trichloroethane	Water	8260B	0.05	0.5	**200**	NR	7200	7500	
1,1,2,2-Tetrachloroethane	Water	8260B	0.064	***0.5***	NR	0.22	NR	280	**0.066**
1,1,2-Trichloroethane	Water	8260B	0.061	***0.5***	5	0.77	32	0.41	**0.24**
1,1-Dichloroethane	Water	8260B	0.042	0.5	NR	NR	1600	2900	**2.4**
1,1-Dichloroethylene	Water	8260B	0.1	0.5				**260**	
1,1-Dichloropropene	Water	8260B	0.05	0.5					
1,2,3-Trichlorobenzene	Water	8260B	0.1	2				**5.2**	
1,2,3-Trichloropropane	Water	8260B	0.14	***0.5***	NR	0.0063	48	0.62	**0.00065**
1,2,4-Trichlorobenzene	Water	8260B	0.13	***2***				3.9	**0.99**
1,2,4-Trimethylbenzene	Water	8260B	0.037	2	NR	NR	400	**15**	
1,2-Dibromo-3-Chloropropane	Water	8260B	0.22	***2***	0.2	0.031	NR	0.36	**0.00032**
1,2-Dichlorobenzene	Water	8260B	0.04	0.5	600	NR	720	**280**	
1,2-Dichloroethane	Water	8260B	0.073	***0.5***	5	0.48	160	13	**0.15**
1,2-Dichloropropane	Water	8260B	0.042	***0.5***	5	0.64	NR	8.3	**0.38**
1,3,5-Trimethylbenzene	Water	8260B	0.042	2	NR	NR	400	**87**	
1,3-Dichlorobenzene	Water	8260B	0.041	0.5	NR	NR	NR		
1,3-Dichloropropane	Water	8260B	0.032	0.5				**290**	

TABLE 5-6
SCREENING LIMITS AND REGULATORY CRITERIA FOR WATER

Analyte	Matrix	Method	MDL (µg/L)	RL (µg/L)	Ground-water Federal MCL (µg/L)	Washington Ground- water MTCA Method B Carcinogen (µg/L)	Washington Ground-water MTCA Method B Non-Carcinogen (µg/L)	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1 (µg/L)	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06 (µg/L)
1,4-Dichlorobenzene	Water	8260B	0.054	0.5	75	1.8	NR	470	**0.42**
1,4-Dioxane	Water	8260B	13	100				470	**0.67**
2,2-Dichloropropane	Water	8260B	0.05	0.5					
2-Chlorotoluene	Water	8260B	0.035	2				**180**	
4-Chlorotoluene	Water	8260B	0.025	2				**190**	
4-Isopropyltoluene	Water	8260B	0.044	2					
Acetone	Water	8260B	2.5	20	NR	NR	**800**	12000	
Acrylonitrile	Water	8260B	7.3	***50***	NR	0.081	8	4.1	**0.045**
Benzene	Water	8260B	0.045	***0.5***	NR	0.8	32	29	**0.39**
Bromobenzene	Water	8260B	0.027	2				**54**	
Bromoform	Water	8260B	0.08	0.5	80	**5.5**	160	290	7.9
Bromomethane	Water	8260B	0.072	0.5	NR	NR	11	**7**	
Carbon disulfide	Water	8260B	0.045	0.5	NR	NR	800	**720**	
Carbon tetrachloride	Water	8260B	0.068	0.5	5	0.625	32	40	**0.39**
Chlorobenzene	Water	8260B	0.045	0.5	100	NR	160	**72**	
Chlorobromomethane	Water	8260B	0.091	0.5					
Chlorodibromomethane	Water	8260B	0.057	0.5					
Chloroethane	Water	8260B	0.13	0.5					
Chloroform	Water	8260B	0.042	***0.5***	80	7.2	80	84	**0.19**
Chloromethane	Water	8260B	0.053	***0.5***	NR	**3.4**	NR	190	
cis-1,2-Dichloroethene	Water	8260B	0.045	***0.5***				**28**	
Dibromomethane	Water	8260B	0.089	0.5				**7.9**	
Dichlorobromomethane	Water	8260B	0.036	***0.5***	80	0.52	160	290	**0.12**
Ethylbenzene	Water	8260B	0.042	0.5	700	NR	800	670	**1.3**
Hexachlorobutadiene	Water	8260B	0.19	***2***	NR	0.56	1.6	4.7	**0.26**
Isopropylbenzene	Water	8260B	0.031	2				**390**	
Methyl Ethyl Ketone	Water	8260B	3.8	20				**4900**	
methyl isobutyl ketone	Water	8260B	3	20				**1000**	
Methyl tert-butyl ether	Water	8260B	0.07	0.5				6300	**12**
Methylene Chloride	Water	8260B	0.23	2	5	5.8	480	640	**4.7**
m-Xylene & p-Xylene	Water	8260B	0.078	0.5	NR	NR	16000	**190**	

TABLE 5-6
SCREENING LIMITS AND REGULATORY CRITERIA FOR WATER

Analyte	Matrix	Method	MDL (µg/L)	RL (µg/L)	Ground-water Federal MCL (µg/L)	Washington Ground- water MTCA Method B Carcinogen (µg/L)	Washington Ground-water MTCA Method B Non-Carcinogen (µg/L)	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1 (µg/L)	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06 (µg/L)
Naphthalene	Water	8260B	0.1	***2***	NR	NR	160	6.1	**0.14**
n-Butylbenzene	Water	8260B	0.056	2	NR	NR	NR	**780**	
N-Propylbenzene	Water	8260B	0.037	2	NR	NR	NR	**530**	
o-Xylene	Water	8260B	0.037	0.5	NR	NR	16000	**190**	
sec-Butylbenzene	Water	8260B	0.036	2	NR	NR	NR		
Styrene	Water	8260B	0.039	0.5	100	**1.5**	1600	1100	
tert-Butylbenzene	Water	8260B	0.038	2	NR	NR	NR		
Tetrachloroethene	Water	8260B	0.077	***0.5***	5	0.081	80	84	**0.072**
Toluene	Water	8260B	0.048	0.5	1000	NR	**640**	860	
trans-1,2-Dichloroethene	Water	8260B	0.048	0.5				**86**	
trans-1,3-Dichloropropene	Water	8260B	0.041	***0.5***				38	**0.41**
trans-1,4-Dichloro-2-butene	Water	8260B	0.2	***10***					**0.0012**
Trichloroethene	Water	8260B	0.061	***0.5***	5	0.11	2.4	2.6	**0.44**
Trichlorofluoromethane	Water	8260B	0.086	0.5				**1100**	
Vinyl chloride	Water	8260B-SIM	0.0084	***0.02***	2	0.029	24	36	**0.015**
Semi-volatile Organic Compounds (SVOCs) (8270C-low-level)									
Aniline	Water	8270C	0.043	1		**7.7**	NR	110	12
1-Methylnaphthalene	Water	8270C	0.026	0.2		NR	NR	460	**0.97**
2,4-Dichlorophenol	Water	8270C	0.047	0.5		NR	**24**	35	
2,4-Dimethylphenol	Water	8270C	2.2	4		NR	**160**	270	
2,4-Dinitrophenol	Water	8270C	0.17	4		NR	32	**30**	
2-Chloronaphthalene	Water	8270C	0.041	0.2				**550**	
2-Chlorophenol	Water	8270C	0.054	0.5		NR	**40**	71	
2-Methylphenol	Water	8270C	0.11	0.5		NR	**400**	720	
2-Nitroaniline	Water	8270C	0.026	0.2		NR	NR	**150**	
2-Nitrophenol	Water	8270C	0.063	0.5					
3 & 4-Methylphenol	Water	8270C	0.06	0.5				**720**	
3,3'-Dichlorobenzidine	Water	8270C	0.428	***2***		0.2	NR		**0.11**
3-Nitroaniline	Water	8270C	0.029	1					
4,6-Dinitro-2-methylphenol	Water	8270C	0.025	***2***				**1.2**	
4-Bromophenyl phenyl ether	Water	8270C	0.026	0.2					

TABLE 5-6
SCREENING LIMITS AND REGULATORY CRITERIA FOR WATER

Analyte	Matrix	Method	MDL (µg/L)	RL (µg/L)	Ground-water Federal MCL (µg/L)	Washington Ground- water MTCA Method B Carcinogen (µg/L)	Washington Ground-water MTCA Method B Non-Carcinogen (µg/L)	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1 (µg/L)	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06 (µg/L)
4-Chloro-3-methylphenol	Water	8270C	0.027	0.2				**1100**	
4-Chloroaniline	Water	8270C	0.025	0.2		NR	32	59	**0.32**
4-Chlorophenyl phenyl ether	Water	8270C	0.027	0.2					
4-Nitroaniline	Water	8270C	0.019	1				61	**3.3**
4-Nitrophenol	Water	8270C	0.28	2					
Benzoic acid	Water	8270C	1.1	5		NR	64000	**58000**	
Benzyl alcohol	Water	8270C	0.073	5		NR	2400	**1500**	
Bis(2-chloroethoxy)methane	Water	8270C	0.00013	0.003				**47**	
Bis(2-chloroethyl)ether	Water	8270C	0.035	0.2			NR		**0.012**
Bis(2-ethylhexyl)phthalate	Water	8270C	0.13	***1***		6.30	320	4.6	**0.071**
Butyl benzyl phthalate	Water	8270C	0.018	0.2		NR	3200	1200	**14**
Diethyl phthalate	Water	8270C	0.012	0.2		NR	13000	**11000**	
Dimethyl phthalate	Water	8270C	0.012	0.2		NR	**16000**		
Di-n-butyl phthalate	Water	8270C	0.023	0.2				**670**	
Di-n-octyl phthalate	Water	8270C	0.018	0.2		NR	**320**		
Hexachlorobenzene	Water	8270C	0.022	***0.2***		0.06	13	13	**0.042**
Hexachlorocyclo-pentadiene	Water	8270C	0.19	1		NR	18	**22**	
Hexachloroethane	Water	8270C	0.024	0.2		3.10	8	5.1	**0.79**
Isophorone	Water	8270C	0.016	0.2		46.00	1600	3000	**67**
Naphthalene	Water	8270C	0.022	***0.2***		NR	160	6.1	**0.14**
N-Nitroso-dimethylamine	Water	8270C	0.42	***2***		0.0009	NR	0.12	**0.00042**
N-Nitrosodi-n-propylamine	Water	8270C	0.037	***0.2***		RND	RND		**0.0093**
N-Nitrosodiphenylamine	Water	8270C	0.048	0.2		RND	RND		**10**
Pentachlorophenol	Water	8270C	0.34	***1***		0.73	480	78	**0.17**
Phenol	Water	8270C	0.063	0.5		NR	4800	**4500**	
Pyridine	Water	8270C	1.4	5		NR	**8**	15	
1,2,4-Trichlorobenzene	Water	8270C	0.016	0.2		NR	80	3.9	**0.99**
2,4,5-Trichlorophenol	Water	8270C	0.031	0.5		NR	**800**	890	
2,4,6-Trichlorophenol	Water	8270C	0.058	0.5		4	NR	9	**3.5**
Polynuclear Aromatic Hydrocarbons (PAHs)									
Acenaphthylene	Water	8270C-SIM	0.0034	0.02					

TABLE 5-6
SCREENING LIMITS AND REGULATORY CRITERIA FOR WATER

Analyte	Matrix	Method	MDL (µg/L)	RL (µg/L)	Ground-water Federal MCL (µg/L)	Washington Ground- water MTCA Method B Carcinogen (µg/L)	Washington Ground-water MTCA Method B Non-Carcinogen (µg/L)	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1 (µg/L)	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06 (µg/L)
Acenaphthene	Water	8270C-SIM	0.0044	0.02	NR	NR	960	**400**	
Anthracene	Water	8270C-SIM	0.0036	0.02	NR	NR	4800	**1300**	
Benzo(a)anthracene*	Water	8270C-SIM	0.0026	0.02	NR	*	NR		**0.029**
Benzo(a)pyrene*	Water	8270C-SIM	0.0043	***0.02***	0.2	0.012	NR		**0.0029**
Benzo(b)fluoranthene*	Water	8270C-SIM	0.0023	***0.02***	NR	*	NR		**0.0029**
Benzo(g,h,i)perylene	Water	8270C-SIM	0.0029	0.02					
Benzo(k)fluoranthene*	Water	8270C-SIM	0.0025	***0.02***	NR	*	NR		**0.0029**
Chrysene*	Water	8270C-SIM	0.0034	0.02	NR	*	NR		**2.9**
Dibenz(a,h)anthracene*	Water	8270C-SIM	0.0025	***0.02***	NR	*	NR		**0.0029**
Fluoranthene	Water	8270C-SIM	0.0044	0.02	NR	NR	640	**630**	
Fluorene	Water	8270C-SIM	0.0038	0.02	NR	NR	640	**220**	
Indeno(1,2,3-cd)pyrene*	Water	8270C-SIM	0.0026	0.02	NR	*	NR		**0.029**
Pyrene	Water	8270C-SIM	0.0035	0.02	NR	NR	480	**87**	
Total cPAHs	Water	8270C-SIM		0.02		RND	RND		
Polychlorinated biphenyls									
Arochlor 1016	Water	8082	0.001	0.02	NR	NR	1.1	1.1	0.96
Arochlor 1221	Water	8082	0.001	***0.02***					0.0043
Arochlor 1232	Water	8082	0.001	***0.02***					0.0043
Arochlor 1242	Water	8082	0.001	0.02					0.034
Arochlor 1248	Water	8082	0.001	0.02					0.034
Arochlor 1254	Water	8082	0.001	0.02	NR	NR	0.32	0.31	0.034
Arochlor 1260	Water	8082	0.001	0.02	NR	NR	NR		0.034
Arochlor 1262	Water	8082	0.001	0.02					
Arochlor 1268	Water	8082	0.001	0.02					
Total PCBs Aroclors	Water	8082	0.001	0.02	0.5	0.1	**0.044** [1]		

TABLE 5-6
SCREENING LIMITS AND REGULATORY CRITERIA FOR WATER

Analyte	Matrix	Method	MDL (µg/L)	RL (µg/L)	Ground-water Federal MCL (µg/L)	Washington Ground- water MTCA Method B Carcinogen (µg/L)	Washington Ground-water MTCA Method B Non-Carcinogen (µg/L)	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1 (µg/L)	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06 (µg/L)
Petroleum Hydrocarbons (NWTPH-G)									
Gasoline	Water	NWTPH-G	13	250					
Petroleum Hydrocarbons (NWTPH-Dx)									
C10-C24	Water	NWTPH-Dx	47	250					
C12-C24	Water	NWTPH-Dx	47	250					
Motor Oil	Water	NWTPH-Dx	76	100					
Jet Fuel	Water	NWTPH-Dx	47	250					
Mineral Oil	Water	NWTPH-Dx	76	100				**47000**	
Miscellaneous Parameters			***mg/L***	***mg/L***					
TOC	Water	415.1	0.05	1					

Notes:

Water values are reported in micrograms per liter (µg/L), with the exception of TOC.

[1] Sum of all Aroclors (PCB congener) must be below 0.044 µg/L. Non-detects are assigned a "0" value. Individual PCB congeners were not evaluated.

Bold Underline and italics indicates reporting limit exceeds screening level.

Bold values are the driving screening level for regulatory comparison for each compound.

Results are reported at the MDL.

PQL from Risk Assessment Information System Clearinghouse maintained by Oakridge National Laboratory, Sept. 2008.

Model Toxics Control Act regulation Washington Administrative Code 173-340.

U.S. Environmental Protection Agency (EPA) RSLs are from EPA Clearing House; values downloaded November 2011.

Method B values are from Model Toxics Control Act Cleanup Levels and Risk Calculations (CLARC) Version 3.0, downloaded January 2008.

Washington Department of Ecology Publication No. 94-145, updated November 2001.

* = cPAHs: there is no criteria for Total cPAHs by MTCA Method B.

Ground water human health standard is based on the relative potency for selected PAH compounds listed in Table 8 of the EPA "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons" July 1993, EPA/600/R-93/089.

No risk-based regulatory criterion for total cPAHs in water.

Blank cell = value not available

MCL = Maximum Contaminant Level

MDL = method detection limit

MTCA = Model Toxics Control Act

NR = not researched

RL = reporting limit

RND = researched no data

TEF = toxicity equivalence factor

TOC = total organic carbon

TABLE 5-7
SCREENING LIMITS AND REGULATORY CRITERIA FOR SOIL VAPOR AND AMBIENT AIR

Analyte	CAS#	Matrix	Method	MDL (µg/m3)	Base RL (µg/m^3)*	Adjusted RL (µg/m^3)**	EPA Regional Screening Level - Carcinogen (µg/m3)	EPA Regional Screening Level (µg/m3) – Non-carcinogen (µg/m3)	Washington Indoor Air Cleanup Levels Method B – Carcinogen (µg/m^3)	Washington Indoor Air Cleanup Levels Method B – Non-carcinogen (µg/m^3)	Washington Groundwater Screening Levels Method B – Carcinogen (µg/L)	Washington Groundwater Screening Levels Method B – Non-carcinogen (µg/L)	Washington Soil Gas Screening Levels Method B – Carcinogen (µg/m^3)***	Washington Soil Gas Screening Levels Method B – Non-carcinogen (µg/m^3)***
Volatile Organic Compounds (VOCs)														
1,1,1-Trichloroethane	71-55-6	Vapor	TO-15	0.011	0.11	0.165		5200		4800		11,000		48,000/480,000
1,1,2,2-Tetrachloroethane	79-34-5	Vapor	TO-15	0.007	0.14	0.21	0.042		0.043		6.2		0.43/4.3	
1,1,2-Trichloroethane	79-00-5	Vapor	TO-15	0.005	0.11	0.165	0.15	0.21	0.16		7.9		1.6/16	
1,1-Dichloroethane	75-34-3	Vapor	TO-15	0.008	0.081	0.1215	1.5			320		2,300		3200/32,000
1,1-Dichloroethene	75-35-4	Vapor	TO-15	0.008	0.04	0.06		210						910/9,100
1,2-Dichloroethane	107-06-2	Vapor	TO-15	0.004	0.081	0.1215	0.094	7.3	0.096	2.2	4.2	98	0.96/9.6	22/220
Benzene	71-43-2	Vapor	TO-15	0.013	0.16	0.24	0.31	31	0.32	14	2.4	100	3.2/32	140/1,400
Carbon tetrachloride	56-23-5	Vapor	TO-15	0.006	0.12	0.18	0.41	100	0.17		0.22		1.7/17	
cis-1,2-Dichloroethene	156-59-2	Vapor	TO-15	0.008	0.079	0.1185				16		160		160/1,600
Ethylbenzene	100-41-4	Vapor	TO-15	0.004	0.087	0.1305	0.97	1000		460		2,800		4,600/46,000
Methyl tert-butyl ether	1634-04-4	Vapor	TO-15	0.011	0.36	0.54	9.4	3100	9.6	1400	610	86,000	96/960	14,000/140,000
Methylene Chloride	75-09-2	Vapor	TO-15	NA	0.69	1.035	5.2	1100					53/530	14,000/140,000
m-Xylene & p-Xylene	133-020-7	Vapor	TO-15	0.004	0.17	0.255		100		46		310		460/4,600
o-Xylene	95-47-6	Vapor	TO-15	0.004	0.087	0.1305		100		46		440		460/4,600
Tetrachloroethene	127-18-4	Vapor	TO-15	0.007	0.14	0.21	0.41	280	0.42	16	1	40	4.1/41	160/1,600
Toluene	108-88-3	Vapor	TO-15	0.004	0.075	0.1125		5200		2,200		15,000		22,000/220,000
trans-1,2-Dichloroethene	156-60-5	Vapor	TO-15	0.008	0.4	0.6		63		32		130		320/3,200
Trichloroethene	79-01-6	Vapor	TO-15	0.005	0.11	0.165	0.43	2.1	0.1	16	0.42	67	1/10	160/1,600
Vinyl chloride	75-01-4	Vapor	TO-15	0.003	0.026	0.039	0.16	100	0.28	46	0.35	57	2.8/28	460/4,600

Notes:

* Base Reporting Limit is the initial reporting limit that is capable of the AirToxics analytical system.

** Adjust Reporting Limit is based on the pressurization step performed by the laboratory at the time of receipt. The reporting limit is calculated by multiplying the base reporting limit by the pressurization dilution factor of 1.5 by the laboratory at the time of receipt dilutes the sample and results in an increase in the base reporting limit.

*** Soil Gas Screening Level is the concentration in the soil gas just beneath a building (first value) or at 15-foot depth or greater (second value) expected to not result in exceedance of the air cleanup level in an overlying structure under most circumstances (see Chapter 3 Draft Guidance for Evaluting Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (October 2009) for more information on the appropriate use of these screening levels).

U.S. Environmental Protection Agency RSLs are from November 2011.

Washington Indoor Air Cleanup levels, groundwater screening levels, and soil gas screening levels are the default values from the 2009 Department of Ecology IV guidance.

MDL = method detection limit

µg/m^3 = micrograms per cubic liter

µg/l = micrograms per liter

RL = reporting limit

TABLE 5-8
SCREENING LIMITS AND REGULATORY CRITERIA FOR AMBIENT AIR (FULL LIST VOCs)

Analyte	Method	CAS#	MDL	RL	SCREENING CRITERIA FOR AMBIENT AIR			
					Washington Indoor Air Clean Up Levels Method B - Carcinogen (µg/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (µg/m3)	Washington Soil Gas Screening Levels Method B- Carcinogen (µg/m3)*	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (µg/m3)*
Volatile Organic Compounds (VOCs)								
1,1,1-Trichloroethane	Modified TO-15	71-55-6	2.7	4		4800		48000/480000
1,1,2,2-Tetrachloroethane	Modified TO-15	79-34-5	3.4	5	0.043		0.43/4.3	
1,1,2-Trichloroethane	Modified TO-15	79-00-5	2.7	4	0.16		1.6/16	
1,1-Dichloroethane	Modified TO-15	75-34-3	2	3		320		3200/32000
1,1-Dichloroethene	Modified TO-15	75-35-4	2	2.9		91		910/9100
1,2,4-Trichlorobenzene	Modified TO-15	120-82-1	15	22		91		910/9100
1,2,4-Trimethylbenzene	Modified TO-15	95-63-6	2.4	3.6		2.7		27/270
1,2-Dibromoethane (EDB)	Modified TO-15	106-93-4	3.8	5.6	0.011	0.16	0.11/1.1	1.6/16
1,2-Dichlorobenzene	Modified TO-15	95-50-1	3	4.4		64		640/6400
1,2-Dichloroethane	Modified TO-15	107-06-2	2	3	0.096	2.2	0.96/9.6	22/220
1,2-Dichloropropane	Modified TO-15	78-87-5	2.3	3.4		1.8		18/180
1,3,5-Trimethylbenzene	Modified TO-15	108-67-8	2.4	3.6		2.7		27/270
1,3-Butadiene	Modified TO-15	106-99-0	1.1	1.6	0.08	0.91	0.8/8	9.1/91
1,3-Dichlorobenzene	Modified TO-15	541-73-1	3	4.4				
1,4-Dichlorobenzene	Modified TO-15	106-46-7	3	4.4		370		3700/37000
1,4-Dioxane	Modified TO-15	123-91-1	7.2	10				
2,2,4-Trimethylpentane	Modified TO-15	540-84-1	2.3	3.4				
2-Butanone (Methyl Ethyl Ketone)	Modified TO-15	78-93-3	2.3	3.4		460		4600/46000
2-Hexanone	Modified TO-15	591-78-6	8.2	12				
2-Propanol	Modified TO-15	8013-70-5	4.9	7.2				
3-Chloropropene	Modified TO-15	107-05-1	6.3	9.1				
4-Ethyltoluene	Modified TO-15	622-96-8	2.4	3.6				
4-Methyl-2-pentanone	Modified TO-15	108-10-1	2	2		32		320/3200
Acetone	Modified TO-15	67-64-1	4.8	6.9				
alpha-Chlorotoluene	Modified TO-15	100-44-7	2.6	2.6	0.052		0.52/5.2	
Benzene	Modified TO-15	71-43-2	1.6	2.3	0.32	14	3.1/31	310/3100
Bromodichloromethane	Modified TO-15	75-27-4	3.4	3.4	0.0033		0.033/0.33	
Bromoform	Modified TO-15	75-25-2	5.2	7.5	2.3		23/230	
Bromomethane	Modified TO-15	74-83-9	1.9	2.8		2.3		23/230
Carbon Disulfide	Modified TO-15	75-15-0	1.6	2.3		320		3200/32000
Carbon Tetrachloride	Modified TO-15	56-23-5	3.1	4.6	0.17		4.1/41	

TABLE 5-8
SCREENING LIMITS AND REGULATORY CRITERIA FOR AMBIENT AIR (FULL LIST VOCs)

Analyte	Method	CAS#	MDL	RL	SCREENING CRITERIA FOR AMBIENT AIR			
					Washington Indoor Air Clean Up Levels Method B - Carcinogen (µg/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (µg/m3)	Washington Soil Gas Screening Levels Method B- Carcinogen (µg/m3)*	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (µg/m3)*
Chlorobenzene	Modified TO-15	108-90-7	2.3	3.4		8		80/800
Chloroethane	Modified TO-15	75-00-3	1.3	1.9	3	4600	30/300	46000/460000
Chloroform	Modified TO-15	67-66-3	2.4	3.6	0.11		1.1/11	
Chloromethane	Modified TO-15	74-87-3	4.1	6	1.4		14/140	
cis-1,2-Dichloroethene	Modified TO-15	156-59-2	2	2.9		16		160/1600
cis-1,3-Dichloropropene	Modified TO-15	542-75-6	2.3	3.3	0.63	9.1	6.3/63	91/910
Isopropylbenzene (Cumene)	Modified TO-15	98-82-8	2.4	3.6		180		1800/18000
Cyclohexane	Modified TO-15	110-82-7	1.7	2.5				
Dibromochloromethane	Modified TO-15	124-48-1	4.2	6.2	0.0045		0.045/0.45	
Ethanol	Modified TO-15	64-17-5	3.8	5.5				
Ethylbenzene	Modified TO-15	100-41-4	2.2	3.2		460		4600/46000
CFC-11	Modified TO-15	75-69-4	2.8	4.1		320		3200/32000
CFC-113	Modified TO-15	76-113-1	3.8	5.6				
CFC- 114	Modified TO-15	76-14-2	3.5	5.1				
CFC-12	Modified TO-15	75-71-8	2.5	3.6		80		800/8000
Heptane	Modified TO-15	142-82-5	2	3				
Hexachlorobutadiene	Modified TO-15	87-68-3	21	31	0.11		1.1/11	
Hexane	Modified TO-15	110-54-3	1.8	2.6		320		3200/32000
m, p-Xylene	Modified TO-15	108-38-3	2.2	3.2		46		7300/73000
Methyl t-butyl ether	Modified TO-15	1634-04-4	2.2	2.6	9.6	1400	96/960	14000/140000
Methylene Chloride	Modified TO-15	75-09-2	1.7	2.5	5.3	1400	53/530	14000/140000
o-Xylene	Modified TO-15	95-47-6	2.2	3.2		46		7300/73000
Benzene, Propyl-	Modified TO-15	103-65-1	2.4	3.6				
Styrene	Modified TO-15	100-42-5	2.1	3.1	4.4	460	44/440	4600/46000
Tetrachloroethene	Modified TO-15	127-18-4	3.4	5	0.42	16	4.1/41	160/1600
Tetrahydrofuran	Modified TO-15	109-99-9	1.5	2.2				
Toluene	Modified TO-15	108-88-3	1.9	2.8		2200		52000/520000
trans-1,2-Dichloroethene	Modified TO-15	156-60-5	2	2.9		32		320/3200

TABLE 5-8
SCREENING LIMITS AND REGULATORY CRITERIA FOR AMBIENT AIR (FULL LIST VOCs)

Analyte	Method	CAS#	MDL	RL	SCREENING CRITERIA FOR AMBIENT AIR			
					Washington Indoor Air Clean Up Levels Method B - Carcinogen (µg/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (µg/m3)	Washington Soil Gas Screening Levels Method B- Carcinogen (µg/m3)*	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (µg/m3)*
trans-1,3-Dichloropropene	Modified TO-15	542-75-6	2.3	3.3	0.63	9.1	6.3/63	91/910
Trichloroethene	Modified TO-15	79-01-6	2.7	3.9	0.1	16	12/120	160/1600
Vinyl Chloride	Modified TO-15	75-01-4	1.3	1.9	0.28	46	2.8/28	460/4600

Notes:

* Soil Gas Screening Level is the concentration in the soil gas just beneath a building (first value) or at 15-foot depth or greater (second value) expected to not result in exceedance of the air cleanup level in an overlying structure under most circumstances (see Chapter 3 Draft Guidance for Evaluting Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (October 2009) for more information on the appropriate use of these screening levels).

U.S. Environmental Protection Agency RSLs are from November 2011.

CAS# = Chemical Abstracts Service registration number

MDL = method detection limit

VOCs = volatile organic compounds

TABLE 5-9
SOIL ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Soil	1,1,1,2-Tetrachloroethane	630-20-6	SW8260B	1900				ug/Kg	211		
Soil	1,1,1-Trichloroethane	71-55-6	SW8260B	2000				ug/Kg	211		
Soil	1,1,2,2-Tetrachloroethane	79-34-5	SW8260B	560				ug/Kg	211		
Soil	1,1,2-Trichloroethane	79-00-5	SW8260B	1100				ug/Kg	211		
Soil	1,1-Dichloroethane	75-34-3	SW8260B	3300				ug/Kg	211		
Soil	1,1-Dichloroethene	75-35-4	SW8260B	240000				ug/Kg	211		
Soil	1,1-Dichloropropene	563-58-6	SW8260B					ug/Kg	211		
Soil	1,2,3-Trichlorobenzene	87-61-6	SW8260B	49000	0.31	0.51	3/211	ug/Kg	211		
Soil	1,2,3-Trichloropropane	96-18-4	SW8260B	5				ug/Kg	211		
Soil	1,2,4-Trichlorobenzene	120-82-1	SW8260B	22000	0.41	0.48	2/211	ug/Kg	211		
Soil	1,2,4-Trichlorobenzene	120-82-1	SW8270C	22000				ug/Kg	168		
Soil	1,2,4-Trimethylbenzene	95-63-6	SW8260B	62000	0.64	0.64	1/211	ug/Kg	211		
Soil	1,2-Dibromo-3-chloropropane	96-12-8	SW8260B	5.4				ug/Kg	211		
Soil	1,2-Dichlorobenzene	95-50-1	SW8260B	1900000				ug/Kg	211		
Soil	1,2-Dichloroethane	107-06-2	SW8260B	430	0.076	0.23	12/211	ug/Kg	211		
Soil	1,2-Dichloropropane	78-87-5	SW8260B	940				ug/Kg	211		
Soil	1,3,5-Trimethylbenzene	108-67-8	SW8260B	780000				ug/Kg	211		
Soil	1,3-Dichlorobenzene	541-73-1	SW8260B					ug/Kg	211		
Soil	1,3-Dichloropropane	142-28-9	SW8260B	1600000				ug/Kg	211		
Soil	1,4-Dichlorobenzene	106-46-7	SW8260B	2400	0.29	1.1	3/211	ug/Kg	211		
Soil	1-Methylnaphthalene	90-12-0	SW8270C	22000	2.4	850	22/168	ug/Kg	168		
Soil	2,2-Dichloropropane	594-20-7	SW8260B					ug/Kg	211		
Soil	2,4,5-Trichlorophenol	95-95-4	SW8270C	6100000				ug/Kg	168		
Soil	2,4,6-Trichlorophenol	88-06-2	SW8270C	44000				ug/Kg	168		
Soil	2,4-Dichlorophenol	120-83-2	SW8270C	180000				ug/Kg	168		
Soil	2,4-Dimethylphenol	105-67-9	SW8270C	1200000				ug/Kg	168		
Soil	2,4-Dinitrophenol	51-28-5	SW8270C	120000				ug/Kg	168		
Soil	2-Butanone	78-93-3	SW8260B	28000000	0.99	9.2	31/211	ug/Kg	211		
Soil	2-Chloronaphthalene	91-58-7	SW8270C	6300000				ug/Kg	168		
Soil	2-Chlorophenol	95-57-8	SW8270C	390000				ug/Kg	168		
Soil	2-Chlorotoluene	95-49-8	SW8260B	1600000				ug/Kg	211		
Soil	2-Nitroaniline	88-74-4	SW8270C	610000				ug/Kg	168		
Soil	2-Nitrophenol	88-75-5	SW8270C					ug/Kg	168		

TABLE 5-9
SOIL ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Soil	3,3'-Dichlorobenzidine	91-94-1	SW8270C	1100	12	12	1/168	ug/Kg	168		
Soil	4,6-Dinitro-2-Methylphenol	534-52-1	SW8270C	4900				ug/Kg	168		
Soil	4-Bromophenyl Phenyl Ether	101-55-3	SW8270C					ug/Kg	168		
Soil	4-Chloro-3-methylphenol	59-50-7	SW8270C	6100000				ug/Kg	168		
Soil	4-Chloroaniline	106-47-8	SW8270C	2400				ug/Kg	168		
Soil	4-Chlorophenyl-Phenylether	7005-72-3	SW8270C					ug/Kg	168		
Soil	4-Chlorotoluene	106-43-4	SW8260B	1600000				ug/Kg	211		
Soil	4-Nitroaniline	100-01-6	SW8270C	24000				ug/Kg	168		
Soil	4-Nitrophenol	100-02-7	SW8270C					ug/Kg	168		
Soil	Acenaphthene	83-32-9	SW8270C	3400000				ug/Kg	10		
Soil	Acenaphthene	83-32-9	SW8270CSIM	3400000	0.23	290	73/204	ug/Kg	204		
Soil	Acenaphthylene	208-96-8	SW8270C	4800000				ug/Kg	10		
Soil	Acenaphthylene	208-96-8	SW8270CSIM	4800000	0.25	1300	90/204	ug/Kg	204		
Soil	Acetone	67-64-1	SW8260B	8000000	30	470	11/211	ug/Kg	211		
Soil	Acrylonitrile	107-13-1	SW8260B	240				ug/Kg	211		
Soil	Aniline	62-53-3	SW8270C	85000				ug/Kg	168		
Soil	Anthracene	120-12-7	SW8270C	17000000				ug/Kg	10		
Soil	Anthracene	120-12-7	SW8270CSIM	17000000	0.5	1700	85/204	ug/Kg	204		
Soil	Arsenic	7440-38-2	SW6010B	0.39	1.95	6.05	10/10	mg/Kg	10	10/10	Building 40, 41, 31
Soil	Barium	7440-39-3	SW6010B	15000	35.1	187	10/10	mg/Kg	10		
Soil	Benz[a]anthracene	56-55-3	SW8270C	100				ug/Kg	10		
Soil	Benz[a]anthracene	56-55-3	SW8270CSIM		0.5	3600	128/204	ug/Kg	204	11/204	
Soil	Benzene	71-43-2	SW8260B	30	0.22	2.8	65/211	ug/Kg	211		
Soil	Benzo(a)pyrene	50-32-8	SW8270C	15				ug/Kg	10		
Soil	Benzo(a)pyrene	50-32-8	SW8270CSIM		0.25	3700	141/204	ug/Kg	204	62/204	
Soil	Benzo(b)fluoranthene	205-99-2	SW8270C	150	1.7	3.5	3/10	ug/Kg	10		
Soil	Benzo(b)fluoranthene	205-99-2	SW8270CSIM		0.34	4100	144/204	ug/Kg	204	23/204	
Soil	Benzo(ghi)perylene	191-24-2	SW8270C		1.8	1.9	3/10	ug/Kg	10		
Soil	Benzo(ghi)perylene	191-24-2	SW8270CSIM		0.65	1600	129/204	ug/Kg	204		
Soil	Benzo(k)fluoranthene	207-08-9	SW8270C	1500				ug/Kg	10		
Soil	Benzo(k)fluoranthene	207-08-9	SW8270CSIM		0.16	1800	101/204	ug/Kg	204	10/204	
Soil	Benzoic Acid	65-85-0	SW8270C	240000000	98	3400	42/168	ug/Kg	168		
Soil	Benzyl Alcohol	100-51-6	SW8270C	6100000	5.7	120	13/168	ug/Kg	168		
Soil	Bis(2-chloroethoxy)methane	111-91-1	SW8270C	180000	230	230	1/168	ug/Kg	168		

TABLE 5-9
SOIL ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Soil	Bis(2-Chloroethyl)Ether	111-44-4	SW8270C	210	24	24	1/168	ug/Kg	168		
Soil	Bis(2-ethylhexyl) Phthalate	117-81-7	SW8270C	35000	7.4	410	78/168	ug/Kg	168		
Soil	Bromobenzene	108-86-1	SW8260B	300000				ug/Kg	211		
Soil	Bromochloromethane	74-97-5	SW8260B					ug/Kg	211		
Soil	Bromoform	75-25-2	SW8260B	62000				ug/Kg	211		
Soil	Bromomethane	74-83-9	SW8260B	7300	0.46	0.5	2/211	ug/Kg	211		
Soil	Butyl Benzyl Phthalate	85-68-7	SW8270C	260000	4.3	91	6/168	ug/Kg	168		
Soil	Cadmium	7440-43-9	SW6010B	2	0.051	0.198	10/10	mg/Kg	10		
Soil	Carbon Disulfide	75-15-0	SW8260B	820000	0.28	2.6	6/211	ug/Kg	211		
Soil	Carbon Tetrachloride	56-23-5	SW8260B	610	0.37	38	18/211	ug/Kg	211		
Soil	CFC-11	75-69-4	SW8260B	790000				ug/Kg	211		
Soil	Chlorobenzene	108-90-7	SW8260B	290000				ug/Kg	211		
Soil	Chloroethane	75-00-3	SW8260B	15000000				ug/Kg	211		
Soil	Chloroform	67-66-3	SW8260B	290	0.22	1.3	12/211	ug/Kg	211		
Soil	Chloromethane	74-87-3	SW8260B	77000	0.46	0.77	5/211	ug/Kg	211		
Soil	Chromium	7440-47-3	SW6010B	2000	37.1	83.4	10/10	mg/Kg	10		
Soil	Chrysene	218-01-9	SW8270C	15000	2.4	3.2	3/10	ug/Kg	10		
Soil	Chrysene	218-01-9	SW8270CSIM		0.42	4500	148/204	ug/Kg	204	31/204	
Soil	cis-1,2-Dichloroethene	156-59-2	SW8260B	160000				ug/Kg	211		
Soil	Copper	7440-50-8	SW6010B	3000	30.4	99.1	10/10	mg/Kg	10		
Soil	Dibenzo(a,h)anthracene	53-70-3	SW8270C	15				ug/Kg	10		
Soil	Dibenzo(a,h)anthracene	53-70-3	SW8270CSIM	15	0.3	580	113/204	ug/Kg	204	36/204	
Soil	Dibromochloromethane	124-48-1	SW8260B					ug/Kg	211		
Soil	Dibromomethane	74-95-3	SW8260B	25000				ug/Kg	211		
Soil	Dibutyl Phthalate	84-74-2	SW8270C	6100000	8	5600	20/168	ug/Kg	168		
Soil	Dichlorobromomethane	75-27-4	SW8260B	270				ug/Kg	211		
Soil	Diesel Range Organics	SW333	NWTPH-DX	2000	1.8	1500	115/204	mg/Kg	204		
Soil	Diethyl Phthalate	84-66-2	SW8270C	49000000	1.3	660	28/168	ug/Kg	168		
Soil	Dimethyl Phthalate	131-11-3	SW8270C	80000000	1.1	1900	52/168	ug/Kg	168		
Soil	Di-n-octyl Phthalate	117-84-0	SW8270C	1600000				ug/Kg	168		
Soil	Dioxane, 1,4-		SW8260B	4900				ug/Kg	211		
Soil	Ethylbenzene	100-41-4	SW8260B	5400	0.35	3.9	5/211	ug/Kg	211		
Soil	Fluoranthene	206-44-0	SW8270C	2300000	2.4	2.4	1/10	ug/Kg	10		
Soil	Fluoranthene	206-44-0	SW8270CSIM	2300000	0.66	11000	144/204	ug/Kg	204		

TABLE 5-9
SOIL ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Soil	Fluorene	86-73-7	SW8270C	2300000	68	68	1/10	ug/Kg	10		
Soil	Fluorene	86-73-7	SW8270CSIM	2300000	0.51	2100	81/204	ug/Kg	204		
Soil	Gasoline Range Organics	SW222	NWTPH-GX	100				mg/Kg	54		
Soil	Hexachlorobenzene	118-74-1	SW8270C	300				ug/Kg	168		
Soil	Hexachlorobutadiene	87-68-3	SW8260B	6200				ug/Kg	211		
Soil	Hexachlorocyclopentadiene	77-47-4	SW8270C	370000				ug/Kg	168		
Soil	Hexachloroethane	67-72-1	SW8270C	12000				ug/Kg	168		
Soil	Indeno(1,2,3-cd)pyrene	193-39-5	SW8270C	150				ug/Kg	10		
Soil	Indeno(1,2,3-cd)pyrene	193-39-5	SW8270CSIM		0.28	2200	141/204	ug/Kg	204	11/204	
Soil	Iron	7439-89-6	SW6010B	55000	28000	58800	10/10	mg/Kg	10		
Soil	Isophorone	78-59-1	SW8270C	510000				ug/Kg	168		
Soil	Isopropylbenzene (Cumene)	98-82-8	SW8260B	2100000	0.14	0.14	1/211	ug/Kg	211		
Soil	Lead	7439-92-1	SW6010B	250	3.53	29700	226/226	mg/Kg	226	14/226	Building 4, 9, 10, 12
Soil	m, p-Xylene	133-020-7	SW8260B	9000	0.39	1.4	17/211	ug/Kg	211		
Soil	Manganese	7439-96-5	SW6010B		326	1610	10/10	mg/Kg	10		
Soil	Mercury	7439-97-6	SW7471A	2	0.028	0.12	10/10	mg/Kg	10		
Soil	Methyl isobutyl ketone	108-10-1	SW8260B	5300000	5.6	7.1	6/211	ug/Kg	211		
Soil	Methyl t-butyl ether	1634-04-4	SW8260B	100	0.19	3.1	52/211	ug/Kg	211		
Soil	Methylene Chloride	75-09-2	SW8260B	20	0.37	25	6/211	ug/Kg	211	2/211	Building 44
Soil	m-Nitroaniline	99-09-2	SW8270C					ug/Kg	168		
Soil	Naphthalene	91-20-3	SW8260B	3600	0.44	0.91	4/211	ug/Kg	211		
Soil	Naphthalene	91-20-3	SW8270C	3600	2.4	4600	43/168	ug/Kg	168		
Soil	n-Butylbenzene	104-51-8	SW8260B	3900000				ug/Kg	211		
Soil	N-Nitrosodimethylamine	62-75-9	SW8270C	2.3				ug/Kg	168		
Soil	N-Nitrosodi-n-propylamine	621-64-7	SW8270C	69				ug/Kg	168		
Soil	N-Nitrosodiphenylamine	86-30-6	SW8270C	99	2.6	360	5/168	ug/Kg	168		
Soil	n-Propylbenzene	103-65-1	SW8260B	3400000				ug/Kg	211		
Soil	o-Cresol	95-48-7	SW8270C	3100000				ug/Kg	168		
Soil	Oil Range Organics	SW444	NWTPH-DX	2000	3.5	5600	143/204	mg/Kg	204	21/204	Building 4,5, 9, 10, 20, 29
Soil	o-Xylene	95-47-6	SW8260B	6900000	0.16	0.51	15/211	ug/Kg	211		
Soil	Total PCBs		SW8082		0.0758	0.171	20/41	mg/Kg	41		
Soil	Total PAHs		SW8270CSIM	100	0.67	4.973	170/204	ug/Kg	204		Building 4, 5, 17, 10, 29
Soil	p-Cresol	106-44-5	SW8270C	310000	21	610	3/168	ug/Kg	168		
Soil	Pentachlorophenol	87-86-5	SW8270C	890	30	1600	14/168	ug/Kg	168		

TABLE 5-9
SOIL ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Soil	Phenol	108-95-2	SW8270C	18000000	2	660	33/168	ug/Kg	168		
Soil	p-Isopropyltoluene	99-87-6	SW8260B		0.81	2.4	6/211	ug/Kg	211		
Soil	Pyrene	129-00-0	SW8270C	1700000	1.7	34	4/10	ug/Kg	10		
Soil	Pyrene	129-00-0	SW8270CSIM	1700000	0.45	8100	144/204	ug/Kg	204		
Soil	Pyridine	110-86-1	SW8270C	78000				ug/Kg	168		
Soil	sec-Butylbenzene	135-98-8	SW8260B		1.8	1.8	1/211	ug/Kg	211		
Soil	Selenium	7782-49-2	SW6010B	390	0.3	0.7	9/10	mg/Kg	10		
Soil	Silver	7440-22-4	SW6010B	390	0.029	21.2	140/147	mg/Kg	147		
Soil	Styrene	100-42-5	SW8260B	33000				ug/Kg	211		
Soil	tert-Butylbenzene	98-06-6	SW8260B					ug/Kg	211		
Soil	Tetrachloroethene	127-18-4	SW8260B	50	0.93	200	10/211	ug/Kg	211	2/211	Building 44
Soil	Toluene	108-88-3	SW8260B	7000	0.19	23	139/211	ug/Kg	211		
Soil	trans-1,2-Dichloroethene	156-60-5	SW8260B	150000				ug/Kg	211		
Soil	trans-1,3-Dichloropropene	10061-02-6	SW8260B	1700				ug/Kg	211		
Soil	trans-1,4-Dichloro-2-butene	110-57-6	SW8260B	6.9				ug/Kg	211		
Soil	Trichloroethene	79-01-6	SW8260B	30				ug/Kg	211		
Soil	Vinyl Chloride	75-01-4	SW8260B	60				ug/Kg	211		
Soil	Vinyl Chloride	75-01-4	SW8260BSIM	60				ug/Kg	207		

Notes:
* Indicates frequency of exceedance above lowest regulatory or risk-based screening criterion.
Criteria column is based on the lowest screening values shown in Table 5.5.
CAS# = Chemical Abstracts Service registration number

TABLE 5-10
WATER ANALYTICAL EXCEEDENCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Water	1,1,1,2-Tetrachloroethane	630-20-6	SW8260B	0.5				ug/L	43		
Water	1,1,1-Trichloroethane	71-55-6	SW8260B	200				ug/L	43		
Water	1,1,2,2-Tetrachloroethane	79-34-5	SW8260B	0.067				ug/L	43		
Water	1,1,2-Trichloroethane	79-00-5	SW8260B	0.24				ug/L	43		
Water	1,1-Dichloroethane	75-34-3	SW8260B	2.4				ug/L	43		
Water	1,1-Dichloroethene	75-35-4	SW8260B	260				ug/L	43		
Water	1,1-Dichloropropene	563-58-6	SW8260B					ug/L	43		
Water	1,2,3-Trichlorobenzene	87-61-6	SW8260B	5.2				ug/L	43		
Water	1,2,3-Trichloropropane	96-18-4	SW8260B	0.00065				ug/L	43		
Water	1,2,4-Trichlorobenzene	120-82-1	SW8260B	0.99				ug/L	43		
Water	1,2,4-Trichlorobenzene	120-82-1	SW8270C	0.99				ug/L	35		
Water	1,2,4-Trimethylbenzene	95-63-6	SW8260B	15	0.19	2.8	5/43	ug/L	43		
Water	1,2-Dibromo-3-chloropropane	96-12-8	SW8260B	0.00032				ug/L	43		
Water	1,2-Dichlorobenzene	95-50-1	SW8260B	280				ug/L	43		
Water	1,2-Dichloroethane	107-06-2	SW8260B	0.15				ug/L	43		
Water	1,2-Dichloropropane	78-87-5	SW8260B	0.38				ug/L	43		
Water	1,3,5-Trimethylbenzene	108-67-8	SW8260B	87	0.1	0.1	2/43	ug/L	43		
Water	1,3-Dichlorobenzene	541-73-1	SW8260B					ug/L	43		
Water	1,3-Dichloropropane	142-28-9	SW8260B	290				ug/L	43		
Water	1,4-Dichlorobenzene	106-46-7	SW8260B	0.42				ug/L	43		
Water	1-Methylnaphthalene	90-12-0	SW8270C	0.97				ug/L	35		
Water	2,2-Dichloropropane	594-20-7	SW8260B					ug/L	43		
Water	2,4,5-Trichlorophenol	95-95-4	SW8270C	800				ug/L	35		
Water	2,4,6-Trichlorophenol	88-06-2	SW8270C	3.5				ug/L	35		
Water	2,4-Dichlorophenol	120-83-2	SW8270C	24				ug/L	35		
Water	2,4-Dimethylphenol	105-67-9	SW8270C	160				ug/L	35		
Water	2,4-Dinitrophenol	51-28-5	SW8270C	30				ug/L	35		
Water	2-Butanone	78-93-3	SW8260B	4900				ug/L	43		
Water	2-Chloronaphthalene	91-58-7	SW8270C	550				ug/L	35		
Water	2-Chlorophenol	95-57-8	SW8270C	40				ug/L	35		

TABLE 5-10
WATER ANALYTICAL EXCEEDENCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Water	2-Chlorotoluene	95-49-8	SW8260B	180				ug/L	43		
Water	2-Nitroaniline	88-74-4	SW8270C	150				ug/L	35		
Water	2-Nitrophenol	88-75-5	SW8270C					ug/L	35		
Water	3,3'-Dichlorobenzidine	91-94-1	SW8270C	0.11				ug/L	35		
Water	4,6-Dinitro-2-Methylphenol	534-52-1	SW8270C	1.2				ug/L	35		
Water	4-Bromophenyl Phenyl Ether	101-55-3	SW8270C					ug/L	35		
Water	4-Chloro-3-methylphenol	59-50-7	SW8270C	1100				ug/L	35		
Water	4-Chloroaniline	106-47-8	SW8270C	0.32				ug/L	35		
Water	4-Chlorophenyl-Phenylether	7005-72-3	SW8270C					ug/L	35		
Water	4-Chlorotoluene	106-43-4	SW8260B	190				ug/L	43		
Water	4-Nitroaniline	100-01-6	SW8270C	3.3				ug/L	35		
Water	4-Nitrophenol	100-02-7	SW8270C					ug/L	35		
Water	Acenaphthene	83-32-9	SW8270C	400				ug/L	5		
Water	Acenaphthene	83-32-9	SW8270CSIM	400	0.0067	0.025	4/36	ug/L	36		
Water	Acenaphthylene	208-96-8	SW8270C					ug/L	5		
Water	Acenaphthylene	208-96-8	SW8270CSIM		0.0036	0.0048	2/36	ug/L	36		
Water	Acetone	67-64-1	SW8260B	800	3.4	7.3	9/43	ug/L	43		
Water	Acrylonitrile	107-13-1	SW8260B	0.045				ug/L	43		
Water	Aniline	62-53-3	SW8270C	7.7				ug/L	35		
Water	Anthracene	120-12-7	SW8270C	1300				ug/L	5		
Water	Anthracene	120-12-7	SW8270CSIM	1300	0.009	0.0093	3/36	ug/L	36		
Water	Arsenic	7440-38-2	EPA200.8	0.045	0.1	4.6	10/15	ug/L	15	11/15	NNW, B-21, B-24, MW-10,-14, -15, -16 and -17
Water	Barium		EPA200.7	2900	16.9	16.9	1/1	ug/L	1		
Water	Barium	7440-39-3	EPA200.8	2900	5.17	216	12/12	ug/L	12		
Water	Benz[a]anthracene	56-55-3	SW8270C	0.029				ug/L	5		
Water	Benz[a]anthracene	56-55-3	SW8270CSIM	0.029	0.007	0.007	1/36	ug/L	36		
Water	Benzene	71-43-2	SW8260B	0.39	0.54	0.54	1/43	ug/L	43		
Water	Benzo(a)pyrene	50-32-8	SW8270C	0.0029				ug/L	5		
Water	Benzo(a)pyrene	50-32-8	SW8270CSIM	0.0029				ug/L	36		
Water	Benzo(b)fluoranthene	205-99-2	SW8270C	0.029				ug/L	10		
Water	Benzo(b)fluoranthene	205-99-2	SW8270CSIM	0.029	0.0026	0.0041	2/36	ug/L	36		

TABLE 5-10
WATER ANALYTICAL EXCEEDENCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Water	Benzo(g,h,i)perylene-D12		SW8270CSIM					ug/L	6		
Water	Benzo(ghi)perylene	191-24-2	SW8270C					ug/L	5		
Water	Benzo(ghi)perylene	191-24-2	SW8270CSIM		0.0039	0.014	2/30	ug/L	30		
Water	Benzo(k)fluoranthene	207-08-9	SW8270CSIM	0.29				ug/L	36		
Water	Benzoic Acid	65-85-0	SW8270C	58000	1.4	1.8	2/35	ug/L	35		
Water	Benzyl Alcohol	100-51-6	SW8270C	1500	0.22	0.22	1/35	ug/L	35		
Water	Bis(2-chloroethoxy)methane	111-91-1	SW8270C	47				ug/L	35		
Water	Bis(2-Chloroethyl)Ether	111-44-4	SW8270C	0.012				ug/L	35		
Water	Bis(2-ethylhexyl) Phthalate	117-81-7	SW8270C	0.071	0.14	24	21/35	ug/L	35		
Water	Bromobenzene	108-86-1	SW8260B	54				ug/L	43		
Water	Bromochloromethane	74-97-5	SW8260B					ug/L	43		
Water	Bromoform	75-25-2	SW8260B	5.5				ug/L	43		
Water	Bromomethane	74-83-9	SW8260B	7				ug/L	43		
Water	Butyl Benzyl Phthalate	85-68-7	SW8270C	14	0.02	7.2	5/35	ug/L	35		
Water	Cadmium	7440-43-9	EPA200.8	6.9	0.007	0.375	10/15	ug/L	15		
Water	Carbon Disulfide	75-15-0	SW8260B	720	0.08	0.19	3/43	ug/L	43		
Water	Carbon Tetrachloride	56-23-5	SW8260B	0.39	0.12	6.8	15/43	ug/L	43	11/43	Nielson Property & Building 44
Water	CFC-11	75-69-4	SW8260B	1100				ug/L	43		
Water	Chlorobenzene	108-90-7	SW8260B	72				ug/L	43		
Water	Chloroethane	75-00-3	SW8260B					ug/L	43		
Water	Chloroform	67-66-3	SW8260B	0.19	0.08	0.1	3/43	ug/L	43		
Water	Chloromethane	74-87-3	SW8260B	3	0.06	0.66	11/43	ug/L	43		
Water	Chromium	7440-47-3	EPA200.8	100	0.08	21.1	10/13	ug/L	13		
Water	Chrysene	218-01-9	SW8270C	2.9				ug/L	5		
Water	Chrysene	218-01-9	SW8270CSIM	2.9				ug/L	36		
Water	cis-1,2-Dichloroethene	156-59-2	SW8260B	28				ug/L	43		
Water	Copper		EPA200.7	590				ug/L	5		
Water	Copper	7440-50-8	EPA200.8	590	17.8	20	2/2	ug/L	2		
Water	Dibenzo(a,h)anthracene	53-70-3	SW8270C	0.0029				ug/L	5		
Water	Dibenzo(a,h)anthracene	53-70-3	SW8270CSIM	0.0029				ug/L	36		
Water	Dibromochloromethane	124-48-1	SW8260B					ug/L	43		
Water	Dibromomethane	74-95-3	SW8260B	7.9				ug/L	43		
Water	Dibutyl Phthalate	84-74-2	SW8270C	670	0.024	0.25	16/35	ug/L	35		
Water	Dichlorobromomethane	75-27-4	SW8260B	0.12				ug/L	43		

TABLE 5-10
WATER ANALYTICAL EXCEEDENCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Water	Diesel Range Organics	SW333	NWTPH-DX		39	390	8/14	ug/L	14		
Water	Diethyl Phthalate	84-66-2	SW8270C	11000	0.013	0.96	13/35	ug/L	35		
Water	Dimethyl Phthalate	131-11-3	SW8270C	16000	0.16	0.16	1/35	ug/L	35		
Water	Di-n-octyl Phthalate	117-84-0	SW8270C	320				ug/L	35		
Water	Dioxane, 1,4-		SW8260B	0.67				ug/L	43		
Water	Ethylbenzene	100-41-4	SW8260B	1.3	0.07	0.08	4/43	ug/L	43		
Water	Fluoranthene	206-44-0	SW8270C	630				ug/L	5		
Water	Fluoranthene	206-44-0	SW8270CSIM	630	0.0057	0.028	5/36	ug/L	36		
Water	Fluorene	86-73-7	SW8270C	220				ug/L	5		
Water	Fluorene	86-73-7	SW8270CSIM	220	0.0048	0.036	8/36	ug/L	36		
Water	Hexachlorobenzene	118-74-1	SW8270C	0.042				ug/L	35		
Water	Hexachlorobutadiene	87-68-3	SW8260B	0.26				ug/L	43		
Water	Hexachlorocyclopentadiene	77-47-4	SW8270C	18				ug/L	35		
Water	Hexachloroethane	67-72-1	SW8270C	0.79				ug/L	35		
Water	Indeno(1,2,3-cd)pyrene	193-39-5	SW8270C	0.029				ug/L	5		
Water	Indeno(1,2,3-cd)pyrene	193-39-5	SW8270CSIM	0.029	0.0032	0.0041	2/36	ug/L	36		
Water	Iron	7439-89-6	EPA200.8	11000	50.5	40800	11/15	ug/L	15	1/15	MW-10
Water	Isophorone	78-59-1	SW8270C	46				ug/L	35		
Water	Isopropylbenzene (Cumene)	98-82-8	SW8260B	390	0.21	0.22	3/43	ug/L	43		
Water	Lead	7439-92-1	EPA200.8	15	0.008	53.1	32/46	ug/L	46	1/46	MW-10
Water	m, p-Xylene	133-020-7	SW8260B	190	0.25	0.32	4/43	ug/L	43		
Water	Manganese	7439-96-5	EPA200.8		0.2	1610	13/15	ug/L	15		
Water	Mercury	7439-97-6	SW7470A	0.63	0.13	0.13	1/12	ug/L	12		
Water	Methyl isobutyl ketone	108-10-1	SW8260B	1000				ug/L	43		
Water	Methyl t-butyl ether	1634-04-4	SW8260B	12				ug/L	43		
Water	Methylene Chloride	75-09-2	SW8260B	4.7				ug/L	43		
Water	m-Nitroaniline	99-09-2	SW8270C	150				ug/L	35		
Water	Naphthalene	91-20-3	SW8260B	0.14	0.31	0.32	3/43	ug/L	43	3/43	Building 41 Grab
Water	Naphthalene	91-20-3	SW8270C	0.14	0.029	0.048	5/35	ug/L	35		
Water	n-Butylbenzene	104-51-8	SW8260B	780				ug/L	43		
Water	N-Nitrosodimethylamine	62-75-9	SW8270C	0.00042				ug/L	35		
Water	N-Nitrosodi-n-propylamine	621-64-7	SW8270C	0.0093				ug/L	35		
Water	N-Nitrosodiphenylamine	86-30-6	SW8270C	10				ug/L	35		
Water	n-Propylbenzene	103-65-1	SW8260B	530				ug/L	43		
Water	o-Cresol	95-48-7	SW8270C	400				ug/L	35		

TABLE 5-10
WATER ANALYTICAL EXCEEDENCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Water	Oil Range Organics	SW444	NWTPH-DX		150	590	7/14	ug/L	14		
Water	o-Xylene	95-47-6	SW8260B	190	0.09	0.09	1/43	ug/L	43		
Water	PCB-aroclor 1016	12674-11-2	SW8082	1.1				ug/L	6		
Water	PCB-aroclor 1221	11104-28-2	SW8082	0.0043				ug/L	6		
Water	PCB-aroclor 1232	11141-16-5	SW8082	0.0043				ug/L	6		
Water	PCB-aroclor 1242	53469-21-9	SW8082	0.034				ug/L	6		
Water	PCB-aroclor 1248	12672-29-6	SW8082	0.034				ug/L	6		
Water	PCB-aroclor 1254	11097-69-1	SW8082	0.034				ug/L	6		
Water	PCB-aroclor 1260	11096-82-5	SW8082	0.034				ug/L	6		
Water	PCB-aroclor 1262	37324-23-5	SW8082					ug/L	6		
Water	PCB-aroclor 1268	11100-14-4	SW8082					ug/L	6		
Water	p-Cresol	106-44-5	SW8270C					ug/L	35		
Water	Pentachlorophenol	87-86-5	SW8270C	0.17				ug/L	35		
Water	Phenol	108-95-2	SW8270C	4500				ug/L	35		
Water	p-Isopropyltoluene	99-87-6	SW8260B		0.11	0.13	3/43	ug/L	43		
Water	Pyrene	129-00-0	SW8270C	87				ug/L	5		
Water	Pyrene	129-00-0	SW8270CSIM	87	0.004	0.016	7/36	ug/L	36		
Water	Pyridine	110-86-1	SW8270C	8				ug/L	35		
Water	sec-Butylbenzene	135-98-8	SW8260B		0.17	0.19	3/43	ug/L	43		
Water	Selenium	7782-49-2	EPA200.8	78	0.3	1.5	8/13	ug/L	13		
Water	Silver	7440-22-4	EPA200.8	71	0.005	0.317	11/41	ug/L	41		
Water	Styrene	100-42-5	SW8260B	1.5				ug/L	43		
Water	tert-Butylbenzene	98-06-6	SW8260B					ug/L	43		
Water	Tetrachloroethene	127-18-4	SW8260B	0.072	0.2	0.21	2/43	ug/L	43	2/43	Building 44
Water	Toluene	108-88-3	SW8260B	640	0.16	0.55	5/43	ug/L	43		
Water	Total Organic Carbon	NA	EPA415.1		0.12	0.9	22/23	mg/L	23		
Water	trans-1,2-Dichloroethene	156-60-5	SW8260B	86				ug/L	43		
Water	trans-1,3-Dichloropropene	10061-02-6	SW8260B	0.41				ug/L	43		
Water	trans-1,4-Dichloro-2-butene	110-57-6	SW8260B	0.0012				ug/L	43		

TABLE 5-10
WATER ANALYTICAL EXCEEDENCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Water	Trichloroethene	79-01-6	SW8260B	0.11	0.25	0.29	2/43	ug/L	43	2/43	Buildings 44
Water	Vinyl Chloride	75-01-4	SW8260B	0.015				ug/L	20		
Water	Vinyl Chloride	75-01-4	SW8260BSIM	15	280	280	1/43	ng/L	43	1/43	Nielson Property

Notes:
* Indicates frequency of exceedence above lowest regulatory or risk-based screening criterion.
Criteria column is based on the lowest screening values shown in Table 5-6.
CAS# = Chemical Abstracts Service registration number
µg/L = micrograms per liter
ng/L = nanograms per liter

TABLE 5-11
AIR ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Air	1,1,1-Trichloroethane	71-55-6	EPA-TO-15	4800	0.029	0.042	4/13	uG/m3	13		
Air	1,1,2,2-Tetrachloroethane	79-34-5	EPA-TO-15	0.042	0.42	0.42	1/13	uG/m3	13	1/13	Building 33
Air	1,1,2-Trichloroethane	79-00-5	EPA-TO-15	0.15				uG/m3	13		
Air	1,1-Dichloroethane	75-34-3	EPA-TO-15	1.5				uG/m3	13		
Air	1,1-Dichloroethene	75-35-4	EPA-TO-15	91				uG/m3	13		
Air	1,2,4-Trichlorobenzene	120-82-1	EPA-TO-15	91				uG/m3	1		
Air	1,2,4-Trimethylbenzene	95-63-6	EPA-TO-15	2.7				uG/m3	1		
Air	1,2-Dichlorobenzene	95-50-1	EPA-TO-15	64				uG/m3	1		
Air	1,2-Dichloroethane	107-06-2	EPA-TO-15	0.094	0.087	0.16	5/13	uG/m3	13	4/13	Buildings 33 and 44
Air	1,2-Dichloropropane	78-87-5	EPA-TO-15	1.8				uG/m3	1		
Air	1,3,5-Trimethylbenzene	108-67-8	EPA-TO-15	2.7				uG/m3	1		
Air	1,3-Butadiene	106-99-0	EPA-TO-15	0.08				uG/m3	1		
Air	1,3-Dichlorobenzene	541-73-1	EPA-TO-15					uG/m3	1		
Air	1,4-Dichlorobenzene	106-46-7	EPA-TO-15	370				uG/m3	1		
Air	2,2,4-Trimethylpentane	540-84-1	EPA-TO-15					uG/m3	1		
Air	2-Butanone	78-93-3	EPA-TO-15	460				uG/m3	1		
Air	2-Hexanone	591-78-6	EPA-TO-15					uG/m3	1		
Air	2-Propanol	8013-70-5	EPA-TO-15					uG/m3	1		
Air	Acetone	67-64-1	EPA-TO-15					uG/m3	1		
Air	Allyl Chloride	107-05-1	EPA-TO-15					uG/m3	1		
Air	Benzene, 1-Ethyl-2-Methyl-	611-14-3	EPA-TO-15	460				uG/m3	1		
Air	Benzene, Propyl-		EPA-TO-15					uG/m3	1		
Air	Benzene	71-43-2	EPA-TO-15	0.31	0.34	12	8/13	uG/m3	13	7/13	Building 33, 44, & Nielson Pumphouse well
Air	Bromoform	75-25-2	EPA-TO-15	2.3				uG/m3	1		
Air	Bromomethane	74-83-9	EPA-TO-15	2.3				uG/m3	1		
Air	Carbon Disulfide	75-15-0	EPA-TO-15	320				uG/m3	1		

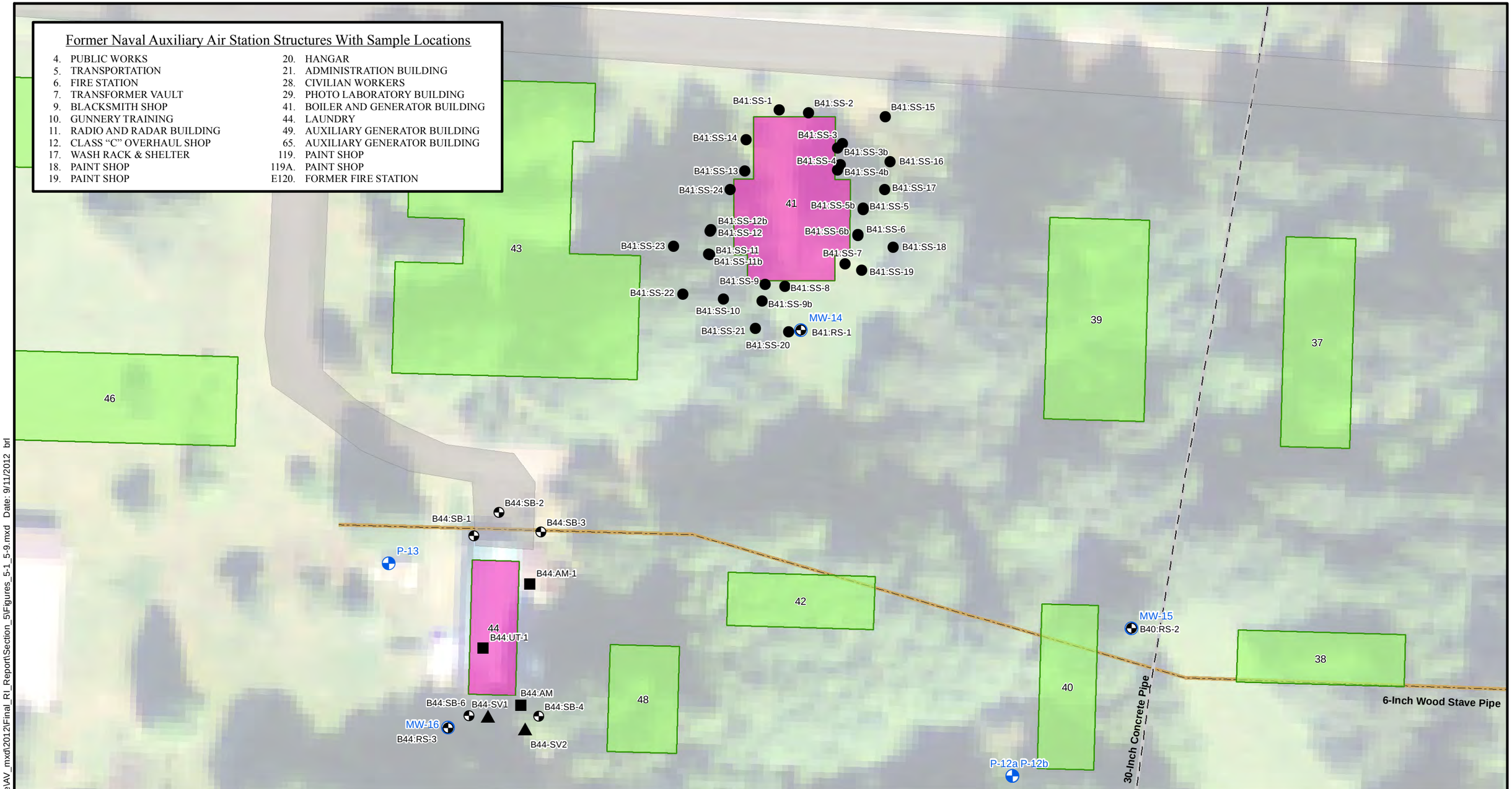
TABLE 5-11
AIR ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Air	Carbon Tetrachloride	56-23-5	EPA-TO-15	0.17	0.19	1900	12/13	uG/m3	13	11/13	Building 44 & Nielson Pumphouse well
Air	CFC- 114		EPA-TO-15					uG/m3	1		
Air	CFC-113	76-13-1	EPA-TO-15					uG/m3	1		
Air	CFC-11	75-69-4	EPA-TO-15	320				uG/m3	1		
Air	CFC-12	75-71-8	EPA-TO-15	80				uG/m3	1		
Air	Chlorobenzene	108-90-7	EPA-TO-15	8				uG/m3	1		
Air	Chloroethane	75-00-3	EPA-TO-15	3				uG/m3	1		
Air	Chloroform	67-66-3	EPA-TO-15	0.11				uG/m3	1		
Air	Chloromethane	74-87-3	EPA-TO-15	1.4				uG/m3	1		
Air	Chloromethylbenzene		EPA-TO-15					uG/m3	1		
Air	Cis-1,2-Dichloroethene	156-59-2	EPA-TO-15	16				uG/m3	13		
Air	Cis-1,3-Dichloropropene	10061-01-5	EPA-TO-15	0.63				uG/m3	1		
Air	Cyclohexane	110-82-7	EPA-TO-15					uG/m3	1		
Air	Dibromochloromethane	124-48-1	EPA-TO-15	0.0045				uG/m3	1		
Air	Dichlorobromomethane	75-27-4	EPA-TO-15	0.0033				uG/m3	1		
Air	Dioxane, 1,4-	123-91-1	EPA-TO-15					uG/m3	1		
Air	Ethanol	64-17-5	EPA-TO-15					uG/m3	1		
Air	Ethylbenzene	100-41-4	EPA-TO-15	0.97	0.074	1.5	8/13	uG/m3	13	6/13	Building 44
Air	Ethylene dibromide	106-93-4	EPA-TO-15					uG/m3	1		
Air	Heptane	142-82-5	EPA-TO-15					uG/m3	1		
Air	Hexachlorobutadiene	87-68-3	EPA-TO-15	0.11				uG/m3	1		
Air	Hexane	110-54-3	EPA-TO-15	7.8				uG/m3	1		
Air	Isopropylbenzene (Cumene)	98-82-8	EPA-TO-15	180				uG/m3	1		
Air	m, p-Xylene		EPA-TO-15	46	0.22	4.3	7/13	uG/m3	13		
Air	Methyl isobutyl ketone	108-10-1	EPA-TO-15	32				uG/m3	1		
Air	Methyl t-butyl ether	1634-04-4	EPA-TO-15	9.4				uG/m3	13		
Air	Methylene Chloride	75-09-2	EPA-TO-15	5.3				uG/m3	13		
Air	o-Xylene	95-47-6	EPA-TO-15	46	0.081	1.4	7/13	uG/m3	13		
Air	Styrene	100-42-5	EPA-TO-15	4.4				uG/m3	1		

TABLE 5-11
AIR ANALYTICAL EXCEEDANCES

Matrix	Analyte	CAS #	Method	Criteria	Detections			Units	# of Tests	Exceedance *	
					Min	Max	Frequency			Frequency	Locations
Air	Tetrachloroethene	127-18-4	EPA-TO-15	0.41	0.026	1800	12/13	uG/m3	13	7/13	Building 44
Air	Tetrahydrofuran	109-99-9	EPA-TO-15					uG/m3	1		
Air	Toluene	108-88-3	EPA-TO-15	2200	0.52	12	11/13	uG/m3	13		
Air	Trans-1,2-Dichloroethene	156-60-5	EPA-TO-15	32				uG/m3	13		
Air	Trans-1,3-Dichloropropene	10061-02-6	EPA-TO-15	0.63				uG/m3	1		
Air	Trichloroethene	79-01-6	EPA-TO-15	0.1	0.022	5.7	5/13	uG/m3	13	3/13	Building 44
Air	Vinyl Chloride	75-01-4	EPA-TO-15	0.16	0.039	0.046	2/13	uG/m3	13		

Notes:
* Indicates frequency of exceedance above lowest regulatory or risk-based screening criterion.
Criteria column is based on the lowest screening values shown in Table 5-6.
CAS # = Chemical Abstracts Service registration number

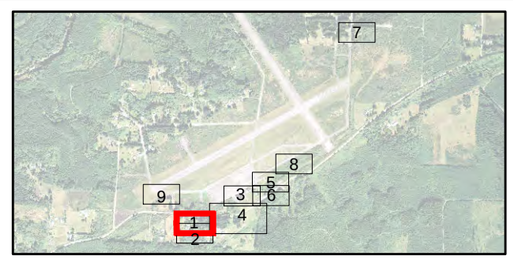


LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

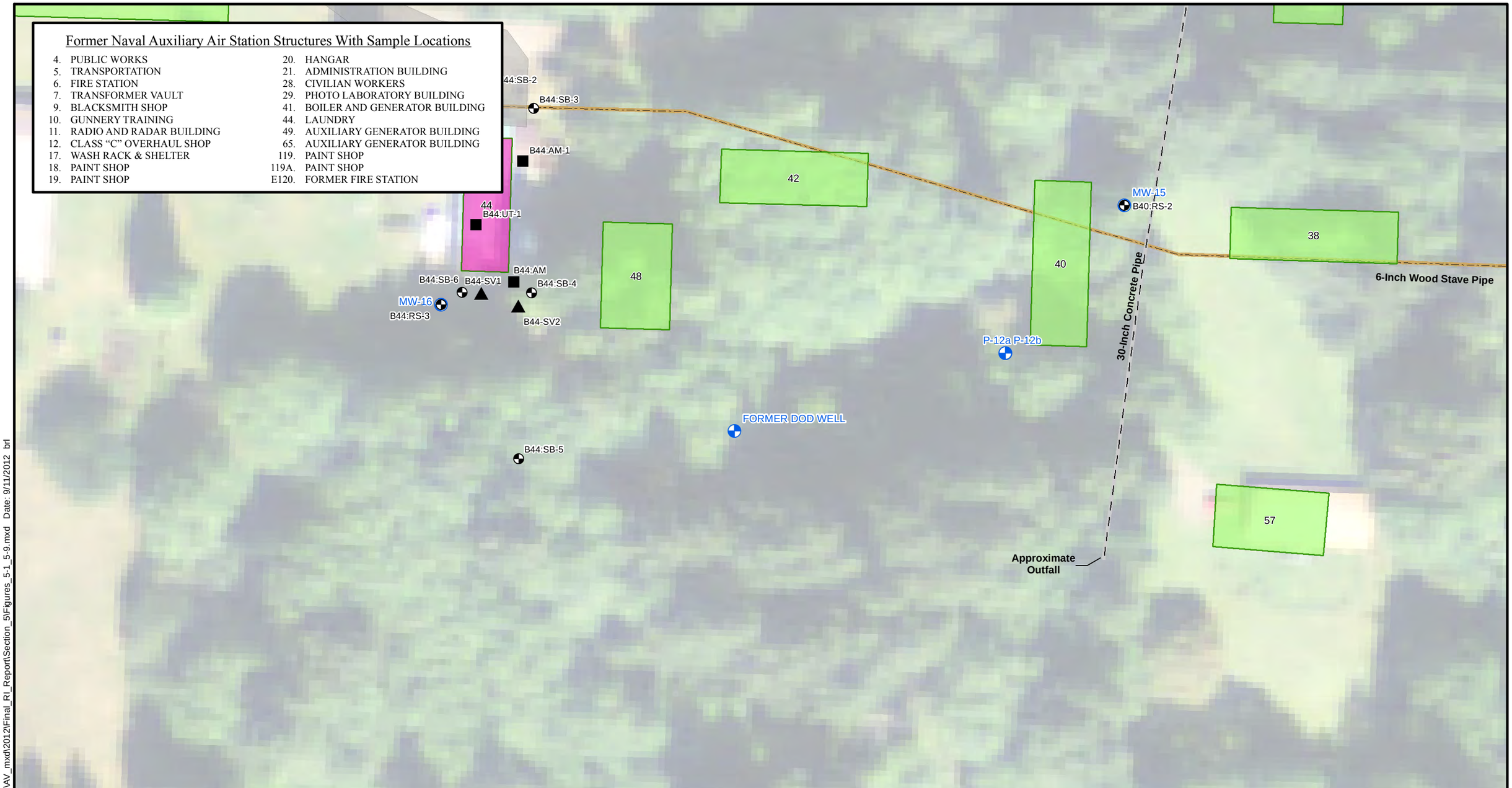
BUILDINGS 40 & 41
SAMPLE LOCATIONS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-1

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

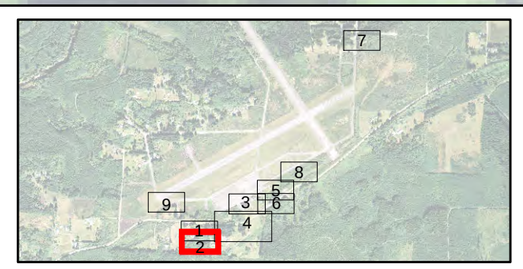


LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 44
SAMPLE LOCATIONS

September 2012 21-1-16506-004

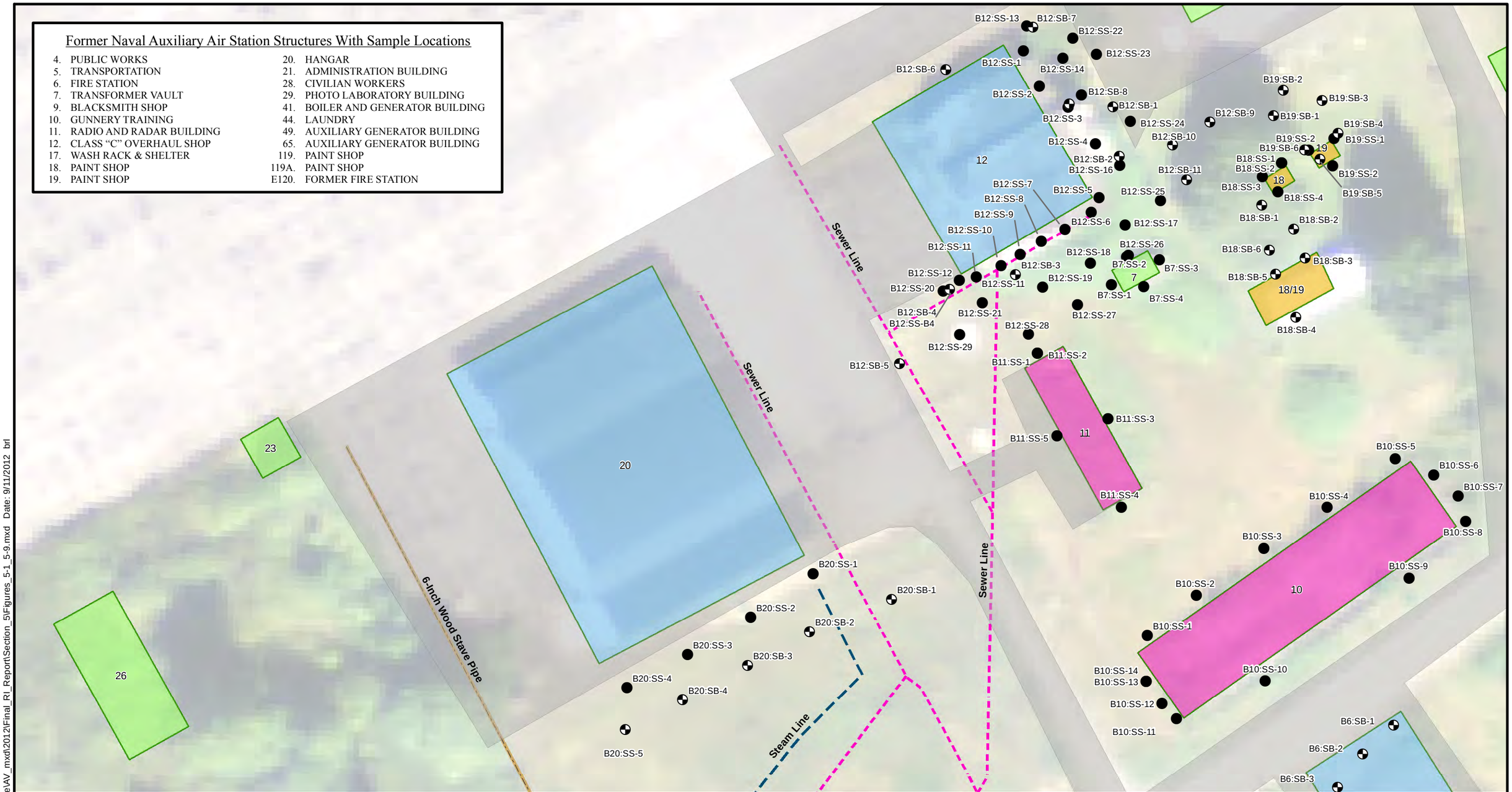
SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-2

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

Former Naval Auxiliary Air Station Structures With Sample Locations

4.	PUBLIC WORKS	20.	HANGAR
5.	TRANSPORTATION	21.	ADMINISTRATION BUILDING
6.	FIRE STATION	28.	CIVILIAN WORKERS
7.	TRANSFORMER VAULT	29.	PHOTO LABORATORY BUILDING
9.	BLACKSMITH SHOP	41.	BOILER AND GENERATOR BUILDING
10.	GUNNERY TRAINING	44.	LAUNDRY
11.	RADIO AND RADAR BUILDING	49.	AUXILIARY GENERATOR BUILDING
12.	CLASS "C" OVERHAUL SHOP	65.	AUXILIARY GENERATOR BUILDING
17.	WASH RACK & SHELTER	119.	PAINT SHOP
18.	PAINT SHOP	119A.	PAINT SHOP
19.	PAINT SHOP	E120.	FORMER FIRE STATION

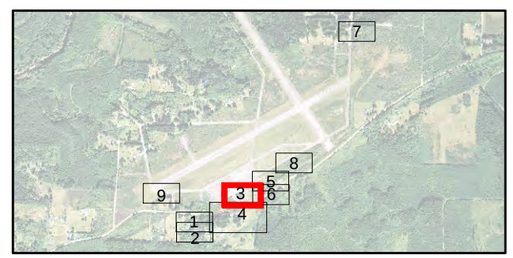


LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

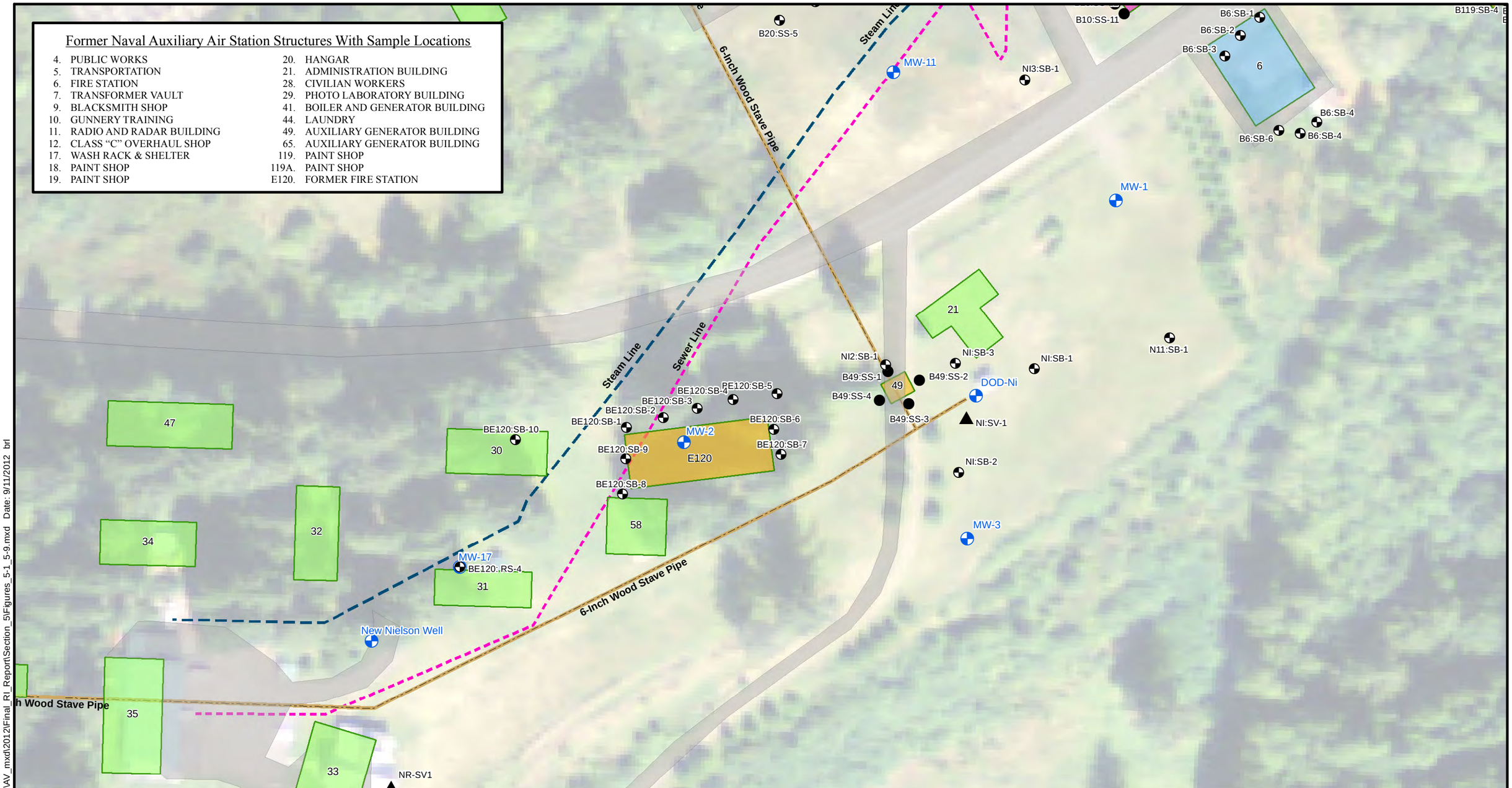
BUILDINGS 7, 10, 11, 12, 18, 19 & 20 SAMPLE LOCATIONS

September 2012 | 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-3

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

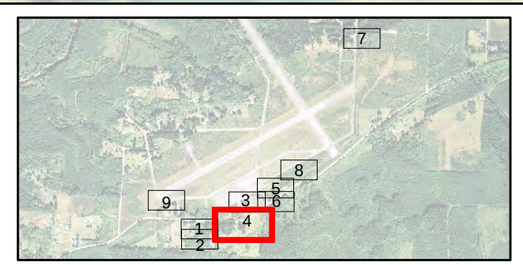


LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 6, 49 & E120 SAMPLE LOCATIONS

September 2012 | 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-4

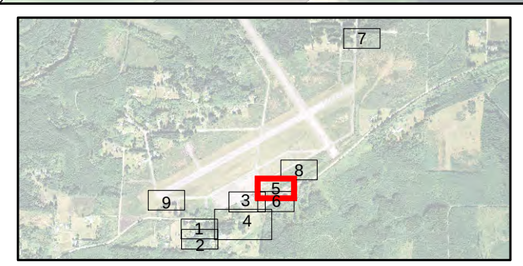
Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N
W E
S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

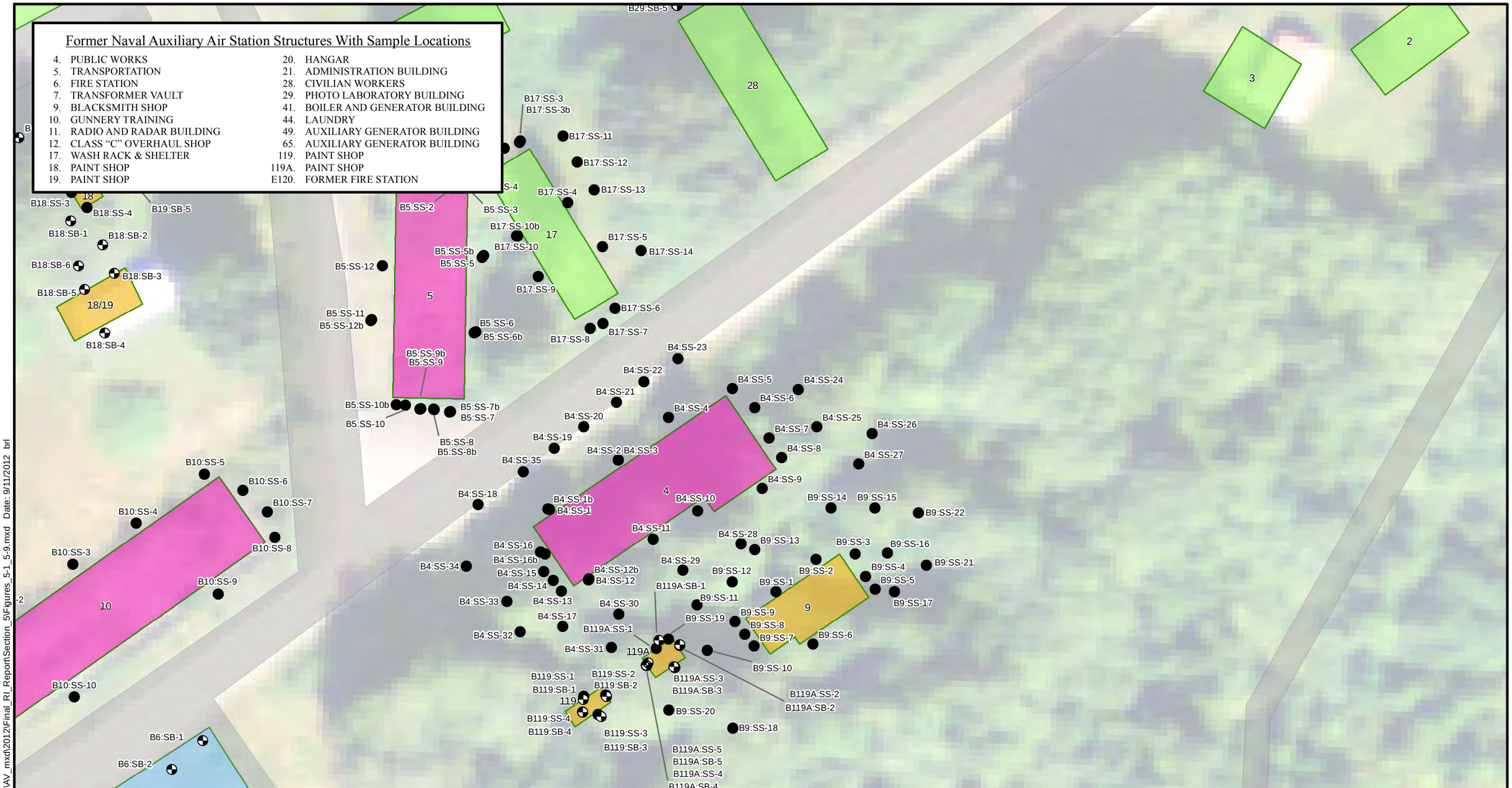
BUILDINGS 5, 17, 18, 19, 29 & 65 SAMPLE LOCATIONS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-5

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

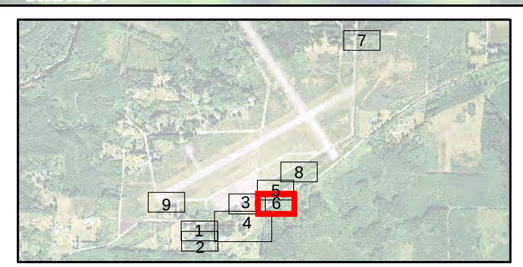


LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 4, 5, 9, 17, 119 & 119A SAMPLE LOCATIONS

September 2012 | 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-6

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

Former Naval Auxiliary Air Station Structures With Sample Locations

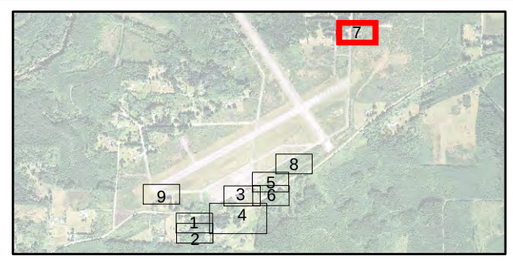
4.	PUBLIC WORKS	20.	HANGAR
5.	TRANSPORTATION	21.	ADMINISTRATION BUILDING
6.	FIRE STATION	28.	CIVILIAN WORKERS
7.	TRANSFORMER VAULT	29.	PHOTO LABORATORY BUILDING
9.	BLACKSMITH SHOP	41.	BOILER AND GENERATOR BUILDING
10.	GUNNERY TRAINING	44.	LAUNDRY
11.	RADIO AND RADAR BUILDING	49.	AUXILIARY GENERATOR BUILDING
12.	CLASS "C" OVERHAUL SHOP	65.	AUXILIARY GENERATOR BUILDING
17.	WASH RACK & SHELTER	119.	PAINT SHOP
18.	PAINT SHOP	119A.	PAINT SHOP
19.	PAINT SHOP	E120.	FORMER FIRE STATION

LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N
W E
S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 101 & 102
SAMPLE LOCATIONS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-7

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

Former Naval Auxiliary Air Station Structures With Sample Locations

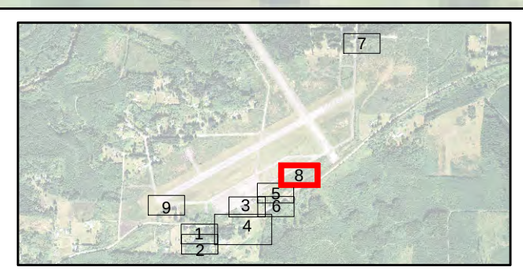
4.	PUBLIC WORKS	20.	HANGAR
5.	TRANSPORTATION	21.	ADMINISTRATION BUILDING
6.	FIRE STATION	28.	CIVILIAN WORKERS
7.	TRANSFORMER VAULT	29.	PHOTO LABORATORY BUILDING
9.	BLACKSMITH SHOP	41.	BOILER AND GENERATOR BUILDING
10.	GUNNERY TRAINING	44.	LAUNDRY
11.	RADIO AND RADAR BUILDING	49.	AUXILIARY GENERATOR BUILDING
12.	CLASS "C" OVERHAUL SHOP	65.	AUXILIARY GENERATOR BUILDING
17.	WASH RACK & SHELTER	119.	PAINT SHOP
18.	PAINT SHOP	119A.	PAINT SHOP
19.	PAINT SHOP	E120.	FORMER FIRE STATION

LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

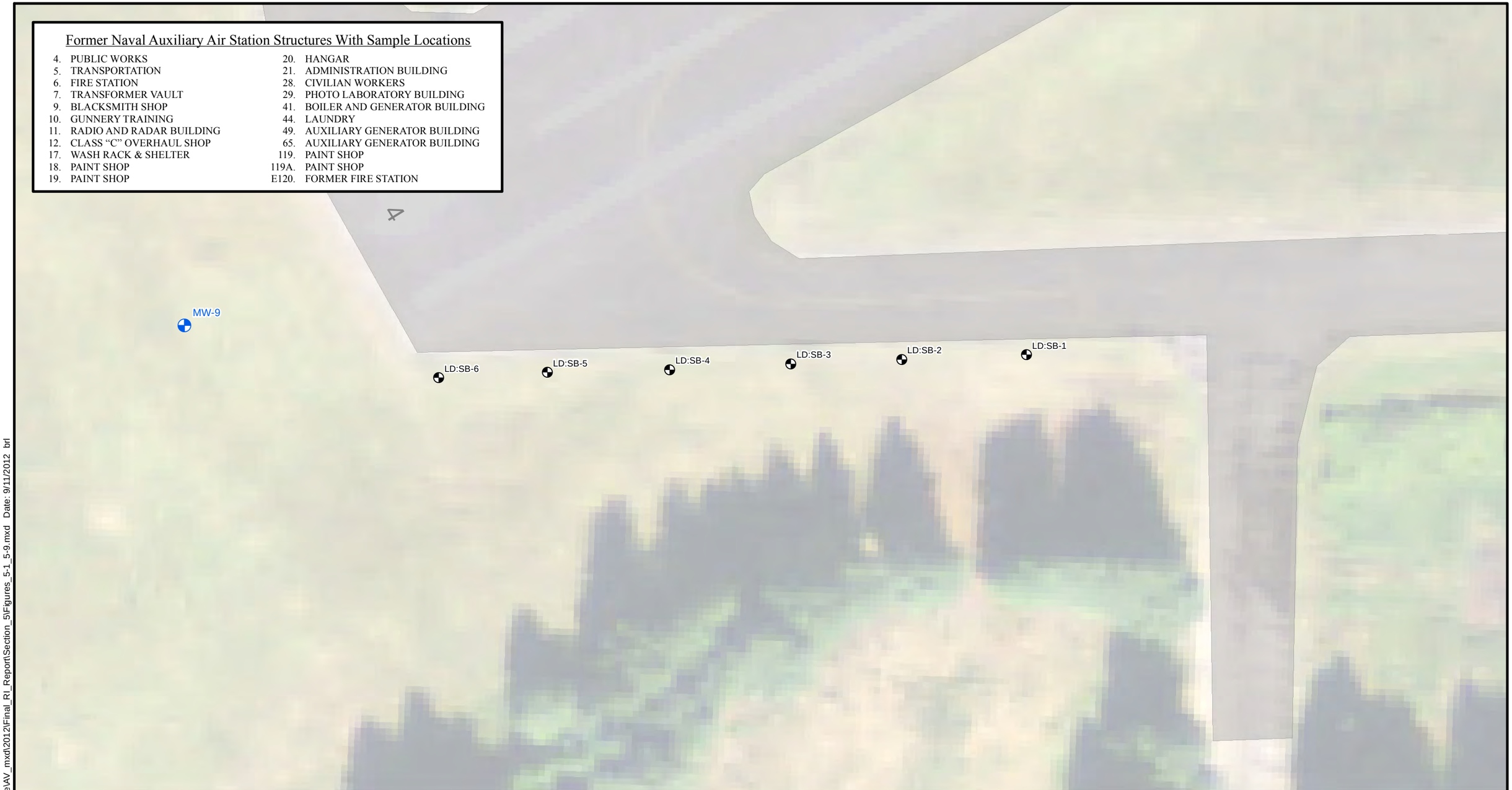
TETRAETHYL LEAD DISPOSAL AREA SAMPLE LOCATIONS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-8

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl



Former Naval Auxiliary Air Station Structures With Sample Locations

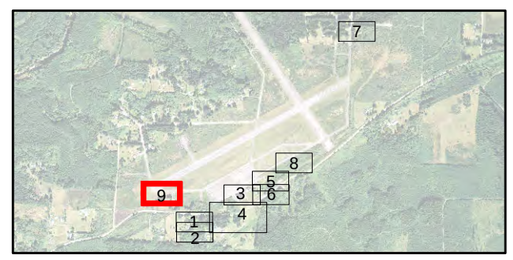
4.	PUBLIC WORKS	20.	HANGAR
5.	TRANSPORTATION	21.	ADMINISTRATION BUILDING
6.	FIRE STATION	28.	CIVILIAN WORKERS
7.	TRANSFORMER VAULT	29.	PHOTO LABORATORY BUILDING
9.	BLACKSMITH SHOP	41.	BOILER AND GENERATOR BUILDING
10.	GUNNERY TRAINING	44.	LAUNDRY
11.	RADIO AND RADAR BUILDING	49.	AUXILIARY GENERATOR BUILDING
12.	CLASS "C" OVERHAUL SHOP	65.	AUXILIARY GENERATOR BUILDING
17.	WASH RACK & SHELTER	119.	PAINT SHOP
18.	PAINT SHOP	119A.	PAINT SHOP
19.	PAINT SHOP	E120.	FORMER FIRE STATION

LEGEND

- Soil Sample Boring
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.



N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

LIQUID DISPOSAL AREA SAMPLE LOCATIONS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-9

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figures_5-1_5-9.mxd Date: 9/11/2012 brl

LEGEND

- Approximate Location: Residential Groundwater Supply Well
- Approximate Location: Monitoring Well
- Approximate Location: Former DOD Supply Well
- Approximate Location: Structures
- Approximate Location: Borrow Pits

NOTE

Locations of structures should be considered approximate and are for visualization purposes only.

0 400 800 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

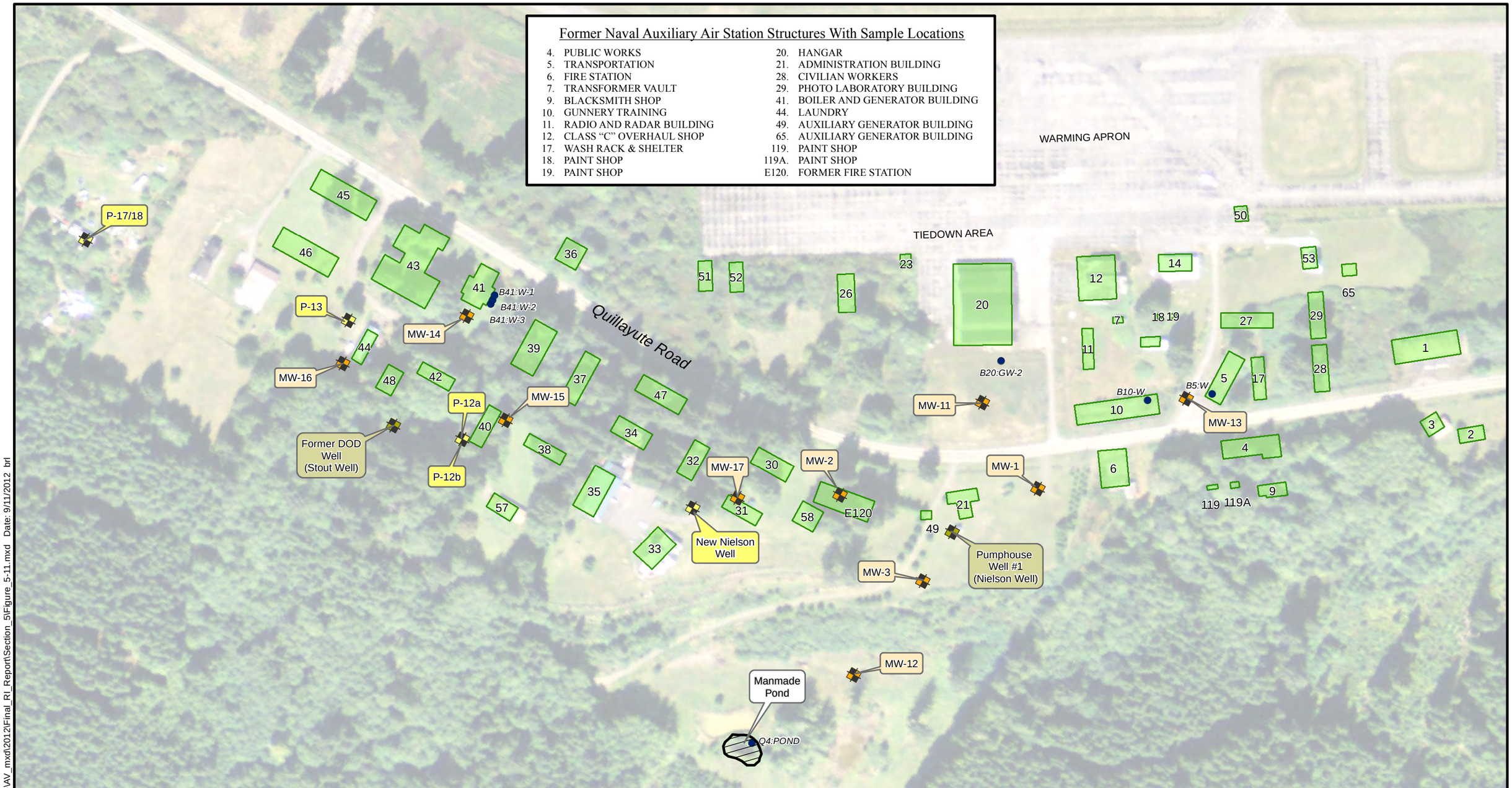
ADMINISTRATION AND OPERATIONS MONITORING & RESIDENTIAL WELL LOCATIONS

September 2012 21-1-16506-006

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-10

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figure_5-10.mxd Date: 9/11/2012 brl



LEGEND

- Grab Sample Location
- Approximate Location: Residential Groundwater Supply Well
- Approximate Location: Monitoring Well
- Approximate Location: Former DOD Supply Well
- Approximate Location: Structures
- Approximate Location: Borrow Pits

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.

0 200 400 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

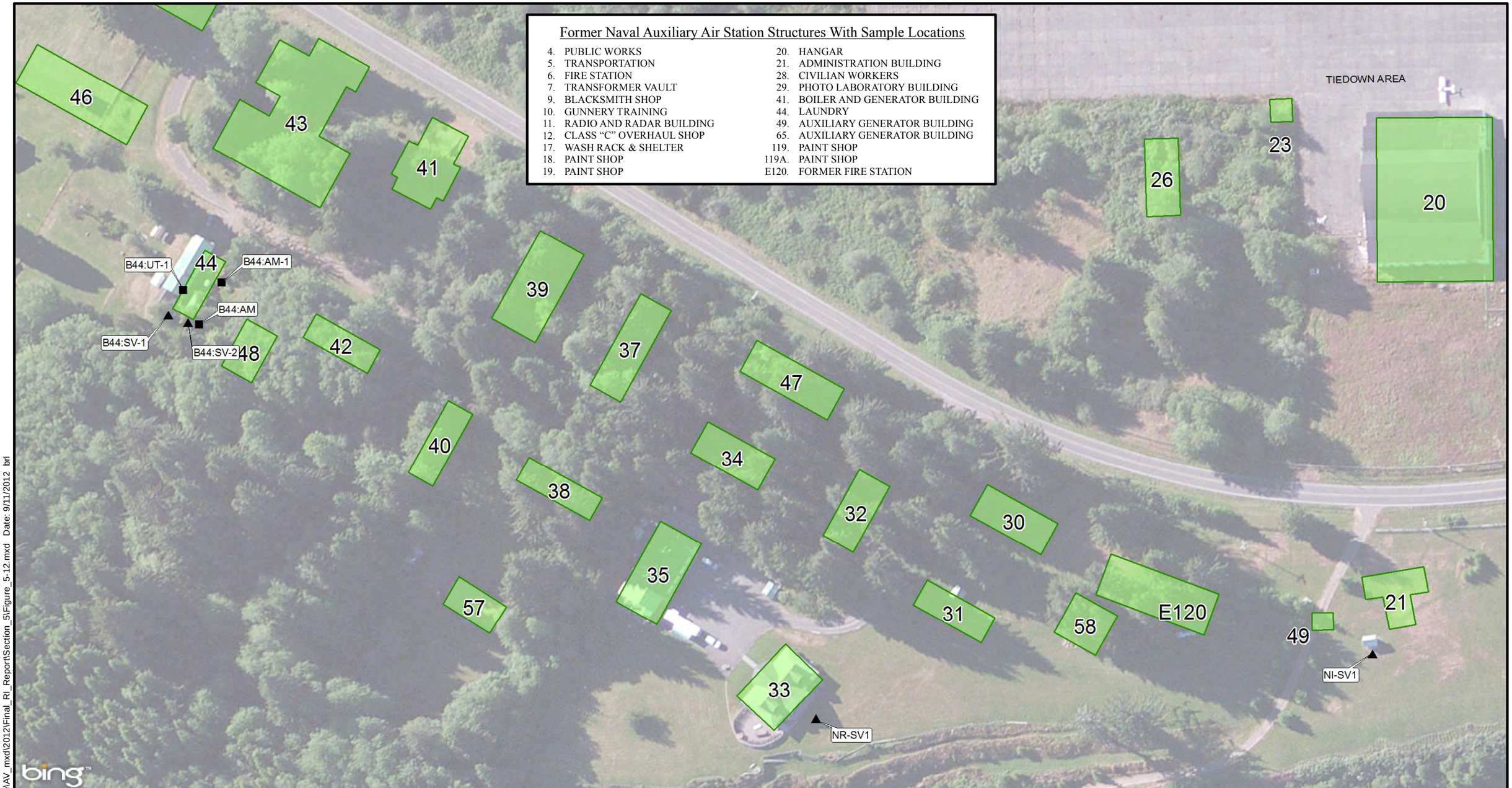
INDUSTRIAL COMPLEX AREA MONITORING & RESIDENTIAL WELL AND GRAB SAMPLE LOCATIONS

September 2012 21-1-16506-006

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-11

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figure_5-11.mxd Date: 9/11/2012 brl



LEGEND

- ▲ Soil Vapor (SV) Locations
- ■ Ambient Air Sample Locations
- Approximate Location: Structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.

N W E S

0 100 200 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

SOIL VAPOR AND AMBIENT AIR LOCATIONS

September 2012 | 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5-12

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_5\Figure_5-12.mxd Date: 9/11/2012 brl

6.0 NATURE AND EXTENT OF CONTAMINATION

This section discusses the nature and extent of soil and groundwater contamination that has been identified at the site. It is organized to address the results of explorations and sampling in each operational area, with a further breakdown by media; specifically, near-surface soil, subsurface soil, and groundwater.

6.1 Administration and Operations Area

Two areas within the Administration and Operations Area were investigated to evaluate whether potential contaminant releases during DoD operations resulted site contamination. The first of these was an alleged liquid disposal area at the southwestern end of Runway 2 (Figure 6-1). This potential source area was identified based on information obtained from an anonymous caller who indicated that liquid wastes from aircraft were disposed of on the ground surface in an area off the southwest end of Runway 2. The second potential source area was a cluster of four borrow pits located to the north of Runway 2 (see Figure 6-2). Although there is no documentation to indicate that these pits were used by DoD for disposal, the potential for groundwater contamination from a contamination source area within the borrow pits was evaluated by hydrogeologic monitoring and sampling from downgradient wells. The results of sampling conducted to evaluate these areas are discussed below.

6.1.1 Liquid Disposal Area

Six direct-push borings were advanced to approximately 25 feet bgs off the south edge of the taxiway at the alleged liquid disposal area (see Figure 6-3). The objective of these borings was to evaluate whether soil or perched groundwater was contaminated as a result of the reported disposal of waste liquids. Soil samples were collected at 5-foot intervals down to a total depth of 25 feet in each boring. Samples were analyzed for VOCs, SVOCs, petroleum hydrocarbons, and for total and dissolved silver and lead. Perched groundwater could not be sampled because it was not encountered in the probes.

6.1.1.1 Subsurface Conditions

Subsurface soils encountered in borings consisted of slightly sandy gravel with occasional organics in the upper 3 feet, overlying a clayey silt that extended to approximately 8 to 9 feet bgs. Below the silt to the bottom of the borings, the soil consisted of slightly sandy gravel. The soil was moist in each boring from approximately 3 to 25 feet. Groundwater was

not encountered in any of the borings, nor was there any indication from the soil samples (such as iron staining or mottling) that there is seasonal perched water above a depth of 25 feet.

6.1.1.2 Analytical Results

No chemicals of interest were detected above screening concentrations in the 31 subsurface soil samples collected in the liquid disposal area (Table 6-1). Lead and silver were uniformly distributed at low concentrations throughout the lateral and vertical extent of sampling; these metal concentrations are consistent with background levels in the site soils, (Ecology, 1994). VOCs that were detected, including acetone, benzene, toluene, xylenes, 2-butanone, methyl tert-butyl ether (MTBE), ethylene dichloride, and methyl isobutyl ketone, were all at concentrations well below screening and regulatory criteria, and their distribution does not suggest proximity to a contamination source. Although the occurrence of toluene and benzene is suggestive of a gasoline release, the presence of residual benzene (and in one instance MTBE, which was not added to fuel until 1980), also suggests that such a release likely would have occurred long after DoD use of the facility. The few SVOCs that were detected in site soils (bis[2-ethylhexyl]phthalate, phenol, and chrysene) also occurred sporadically and at very low concentrations. The phthalate detections are likely the result of cross contamination during sampling or laboratory analysis.

6.1.1.3 Summary of Findings

The RI sampling and reconnaissance of the area found no evidence to support the anonymous report of liquid disposal at this location. Contaminants were detected only sporadically and at concentrations that are well below risk-based screening levels and regulatory criteria. Based on the very low concentrations of contaminants detected and the lack of any surficial or subsurface evidence of liquid disposal, this area should be eliminated from further consideration as a potential source area.

6.1.2 Borrow Pits

Four borrow pits are shown on the 1946 site map on the west and east sides of Runway No. 1, portions of which extend into the West and East Parcels Areas. No historical documentation has been found to indicate that the borrow pits were used for disposal during active military operations. However, because of the potential for such use, these pits were identified as a potential source area for soil and groundwater contamination resulting from DoD operations.

As an initial step in the investigation of the borrow pits, four monitoring wells and four residential wells in the northern part of the site were purged and sampled for total and dissolved lead and silver, VOCs, SVOCs, and PAHs. The monitoring wells in the area were also monitored for groundwater elevations to establish which wells are downgradient from the borrow pits. Perched groundwater is not considered to be a feasible contaminant migration pathway from the borrow pits because the pits are about 50 feet deep, which places them below perched zones that have been observed in borings drilled during previous investigations. Therefore, no attempt was made to identify or sample perched water zones in the vicinity of the borrow pits. Soil and groundwater sampling within the borrow pits was not included as part of the sampling effort. Rather, downgradient groundwater sampling was considered an appropriate means of evaluating any potential human health risks associated with the borrow pits because the primary potential exposure pathway is via groundwater to downgradient residential wells. This approach is consistent with USEPA's presumptive remedy for remediation of landfills because excavation of landfill materials would not likely be a viable remedial measure if pits were found to be a source of contamination.

6.1.2.1 Hydrogeologic Conditions

Groundwater in the borrow pit area ranges from about 90 to 115 feet bgs, or roughly 40 feet below the estimated floor of the borrow pits. Based on groundwater elevations measured in monitoring wells MW-6, MW-7, MW-8, and MW-10, the estimated groundwater flow direction is toward the southwest at a gradient of about 1 vertical to 100 horizontal (Appendix B, Figure 3). Based on this finding, all of the residential wells in this area are downgradient from one or more of the borrow pits. Monitoring Well MW-8 (in the East Parcels Area) is an upgradient well and MW-10 is upgradient of all of the borrow pits except the one located to the east of Runway No. 1.

Rapid response of the monitoring well piezometers to rainfall events, as measured and recorded by vibrating wire piezometers connected to data loggers between April 2009 and April 2010, suggests the borrow pits are likely an important local source of recharge to the water supply aquifer. Field observations in April 2010 of rapid infiltration of runoff into granular soils underlying one of the borrow pits supports this interpretation.

6.1.2.2 Analytical Results

Contaminants have been detected above screening levels in two monitoring wells and one residential well in the vicinity of the borrow pits (Table 6-26 and Figure 6-33). In the

upgradient well MW-8, arsenic was detected at 0.6 µg/L during the 2006 sampling event (Appendix F). This concentration is below the federal MCL of 10 µg/L and the MTCA Method A groundwater cleanup criterion of 5 µg/L, but is above the MTCA Method B level of 0.058 µg/L and the EPA's RSL of 0.045 µg/L for carcinogenic risk. Bis(2-ethylhexyl)phthalate was also detected in this well at a concentration of 0.51 µg/L, which is above the EPA RSL for carcinogenic risk of 0.071 µg/L.

Arsenic and lead have been detected at elevated concentrations in MW-10, which is located upgradient of three of the four borrow pits. Arsenic was detected in this monitoring well in 2006 at 0.2 µg/L; lead was not detected at that time. In March 2009, arsenic was detected at 4.6 µg/L, and lead was detected at 53.1 µg/L. However, because the groundwater at the time of sampling was highly turbid, the analytical results were questionable, so a follow-up sample was collected in April 2010. At that time, the turbidity was greatly reduced, and the lead concentration (0.166 µg/L) was below regulatory and risk-based screening levels. Based on this more representative sampling, the elevated lead concentrations detected in March 2009 are not considered to be representative of groundwater conditions at this well.

Water from residential well B-21, located directly downgradient from the north and east borrow pits, was sampled in April 2009 and again in November 2009. In April, TCE was detected at an estimated concentration of 0.25 µg/L, which is well below the federal MCL and MTCA Method A criterion of 5 µg/L, but slightly above the MTCA Method B criterion of 0.11 µg/L for carcinogenic risk. Bis(2-ethylhexyl) phthalate was also detected in April 2009 at a concentration of 24 µg/L, although it was also detected in an associated laboratory blank. Upon resampling in November 2009, TCE was not detected and the bis(2-ethylhexyl)phthalate concentration was reduced to an estimated 0.48 µg/L, which is well below the corresponding screening criteria. In contrast, although arsenic was not detected in the initial sampling from this well, it was detected at 0.13 µg/L in the November 2009 sample. This concentration is slightly above the MTCA Method B and USEPA RSL screening concentrations for carcinogenic risk.

6.1.2.3 Summary of Findings

Water levels from monitoring wells indicate that several of the residential wells in the Administration and Operations Area are located a relatively short distance downgradient from the borrow pits. The hydrogeologic response in the downgradient monitoring wells to rainfall events suggests the borrow pits serve as a local recharge area for the water supply aquifer, so the aquifer and downgradient wells would be at risk if there were a source of contamination in the borrow pits. Although no sampling has been conducted to determine if

there is a contaminant source within the borrow pits, the analytical results from the downgradient wells suggest that there is no contaminant plume originating from the borrow pits.

Arsenic and bis(2-ethylhexyl) phthalate have been detected both upgradient and downgradient from the borrow pits, at concentrations that exceed risk-based screening criteria but are well below the federal MCL and MTCA Method A criterion for groundwater. The single elevated lead concentration detected in MW-10, which could not be duplicated in a follow-up sample, appears to be an artifact of high turbidity rather than groundwater contamination.

6.2 West Parcels Area

The West Parcels Area is adjacent to the historical Administration and Operations Area. The only potential source area identified for this area is the cluster of borrow pits, which are largely located within the Administration and Operations Area. The results of groundwater sampling to evaluate these potential contaminant sources are discussed in Section 6.1.

6.3 Industrial Complex Area

The objectives of the RI in the Industrial Complex Area were to: (a) identify and characterize potential sources of contamination based on known and suspected DoD uses of the area, and (b) assess the source and extent of the carbon tetrachloride that has been detected in the Nielson Pumphouse well near the center of the area. An initial reconnaissance was conducted in advance of sampling to identify and confirm the locations of previous structures where DoD operations could have generated or released contaminants to the environment. The reconnaissance also focused on identifying evidence of contamination and evaluating whether surface water drainage could transport contaminants from potential contamination source areas.

Several distinct types of sampling programs were designed to evaluate the nature and extent of the various types of potential contaminant sources and/or pathways in the Industrial Complex Area:

- At industrial buildings where DoD operations could have generated a variety of potential contaminants, the initial sampling focused on collecting near-surface soil samples proximal to the building footprints for analysis for petroleum hydrocarbons, lead and silver, SVOCs, and PAHs. Step-out samples were then collected to better assess the lateral extent of contamination where elevated concentrations of COI previously had been detected. This near-surface sampling was conducted around the perimeters of Buildings 4, 5, 9, 10, 12, 17, 18, 19, 20, 29, 119, and 119A, as shown in Figure 6-4.

- At five former buildings that were used by DoD for power generation/transmission or as radio/radar facilities (Buildings 7, 11, 41, 49, and 65 in Figure 6-5), near-surface soil sampling was conducted around the building perimeters for DRO, ORO, PAHs, and PCBs.
- Buildings that would likely have used VOCs in their operations were investigated by collecting subsurface soil samples, typically to depths of 25 feet bgs (Figure 6-6). These borings were also used to evaluate the potential for perched groundwater, if present, to provide a pathway for lateral migration for contaminants. Three additional geoprobe borings were advanced to evaluate the potential for a perched groundwater pathway for migration of carbon tetrachloride in site groundwater.
- A tetraethyl lead disposal area adjacent to two large gasoline tanks near the eastern end of the Industrial Complex Area (Figure 6-6) was investigated by drilling and sampling a series of four soil borings to evaluate the lateral and vertical extent of potential contamination. Subsurface soil samples were collected for analyses for gasoline range organics, DRO, ORO, lead, VOCs, SVOCs, and PAHs.
- All accessible water supply and monitoring wells were used to evaluate the site hydrogeology and to obtain samples to characterize the groundwater quality. This evaluation focused primarily on evaluating the nature and extent of the carbon tetrachloride that has been detected in the Nielson (Pumphouse) well in the center of the Industrial Complex Area.
- Soil gas and ambient air samples were sampled for VOCs at three locations to evaluate whether chlorinated solvents detected in subsurface soil and groundwater could migrate through soil pores to the accessible environment. The following discussion of the nature and extent of contamination is organized by the above types of potential environmental issues within the Industrial Complex Area.

6.3.1 Near-surface Sampling – Industrial Buildings 4, 5, 9, 10, 12, 17, 18, 19, 20, 29, 119, and 119A

Near-surface soil sampling was conducted around 12 former and existing buildings to evaluate if potential contaminant releases associated with the buildings had occurred. Prior to sampling at each building, a site reconnaissance was conducted and overgrown vegetation was cleared from around buildings, where required. One near-surface soil sample was collected at a depth of approximately 3 to 6 inches bgs at each sampling location. The samples were analyzed for petroleum hydrocarbons, SVOCs, PAHs, lead, silver, and TOC. Petroleum hydrocarbons were analyzed by the NWTPH-Dx method, which provides results for both DRO and ORO. DRO are defined as a carbon range from C10 to C24, and ORO are defined as a carbon range from C24 to C34.

The number of samples for each building was determined based on approximate 30-foot spacings around the perimeter of the observed or assumed building foundation. Sample locations were then shifted to focus on presumed doorways (identified from historic records and/or site reconnaissance). The remaining sample locations for each building were evenly spaced around the perimeter of the building footprint. Based on the analytical results from the initial sampling event, additional step-out samples and repeat samples were collected at select locations to better assess the lateral extent of contamination.

6.3.1.1 Analytical Results

Buildings 4, 9, 119, and 119A. Buildings 4, 9, 119, and 119A were located on the south side of Quillayute Road in the south central part of the Industrial Complex Area (Figure 6-4). Building 4 was a public works shop, Building 9 was a blacksmith shop, and Buildings 119 and 119A were paint shops.

Near-surface soil sampling at these buildings was accomplished in two phases. The initial phase involved collection of 34 samples from the building perimeters for chemical analysis of petroleum hydrocarbons, SVOCs (including PAHs), lead, and silver. The second phase involved step-out sampling from an additional 32 locations around Buildings 4 and 9 to better define the lateral extent of lead contamination, and re-sampling at three locations where elevated PAH concentrations were detected initially.

The near-surface analytical results and sampling locations for these buildings are summarized on the following tables and figures:

▪ Building 4	Table 6-2	Figures 6-7, 6-8, and 6-9
▪ Building 9	Table 6-3	Figures 6-7, 6-8, and 6-9
▪ Buildings 119 and 119A	Table 6-4A	Figures 6-7, 6-8, and 6-9

ORO, lead, and carcinogenic PAHs were detected in every near-surface soil sample collected around these buildings during the first phase of sampling (Figure 6-7). The ORO concentrations ranged from as low as 76 to 5,500 milligrams per kilogram (mg/kg). ORO concentrations detected around Buildings 119 and 119A were substantially lower, ranging from 160 to 600 mg/kg.

Lead concentrations detected from building perimeter samples ranged from 13.9 to 1,810 mg/kg, with one sample from around Building 4 and four samples from around Building 9 exceeding the MTCA Method A soil residential (unrestricted land use) cleanup level

of 250 mg/kg (Figure 6-8). In contrast, the step-out samples that were collected to evaluate the lateral extent of the lead contamination contained much lower lead concentrations, typically ranging from about10 to 40 mg/kg.

Total cPAH concentrations detected around Buildings 4, 9, 119, and 119A, calculated based on the TEF, are shown in Figure 6-9. The total cPAH concentrations detected around Buildings 119 and 119A were relatively low, averaging about 4 micrograms per kilogram (µg/kg), but with a maximum concentration of 82.86 µg/kg at one location. Similarly, the total cPAH concentrations around Building 9 were relatively low, ranging from 7.9 to 51.03 µg/kg.

The initial sampling around the western end of Building 4 identified three locations where the total cPAH concentrations (TEF adjusted) of 102.4 µg/kg in B4-SS-12, 106 µg/kg in B4:SS-1, and 115.15 µg/kg in B4:16 that slightly exceeded the MTCA Method A criterion of 100 µg/kg. Elsewhere, the total cPAH concentrations around Building 4 ranged from 1.7 to 85.7 µg/kg. Based on the initial sampling results, the three locations with total PAH exceedances were resampled at a depth of approximately 6 to 9 inches during the second phase of sampling. The analytical results of this follow-up sampling, as shown in Table 6-2, indicated lower concentrations of 11.40 µg/kg in B4:SS-1b, 19.59 µg/kg in B4:SS-12b and 53.80 µg/kg in B4:SS-16b, were all well below the MTCA cleanup criterion.

Buildings 5 and 17. Buildings 5 and 17 were located on the north side of Quillayute Road in the south central part of the Industrial Complex Area (Figure 6-4). Building 5 was a transportation facility and Building 17 was a wash rack and shelter for vehicles.

Near-surface soil sampling at these buildings was accomplished in two phases. The initial phase involved collection of 22 samples from the building perimeters for chemical analysis of petroleum hydrocarbons, SVOCs (including PAHs), lead, and silver.

The second phase involved step-out sampling in seven locations to delineate and to better define the lateral extent of PAH contamination around the buildings. In addition to the step-out sampling, PAHs were also resampled at 10 locations. Initial near-surface samples were collected from a thick organic layer that had accumulated on top of asphalt adjacent to the building. The additional samples were collected 4 to 6 inches below the asphalt layer.

The analytical results and soil sampling locations for these buildings are summarized i3n the following tables and figures:

▪ Building 5	Table 6-5	Figures 6-10, 6-11, and 6-12
▪ Building 17	Table 6-6	Figures 6-10, 6-11, and 6-12

Lead, silver, and cPAHs were detected in all of the samples collected from the perimeters of Buildings 5 and 17. DRO and ORO were also detected in all of the Building 5 perimeter samples and in several of the samples collected from the perimeter of Building 17. However, total cPAHs as TEF were the only analytes that exceeded the regulatory or risk-based screening criteria. The ORO and PAHs around Building 5 do not appear to be from a common source as there is no spatial association by either occurrence or concentration.

As shown in Figure 6-10, the ORO concentrations around Building 5 ranged from 1,500 to 3,300 mg/kg. Only three of the samples designated from Building 17 contained ORO, at concentrations ranging from 180 to 1,100 mg/kg.

Figure 6-11 shows the distribution of lead in the near-surface soils around Buildings 5 and 17. Lead concentrations detected in these samples ranged from 6.39 to 143 mg/kg, averaging about 81 mg/kg around Building 5 and 27 mg/kg around Building 17. Although most of the concentrations detected in these soils are above background levels, none approach the 250 mg/kg cleanup criterion established under MTCA Method A for unrestricted land use.

Twelve soil samples collected around the perimeter of Building 5 and two samples from the northern and western sides of Building 17 had total cPAH concentrations (TEF adjusted) substantially above the MTCA Method A criterion of 100 µg/kg for unrestricted land use. Total PAH concentrations ranged from 5.51 to 4,973 µg/kg in the initial Building 5 samples, and from 5.4 to 53.0 µg/kg in follow-up samples. The total PAH exceedances at Building 17 were 236.5 and 1,302.0 µg/kg in the initial sampling event; whereas, the follow-up samples had total PAH detections that were well below the MTCA criterion, at concentrations that were an order of magnitude less than the corresponding initial samples.

In addition to the near-surface soil sampling that was conducted at Building 5, a water grab sample and field duplicate were collected from a sump located in the southeast corner of the building foundation. The samples were analyzed for petroleum hydrocarbons, VOCs, and SVOCs (including PAHs); the analytical results are summarized in Table 6-28.

DRO and ORO were detected in both water samples, along with low concentrations of VOCs and PAHs. ORO concentrations ranged between 470 and 540 mg/L. All of the detected VOCs and PAHs were below screening criteria. SVOCs were not detected in

either sample. The water that had collected in the sump apparently was runoff water from the building foundation.

Building 10. Building 10 was located on the north side of Quillayute Road in the central part of the Industrial Complex Area (Figure 6-4). It reportedly was used as a gunnery range and training facility.

Fourteen near-surface soil samples were collected from the building perimeter for chemical analysis of petroleum hydrocarbons, SVOCs (including PAHs), lead, and silver. The analytical results and sampling locations for this building are summarized in Table 6-7 and Figures 6-13, 6-14, and 6-15.

Lead, silver, and cPAHs were detected in all of the soil samples collected from the perimeter of Building 10. DRO and ORO were also detected in most of the samples. Three occurrences of lead exceeded regulatory criteria and one location had total PAHs that exceeded the MTCA Method A unrestricted land use criterion.

The distribution of ORO contamination is shown in Figure 6-13. Concentrations ranged from non-detect in one sample to a maximum concentration of 700 mg/kg. There is a general correlation between ORO and DRO concentrations, although the DRO ranges from non-detect to a maximum concentration of 68 mg/kg.

Figure 6-14 shows the distribution of lead in near-surface soils around the perimeter of Building 10. Lead was detected in every sample, although only three samples exceeded the MTCA Method A cleanup criterion of 250 mg/kg for unrestricted land use; one at the northeast end of the building footprint at 310 mg/kg, and two at the southwest end of the building at 327 mg/kg and 29,700 mg/kg. It is likely that the latter concentration was skewed by inclusion of a particle of lead or LBP in the soil sample, resulting in the anomalously high concentration of nearly 3 percent by weight of lead.

CPAHs were detected in all 14 of the samples collected from Building 10, as shown in Figure 6-15. One sample, B10:SS-1, had a total cPAH concentration of 142.3 µg/kg, which exceeds the MTCA Method A cleanup level of 100 µg/kg (unrestricted land use) for total cPAHs.

In addition to the near-surface soil samples, one surface water grab sample was collected from a sump at the northeast corner of the building foundation. The sample

(B10:GW:500) was analyzed for petroleum hydrocarbons, VOCs, and SVOCs (including PAHs); the analytical results are summarized in Table 6-28.

VOCs and SVOCs were not detected above screening criteria in the water sample. PAHs were detected, although they did not exceed regulatory or risk-based screening criteria. The sump appears to collect runoff water from the surface of the building foundation.

Buildings 12, 18, and 19. Buildings 12, 18, and 19 were located north of Quillayute Road in the north-central part of the Industrial Complex Area (Figure 6-4). Building 12 was referred to as a Class C overhaul shop on site maps and Buildings 18 and 19 were used as paint shops.

Near-surface soil sampling at these buildings was accomplished in two phases. The initial phase included 12 samples from the northeast and southeast perimeters of Building 12, and three samples each from Buildings 18 and 19. These samples were all analyzed for petroleum hydrocarbons, lead and silver, SVOCs, and PAHs. The second phase involved step-out sampling for lead in 17 locations around Building 12 to better define the lateral extent of contamination identified in the first phase.

The analytical results and sampling locations for these buildings are summarized in the following tables and figures:

▪ Building 12	Table 6-8	Figures 6-17, 6-18, and 6-19
▪ Building 18 and 19	Table 6-9	Figures 6-17, 6-18, and 6-19

Lead, silver, and cPAHs were detected in all of the samples collected from the perimeters of Buildings 12, 18, and 19. DRO and ORO were also detected in all except one of the perimeter samples from Building 12. At Buildings 18 and 19, DRO was only detected at one location (at 35 mg/kg).

Figure 6-16 shows the distribution of ORO in near-surface soils around the perimeters of these buildings. ORO was detected in 11 of the 12 locations sampled, at concentrations ranging from 110 to 730 mg/kg. At Buildings 18 and 19, ORO was detected in four of the six locations sampled, at concentrations ranging from 130 to 340 mg/kg.

Lead is the only chemical that was detected in this area at concentrations above the regulatory and risk-based screening criteria. It was detected in three Building 12 perimeter samples, at concentrations of 287, 312, and 932 mg/kg. The MTCA Method A cleanup criterion

for unrestricted use is 250 mg/kg. The average lead concentration in the Building 12 perimeter samples was 182 mg/kg, whereas the average lead concentration of the step-out samples was 50 mg/kg. This pattern is consistent with deposition of lead paint particles near the buildings, with decreasing presence of lead as distance from the building increases. In contrast, the lead concentrations detected at Buildings 18 and 19 ranged from 6.11 to 10.8 mg/kg and appear to reflect background concentrations for lead in soil (San Juan, 1994).

Total cPAH concentrations were relatively low at these buildings, as shown in Figure 6-18. The highest detected total PAH concentration was 44.85 µg/kg, which is well below the MTCA Method A cleanup criterion of 100 µg/kg for total PAHs (unrestricted land use). As with both lead and ORO contaminant levels, the PAH concentrations detected at Buildings 18 and 19 were also very low.

Building 20. Building 20 is an airplane hangar located along the south side of the Runway 2 taxiways in the north-central part of the Industrial Complex Area (Figure 6-4). The hangar was operational during the DoD use of the site and has remained in use by subsequent owners.

Four near-surface soil samples were collected along the southeastern perimeter of Building 20 for chemical analysis of petroleum hydrocarbons, SVOCs (including PAHs), lead, and silver. The analytical results and sampling locations for this building are summarized in Table 6-10 and Figure 6-19.

DRO and ORO, lead, silver, and cPAHs were detected in all four soil samples collected from the perimeter of Building 20. As shown in Figure 6-19, the two westernmost samples contained ORO at concentrations of 3,900 and 2,300 mg/kg. The other samples had ORO concentrations of 1,200 and 1,500 mg/kg.

Lead concentrations detected in these soil samples ranged from 18.2 to 28.3 mg/kg, approximately an order of magnitude below the MTCA Method A cleanup criterion of 250 mg/kg for unrestricted land use, and close to the natural background concentration for the Puget Sound region of 24 mg/kg (San Juan, 1994). Total cPAH concentrations detected at Building 20 ranged from 27.27 to 63.73 µg/kg, substantially below the MTCA Method A criterion of 100 µg/kg for unrestricted land use.

Dimethyl phthalate was detected at 1,900 µg/kg and at 320 µg/kg in two of the soil samples. No regulatory or risk-based screening criteria are available for this compound.

Building 29. Building 29 was used as a photography laboratory during DoD occupation of the property. It was located north of Quillayute Road in the central part of the Industrial Complex Area (Figure 6-4).

Near-surface soil samples were initially collected from 10 locations around the perimeter of the building for chemical analysis for petroleum hydrocarbons, SVOCs (including PAHs), lead, and silver. A second phase of sampling for PAHs only was conducted near the southeastern corner of the building footprint after the initial results identified an elevated PAH concentration in sample B29:SS-5. The second phase consisted of one step-out sample to evaluate lateral extent of the contamination and a re-sampling of B29:SS-5 at a slightly greater depth to evaluate if the contamination was limited to a veneer of soil just below the ground surface. The analytical results and sampling locations for this building are summarized in Table 6-11A and Figure 6-20.

The total cPAH concentration of 141.2 µg/kg for one sample at Building 29 exceeded the MTCA Method A criterion of 100 µg /kg. An elevated benzo(a)pyrene concentration contributed to this exceedance. Total cPAH concentrations detected elsewhere around the building, and in follow-up samples at and near the exceedance location, were all well below the MTCA Method A criterion, ranging from non-detect in a sample collected from directly below the previous sample to a maximum concentration of 5.99 µg/kg (Figure 6-20).

DRO and ORO were detected at low concentrations in several samples. DRO was detected in 2 of 10 samples at estimated concentrations of 21 and 28 mg/kg, and ORO was detected in 4 of 10 samples at estimated concentrations of 170 to 330 mg/kg (see Figure 6-20 for ORO concentrations).

Lead and silver were also detected in each of the 10 initial soil samples, both at concentrations that are consistent with background concentrations for these metals. Lead concentrations detected in these soil samples ranged from 7.24 to 15.4 mg/kg, over an order of magnitude below the MTCA Method A cleanup criterion of 250 mg/kg, and less than the natural background concentrations for the Puget Sound region of 24 mg/kg (San Juan, 1994). Silver concentrations ranged from 0.037 to 0.098 mg/kg, compared to literature data on background concentrations of silver in soil at 2.2 mg/kg (Hunter and Davis, 2001).

6.3.1.2 Summary of Findings

Near-surface soil sampling has identified three COI around the perimeters of Industrial Complex Area buildings where the DoD may have used, stored, or disposed of

hazardous substances. Specifically, lead, and total PAHs were all detected in numerous samples at concentrations that exceed MTCA Method A cleanup criteria for unrestricted land use.

Elevated lead concentrations were detected in near-surface soils from the perimeters of Building 4 (in 2 of 16 samples), Building 9 (4 of 9 samples), Building 10 (3 of 14 samples), and Building 12 (3 of 12 samples) collected during Phase 1a. Step-out samples collected farther from the building footprints, during Phase 1b, consistently contained substantially lower lead concentrations, suggesting that the source of lead was at the buildings; most likely resulting from lead-based paint on the structures that deteriorated or was scraped for repainting, resulting in deposition of paint particles on the ground. It should be noted that, when hazardous building materials such as lead-based paint create an imminent and substantial endangerment to the public health or welfare or to the environment at FUDS sites, they may be addressed in certain situations, such as during building demolition and debris removal or as an incidental response to clean up of hazardous substances.

Total PAHs were detected above the MTCA Method A criterion of 100 µg/kg (unrestricted land use) at five of the 12 buildings investigated. These included Building 4 (3 of 16 initial samples) and Building 5 (10 of 12 initial samples), where the PAH contamination appears to be widespread and to coincide with areas where ORO is also elevated. In contrast, the ORO and PAHs around Building 5 do not appear to be directly related. One sample each at Buildings 10, 17, and 29 contained elevated total PAH. In each instance where follow-up samples were collected directly below the initial sampling depths, the total cPAH concentration was substantially lower than the MTCA Method A criterion. Consequently, it appears that the cPAH contamination above screening level concentrations is limited to the upper 6 inches of the soil profile and where the contamination encountered may be related to the deteriorated asphalt and/or oiled hardstand that is located around the building.

6.3.2 Subsurface Soil, Sampling - Industrial Buildings 6, E120 (Nielson Pumphouse Well Vicinity), 12, 18, 19, 20, 29, 31, 40, 41, 44 119, and 119A

During the Phase 1 sampling event, soil borings were drilled and sampled around 10 buildings in the Industrial Complex Area where historical DoD activities could have resulted in a release or spill of VOCs. Boring locations were selected based on the identified or presumed locations of doorways of the existing or former buildings, where carbon tetrachloride and other contaminants may have been used during DoD occupation.

Although the subsurface sampling was directed at identifying any VOC contamination, a focus of these explorations was to attempt to locate a contamination source and migration pathway for the carbon tetrachloride that was detected in the Nielson Pumphouse well and associated monitoring wells in the center of the Industrial Complex Area. Accordingly, three additional borings that were not associated with any buildings or known site uses were also drilled and sampled in the vicinity of the Nielson Pumphouse well to evaluate potential migration pathways for the carbon tetrachloride.

Based on the analytical results of the Phase 1 sampling, additional soil sampling was also conducted at Building 44 to further investigate the presence of detected VOCs, including carbon tetrachloride, TCE, and methylene chloride. Four monitoring wells, MW-14 (Building 41), MW-15, (Building 40), MW-16 (Building 44), and MW-17 (Building 31/BE-120), were installed during Phase 2 to further characterize the subsurface hydrogeologic conditions of the Industrial Complex Area, specifically to evaluate the potential for subsurface pathways along which contaminants could migrate from the source area associated with Building 44. Three geoprobes were also advanced around the Nielson Pumphouse well to evaluate whether carbon tetrachloride was present in the subsurface soils surrounding that well.

As shown in Figure 6-6, Buildings 6, 12, 18, 19, 20, 29, 31, 40, 41, 44, 119, 119A, and E-120, and the area around the Nielson Pumphouse well, were investigated for VOCs. The results from this sampling are discussed below.

6.3.2.1 Analytical Results

Nielson Pumphouse Well Vicinity (Buildings 6 and E120). Buildings 6 and E120 were located south of Quillayute Road in the central part of the Industrial Complex Area. Both buildings were used as fire stations during DoD operations. As shown in Figure 6-21, Building 6 was located about 350 feet northeast of the Nielson Pumphouse well (sample location DoD-Ni), and Building E120 was about 200 feet west of the well. As carbon tetrachloride reportedly was used in fire extinguishers at the base, both fire stations were considered as a possible source for the carbon tetrachloride that has been detected in the Nielson Pumphouse well.

During Phase 1, 18 geoprobe soil borings were advanced in this area, six around the perimeter of Building 6, nine around the perimeter of Building E120, and three between these two buildings in the vicinity of the Nielson Pumphouse well (Figure 6-21). Soil samples were collected from each geoprobe for VOC analysis, typically from depths of 7.5 and 25 feet bgs.

Although sampling of perched groundwater was planned for these geoprobes, no water was encountered, so the sampling for chemical analysis was limited to soil samples.

Three additional geoprobes were advanced during Phase 2 to further investigate the presence of carbon tetrachloride in the vicinity of the Nielson Pumphouse well (Figure 6-21). Soil samples were collected from depths of 12 and 18 feet bgs in each of the three geoprobes and analyzed for VOCs. Groundwater was not encountered in the geoprobe borings.

The analytical results from these subsurface soil samples are summarized in Table 6-12 for Building 6, Table 6-13 for Building E120, and Table 6-14 for the six geoprobe locations surrounding the Nielson Pumphouse well. The results from each of these areas are similar. Although several VOCs were detected sporadically in these samples, all were at very low concentrations, well below the referenced screening criteria. VOCs detected included benzene, toluene, xylenes, and MTBE, as well as 1,2,4- trichlorobenzene, 2-butanone, chloroform, acetone, and methylene chloride. Carbon tetrachloride was not detected in any of the samples.

The analytical results of the samples collected from the three Phase 2 geoprobes are similar to the results of the Phase 1 sampling. Several VOCs, including 1,2,4-trimethylbenzene, acetone, benzene, xylenes, methylene chloride, and toluene were detected in all of the samples. Naphthalene was only detected in geoprobe borings NI:SB-1 and NI:SB-2 at depths of 12 and 18 feet bgs. Boring N1:SB-1 also contained 1,3,5-trimethylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and 2-butanone at 12 feet bgs. Carbon tetrachloride was not detected in any of the soil samples from the Phase 2 geoprobes in the vicinity of the Nielson Pumphouse well.

Buildings 12, 18, and 19. Buildings 12, 18, and 19 were located north of Quillayute Road in the north-central part of the Industrial Complex Area (Figure 6-4). Building 12 was referred to as a Class C overhaul shop on site maps, and Buildings 18 and 19 were used as paint shops.

The geoprobe sampling locations for these buildings are shown in Figure 6-22, and the analytical results are summarized on Table 6-15 for Building 12 and Table 6-16 for Buildings18 and 19.

Eleven soil probes were advanced around Building 12. Two soil samples were collected from each probe at depths of 7.5 and 25 feet bgs, with the exception of B12:SB-1,

where the only sample was collected at 25 feet bgs. Several VOCs were detected in these probes, all at concentrations far below screening criteria. Benzene, which was the most frequently detected VOC, was detected at estimated concentrations ranging from 0.31 to 0.56 µg/kg in 8 of 23 samples. MTBE was detected in six samples, carbon tetrachloride was detected in five samples, toluene was detected in three samples, and xylenes were detected in one sample. As shown in Figure 6-22, carbon tetrachloride was detected in four locations near Building 12 at 25 feet bgs. The carbon tetrachloride concentrations detected ranged from estimated concentrations of 0.52 to 1 µg/kg, roughly two orders of magnitude below the lowest screening criterion for carcinogenic risk of 610 µg/kg.

Twelve geoprobes were advanced around Buildings 18 and 19, with two soil samples collected from each location at depths of 7.5 and 25 feet bgs. A total of 26 samples, including field duplicates, were analyzed for VOCs. Several VOCs were detected at very low concentrations, well below regulatory or risk-based screening criteria. MTBE was the most frequently detected VOC in this area (detected in 19 of 26 samples); toluene was detected in seven samples, benzene was detected in two samples, and naphthalene and carbon tetrachloride were each detected in one sample. As shown in Figure 6-22, the carbon tetrachloride detection (an estimated 0.37 µg/kg) was from 25 feet bgs in a geoprobe located north of Building 19.

Building 20. Building 20 is an airplane hangar located along the south side of the Runway 2 taxiways and aprons in the north-central part of the Industrial Complex Area (Figure 6-4). The hangar was operational during the DoD use of the site, and has remained in use by subsequent owners.

Five geoprobes were advanced along the southeastern perimeter of Building 20 for chemical analysis of VOCs. Samples were collected from depths of 7.5 and 25 feet bgs in each geoprobe. The geoprobe locations are shown in Figure 6-23, and the analytical results are summarized in Table 6-17. Ten samples were analyzed for VOCs. Although several VOCs were detected, all were at concentrations well below any regulatory or risk-based screening criteria. Toluene was the most frequently detected VOC in this area (detected in 6 of 10 samples), whereas MTBE was detected in five samples, and benzene and carbon tetrachloride were detected in four samples each. As shown in Figure 6-23, carbon tetrachloride was detected in four of the five geoprobes at concentrations ranging from 0.59 to 1.6 µg/kg. Carbon tetrachloride was not detected in any of the shallow soil samples.

The only perched groundwater found during the RI (of sufficient quantity to be sampled) was encountered in B 20:SB2. The boring was completed as a temporary well point

and sampled for VOCs. As shown in Table 6-29, only very low concentrations of several VOCs were detected in the perched groundwater, all at concentrations well below screening criteria. Carbon tetrachloride was not detected in the water sample.

Buildings 29, 119, and 119A. Building 29 was used as a photography laboratory during DoD occupation of the property. It was located north of Quillayute Road in the central part of the Industrial Complex Area. Buildings 119 and 119A were paint shops located on the south side of Quillayute Road in the south central part of the Industrial Complex Area. The locations of these buildings are shown in Figure 6-4.

Subsurface soil samples were collected for VOC analysis from six locations around the perimeter of Building 29 and from four locations around Buildings 119 and 119A. Samples were collected from each geoprobe boring at 7.5 and 25 feet bgs. The analytical results for Building 29 are summarized in Table 6-11B, and Table 6-4B provides a summary of the results for Buildings 119 and 119A. Only low concentrations of several VOCs were detected in the subsurface samples from these buildings. Specifically, concentrations of benzene, toluene, and MTBE were detected in a few samples, and single occurrences of 2-butanone, 1,4-dichlorobenzene, methylene chloride, and p-isopropyltoluene were detected. Carbon tetrachloride was not detected in any of the subsurface samples from these buildings.

Building 31. Building 31, located on the south side of Quillayute Road in the central part of the Industrial Complex Area, was used as barracks during the DoD occupation of the facility. Soil boring BE120:RS-3 was drilled, sampled, and completed as monitoring well MW-17 during Phase 2 activities (Figure 6-4). The location of the well was chosen because it was potentially downgradient of Building 44 in the central part of the Industrial Complex Area, and in the vicinity of the former facility utility trenches that were suspected of providing a potential preferred pathway for migration of carbon tetrachloride toward the center of the Industrial Complex Area.

Subsurface soil samples were collected from boring BE120:RS-3 at depths of 8, 18, and 100 feet bgs. The analytical results are summarized in Table 6-29. Several VOCs were detected at concentrations below established regulatory or risk-based screening criteria, including: 2-butanone, benzene, xylenes, MTBE, methylene chloride, p-isopropyltoluene, and toluene. Carbon tetrachloride was not detected in any of the samples collected.

Five SVOCs, including 1-methylnaphthalene, benzyl alcohol, bis(2-ethylhexyl)phthalate, diethyl phthalate, and naphthalene were detected in the soil samples

collected from MW-17. Naphthalene and 1-methylnaphthalene were only detected in the sample collected from 18 feet bgs, and benzyl alcohol, bis(2-ethylhexyl) phthalate, diethyl phthalate were only detected in the sample collected at 100 feet bgs. None of the SVOCs detected exceeded regulatory or risk-based screening criteria.

Arsenic, cadmium, chromium, iron, lead, manganese, and mercury were detected in all four soil samples. Arsenic exceeded the USEPA carcinogenic RSL of 0.39 mg/kg in all four samples. It ranged from 4.98 mg/kg at 8 feet bgs to 2.29 mg/kg at 100 feet bgs, which is less than the Puget Sound regional soil background concentration of 7 mg/kg (San Juan, 1994). Iron slightly exceeded the EPA non-carcinogenic RSL of 55,000 mg/kg in the 18-foot sample, at a concentration of 55,600 mg/kg. These results are in the same magnitude as the Puget Sound regional soil background concentration of 58,700 mg/kg (San Juan, 1994).

Building 40. Former Building 40, located in the western half of the Industrial Complex Area to the east of Building 44, was used as barracks during the DoD occupation of the facility (Figure 6-4). As part of the Phase 2 scope of work, soil boring B40:RS-2 was advanced, sampled, and completed as monitoring well MW-15 adjacent to this former building location. Subsurface soil samples were collected at depths of 9, 17, and 107 feet bgs. Based on field observations during drilling, the soil samples collected at 9, 17, and 107 feet bgs were analyzed for petroleum hydrocarbons in addition to VOCs, SVOCs, and metals. Analytical results of the soil samples collected during the installation of MW-15 are summarized in Table 6-29.

VOCs (including 2-butanone, benzene, xylenes, and toluene) were detected in the samples collected during the drilling. Toluene was only detected in the samples collected at 9 and 17 feet bgs, and xylenes were only detected in the sample collected at 9 feet bgs. All of the detected concentrations were below the referenced regulatory or risk-based screening criteria. No carbon tetrachloride was detected in any of the samples.

Bis(2-ethylhexyl) phthalate was the only SVOC detected in soil samples collected from MW-15. It was detected at depths of 9 and 107 feet, at concentrations well below regulatory or risk-based screening criteria.

Arsenic, cadmium, chromium, iron, lead, manganese, and mercury were detected in all three soil samples. Arsenic exceeded the EPA carcinogenic RSL of 0.39 mg/kg in all three samples, ranging from 3.75 mg/kg at 9 feet bgs to 2.21 mg/kg at 107 feet bgs. Iron exceeded the EPA non-carcinogenic RSL of 55,000 mg/kg in the sample from 17 feet bgs, at a concentration

of 58,800 mg/kg. These results are within the range of regional background soil concentrations for arsenic and iron of 7 and 58,700 mg/kg, respectively (San Juan, 1994).

DRO and ORO were detected in the samples collected from 9 and 107 feet, whereas only DRO was detected in the sample from 17 feet bgs. The analytical results of the soil samples collected during the installation of MW-15 are summarized in Table 6-29 and the location of the boring/monitoring well is shown on Figure 6-36.

Building 41. Monitoring well MW-14 was installed in the vicinity of the former Building 41. This building was a boiler and generation building during the DoD occupation of the facility. Based on field observations during drilling, the soil samples from 10, 22, and 109 feet bgs were analyzed for petroleum hydrocarbons in addition to VOCs, SVOCs, and metals. According to the Tank Closure Report (Farallon Consulting, 2005), two 10,000-gallon USTs were closed in place in 2004. Confirmation samples collected during the tank closure established that DRO-contaminated soil was left in place in one location at a concentration of 2,870 mg/kg. Analytical results for the other confirmation samples were all below established cleanup levels. A site-specific cleanup level of 3,200 mg/kg for DRO was established at the time of the closure using MTCA Method B protocols.

Numerous VOCs were detected in the subsurface soil samples. The detected VOCs included 1,2,4-trimethylbenzene, 2-butanone, benzene, carbon disulfide, carbon tetrachloride, chloroform, ethylbenzene, isopropylbeneze, xylenes, sec-butylbenzene, and rtoluene. None of the VOCs exceeded regulatory or state screening criteria. Carbon tetrachloride, at 0.8 µg/kg, was only detected in the soil sample from 22 feet bgs.

SVOCs were not detected in the samples collected at 10 or 22 feet bgs. Several SVOCs were detected at low concentrations in sample B41:RS-1:109, collected from 109 feet bgs. Fluorene was also detected in the sample collected at 22 feet bgs. The SVOC concentrations were all below regulatory and risk-based screening criteria.

Arsenic, cadmium, chromium, iron, lead, manganese, and mercury were detected in all of the soil samples. Arsenic was the only metal that exceeded regulatory and risk-based screening criteria. Arsenic concentrations in all three samples exceeded the USEPA RSL criterion of 0.39 mg/kg, ranging from 6.05 mg/kg at 10 feet bgs to 1.95 mg/kg at 109 feet bgs. These arsenic concentrations are consistent with the background level of 7 mg/kg for soils in the Puget Sound region (San Juan, 1994).

DRO and ORO were detected in all six of the soil samples. Detected concentrations ranged from 4.2 mg/kg in B41:RS-1:109 to 1,500 mg/kg in B41:RS-1:22 for DRO and 31 mg/kg in B41:RS-1:109 to 150 mg/kg in B41:RS-1:22 for ORO. The analytical results of the soil samples collected during the installation of MW-14 are summarized in Table 6-29, and the location of the boring/monitoring well is shown on Figure 6-36.

Building 44. Building 44 was located at the southwestern end of the Industrial Complex Area, about 1,300 feet southwest of the Nielson Pumphouse well. The building was used by the DoD as a laundry, with dry cleaning equipment. Currently, only the concrete slab from the laundry building remains. The concrete slab is partially occupied by a mobile home that is used as a private residence.

During Phase 1, six geoprobes were advanced to the north and south of the former building to obtain subsurface soil samples for VOC analysis. The locations of these probes are shown in Figure 6-24, and the analytical results for the soil samples are summarized in Table 6-18. Several VOCs were detected at very low concentrations in the Phase 1 geoprobe soil samples. However, one soil sample (and a field duplicate) from 25 feet bgs in SB-6 at the southeast corner of the building pad (Figure 6-24) contained elevated concentrations of methylene chloride and PCE. The methylene chloride detection, at an estimated 25 µg/kg, is slightly higher than the MTCA Method A criterion of 20 µg/kg for unrestricted land use, but is well below the risk-based criterion. The PCE detection, at an estimated 200 µg/kg, also exceeds the corresponding MTCA Method A criterion of 50 µg/kg for unrestricted land use. This sample also contained slightly elevated concentrations of carbon tetrachloride at 38 µg/kg, and toluene at 23 µg/kg, both of which are well below the risk-based screening criteria. The 7.5-foot sample at this location also had low concentrations of carbon tetrachloride (1.2 µg/kg) and PCE (5 µg/kg).

The Phase 1 analytical results did not provide enough information regarding the vertical extent of the contamination or about subsurface soil conditions to evaluate the potential for migration to groundwater by leaching. To evaluate the risk of migration to groundwater by leaching, Building 44 subsurface soil sample data were compared to USEPA MCL-based Soil Screening Levels (SSLs) adjusted to a Dilution Attenuation Factor (DAF) of 20. A DAF of 20 (DAF20) was selected to better reflect the likelihood of impact to groundwater than the more conservative DAF of 1 used in the RSLs. For example, the EPA MCL-based SSL for PCE and carbon tetrachloride are 2.3 and 1.9 µg /kg, respectively. The equivalent DAF20 values for PCE and carbon tetrachloride are 46 and 38 µg /kg. PCE and carbon tetrachloride were the only compounds at Building 44 found to slightly exceed (as for PCE) or equal (as for carbon tetrachloride) the DAF20-adjusted SSL.

Similarly, the Phase 1 analytical results did not provide enough information about subsurface conditions, maximum soil concentrations, and the vertical distribution of contamination to evaluate whether the contamination could potentially pose an inhalation risk as a result of migration of soil vapor to the ground surface through the vadose zone.

Accordingly, the Phase 2 sampling at Building 44 was designed to fill these data gaps. The Phase 2 sampling included installation and sampling of both soil and groundwater from monitoring well MW-16, and collection of soil gas and ambient air samples adjacent to and on the existing concrete pad. The soil gas and ambient air sampling results are discussed in Section 6.3.3 and the groundwater sampling results are discussed in Section 6.3.6.2.

During the installation of monitoring well MW-16, six soil samples were collected and analyzed for VOCs from depths of 6, 12, 18, 25, 70, and 90 feet bgs. Numerous VOCs were detected in the soil samples, at concentrations that were well below regulatory and risk-based screening criteria. These included 2-butanone, acetone, benzene, carbon disulfide, carbon tetrachloride, chloroform, chloromethane, ethylbenzene, xylenes, methyl t-butyl ether, methylene chloride, p-isopropyltoluene, PCE, and toluene. PCE and methylene chloride were detected at concentrations of 0.93 and 1.5 µg/kg, respectively, in the soil sample collected at the water table interface at 90 feet bgs.

VOCs including carbon tetrachloride and PCE were detected in groundwater, soil gas, and ambient air samples at concentrations that exceeded regulatory and risk-based screening criteria. A further discussion of soil gas, air, and groundwater sampling is provided in Sections 6.3.3 and 6.3.6, respectively. The location of monitoring well MW-16 is shown in Figure 6-24, and the analytical results are summarized in Table 6-18.

The elevated VOC concentrations detected in the soil at Building 44 are indicative of a contaminant release, and the types of contamination are consistent with the DoD use of the building as a laundry/dry cleaning facility. However, the owner/resident has indicated that he repeatedly used carbon tetrachloride as a cleaning product in the 1960s, some of which was released into the gravel alongside his trailer home. There is also a potential that carbon tetrachloride could have resulted from disposal of used household cleaning products that contain bleach. Laboratory research by Odabasi (2008) has shown that measurable carbon tetrachloride concentrations have been generated during use of household cleaners containing soap or surfactants and bleach.

6.3.2.2 Summary of Findings

The Phase 1 subsurface soil sampling in the Industrial Complex Area focused on areas where VOCs were likely to have been used, released, or spilled during DoD occupation. VOC analyses were performed on samples from numerous borings around each of ten former buildings, and from three borings that were potentially situated along a perched groundwater pathway toward the Nielson Pumphouse well.

Based on the analytical results of the Phase 1 sampling, additional soil sampling was conducted to further evaluate the presence of VOC contamination detected at Building 44. Four new monitoring wells were installed in the western and central portions of the Industrial Complex Area to further characterize the subsurface hydrogeologic conditions and to evaluate potential subsurface pathways along which contaminants could migrate from a source area at Building 44 to downgradient locations including the Nielson Pumphouse well. These monitoring wells were installed at locations between Building 44 and the Nielson Pumphouse well. Additional soil samples were also collected at three locations around the Nielson Pumphouse well to further investigate the potential source of the carbon tetrachloride contamination in the groundwater. The samples were collected to see if carbon tetrachloride or other VOCs were present in perched groundwater.

No direct source of carbon tetrachloride has been identified in the soil near the Nielson well; carbon tetrachloride was not present in soil samples collected within the central portion of the Industrial Complex Area. However, low concentrations of carbon tetrachloride were detected in samples collected at Buildings 12 and 20 in the northern portion of the Industrial Complex Area and in one sample collected during the installation of monitoring well MW-14, located along the western edge of the Industrial Complex Area. A potential source of carbon tetrachloride may have been industrial cleaning materials/degreasers associated with Building 12. Building 12, a Class C Overhaul Shop, was used to repair and maintenance of aircraft and may have used materials that contained carbon tetrachloride and other VOCs. There is no indication that industrial cleaning materials would have been used at Building 20.

As identified on historical maps of the DoD facility and shown in Figure 6-1a, sewer and steam lines ran from Buildings 12 and 20 across the central portion of the Industrial Complex Area to its western edge. A 6-inch wood stave pipe also apparently ran from the western side of Building 20 toward the Nielson Pumphouse well. Subsurface soil samples were collected at several locations along these pipeline corridors to evaluate whether the utility trench backfills or abandoned pipelines could have served as a preferred migration pathway for

contaminants, notably carbon tetrachloride. Although low concentrations of carbon tetrachloride were present in samples collected adjacent to Building 12 and 20 near the former utility lines, the carbon tetrachloride does not appear to be present in other areas associated with the utility lines. The utility lines did not appear to provide a migration pathway to the Nielson Pumphouse well and the central portion of the Industrial Complex Area. As discussed above, the additional sampling conducted at Building 44 confirmed that contamination likely associated with it use as a former laundry facility with dry cleaning equipment was present in soil, groundwater and soil gas and ambient air.

Sampling at Building 44 detected carbon tetrachloride and PCE contamination likely associated with its use as a former laundry/dry cleaning facility.

6.3.3 Soil Gas and Ambient Air Sampling - Industrial Complex Area Buildings 33, 44, and Nielson Pumphouse Well

Soil vapor and ambient air sampling was conducted at three former and existing buildings to evaluate the presence of VOCs (including carbon tetrachloride) in subsurface soil and ambient air. Based on the analytical results of soil and groundwater samples collected in the Industrial Complex Area, 6 temporary soil gas points installed in two gas clusters were advanced and sampled adjacent to the existing Building 44 concrete pad. Follow-on ambient air sampling was conducted underneath the existing mobile home based on the result of the gas samples. Two additional gas samples were collected adjacent to former Building 33 (the Nielson residence) and the Nielson Pumphouse well. The samples were analyzed for VOCs.

Building 44. Building 44 was located at the southwestern end of the Industrial Complex Area, about 1,300 feet southwest of the Nielson Pumphouse well. The building was used by the DoD as a laundry, with dry cleaning equipment. Currently, only the concrete slab from the old building remains and it is partially occupied by a mobile home that is used as a private residence.

Based on the detection of several VOCs including methylene chloride and PCE at concentrations that exceeded regulatory and risk-based screening criteria during Phase I soil sampling, soil gas and follow-up ambient air sampling was conducted during Phase 2 and Phase 2A. Analytical results associated with subsurface soil sampling are discussed in Section 6.3.2.1. During Phase 2 sampling activities, two clusters of temporary soil gas probes, B44:SV-1 and B44:SV-2, were installed and sampled along the south end of the concrete pad. Seven soil gas samples and one ambient air sample (B44:AM) were collected and analyzed for VOCs. Based on the results of the gas sampling, three additional ambient air samples, including

one duplicate, were collected. Two samples (B44:UT-1) and the associated field duplicate were collected under the mobile home and one sample (B44:AM-1) was collected adjacent to the residence. The samples were analyzed for VOCs.

Soil gas and ambient air analytical results for the Building 44 samples are summarized in Table 6-30 and 6-31. The locations of the temporary probes and ambient air samples are shown in Figure 6-37.

Carbon tetrachloride and PCE were detected in all of the soil gas samples at concentrations that exceeded both regulatory and risk-based screening criteria. Carbon tetrachloride concentrations in samples from B44:SV-1 ranged from 380 micrograms per cubic meter (µg/m^3) at 6 feet bgs to 1,900 µg/m^3 at 18 feet bgs; these concentrations exceed the EPA RSL for carcinogenic risk of 0.41 µg/m^3 and Washington State Soil Gas Screening Level Method B carcinogenic criterion of 1.7 µg/m^3. PCE concentrations ranged from 770 µg/m^3 in the 6-foot sample to 1,800 µg/m^3 in the 13-foot sample, which exceeded both the EPA RSL carcinogenic risk criterion of 0.41 µg/m^3 and Washington State Soil Gas Screening Level Method B carcinogenic criterion of 4.2 µg/m^3.

In samples collected from B44:SV-2, carbon tetrachloride ranged from 18 µg/m^3 in the 6-foot sample to 1,200 µg/m^3 in the 18-foot sample; these concentrations exceeded EPA RSL carcinogenic risk criterion and Washington State Soil Gas Screening Level Method B carcinogenic criterion. PCE concentrations from this probe ranged from 7.2 µg/m^3 at 6 feet bgs to 120 µg/m^3 at 18 feet bgs; these values exceeded both the EPA RSL carcinogenic risk criterion and Washington State Soil Gas Screening Level Method B carcinogenic criterion.

Other VOCs including ethylbenzene, toluene, and TCE were also detected in B44:SV-1, and benzene, ethylbenzene, xylenes, toluene, and vinyl chloride were detected in B44:SV-2. None of these analytes exceeded either the regulatory or risk-based screening criteria, with the exception of TCE and ethylbenzene in B44:SV-1 and benzene in B44:SV-2.

TCE exceeded the EPA RSL carcinogenic risk criterion of 0.43 µg/m^3 in both the 13- and 18-foot samples at concentrations of 2.7 and 5.7 µg/m^3, respectively, in B44:SV-1. Ethylbenzene was detected at a concentration of 1.5 µg/m^3 in the 13-foot sample collected in B44:SV-1. The detected concentration exceeded the risk-based screening criterion. Benzene was detected in the samples collected from B44:SV-2 at concentrations of 0.48 µg/m^3 at 6 feet bgs, 12 µg/m^3 at 13 feet bgs, and 2.9 µg/m^3 at 19 feet bgs, all of which exceeded the EPA RSL carcinogenic risk criterion of 0.31 µg/m^3.

Based on the Phase 2 soil gas sampling results, two additional ambient air samples (B44:UT-1 and B44:AM-1) and one duplicate were collected at Building 44 during Phase 2A. Low concentrations of several VOCs were detected in all three samples. However, 1,2-dicloroethane, benzene, and carbon tetrachloride concentrations exceeded both risk-based and state screening criteria. 1,2-dichloroethane concentrations ranged from 0.12 µg/m^3 to 0.14 µg/m^3, while benzene ranged from 0.34 to 0.42 µg/m^3, and carbon tetrachloride ranged from 0.4 to 0.48 µg/m^3. As shown in Table 6-30, these three analytes were present at concentrations above their respective EPA RSL carcinogenic risk criteria and MTCA Indoor Air Method B cleanup criteria for carcinogenic risk.

Buildings 33 (Nielson Residence). The former Building 33 site, which is now occupied by the Nielson residence, is approximately 600 feet southwest of the Nielson Pumphouse well and approximately 150 feet to the south-southeast of MW-17 and the new Nielson well. The former building was used as a barracks during the DoD occupation of the facility. As part of the Phase 2A sampling event, one soil gas sample, NR:SV-1:6, was collected from a temporary gas point installed approximately 15 feet from the Nielson residence and analyzed for VOCs. This sample location was approximately 25 feet from a residential septic system located next to the building. The location of this temporary probe is shown in Figure 6-37.

Several VOCs were detected at concentrations well below regulatory or risk-based screening criteria, including 1,1,1-trichloroethane, carbon tetrachloride, ethylbenzene, MTBE, xylenes, PCE, toluene, TCE, and vinyl chloride. However, three VOCs (1,1,2,2-tetrachloroethane, 1,2-dichloroethane, and benzene) were detected at concentrations exceeding regulatory or risk-based screening criteria. 1,1,2,2-tetrachloroethane was detected at a concentration of 0.42 µg/m^3, which is greater than the EPA RSL carcinogenic criterion of 0.33 µg/m^3. Benzene was detected at 2.2 µg/m^3, which is greater than the EPA RSL carcinogenic criterion of 0.31 µg/m^3; and 1,2-dichloroethane was detected at 0.16 µg/m3, which is greater than the EPA RSL carcinogenic criterion of 0.094 µg/m$^{3.}$ Soil gas analytical results for sample NR:SV-1:6 are summarized in Table 6-30.

Nielson Pumphouse Well. To further investigate the presence of VOCs, particularly carbon tetrachloride, in the vicinity of the Nielson Pumphouse well, a temporary soil gas probe was advanced and sampled for VOCs during Phase 2A. The location of the soil gas probe is shown in Figure 6-37.

Soil gas analytical results from this probe are summarized in Table 6-30. The sample contained elevated concentrations of 1,1,1-trichloroethane, 1,2-dichloroethane, PCE, TCE,

toluene, xylenes, MTBE, and methylene chloride. The detected concentrations were all below regulatory screening criteria. However, benzene and carbon tetrachloride were detected at concentrations greater than the EPA RSL carcinogenic risk criteria of 0.31 µg/m^3 for benzene and 0.41 µg/m^3 for carbon tetrachloride. Benzene was detected at 0.74 µg/m^3 and carbon tetrachloride was detected at 1.2 µg/m^3.

6.3.3.1 Summary of Findings

Building 44. Elevated concentrations of carbon tetrachloride and PCE in soil gas and ambient air samples collected at the site of Building 44 are indicative of a contaminant release at the site. Both carbon tetrachloride and PCE were detected in soil gas at concentrations that exceed risk-based screening criteria. Carbon tetrachloride, benzene, and 1,2- dichloroethane were detected in ambient air samples that were collected adjacent to the mobile home and from an open space beneath it. These volatiles were detected at concentrations that exceeded their corresponding USEPA risk-based screening criteria. Air sampling was not performed inside the residence because the open space beneath the trailer would provide some protection from vapor intrusion and because the owner would not allow indoor sampling. However, the carbon tetrachloride that was detected could be from multiple sources; specifically, the owner reportedly used and disposed of small quantities of carbon tetrachloride in the gravel pad outside his home on multiple occasions. Also, as discussed in Section 6.3.2.1, laboratory research by Odabasi (2008) suggests that a possible source of carbon tetrachloride could be mixtures of household bleach-containing products discharged to domestic septic systems.

Building 33 (Nielson Residence). Numerous VOCs, including low levels of carbon tetrachloride, were detected in a soil gas sample collected adjacent to the Nielson residence. However, only 1,1,2,2-tetrachloroethane, 1,2-dichloroethane, and benzene were detected at concentrations that exceeded the EPA RSL carcinogenic risk-based screening criteria. Carbon tetrachloride was detected in groundwater samples from monitoring well MW-17 and the new Nielson water supply well, both at concentrations that were greater than the risk-based screening criteria. Both wells are located 150 to 200 feet to the north/northeast of the residence. Based on the analytical results, no potential source of carbon tetrachloride is apparent; however, as discussed above, a potential source of the carbon tetrachloride may be related to bleach-containing household cleaning products that may have been used in the Nielson residence and disposed of in the septic system.

Nielson Pumphouse Well. Several VOCs were detected in the soil gas sample collected adjacent to the Nielson Pumphouse well, at concentrations that are below risk-based

screening criteria, with the exceptions of benzene and carbon tetrachloride. These two analytes were detected at concentrations that exceeded the USEPA carcinogenic RSLs of 0.31 µg/m^3 for benzene and 0.41 µg/m^3 for carbon tetrachloride.

Benzene has not been detected in groundwater samples collected from the Nielson Pumphouse well or any of the surrounding monitoring wells located in the central portion of the Industrial Complex Area. However, low concentrations of benzene were detected in soil samples collected around the Nielson Pumphouse well at depths of 12 and 18 feet bgs during Phase 2A activities.

Although carbon tetrachloride has been detected in groundwater samples collected from the Nielson Pumphouse well, it has not been detected in any subsurface soil samples collected in the vicinity.

Historical site maps indicated that a 6-inch wood stave pipe used during by DoD ran from the western side of Building 20 toward the Nielson Pumphouse well. There is the potential that the pipe or trench backfill could have provided a migration pathway for VOCs including carbon tetrachloride and benzene. However, carbon tetrachloride and benzene were not detected in any of the soil samples collected in the proximity of the former pipe except for very low concentrations adjacent to Building 20.

6.3.4 Transformer/Generator Buildings (Buildings 7, 11, 41, 49, and 65)

According to historical site records, Buildings 7, 11, 41, 49, and 65 likely housed transformers or generators containing dielectric fluids, which possibly contained PCBs. The focus of this RI for these buildings was to obtain and analyze near-surface soil samples from around the perimeter of each of these buildings, to evaluate whether spills or releases of PCBs and related fluids had occurred to the soil adjacent to the buildings, presumably during DoD operations.

A site reconnaissance was initially conducted to confirm the locations of the former buildings, to look for evidence of contamination, and to select sample locations for soil sampling. Full structures, foundations, and/or partial foundations were located for Buildings 7, 11, and 41. No structural evidence was found for Buildings 49 and 65. Therefore, the sample locations for these buildings were based on measurements taken from a 1946 map of the former NAAS and from current physical features that were also identified on the historic map.

No indication of surface releases was found around any of the existing or former structures. Therefore, sample locations were selected at relatively uniform spacing around the perimeter of each building location. Near-surface soil samples were collected from 31 locations around the perimeters of Buildings 7, 11, 41, 49, and 65 for analysis for PCBs, PAHs, DRO, and ORO. An additional eight re-sample and 10 step-out samples were collected at Building 41 during follow-on sampling to further evaluate petroleum hydrocarbon detections encountered during the initial sampling.

6.3.4.1 Analytical Results

The analytical results for these buildings are discussed below and summarized in the following tables and figures:

▪ Building 7	Table 6-19	Figure 6-25
▪ Building 11	Table 6-20	Figure 6-25
▪ Building 41	Table 6-21	Figures 6-26, 6-27, and 6-28
▪ Building 49	Table 6-22	Figure 6-29
▪ Building 65	Table 6-23	Figure 6-30

Buildings 7, 11, 49, and 65. Oil and DRO were detected in most of the samples collected from Buildings 7, 11, 49, and 65. The maximum detected ORO concentration was 1,200 mg/kg and the maximum detected DRO concentration was 110 mg/kg.

PCBs were detected in four of the 17 samples collected from these four buildings. PCBs were detected in samples from Buildings 7 and 11, at total PCB concentrations that ranged from 0.0758 to 0.0991 mg/kg. These concentrations are well below regulatory and MTCA Method B carcinogenic risk-based criteria of 0.5 mg/kg. Only PCB-aroclors 1262 and 1268 were encountered.

PAHs, including (cPAHs), were detected in all 17 of the samples collected. Total cPAH concentrations (TEF adjusted) ranged from 0.93 µg/kg, at Building 7 to 88.97 µg/kg, at Building 11. Total cPAH concentrations were below the MTCA Method A level of 100 µg/kg.

Building 41. Concentrations of DRO and ORO were detected in all of the near-surface soil samples initially collected around Building 41. Elevated ORO concentrations ranging from 1,100 mg/kg to 3,600 mg/kg were detected in several samples.

Based on the results of the initial sampling, 20 additional soil samples were collected and analyzed for petroleum hydrocarbons. ORO were detected in all of the additional

samples, up to a maximum concentration of 5,600 mg/kg in sample B41:SS-21. DRO concentrations detected in these samples ranged from 23 to 730 mg/kg.

PCB-aroclor 1262 and PCB-aroclor 1268 were detected in 8 of the 15 samples collected for PCB analysis. Total PCB concentrations ranged from 0.0976 to 0.171 mg/kg. These concentrations were well below MTCA Method B carcinogenic screening level of 0.5 mg/kg. Concentrations of total PCBs are shown in Figure 6-27.

PAHs were detected in each of the 15 samples that were collected around Building 41 for analysis of PAHs. The maximum total cPAH concentration (TEF adjusted) at 91.3 µg/kg was below the MTCA Method A criteria of 100 µg/kg.

Three water grab samples were collected from three metal-lined holes located in the foundation on the east side of Building 41. The results from these analyses, identified as samples B-41: W-1, W-2, and W-3, are summarized in Table 6-28. The analytical results from these three samples are consistent, suggesting a common source of the water. DRO and ORO concentrations ranged from 280 to 360 mg/kg. Several VOCs and PAHs were also detected, but all were detected at concentrations below screening criteria.

6.3.4.2 Summary of Findings

No elevated concentrations of PCBs were detected at the former transformer/ generator buildings in the Industrial Complex Area. Rather, only low concentrations of aroclor 1262 and 1268 were detected in near-surface soil samples from Buildings 7, 11, and 41. Similarly, only relatively low concentrations of PAHs and petroleum hydrocarbons were detected in soils from Buildings 7, 11, and 65.

Elevated concentrations of ORO were encountered in several samples around Building 41. Based on the distribution of these samples, the oil contamination appears to be sporadic but fairly widespread, with detected concentrations as high as 5,600 mg/kg, and an average concentration of 1,545 mg/kg. The sampling did not fully constrain the lateral extent of the contamination as two of the step-out samples had higher concentrations detected than the corresponding initial samples.

The analytical results from three soil samples collected during the installation of MW-14 identified low concentrations of VOCs, SVOCs, petroleum hydrocarbons, and metals. Arsenic was the only metal that exceeded an established regulatory or risk-based screening criterion. DRO was detected in the sample from 22 feet bgs at a concentration of 1,500 mg/kg.

Based on the location of the boring, the DRO probably was released from one of the nearby USTs that were subsequently closed in place. The detected concentration is well below the MTCA Method B cleanup level of 3,200 mg/kg that was established for the cleanup at the time of the closure of the two tanks.

6.3.5 Tetraethyl Lead Disposal Area

The tetraethyl lead disposal area is an area located to the east of the Industrial Complex Area and to the south of the location of two former 100,000-gallon ASTs. According to the Final Preliminary Site Assessment Report (Hart Crowser, 2002), two 100,000-gallon ASTs were decommissioned and removed from the site in 1963, and the tetraethyl lead sludge from the tanks was spread on the ground on the south side of the easternmost tank, burned, and buried by the U.S. Oil and Refining Company.

The location of the tetraethyl lead disposal area was determined from previous reports and the 1946 map of the former NAAS. The area was cleared of overgrown vegetation to select boring locations, and to look for evidence of contamination and potential surface water pathways that could transport soil contaminants from the area. Four soil borings (TL:SB-1 thru TL:SB-4) were then advanced via direct-push technology to characterize the subsurface soil, obtain soil samples, and collect perched groundwater samples (if present) for analytical testing.

Soil samples were collected every 5 feet, down to a total depth of 25 feet bgs in each boring. All of the samples were analyzed for petroleum hydrocarbons, VOCs, SVOCs, and lead. No perched groundwater was encountered. Analytical results for the samples collected at this site are presented in Table 6-25.

6.3.5.1 Investigation Results

Gasoline-range organics were not detected in any of the 22 soil samples collected, whereas ORO were detected in only one sample and its field duplicate at a concentration of 34 mg/kg.

VOCs were detected in 18 of the 22 soil samples collected. The detected volatile compounds included toluene, 1,2-dichloroethane, methyl t-butyl ether, carbon disulfide, and naphthalene. None of the VOC concentrations exceeded regulatory or risk-based screening criteria.

Only four SVOCs, including phenol, dimethyl phthalate, bis(2-ethylhexyl) phthalate, and 3,3'-dichlorobenzidine were detected in the soil samples collected in the area. None of the SVOCs detected exceeded regulatory or risk-based screening criteria.

Lead was detected in all of the soil boring samples, at concentrations ranging from a low of 3.53 mg/kg in sample TL:SB-1:25:340 to a maximum concentration of 10.6 mg/kg in sample TL:SB-1:5:335. None of the detected concentrations exceeded regulatory or risk-based screening criteria.

6.3.5.2 Summary of Findings

The analytical results from the tetraethyl lead disposal area indicate that this area is not a potential source of soil or groundwater contamination. The very low concentrations of all analytes tested suggest that the sludge disposal and burning effectively eliminated the potential for soil and groundwater contamination.

6.3.6 Hydrogeologic Conditions

A hydrogeologic evaluation of the groundwater conditions within the Industrial Complex Area was conducted to: (a) assess depths to groundwater and groundwater flow direction, including seasonal variations; (b) characterize groundwater quality in residential water supply wells, former DoD wells, and existing monitoring wells; (c) identify downgradient receptors potentially at risk of exposure to carbon tetrachloride or other groundwater contaminants; and (d) assess whether the existing monitoring well network provides sufficient coverage of the site to be protective of potential receptors. .

6.3.6.1 Groundwater Elevations and Flow Direction

Prior to groundwater sampling, the depth to groundwater was measured in each of the monitoring wells. The water supply wells and DoD wells were not accessible because of the sealed well heads, so water levels could not be measured in these wells. The depths to water in monitoring wells were converted to groundwater elevations using recent survey data for each well. The groundwater elevations measured prior to groundwater sampling in December 2011 are shown in Figure 1 of the Hydrogeologic Assessment Memorandum (Appendix B).

Following groundwater sampling in April 2009, the depths to water in MW-2, MW-3, and MW-13 were recorded utilizing Solinst Levellogger pressure transducer/data logger systems. The levelloggers were programmed to record data every 15 minutes for a 12-month

period beginning April 4, 2009. The long-term water level monitoring shows a fluctuation of groundwater elevation in the center of the Industrial Complex Area of about 10 feet through the year, with the lowest levels corresponding to the dry season (Figure 4, Appendix B). The seasonal variation in groundwater elevations results in only a slight variability in groundwater flow direction and gradient. As shown in Figure 3, Appendix B, the groundwater contours from December 2011 indicate the flow direction is primarily toward the northeast with a hydraulic gradient ranging from 0.001 to 0.02. This flow direction and gradient are generally consistent with those observed during the Site Investigation in 2005 and 2007 and during the RI in 2009, 2010, and 2011.

Based on groundwater level readings in three new monitoring wells (MW-14, MW-15, and MW-16A) during January and December 2011, there appears to be a slight reversal in flow direction, at least during the rainy season, at the westernmost end of the Industrial Complex Area. In this area, groundwater appears to flow both northeastward along a relatively steep gradient, and also to the southeast along a much shallower gradient, from a high point near MW-14 and MW-15. This anomaly may be the seasonal result of recharge from a small stream that flows between these well locations.

6.3.6.2 Groundwater Quality

Groundwater samples were collected during Phase 1 from monitoring wells MW-1, MW-2, MW-3, and the Nielson Pumphouse well on the Nielson property; monitoring wells MW-11, MW-12, and MW-13 in the area surrounding the Nielson property; and residential wells P12A, P13, and P17/18 in the western part of the Industrial Complex Area. The locations of these wells are shown in Figure 6-35. Each well was sampled for VOCs, SVOCs, PAHs, and for lead and silver. The residential well samples were collected from spigots, whereas, the monitoring well samples were collected by downhole sampling with a low-flow pump.

Monitoring wells MW-14, MW-15, MW16, and MW-17 were installed and sampled during Phase 2 to further characterize the groundwater flow direction and water quality within the Industrial Complex Area. The groundwater samples were analyzed for VOCs. SVOCs, PAHs, lead, and silver. In addition to sampling the new wells, monitoring wells MW-1, MW-2, MW-3, and the Nielson Pumphouse well were re-sampled and analyzed for VOCs only. A new residential well (IC:NNW; the new Nielson well) (which was installed on the Nielson property in January 2011) was also sampled for VOCs, SVOCs, PAHs, and metals.

The analytical results from both phases of the investigation of the Industrial Complex Area wells are provided in Table 6-27. During the Phase 1 sampling events as shown in Figure 6-35, carbon tetrachloride was detected in the Nielson Pumphouse well (collected between the well and a carbon filter) at an estimated concentration of 6.8 µg/L, which exceeds the federal MCL and the risk-based screening criterion. Lower concentrations of carbon tetrachloride were also detected in the three nearby monitoring wells; MW-1 at 1.6 µg/L, MW-2 at 2 µg/L, and MW-3 at an estimated 4.7 µg/L. Carbon tetrachloride was also detected in monitoring well MW-12, located about 350 feet south of the Nielson Pumphouse well. The concentration of carbon tetrachloride in MW-12 was an estimated 0.14 µg/L, which is below screening criteria.

A second sample was also collected from the Nielson Pumphouse well at the tap. This water sample, which had passed through a carbon filter, had no detectable carbon tetrachloride. However, it did contain vinyl chloride at 0.28 µg/L, in contrast to the unfiltered sample, which had no detectable vinyl chloride. This vinyl chloride concentration was an order of magnitude greater than the carcinogenic risk-based screening level, but well below the federal and state water quality standards. This result suggests that the vinyl chloride detected in the tap sample is not a site contaminant but rather was introduced by the filter or in the sampling or analytical process.

In addition to the groundwater sampling, the man-made pond on Parcel K was also sampled for VOCs because of the potential that it could be hydraulically connected to the water supply aquifer. This pond is situated approximately 600 feet south of the Nielson Pumphouse well, and about 80 feet lower in elevation, or roughly the elevation of groundwater at MW-12, the closest monitoring well. Based on the estimated groundwater gradient, the pond is situated slightly cross gradient from the wells where carbon tetrachloride was detected.

The residential pond was sampled in mid-November 2009, when groundwater levels were high and the chance for a hydraulic connection was greatest. However, as shown in Table 6-28, VOCs were not detected in the water sample from the pond.

Carbon tetrachloride was detected during Phase 2 in monitoring wells MW-16, and MW-17 and the new Nielson Well (IC:NNW) , at estimated concentrations of 0.62, 0.4, and 0.14 µg/L, respectively. MW-16 is located approximately 1,400 feet southwest of the Nielson Pumphouse well and adjacent to Building 44, while MW-17 and the new Nielson well are located approximately 550 and 650 feet to the southwest of the Nielson Pumphouse well, respectively. Carbon tetrachloride was also detected in the four wells (MW-1, MW-2, MW-3,

and the Nielson Pumphouse well) that were re-sampled during Phase 2. It was detected at 0.8 µg/L in MW-1, 1.7 µg/L in MW-2, 2.8 µg/L in MW-3, and 3.4 µg/L in the Nielson Pumphouse well (collected from the water line between the well and carbon filter). All of the detected concentrations exceeded both the Washington State Method B carcinogenic criterion and the USEPA carcinogenic RSL, with the exception of the sample collected from the new Nielson well. The detected concentration in the new Nielson well only exceeded the criterion for carcinogenic risk. None of the detected concentrations exceeded the federal MCL during the Phase 2 sampling event. The detected concentrations of carbon tetrachloride are shown in Figure 6-35.

Carbon tetrachloride was not detected in samples collected from monitoring wells MW-14 and MW-15. Both wells are located in between Building 44 and the Nielson property.

PCE was detected at 0.21 and 0.2 µg/L in a groundwater sample from MW-16; these concentrations exceed the MTCA Method B carcinogenic cleanup level of 0.081 µg/L and the USEPA carcinogenic RSL of 0.072 µg/L. PCE was not detected in any of the other groundwater samples during Phase 2 sampling.

6.3.6.3 Summary of Findings

Carbon tetrachloride was detected in two separate areas within the Industrial Complex Area. It was detected in monitoring wells and residential drinking water wells on the Nielson property and in the monitoring well located adjacent to Building 44. In both area, the carbon tetrachloride exceeded risk-based screening criteria. It was not detected in samples collected from MW-14, MW-15, or the residential drinking water well P-12A, which are located between the contaminated areas. Based on the findings of the groundwater monitoring and hydrologic assessment, the two areas of contamination appear to have originated from separate sources.

In addition to carbon tetrachloride, PCE was also detected in the groundwater sample from MW-16. The groundwater contamination at Building 44 is consistent with that which could have resulted from releases associated with the dry cleaning operations that the DoD operated at this location. Although it is possible that the carbon tetrachloride could have been derived from use and disposal of household cleaners containing bleach, this theory does not account for the presence of PCE along with carbon tetrachloride in site groundwater and soil.

6.4 East Parcels Area

The East Parcels Area is directly east of the Administration and Operations Area. It contained taxiways, aircraft tie-down areas, a radio building and radio generator building, and fueling systems (USTs, piping, and fueling pits). The aboveground structures associated with the military operations were demolished prior to transfer to private ownership.

The East Parcels Area has been subdivided into 25 lots, according to the Clallam County Assessor's website. Development of individual parcels adjacent to Taxiway Nos. 4 and 5 was underway in 2004; the number of residences and individual water supply wells is not known.

6.4.1 Operational History and Potential Waste Streams

According to historical site records, Buildings 101 and 102 were former radio and generator buildings that likely had transformers containing dielectric fluids, which possibly contained PCBs. Based upon historical activities that typically occurred at these types of facilities, there is a potential for releases of dielectric oils containing PCBs to the soil adjacent to the building.

6.4.2 Site Investigations

The focus of the RI in the East Parcels Area was to evaluate whether PCBs and/or oil may be present in the vicinity of the former radio station and generator storage shack buildings, Buildings 101 and 102. The locations of both buildings were identified in the field, based on measurements taken from the historic 1946 map of the former NAAS and current physical features identified the map. Dense brush and heavy vegetation were cleared in the location of the former buildings. Nine surface soil samples (B101:SS-1 through B101:SS-5 and B102:SS-1 through B102:SS-4) were collected around the two building sites. The soil samples were collected from a depth of approximately 3 to 6 inches and were analyzed for PCBs, PAHs, and petroleum hydrocarbons.

6.4.3 Investigation Results

A reconnaissance of the vicinity of Buildings 101 and 102 did not reveal any physical evidence of soil contamination. The area has a dense vegetation cover and there was no indication of surface erosion or surface water pathways away from the former buildings.

The analytical results for Buildings 101 and 102 are shown in Table 6-24. The distribution of ORO, total PCBs, and cPAHs (TEFs) in surface soils are portrayed in Figure 6-31.

ORO was detected in all nine of the samples collected around Buildings 101 and 102, at concentrations ranging from a maximum of 1,300 mg/kg in B101:SS-3 to a minimum of 110 mg/kg in samples B102:SS-1 and B102:SS-4. Low levels of DRO were also detected in all five of the Building 101 samples and in one of the Building 102 samples, B102:SS-3.

PCBs -aroclors-1254 and 1260 were detected in two of the nine samples collected, B101:SB-3 and B101:SB-4. Total PCB concentrations were 0.025 mg/kg and 0.0158 mg/kg, respectively. These concentrations are below the MTCA Method B carcinogenic criteria of 0.5 mg/kg. Concentrations of total PCBs detected are shown in Figure 6-31.

PAHs were detected in all nine of the samples collected.

6.4.4 Summary of Findings

The chemical analyses from surface samples collected around Buildings 101 and 102 detected low levels of total petroleum hydrocarbons, PCBs, and PAHs. A single TEF-adjusted detection of total cPAHs exceeded the MTCA Method A unrestricted land use cleanup criterion. This contamination appears to be of limited extent. The co-location of PCB detections with the highest concentrations of petroleum hydrocarbons and PAHs suggests that there were minor releases of dielectric fluids near Building 101. However, the total PCB concentrations detected are well below both regulatory and risk-based screening criteria.

6.5 Summary of Chemicals of Interest (COI)

Summaries of COI detected during the RI are presented in Tables 6-33A and 6-33B. Table 6-33A contains a list of buildings by area with detected COI for each of the buildings. Table 6-33B contains a list of monitoring /residential wells and locations of grab samples were detected COI were detected. Regulatory exceedances of COI are indicated in each table.

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Study Area Sample Location Sample Depth Sample Date Sample Number							LD SB-1 5 11/11/2009 LD:SB-1:5:357	LD SB-1 5 11/11/2009 LD:SB-1:5:358	LD SB-1 10 11/11/2009 LD:SB-1:10:359	LD SB-1 15 11/11/2009 LD:SB-1:15:360	LD SB-1 20 11/11/2009 LD:SB-1:20:361	LD SB-1 25 11/11/2009 LD:SB-1:25:362
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Oil Range Organics	NWTPH-Dx	SW444	2000					5.5 U	6 U	4.4 U	5 U	120 U	120 U
Metals (mg/kg)													
Lead	SW6020	7439-92-1	250	NR	NR		400	**7.14**	**7**	**3.79**	**5.18**	**5.04**	**4.85**
Silver	SW6020	7440-22-4					390	**0.035**	**0.033**	**0.174**	**0.137**	**0.116**	**0.104**
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	25 UJ	26 UJ	26 UJ	24 UJ	37 UJ	21 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	6.2 U	6.5 U	6.4 U	6 U	9.3 U	5.1 U
2-Butanone	SW8260B	78-93-3					28000000	25 U	26 U	26 U	**1.8 J**	37 U	**3 J**
Acetone	SW8260B	67-64-1		NR	8000000		61000000	7 J U	3.2 U	32 U	11 U	34 U	**72**
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.2 U	6.5 U	**0.32 J**	**0.59 J**	9.3 U	**0.3 J**
Methyl isobutyl ketone	SW8260B	108-10-1					5300000	25 U	26 U	26 U	24 U	37 U	21 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	6.2 UJ	6.5 UJ	6.4 UJ	6 UJ	9.3 UJ	5.1 UJ
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	6.2 U	**1 J**	**0.65 J**	**1.4 J**	**0.61 J**	**0.64 J**
Semi-volatile Organic Compounds (µg/kg)													
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	98 UJ	**7.9 J**	**13 J J**	**21 J**	**12 J**	**26 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	**2.9 J**	29 U	**7.7 J**	29 U	30 U
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.5 U	2.5 U	2.5 U	**1.2 J**	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89	1.89	**1.89**	1.89	1.89

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Study Area Sample Location Sample Depth Sample Date Sample Number							LD SB-2 5 11/11/2009 LD:SB-2:5:363	LD SB-2 10 11/11/2009 LD:SB-2:10:364	LD SB-2 15 11/11/2009 LD:SB-2:15:365	LD SB-2 20 11/11/2009 LD:SB-2:20:366	LD SB-2 25 11/11/2009 LD:SB-2:25:367	LD SB-3 5 11/11/2009 LD:SB-3:5:368
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Oil Range Organics	NWTPH-Dx	SW444	2000					7.1 U	6.6 U	5.7 U	3.4 U	120 U	6 U
Metals (mg/kg)													
Lead	SW6020	7439-92-1	250	NR	NR		400	**6.98**	**6.04**	**6.17**	**5.71**	**4.61**	**6.54**
Silver	SW6020	7440-22-4					390	**0.039**	**0.085**	**0.133**	**0.103**	**0.153**	**0.037**
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	**0.34 J**	20 UJ	27 UJ	21 UJ	21 U	25 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	6.4 U	4.9 U	6.7 U	**0.094 J**	5.3 U	6.2 U
2-Butanone	SW8260B	78-93-3					28000000	4.8 J U	20 U	27 U	21 U	3.7 J U	25 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	37 U	32 U	17 U	13 U	39 U	18 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.41 J**	**0.28 J**	6.7 U	**0.42 J**	**0.71 J**	6.2 U
Methyl isobutyl ketone	SW8260B	108-10-1					5300000	**7.1 J**	20 U	27 U	21 U	**6.4 J**	25 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.51 U	4.9 UJ	6.7 UJ	5.3 UJ	0.25 U	6.2 UJ
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.2 J**	**0.56 J**	**0.46 J**	**0.79 J**	**1.5 J**	**0.39 J**
Semi-volatile Organic Compounds (µg/kg)													
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**11 J**	**21 J**	**9.4 J**	**8.8 J**	**81 J**	130 UJ
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	30 U	30 U	30 U	30 U	38 U
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.5 U	**1.3 J**	2.5 U	2.5 U	2.5 U	3.2 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	**1.88**	1.89	1.89	1.89	1.89

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Study Area Sample Location Sample Depth Sample Date Sample Number							LD SB-3 5 11/11/2009 LD:SB-3:5:369	LD SB-3 10 11/11/2009 LD:SB-3:10:370	LD SB-3 15 11/11/2009 LD:SB-3:15:371	LD SB-3 20 11/11/2009 LD:SB-3:20:372	LD SB-3 25 11/11/2009 LD:SB-3:25:373	LD SB-4 5 11/11/2009 LD:SB-4:5:374
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Oil Range Organics	NWTPH-Dx	SW444	2000					6 U	7.3 U	3.8 U	110 U	**4.2 J**	**7.5 J**
Metals (mg/kg)													
Lead	SW6020	7439-92-1	250	NR	NR		400	**6.66**	**7.34**	**4.43**	**4.71**	**5.01**	**6.92**
Silver	SW6020	7440-22-4					390	**0.039**	**0.079**	**0.154**	**0.133**	**0.124**	**0.044**
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	26 U	24 U	23 U	18 U	20 UJ	25 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	**0.14 J**	**0.082 J**	**0.11 J**	4.5 U	5 U	6.2 U
2-Butanone	SW8260B	78-93-3					28000000	26 U	1.5 J U	1.4 J U	18 U	20 U	25 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	23 U	19 U	23 U	4.5 U	2.2 U	3.1 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.4 U	5.9 U	5.8 U	4.5 U	5 U	6.2 U
Methyl isobutyl ketone	SW8260B	108-10-1					5300000	**7.1 J**	**6.7 J**	**6.7 J**	**5.6 J**	20 U	25 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.24 U	0.32 U	5.8 U	4.5 U	5 U	6.2 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.45 J**	**0.33 J**	**0.49 J**	**0.33 J**	**0.19 J**	6.2 U
Semi-volatile Organic Compounds (µg/kg)													
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**9.3 J**	**18 J J**	**9.4 J**	98 UJ	**8.1 J**	99 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	29 U	30 U	30 U	30 U	**2.3 J**	**2.3 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.5 U	2.5 U	**0.85 J**	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					0.00	1.89	**1.88**	1.89	1.89	1.89

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Study Area Sample Location Sample Depth Sample Date Sample Number							LD SB-4 10 11/11/2009 LD:SB-4:10:375	LD SB-4 15 11/11/2009 LD:SB-4:15:376	LD SB-4 20 11/11/2009 LD:SB-4:20:377	LD SB-4 25 11/11/2009 LD:SB-4:25:378	LD SB-5 5 11/11/2009 LD:SB-5:5:379	LD SB-5 10 11/11/2009 LD:SB-5:10:380
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Oil Range Organics	NWTPH-Dx	SW444	2000					**8.3 J**	**5.4 J**	120 U	**3.5 J**	**9.1 J**	**7.3 J**
Metals (mg/kg)													
Lead	SW6020	7439-92-1	250	NR	NR		400	**8.47**	**5.09**	**4.52**	**4.05**	**6.8**	**9.01**
Silver	SW6020	7440-22-4					390	**0.098**	**0.15**	**0.121**	**0.144**	**0.047**	**0.088**
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	23 UJ	21 UJ	21 U	22 UJ	26 UJ	25 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	5.7 U	5.2 U	5.1 U	5.4 U	6.5 U	6.1 U
2-Butanone	SW8260B	78-93-3					28000000	23 U	21 U	21 U	22 U	26 U	25 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	3.7 U	2.7 U	3.1 U	3 U	5.6 U	2.7 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5.7 U	5.2 U	**0.56 J**	5.4 U	6.5 U	6.1 U
Methyl isobutyl ketone	SW8260B	108-10-1					5300000	23 U	21 U	5.6 U	22 U	26 U	25 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.7 U	5.2 U	0.19 U	5.4 U	**0.38 J**	6.1 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	5.7 U	**0.22 J**	**0.39 J**	**0.32 J**	6.5 U	6.1 U
Semi-volatile Organic Compounds (µg/kg)													
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	100 U	98 U	99 U	99 U	98 U	100 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	**2.2 J**	**2.3 J**	**2.1 J**	30 U	30 U	**2.9 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.5 U	**1 J**	**0.81 J**	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	**1.88**	**1.88**	1.89	1.89	1.89

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Study Area Sample Location Sample Depth Sample Date Sample Number							LD SB-5 15 11/11/2009 LD:SB-5:15:381	LD SB-5 20 11/11/2009 LD:SB-5:20:382	LD SB-5 25 11/11/2009 LD:SB-5:25:383	LD SB-6 5 11/11/2009 LD:SB-6:5:384	LD SB-6 10 11/11/2009 LD:SB-6:10:385	LD SB-6 15 11/11/2009 LD:SB-6:15:386
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Oil Range Organics	NWTPH-Dx	SW444	2000					**4.7 J**	110 U	120 U	**8.2 J**	**11 J**	120 U
Metals (mg/kg)													
Lead	SW6020	7439-92-1	250	NR	NR		400	**6.59**	**5.2**	**4.9**	**7.1**	**5.16**	**5**
Silver	SW6020	7440-22-4					390	**0.155**	**0.145**	**0.155**	**0.05**	**0.148**	**0.133**
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	20 UJ	21 UJ	20 UJ	25 UJ	26 UJ	21 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	4.8 U	5.2 U	4.9 U	6.1 U	6.4 U	5.3 U
2-Butanone	SW8260B	78-93-3					28000000	20 U	21 U	20 U	25 U	26 U	21 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	3.1 U	2.5 U	2.8 U	3.9 U	2.9 U	2.6 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	4.8 U	**0.24 J**	**0.22 J**	6.1 U	6.4 U	5.3 U
Methyl isobutyl ketone	SW8260B	108-10-1					5300000	20 U	21 U	20 U	25 U	26 U	21 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	4.8 U	5.2 U	4.9 U	6.1 U	6.4 U	5.3 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.2 J**	5.2 U	**0.27 J**	6.1 U	6.4 U	**0.21 J**
Semi-volatile Organic Compounds (µg/kg)													
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	100 U	**10 J**	99 U	100 U	100 U	99 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	**3.1 J**	**2.9 J**	30 U	**2.6 J**	**2.4 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89	1.89	1.89	1.89	1.89

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Study Area Sample Location Sample Depth Sample Date Sample Number							LD SB-6 20 11/11/2009 LD:SB-6:20:387	LD SB-6 25 11/11/2009 LD:SB-6:25:388
Analyte	**Method**	**CAS #**							
Petroleum Hydrocarbons (mg/kg)									
Oil Range Organics	NWTPH-Dx	SW444	2000					120 U	120 U
Metals (mg/kg)									
Lead	SW6020	7439-92-1	250	NR	NR		400	**3.98**	**4.81**
Silver	SW6020	7440-22-4					390	**0.13**	**0.13**
Volatile Organic Compounds (µg/kg)									
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	22 UJ	22 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	5.4 U	5.4 U
2-Butanone	SW8260B	78-93-3					28000000	22 U	22 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	3.1 U	3.4 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5.4 U	5.4 U
Methyl isobutyl ketone	SW8260B	108-10-1					5300000	22 U	22 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.4 U	5.4 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.39 J**	**0.23 J**
Semi-volatile Organic Compounds (µg/kg)									
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**43 J**	**16 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	**2.4 J**	**2.5 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)									
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89

TABLE 6-1
ADMINISTRATION AND OPERATIONS AREA - LIQUID DISPOSAL AREA,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

JJ = Organic Data Qualifier: the result is an estimated concentration that is less than the method reporting limit but greater than or equal to the method detection limit.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-2
INDUSTRIAL COMPLEX AREA - BUILDING 4,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL														
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1										
	Building							B4	B4	B4	B4	B4	B4	B4	B4	B4
	Sample Location							SS-1	SS-1b	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
	Sample Date							3/29/2009	11/14/2009	3/29/2009	3/29/2009	3/29/2009	3/29/2009	3/29/2009	3/29/2009	3/29/2009
	Sample Number							B4:SS-1:79	B4:SS-1b:600	B4:SS-2:80	B4:SS-3:81	B4:SS-4:82	B4:SS-5:83	B4:SS-6:84	B4:SS-7:85	B4:SS-8:86
Analyte	**Method**	**CAS #**														
Petroleum Hydrocarbons (mg/kg)																
Diesel Range Organics	NWTPH-Dx	SW333	2000					**260 J**	--	**330 H**	**360 H**	**460 H**	**31 J**	11 U	**62 H**	**78 H**
Oil Range Organics	NWTPH-Dx	SW444	2000					**2400 J**	--	**2600 DO**	**3400 DO**	**4900 DO**	**450 O**	**170 Z**	**760 O**	**940 O**
Metals (mg/kg)																
Lead	SW6020	7439-92-1	250	NR	NR		400	**141 J**	--	**458 J**	**436 J**	**75 J**	**34.1 J**	**25.9 J**	**145 J**	**43.8 J**
Silver	SW6020	7440-22-4					390	**0.245 J**	--	**0.177 J**	**0.294 J**	**0.22 J**	**0.154 J**	**0.089 J**	**0.129 J**	**0.068 J**
Total Organic Carbon	ASTMD4129M	NA						**4.79**	--	**4.41**	**5.2**	**13.3**	**8.06**	**4.84**	**7.2**	**10.2**
Semi-volatile Organic Compounds (µg/kg)																
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	300 UJ	--	250 UJ	250 UJ	250 UJ	10 UJ	9.9 UJ	**4.7 J**	**3.9 J**
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**3100 JD**	--	**2500 JD**	**2700 JD**	**2500 JD**	**120 J**	**110 J**	**110 J**	**130 J**
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	590 U	--	500 U	500 U	500 U	20 U	20 U	**5.7 J**	20 U
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	300 U	--	250 U	250 U	250 U	10 U	9.9 U	9.9 U	10 U
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		300 U	--	250 U	250 U	250 U	10 U	9.9 U	9.9 U	10 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	3000 U	--	2500 U	2500 U	2500 U	**43 J**	**14 J**	**54 J**	100 U
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	300 U	--	250 U	250 U	250 U	10 U	9.9 U	9.9 U	10 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	590 U	--	500 U	500 U	500 U	**18 J**	20 U	**110**	**8.3 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	300 U	--	250 U	250 U	250 U	**2.1 J**	9.9 U	**3.5 J**	10 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**170 JD**	--	**310 D**	**180 JD**	**190 JD**	**150**	9.9 U	**280**	**690**
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	300 U	--	250 U	250 U	**74 JD**	10 U	9.9 U	**4.1 J**	**4.1 J**
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		**360 D**	--	250 U	250 U	250 U	10 U	9.9 U	**8.8 J**	10 U
p-Cresol	SW8270C	106-44-5					310000	300 U	--	250 U	250 U	250 U	10 U	9.9 U	9.9 U	10 U
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	**1600 J**	--	**1000 JD**	**1200 JD**	**1400 JD**	100 U	99 U	**45 J**	100 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	890 U	--	750 U	750 U	750 U	30 U	30 U	30 U	30 U
Polynuclear Aromatic Hydrocarbons (µg/kg)																
Acenaphthene	SW8270CSIM	83-32-9					3400000	**1.6 JD**	3 U	**1.5 J**	**1.2 J**	**2 J**	**0.24 J**	2.5 U	**1 J**	**0.33 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**20 J**	**2.7 J**	**6.8**	**12**	**15**	**2.7**	**0.42 J**	**1.9 J**	**1.7 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**15 J**	**1.7 J**	**9.2**	**12**	**16**	**1.8 J**	2.5 U	**6.5**	**1.6 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**27 J**	3 U	**0.03**	**28**	**44**	**5.9**	**2.2 J**	**22**	**8.2**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**71 J**	3 U	**39**	**49**	**58 D**	**8.8**	**2.6**	**24**	**14**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**170 J**	**51 X JN**	**76**	**110**	**100 D**	**15**	**4.3**	**31**	**19**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**93 J**	**38 D**	**58**	**85**	**83 D**	**8.7**	**2.7**	**18**	**20**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**32 J**	3 UX UJ	**20**	**23**	**28 D**	**4.5**	**1.3 J**	**11**	**6.1**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**340 J**	**110**	**150**	**230**	**230**	**21**	**4.6**	**23**	**13**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**42 J**	**15 D**	**27**	**42**	**37 D**	**2.1 J**	**0.59 J**	**4.4**	**4.7**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**53 J**	**20**	**55**	**47**	**57**	**14**	**3.9**	**40**	**12**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**4.8 JD**	**1.1 J**	**3.5**	**4.2**	**7.7**	**0.65 J**	2.5 U	**2.1 J**	**0.65 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**45 J**	**19**	**48**	**57**	**45 D**	**6.4**	**2.3 J**	**15**	**13**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**74 J**	**22**	**63**	**63**	**74**	**16**	**4.3**	**35**	**14**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**106.00**	**13.20**	**57.60**	**77.30**	**85.70**	**12.40**	**3.720**	**32.57**	**19.23**

TABLE 6-2
INDUSTRIAL COMPLEX AREA - BUILDING 4,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL													
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1									
	Building							B4	B4	B4	B4	B4	B4	B4	B4	B4
	Sample Location							SS-9	SS-10	SS-11	SS-12	SS-12b	SS-13	SS-14	SS-15	SS-16
	Sample Date							3/29/2009	3/29/2009	3/29/2009	3/29/2009	11/14/2009	3/29/2009	3/29/2009	3/29/2009	3/29/2009
	Sample Number							B4:SS-9:87	B4:SS-10:88	B4:SS-11:89	B4:SS-12:90	B4:SS-12b:602	B4:SS-13:91	B4:SS-14:92	B4:SS-15:93	B4:SS-16:94
Analyte	**Method**	**CAS #**														
Petroleum Hydrocarbons (mg/kg)																
Diesel Range Organics	NWTPH-Dx	SW333	2000					**96 H**	**190 H**	**69 Z**	**380 H**	--	**7.4 J**	**5.2 J**	**35 H**	**770 H**
Oil Range Organics	NWTPH-Dx	SW444	2000					**1300 O**	**1300 O**	**310 O**	**4600 DO**	--	**120 J**	**76 J**	**390 O**	**5500 DO**
Metals (mg/kg)																
Lead	SW6020	7439-92-1	250	NR	NR		400	**39.5 J**	**81.3 J**	**38.3 J**	**229 J**	--	**26.7**	**116**	**106**	**242**
Silver	SW6020	7440-22-4					390	**0.094 J**	**0.094 J**	**0.083 J**	**0.125 J**	--	**0.058**	**0.098**	**0.09**	**0.142**
Total Organic Carbon	ASTMD4129M	NA						**7.03**	**2.5**	**5.76**	**14**	--	**3.1**	**2.31**	**3.56**	**16.8**
Semi-volatile Organic Compounds (µg/kg)																
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	**5.6 J**	250 UJ	**6.9 J**	260 UJ	--	10 UJ	10 UJ	10 UJ	500 UJ
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**150 J**	**2500 JD**	**110 J**	**3400 J**	--	200 UJ	200 UJ	200 UJ	10000 R
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	20 U	500 U	20 U	520 R	--	**8.9 J**	20 U	**7.4 J**	1000 R
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	10 U	250 U	9.9 U	260 U	--	10 U	10 U	10 U	500 U
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		10 U	250 U	9.9 U	260 U	--	10 U	10 U	10 U	500 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	100 U	2500 U	99 U	2600 U	--	**19 J**	**12 J**	**28 J**	5000 U
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	10 U	250 U	9.9 U	260 U	--	10 U	10 U	10 U	500 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	**20 J**	500 U	**8.3 J**	520 U	--	20 U	**12 J**	**11 J**	1000 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 U	250 U	9.9 U	260 U	--	**3.8 J**	**2.3 J**	**2.2 J**	500 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**590**	**300 D**	9.9 U	**700 D**	--	**230**	10 U	10 U	**310 JD**
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**4.9 J**	250 U	**7.1 J**	260 U	--	10 U	**3 J**	10 U	500 U
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		10 U	250 U	9.9 U	260 U	--	10 U	10 U	10 U	500 U
p-Cresol	SW8270C	106-44-5					310000	10 U	250 U	9.9 U	260 R	--	10 U	10 U	10 U	500 R
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	100 U	2500 U	99 U	2600 R	--	100 U	**30 J**	**34 J**	5000 R
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	740 U	30 U	780 R	--	30 U	30 U	30 U	1500 R
Polynuclear Aromatic Hydrocarbons (µg/kg)																
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.28 J**	**0.36 J**	**0.23 J**	**0.54 J**	3.9 U	2.5 U	2.5 U	**0.32 J**	**2.3 JD**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1.9 J**	**8.6**	**0.26 J**	**18**	**2 J**	**0.47 J**	**0.4 J**	**0.48 J**	**5.6 D**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.6 J**	**6.4**	2.5 U	**9.3**	**0.8 J**	2.5 U	**0.78 J**	**1 J**	**11 D**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**8.2**	**21**	**1.3 J**	**32 D**	**10**	**2.9**	**6.1**	**4.9**	**52 D**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**14**	**43**	**1 J**	**71 D**	**12**	**4.8**	**6.6**	**6.2**	**93 D**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**23**	**88**	**2 J**	**130 D**	**37**	**8.1**	**9.5**	**8**	**87 D**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**17**	**44**	**1.6 J**	**75 D**	**26**	**5.5**	**5.1**	**5**	**51 D**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**6**	2.5 U	2.5 U	**39 D**	**5.4**	**1.9 J**	**2.8**	**2.2 J**	5 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**20**	**89**	**1.7 J**	**170 D**	**35**	**9.1**	**10**	**6.3**	**290 D**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**4.5**	**19**	2.5 U	**39 D**	**10**	**1.3 J**	**1.3 J**	**1.3 J**	**19 D**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**13**	**26**	**2.3 J**	**68**	**26**	**6.6**	**10**	**12**	**71 D**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**0.73 J**	**2.2 J**	**0.98 J**	**3.3**	**0.73 J**	2.5 U	2.5 U	2.5 U	**13 D**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**10**	**33**	**1.1 J**	**57 D**	**10**	**4.3**	**4.5**	**3.9**	**32 D**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**18**	**38**	**2.6**	**74**	**20**	**7.1**	**9.3**	**12**	**110 D**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**19.37**	**60.12**	**1.707**	**102.40**	**19.59**	**6.74**	**9.12**	**8.29**	**115.15**

TABLE 6-2
INDUSTRIAL COMPLEX AREA - BUILDING 4,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL												
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1								
	Building Sample Location Sample Date Sample Number							B4 SS-16b 11/14/2009 B4:SS-16b:601	B4 SS-17 11/14/2009 B4:SS-17:603	B4 SS-18 11/14/2009 B4:SS-18:604	B4 SS-19 11/14/2009 B4:SS-19:605	B4 SS-20 11/14/2009 B4:SS-20:606	B4 SS-21 11/14/2009 B4:SS-21:607	B4 SS-22 11/14/2009 B4:SS-22:608	B4 SS-23 11/14/2009 B4:SS-23:609
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/kg)															
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--	--	--	--	--
Metals (mg/kg)															
Lead	SW6020	7439-92-1	250	NR	NR		400	--	**11.6**	**46.2**	**22.1**	**46.6**	**39.8**	**26.1**	**63.4**
Silver	SW6020	7440-22-4					390	--	--	--	--	--	--	--	--
Total Organic Carbon	ASTMD4129M	NA						--	--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)															
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--	--	--	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--	--	--	--	--
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	--	--	--	--	--	--	--	--
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--	--	--	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		--	--	--	--	--	--	--	--
p-Cresol	SW8270C	106-44-5					310000	--	--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)															
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.7 J**	2.9 U	**1.5 J**	3 U	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**2.5 J**	2.9 U	**5.5**	3 U	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.7 J**	**0.74 J**	**6.3**	**1 J**	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**13**	**5.2**	**26**	**3.7**	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**44**	**6.1**	**29**	**4.1**	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**40 JN**	**7.4**	**48**	**11**	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**52**	**5.4**	**43**	**11**	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		3.9 UJ	**2.7 J**	**18**	**3.2**	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		**40**	**5.7**	**52**	**7.9**	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**17**	**1.6 J**	**11**	**2.7 J**	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**19**	**8.3**	**74**	**12**	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1 J**	2.9 U	**6.2**	**0.69 J**	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**22**	**5.5**	**34**	**7**	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**36**	**7.4**	**65**	**9.3**	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**53.99**	**8.40**	**43.22**	**6.94**	--	--	--	--

TABLE 6-2
INDUSTRIAL COMPLEX AREA - BUILDING 4,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL												
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1								
	Building							B4	B4	B4	B4	B4	B4	B4	B4
	Sample Location							SS-24	SS-25	SS-26	SS-27	SS-28	SS-29	SS-30	SS-30
	Sample Date							11/14/2009	11/14/2009	11/14/2009	11/14/2009	11/14/2009	11/14/2009	11/14/2009	11/14/2009
	Sample Number							B4:SS-24:610	B4:SS-25:611	B4:SS-26:612	B4:SS-27:613	B4:SS-28:614	B4:SS-29:615	B4:SS-30:616	B4:SS-30:617
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/kg)															
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--	--	--	--	--
Metals (mg/kg)															
Lead	SW6020	7439-92-1	250	NR	NR		400	**12.2**	**9.68**	**11.5**	**11.3**	**15**	**22.3**	**15.8**	**17.1**
Silver	SW6020	7440-22-4					390	--	--	--	--	--	--	--	--
Total Organic Carbon	ASTMD4129M	NA						--	--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)															
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--	--	--	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--	--	--	--	--
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	--	--	--	--	--	--	--	--
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--	--	--	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		--	--	--	--	--	--	--	--
p-Cresol	SW8270C	106-44-5					310000	--	--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)															
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		--	--	--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**					--	--	--	--	--	--	--	--

TABLE 6-2
INDUSTRIAL COMPLEX AREA - BUILDING 4,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B4 SS-31 11/14/2009 B4:SS-31:618	B4 SS-32 11/14/2009 B4:SS-32:619	B4 SS-32 11/14/2009 B4:SS-32:620	B4 SS-33 11/14/2009 B4:SS-33:621	B4 SS-34 11/14/2009 B4:SS-34:622	B4 SS-35 11/14/2009 B4:SS-35:623	B4 SS-35 11/14/2009 B4:SS-35:624
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--	--	--	--
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**10.8**	**17.1**	**13.4**	**13**	**8.16**	**16.3**	**12.3**
Silver	SW6020	7440-22-4					390	--	--	--	--	--	--	--
Total Organic Carbon	ASTMD4129M	NA						--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--	--	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--	--	--	--
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	--	--	--	--	--	--	--
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--	--	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		--	--	--	--	--	--	--
p-Cresol	SW8270C	106-44-5					310000	--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		--	--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**					--	--	--	--	--	--	--

TABLE 6-2
INDUSTRIAL COMPLEX AREA - BUILDING 4,
NOTE PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

D = The reported result is from a dilution

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

X = See case narrative.

TABLE 6-3
INDUSTRIAL COMPLEX AREA - BUILDING 9,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL												
\			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1								
	Building Sample Location Sample Date Sample Number							B9 SS-1 3/29/2009 B9:SS-1:95	B9 SS-2 3/29/2009 B9:SS-2:96	B9 SS-3 3/29/2009 B9:SS-3:97	B9 SS-4 3/29/2009 B9:SS-4:98	B9 SS-5 3/29/2009 B9:SS-5:99	B9 SS-6 3/29/2009 B9:SS-6:100	B9 SS-7 3/29/2009 B9:SS-7:101	B9 SS-8 3/29/2009 B9:SS-8:102
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/kg)															
Diesel Range Organics	NWTPH-Dx	SW333	2000					**99 H**	**78 H**	**15 J**	**16 J**	**51 H**	**220 H**	**56 H**	**31 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**860 J**	**790 O**	**210 Z**	**260 Z**	**540 O**	**2300 DO**	**550 O**	**410 O**
Metals (mg/kg)															
Lead	SW6020	7439-92-1	250	NR	NR		400	**1810**	**365**	**24.1**	**37.9**	**403**	**107**	**418**	**158**
Silver	SW6020	7440-22-4					390	**0.297**	**0.181**	**0.164**	**0.176**	**0.178**	**0.097**	**0.276**	**0.155**
Semi-volatile Organic Compounds (µg/kg)															
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	57 UJ	**25 JD J**	10 UJ	10 UJ	9.9 UJ	250 UJ	**19 J**	9.6 UJ
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	120 U	100 U	**9.5 J**	20 UJ	20 R	500 R	97 U	20 R
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		57 U	**24 JD**	10 U	80 U,i	17 U,i	250 U	49 U	14 U,i
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**160 JD**	**100 JD**	**19 J**	100 U	**16 J**	2500 U	490 U	96 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	**5600 D**	**82 JD**	20 U	20 U	20 U	500 U	**93 JD**	**9 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**660 D**	50 U	**1.9 J**	10 U	**2.7 J**	250 U	49 U	9.6 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**210 D**	**130 D**	10 U	10 U	40 UJ	**110 JD**	49 U	9.6 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**15 JD**	**31 JD**	**2.9 J**	**2.8 J**	**3.2 J**	250 U	**22 JD**	9.6 U
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	570 U	**310 JD**	100 U	100 UJ	99 R	2500 R	490 U	96 R
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	170 U	150 U	30 U	**10 J**	**7.6 J**	750 R	150 U	27 UJ
Polynuclear Aromatic Hydrocarbons (µg/kg)															
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.52 J**	**0.57 J**	**0.26 J**	2.5 U	2.5 U	2.5 U	**1.8 J**	2.4 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1.6 J**	**1.1 J**	2.5 U	2.5 U	**1.8 J**	**0.75 J**	**1.1 J**	2.4 U
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.5 J**	**2.2 J**	2.5 U	**0.54 J**	**3.5**	**1.3 J**	**2.8**	2.4 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**8.6**	**7.4**	**4**	**2.8**	**26**	**12**	**6**	**2.1 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**14**	**7.3**	**6.8**	**3**	**36**	**21**	**5**	**2.3 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**19**	**14**	**8.9**	**4.3**	**59**	**70**	**12**	**3.9**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**19**	**8.9**	**6.4**	**2.9**	**34**	**45**	**6.2**	**2.2 J**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**5.1**	**2.7**	**2.9**	**1.2 J**	**17**	**8.9**	**2.3 J**	**1.1 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**18**	**12**	**5.5**	**3.4**	**35**	**150**	**18**	**2.7**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**5.5**	**3.2**	**1.4 J**	**0.5 J**	**5.8**	**37**	**2.4 J**	**0.69 J**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**14**	**11**	**4.6**	**6**	**29**	**8.9**	**17**	**3.3**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.2 J**	**1.5 J**	2.5 U	2.5 U	**0.88 J**	**0.81 J**	**5.1**	2.4 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**13**	**5.7**	**6.9**	**2.7**	**39**	**27**	**4.5**	**1.6 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**18**	**12**	**4.5**	**7.6**	**40**	**25**	**14**	**2.9**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**19.30**	**10.72**	**9.27**	**4.18**	**51.03**	**37.99**	**7.90**	**3.27**

TABLE 6-3
INDUSTRIAL COMPLEX AREA - BUILDING 9,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL												
\			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1								
	Building Sample Location Sample Date Sample Number							B9 SS-9 3/29/2009 B9:SS-9:103	B9 SS-10 11/14/2009 B9:SS-10:629	B9 SS-11 11/14/2009 B9:SS-11:630	B9 SS-12 11/14/2009 B9:SS-12:631	B9 SS-13 11/14/2009 B9:SS-13:632	B9 SS-14 11/14/2009 B9:SS-14:633	B9 SS-15 11/14/2009 B9:SS-15:634	B9 SS-16 11/14/2009 B9:SS-16:635
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/kg)															
Diesel Range Organics	NWTPH-Dx	SW333	2000					**44 H**	--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					**540 O**	--	--	--	--	--	--	--
Metals (mg/kg)									--						
Lead	SW6020	7439-92-1	250	NR	NR		400	**91.2**	**37.2**	**11.9**	**23.7**	**27.2**	**25.7**	**7.49**	**15.9**
Silver	SW6020	7440-22-4					390	**0.121**	--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)															
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	**4J J**	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	23 U	--	--	--	--	--	--	--
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		310 U,i	--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**18 J**	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	**40**	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**3.1 J**	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			12 U	--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**4.4 J**	--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	120 U	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	50 U,i	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)															
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.48 J**	--	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1.5 J**	--	--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.2 J**	--	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**11**	--	--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**10**	--	--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**22**	--	--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**12**	--	--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**6.3**	--	--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		**15**	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**3.3**	--	--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**17**	--	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.1 J**	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**12**	--	--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**14**	--	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**15.61**	--	--	--	--	--	--	--

TABLE 6-3
INDUSTRIAL COMPLEX AREA - BUILDING 9,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL												
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1								
	Building Sample Location Sample Date Sample Number							B9 SS-17 11/14/2009 B9:SS-17:636	B9 SS-18 11/14/2009 B9:SS-18:637	B9 SS-18 11/14/2009 B9:SS-18:638	B9 SS-19 11/14/2009 B9:SS-19:639	B9 SS-20 11/14/2009 B9:SS-20:640	B9 SS-21 11/14/2009 B9:SS-21:641	B9 SS-21 11/14/2009 B9:SS-21:642	B9 SS-22 11/14/2009 B9:SS-22:643
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/kg)															
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--	--	--	--	--
Metals (mg/kg)															
Lead	SW6020	7439-92-1	250	NR	NR		400	**26.8**	**103**	**101**	**14.2**	**17.4**	**16.6**	**15**	**23.7**
Silver	SW6020	7440-22-4					390	--	--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)															
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--	--	--	--	--
Bis(2-Chloroethyl)Ether	SW8270C	111-44-4	RND	910	NR	210		--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)															
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		--	--	--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**					--	--	--	--	--	--	--	--

TABLE 6-3
INDUSTRIAL COMPLEX AREA - BUILDING 9,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

D = The reported result is from a dilution.
DNR = Do not report; a more appropriate result is reported from another analysis or dilution.
H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
i = The method reporting limit/method detection limit or limit of quantitation/limit of detection has been elevated due to a matrix interference.
J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.
R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.
U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-4A
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING SOIL CRITERIA								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B119 SS-1 3/29/2009 B119:SS-1:109	B119 SS-2 3/29/2009 B119:SS-2:110	B119 SS-3 3/29/2009 B119:SS-3:111	B119 SS-4 3/29/2009 B119:SS-4:112
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**15 J**	**49 H**	**15 J**	**20 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**250 Z**	**600 Z**	**230 Z**	**280 Z**
Metals (mg/kg)											
Lead	SW6020	7439-92-1	250	NR	NR		400	**14.5**	**19.3**	**19.3**	**16.8**
Silver	SW6020	7440-22-4					390	**0.114**	**0.126**	**0.125**	**0.079**
Semi-volatile Organic Compounds (µg/kg)											
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	9.8 UJ	**2.4 J**	**2.9 J**	**9.6 J**
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**140 J**	**140 J**	**130 J**	**150 J**
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	**22**	**16 J**	20 U	**14 J**
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**10 J**	99 U	100 U	**11 J**
Dibutyl phthalate	SW8270C	84-74-2					6100000	20 U	20 U	20 U	20 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**2.4 J**	9.9 U	10 U	10 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	9.8 U	**2.8 J**	**4.1 J**	**22**
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.5 U	2.5 U	2.5 U	**7.6**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			2.5 U	2.5 U	2.5 U	**0.81 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.5 U	2.5 U	2.5 U	**39**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**2.1 J**	**2.1 J**	**1.9 J**	**85**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**2.1 J**	**2.1 J**	**1.5 J**	**58**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**3.4**	**3.4**	**3.4**	**85**
Benzo(ghi)perylene	SW8270CSIM	191-24-2			0			**2.3 J**	**1.8 J**	**1.7 J**	**32**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**0.85 J**	**0.89 J**	**0.94 J**	**26**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**3.2**	**2.4 J**	**4**	**76**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.46 J**	**0.39 J**	**0.65 J**	**10**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**3.1**	**3.9**	**3.7**	**190**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.5 U	2.5 U	2.5 U	**14**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**2.3 J**	**1.8 J**	**1.8 J**	**35**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**2.9**	**3.5**	**4.1**	**140**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**3.04**	**2.98**	**2.41**	**82.86**

TABLE 6-4A
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING SOIL CRITERIA								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B119A SS-1 3/29/2009 B119A:SS-1:104	B119A SS-2 3/29/2009 B119A:SS-2:105	B119A SS-3 3/29/2009 B119A:SS-3:106	B119A SS-4 3/29/2009 B119A:SS-4:107
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**12 J**	**12 J**	**15 J**	**23 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**180 Z**	**160 J**	**250 Z**	**340 Z**
Metals (mg/kg)											
Lead	SW6020	7439-92-1	250	NR	NR		400	**13.9**	**16.7**	**35.8**	**21.3**
Silver	SW6020	7440-22-4					390	**0.108**	**0.135**	**0.083**	**0.103**
Semi-volatile Organic Compounds (µg/kg)											
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	**6.2 J**	**5 J**	**8.9 J**	**7.3 J**
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	180 UJ	**140 J**	**140 J**	**140 J**
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	**12 J**	25 UJ	**11 J**	**10 J**
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**97**	130 U	91 U	**12 J**
Dibutyl phthalate	SW8270C	84-74-2					6100000	18 U	25 U	**8 J**	**8.4 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**1.9 J**	13 U	9.1 U	10 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**4.9 J**	**5.9 J**	**9.6**	**7 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.3 U	**0.28 J**	**0.5 J**	**0.3 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.32 J**	**0.5 J**	**0.53 J**	**0.45 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**0.57 J**	3.1 U	**1.4 J**	**0.56 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**3.1**	**2.5 J**	**5.5**	**3.1**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**2.8**	**2.3 J**	**5.1**	**3.4**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**4.1**	**3.6**	**7.2**	**5.4**
Benzo(ghi)perylene	SW8270CSIM	191-24-2			0			**2.3**	**2.1 J**	**3.8**	**3**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**1.1 J**	**1.2 J**	**2 J**	**1.6 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**3.3**	**2.7 J**	**8.3**	**5.1**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.49 J**	**0.42 J**	**0.89 J**	**0.63 J**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**4.8**	**4.5**	**9.8**	**5.6**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.3 U	**0.51 J**	**1.1 J**	**0.68 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**2.1 J**	**2.1 J**	**3.8**	**2.4 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**4.1**	**4.2**	**8.5**	**4.8**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**3.92**	**3.31**	**7.12**	**4.76**

TABLE 6-4A
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING SOIL CRITERIA					
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	
	Building Sample Location Sample Date Sample Number							B119A SS-5 3/29/2009 B119A:SS-5:108
Analyte	**Method**	**CAS #**						
Petroleum Hydrocarbons (mg/kg)								
Diesel Range Organics	NWTPH-Dx	SW333	2000					**29 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**390 O**
Metals (mg/kg)								
Lead	SW6020	7439-92-1	250	NR	NR		400	**17.9**
Silver	SW6020	7440-22-4					390	**0.093**
Semi-volatile Organic Compounds (µg/kg)								
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	**6.9 J**
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**170 J**
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	24 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	120 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	24 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	12 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**6.8 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)								
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.5 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.33 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.5 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**2.5 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**3**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**4.6**
Benzo(ghi)perylene	SW8270CSIM	191-24-2			0			**2.8**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**1.3 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**2.7**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.63 J**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**4.9**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**2.3 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**4.3**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**4.16**

TABLE 6-4A
INDUSTRIAL COMPLEX AREA - BUILDING 119 AND 119A,
NOTES PAGE

Notes:

(1)Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Z = The chromatographic fingerprint does not resemble a petroleum product.

Table 6-4B
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B119 SB-1 7.5 11/9/2009 B119:SB-1:7.5:312	B119 SB-1 25 11/9/2009 B119:SB-1:25:313	B119 SB-1 25 11/9/2009 B119:SB-1:25:314	B119 SB-2 7.5 11/9/2009 B119:SB-2:7.5:306	B119 SB-2 25 11/9/2009 B119:SB-2:25:307
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.43 J**	**0.39 J**	4.5 U	**0.33 J**	**0.52 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	6.5 U	0.24 U	0.41 U	5.6 U	11 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.1 J**	**0.7 J**	**0.2 J**	**0.78 J**	**0.58 J**

Table 6-4B
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B119 SB-3 7.5 11/9/2009 B119:SB-3:7.5:308	B119 SB-3 25 11/9/2009 B119:SB-3:25:309	B119 SB-4 7.5 11/9/2009 B119:SB-4:7.5:310	B119 SB-4 25 11/9/2009 B119:SB-4:25:311	B119A SB-1 23 7/7/2009 B119A:SB-1:23:204
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.54 J**	5.7 U	**0.63 J**	**0.33 J**	**0.25 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	7.1 U	0.32 U	**0.28 J**	5.3 U	**0.47 J**
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.3 J**	5.7 U	**1.6 J**	**0.83 J**	**0.33 J**

Table 6-4B
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B119A SB-2 7.5 11/9/2009 B119A:SB-2:7.5:300	B119A SB-2 25 11/9/2009 B119A:SB-2:25:301	B119A SB-3 7.5 11/9/2009 B119A:SB-3:7.5:302	B119A SB-3 25 11/9/2009 B119A:SB-3:25:303	B119A SB-4 7.5 11/9/2009 B119A:SB-4:7.5:304
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.6 U	6.8 U	6.8 U	5.9 U	**0.52 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	6.6 U	6.8 U	6.8 U	0.38 U	**0.28 J**
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.88 J**	6.8 U	6.8 U	**0.66 J**	**1.6 J**

TABLE 6-4B
INDUSTRIAL COMPLEX AREA - BUILDINGS 119 AND 119A,
NOTES PAGE

Notes:

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Z The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-5
INDUSTRIAL COMPLEX AREA - BUILDING 5,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B5 SS-1 4/2/2009 B5:SS-1:168	B5 SS-2 4/2/2009 B5:SS-2:169	B5 SS-3 4/2/2009 B5:SS-3:170	B5 SS-4 4/2/2009 B5:SS-4:171	B5 SS-5 4/2/2009 B5:SS-5:172
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					**140 H**	**210 H**	**190 H**	**790 H**	**490 DH**
Oil Range Organics	NWTPH-Dx	SW444	2000					**1200 O**	**1800 O**	**1800 O**	**2100 O**	**2900 DO**
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**41.4 J**	**37.4 J**	**143 J**	**132 J**	**55 J**
Silver	SW6020	7440-22-4					390	**0.113 J**	**0.093 J**	**0.15 J**	**0.133 J**	**0.157 J**
Semi-volatile Organic Compounds (µg/kg)												
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	250 UJ	250 UJ	250 UJ	**250 J**	**850 J**
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	250 U	250 U	250 U	350 U	500 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**160 JD**	**500 D**	**1200 D**	**300 JD**	**420 JD**
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	250 U	250 U	**80 JD**	**1200 D**	**4600 D**
p-Cresol	SW8270C	106-44-5					3100000	250 U	250 U	250 U	**170 JD**	**610 D**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	750 U	750 U	730 UJ	**190 JD**	**660 JD**
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.61 J**	**5.8**	**36**	**76**	**290**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**6**	**54**	**270 J**	**540**	**1300 D**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**5.1**	**54**	**380**	**630**	**1700 D**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**13**	**100**	**890 J**	**1300 D**	**3600 D**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**27 D**	**140 D**	**1300 D**	**1500 D**	**3700 D**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**38 D**	**170 D**	**1300 D**	**1600 D**	**4100 D**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**43 D**	**98 D**	**650 D J**	**680 D**	**1600 D**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**11 JD**	**59 D**	**570 D**	**670 D**	**1800 D**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**57**	**190**	**1100 D**	**1700 D**	**4500 D**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**19 D**	**32 D**	**190 D**	**190 D**	**580 D**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**29**	**260**	**1600 D**	**3500 D**	**11000 D**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**2.8**	**27**	**81 J**	**360**	**2100 D**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**16 D**	**84 D**	**850 DJ**	**870 D**	**2200 D**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**28**	**230**	**1300 D**	**2800 D**	**8100 D**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**37.27**	**186.40**	**1691.00**	**1980.00**	**4973.00**

TABLE 6-5
INDUSTRIAL COMPLEX AREA - BUILDING 5,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B5 SS-5b 11/13/2009 B5:SS-5b:670	B5 SS-6 4/2/2009 B5:SS-6:173	B5 SS-6b 11/13/2009 B5:SS-6b:671	B5 SS-7 4/2/2009 B5:SS-7:174	B5 SS-7b 11/13/2009 B5:SS-7b:672
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	**430 DH**	--	**330 DH**	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	**3300 DO**	--	**2200 DO**	--
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	--	**117 J**	--	**126 J**	--
Silver	SW6020	7440-22-4					390	--	**0.083 J**	--	**0.09 J**	--
Semi-volatile Organic Compounds (µg/kg)												
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	500 UJ	--	500 UJ	--
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	--	500 U	--	**230 JD**	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	**350 JD**	--	**540 D**	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	**140 JD**	--	**360 JD**	--
p-Cresol	SW8270C	106-44-5					3100000	--	500 U	--	500 U	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	1500 U	--	1500 U	--
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.84 J**	**12**	3 U	**29**	**1.2 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**6.5**	**130**	3 U	**210**	**4.2**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**4.9**	**140**	3 U	**240**	**4**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**17**	**240**	**2.7 J**	**450 D**	**20**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**35**	**360 D**	**3.9**	**530 D**	**25**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**66**	**470 D**	**6.3**	**640 D**	**33**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**87**	**250 D**	**6**	**280 D**	**20**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**18**	**150 D**	**1.7 J**	**250 D**	**13**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**120**	**430**	**2.6 J**	**730 D**	**29**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**34**	**88 D**	**2.2 J**	**83 D**	**6.4**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**51**	**540**	**6.5**	**1500 D**	**63**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**7**	**40**	**0.95 J**	**120**	**7.6**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**33**	**250 D**	**2.9 J**	**320 D**	**18**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**47**	**450**	**5.8**	**1200 D**	**48**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**53.00**	**484.10**	**5.51**	**711.60**	**34.33**

TABLE 6-5
INDUSTRIAL COMPLEX AREA - BUILDING 5,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B5 SS-8 4/2/2009 B5:SS-8:175	B5 SS-8b 11/13/2009 B5:SS-8b:673	B5 SS-9 4/2/2009 B5:SS-9:176	B5 SS-9b 11/13/2009 B5:SS-9b:674	B5 SS-10 4/2/2009 B5:SS-10:177
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					**260 JD**	--	**430 DH**	--	200 U
Oil Range Organics	NWTPH-Dx	SW444	2000					**1800 DO**	--	**2600 DO**	--	**1400 JD**
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**124 J**	--	**81 J**	--	**52.2 J**
Silver	SW6020	7440-22-4					390	**0.096 J**	--	**0.077 J**	--	**0.08 J**
Semi-volatile Organic Compounds (µg/kg)												
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	**160 J**	--	**220 J**	--	500 UJ
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	500 U	--	500 U	--	500 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**320 JD**	--	**770 D**	--	**380 JD**
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**450 JD**	--	**1300 D**	--	**320 JD**
p-Cresol	SW8270C	106-44-5					3100000	500 U	--	500 U	--	500 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	1500 U	--	1500 U	--	1500 U
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	**60**	**1.4 J**	**54**	**1.1 J**	**37**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**390**	**5.8**	**340**	**5.9**	**260**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**390**	**6**	**360**	**4.8**	**250**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**760 D**	**27**	**710 D**	**21**	**450 D**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**840 D**	**35**	**770 D**	**25**	**530 D**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**930 D**	**50**	**910 D**	**48**	**630 D**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**400 D**	**35**	**390 D**	**35**	**270 D**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**380 D**	**17**	**360 D**	**12**	**230 D**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**1200 D**	**33**	**890 D**	**82**	**730 D**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**120 D**	**13**	**120 D**	**14**	**820 D**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**2400 D**	**87**	**2400 D**	**66**	**1400 D**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**220**	**7.8**	**310**	**6.5**	**130**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**490 D**	**28**	**480 D**	**21**	**340 D**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**1900 D**	**67**	**1900 D**	**48**	**1100 D**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**1120.00**	**48.83**	**1036.90**	**37.42**	**784.30**

TABLE 6-5
INDUSTRIAL COMPLEX AREA - BUILDING 5,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B5 SS-10b 11/13/2009 B5:SS-10b:675	B5 SS-11 4/2/2009 B5:SS-11:178	B5 SS-12 4/2/2009 B5:SS-12:179	B5 SS-12b 11/13/2009 B5:SS-12b:676	B5 SS-12b 11/13/2009 B5:SS-12b:677
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	**230 JD**	120 U	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	**1500 DO**	810 U	--	--
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	--	**37.8 J**	**30.1 J**	--	--
Silver	SW6020	7440-22-4					390	--	**0.14 J**	**0.098 J**	--	--
Semi-volatile Organic Compounds (µg/kg)												
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	500 UJ	460 UJ	--	--
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	--	500 U	460 U	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	**650 D**	**240 JD**	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	500 U	460 U	--	--
p-Cresol	SW8270C	106-44-5					3100000	--	500 U	460 U	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	1500 U	1400 U	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.9 U	**11 JD**	**0.76 J**	2.9 U	3.1 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1.6 J**	**41 D**	**5.6**	2.9 U	**0.86 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.6 J**	**40 D**	**4.3**	2.9 U	**0.75 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**8.1**	**90 D**	**15 D**	**1.8 J**	**5**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**11**	**140 D**	**35 D**	**4**	**7.1**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**16**	**180 D**	**72 D**	**4.9 J**	**12 J**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**11**	**110 D**	**45 D**	**4.6 J**	**15 J**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**6.2**	**72 D**	12 U	**1.7 J**	**2.8 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**14**	**280 D**	**130 D**	**3.4**	**4**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**3.5**	**70 D**	**25 D**	**1.6 J**	**5.3**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**30**	**280 D**	**26**	**4.9**	**9.3**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**2.7 J**	**26 D**	**3.6**	2.9 U	**0.7 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**9.5**	**99 D**	**26 D**	**3.7**	**5.6**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**22**	**230 D**	**39 D**	**3.9**	**8.4**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**15.47**	**193.90**	**51.30**	**5.40**	**10.21**

TABLE 6-5
INDUSTRIAL COMPLEX AREA - BUILDING 5,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Building Sample Location Sample Date Sample Number							B5 SS-13 11/13/2009 B5:SS-13:678	B5 SS-14 11/13/2009 B5:SS-14:679
Analyte	**Method**	**CAS #**							
Petroleum Hydrocarbons (mg/kg)									
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--
Metals (mg/kg)									
Lead	SW6020	7439-92-1	250	NR	NR		400	--	--
Silver	SW6020	7440-22-4					390	--	--
Semi-volatile Organic Compounds (µg/kg)									
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--
Bis(2-chloroethoxy)methane	SW8270C	111-91-1					180000	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--
p-Cresol	SW8270C	106-44-5					3100000	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)									
Acenaphthene	SW8270CSIM	83-32-9					3400000	3.3 U	**2 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.89 J**	**5.6**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	3.3 U	**4.9**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		11 U, i	**33**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**31**	**79**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**56 X**	**110 D**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**60**	**93**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		3.3 UX	**17 JD**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**160**	**240**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**29**	**40**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**4.2**	**31**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**2.1 J**	**10**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**12**	**16**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**19**	**44**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**43.73**	**103.00**

TABLE 6-5
INDUSTRIAL COMPLEX AREA - BUILDING 5,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

D = The reported result is from a dilution.

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

i = The method reporting limit/method detection limit or limit of quantitation/limit of detection has been elevated due to a matrix interference.

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

X = See case narrative.

TABLE 6-6
INDUSTRIAL COMPLEX AREA - BUILDING 17,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B17 SS-1 4/3/2009 B17:SS-1:181	B17 SS-2 4/3/2009 B17:SS-2:182	B17 SS-3 4/3/2009 B17:SS-3:183	B17 SS-3b 11/13/2009 B17:SS-3b:681	B17 SS-4 4/3/2009 B17:SS-4:184	B17 SS-5 4/3/2009 B17:SS-5:185	B17 SS-6 4/3/2009 B17:SS-6:186
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					120 U	**120**	140 U	--	110 U	18 U	94 U
Oil Range Organics	NWTPH-Dx	SW444	2000					850 U	860 U	1100 U	--	740 U	**180 Z**	700 U
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**6.39**	**8.47**	**35.1**	--	**18**	**30.3**	**65.6**
Silver	SW6020	7440-22-4					390	**0.031**	**0.034**	**0.056**	--	**0.06**	**0.066**	**0.034**
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	420 UJ	330 UJ	440 UJ	--	460 UJ	**4.6 J**	410 UJ
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	4200 U	3300 U	4400 U	--	4600 U	**7.5 J**	4100 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	830 U	660 U	880 U	--	910 U	**15 J**	820 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	420 U	330 U	440 U	--	460 U	**1.7 J**	410 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**51 JD**	**66 JD**	440 U	--	460 U	8.4 U	410 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	420 U	330 U	440 U	--	460 U	**19**	410 U
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.1 U	**0.44 J**	**3.5**	3.2 U	**0.85 J**	**0.68 J**	**0.83 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.42 J**	**5.2**	**14**	**0.7 J**	**5.7**	**3.4**	**1.7 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.1 U	**4.3**	**41**	**1.7 J**	**15**	**140**	**1.7 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		3.5 U	**14**	**89**	**7.8**	**45**	**34**	**7.6**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**8.3**	**22**	**160**	**14**	**61**	**25**	**11**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**20**	**32**	**370**	**42**	**160**	**39**	**19**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**18**	**30**	**86**	**17**	**38**	**13**	**13**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**2 J**	**8**	**130**	**13**	**50**	**18**	**4.3**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**51**	**12**	**360**	**23**	**130**	**110**	**13**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**9.6**	**13**	**30**	**6.9**	**12**	**3.3**	**4.5**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**2.3**	**16**	**150**	**15**	**170**	**51**	**21**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.4 J**	**2.5**	**8.6**	3.2 U	**2.8**	**7.1**	**1.4 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**3.8**	**16**	**110**	**13**	**41**	**16**	**6.7**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**3.7**	**18**	**350**	**31**	**210**	**62**	**20**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**12.70**	**30.42**	**236.50**	**22.50**	**93.10**	**37.13**	**15.34**

TABLE 6-6
INDUSTRIAL COMPLEX AREA - BUILDING 17,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B17 SS-7 4/3/2009 B17:SS-7:187	B17 SS-8 4/3/2009 B17:SS-8:188	B17 SS-9 4/3/2009 B17:SS-9:189	B17 SS-10 4/3/2009 B17:SS-10:190	B17 SS-10b 11/13/2009 B17:SS-10b:680	B17 SS-11 11/13/2009 B17:SS-11:682	B17 SS-12 11/13/2009 B17:SS-12:683
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					120 U	**120 H**	19 U	**290 Z**	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					840 U	**1100 O**	150 U	**1100 O**	--	--	--
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**52.4**	**29.5**	**8.31**	**11.7**	--	--	--
Silver	SW6020	7440-22-4					390	**0.051**	**0.061**	**0.029**	**0.06**	--	--	--
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	500 UJ	290 UJ	5.8 UJ	**180 J**	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	5000 U	2900 U	58 U	2300 U	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	990 U	570 U	12 U	460 U	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	500 U	290 U	**1.4 J**	230 U	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			500 U	290 U	5.8 U	230 U	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	500 U	290 U	**2.6 J**	**740 D**	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	**3.1**	**0.8 J**	1.5 U	**45 D**	3.2 U	3.4 U	3.1 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**16**	**4.3**	**0.79 J**	**310 D**	**0.82 J**	3.4 U	3.1 U
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**16**	**4.1**	**0.67 J**	**370 D**	**0.79 J**	3.4 U	3.1 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**45**	**14**	**2.6**	**780 D**	**4.9**	**1.5 J**	**4.3**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**55**	**22**	**3.4**	**990 D**	**7.6**	**1.7 J**	**5.5**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**74**	**30**	**4.6**	**1000 D**	**22**	**2.2 J**	**6.3**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**38**	**23**	**2.8**	**490 D**	**29**	**2.1 J**	**5.8**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**25**	**8**	**1.6**	**440 D**	**5.2**	**1 J**	**2.4 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**81**	**18**	**4.9**	**1000 D**	**53**	**1.8 J**	**7.2**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**12**	**8.5**	**0.68 J**	**170 D**	**12**	**0.91 J**	3.1 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**130**	**33**	**8.1**	**1900 D**	**12**	**2.9 J**	**9.7**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**16**	**3.1**	**0.66 J**	**240 D**	**1.7 J**	3.4 U	3.1 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**39**	**13**	**3**	**630 D**	**6.5**	**2 J**	**4.5**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**130**	**33**	**6.7**	**1600 D**	**15**	**2.4 J**	**11**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**75.31**	**29.53**	**4.70**	**1302.00**	**13.19**	**2.48**	**7.63**

TABLE 6-6
INDUSTRIAL COMPLEX AREA - BUILDING 17,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL							
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1			
	Building Sample Location Sample Date Sample Number							B17 SS-13 11/13/2009 B17:SS-13:684	B17 SS-14 11/13/2009 B17:SS-14:685	B17 SS-14 11/13/2009 B17:SS-14:686
Analyte	**Method**	**CAS #**								
Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--
Metals (mg/kg)										
Lead	SW6020	7439-92-1	250	NR	NR		400	--	--	--
Silver	SW6020	7440-22-4					390	--	--	--
Semi-volatile Organic Compounds (µg/kg)										
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)										
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.9 U	3 U	3 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			2.9 U	3 U	3 U
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.9 U	3 U	3 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.9 U	**1.1 J**	3 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.9 U	**1.2 J**	3 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		2.9 U	**1.9 J**	**1.1 J**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.9 U	**1.4 J**	3 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.9 U	3 U	3 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		2.9 U	**1.3 J**	3 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.9 U	3 U	3 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	2.9 U	**1.7 J**	**0.99 J**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.9 U	3 U	3 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.9 U	**1.3 J**	3 U
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	2.9 U	**1.9 J**	**0.79 J**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	**1.89**	**1.87**

TABLE 6-6
INDUSTRIAL COMPLEX AREA - BUILDING 17,
NOTES PAGE

Notes:

(1)Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

D = The reported result is from a dilution.

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

ND = Not detected.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-7
INDUSTRIAL COMPLEX AREA - BUILDING 10,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B10 SS-1 3/30/2009 B10:SS-1:114	B10 SS-2 3/30/2009 B10:SS-2:115	B10 SS-3 3/30/2009 B10:SS-3:116	B10 SS-4 3/30/2009 B10:SS-4:117	B10 SS-5 3/30/2009 B10:SS-5:118	B10 SS-6 3/30/2009 B10:SS-6:119	B10 SS-7 3/30/2009 B10:SS-7:120
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					**19 J**	**68 H**	6.8 U	**45 H**	**15 J**	**14 J**	**20 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**230 Z**	**700 O**	**79 J**	**500 O**	**200 O**	**190 Z**	**400 Z**
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**126**	**88.5**	**37.7**	**60.6**	**310**	**225**	**121**
Silver	SW6020	7440-22-4					390	**0.136**	**0.105**	**0.113**	**0.094**	**0.22**	**0.201**	**0.14**
Semi-volatile Organic Compounds (µg/kg)														
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**180 J**	**140 J**	**140 J**	2100 U	**150 J**	5000 U	2000 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**12 J**	100 U	100 U	1100 U	**48 J**	2500 U	1000 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	20 U	**160**	20 U	210 U	20 U	500 U	200 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 U	10 U	10 U	110 U	10 U	250 U	100 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			10 U	10 U	10 U	110 U	10 U	**550 D**	100 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	10 U	10 U	10 U	110 U	**2.4 J**	250 U	100 U
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	100 U	**40 J**	100 U	1100 U	**50 J**	2500 U	1000 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	30 U	30 U	310 U	30 U	750 U	300 U
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.5 U	**0.29 J**	2.5 U	2.6 U	2.5 U	2.5 U	**0.3 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**4.8**	**1.4 J**	2.5 U	**0.3 J**	2.5 U	**1.2 J**	**1.3 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**16**	**3.1**	2.5 U	2.6 U	2.5 U	**1.5 J**	**2.1 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**97**	**12**	**0.52 J**	**2.9**	**0.58 J**	**18**	**7.5**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**83**	**19**	**0.55 J**	**3.3**	**1.3 J**	**36**	**9.9**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**260**	**49**	**0.91 J**	**4.8**	**1.8 J**	**39**	**20**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**78**	**19**	**0.68 J**	**4.4**	**1.3 J**	**23**	**8.6**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**94**	**14**	2.5 U	2.6 U	**0.57 J**	2.5 U	**6.5**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**170**	**20**	**0.75 J**	**8.1**	**1.4 J**	**120**	**18**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**25**	**5.3**	2.5 U	**1 J**	**0.3 J**	2.5 U	**4.1**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**30**	**16**	**1.2 J**	**3.1**	**1.9 J**	**18**	**13**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.1 J**	2.5 U	2.5 U	2.6 U	2.5 U	**0.94 J**	**0.81 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**100**	**22**	**0.44 J**	**1.6 J**	**0.96 J**	2.5 U	**10**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**31**	**16**	**1 J**	**6.8**	**1.6 J**	**37**	**16**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**142.30**	**29.43**	**0.99**	**4.67**	**1.73**	**42.98**	**14.89**

TABLE 6-7
INDUSTRIAL COMPLEX AREA - BUILDING 10, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B10 SS-8 3/30/2009 B10:SS-8:121	B10 SS-9 3/30/2009 B10:SS-9:122	B10 SS-10 3/30/2009 B10:SS-10:123	B10 SS-11 3/30/2009 B10:SS-11:124	B10 SS-12 3/30/2009 B10:SS-12:125	B10 SS-13 3/30/2009 B10:SS-13:126	B10 SS-14 3/30/2009 B10:SS-14:127
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					3 U	**21 J**	**38 J**	**14 J**	**16 J**	**64 J**	**28 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					29 U	**360 Z**	**400 O**	**170 Z**	**180 Z**	**480 O**	**330 Z**
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**5.65**	**90.5**	**234**	**41.7**	**29700**	**327**	**194**
Silver	SW6020	7440-22-4					390	**0.035**	**0.095**	**0.317**	**0.117**	**1.19**	**0.153**	**0.14**
Semi-volatile Organic Compounds (µg/kg)														
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	200 U	2000 U	2000 U	**98 J**	**110 J**	**120 J**	210 U,i
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	99 U	1000 U	**220 JD**	**16 J**	**15 J**	**170**	**110**
Dibutyl phthalate	SW8270C	84-74-2					6100000	20 U	200 U	200 U	**14 J**	20 U	20 U	**12 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**1.3 J**	100 U	100 U	**2.4 J**	**2.9 J**	10 U	10 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			9.9 U	100 U	**610 D**	10 U	10 U	10 U	10 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	**2.7 J**	100 U	100 U	**5 J**	**3 J**	**2.5 J**	**3.5 J**
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	99 U	1000 U	1000 U	100 U	100 U	**51 J**	**52 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	300 U	300 U	30 U	30 U	30 U	**3.3 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.5 U	2.5 U	2.5 U	**0.72 J**	**0.34 J**	**0.45 J**	**0.29 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			2.5 U	**0.44 J**	**0.38 J**	**5.6**	**2.1 J**	**2.5 J**	**2.4 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.5 U	**0.65 J**	**0.5 J**	**6.8**	**5.2**	**5.8**	**4.9**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.5 U	**2.3 J**	**2 J**	**19**	**16**	**17**	**17**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.5 U	**2.7**	**4.4**	**20**	**16**	**19**	**21**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**1.3 J**	**4.4**	**6.7**	**31**	**27**	**37**	**41**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	**2.7**	**4.9**	**12**	**11**	**14**	**16**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.5 U	**1.3 J**	**1.7 J**	**11**	**9.1**	**13**	**13**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**1.7 J**	**5.2**	**7.7**	**25**	**21**	**24**	**25**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	**0.67 J**	**2 J**	**3.4**	**2.9**	**4.1**	**4.5**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**1.3 J**	**6.3**	**3.5**	**42**	**37**	**41**	**37**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.5 U	2.5 U	2.5 U	**3**	**0.73 J**	**0.94 J**	**0.67 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.5 U	**2.2 J**	**3.4**	**16**	**15**	**18**	**20**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**1.1 J**	**6.4**	**4.6**	**38**	**28**	**31**	**28**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**1.90**	**3.84**	**6.06**	**28.29**	**23.21**	**28.15**	**30.80**

TABLE 6-7
INDUSTRIAL COMPLEX AREA - BUILDING 10,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

D = The reported result is from a dilution.

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

i = The method reporting limit/method detection limit or limit of quantitation/limit of detection has been elevated due to a matrix interference.

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-8
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B12 SS-1 3/28/2009 B12:SS-1:60	B12 SS-2 3/28/2009 B12:SS-2:61	B12 SS-3 3/28/2009 B12:SS-3:62	B12 SS-4 3/28/2009 B12:SS-4:63	B12 SS-5 3/28/2009 B12:SS-5:64	B12 SS-6 3/28/2009 B12:SS-6:65	B12 SS-7 3/28/2009 B12:SS-7:66
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					**22 J**	**28 J**	**61 H**	**50 H**	**19 J**	**5.2 J**	**6.9 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**110 J**	**120 J**	**470 O**	**600 O**	**280 O**	**91 J**	**120 J**
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**39.4**	**41.4**	**69.3**	**932**	**287**	**153**	**230**
Silver	SW6020	7440-22-4					390	**0.126**	**0.135**	**0.146**	**0.126**	**0.151**	**0.137**	**0.148**
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	7 UJ	7.5 UJ	7.9 UJ	7.4 UJ	8.5 UJ	7.7 UJ	8.1 UJ
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	140 UJ	150 R	160 UJ	**190 J**	170 UJ	160 R	170 UJ
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	14 UJ	15 R	16 U	**120**	17 U	16 R	17 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**9.6 J**	**8.2 J**	**17 J**	**20 J**	**24 J**	**15 J**	**42 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	7 U	7.5 U	7.9 U	7.4 U	8.5 U	7.7 U	**4.3 J**
Dibutyl phthalate	SW8270C	84-74-2					6100000	14 U	15 U	16 U	15 U	17 U	16 U	17 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**2.5 J**	**1.3 J**	7.9 U	7.4 U	8.5 U	**1.4 J**	8.1 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**200**	7.5 U	7.9 U	7.4 U	8.5 U	7.7 U	8.1 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	7 U	7.5 U	7.9 U	7.4 U	**3.9 J**	7.7 U	8.1 U
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		7 U	7.5 U	7.9 U	7.4 U	8.5 U	7.7 U	**2.6 J**
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	70 UJ	75 R	**230**	74 U	85 U	77 R	81 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	21 UJ	23 R	24 U	23 U	26 U	23 R	25 U
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	1.8 U	1.9 U	2 U	1.9 U	**1.5 J**	2 U	2.1 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			1.8 U	1.9 U	2 U	1.9 U	**0.34 J**	2 U	2.1 U
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	1.8 U	1.9 U	2 U	1.9 U	**2.9**	2 U	2.1 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**0.75 J**	1.9 U	**2 J**	**2**	**9.9**	**1 J**	2.1 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**1.5 J**	**0.38 J**	**2.4**	**3.8**	**11**	**1 J**	**0.43 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**2.2**	**0.5 J**	**3.1**	**4.4**	**13**	**1.6 J**	**0.63 J**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**2.1**	1.9 U	**2.4**	**3**	**6.4**	**1.3 J**	2.1 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		1.8 U	1.9 U	**0.66 J**	1.9 U	**4.6**	**0.52 J**	2.1 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**3.3**	**0.77 J**	**5.6**	**2.9**	**12**	**1.6 J**	**0.74 J**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.58 J**	1.9 U	**0.68 J**	**1.5 J**	**1.7 J**	**0.43 J**	2.1 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**1.3 J**	**0.71 J**	**3.3**	**3.2**	**17**	**1.4 J**	**0.76 J**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	1.8 U	1.9 U	2 U	1.9 U	**1.6 J**	2 U	2.1 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**0.82 J**	**0.37 J**	**0.82 J**	**1.9**	**6.2**	**0.8 J**	**0.37 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**1.9**	**0.63 J**	**4.3**	**3.2**	**15**	**1.5 J**	**0.74 J**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**2.15**	**0.85**	**3.18**	**4.93**	**14.66**	**1.45**	**0.85**

TABLE 6-8
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B12 SS-8 3/28/2009 B12:SS-8:67	B12 SS-9 3/28/2009 B12:SS-9:68	B12 SS-10 3/28/2009 B12:SS-10:69	B12 SS-11 3/28/2009 B12:SS-11:70	B12 SS-12 3/28/2009 B12:SS-12:71	B12 SS-13 11/14/2009 B12:SS-13:690	B12 SS-14 11/14/2009 B12:SS-14:691
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					**29 J**	**9.9 J**	**14 J**	**26 J**	**110 Y**	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					**340 O**	63 U	**110 J**	**130 J**	**730 O**	--	--
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**138**	**37**	**38.1**	**57.7**	**312 J**	**138**	**25.5**
Silver	SW6020	7440-22-4					390	**0.21**	**0.129**	**0.156**	**0.785**	**21.2 J**	--	--
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	8.8 UJ	7.6 UJ	7.7 UJ	7.2 UJ	**7.6 J J**	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	180 UJ	160 UJ	160 UJ	150 UJ	**180 J**	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	18 U	16 U	16 UJ	15 U	20 U	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**71 J**	**13 J**	**16 J**	**27 J**	**410**	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	8.8 U	7.6 U	7.7 U	**7.8**	**91**	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	18 U	16 U	16 U	15 U	**100**	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	8.8 U	**1.7 J**	**1.7 J**	**1.6 J**	10 U	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			8.8 U	7.6 U	**3.6 J**	7.2 U	**450**	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	8.8 U	7.6 U	7.7 U	7.2 U	**12**	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		8.8 U	7.6 U	7.7 U	**12**	**62**	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	88 U	76 U	77 UJ	72 U	**51 J**	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	27 U	23 UJ	23 UJ	22 U	**150**	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.2 U	1.9 U	2 U	1.8 U	**0.54 J**	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			2.2 U	1.9 U	2 U	1.8 U	**1.2 J**	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.2 U	1.9 U	2 U	1.8 U	**2.6**	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**1.8 J**	1.9 U	**2.5**	**1.8 J**	**26**	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**2.6**	**0.36 J**	**3.4**	**1.6 J**	**31**	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**3.1**	**0.61 J**	**4.8**	**3**	**58**	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**2.6**	1.9 U	**2.8**	**1.4 J**	**30**	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.2 U	**0.16 J**	**0.95 J**	**0.76 J**	**14**	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		**2.9**	**0.69 J**	**5**	**2.6**	**51**	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.79 J**	1.9 U	**0.81 J**	**0.34 J**	**5.4**	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**2.5**	**0.99 J**	**4.3**	**4.1**	**49**	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.2 U	1.9 U	2 U	1.8 U	**1.4 J**	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**1.4 J**	**0.4 J**	**1.6 J**	**1.8 J**	**30**	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**3**	**0.78 J**	**5**	**4**	**52**	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**3.45**	**0.67**	**4.52**	**2.40**	**44.85**		

TABLE 6-8
INDUSTRIAL COMPLEX AREA - BUILDING 12, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B12 SS-14 11/14/2009 B12:SS-14:692	B12 SS-15 11/14/2009 B12:SS-15:709	B12 SS-16 11/14/2009 B12:SS-16:693	B12 SS-17 11/14/2009 B12:SS-17:694	B12 SS-18 11/14/2009 B12:SS-18:695	B12 SS-19 11/14/2009 B12:SS-19:696	B12 SS-20 11/14/2009 B12:SS-20:697
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--	--	--	--
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**27**	**21.5**	**26.6**	**28.1**	**15.1**	**25.4**	**72.1**
Silver	SW6020	7440-22-4					390	--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--	--	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--	--	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		--	--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**											

TABLE 6-8
INDUSTRIAL COMPLEX AREA - BUILDING 12, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B12 SS-21 11/14/2009 B12:SS-21:698	B12 SS-22 11/14/2009 B12:SS-22:699	B12 SS-23 11/14/2009 B12:SS-23:700	B12 SS-24 11/14/2009 B12:SS-24:701	B12 SS-25 11/14/2009 B12:SS-25:702	B12 SS-25 11/14/2009 B12:SS-25:703	B12 SS-26 11/14/2009 B12:SS-26:704
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--	--	--	--
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**202**	**23.9**	**86.7**	**14.8**	**23.8**	**20.4**	**11.5**
Silver	SW6020	7440-22-4					390	--	--	--	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)														
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--	--	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	--	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--	--	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	--	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		--	--	--	--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		--	--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**											

TABLE 6-8
INDUSTRIAL COMPLEX AREA - BUILDING 12, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B12 SS-27 11/14/2009 B12:SS-27:705	B12 SS-27 11/14/2009 B12:SS-27:706	B12 SS-28 11/14/2009 B12:SS-28:707	B12 SS-29 11/14/2009 B12:SS-29:708
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	--	--
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	--	--
Metals (mg/kg)											
Lead	SW6020	7439-92-1	250	NR	NR		400	**53.1**	**55.7**	**66.8**	**23.8**
Silver	SW6020	7440-22-4					390	--	--	--	--
Semi-volatile Organic Compounds (µg/kg)											
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	--	--	--	--
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	--	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	--	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	--	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	--	--
Dibutyl phthalate	SW8270C	84-74-2					6100000	--	--	--	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	--	--
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			--	--	--	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	--	--
N-Nitrosodiphenylamine	SW8270C	86-30-6	RND	200000	NR	99000		--	--	--	--
Pentachlorophenol	SW8270C	87-86-5	RND	8300	2400000	890	230000	--	--	--	--
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--
Toxicity Equivalency Factor (µg/kg)[1]			**100**								

TABLE 6-8
INDUSTRIAL COMPLEX AREA - BUILDING 12,
NOTES PAGE

Notes:

(1)Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Y = The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range but the elution pattern does not match the calibration standard.

TABLE 6-9
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19, SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL											
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1							
	Building Sample Location Sample Date Sample Number							B18 SS-1 3/29/2009 B18:SS-1:75	B18 SS-2 3/29/2009 B18:SS-2:76	B18 SS-3 3/29/2009 B18:SS-3:77	B18 SS-4 3/29/2009 B18:SS-4:78	B19 SS-1 3/29/2009 B19:SS-1:72	B19 SS-2 3/29/2009 B19:SS-2:73	B19 SS-3 3/29/2009 B19:SS-3:74
Analyte	**Method**	**CAS #**												
Petroleum Hydrocarbons (mg/kg)														
Diesel Range Organics	NWTPH-Dx	SW333	2000					7.2 U	6 U	6.4 U	5.5 U	**35 J**	7.4 U	4.6 U
Oil Range Organics	NWTPH-Dx	SW444	2000					**120 J**	**110 J**	**120 J**	100 U	**340 J**	**130 J**	65 U
Metals (mg/kg)														
Lead	SW6020	7439-92-1	250	NR	NR		400	**9.22 J**	**10.8 J**	**8.41 J**	**6.11 J**	**11.5 J**	**10.4 J**	**8.25 J**
Silver	SW6020	7440-22-4					390	**0.092 J**	**0.093 J**	**0.057 J**	**0.076 J**	**0.165 J**	**0.079 J**	**0.07 J**
Semi-volatile Organic Compounds (µg/kg)														
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**140 J**	**160 J**	**110 J**	**120 J**	160 UJ	**120 J**	**110 J**
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**31 J**	**23 J**	**100**	**13 J**	77 U	**18 J**	100 U
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	9.9 U	9.9 U	**11**	9.8 U	7.7 U	10 U	10 U
Dibutyl phthalate	SW8270C	84-74-2					6100000	20 U	20 U	20 U	**16 J**	16 U	20 U	20 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	9.9 U	**1.4 J**	**1.5 J**	9.8 U	**1.4 J**	10 U	10 U
p-Cresol	SW8270C	106-44-5					3100000	9.9 U	9.9 U	10 U	9.8 U	7.7 U	10 U	**21**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	30 U	**7.2 J**	30 U	23 UJ	30 U	30 U
Polynuclear Aromatic Hydrocarbons (µg/kg)														
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**0.55 J**	2.5 U	**0.95 J**	2.5 U	**1.4 J**	**0.83 J**	2.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**0.53 J**	**0.38 J**	**1 J**	**0.35 J**	**1.2 J**	**0.73 J**	**0.25 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**0.7 J**	**0.51 J**	**1.5 J**	**0.51 J**	**1.3 J**	**1 J**	**0.34 J**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	2.5 U	**1 J**	2.5 U	**0.81 J**	**0.65 J**	2.5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**0.17 J**	2.5 U	**0.33 J**	2.5 U	**0.4 J**	**0.28 J**	2.5 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**0.71 J**	**0.59 J**	**1.8 J**	**0.81 J**	**2.1 J**	**0.98 J**	**0.42 J**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	**2.5 J**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**1.2 J**	**0.78 J**	**1.9 J**	**0.77 J**	**2 J**	**1.6 J**	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**0.4 J**	**0.3 J**	**0.77 J**	**0.32 J**	**0.62 J**	**0.4 J**	**2.5 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**1.1 J**	**0.78 J**	**2.1 J**	**0.73 J**	**2.7**	**1.4 J**	**0.46 J**
Toxicity Equivalency Factor (µg/kg)			**100**					**0.84**	**0.84**	**1.50**	**0.82**	**1.72**	**1.12**	**2.04**

TABLE 6-9
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-10
INDUSTRIAL COMPLEX AREA - BUILDING 20,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B20 SS-1 3/30/2009 B20:SS-1:129	B20 SS-2 3/30/2009 B20:SS-2:130	B20 SS-3 3/30/2009 B20:SS-3:131	B20 SS-4 3/30/2009 B20:SS-4:132
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**170 DH**	**140 JDH**	**400 DH**	**210 JDH**
Oil Range Organics	NWTPH-Dx	SW444	2000					**1200 DO**	**1500 DO**	**3900 DO**	**2300 DO**
Metals (mg/kg)											
Lead	SW6020	7439-92-1	250	NR	NR		400	**18.2**	**22.4**	**23.3**	**28.3**
Silver	SW6020	7440-22-4					390	**0.135**	**0.113**	**0.13**	**0.118**
Semi-volatile Organic Compounds (µg/kg)											
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			250 U	250 U	**1900 D**	**320 JD**
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.24 J**	**0.34 J**	**0.73 J**	**0.64 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.63 J**	**1.2 J**	**5.2**	**3.1**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.3 J**	**1.8 J**	**5.5**	**3.9**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**6.8**	**8.2**	**18**	**22**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**18**	**23**	**29**	**39**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**41**	**57**	**82**	**140**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**28**	**39**	**37**	**51**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**2.5 J**	2.5 U	2.5 U	2.5 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**96**	**93**	**87**	**240**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**18**	**23**	**22**	**33**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**8**	**9.2**	**38**	**41**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**0.66 J**	**1.6 J**	**2.1 J**	**2.9**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**16**	**21**	**18**	**27**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**18**	**21**	**67**	**60**
Toxicity Equivalency Factor (µg/kg)			**100**					**27.39**	**34.98**	**44.00**	**63.73**

TABLE 6-10
INDUSTRIAL COMPLEX AREA - BUILDING 20,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

Shaded text indicates concentration exceeds a screening value or regulatory criteria

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

D = The reported result is from a dilution.

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-11A
INDUSTRIAL COMPLEX AREA - BUILDING 29,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B29 SS-1 4/3/2009 B29:SS-1:191	B29 SS-2 4/3/2009 B29:SS-2:192	B29 SS-3 4/3/2009 B29:SS-3:193	B29 SS-4 4/3/2009 B29:SS-4:194	B29 SS-5 4/3/2009 B29:SS-5:195
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					11 U	13 U	14 U	**28 J**	**21 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					130 U	160 U	**170 J**	**330 O**	**190 Z**
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**8.13**	**8.06**	**7.47**	**12.1**	**7.51**
Silver	SW6020	7440-22-4					390	**0.094**	**0.097**	**0.098**	**0.091**	**0.05**
Semi-volatile Organic Compounds (µg/kg)												
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	**110 J**	160 UJ	**110 J**	160 UJ	**130 J**
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	16 U	16 U	**13 J**	16 U	15 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	80 U	80 U	**12 J**	77 U	**14 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	8 U	**6.1 J**	**5.5 J**	7.7 U	7.2 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**1.4 J**	8 U	8.1 U	7.7 U	7.2 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	8 U	**3.7 J**	**2.9 J**	7.7 U	7.2 U
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	2 UJ	**1.1 J**	**0.85 J**	2 U	**0.46 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			2 UJ	2 U	2.1 U	**0.26 J**	**0.4 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2 UJ	2 U	2.1 U	2 U	**3.2**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**1.4 J**	2 U	**0.95 J**	**2.4**	**80**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**1.5 J**	**0.4 J**	**0.81 J**	**4.6**	**110**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**2.2 J**	**0.6 J**	**1.2 J**	**5.7**	**110**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**0.81 J**	2 U	2.1 U	**4.1**	**74**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**0.920 J**	**0.17 J**	**0.24 J**	**1.5 J**	**32**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**1.7 J**	**.049 J**	**1.1 J**	**3.4**	**110**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.41 J**	2 U	2.1 U	**0.53 J**	**11**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**1.3 J**	2 U	**2 J**	**3.6**	**140**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2 UJ	2 U	2.1 U	2 U	1.8 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**0.91 J**	**0.28 J**	**0.42 J**	**3.4**	**68**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**1.1 J**	**0.5 J**	**1.7 J**	**5.4**	**190**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**2.10**	**0.71**	**1.23**	**5.99**	**141.2**

TABLE 6-11A
INDUSTRIAL COMPLEX AREA - BUILDING 29,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B29 SS-5b 11/13/2009 B29:SS-5b:687	B29 SS-5b 11/13/2009 B29:SS-5b:688	B29 SS-6 4/3/2009 B29:SS-6:196	B29 SS-7 4/3/2009 B29:SS-7:197	B29 SS-8 4/3/2009 B29:SS-8:198
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					--	--	14 U	11 U	12 U
Oil Range Organics	NWTPH-Dx	SW444	2000					--	--	140 U	87 U	110 U
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	--	--	**9.85**	**7.24**	**7.96**
Silver	SW6020	7440-22-4					390	--	--	**0.091**	**0.044**	**0.037**
Semi-volatile Organic Compounds (µg/kg)												
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	--	--	170 UJ	**98 J J**	**270 J**
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	--	--	17 UJ	14 U	14 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	--	--	81 U	**8.8 J**	67 U
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	--	--	8.1 U	6.6 U	6.7 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	--	--	8.1 U	6.6 U	6.7 U
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	--	--	8.1 U	6.6 U	6.7 U
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	3.8 U	3.6 U	2.1 U	1.7 U	1.7 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			3.8 U	3.6 U	2.1 U	1.7 U	1.7 U
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	3.8 U	3.6 U	2.1 U	1.7 U	1.7 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		3.8 U	3.6 U	2.1 U	**0.57 J**	**1.2 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**1.6 J**	3.6 U	**0.37 J**	**0.63 J**	**1.4 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		3.8 U	3.6 U	**0.69 J**	**1.2 J**	1.7 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						3.8 U	3.6 U	2.1 U	**0.81 J**	**1.2 J**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		3.8 U	3.6 U	**0.21 J**	**0.4 J**	**0.57 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		3.8 U	3.6 U	**0.54 J**	**0.79 J**	**1.4 J**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		3.8 U	3.6 U	2.1 U	1.7 U	1.7 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	3.8 U	3.6 U	**0.79 J**	**1 J**	**2.4**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	3.8 U	3.6 U	2.1 U	1.7 U	1.7 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		3.8 U	3.6 U	**0.41 J**	**0.78 J**	**1.1 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	3.8 U	3.6 U	**0.68 J**	**0.84 J**	**2.4**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**2.24**	1.89	**0.72**	**1.02**	**1.96**

TABLE 6-11A
INDUSTRIAL COMPLEX AREA - BUILDING 29,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL							
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1			
	Building Sample Location Sample Date Sample Number							B29 SS-9 4/3/2009 B29:SS-9:199	B29 SS-10 4/3/2009 B29:SS-10:200	B29 SS-11 11/13/2009 B29:SS-11:689
Analyte	**Method**	**CAS #**								
Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	NWTPH-Dx	SW333	2000					20 U	18 U	--
Oil Range Organics	NWTPH-Dx	SW444	2000					**180 J**	160 U	--
Metals (mg/kg)										
Lead	SW6020	7439-92-1	250	NR	NR		400	**9.99**	**15.4**	--
Silver	SW6020	7440-22-4					390	**0.123**	**0.129**	--
Semi-volatile Organic Compounds (µg/kg)										
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	190 UJ	190 UJ	--
Benzyl Alcohol	SW8270C	100-51-6	RND	NR	24000000		6100000	19 U	**17 J**	--
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**24 J**	**23 J**	--
Butyl Benzyl Phthalate	SW8270C	85-68-7	RND	NR	16000000	260000	12000000	9.3 U	9.2 U	--
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	9.3 U	9.2 U	--
Naphthalene	SW8270C	91-20-3	5000	NR	1600000	3600	140000	9.3 U	9.2 U	--
Polynuclear Aromatic Hydrocarbons (µg/kg)										
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.4 U	2.3 U	3.1 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			2.4 U	2.3 U	3.1 U
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	2.4 U	2.3 U	3.1 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.4 U	**0.69 J**	3.1 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**0.27 J**	**0.63**	**1.6 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**0.64 J**	**0.88 J**	3.1 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.4 U	**0.73 J**	**0.94 J**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.4 U	**0.3 J**	3.1 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**0.47 J**	**0.52 J**	3.1 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.4 U	2.3 U	3.1 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**0.77 J**	**0.75 J**	**1.1 J**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.4 U	2.3 U	3.1 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**0.38 J**	**0.55 J**	**0.93 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**0.47 J**	**0.62 J**	**1 J**
Toxicity Equivalency Factor (µg/kg)[1]			**100**					**0.75**	**0.99**	**2.33**

TABLE 6-11A
INDUSTRIAL COMPLEX AREA - BUILDING 29,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

Shaded text indicates concentration exceeds a screening value or regulatory criteria

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

JJ = Organic Data Qualifier: the result is an estimated concentration that is less than the method reporting limit but greater than or equal to the method detection limit.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-11B
INDUSTRIAL COMPLEX AREA - BUILDING 29,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B29 SB-1 22 7/7/2009 B29:SB-1:22:207	B29 SB-2 7.5 11/8/2009 B29:SB-2:7.5:287	B29 SB-2 25 11/8/2009 B29:SB-2:25:288	B29 SB-3 7.5 11/8/2009 B29:SB-3:7.5:289	B29 SB-3 25 11/8/2009 B29:SB-3:25:290
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	4.4 U	7.5 U	7 U	6.9 U	**1.1 J**
2-Butanone	SW8260B	78-93-3					28000000	**18 R**	30 U	28 U	**1.9 J**	22 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	4.4 U	**0.61 J**	**0.53 J**	**0.36 J**	5.4 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.39 J**	0.51 U	**0.55 J**	**0.54 J**	5.4 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	**0.37 J**	15 U	1.1 U	1.6 U	3.8 U
p-Isopropyltoluene	SW8260B	99-87-6						18 U	30 U	28 U	28 U	22 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.23 J**	**1.3 J**	**1.1 J**	**0.96 J**	5.4 U

TABLE 6-11B
INDUSTRIAL COMPLEX AREA - BUILDING 29,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B29 SB-4 7.5 11/8/2009 B29:SB-4:7.5:291	B29 SB-4 25 11/8/2009 B29:SB-4:25:292	B29 SB-5 7.5 11/8/2009 B29:SB-5:7.5:293	B29 SB-5 25 11/8/2009 B29:SB-5:25:294	B29 SB-5 25 11/8/2009 B29:SB-5:25:295
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	6.9 U	5.7 U	7.9 U	4.7 U	5.4 U
2-Butanone	SW8260B	78-93-3					28000000	28 U	**2.9 J**	32 U	19 U	**6.2 J**
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.74 J**	**0.53 J**	7.9 U	**0.58 J**	**0.5 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.41 U	**0.44 J**	0.58 U	0.31 U	0.33 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	14 U	0.78 U	1.6 U	9.3 U	0.74 U
p-Isopropyltoluene	SW8260B	99-87-6						28 U	23 U	**2.1 J**	19 U	22 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.7 J**	**1.1 J**	7.9 U	**1.1 J**	**1.2 J**

TABLE 6-11B
INDUSTRIAL COMPLEX AREA - BUILDING 29,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Building Sample Location Sample Depth Sample Date Sample Number							B29 SB-6 7.5 11/8/2009 B29:SB-6:7.5:285	B29 SB-6 25 11/8/2009 B29:SB-6:25:286
Analyte	**Method**	**CAS #**							
Volatile Organic Compounds (µg/kg)									
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	6.7 U	5.7 U
2-Butanone	SW8260B	78-93-3					28000000	27 U	23 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.7 U	**0.32 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.63 U	**0.33 J**
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	1.4 U	1.1 U
p-Isopropyltoluene	SW8260B	99-87-6						27 U	23 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	6.7 U	**0.73 J**

TABLE 6-11B
INDUSTRIAL COMPLEX AREA - BUILDING 29,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-12
INDUSTRIAL COMPLEX AREA- BUILDING 6,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Depth Sample Date Sample Number							B6 SB-1 25 7/8/2009 B6:SB-1:25:212	B6 SB-2 7.5 11/5/2009 B6:SB-2:7.5:232	B6 SB-2 25 11/5/2009 B6:SB-2:25:233	B6 SB-3 7.5 11/5/2009 B6:SB-3:7.5:234	B6 SB-3 25 11/5/2009 B6:SB-3:25:235	B6 SB-4 7.5 11/4/2009 B6:SB-4:7.5:215
Analyte	**Method**	**CAS #**											
Volatile Organic Compounds (µg/kg)													
2-Butanone	SW8260B	78-93-3					28000000	19 R	26 U	**3.6 J**	**4 J**	**2.9 J**	29 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	14 U	3.2 U	**38**	**36**	19 U	7.6 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	4.6 U	6.5 U	**0.31 J**	**0.41 J**	**0.37 J**	7.3 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	4.6 U	6.5 U	4.9 U	7.4 U	4.6 U	**0.35 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.24 J**	6.5 U	0.19 U	0.34 U	4.6 U	7.3 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.24 J**	0.56 U	0.63 U	0.98 U	0.68 U	**0.84 J**

TABLE 6-12
INDUSTRIAL COMPLEX AREA- BUILDING 6,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B6 SB-4 25 11/4/2009 B6:SB-4:25:216	B6 SB-5 7.5 11/4/2009 B6:SB-5:7.5:217	B6 SB-5 25 11/4/2009 B6:SB-5:25:218	B6 SB-6 7.5 11/4/2009 B6:SB-6:7.5:219	B6 SB-6 25 11/4/2009 B6:SB-6:25:220
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	21 U	30 U	23 U	26 U	26 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	11 U	6.2 U	5.4 U	12 U	12 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5.1 U	7.4 U	5.8 U	6.5 U	6.3 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	**0.4 J**	7.4 U	5.8 U	6.5 U	**0.6 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.28 J**	7.4 U	5.8 U	6.5 U	0.41 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.56 J**	7.4 U	**0.97 J**	**0.62 J**	**0.59 J**

TABLE 6-12
INDUSTRIAL COMPLEX AREA - BUILDING 6,
NOTES PAGE

Notes:

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-13
INDUSTRIAL COMPLEX AREA - BUILDING E120, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							BE120 SB-1 25 7/8/2009 BE120:SB-1:25:213	BE120 SB-2 7.5 11/6/2009 BE120:SB-2:7.5:242	BE120 SB-2 25 11/6/2009 BE120:SB-2:25:243	BE120 SB-3 7.5 11/6/2009 BE120:SB-3:7.5:244	BE120 SB-3 25 11/6/2009 BE120:SB-3:25:245
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
1,2,4-Trichlorobenzene	SW8260B	120-82-1				22000	62000	22 U	26 U	**0.41 J**	26 U	21 U
2-Butanone	SW8260B	78-93-3					28000000	22 R	26 U	28 U	**3.6 J**	21 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	22 U	**37**	20 U	**47**	19 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5.3 U	6.3 U	**0.32 J**	**0.33 J**	5.2 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	5.3 U	6.3 U	**0.34 J**	6.4 U	5.2 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	5.3 U	6.3 U	6.9 U	6.4 U	5.2 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.3 U	6.3 U	**3.1 J**	**0.32 J**	5.2 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	5.3 U	6.3 U	6.9 U	6.4 U	5.2 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.28 J**	**0.29 J**	**0.37 J**	**0.87 J**	**0.35 J**

TABLE 6-13
INDUSTRIAL COMPLEX AREA - BUILDING E120,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							BE120 SB-4 7.5 11/6/2009 BE120:SB-4:7.5:246	BE120 SB-4 25 11/6/2009 BE120:SB-4:25:247	BE120 SB-4 25 11/6/2009 BE120:SB-4:25:248	BE120 SB-5 7.5 11/6/2009 BE120:SB-5:7.5:249	BE120 SB-5 25 11/6/2009 BE120:SB-5:25:250
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
1,2,4-Trichlorobenzene	SW8260B	120-82-1				22000	62000	30 U	19 U	19 U	27 U	25 U
2-Butanone	SW8260B	78-93-3					28000000	**2.6 J**	19 U	19 U	27 U	25 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	**39**	2.2 U	12 U	3.8 U	9.9 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	7.4 U	4.7 U	4.7 U	6.7 U	6.3 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	7.4 U	4.7 U	4.7 U	6.7 U	6.3 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	7.4 U	4.7 U	4.7 U	6.7 U	6.3 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	7.4 U	4.7 U	4.7 U	6.7 U	6.3 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	7.4 U	4.7 U	4.7 U	6.7 U	6.3 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.9 J**	4.7 U	**0.34 J**	**1.1 J**	**0.66 J**

TABLE 6-13
INDUSTRIAL COMPLEX AREA - BUILDING E120,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							BE120 SB-6 7.5 11/6/2009 BE120:SB-6:7.5:251	BE120 SB-6 25 11/6/2009 BE120:SB-6:25:252	BE120 SB-7 7.5 11/6/2009 BE120:SB-7:7.5:253	BE120 SB-7 25 11/6/2009 BE120:SB-7:25:254	BE120 SB-8 7.5 11/6/2009 BE120:SB-8:7.5:238
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
1,2,4-Trichlorobenzene	SW8260B	120-82-1				22000	62000	27 U	24 U	25 U	25 U	24 U
2-Butanone	SW8260B	78-93-3					28000000	27 U	24 U	25 U	25 U	24 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	3 U	14 U	4 U	3.5 U	24 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.7 U	**0.54 J**	6.2 U	6.2 U	5.9 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	**0.41 J**	5.9 U	6.2 U	6.2 U	5.9 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	6.7 U	**0.85 J**	6.2 U	6.2 U	5.9 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.51 U	5.9 U	6.2 U	0.27 U	**0.35 J**
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	6.7 U	**0.22 J**	6.2 U	6.2 U	5.9 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	6.7 U	**1.5 J**	**0.33 J**	**0.44 J**	**0.41 J**

TABLE 6-13
INDUSTRIAL COMPLEX AREA - BUILDING E120,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							BE120 SB-8 25 11/6/2009 BE120:SB-8:25:239	BE120 SB-9 7.5 11/6/2009 BE120:SB-9:7.5:240	BE120 SB-9 25 11/6/2009 BE120:SB-9:25:241	BE120 SB-10 7.5 11/6/2009 BE120:SB-10:7.5:403	BE120 SB-10 25 11/6/2009 BE120:SB-10:25:404
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
1,2,4-Trichlorobenzene	SW8260B	120-82-1				22000	62000	24 U	26 U	20 U	28 UJ	31 UJ
2-Butanone	SW8260B	78-93-3					28000000	24 U	26 U	**1.7 J**	28 U	31 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	7.5 U	2.3 U	14 U	3.2 U	3.9 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5.9 U	6.5 U	5 U	6.8 U	7.6 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	5.9 U	6.5 U	**0.38 J**	6.8 U	7.6 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	5.9 U	6.5 U	5 U	6.8 U	7.6 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.9 U	6.5 U	**2.6 J**	6.8 U	7.6 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	5.9 U	6.5 U	5 U	6.8 U	7.6 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.64 J**	**0.39 J**	**1.1 J**	6.8 U	7.6 U

TABLE 6-13
INDUSTRIAL COMPLEX AREA - BUILDING E120,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-14
INDUSTRIAL COMPLEX AREA - NIELSON PROPERTY, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Study Area Sample Location Sample Depth Sample Date Sample Number							NI1 SB-1 24 7/7/2009 NI1:SB-1:24:202	NI2 SB-1 24 7/7/2009 NI2:SB-1:24:203	NI3 SB-1 24 7/7/2009 NI3:SB-1:24:206	NI SB-1 12 12/13/2011 NI:SB-1:12:480	NI SB-1 18 12/13/2011 NI:SB-1:18:481
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	21 R	18 R	21 R	27 U	21 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	18 U	3.8 U	**46**	25 U	8.3 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	5.2 U	4.5 U	5.1 U	6.6 U	5.2 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	5.2 U	4.5 U	5.1 U	6.6 U	5.2 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000	5.2 UJ	4.5 UJ	5.1 UJ	6.6 U	5.2 U
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	5.2 U	4.5 U	**3.9 J**	6.6 U	5.2 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.43 J	0.25 J	**0.37 J**	6.6 U	5.2 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	11 U	0.41 J	**0.4 J**	4.8 U	3.7 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	21 U	18 U	21 U	0.37 U	0.2 U
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	5.2 U	4.5 U	5.1 U	6.6 U	5.2 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	5.2 U	0.38 J	**0.42 J**	**0.72 J**	**0.5 J**

TABLE 6-14
INDUSTRIAL COMPLEX AREA - NIELSON PROPERTY,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Study Area Sample Location Sample Depth Sample Date Sample Number							NI SB-2 12 12/13/2011 NI:SB-2:12:482	NI SB-2 12 12/13/2011 NI:SB-2:12:483	NI SB-2 18 12/13/2011 NI:SB-2:18:484	NI SB-3 12 12/13/2011 NI:SB-3:12:485	NI SB-3 18 12/13/2011 NI:SB-3:18:486
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	20 U	20 U	21 U	18 U	18 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000	7 U	7.1 U	12 U	7.9 U	5.9 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	5 U	5 U	5.3 U	4.5 U	4.4 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	5 U	5 U	5.3 U	4.5 U	4.4 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000	5 U	5 U	5.3 U	4.5 U	4.4 U
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	5 U	5 U	5.3 U	4.5 U	4.4 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5 U	5 U	5.3 U	4.5 U	4.4 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	3.5 U	3.9 U	4.1 U	3 U	3 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	0.15 U	20 U	0.16 U	18 U	18 U
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	5 U	5 U	5.3 U	4.5 U	4.4 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.39 J**	**0.45 J**	**0.46 J**	**0.4 J**	0.44 U

TABLE 6-14
INDUSTRIAL COMPLEX AREA - NIELSON PROPERTY
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-15
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B12 SB-1 25 7/7/2009 B12:SB-1:25:211	B12 SB-2 7.5 11/10/2009 B12:SB-2:7.5:331	B12 SB-2 25 11/10/2009 B12:SB-2:25:332	B12 SB-3 7.5 11/10/2009 B12:SB-3:7.5:318	B12 SB-3 25 11/10/2009 B12:SB-3:25:319
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	22 R	29 U	20 U	21 U	21 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.24 J**	**0.36 J**	**0.56 J**	**0.31 J**	5.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	**0.83 J**	7.2 U	4.9 U	5.3 U	5.1 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	5.3 U	7.2 U	4.9 U	5.3 U	5.1 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.27 J**	7.2 U	4.9 U	5.3 U	5.1 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	5.3 U	7.2 U	4.9 U	5.3 U	5.1 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	5.3 U	1.1 U	0.98 U	**0.71 J**	5.1 U

TABLE 6-15
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B12 SB-4 7.5 11/10/2009 B12:SB-4:7.5:320	B12 SB-4 25 11/10/2009 B12:SB-4:25:321	B12 SB-5 7.5 11/9/2009 B12:SB-5:7.5:315	B12 SB-5 25 11/9/2009 B12:SB-5:25:316	B12 SB-6 7.5 11/10/2009 B12:SB-6:7.5:322
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	27 U	21 U	3.3 U	28 U	1.5 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.59 J**	**0.57 J**	6.9 U	7 U	5.9 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	6.8 U	**1 J**	6.9 U	7 U	5.9 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	6.8 U	5.1 U	**0.59 J**	7 U	5.9 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	6.8 U	5.1 U	6.9 U	7 U	**0.27 J**
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	6.8 U	5.1 U	**0.21 J**	7 U	5.9 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	1.5 U	1.2 U	**1.1 J**	7 U	0.37 U

TABLE 6-15
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B12 SB-6 25 11/10/2009 B12:SB-6:25:323	B12 SB-7 7.5 11/10/2009 B12:SB-7:7.5:324	B12 SB-7 25 11/10/2009 B12:SB-7:25:325	B12 SB-7 7.5 11/10/2009 B12:SB-7:25:326	B12 SB-8 7.5 11/10/2009 B12:SB-8:7.5:327
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	19 U	24 U	2.2 U	19 U	25 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.27 J**	5.9 U	**0.49 J**	0.22 U	6.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	**0.52 J**	5.9 U	**0.94 J**	**0.66 J**	6.1 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	4.6 U	5.9 U	4.6 U	4.6 U	6.1 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	4.6 U	**0.41 J**	4.6 U	4.6 U	6.1 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	4.6 U	5.9 U	4.6 U	4.6 U	6.1 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	0.33 U	5.9 U	0.95 U	0.28 U	6.1 U

TABLE 6-15
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B12 SB-8 25 11/10/2009 B12:SB-8:25:328	B12 SB-9 7.5 11/13/2009 B12:SB-9:7.5:396	B12 SB-9 7.5 11/13/2009 B12:SB-9:7.5:397	B12 SB-9 25 11/13/2009 B12:SB-9:25:398	B12 SB-10 7.5 11/13/2009 B12:SB-10:7.5:399
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
2-Butanone	SW8260B	78-93-3					28000000	2.4 U	22 U	24 U	22 U	25 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	4.7 U	5.4 U	6 U	5.4 U	6.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	4.7 U	1.1 U	1.2 U	1.1 U	1.3 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	4.7 U	5.4 U	6 U	5.4 U	6.1 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	0.23 U	5.4 U	6 U	**0.22 J**	**0.26 J**
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	4.7 U	5.4 U	6 U	5.4 U	6.1 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	0.42 U	5.4 U	6 U	5.4 U	6.1 U

TABLE 6-15
INDUSTRIAL COMPLEX AREA - BUILDING 12,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL							
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1			
	Building Sample Location Sample Depth Sample Date Sample Number							B12 SB-10 25 11/13/2009 B12:SB-10:25:400	B12 SB-11 7.5 11/13/2009 B12:SB-11:7.5:401	B12 SB-11 25 11/13/2009 B12:SB-11:25:402
Analyte	**Method**	**CAS #**								
Volatile Organic Compounds (µg/kg)										
2-Butanone	SW8260B	78-93-3					28000000	20 U	27 U	21 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5 U	6.6 U	5.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	0.99 U	1.4 U	1.1 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	5 U	6.6 U	5.1 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5 U	**0.3 J**	5.1 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	5 U	6.6 U	5.1 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.24 J**	6.6 U	**0.26 J**

TABLE 6-15
INDUSTRIAL COMPLEX AREA - BUILDING 12,
NOTES PAGE

Notes:

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-16
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Depth Sample Date Sample Number							B18 SB-1 7.5 11/7/2009 B18:SB-1:7.5:266	B18 SB-1 25 11/7/2009 B18:SB-1:25:267	B18 SB-2 7.5 11/7/2009 B18:SB-2:7.5:261	B18 SB-2 25 11/7/2009 B18:SB-2:25:262	B18 SB-2 25 11/7/2009 B18:SB-2:25:263	B18 SB-3 7.5 11/7/2009 B18:SB-3:7.5:264
Analyte	**Method**	**CAS #**											
Volatile Organic Compounds (µg/kg)													
2-Butanone	SW8260B	78-93-3					28000000	27 U	22 U	28 U	22 U	25 U	29 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.7 U	5.5 U	7 U	5.5 U	6.1 U	7.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	6.7 U	5.5 U	7 U	5.5 U	6.1 U	7.1 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.32 J**	**0.26 J**	7 U	**0.97 J**	**0.24 J**	**0.55 J**
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	27 U	22 U	28 U	22 U	25 U	29 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	6.7 U	5.5 U	7 U	5.5 U	6.1 U	**0.95 J**

TABLE 6-16
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Depth Sample Date Sample Number							B18 SB-3 25 11/7/2009 B18:SB-3:25:265	B18 SB-4 7.5 11/7/2009 B18:SB-4:7.5:255	B18 SB-4 25 11/7/2009 B18:SB-4:25:256	B18 SB-5 7.5 11/7/2009 B18:SB-5:7.5:259	B18 SB-5 25 11/7/2009 B18:SB-5:25:260	B18 SB-6 7.5 11/7/2009 B18:SB-6:7.5:257
Analyte	**Method**	**CAS #**											
Volatile Organic Compounds (µg/kg)													
2-Butanone	SW8260B	78-93-3					28000000	22 U	25 U	23 U	29 U	23 U	22 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	5.3 U	6.1 U	5.6 U	7.1 U	5.6 U	5.4 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	5.3 U	6.1 U	5.6 U	7.1 U	5.6 U	5.4 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.21 J**	6.1 U	**0.21 J**	**1 J**	5.6 U	**0.21 J**
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	22 U	25 U	23 U	29 U	23 U	22 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	5.3 U	6.1 U	5.6 U	7.1 U	5.6 U	5.4 U

TABLE 6-16
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Depth Sample Date Sample Number							B18 SB-6 25 11/7/2009 B18:SB-6:25:258	B19 SB-1 24 7/7/2009 B19:SB-1:24:208	B19 SB-2 12 7/8/2009 B19:SB-2:12:209	B19 SB-3 9.5 11/10/2009 B19:SB-3:9.5:329	B19 SB-3 12 7/8/2009 B19:SB-3:12:210	B19 SB-3 25 11/10/2009 B19:SB-3:25:330
Analyte	**Method**	**CAS #**											
Volatile Organic Compounds (µg/kg)													
2-Butanone	SW8260B	78-93-3					28000000	24 U	**21 R**	**27 R**	2.4 U	**25 R**	21 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6 U	5.2 U	6.7 U	**0.31 J**	6.1 U	5.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	6 U	5.2 U	6.7 U	6 U	6.1 U	**0.37 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	6 U	**0.27 J**	**0.35 J**	6 U	**0.41 J**	5.1 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	24 U	0.74 U	0.65 U	24 U	1.1 U	21 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	6 U	5.2 U	**0.25 J**	**0.84 J**	6.1 U	**0.22 J**

TABLE 6-16
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Depth Sample Date Sample Number							B19 SB-4 7.5 11/7/2009 B19:SB-4:7.5:272	B19 SB-4 25 11/7/2009 B19:SB-4:25:273	B19 SB-5 7.5 11/7/2009 B19:SB-5:7.5:270	B19 SB-5 25 11/7/2009 B19:SB-5:25:271	B19 SB-6 7.5 11/7/2009 B19:SB-6:7.5:268	B19 SB-6 15 7/9/2009 B19:SB-6:15:215
Analyte	**Method**	**CAS #**											
Volatile Organic Compounds (µg/kg)													
2-Butanone	SW8260B	78-93-3					28000000	27 U	20 U	27 U	19 U	25 U	19 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	6.6 U	4.9 U	6.7 U	4.7 U	6.1 U	4.7 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	6.6 U	4.9 U	6.7 U	4.7 U	6.1 U	4.7 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.26 J**	**0.31 J**	6.7 U	**0.19 J**	**0.28 J**	**0.32 J**
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	27 U	20 U	27 U	19 U	25 U	19 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	6.6 U	4.9 U	6.7 U	4.7 U	6.1 U	**0.27 J**

TABLE 6-16
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Building Sample Location Sample Depth Sample Date Sample Number							B19 SB-6 23 7/9/2009 B19:SB-6:23:216	B19 SB-6 25 11/7/2009 B19:SB-6:25:269
Analyte	**Method**	**CAS #**							
Volatile Organic Compounds (µg/kg)									
2-Butanone	SW8260B	78-93-3					28000000	19 U	18 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	4.8 U	**0.36 J**
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	4.8 U	4.5 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.31 J**	**0.23 J**
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	**0.94 J**	18 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.26 J**	**0.8 J**

TABLE 6-16
INDUSTRIAL COMPLEX AREA - BUILDINGS 18 AND 19,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-17
INDUSTRIAL COMPLEX AREA - BUILDING 20,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B20 SB-1 7.5 11/8/2009 B20:SB-1:7.5:283	B20 SB-1 25 11/8/2009 B20:SB-1:25:284	B20 SB-2 7.5 11/8/2009 B20:SB-2:7.5:281	B20 SB-2 25 11/8/2009 B20:SB-2:25:282	B20 SB-3 7.5 11/8/2009 B20:SB-3:7.5:279
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	6.4 U	4.5 U	6.5 U	6 U	6.7 U
2-Butanone	SW8260B	78-93-3					28000000	**5.8 J**	2.6 U	26 U	24 U	27 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.69 J**	**0.42 J**	6.5 U	6 U	**0.51 J**
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	6.4 U	**0.59 J**	6.5 U	6 U	6.7 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000	6.4 U	4.5 U	6.5 U	6 U	6.7 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.25 J**	0.31 U	6.5 U	6 U	6.7 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	13 U	0.42 U	13 U	0.46 U	14 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	26 U	18 U	26 U	24 UJ	0.56 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.5 J**	**0.76 J**	6.5 U	**0.54 J**	**1.6 J**

TABLE 6-17
INDUSTRIAL COMPLEX AREA - BUILDING 20,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Depth Sample Date Sample Number							B20 SB-3 25 11/8/2009 B20:SB-3:25:280	B20 SB-4 7.5 11/8/2009 B20:SB-4:7.5:276	B20 SB-4 25 11/8/2009 B20:SB-4:25:277	B20 SB-4 25 11/8/2009 B20:SB-4:25:278	B20 SB-5 25 7/7/2009 B20:SB-5:25:205
Analyte	**Method**	**CAS #**										
Volatile Organic Compounds (µg/kg)												
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	5.4 U	6.9 U	**0.29 J**	5 U	4.3 U
2-Butanone	SW8260B	78-93-3					28000000	22 U	**2.2 J**	21 U	20 U	18 R
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.56 J**	6.9 U	5.1 U	5 U	4.3 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	**1.2 J**	6.9 U	5.1 U	**1.6 J**	**0.83 J**
Chloromethane	SW8260B	74-87-3		77000	NR		120000	5.4 U	6.9 U	**0.46 J**	5 U	4.3 UJ
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.4 U	**0.4 J**	**0.46 J**	**0.19 J**	**0.31 J**
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	11 U	1.1 U	11 U	**0.39 J**	8.6 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	22 U	28 U	**0.46 J**	0.8 U	18 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.2 J**	**0.79 J**	**0.65 J**	5 U	4.3 U

TABLE 6-17
INDUSTRIAL COMPLEX AREA - BUILDING 20,
NOTES PAGE

Notes:

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-18
INDUSTRIAL COMPLEX AREA - BUILDING 44, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	EPA Soil Screening Level for Protection of Groundwater MCL					
	Building Sample Location Sample Depth Sample Date Sample Number								B44 SB-1 25 7/8/2009 B44:SB-1:25:214	B44 SB-2 7.5 11/5/2009 B44:SB-2:7.5:230	B44 SB-2 25 11/5/2009 B44:SB-2:25:231	B44 SB-3 7.5 11/5/2009 B44:SB-3:7.5:228	B44 SB-3 25 11/5/2009 B44:SB-3:25:229
Analyte	**Method**	**CAS#**											
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000		21 U	**0.51 J**	**0.31 J**	28 U	22 U
1,2,4-Trichlorobenzene	SW8260B	120-82-1	RND	NR	800000	22000	62000	400	21 U	**0.48 J**	23 U	28 U	22 U
2-Butanone	SW8260B	78-93-3					28000000		21 R	30 U	**3.7 J**	28 U	22 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000		18 U	14 U	**30**	6 U	2.6 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	52000	5.1 U	7.5 U	**0.9 J**	**0.37 J**	5.5 U
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000		5.1 U	7.5 U	5.6 U	6.9 U	5.5 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	38000	5.1 U	7.5 UJ	5.6 UJ	6.9 U	5.5 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	44000	5.1 U	7.5 U	5.6 U	6.9 U	5.5 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000		5.1 U	7.5 U	5.6 U	6.9 UJ	5.5 UJ
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	1560	5.1 U	7.5 U	5.6 U	6.9 U	5.5 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000		5.1 U	7.5 U	5.6 U	6.9 U	5.5 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000		**0.32 J**	7.5 U	0.22 U	6.9 U	5.5 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	26000	0.76 U	0.43 U	0.64 U	0.65 U	0.9 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000		21 U	**0.73 J**	**0.44 J**	28 U	22 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000		5.1 U	7.5 U	5.6 U	6.9 U	5.5 U
p-Isopropyltoluene	SW8260B	99-87-6							21 U	30 U	23 U	28 U	22 U
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	46000	5.1 U	7.5 UJ	5.6 UJ	6.9 UJ	5.5 UJ
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	1380	**0.26 J**	**2.1 J**	**1.2 J**	**2.5 J**	**0.7 J**

TABLE 6-18
INDUSTRIAL COMPLEX AREA - BUILDING 44,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	EPA Soil Screening Level for Protection of Groundwater MCL				
	Building Sample Location Sample Depth Sample Date Sample Number								B44 SB-4 7.5 11/5/2009 B44:SB-4:7.5:221	B44 SB-4 25 11/5/2009 B44:SB-4:25:222	B44 SB-5 7.5 11/5/2009 B44:SB-5:7.5:226	B44 SB-5 25 11/5/2009 B44:SB-5:25:227
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000		28 U	21 U	28 U	22 U
1,2,4-Trichlorobenzene	SW8260B	120-82-1	RND	NR	800000	22000	62000	400	28 U	21 U	28 U	22 U
2-Butanone	SW8260B	78-93-3					28000000		28 U	**2.8 J**	28 U	22 U
Acetone	SW8260B	67-64-1		NR	8000000		61000000		4.1 U	24 U	5.5 U	7.2 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	52000	6.9 U	5.1 U	**0.41 J**	**0.3 J**
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000		6.9 U	5.1 U	7 U	5.3 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	38000	6.9 U	5.1 U	7 U	5.3 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	44000	6.9 U	5.1 U	7 U	5.3 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000		6.9 UJ	5.1 UJ	7 UJ	5.3 UJ
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	1560	6.9 U	5.1 U	7 U	5.3 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000		6.9 U	5.1 U	7 U	5.3 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000		6.9 U	0.2 U	7 U	5.3 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	26000	0.33 U	0.94 U	0.18 U	0.22 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000		28 U	21 U	28 U	22 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000		6.9 U	5.1 U	7 U	5.3 U
p-Isopropyltoluene	SW8260B	99-87-6							28 U	21 U	28 U	22 U
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	46000	6.9 UJ	5.1 UJ	7 UJ	5.3 UJ
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	1380	**1.4 J**	**0.79 J**	**1.3 J**	**0.21 J**

TABLE 6-18
INDUSTRIAL COMPLEX AREA - BUILDING 44, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	EPA Soil Screening Level for Protection of Groundwater MCL					
	Building Sample Location Sample Depth Sample Date Sample Number								B44 SB-6 7.5 11/5/2009 B44:SB-6:7.5:223	B44 SB-6 25 11/5/2009 B44:SB-6:25:224	B44 SB-6 25 11/5/2009 B44:SB-6:25:225	B44 RS-3 6 12/13/2010 B44:RS-3:6:432	B44 RS-3 12 12/13/2010 B44:RS-3:12:433
Analyte	**Method**	**CAS#**											
Volatile Organic Compounds (µg/kg)													
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000		30 U	300 UJ	330 UJ	32 U	20 U
1,2,4-Trichlorobenzene	SW8260B	120-82-1	RND	NR	800000	22000	62000	400	30 U	300 UJ	330 UJ	32 U	20 U
2-Butanone	SW8260B	78-93-3					28000000		30 U	3000 UJ	3300 UJ	**9.2 J**	**4.6 J**
Acetone	SW8260B	67-64-1		NR	8000000		61000000		2.6 U	**470 J**	3300 UJ	62 U	31 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	52000	7.4 U	73 UJ	83 UJ	7.9 U	4.9 U
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000		7.4 U	73 UJ	83 UJ	2.5 U	1.4 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	38000	**1.2 J**	**36 J**	**38 J**	1.6 U	**0.88 J**
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	44000	7.4 U	73 UJ	83 UJ	7.9 U	4.9 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000		7.4 UJ	73 UJ	83 UJ	7.9 U	4.9 U
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	1560	7.4 U	73 UJ	83 UJ	7.9 U	4.9 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000		7.4 U	73 UJ	83 UJ	**0.93 J**	**0.49 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000		7.4 U	73 UJ	83 UJ	1.3 U	0.77 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	26000	0.29 U	**22 J**	**25 J**	4.7 U	2.2 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000		30 U	300 UJ	330 UJ	32 U	20 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000		7.4 U	73 UJ	83 UJ	**0.39 J**	**0.2 J**
p-Isopropyltoluene	SW8260B	99-87-6							30 U	300 UJ	330 UJ	32 U	20 U
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	46000	**5 J**	**200 J**	**190 J**	**3.1 J**	**1.4 J**
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	1380	7.4 U	**13 J**	**23 J**	**1.1 J**	**0.67 J**

TABLE 6-18
INDUSTRIAL COMPLEX AREA - BUILDING 44,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	EPA Soil Screening Level for Protection of Groundwater MCL				
	Building Sample Location Sample Depth Sample Date Sample Number								B44 RS-3 18 12/13/2010 B44:RS-3:18:434	B44 RS-3 25 12/13/2010 B44:RS-3:25:435	B44 RS-3 70 12/14/2010 B44:RS-3:70:436	B44 RS-3 70 12/14/2010 B44:RS-3:70:437
Analyte	**Method**	**CAS#**										
Volatile Organic Compounds (µg/kg)												
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000		20 U	22 U	25 U	17 U
1,2,4-Trichlorobenzene	SW8260B	120-82-1	RND	NR	800000	22000	62000	400	20 U	22 U	25 U	17 U
2-Butanone	SW8260B	78-93-3					28000000		**4 J**	**2.1 J**	**5 J**	**5.6 J**
Acetone	SW8260B	67-64-1		NR	8000000		61000000		36 U	52 U	28 U	69 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	52000	**0.34 J**	**0.33 J**	**2.8 J**	**2.5 J**
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000		1.2 U	1.5 U	1.8 U	1.3 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	38000	**2.2 J**	**1 J**	**0.64 J**	0.81 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	44000	**0.22 J**	**0.25 J**	**1.3 J**	**1.2 J**
Chloromethane	SW8260B	74-87-3		77000	NR		120000		4.9 U	5.4 U	**0.77 J**	**0.63 J**
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	1560	4.9 U	5.4 U	**0.6 J**	**0.35 J**
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000		**0.54 J**	**0.75 J**	**1.4 J**	**0.92 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000		0.74 U	1 U	0.68 U	0.35 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	26000	2.2 U	2.6 U	2.7 U	1.5 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000		20 U	22 U	25 U	17 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000		**0.2 J**	**0.29 J**	**0.5 J**	**0.27 J**
p-Isopropyltoluene	SW8260B	99-87-6							20 U	22 U	25 U	17 U
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	46000	**1.1 J**	**4.9 J**	**10 J**	**7.5 J**
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	1380	**0.78 J**	**1.1 J**	**3.7 J**	**2.8 J**

TABLE 6-18
INDUSTRIAL COMPLEX AREA - BUILDING 44,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	EPA Soil Screening Level for Protection of Groundwater MCL	
	Building **Sample Location** **Sample Depth** **Sample Date** **Sample Number**								**B44** **RS-3** **90** **12/14/2010** **B44:RS-3:90:438**
Analyte	**Method**	**CAS#**							
Volatile Organic Compounds (µg/kg)									
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000		11 U
1,2,4-Trichlorobenzene	SW8260B	120-82-1	RND	NR	800000	22000	62000	400	11 U
2-Butanone	SW8260B	78-93-3					28000000		**2.6 J**
Acetone	SW8260B	67-64-1		NR	8000000		61000000		22 U
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	52000	**1.4 J**
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000		**0.28 J**
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	38000	0.52 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	44000	**0.67 J**
Chloromethane	SW8260B	74-87-3		77000	NR		120000		**0.7 J**
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	1560	2.6 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000		**0.39 J**
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000		0.58 U
Methylene Chloride	SW8260B	75-09-2	20	130000	4800000	11000	1700000	26000	1.5 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000		11 U
o-Xylene	SW8260B	95-47-6		NR	160000000		690000		**0.16 J**
p-Isopropyltoluene	SW8260B	99-87-6							**0.81 J**
Tetrachloroethene	SW8260B	127-18-4	50	1900	800000	550	370000	46000	**0.93 J**
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	1380	**1.1 J**

TABLE 6-18
INDUSTRIAL COMPLEX AREA - BUILDING 44,
NOTES PAGE

Notes:

Bold text indicates a detected analyte

Shaded text indicates concentration exceeds a screening value or regulatory criteria

The EPA MCL-based SSLs (based on DAF=1) were adjusted to DAF=20 to more accurtely represent site conditions. The DAF20-adjusted SSLs were used in the decision-making process to investigate potential soil sources for observed groundwater contamination in the industrial complex area. DAF20-adjusted SSLs are not used in determining Chemicals of Interest (COI).

Adjusted DAF20 values are calculated as the following: DAF20 value = (MCL-based SSL) x 20.

For further discussion see Section 6.3.2.1 in report text.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-19
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 7,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B7 SS-1 3/28/2009 B7:SS-1:56	B7 SS-2 3/28/2009 B7:SS-2:57	B7 SS-3 3/28/2009 B7:SS-3:58	B7 SS-4 3/28/2009 B7:SS-4:59
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**10 J**	**18 J**	**9.8 J**	**7.1 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**140 J**	**130 J**	**120 J**	**85 J**
Polychlorinated biphenyls (PCBs) (mg/kg)											
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.019 U	0.0081 U	0.0082 U	0.0085 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.046 U	0.0081 U	0.0082 U	0.0085 U
PCB-aroclor 1262	SW8082	37324-23-5						0.12 U	0.0081 U	**0.004 J**	**0.0041 JP**
PCB-aroclor 1268	SW8082	11100-14-4						0.05 U	0.0081 U	0.0082 U	**0.0037 J**
Total PCBs			1					ND	ND	**0.0784**	**0.0758**
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.36 J**	**0.38 J**	2.1 U	**0.34 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.35 J**	2 U	2.1 U	**1.1 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**1.6 J**	**1.5 J**	2.1 U	**2.7**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**12**	**10**	2.1 U	**6.2**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**11**	**9.3**	**0.44 J**	**6.1**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**15**	**11**	**.63 J**	**15**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**8.5**	**6.4**	2.1 U	**4**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**5.2**	**3.7**	2.1 U	**4.6**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**13**	**26**	**.55 J**	**7.8**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**1.8 J**	**2.5**	2.1 U	**1.1 J**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**19**	**12**	**0.91 J**	**16**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	2.1 U	**0.55 J**	2.1 U	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**8.2**	**3.5**	2.1 U	**5.1**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**15**	**15**	**0.7 J**	**13**
Toxicity Equivalency Factor (µg/kg)			**100**					**15.35**	**12.63**	**0.93**	**9.38**

TABLE 6-19
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 7,
NOTES PAGE

Notes:

(1)Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

ND = Not detected

P = The gas chromatograph or high-pressure liquid chromatography confirmation criteria were exceeded. The relative percent difference is greater than 40 percent between the two analytical results.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-20
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 11,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B11 SS-1 3/28/2009 B11:SS-1:51	B11 SS-2 3/28/2009 B11:SS-2:52	B11 SS-3 3/28/2009 B11:SS-3:53	B11 SS-4 3/28/2009 B11:SS-4:54	B11 SS-5 3/28/2009 B11:SS-5:55
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					**8.7 J**	**32 J**	**17 J**	**110 H**	**110 H**
Oil Range Organics	NWTPH-Dx	SW444	2000					**110 J**	**350 J**	**270 O**	**1200 O**	**960 O**
Polychlorinated biphenyls (PCBs) (mg/kg)												
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.0085 U	0.0077 U	0.009 U	0.0081 U	0.0057 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.0085 U	0.0077 U	0.009 U	0.0081 U	0.0057 U
PCB-aroclor 1262	SW8082	37324-23-5						0.0085 U	0.0077 U	0.012 U	**0.027**	0.0057 U
PCB-aroclor 1268	SW8082	11100-14-4						0.0085 U	0.0077 U	**0.0051 J**	**0.0065 JP**	0.0057 U
Total PCBs			1					ND	ND	**0.0891**	**0.0991**	ND
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	2.2 U	2 U	2.3 U	2.1 U	1.5 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**0.31 J**	**0.8 J**	**1.2 J**	2.1 U	**0.35 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**0.89 J**	**0.75 J**	**6.3**	2.1 U	1.5 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**7.4**	**4.5**	**96**	**4.1**	1.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**9.9**	**5.7**	**56**	**10**	**6.4**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**12**	**8.1**	**130**	**12**	**21**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**6.2**	**4**	**34**	**7.9**	**25**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**3.5**	**2.1**	**41**	2.1 U	1.5 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**9.8**	**8**	**87**	**20**	**49**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**2.2 J**	**1.1 J**	**12**	**3.8**	**11**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**10**	**10**	**170**	**3.4**	**1.2 J**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**0.55 J**	**1.3 J**	**0.92 J**	2.1 U	1.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**6.1**	**4.5**	**42**	**4.5**	**4.1**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**11**	**8.8**	**130**	**8**	**4**
Toxicity Equivalency Factor (µg/kg)			**100**					**13.12**	**7.81**	**88.97**	**12.75**	**10.65**

TABLE 6-20
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 20,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

Shaded text indicates concentration exceeds a screening value or regulatory criteria

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not detected

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

P = The gas chromatograph or high-pressure liquid chromatography confirmation criteria were exceeded. The relative percent difference is greater than 40 percent between the two analytical results.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building							B41	B41	B41	B41	B41	B41
	Sample Location							SS-1	SS-2	SS-3	SS-3b	SS-4	SS-4b
	Sample Date							3/31/2009	3/31/2009	3/31/2009	11/14/2009	3/31/2009	11/14/2009
	Sample Number							B41:SS-1:134	B41:SS-2:135	B41:SS-3:136	B41:SS-3b:650	B41:SS-4:137	B41:SS-4b:651
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Diesel Range Organics	NWTPH-Dx	SW333	2000					**23 J**	**28 J**	**510 Z**	**390 J**	**310 Z**	**290 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**190 Z**	**230 O**	**1100 O**	**1700 J**	**1400 O**	**940 J**
Polychlorinated biphenyls (PCBs) (mg/kg)													
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.01 U	0.01 U	0.01 U,i	--	0.01 U	--
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.01 U	0.01 U	0.01 U,i	--	0.01 U	--
PCB-aroclor 1262	SW8082	37324-23-5						0.01 U	0.01 U	0.01 U	--	0.01 U	--
PCB-aroclor 1268	SW8082	11100-14-4						**0.013**	0.01 U	0.01 U	--	**0.0076 J**	--
Total PCBs			1					**0.103**	ND	ND	--	**0.0976**	--
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.6 J**	**0.55 J**	**18**	--	**25**	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1.3 J**	**1.1 J**	44 U,i	--	71 U,i	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**2.2 J**	**1.6 J**	**110**	--	**160**	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**6.5**	**3.4 J**	**66**	--	**100**	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**18**	**3.2 J**	**40**	--	**61**	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**20**	**7.4**	**45**	--	**61**	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**18**	**5.6**	**28**	--	**35**	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**34 J**	**11 J**	**12**	--	**14**	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		**15**	**8**	**94**	--	**140**	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**56**	**1.7 J**	**45**	--	**60**	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**14**	**7.7**	**120**	--	**170**	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.3 J**	**1.1 J**	**65**	--	**100**	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5				150		**8.6**	**2.5 J**	**40**	--	**54**	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**18**	**7.6**	**140**	--	**200**	--
Toxicity Equivalency Factor (µg/kg)			**100**					**22.56**	**4.89**	**61.74**	--	**91.30**	--

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building							**B41**	**B41**	**B41**	**B41**	**B41**	**B41**
	Sample Location							**SS-5**	**SS-5b**	**SS-6**	**SS-6b**	**SS-7**	**SS-8**
	Sample Date							**3/31/2009**	**11/14/2009**	**3/31/2009**	**11/14/2009**	**3/31/2009**	**3/31/2009**
	Sample Number							**B41:SS-5:138**	**B41:SS-5b:652**	**B41:SS-6:139**	**B41:SS-6b:653**	**B41:SS-7:140**	**B41:SS-8:141**
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Diesel Range Organics	NWTPH-Dx	SW333	2000					**260 H**	**220 J**	**490 H**	**140 J**	**56 H**	**42 H**
Oil Range Organics	NWTPH-Dx	SW444	2000					**1900 O**	**1900 J**	**3000 DO**	**1200 J**	**620 O**	**480 O**
Polychlorinated biphenyls (PCBs) (mg/kg)													
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.011 U	--	0.01 U	--	0.01 U	0.01 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.011 U	--	0.01 U	--	0.01 U	0.01 U,i
PCB-aroclor 1262	SW8082	37324-23-5						**0.039**	--	**0.011 P**	--	**0.0084 JP**	0.01 U,i
PCB-aroclor 1268	SW8082	11100-14-4						**0.045**	--	**0.0099 J**	--	0.01 U	0.01 U
Total PCBs			1					**0.171**	--	**0.1009**	--	**0.0984**	ND
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Acenaphthene	SW8270CSIM	83-32-9					3400000	**6.5**	--	**6.6**	--	**0.25 J**	**0.27 J**
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			16 U,i	--	16 U,i	--	**0.59 J**	**0.33 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**33**	--	**40**	--	**0.73 J**	**0.78 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**26**	--	**31**	--	**1.3 J**	**3.3 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**23**	--	**39**	--	**2.2 J**	**9.2**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**25**	--	**37**	--	**3.5 J**	**12**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**18**	--	**29**	--	**3.2 J**	**14**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**5.7**	--	5 U	--	5 U	**2.1 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**31**	--	**71**	--	**3.6 J**	**6.4**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**6.4**	--	**15**	--	5 U	**5.7**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**44**	--	**51**	--	**3.2 J**	**5.7**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**19**	--	**21**	--	**0.59 J**	**0.83 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5				150		**20**	--	**26**	--	**2.8 J**	**4.9 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**55**	--	**83**	--	**3.6 J**	**14**
Toxicity Equivalency Factor (µg/kg)			**100**					**31.62**	--	**50.86**	--	**3.50**	**12.06**

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building							**B41**	**B41**	**B41**	**B41**	**B41**	**B41**
	Sample Location							**SS-9**	**SS-9b**	**SS-10**	**SS-11**	**SS-11b**	**SS-11b**
	Sample Date							**3/31/2009**	**11/14/2009**	**3/31/2009**	**3/31/2009**	**11/14/2009**	**11/14/2009**
	Sample Number							**B41:SS-9:142**	**B41:SS-9b:654**	**B41:SS-10:143**	**B41:SS-11:144**	**B41:SS-11b:655**	**B41:SS-11b:656**
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Diesel Range Organics	NWTPH-Dx	SW333	2000					**220 J**	**220 J**	**34 J**	**290 Z**	**110 J**	**220 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**1500 J**	**2500 J**	**330 O**	**1400 O**	**770 J**	**1100 J**
Polychlorinated biphenyls (PCBs) (mg/kg)													
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.01 U	--	0.05 U,i	0.012 U	--	--
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.01 U,i	--	0.05 U,i	0.012 U,i	--	--
PCB-aroclor 1262	SW8082	37324-23-5						0.01 U,i	--	0.069 U,i	0.012 U	--	--
PCB-aroclor 1268	SW8082	11100-14-4						0.01 U,i	--	0.05 U	0.012 U	--	--
Total PCBs			1					ND	--	ND	ND	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Acenaphthene	SW8270CSIM	83-32-9					3400000	**0.58 J**	--	5 U	**0.3 J**	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1.2 J**	--	**0.35 J**	**0.65 J**	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**3.1 J**	--	5 U	5.9 U	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**12**	--	**.89 J**	**2.7 J**	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**23**	--	**.92 J**	**6.2**	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**32**	--	**2.4 J**	**7.3**	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**26**	--	**1.7 J**	**5.7 J**	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**4.8 J**	--	5 U	5.9 U	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		**39**	--	**2.4 J**	**11**	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**9.6**	--	5 U	**1.4 J**	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**20**	--	**3 J**	**5.9 J**	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.9 J**	--	5 U	5.9 U	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5				150		**9.4**	--	**1.6 J**	**2.3 J**	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**43**	--	**2.8 J**	**6.8**	--	--
Toxicity Equivalency Factor (µg/kg)			**100**					**30.17**	--	**1.93**	**7.97**	--	--

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Date Sample Number							B41 SS-12 3/31/2009 B41:SS-12:145	B41 SS-12b 11/14/2009 B41:SS-12b:657	B41 SS-13 3/31/2009 B41:SS-13:146	B41 SS-14 3/31/2009 B41:SS-14:147	B41 SS-15 3/31/2009 B41:SS-15:148	B41 SS-15 3/31/2009 B41:SS-15:658
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Diesel Range Organics	NWTPH-Dx	SW333	2000					**340 Z**	**360 J**	**190 H**	**57 H**	**52 H**	**730 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**3600 Z**	**2900 J**	**1900 O**	**440 O**	**410 O**	**3000 J**
Polychlorinated biphenyls (PCBs) (mg/kg)													
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.018 U	--	0.01 U	0.01 U	0.01 U	--
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.018 U	--	0.01 U	0.01 U	0.01 U	--
PCB-aroclor 1262	SW8082	37324-23-5						0.018 U	--	0.01 U,i	0.011 U,i	0.012 U,i	--
PCB-aroclor 1268	SW8082	11100-14-4						0.018 U	--	**0.015**	**0.012**	**0.013**	--
Total PCBs			1					ND	--	**0.105**	**0.103**	**0.105**	--
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Acenaphthene	SW8270CSIM	83-32-9					3400000		--	**2.4 J**	**0.8 J**	**0.97 J**	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**1 J**	--	**2.9 J**	**1.6 J**	**1.8 J**	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	8.6 U	--	**3.3 J**	**1.8 J**	**1.7 J**	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**2.9 J**	--	**8.5**	**6.1**	**5.8**	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**2.1 J**	--	**28**	**13**	**7.3**	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**5.2 J**	--	**35**	**20**	**13**	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**3 J**	--	**34**	**19**	**8.7**	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**.84 J**	--	5 U	**4.9 J**	**3.7 J**	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		**5.9 J**	--	**17**	**11**	**12**	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		8.6 U	--	**18**	**7.5**	**1.9 J**	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**10**	--	**17**	**17**	**17**	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	8.6 U	--	**6.7**	**1.9 J**	**2 J**	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5				150		3.1 U	--	**24**	**9.6**	**8.1**	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**6.8 J**	--	**29**	**16**	**14**	--
Toxicity Equivalency Factor (µg/kg)			**100**					**3.79**	--	**36.97**	**17.92**	**10.67**	--

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL										
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1						
	Building Sample Location Sample Date Sample Number							B41 SS-16 11/14/2009 B41:SS-16:659	B41 SS-16 11/14/2009 B41:SS-16:660	B41 SS-17 11/14/2009 B41:SS-17:661	B41 SS-18 11/14/2009 B41:SS-18:662	B41 SS-19 11/14/2009 B41:SS-19:663	B41 SS-20 11/14/2009 B41:SS-20:664
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/kg)													
Diesel Range Organics	NWTPH-Dx	SW333	2000					**410 H**	**460 H**	**700 DH**	20 U	**120 J**	**51 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**840 O**	**910 O**	**4400 DO**	**180 J**	**1400 J**	**570 J**
Polychlorinated biphenyls (PCBs) (mg/kg)													
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	--	--	--	--	--	--
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		--	--	--	--	--	--
PCB-aroclor 1262	SW8082	37324-23-5						--	--	--	--	--	--
PCB-aroclor 1268	SW8082	11100-14-4						--	--	--	--	--	--
Total PCBs			1					--	--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)													
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5				150		--	--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)			**100**					--	--	--	--	--	--

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B41 SS-21 11/14/2009 B41:SS-21:665	B41 SS-22 11/14/2009 B41:SS-22:666	B41 SS-22 11/14/2009 B41:SS-22:667	B41 SS-23 11/14/2009 B41:SS-23:668	B41 SS-24 11/14/2009 B41:SS-24:669
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					**650 J**	**70 J**	**41 J**	**32 J**	**110 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**5600 J**	**670 J**	**370 J**	**310 J**	**1300 J**
Polychlorinated biphenyls (PCBs) (mg/kg)												
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	--	--	--	--	--
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		--	--	--	--	--
PCB-aroclor 1262	SW8082	37324-23-5						--	--	--	--	--
PCB-aroclor 1268	SW8082	11100-14-4						--	--	--	--	--
Total PCBs			1					--	--	--	--	--
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthene	SW8270CSIM	83-32-9					3400000	--	--	--	--	--
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			--	--	--	--	--
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	--	--	--	--	--
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		--	--	--	--	--
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		--	--	--	--	--
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		--	--	--	--	--
Benzo(ghi)perylene	SW8270CSIM	191-24-2						--	--	--	--	--
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		--	--	--	--	--
Chrysene	SW8270CSIM	218-01-9			NR	15000		--	--	--	--	--
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		--	--	--	--	--
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	--	--	--	--	--
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5				150		--	--	--	--	--
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	--	--	--	--	--
Toxicity Equivalency Factor (µg/kg)			**100**					--	--	--	--	--

TABLE 6-21
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 41,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

D = The reported result is from a dilution.

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

i = The method reporting limit/method detection limit or limit of quantitation/limit of detection has been elevated due to a matrix interference.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not detected

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

P = The gas chromatograph or high-pressure liquid chromatography confirmation criteria were exceeded. The relative percent difference is greater than 40 percent between the two analytical results.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-22
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 49,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B49 SS-1 3/31/2009 B49:SS-1:150	B49 SS-2 3/31/2009 B49:SS-2:151	B49 SS-3 3/31/2009 B49:SS-3:152	B49 SS-4 3/31/2009 B49:SS-4:153
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**15 J**	**65 H**	**21 J**	14 U
Oil Range Organics	NWTPH-Dx	SW444	2000					**160 J**	**660 O**	**210 Z**	**130 J**
Polychlorinated biphenyls (PCBs) (mg/kg)											
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.01 U	0.01 U	0.01 U	0.01 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.01 U	0.01 U	0.01 U	0.01 U
PCB-aroclor 1262	SW8082	37324-23-5						0.01 U	0.01 U	0.01 U	0.01 U,i
PCB-aroclor 1268	SW8082	11100-14-4						0.01 U	0.01 U	0.01 U	0.01 U
Total PCBs			1					ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthene	SW8270CSIM	83-32-9					3400000	**1 J**	**0.8 J**	**0.32 J**	5 U
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			**8.5**	**4.9 J**	**0.68 J**	**0.25 J**
Anthracene	SW8270CSIM	120-12-7		NR	24000000		17000000	**14**	**7.5**	**1.1 J**	5 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**36**	**14**	**5.6**	**1.9 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**25**	**14**	**5**	**1.3 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**100**	**42**	**9.3**	**2.7 J**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**15**	**10**	**3.4 J**	**1.1 J**
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		**28**	**11**	**2.9 J**	**0.62 J**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**98**	**31**	**8.2**	**2.3 J**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**3.9 J**	**3 J**	**0.78 J**	5 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**180**	**21**	**11**	**3.1 J**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	**1.5 J**	**1.4 J**	**0.51 J**	5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**21**	**13**	**4.1 J**	**0.92 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**140**	**19**	**11**	**2.8 J**
Toxicity Equivalency Factor (µg/kg)			**100**					**44.87**	**22.61**	**7.35**	**2.19**

TABLE 6-22
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 49,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

Shaded text indicates concentration exceeds a screening value or regulatory criteria

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

i = The method report limit/method detection limit or limit of quantitation/limit of detection has been elevated due to a matrix interference.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not detected.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-23
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 65,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washinginton Method A Unrestricted Land Use	Soil Washinginton Method B-Carcinogen	Soil Washinginton Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B65 SS-1 3/31/2009 B65:SS-1:154	B65 SS-2 3/31/2009 B65:SS-2:155	B65 SS-3 3/31/2009 B65:SS-3:156	B65 SS-4 3/31/2009 B65:SS-4:157
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					11 U	7.4 U	9.7 U	**11 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**180 Z**	**120 J**	**160 J**	**180 Z**
Polychlorinated biphenyls (PCBs) (mg/kg)											
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.01 U	0.01 U	0.0099 U	0.01 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.01 U	0.01 U	0.0099 U	0.01 U
PCB-aroclor 1262	SW8082	37324-23-5						0.01 U	0.01 U	0.0099 U	0.01 U
PCB-aroclor 1268	SW8082	11100-14-4						0.01 U	0.01 U	0.0099 U	0.01 U
Total PCBs			1					ND	ND	ND	ND
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150.00		**0.96 J**	**0.63 J**	**0.56 J**	**0.56 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15.00		**0.85 J**	4.9 U	5 U	**0.37 J**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150.00		**1.5**	**1.1 J**	5 U	**0.68 J**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**0.81 J**	4.9 U	5 U	5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500.00		5 U	4.9 U	5 U	5 U
Chrysene	SW8270CSIM	218-01-9			NR	15000.00		**1 J**	**0.66 J**	5 U	**0.86 J**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15.00		5 U	4.9 U	5 U	5 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**1.2 J**	**0.66 J**	5 U	**0.75 J**
Fluorene	SW8270CSIM	86-73-7		NR	3200000		2300000	5 U	4.9 U	5 U	5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150.00		**0.61 J**	**0.38 J**	5 U	**0.42 J**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**1.2 J**	**0.45 J**	5 U	**0.53 J**
Toxicity Equivalency Factor (µg/kg)			**100**					**1.67**	**3.16**	**3.58**	**1.04**

TABLE 6-23
INDUSTRIAL COMPLEX AREA - TRANSFORMER AND GENERATOR BUILDING 65,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environnental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not detected

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-24
EAST PARCELS AREA - BUILDINGS 101 AND 102,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number							B101 SS-1 4/1/2009 B101:SS-1:158	B101 SS-2 4/1/2009 B101:SS-2:159	B101 SS-3 4/1/2009 B101:SS-3:160	B101 SS-4 4/1/2009 B101:SS-4:161	B101 SS-5 4/1/2009 B101:SS-5:162
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Diesel Range Organics	NWTPH-Dx	SW333	2000					**41 H**	**49 H**	**100 H**	**46 H**	**16 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**450 O**	**520 O**	**1300 O**	**740 O**	**220 Z**
Polychlorinated biphenyls (PCBs) (mg/kg)												
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.01 U	0.011 U	**0.011**	**0.0099 J**	0.01 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.01 U,i	0.011 U	**0.014 P**	**0.0059 J**	0.01 U
Total PCBs								**ND**	**ND**	**0.105**	**0.0958**	**ND**
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			5 U	5 U	4.9 U	5 U	**0.77 J**
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**2.8 J**	**3.1 J**	**4.5 J**	**18**	**3.1 J**
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**7**	**6.8**	**21**	**55**	**9.2**
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**4.5 J**	**4.3 J**	**11**	**27**	**6.5**
Benzo(ghi)perylene	SW8270CSIM	191-24-2						**11**	**13**	**28**	**97**	**16**
Chrysene	SW8270CSIM	218-01-9			NR	15000		**3.6 J**	**4.8 J**	**6.6**	**48**	**4.8 J**
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**2 J**	**2.1 J**	**4.70 J**	**9.8**	**2.1 J**
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**1.2 J**	**1.2 J**	**1.7 J**	**1.4 J**	**1 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**3 J**	**3.6 J**	**7.2**	**29**	**5.4**
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**2.8 J**	**2.8 J**	**3.9 J**	**14**	**3 J**
Toxicity Equivalency Factor (µg/kg)			**100**					**8.52**	**8.41**	**24.05**	**64.11**	**11.21**

TABLE 6-24
EAST PARCELS AREA - BUILDINGS 101 AND 102,
SURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Building Sample Location Sample Date Sample Number							B102 SS-1 4/1/2009 B102:SS-1:163	B102 SS-2 4/1/2009 B102:SS-2:164	B102 SS-3 4/1/2009 B102:SS-3:165	B102 SS-4 4/1/2009 B102:SS-4:166
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					8.9 U	10 U	**14 J**	9.7 U
Oil Range Organics	NWTPH-Dx	SW444	2000					**110 J**	**130 J**	**160 O**	**110 J**
Polychlorinated biphenyls (PCBs) (mg/kg)											
PCB-aroclor 1254	SW8082	11097-69-1		NR	1.6	0.22	1.1	0.01 U	0.01 U	0.0099 U	0.01 U
PCB-aroclor 1260	SW8082	11096-82-5		NR	NR	0.22		0.01 U	0.01 U	0.0099 U	0.01 U
Total PCBs								**ND**	**ND**	**ND**	**ND**
Polynuclear Aromatic Hydrocarbons (µg/kg)											
Acenaphthylene	SW8270CSIM	208-96-8		NR	4800000			4.9 U	4.9 U	5 U	4.9 U
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		**0.5 J**	4.9 U	5 U	4.9 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		**0.36 J**	4.9 U	**5.7**	4.9 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		**0.64 J**	4.9 U	**7.4**	4.9 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						4.9 U	4.9 U	**9.6**	4.9 U
Chrysene	SW8270CSIM	218-01-9			NR	15000		**0.8 J**	4.9 U	**16**	4.9 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		**0.36 J**	4.9 U	**4 J**	4.9 U
Fluoranthene	SW8270CSIM	206-44-0		NR	3200000		2300000	**0.77 J**	**0.73 J**	**1 J**	**0.69 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		**0.62 J**	4.9 U	**4.1 J**	4.9 U
Pyrene	SW8270CSIM	129-00-0		NR	2400000		1700	**0.45 J**	4.9 U	**1.9 J**	4.9 U
Toxicity Equivalency Factor (µg/kg)			**100**					**0.83**	**3.70**	**7.91**	**3.68**

TABLE 6-24
EAST PARCELS AREA - BUILDINGS 101 AND 102,
NOTES PAGE

Notes:

[(1)]Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criterion.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

H = The chromatographic fingerprint of the sample resembles a petroleum product but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.

i = The method reporting limit/method detection limit or limit of quantitation/limit of detection has been elevated due to a matrix interference.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = not detected

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

O = The chromatographic fingerprint of the sample resembles an oil but does not match the calibration standard.

P = The gas chromatograph or high-pressure liquid chromatography confirmation criteria were exceeded. The relative percent difference is greater than 40 percent between the two analytical results.

Z = The chromatographic fingerprint does not resemble a petroleum product.

TABLE 6-25
INDUSTRIAL COMPLEX AREA - TETRAETHYL LEAD DISPOSAL AREA, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Study Area Sample Location Sample Depth Sample Date Sample Number							TL SB-1 5 11/11/2009 TL:SB-1:5:335	TL SB-1 10 11/11/2009 TL:SB-1:10:336	TL SB-1 10 11/11/2009 TL:SB-1:10:337	TL SB-1 15 11/11/2009 TL:SB-1:15:338	TL SB-1 20 11/11/2009 TL:SB-1:20:339
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Oil Range Organics	NWTPH-Dx	SW444	2000					45 U	16 U	18 U	12 U	10 U
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**10.6**	**6.02**	**7.2**	**5.45**	**5.41**
Volatile Organic Compounds (µg/kg)												
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	36 U	28 U	0.64 U	21 U	14 U
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	8.9 U	**0.17 J**	**0.23 J**	**0.11 J**	3.5 U
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	8.9 U	7 U	**0.43 J**	5.3 U	3.5 U
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	8.9 U	7 U	**0.51 J**	5.3 U	3.5 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	8.9 U	7 U	7.3 U	5.3 U	3.5 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	36 U	28 U	**0.91 J**	21 U	14 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	8.9 U	**0.61 J**	**0.77 J**	**0.45 J**	**0.3 J**
Semi-volatile Organic Compounds (µg/kg)												
3,3'-Dichlorobenzidine	SW8270C	91-94-1	RND	2200	NR	1100		100 U	100 U	100 U	99 U	99 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	100 U	100 U	100 U	**9.1 J**	**22 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 U	10 U	10 U	9.9 U	9.9 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**1.2 J**	**1.5 J**	**3.2 J**	9.9 U	**1.5 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	30 U	**2 J**	30 U	30 U
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.5 U	2.5 U	**0.8 J**	2.5 U	2.5 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		2.5 U	2.5 U	**1.3 J**	2.5 U	2.5 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	2.5 U	**1.4 J**	2.5 U	2.5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.5 U	2.5 U	**1 J**	2.5 U	2.5 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	2.5 U	**0.97 J**	2.5 U	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.5 U	2.5 U	**0.98 J**	2.5 U	2.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89	**1.77**	1.89	1.89

TABLE 6-25
INDUSTRIAL COMPLEX AREA - TETRAETHYL LEAD DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Study Area Sample Location Sample Depth Sample Date Sample Number							TL SB-1 25 11/11/2009 TL:SB-1:25:340	TL SB-2 5 11/11/2009 TL:SB-2:5:341	TL SB-2 10 11/11/2009 TL:SB-2:10:342	TL SB-2 15 11/11/2009 TL:SB-2:15:343	TL SB-2 20 11/11/2009 TL:SB-2:20:344
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Oil Range Organics	NWTPH-Dx	SW444	2000					9.3 U	33 U	11 U	12 U	5.5 U
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**3.53**	**6.41**	**6.14**	**5.88**	**4.78**
Volatile Organic Compounds (µg/kg)												
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	21 U	29 U	27 U	21 U	20 U
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	**0.18 J**	7.2 U	**0.16 J**	5.2 U	**0.086 J**
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	5.1 U	7.2 U	6.6 U	5.2 U	4.8 U
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	5.1 U	7.2 U	6.6 U	5.2 U	4.8 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.1 U	7.2 U	**0.33 J**	5.2 U	4.8 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	21 U	29 U	27 U	21 U	20 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.63 J**	7.2 U	**0.39 J**	**0.42 J**	**0.45 J**
Semi-volatile Organic Compounds (µg/kg)												
3,3'-Dichlorobenzidine	SW8270C	91-94-1	RND	2200	NR	1100		**12 J**	100 U	100 U	100 U	100 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**15 J**	**7.4 J**	100 U	**17 J**	**9.4 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	**1.4 J**	10 U	10 U	10 U	10 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			2.1 U	**1.6 J**	1.7 U	**1.1 J**	1.3 U
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	**2.3 J**	30 U	**2.4 J**	30 U	30 U
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	2.5 U	**1.4 J**	2.5 U	2.5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	2.5 U	**0.91 J**	2.5 U	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.5 U	2.5 U	**0.95 J**	2.5 U	2.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89	**1.82**	1.89	1.89

TABLE 6-25
INDUSTRIAL COMPLEX AREA - TETRAETHYL LEAD DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Study Area Sample Location Sample Depth Sample Date Sample Number							TL SB-2 25 11/11/2009 TL:SB-2:25:345	TL SB-3 5 11/11/2009 TL:SB-3:5:346	TL SB-3 5 11/11/2009 TL:SB-3:5:347	TL SB-3 10 11/11/2009 TL:SB-3:10:348	TL SB-3 15 11/11/2009 TL:SB-3:15:349
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Oil Range Organics	NWTPH-Dx	SW444	2000					6.2 U	**34 J**	**34 J**	9.1 U	16 U
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**3.98**	**6.53**	**5.21**	**6.47**	**7.38**
Volatile Organic Compounds (µg/kg)												
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	20 U	0.56 U	29 U	27 UJ	22 U
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	**0.076 J**	8.3 U	7.2 U	**0.13 J**	5.4 U
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	4.8 U	8.3 U	7.2 U	6.6 U	5.4 U
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	4.8 U	8.3 U	7.2 U	6.6 U	5.4 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	**0.21 J**	8.3 U	**0.3 J**	6.6 U	5.4 U
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	20 U	0.99 U	29 U	27 U	22 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.48 J**	8.3 U	7.2 U	**0.37 J**	**0.56 J**
Semi-volatile Organic Compounds (µg/kg)												
3,3'-Dichlorobenzidine	SW8270C	91-94-1	RND	2200	NR	1100		100 U	100 U	100 U	99 U	99 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**14 J**	**9.4 J**	100 U	99 U	**7.7 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 U	10 U	10 U	9.9 U	9.9 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			1.7 U	2.2 J U	1.6 U	2.8 U	**1.4 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	**2.7 J**	**2.5 J**	**3.4 J**	**2.3 J**	**2 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89	1.89	1.89	1.89

TABLE 6-25
INDUSTRIAL COMPLEX AREA - TETRAETHYL LEAD DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL									
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Study Area Sample Location Sample Depth Sample Date Sample Number							TL SB-3 20 11/11/2009 TL:SB-3:20:350	TL SB-3 25 11/11/2009 TL:SB-3:25:351	TL SB-4 4 11/11/2009 TL:SB-4:5:352	TL SB-4 10 11/11/2009 TL:SB-4:10:353	TL SB-4 15 11/11/2009 TL:SB-4:15:354
Analyte	**Method**	**CAS #**										
Petroleum Hydrocarbons (mg/kg)												
Oil Range Organics	NWTPH-Dx	SW444	2000					10 U	11 U	34 U	13 U	15 U
Metals (mg/kg)												
Lead	SW6020	7439-92-1	250	NR	NR		400	**5.38**	**4.49**	**6.88**	**5.96**	**6.36**
Volatile Organic Compounds (µg/kg)												
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	20 UJ	20 UJ	38 UJ	27 U	21 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	4.8 U	4.8 U	9.3 U	6.7 U	5.3 U
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	4.8 UJ	4.8 UJ	9.3 UJ	6.7 U	5.3 UJ
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	**0.55 J**	4.8 U	9.3 U	6.7 U	5.3 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	4.8 UJ	4.8 UJ	9.3 UJ	6.7 U	5.3 UJ
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	20 UJ	20 UJ	38 UJ	27 U	21 UJ
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.28 J**	**0.22 J**	9.3 U	**0.6 J**	**0.43 J**
Semi-volatile Organic Compounds (µg/kg)												
3,3'-Dichlorobenzidine	SW8270C	91-94-1	RND	2200	NR	1100		100 U	98 U	110 U	100 U	97 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**8.7 J**	98 U	**12 J**	100 U	97 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 U	9.8 U	11 U	10 U	9.7 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**1.5 J**	**1.1 J**	**1.4 J**	**1.5 J**	**1.6 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	**2.1 J**	**2 J**	31 U	30 U	30 U
Polynuclear Aromatic Hydrocarbons (µg/kg)												
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.5 U	2.5 U	2.6 U	2.5 U	2.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89	1.89	1.89	1.89

TABLE 6-25
INDUSTRIAL COMPLEX AREA - TETRAETHYL LEAD DISPOSAL AREA,
SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Study Area Sample Location Sample Depth Sample Date Sample Number							TL SB-4 20 11/11/2009 TL:SB-4:20:355	TL SB-4 25 11/11/2009 TL:SB-4:25:356
Analyte	**Method**	**CAS #**							
Petroleum Hydrocarbons (mg/kg)									
Oil Range Organics	NWTPH-Dx	SW444	2000					11 U	10 U
Metals (mg/kg)									
Lead	SW6020	7439-92-1	250	NR	NR		400	**5.83**	**3.79**
Volatile Organic Compounds (µg/kg)									
1,2,3-Trichlorobenzene	SW8260B	87-61-6					49000	24 UJ	19 UJ
1,2-Dichloroethane (EDC)	SW8260B	107-06-2		11000	1600000	430	33000	5.9 U	4.6 U
1,4-Dichlorobenzene	SW8260B	106-46-7		42000	NR	2400	3500000	5.9 UJ	4.6 UJ
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	5.9 U	4.6 U
Methyl t-butyl ether	SW8260B	1634-04-4	100			43000	17000000	5.9 UJ	4.6 UJ
Naphthalene	SW8260B	91-20-3	5000	NR	1600000	3600	140000	24 UJ	19 UJ
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.41 J**	**0.24 J**
Semi-volatile Organic Compounds (µg/kg)									
3,3'-Dichlorobenzidine	SW8270C	91-94-1	RND	2200	NR	1100		100 U	100 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	**11 J**	100 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 U	10 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			**1.3 J**	**1.6 J**
Phenol	SW8270C	108-95-2	RND	NR	48000000		18000000	30 U	**2.5 J**
Polynuclear Aromatic Hydrocarbons (µg/kg)									
Benz[a]anthracene	SW8270CSIM	56-55-3			NR	150		2.5 U	2.5 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2			NR	150		2.5 U	2.5 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2						2.5 U	2.5 U
Benzo(k)fluoranthene	SW8270CSIM	207-08-9			NR	1500		2.5 U	2.5 U
Dibenzo(a,h)anthracene	SW8270CSIM	53-70-3			NR	15		2.5 U	2.5 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5			NR	150		2.5 U	2.5 U
Benzo(a)pyrene	SW8270CSIM	50-32-8	100	140	NR	15		2.5 U	2.5 U
Toxicity Equivalency Factor (µg/kg)[1]			**100**					1.89	1.89

TABLE 6-25
INDUSTRIAL COMPLEX AREA - TETRAETHYL LEAD DISPOSAL AREA,
NOTES PAGE

Notes:

(1)Sum of the toxic equivalency factor (TEF) for each cPAH.

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

ND = Not detected

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER									
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Date Sample Number								AO Airport 3/28/2009 AO:Airport:09	AO B-14 3/28/2009 AO:B-14:01	AO B-21 4/3/2009 AO:B-21:31	AO B-21 11/23/2009 AO:B-21:900
Analyte	**Method**	**CAS #**										
Metals (mg/L)												
Arsenic (Total)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7			0.2 U	**0.13 J**
Arsenic (Dissolved)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7				**0.1 J**
Barium (Total)	EPA200.8	7440-39-3						2900			**6.81**	**7.34**
Barium (Dissolved)	EPA200.8	7440-39-3						2900				**7.14**
Cadmium (Total)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9			**0.019 B**	0.004 U
Cadmium (Dissolved)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9				0.003 U
Chromium (Total)	EPA200.8	7440-47-3	100	50	NR	NR					**0.08 B**	0.26 U
Chromium (Dissolved)	EPA200.8	7440-47-3	100	50	NR	NR						0.26 U
Copper (Total)	EPA200.8	7440-50-8	1300		NR	590.0		620				**20**
Copper (Dissolved)	EPA200.8	7440-50-8	1300		NR	590.0		620				**17.8**
Iron (Total)	EPA200.8	7439-89-6	NR		NR	NR		11000			**6.5 B**	**7.7**
Iron (Dissolved)	EPA200.8	7439-89-6	NR		NR	NR		11000				**2.2**
Lead (Total)	EPA200.8	7439-92-1	15	15	NR	NR			**0.136**	**0.41**	**2.13**	**1.02**
Lead (Dissolved)	EPA200.8	7439-92-1	15	15	NR	NR						**0.937**
Mercury (Total)	SW7471	7439-97-6	2	2	NR	4.8		0.6			0.05 U	0.02 UJ
Selenium (Total)	EPA200.8	7782-49-2						78			0.4 U	**0.4 J**
Selenium (Dissolved)	EPA200.8	7782-49-2						78				**0.4 J**
Silver (Total)	EPA200.8	7440-22-4						71	**0.027**	0.02 U	**0.015 B**	**0.033**
Silver (Dissolved)	EPA200.8	7440-22-4						71				**0.031**
Volatile Organic Compounds (ug/L)												
2-Butanone	SW8260B	78-93-3						4900	20 U	20 U	20 U	20 U
Acetone	SW8260B	67-64-1	NR		NR	800		12000	3.4 U	2.9 U	20 U	20 U
Chloromethane	SW8260B	74-87-3	NR		3.40	NR		190	0.5 U	0.5 U	**0.06 J**	0.5 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		860	0.5 U	0.5 U	0.5 U	**0.16 J**
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.44	2.6	0.5 U	0.5 U	**0.25 J**	0.5 U
Semi-volatile Organic Compounds (ug/L)												
Benzoic Acid	SW8270C	65-85-0			NR	64000		58000	4.9 U	4.8 U	5 U	4.8 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.30	320	0.071	4.6	**0.37 J**	**0.21 J**	**24 D**	**0.48 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200	14	1200	0.2 U	0.2 U	**0.027 J**	0.19 U
Dibutyl phthalate	SW8270C	84-74-2						670	0.059 U	0.069 U	**0.037 J**	**0.028 J**
Diethyl Phthalate	SW8270C	84-66-2			NR	13000		11000	0.018 U	0.2 U	**0.017 J**	0.02 U

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER									
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Date Sample Number								AO Airport 3/28/2009 AO:Airport:09	AO B-14 3/28/2009 AO:B-14:01	AO B-21 4/3/2009 AO:B-21:31	AO B-21 11/23/2009 AO:B-21:900
Analyte	**Method**	**CAS #**										
Polynuclear Aromatic Hydrocarbons (ug/L)												
Acenaphthene	W8270CSIM	83-32-9	NR		NR	960		400	0.02 U	0.02 U	0.02 U	**0.025**
Anthracene	W8270CSIM	120-12-7	NR		NR	4800		1300	0.02 U	0.02 U	0.02 U	**0.0091 J**
Benz[a]anthracene	W8270CSIM	56-55-3	NR		*	NR	0.029		0.02 U	0.02 U	0.02 U	**0.007 J**
Fluoranthene	W8270CSIM	206-44-0	NR		NR	640		630	0.02 U	0.02 U	0.02 U	**0.028**
Fluorene	W8270CSIM	86-73-7	NR		NR	640		220	0.02 U	0.02 U	0.02 U	**0.036**
Pyrene	W8270CSIM	129-00-0	NR		NR	480		87	0.02 U	0.02 U	0.02 U	**0.016 J**
Field Parameters												
Total Dissolved Solids (g/l)									**0.087**	**0.066**	**0.067**	**0.07**
Oxidation Reduction Potential (Mv)									**145.8**	**243.2**	**343**	**229**
Temperature (^{o}C)									**6.24**	**8.80**	**8.42**	**9.7**
Specific Conductivity (mS/cm)									**134**	**101**	**102**	**11**
Dissolved Oxygen (mg/L)									**5.12**	**7.73**	**7.55**	**8.12**
pH									**6.66**	**6.03**	**6.25**	**4.76**
Turbidity (NTU)									**0.27**	**0.05**	< 1.0	**10.1**
Color									clear	clear	clear	clear

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER									
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Date Sample Number								AO MW-10 3/30/2009 AO:MW-10:13	AO MW-10 4/29/2010 AO:MW-10:500	AO MW-7 4/2/2009 AO:MW-7:24	AO MW-9 4/3/2009 AO:MW-9:29
Analyte	**Method**	**CAS #**										
Metals (mg/L)												
Arsenic (Total)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7	**4.6**		0.2 U	
Arsenic (Dissolved)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7	**1**		0.2 U	
Barium (Total)	EPA200.8	7440-39-3						2900	**216**		**12.5**	
Barium (Dissolved)	EPA200.8	7440-39-3						2900	**11.7**		**5.17**	
Cadmium (Total)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9	**0.375**		**0.008 J**	
Cadmium (Dissolved)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9	**0.047**		**0.008 J**	
Chromium (Total)	EPA200.8	7440-47-3	100	50	NR	NR			**21.1**		**2.26**	
Chromium (Dissolved)	EPA200.8	7440-47-3	100	50	NR	NR			**1.45**		**0.19 B**	
Copper (Total)	EPA200.8	7440-50-8	1300		NR	590.0		620				
Copper (Dissolved)	EPA200.8	7440-50-8	1300		NR	590.0		620				
Iron (Total)	EPA200.8	7439-89-6	NR		NR	NR		11000	**40800**		**1530**	
Iron (Dissolved)	EPA200.8	7439-89-6	NR		NR	NR		11000	**968**		**12.4 B**	
Lead (Total)	EPA200.8	7439-92-1	15	15	NR	NR			**53.1**	**0.166**	**0.331**	**0.668**
Lead (Dissolved)	EPA200.8	7439-92-1	15	15	NR	NR			**1.33**	**0.101**	0.011 B U	**0.008 B**
Mercury (Total)	SW7471	7439-97-6	2	2	NR	4.8		0.6	**0.13 B**		0.05 U	
Selenium (Total)	EPA200.8	7782-49-2						78	**1.5 B**		0.4 U	
Selenium (Dissolved)	EPA200.8	7782-49-2						78	0.4 U		0.4 U	
Silver (Total)	EPA200.8	7440-22-4						71	**0.317**		0.011 B U	**0.012 B**
Silver (Dissolved)	EPA200.8	7440-22-4						71	**0.01 B**		0.005 U	0.005 U
Volatile Organic Compounds (ug/L)												
2-Butanone	SW8260B	78-93-3						4900	20 U		**20 R**	20 U
Acetone	SW8260B	67-64-1	NR		NR	800		12000	6.7 U		**20 R**	20 U
Chloromethane	SW8260B	74-87-3	NR		3.40	NR		190	0.5 U		0.5 U	0.5 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		860	0.08 U		0.27 U	0.2 U
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.44	2.6	0.5 U		0.5 U	0.5 U
Semi-volatile Organic Compounds (ug/L)												
Benzoic Acid	SW8270C	65-85-0			NR	64000		58000	4.8 U		4.8 U	**1.4 J**
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.30	320	0.071	4.6	**0.25 J**		**0.28 J**	**0.23 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200	14	1200	0.2 U		0.19 U	**0.037 J**
Dibutyl phthalate	SW8270C	84-74-2						670	0.095 U		**0.13 J**	**0.25**
Diethyl Phthalate	SW8270C	84-66-2			NR	13000		11000	0.029 U		**0.026 J**	**0.032 J**

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER									
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Date Sample Number								AO MW-10 3/30/2009 AO:MW-10:13	AO MW-10 4/29/2010 AO:MW-10:500	AO MW-7 4/2/2009 AO:MW-7:24	AO MW-9 4/3/2009 AO:MW-9:29
Analyte	**Method**	**CAS #**										
Polynuclear Aromatic Hydrocarbons (ug/L)												
Acenaphthene	W8270CSIM	83-32-9	NR		NR	960		400	0.02 U		0.019 U	0.019 U
Anthracene	W8270CSIM	120-12-7	NR		NR	4800		1300	0.02 U		0.019 U	0.019 U
Benz[a]anthracene	W8270CSIM	56-55-3	NR		*	NR	0.029		0.02 U		0.019 U	0.019 U
Fluoranthene	W8270CSIM	206-44-0	NR		NR	640		630	0.02 U		0.019 U	0.019 U
Fluorene	W8270CSIM	86-73-7	NR		NR	640		220	0.02 U		0.019 U	0.019 U
Pyrene	W8270CSIM	129-00-0	NR		NR	480		87	**0.004 J**		0.019 U	0.019 U
Field Parameters												
Total Dissolved Solids (g/l)									**0.07**	**0.061**	**0.055**	**0.105**
Oxidation Reduction Potential (Mv)									**114.0**	**236.7**	**221.9**	**129.2**
Temperature (^{o}C)									**9.91**	**10.49**	**8.72**	**10.61**
Specific Conductivity (mS/cm)									**151**	**94**	**85.0**	**162**
Dissolved Oxygen (mg/L)									**4.65**	**13.32**	**8.29**	**4.67**
pH									**6.23**	**5.89**	**5.79**	**6.79**
Turbidity (NTU)									**3926.0**	**1.52**	**10.0**	**5.0**
Color									brown	clear	clear	clear

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER									
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Date Sample Number								WP B-24 3/30/2009 WP:B-24:11	WP MW-6 4/3/2009 WP:MW-6:30	OW B-26 4/3/2009 OW:B-26:35	OW B-6 4/3/2009 OW:B-6:33
Analyte	**Method**	**CAS #**										
Metals (mg/L)												
Arsenic (Total)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7	**0.2**			
Arsenic (Dissolved)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7				
Barium (Total)	EPA200.8	7440-39-3						2900	**6.59**			
Barium (Dissolved)	EPA200.8	7440-39-3						2900				
Cadmium (Total)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9	0.005 U			
Cadmium (Dissolved)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9				
Chromium (Total)	EPA200.8	7440-47-3	100	50	NR	NR			**0.75**			
Chromium (Dissolved)	EPA200.8	7440-47-3	100	50	NR	NR						
Copper (Total)	EPA200.8	7440-50-8	1300		NR	590.0		620				
Copper (Dissolved)	EPA200.8	7440-50-8	1300		NR	590.0		620				
Iron (Total)	EPA200.8	7439-89-6	NR		NR	NR		11000	**50.5**			
Iron (Dissolved)	EPA200.8	7439-89-6	NR		NR	NR		11000				
Lead (Total)	EPA200.8	7439-92-1	15	15	NR	NR			**0.529**	**0.024**	**0.906**	**0.892**
Lead (Dissolved)	EPA200.8	7439-92-1	15	15	NR	NR				**0.05**		
Mercury (Total)	SW7471	7439-97-6	2	2	NR	4.8		0.6	0.05 U			
Selenium (Total)	EPA200.8	7782-49-2						78	**0.7 B**			
Selenium (Dissolved)	EPA200.8	7782-49-2						78				
Silver (Total)	EPA200.8	7440-22-4						71	0.009 U	0.005 U	0.005 U	0.005 U
Silver (Dissolved)	EPA200.8	7440-22-4						71		0.005 U		
Volatile Organic Compounds (ug/L)												
2-Butanone	SW8260B	78-93-3						4900	20 U	20 U	20 U	20 U
Acetone	SW8260B	67-64-1	NR		NR	800		12000	20 U	20 U	20 U	20 U
Chloromethane	SW8260B	74-87-3	NR		3.40	NR		190	0.5 U	**0.06 J**	**0.13 J**	0.5 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		860	0.5 U	0.15 U	0.5 U	0.5 U
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.44	2.6	0.5 U	0.5 U	0.5 U	0.5 U
Semi-volatile Organic Compounds (ug/L)												
Benzoic Acid	SW8270C	65-85-0			NR	64000		58000	5 U	5.3 U	4.9 U	5 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.30	320	0.071	4.6	**0.2 J**	1.1 U	0.98 U	0.99 U
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200	14	1200	0.2 U	0.21 U	0.2 U	**0.02 J**
Dibutyl phthalate	SW8270C	84-74-2						670	0.071 U	**0.047 J**	**0.039 J**	**0.032 J**
Diethyl Phthalate	SW8270C	84-66-2			NR	13000		11000	0.024 U	**0.015 J**	**0.032 J**	**0.013 J**

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER									
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Date Sample Number								WP B-24 3/30/2009 WP:B-24:11	WP MW-6 4/3/2009 WP:MW-6:30	OW B-26 4/3/2009 OW:B-26:35	OW B-6 4/3/2009 OW:B-6:33
Analyte	**Method**	**CAS #**										
Polynuclear Aromatic Hydrocarbons (ug/L)												
Acenaphthene	W8270CSIM	83-32-9	NR		NR	960		400	0.02 U	0.022 U	0.021 U	0.021 U
Anthracene	W8270CSIM	120-12-7	NR		NR	4800		1300	0.02 U	0.022 U	0.021 U	0.021 U
Benz[a]anthracene	W8270CSIM	56-55-3	NR		*	NR	0.029		0.02 U	0.0042 U	0.021 U	0.004 U
Fluoranthene	W8270CSIM	206-44-0	NR		NR	640		630	0.02 U	0.022 U	0.021 U	**0.0057 J**
Fluorene	W8270CSIM	86-73-7	NR		NR	640		220	0.02 U	0.022 U	0.021 U	0.021 U
Pyrene	W8270CSIM	129-00-0	NR		NR	480		87	0.02 U	**0.0043 J**	0.021 U	**0.0042 J**
Field Parameters												
Total Dissolved Solids (g/l)									**0.062**	**0.061**	**0.079**	**0.06**
Oxidation Reduction Potential (Mv)									**119.3**	**347.6**	**213.9**	**288.6**
Temperature (^{o}C)									**9.13**	**10.14**	**6.55**	**8.86**
Specific Conductivity (mS/cm)									**96**	**94.0**	**113**	**92**
Dissolved Oxygen (mg/L)									**7.88**	**8.84**	**5.15**	**9.29**
pH									**5.84**	**6.02**	**6.27**	**6.16**
Turbidity (NTU)									< 1.0	< 1.0		**-2.1**
Color									clear	clear	clear	clear

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER						
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	
	Study Area Sample Location Sample Date Sample Number								EP MW-8 4/1/2009 EP:MW-8:21
Analyte	**Method**	**CAS #**							
Metals (mg/L)									
Arsenic (Total)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7	
Arsenic (Dissolved)	EPA200.8	7440-38-2	10	5	0.058	4.80	0.045	4.7	
Barium (Total)	EPA200.8	7440-39-3						2900	
Barium (Dissolved)	EPA200.8	7440-39-3						2900	
Cadmium (Total)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9	
Cadmium (Dissolved)	EPA200.8	7440-43-9	5	5	NR	8.0		6.9	
Chromium (Total)	EPA200.8	7440-47-3	100	50	NR	NR			
Chromium (Dissolved)	EPA200.8	7440-47-3	100	50	NR	NR			
Copper (Total)	EPA200.8	7440-50-8	1300		NR	590.0		620	
Copper (Dissolved)	EPA200.8	7440-50-8	1300		NR	590.0		620	
Iron (Total)	EPA200.8	7439-89-6	NR		NR	NR		11000	
Iron (Dissolved)	EPA200.8	7439-89-6	NR		NR	NR		11000	
Lead (Total)	EPA200.8	7439-92-1	15	15	NR	NR			**0.496**
Lead (Dissolved)	EPA200.8	7439-92-1	15	15	NR	NR			0.003 U
Mercury (Total)	SW7471	7439-97-6	2	2	NR	4.8		0.6	
Selenium (Total)	EPA200.8	7782-49-2						78	
Selenium (Dissolved)	EPA200.8	7782-49-2						78	
Silver (Total)	EPA200.8	7440-22-4						71	0.016 B U
Silver (Dissolved)	EPA200.8	7440-22-4						71	0.005 U
Volatile Organic Compounds (ug/L)									
2-Butanone	SW8260B	78-93-3						4900	20 UJ
Acetone	SW8260B	67-64-1	NR		NR	800		12000	**20 R**
Chloromethane	SW8260B	74-87-3	NR		3.40	NR		190	0.5 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		860	0.1 U
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.44	2.6	0.5 U
Semi-volatile Organic Compounds (ug/L)									
Benzoic Acid	SW8270C	65-85-0			NR	64000		58000	4.8 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.30	320	0.071	4.6	**0.51 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200	14	1200	0.19 U
Dibutyl phthalate	SW8270C	84-74-2						670	**0.11 J**
Diethyl Phthalate	SW8270C	84-66-2			NR	13000		11000	**0.017 J**

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
ADMINISTRATION AND OPERATIONS AREA

			SCREENING CRITERIA FOR GROUNDWATER						
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1	
	Study Area **Sample Location** **Sample Date** **Sample Number**								**EP** **MW-8** **4/1/2009** **EP:MW-8:21**
Analyte	**Method**	**CAS #**							
Polynuclear Aromatic Hydrocarbons (ug/L)									
Acenaphthene	W8270CSIM	83-32-9	NR		NR	960		400	0.019 U
Anthracene	W8270CSIM	120-12-7	NR		NR	4800		1300	0.019 U
Benz[a]anthracene	W8270CSIM	56-55-3	NR		*	NR	0.029		0.019 U
Fluoranthene	W8270CSIM	206-44-0	NR		NR	640		630	0.019 U
Fluorene	W8270CSIM	86-73-7	NR		NR	640		220	0.019 U
Pyrene	W8270CSIM	129-00-0	NR		NR	480		87	0.019 U
Field Parameters									
Total Dissolved Solids (g/l)									**0.052**
Oxidation Reduction Potential (Mv)									**233**
Temperature (^{o}C)									**9.66**
Specific Conductivity (mS/cm)									**81.0**
Dissolved Oxygen (mg/L)									**8.15**
pH									**5.74**
Turbidity (NTU)									**39.0**
Color									clear

TABLE 6-26
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/l = milligrams per liter

µg/l = micrograms per liter

NR = not researched

Data Validation Qualifiers:

B = The analyte was found in the associated method blank at a level that is significant relative to the sample result.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**DOD-Ni**	**DOD-Ni**	**DOD-Ni**	**MW-1**	**MW-1**
	Sample Date										**3/31/2009**	**3/31/2009**	**3/31/2009**	**4/2/2009**	**12/16/2010**
	Sample Number										**IC:DOD-Ni:16**	**IC:DOD-Ni:17**	**IC:DOD-Ni:18**	**IC:MW-1:23**	**IC:MW-1:52**
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/L)															
Diesel Range Organics	NWTPH-Dx	SW333		500											
Oil Range Organics	NWTPH-Dx	SW444		500											
Metals (ug/L)															
Arsenic	EPA200.8	7440-38-2	10	5	0.058	4.8			0.045	4.7					
Barium	EPA200.8	7440-39-3								2900					
Cadmium	EPA200.8	7440-43-9	5	5	NR	8				6.9					
Chromium	EPA200.8	7440-47-3	100	50	NR	NR									
Iron	EPA200.8	7439-89-6	NR		NR	NR				11000					
Lead	EPA200.8	7439-92-1	15	15	NR	NR					**0.113**	**0.11**		0.02 U	
Lead Dissolved	EPA200.8	7439-92-1	15	15	NR	NR								0.009 U	
Manganese	EPA200.8	7439-96-5								320					
Selenium	EPA200.8	7782-49-2								78					
Silver	EPA200.8	7440-22-4								71	0.02 U	0.02 U		0.02 U	
Volatile Organic Compounds (ug/L)															
2-Butanone	SW8260B	78-93-3								4900	**20 R**	**20 R**	**20 R**	**20 R**	20 UJ
2-Chlorotoluene	SW8260B	95-49-8								180	2 U	2 U	2 U	2 U	2 UJ
4-Chlorotoluene	SW8260B	106-43-4								190	2 U	2 U	2 U	2 U	2 UJ
Acetone	SW8260B	67-64-1	NR		NR	800				12000	3.6 UJ	3 UJ	**20 R**	**20 R**	20 UJ
Acrylonitrile	SW8260B	107-13-1	NR		0.081	8			0.045	4.1	**50 R**	**50 R**	**50 R**	**50 R**	50 UJ
Benzene	SW8260B	71-43-2	NR	5	0.8	32	2.40	100	0.390	29	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Bromobenzene	SW8260B	108-86-1								54	2 U	2 U	2 U	2 U	2 UJ
Bromochloromethane	SW8260B	74-97-5									0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Bromoform	SW8260B	75-25-2	80		5.5	160			7.9	290	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Bromomethane	SW8260B	74-83-9	NR		NR	11				7.0	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800				720	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
Carbon Tetrachloride	SW8260B	56-23-5	5		0.625	32	0.22		0.390	40	**6.7 J**	**6.8 J**	0.5 U	**1.6**	**0.84 J**
Chlorobenzene	SW8260B	108-90-7	100		NR	160				72	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Chloroethane	SW8260B	75-00-3									0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Chloroform	SW8260B	67-66-3	80		7.2	80			0.19	84	0.21 U	0.2 U	0.5 U	0.08 U	0.5 UJ
Chloromethane	SW8260B	74-87-3	NR		3.0	NR				190	0.5 U	0.5 U	0.5 U	0.5 U	0.82 UJ
cis-1,2-Dichloroethene	SW8260B	156-59-2						160		28	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Dibromochloromethane	SW8260B	124-48-1									0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Dibromomethane	SW8260B	74-95-3								7.9	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Dichlorobromomethane	SW8260B	75-27-4	80		0.52	160			0.120	290	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**DOD-Ni**	**DOD-Ni**	**DOD-Ni**	**MW-1**	**MW-1**
	Sample Date										**3/31/2009**	**3/31/2009**	**3/31/2009**	**4/2/2009**	**12/16/2010**
	Sample Number										**IC:DOD-Ni:16**	**IC:DOD-Ni:17**	**IC:DOD-Ni:18**	**IC:MW-1:23**	**IC:MW-1:52**
Analyte	**Method**	**CAS #**													
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800		2800	1.3	670	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Hexachlorobutadiene	SW8260B	87-68-3	NR		0.56	1.6			0.26	4.7	2 U	2 U	2 U	2 U	2 UJ
Isopropylbenzene (Cumene)	SW8260B	98-82-8								390	2 U	2 U	2 U	0.04 U	2 UJ
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000				190	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Methyl isobutyl ketone	SW8260B	108-10-1								1000	**20 R**	**20 R**	**20 R**	**20 R**	20 UJ
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR					2 UJ	2 UJ	2 UJ	0.06 U	2 UJ
Styrene	SW8260B	100-42-5	100		1.5	1600				1100	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
tert-Butylbenzene	SW8260B	98-06-6	NR		NR	NR					2 U	2 U	2 U	2 U	2 UJ
Tetrachloroethene	SW8260B	127-18-4	5	5	0.081	80	1	40	0.07	84	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Toluene	SW8260B	108-88-3	1000	1000	NR	640		1500		860	0.5 U	0.5 U	0.5 U	0.07 U	0.06 UJ
trans-1,2-Dichloroethene	SW8260B	156-60-5						130		86	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
trans-1,3-Dichloropropene	SW8260B	10061-02-6							0.41	38	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
trans-1,4-Dichloro-2-butene	SW8260B	110-57-6							0.001		10 U	10 U	10 U	10 U	10 UJ
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.42	67	0.44	2.6	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
Vinyl Chloride	SW8260B	75-01-4	2		0.029	24	0.35	57	0.015	36					0.5 UJ
Semi-volatile Organic Compounds (ug/L)															
1-Methylnaphthalene	SW8270C	90-12-0			NR	NR			0.97	460	0.2 UJ	0.2 UJ		0.21 UJ	
2,4-Dimethylphenol	SW8270C	105-67-9			NR	160				270	3.9 UJ	3.9 UJ		4.1 UJ	
2,4-Dinitrophenol	SW8270C	51-28-5			NR	32				30	**3.9 R**	**3.9 R**		**4.1 R**	
3,3'-Dichlorobenzidine	SW8270C	91-94-1			0.20	NR			0.11		2 U	2 U		2.1 U	
4-Chloroaniline	SW8270C	106-47-8			NR	32			0.32	59	0.2 U	0.2 U		0.21 U	
Aniline	SW8270C	62-53-3			7.7	NR			12.00	110	0.97 U	0.97 U		1.1 U	
Benzoic Acid	SW8270C	65-85-0			NR	64000				58000	4.9 U	4.9 U		5.1 U	
Benzyl Alcohol	SW8270C	100-51-6			NR	2400				1500	0.49 U	0.49 U		0.51 U	
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.3	320			0.071	4.6	0.97 U	0.97 U		1.1 U	
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200			14	1200	0.2 U	0.2 U		0.21 U	
Dibutyl Phthalate	SW8270C	84-74-2								670	**0.025 J**	**0.024 J**		**0.053 J**	
Diethyl Phthalate	SW8270C	84-66-2			NR	13000				11000	0.2 U	0.2 U		0.21 U	
Dimethyl Phthalate	SW8270C	131-11-3			NR	16000					0.2 U	0.2 U		0.21 U	
Hexachlorocyclopentadiene	SW8270C	77-47-4			NR	18				22	0.97 U	0.97 U		1.1 U	
Naphthalene	SW8270C	91-20-3		160	NR	160			0.14	6.10	0.2 U	0.2 U		0.21 U	
Pyridine	SW8270C	110-86-1			NR	8				15	4.9 U	4.9 U		5.1 U	
Polynuclear Aromatic Hydrocarbon (ug/L)															
Fluorene	SW8270CSIM	86-73-7	NR		NR	640				220	0.023 U	0.02 U		0.02 U	
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR			0.029		0.023 U	0.02 U		0.02 U	
Low-level Volatile Organic Compounds (ug/L)															
Vinyl Chloride	SW8260BSIM	75-01-4	2	0.2	0.029	24			0.015	36	20 U	20 U	**0.28**	20 U	20 U
Total Organic Carbon	EPA415.1	NA									**0.4 J**	**0.34 J**		**0.6**	
Field Parameters															
Total Dissolved Solids (g/l)											0.06	0.06	0.06	0.059	0.056
Oxidation Reduction Potential (mV)											202.6	202.6	202.6	355	253.2
Temperature (^{o}C)											10.51	10.51	10.51	10.20	10.31

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area Sample Location Sample Date Sample Number										IC DOD-Ni 3/31/2009 IC:DOD-Ni:16	IC DOD-Ni 3/31/2009 IC:DOD-Ni:17	IC DOD-Ni 3/31/2009 IC:DOD-Ni:18	IC MW-1 4/2/2009 IC:MW-1:23	IC MW-1 12/16/2010 IC:MW-1:52
Analyte	**Method**	**CAS #**													
Specific Conductivity (mS/cm)											92.0	92.0	92.0	91.0	91.0
Dissolved Oxygen (mg/L)											8.99	8.99	8.99	8.11	8.42
pH											6.04	6.04	6.04	6.20	6.07
Turbidity (NTU)											< 1.0	< 1.0	< 1.0	5.60	1.95
Color											clear	clear	clear	clear	clear

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-2**	**MW-2**	**MW-3**	**MW-3**	**MW-11**
	Sample Date										**4/2/2009**	**12/18/2010**	**4/1/2009**	**12/16/2010**	**3/29/2009**
	Sample Number										**IC:MW-2:26**	**IC:MW-2:57**	**IC:MW-3:20**	**IC:MW-3:53**	**IC:MW-11:05**
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/L)															
Diesel Range Organics	NWTPH-Dx	SW333		500											
Oil Range Organics	NWTPH-Dx	SW444		500											
Metals (ug/L)															
Arsenic	EPA200.8	7440-38-2	10	5	0.058	4.8			0.045	4.7					
Barium	EPA200.8	7440-39-3								2900					
Cadmium	EPA200.8	7440-43-9	5	5	NR	8				6.9					
Chromium	EPA200.8	7440-47-3	100	50	NR	NR									
Iron	EPA200.8	7439-89-6	NR		NR	NR				11000					
Lead	EPA200.8	7439-92-1	15	15	NR	NR					0.005 U		**0.678**		**0.128**
Lead Dissolved	EPA200.8	7439-92-1	15	15	NR	NR					0.004 U		0.003 U		
Manganese	EPA200.8	7439-96-5								320					
Selenium	EPA200.8	7782-49-2								78					
Silver	EPA200.8	7440-22-4								71	0.02 U		0.022 U		**0.01 B**
Volatile Organic Compounds (ug/L)															
2-Butanone	SW8260B	78-93-3								4900	**20 R**	20 UJ	20 UJ	20 UJ	20 U
2-Chlorotoluene	SW8260B	95-49-8								180	2 U	2 UJ	2 U	2 UJ	2 U
4-Chlorotoluene	SW8260B	106-43-4								190	2 U	2 UJ	2 U	2 UJ	2 U
Acetone	SW8260B	67-64-1	NR		NR	800				12000	**20 R**	**7.3 J**	**20 R**	**4.9 J**	**3.4 J**
Acrylonitrile	SW8260B	107-13-1	NR		0.081	8			0.045	4.1	**50 R**	50 UJ	**50 R**	50 UJ	50 U
Benzene	SW8260B	71-43-2	NR	5	0.8	32	2.40	100	0.390	29	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Bromobenzene	SW8260B	108-86-1								54	2 U	2 UJ	2 U	2 UJ	2 U
Bromochloromethane	SW8260B	74-97-5									0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Bromoform	SW8260B	75-25-2	80		5.5	160			7.9	290	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Bromomethane	SW8260B	74-83-9	NR		NR	11				7.0	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800				720	0.5 UJ	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Carbon Tetrachloride	SW8260B	56-23-5	5		0.625	32	0.22		0.390	40	**2**	**1.7 J**	**4.7 J**	**2.8 J**	0.5 U
Chlorobenzene	SW8260B	108-90-7	100		NR	160				72	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Chloroethane	SW8260B	75-00-3									0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Chloroform	SW8260B	67-66-3	80		7.2	80			0.19	84	0.06 U	0.5 UJ	0.14 U	**0.1 J**	0.5 U
Chloromethane	SW8260B	74-87-3	NR		3.0	NR				190	0.5 U	**0.27 J**	**0.08 J**	0.71 UJ	0.5 U
cis-1,2-Dichloroethene	SW8260B	156-59-2						160		28	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Dibromochloromethane	SW8260B	124-48-1									0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Dibromomethane	SW8260B	74-95-3								7.9	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Dichlorobromomethane	SW8260B	75-27-4	80		0.52	160			0.120	290	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-2**	**MW-2**	**MW-3**	**MW-3**	**MW-11**
	Sample Date										**4/2/2009**	**12/18/2010**	**4/1/2009**	**12/16/2010**	**3/29/2009**
	Sample Number										**IC:MW-2:26**	**IC:MW-2:57**	**IC:MW-3:20**	**IC:MW-3:53**	**IC:MW-11:05**
Analyte	**Method**	**CAS #**													
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800		2800	1.3	670	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
Hexachlorobutadiene	SW8260B	87-68-3	NR		0.56	1.6			0.26	4.7	2 U	2 UJ	2 U	2 UJ	2 U
Isopropylbenzene (Cumene)	SW8260B	98-82-8								390	2 U	2 UJ	2 U	2 UJ	2 U
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000				190	0.5 U	0.5 UJ	0.08 U	0.5 UJ	0.5 U
Methyl isobutyl ketone	SW8260B	108-10-1								1000	**20 R**	20 UJ	**20 R**	20 UJ	20 U
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR					0.06 U	2 UJ	0.04 U	2 UJ	2 U
Styrene	SW8260B	100-42-5	100		1.5	1600				1100	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
tert-Butylbenzene	SW8260B	98-06-6	NR		NR	NR					2 U	2 UJ	2 U	2 UJ	2 U
Tetrachloroethene	SW8260B	127-18-4	5	5	0.081	80	1	40	0.07	84	0.5 U	0.5 UJ	0.19 U	0.5 UJ	0.5 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		1500		860	0.09 U	0.5 UJ	0.13 U	0.06 U	0.06 U
trans-1,2-Dichloroethene	SW8260B	156-60-5						130		86	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
trans-1,3-Dichloropropene	SW8260B	10061-02-6							0.41	38	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
trans-1,4-Dichloro-2-butene	SW8260B	110-57-6							0.001		10 U	10 UJ	10 U	10 UJ	10 U
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.42	67	0.44	2.6	0.5 U	0.5 UJ	**0.29 J**	0.5 UJ	0.5 U
Vinyl Chloride	SW8260B	75-01-4	2		0.029	24	0.35	57	0.015	36		0.5 UJ		0.5 UJ	
Semi-volatile Organic Compounds (ug/L)															
1-Methylnaphthalene	SW8270C	90-12-0			NR	NR			0.97	460	0.21 UJ		0.2 UJ		0.21 U
2,4-Dimethylphenol	SW8270C	105-67-9			NR	160				270	4.1 UJ		4 UJ		4.2 U
2,4-Dinitrophenol	SW8270C	51-28-5			NR	32				30	**4.1 R**		**4 R**		4.2 U
3,3'-Dichlorobenzidine	SW8270C	91-94-1			0.20	NR			0.11		2.1 U		2 U		2.1 U
4-Chloroaniline	SW8270C	106-47-8			NR	32			0.32	59	0.21 U		0.2 U		0.21 U
Aniline	SW8270C	62-53-3			7.7	NR			12.00	110	1.1 U		1 U		1.1 U
Benzoic Acid	SW8270C	65-85-0			NR	64000				58000	5.2 U		5 U		5.2 U
Benzyl Alcohol	SW8270C	100-51-6			NR	2400				1500	0.52 U		0.5 U		0.52 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.3	320			0.071	4.6	**0.14 J**		**0.18 J**		**1.8**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200			14	1200	0.21 U		0.2 U		0.21 U
Dibutyl Phthalate	SW8270C	84-74-2								670	**0.071 J**		**0.09 J**		0.16 U
Diethyl Phthalate	SW8270C	84-66-2			NR	13000				11000	**0.019 J**		**0.033 J**		0.042 U
Dimethyl Phthalate	SW8270C	131-11-3			NR	16000					0.21 U		0.2 U		0.21 U
Hexachlorocyclopentadiene	SW8270C	77-47-4			NR	18				22	1.1 U		1 U		1.1 U
Naphthalene	SW8270C	91-20-3		160	NR	160			0.14	6.10	0.21 U		0.2 U		0.21 U
Pyridine	SW8270C	110-86-1			NR	8				15	5.2 U		5 U		5.2 U
Polynuclear Aromatic Hydrocarbon (ug/L)															
Fluorene	SW8270CSIM	86-73-7	NR		NR	640				220	0.022 U		0.02 U		0.021 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR			0.029		0.022 U		0.02 U		**0.0032 J**
Low-level Volatile Organic Compounds (ug/L)															
Vinyl Chloride	SW8260BSIM	75-01-4	2	0.2	0.029	24			0.015	36	20 U	20 U	20 U	20 U	20 U
Total Organic Carbon	EPA415.1	NA									**0.35 J**		**0.9**		**0.5**
Field Parameters															
Total Dissolved Solids (g/l)											0.08	0.079	0.071	0.071	0.075
Oxidation Reduction Potential (mV)											357	235.1	218.2	238	169.2
Temperature (^{o}C)											10.10	10.11	9.13	10.51	11.21

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-2**	**MW-2**	**MW-3**	**MW-3**	**MW-11**
	Sample Date										**4/2/2009**	**12/18/2010**	**4/1/2009**	**12/16/2010**	**3/29/2009**
	Sample Number										**IC:MW-2:26**	**IC:MW-2:57**	**IC:MW-3:20**	**IC:MW-3:53**	**IC:MW-11:05**
Analyte	**Method**	**CAS #**													
Specific Conductivity (mS/cm)											123.0	122.0	112.0	110.0	115.0
Dissolved Oxygen (mg/L)											9.14	9.93	7.92	8.30	6.93
pH											6.10	6.01	6.02	6.04	6.18
Turbidity (NTU)											<1.0	0.57	66.0	7.00	21.3
Color											clear	clear	brown	clear	clear

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-11**	**MW-12**	**MW-13**	**MW-14**	**MW-14**
	Sample Date										**3/30/2009**	**3/31/2009**	**4/2/2009**	**12/13/2011**	**12/15/2010**
	Sample Number										**IC:MW-11:05**	**IC:MW-12:14**	**IC:MW-13:27**	**IC:MW-14:71**	**IC:MW-14:50**
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/L)															
Diesel Range Organics	NWTPH-Dx	SW333		500											38 U
Oil Range Organics	NWTPH-Dx	SW444		500											120 U
Metals (ug/L)															
Arsenic	EPA200.8	7440-38-2	10	5	0.058	4.8			0.045	4.7					**0.29 J**
Barium	EPA200.8	7440-39-3								2900					**12.4**
Cadmium	EPA200.8	7440-43-9	5	5	NR	8				6.9					**0.011 J**
Chromium	EPA200.8	7440-47-3	100	50	NR	NR									**2.06**
Iron	EPA200.8	7439-89-6	NR		NR	NR				11000					**1200**
Lead	EPA200.8	7439-92-1	15	15	NR	NR						0.018 U	**0.284**		**0.248**
Lead Dissolved	EPA200.8	7439-92-1	15	15	NR	NR					**0.011 B**	0.02 U	0.003 U		
Manganese	EPA200.8	7439-96-5								320					**78.1**
Selenium	EPA200.8	7782-49-2								78					**0.3 J**
Silver	EPA200.8	7440-22-4								71		0.007 U	0.02 U		**0.005 J**
Volatile Organic Compounds (ug/L)															
2-Butanone	SW8260B	78-93-3								4900		**20 R**	**20 R**		20 UJ
2-Chlorotoluene	SW8260B	95-49-8								180		2 U	2 U		2 UJ
4-Chlorotoluene	SW8260B	106-43-4								190		2 U	2 U		2 UJ
Acetone	SW8260B	67-64-1	NR		NR	800				12000		**20 R**	**20 R**		**3.5 J**
Acrylonitrile	SW8260B	107-13-1	NR		0.081	8			0.045	4.1		**50 R**	**50 R**		50 UJ
Benzene	SW8260B	71-43-2	NR	5	0.8	32	2.40	100	0.390	29		0.5 U	0.5 U		0.5 UJ
Bromobenzene	SW8260B	108-86-1								54		2 U	2 U		2 UJ
Bromochloromethane	SW8260B	74-97-5										0.5 U	0.5 U		0.5 UJ
Bromoform	SW8260B	75-25-2	80		5.5	160			7.9	290		0.5 U	0.5 U		0.5 UJ
Bromomethane	SW8260B	74-83-9	NR		NR	11				7.0		0.5 U	0.5 U		0.5 UJ
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800				720		0.5 U	0.5 UJ		0.5 UJ
Carbon Tetrachloride	SW8260B	56-23-5	5		0.625	32	0.22		0.390	40		**0.14 J**	0.5 U		0.5 UJ
Chlorobenzene	SW8260B	108-90-7	100		NR	160				72		0.5 U	0.5 U		0.5 UJ
Chloroethane	SW8260B	75-00-3										0.5 U	0.5 U		0.5 UJ
Chloroform	SW8260B	67-66-3	80		7.2	80			0.19	84		0.13 U	0.05 U		0.5 UJ
Chloromethane	SW8260B	74-87-3	NR		3.0	NR				190		0.5 U	0.5 U		**0.66 J**
cis-1,2-Dichloroethene	SW8260B	156-59-2						160		28		0.5 U	0.5 U		0.5 UJ
Dibromochloromethane	SW8260B	124-48-1										0.5 U	0.5 U		0.5 UJ
Dibromomethane	SW8260B	74-95-3								7.9		0.5 U	0.5 U		0.5 UJ
Dichlorobromomethane	SW8260B	75-27-4	80		0.52	160			0.120	290		0.5 U	0.5 U		0.5 UJ

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-11**	**MW-12**	**MW-13**	**MW-14**	**MW-14**
	Sample Date										**3/30/2009**	**3/31/2009**	**4/2/2009**	**12/13/2011**	**12/15/2010**
	Sample Number										**IC:MW-11:05**	**IC:MW-12:14**	**IC:MW-13:27**	**IC:MW-14:71**	**IC:MW-14:50**
Analyte	**Method**	**CAS #**													
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800		2800	1.3	670		0.5 U	0.5 U		0.5 UJ
Hexachlorobutadiene	SW8260B	87-68-3	NR		0.56	1.6			0.26	4.7		2 U	2 U		2 UJ
Isopropylbenzene (Cumene)	SW8260B	98-82-8								390		2 U	2 U		2 UJ
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000				190		0.5 U	0.5 U		0.5 UJ
Methyl isobutyl ketone	SW8260B	108-10-1								1000		**20 R**	**20 R**		20 UJ
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR						2 UJ	0.04 U		2 UJ
Styrene	SW8260B	100-42-5	100		1.5	1600				1100		0.5 U	0.5 U		0.5 UJ
tert-Butylbenzene	SW8260B	98-06-6	NR		NR	NR						2 U	2 U		2 UJ
Tetrachloroethene	SW8260B	127-18-4	5	5	0.081	80	1	40	0.07	84		0.5 U	0.5 U		0.5 UJ
Toluene	SW8260B	108-88-3	1000	1000	NR	640		1500		860		0.5 U	0.17 U		0.5 UJ
trans-1,2-Dichloroethene	SW8260B	156-60-5						130		86		0.5 U	0.5 U		0.5 UJ
trans-1,3-Dichloropropene	SW8260B	10061-02-6							0.41	38		0.5 U	0.5 U		0.5 UJ
trans-1,4-Dichloro-2-butene	SW8260B	110-57-6							0.001			10 U	10 U		10 UJ
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.42	67	0.44	2.6		0.5 U	0.5 U		0.5 UJ
Vinyl Chloride	SW8260B	75-01-4	2		0.029	24	0.35	57	0.015	36					0.5 UJ
Semi-volatile Organic Compounds (ug/L)															
1-Methylnaphthalene	SW8270C	90-12-0			NR	NR			0.97	460		0.21 UJ	0.2 UJ	0.1 U	0.2 U
2,4-Dimethylphenol	SW8270C	105-67-9			NR	160				270		4.2 UJ	3.8 UJ	6 U	3.9 U
2,4-Dinitrophenol	SW8270C	51-28-5			NR	32				30		**4.2 R**	**3.8 R**	4 U	3.9 U
3,3'-Dichlorobenzidine	SW8270C	91-94-1			0.20	NR			0.11			2.1 U	1.9 U	**4 R**	**2 R**
4-Chloroaniline	SW8270C	106-47-8			NR	32			0.32	59		0.21 U	0.19 U	0.1 U	**0.2 R**
Aniline	SW8270C	62-53-3			7.7	NR			12.00	110		1.1 U	0.95 U	**0.2 R**	**0.96 R**
Benzoic Acid	SW8270C	65-85-0			NR	64000				58000		5.3 U	**1.8 J**	6 U	4.8 U
Benzyl Alcohol	SW8270C	100-51-6			NR	2400				1500		0.53 U	0.48 U	0.3 UJ	0.48 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.3	320			0.071	4.6		1.1 U	**0.6 J**	0.34 U	**0.86 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200			14	1200		0.21 U	0.19 U	0.066 U	**0.03 J**
Dibutyl Phthalate	SW8270C	84-74-2								670		**0.034 J**	0.073 U	0.097 U	0.044 U
Diethyl Phthalate	SW8270C	84-66-2			NR	13000				11000		0.21 U	**0.014 J**	0.07 U	0.038 U
Dimethyl Phthalate	SW8270C	131-11-3			NR	16000						0.21 U	0.19 U	0.1 U	0.2 U
Hexachlorocyclopentadiene	SW8270C	77-47-4			NR	18				22		1.1 U	0.95 U	**1.2 R**	0.96 U
Naphthalene	SW8270C	91-20-3		160	NR	160			0.14	6.10		0.21 U	0.19 U	0.1 U	0.2 U
Pyridine	SW8270C	110-86-1			NR	8				15		5.3 U	4.8 U	4 U	**4.8 R**
Polynuclear Aromatic Hydrocarbon (ug/L)															
Fluorene	SW8270CSIM	86-73-7	NR		NR	640				220		0.02 U	0.019 U	**0.0054 J**	
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR			0.029			0.02 U	0.019 U	0.005 U	
Low-level Volatile Organic Compounds (ug/L)															
Vinyl Chloride	SW8260BSIM	75-01-4	2	0.2	0.029	24			0.015	36		20 U	20 U		20 UJ
Total Organic Carbon	EPA415.1	NA										**0.36 J**	**0.18 U**		
Field Parameters															
Total Dissolved Solids (g/l)											0.075	0.057	0.075	0.074	0.082
Oxidation Reduction Potential (mV)											180.8	239.1	171.4	138.5	-20.1
Temperature (^{o}C)											11.20	9.38	10.25	9.83	9.92

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-11**	**MW-12**	**MW-13**	**MW-14**	**MW-14**
	Sample Date										**3/30/2009**	**3/31/2009**	**4/2/2009**	**12/13/2011**	**12/15/2010**
	Sample Number										**IC:MW-11:05**	**IC:MW-12:14**	**IC:MW-13:27**	**IC:MW-14:71**	**IC:MW-14:50**
Analyte	**Method**	**CAS #**													
Specific Conductivity (mS/cm)											115.0	88.0	117.0	114.0	126.0
Dissolved Oxygen (mg/L)											6.85	8.81	7.71	6.00	5.06
pH											6.18	5.44	6.19	6.35	6.47
Turbidity (NTU)											22.9	0.88	35.1	7.35	12.0
Color											clear	clear	clear	clear	clear

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-15**	**MW-15**	**MW-16**	**MW-16**	**MW-16**
	Sample Date										**12/15/2011**	**12/17/2010**	**12/13/2011**	**12/18/2010**	**12/18/2010**
	Sample Number										**IC:MW-15: 76**	**IC:MW-15:54**	**IC:MW-16:70**	**IC:MW-16:55**	**IC:MW-16:56**
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/L)															
Diesel Range Organics	NWTPH-Dx	SW333		500								23 U		42 U	**130 J**
Oil Range Organics	NWTPH-Dx	SW444		500								32 U		75 U	**590 O**
Metals (ug/L)															
Arsenic	EPA200.8	7440-38-2	10	5	0.058	4.8			0.045	4.7		**1.79**		**0.26 J**	**0.26 J**
Barium	EPA200.8	7440-39-3								2900		**23.1**		**17.5**	**18**
Cadmium	EPA200.8	7440-43-9	5	5	NR	8				6.9		**0.007 J**		**0.011 J**	**0.015 J**
Chromium	EPA200.8	7440-47-3	100	50	NR	NR						0.52 U		**2.71**	**2.8**
Iron	EPA200.8	7439-89-6	NR		NR	NR				11000		**227**		**1940**	**1940**
Lead	EPA200.8	7439-92-1	15	15	NR	NR						**0.08**		0.378 U	0.392 U
Lead Dissolved	EPA200.8	7439-92-1	15	15	NR	NR									
Manganese	EPA200.8	7439-96-5								320		**128**		**92.7**	**97.9**
Selenium	EPA200.8	7782-49-2								78		**0.5 J**		**0.4 J**	**0.5 J**
Silver	EPA200.8	7440-22-4								71		0.02 U		**0.005 J**	0.02 U
Volatile Organic Compounds (ug/L)															
2-Butanone	SW8260B	78-93-3								4900		20 UJ		20 UJ	20 UJ
2-Chlorotoluene	SW8260B	95-49-8								180		2 UJ		2 UJ	2 UJ
4-Chlorotoluene	SW8260B	106-43-4								190		2 UJ		2 UJ	2 UJ
Acetone	SW8260B	67-64-1	NR		NR	800				12000		20 UJ		20 UJ	20 UJ
Acrylonitrile	SW8260B	107-13-1	NR		0.081	8			0.045	4.1		50 UJ		50 UJ	50 UJ
Benzene	SW8260B	71-43-2	NR	5	0.8	32	2.40	100	0.390	29		0.5 UJ		0.5 UJ	0.5 UJ
Bromobenzene	SW8260B	108-86-1								54		2 UJ		2 UJ	2 UJ
Bromochloromethane	SW8260B	74-97-5										0.5 UJ		0.5 UJ	0.5 UJ
Bromoform	SW8260B	75-25-2	80		5.5	160			7.9	290		0.5 UJ		0.5 UJ	0.5 UJ
Bromomethane	SW8260B	74-83-9	NR		NR	11				7.0		0.5 UJ		0.5 UJ	0.5 UJ
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800				720		0.5 UJ		0.5 UJ	0.5 UJ
Carbon Tetrachloride	SW8260B	56-23-5	5		0.625	32	0.22		0.390	40		0.5 UJ		**0.59 J**	**0.62 J**
Chlorobenzene	SW8260B	108-90-7	100		NR	160				72		0.5 UJ		0.5 UJ	0.5 UJ
Chloroethane	SW8260B	75-00-3										0.5 UJ		0.5 UJ	0.5 UJ
Chloroform	SW8260B	67-66-3	80		7.2	80			0.19	84		0.5 UJ		0.5 UJ	0.5 UJ
Chloromethane	SW8260B	74-87-3	NR		3.0	NR				190		**0.08 J**		0.5 UJ	0.12 UJ
cis-1,2-Dichloroethene	SW8260B	156-59-2						160		28		0.5 UJ		0.5 UJ	0.5 UJ
Dibromochloromethane	SW8260B	124-48-1										0.5 UJ		0.5 UJ	0.5 UJ
Dibromomethane	SW8260B	74-95-3								7.9		0.5 UJ		0.5 UJ	0.5 UJ
Dichlorobromomethane	SW8260B	75-27-4	80		0.52	160			0.120	290		0.5 UJ		0.5 UJ	0.5 UJ

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**IC**
	Sample Location										**MW-15**	**MW-15**	**MW-16**	**MW-16**	**MW-16**
	Sample Date										**12/15/2011**	**12/17/2010**	**12/13/2011**	**12/18/2010**	**12/18/2010**
	Sample Number										**IC:MW-15: 76**	**IC:MW-15:54**	**IC:MW-16:70**	**IC:MW-16:55**	**IC:MW-16:56**
Analyte	**Method**	**CAS #**													
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800		2800	1.3	670		0.5 UJ		0.5 UJ	0.5 UJ
Hexachlorobutadiene	SW8260B	87-68-3	NR		0.56	1.6			0.26	4.7		2 UJ		2 UJ	2 UJ
Isopropylbenzene (Cumene)	SW8260B	98-82-8								390		2 UJ		2 UJ	2 UJ
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000				190		0.5 UJ		0.5 UJ	0.5 UJ
Methyl isobutyl ketone	SW8260B	108-10-1								1000		20 UJ		20 UJ	20 UJ
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR						2 UJ		2 UJ	2 UJ
Styrene	SW8260B	100-42-5	100		1.5	1600				1100		0.5 UJ		0.5 UJ	0.5 UJ
tert-Butylbenzene	SW8260B	98-06-6	NR		NR	NR						2 UJ		2 UJ	2 UJ
Tetrachloroethene	SW8260B	127-18-4	5	5	0.081	80	1	40	0.07	84		0.5 UJ		**0.21 J**	**0.2 J**
Toluene	SW8260B	108-88-3	1000	1000	NR	640		1500		860		0.1 UJ		0.08 UJ	0.5 UJ
trans-1,2-Dichloroethene	SW8260B	156-60-5						130		86		0.5 UJ		0.5 UJ	0.5 UJ
trans-1,3-Dichloropropene	SW8260B	10061-02-6							0.41	38		0.5 UJ		0.5 UJ	0.5 UJ
trans-1,4-Dichloro-2-butene	SW8260B	110-57-6							0.001			10 UJ		10 UJ	10 UJ
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.42	67	0.44	2.6		0.5 UJ		0.5 UJ	0.5 UJ
Vinyl Chloride	SW8260B	75-01-4	2		0.029	24	0.35	57	0.015	36		0.5 UJ		0.5 UJ	0.5 UJ
Semi-volatile Organic Compounds (ug/L)															
1-Methylnaphthalene	SW8270C	90-12-0			NR	NR			0.97	460	0.05 U	0.2 U	0.05 U	0.2 U	0.2 U
2,4-Dimethylphenol	SW8270C	105-67-9			NR	160				270	3 U	3.9 UJ	3 U	3.9 UJ	3.9 UJ
2,4-Dinitrophenol	SW8270C	51-28-5			NR	32				30	2 U	3.9 U	2 U	3.9 U	3.9 U
3,3'-Dichlorobenzidine	SW8270C	91-94-1			0.20	NR			0.11		2 U	**2 R**	2 U	**2 R**	**2 R**
4-Chloroaniline	SW8270C	106-47-8			NR	32			0.32	59	0.05 U	**0.2 R**	0.05 U	**0.2 R**	**0.2 R**
Aniline	SW8270C	62-53-3			7.7	NR			12.00	110	0.1 U	**0.96 R**	0.1 U	**0.96 R**	**0.96 R**
Benzoic Acid	SW8270C	65-85-0			NR	64000				58000	3 U	4.8 U	3 U	4.8 U	4.8 U
Benzyl Alcohol	SW8270C	100-51-6			NR	2400				1500	0.15 U	0.48 U	0.15 U	0.48 U	0.48 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.3	320			0.071	4.6	0.27 U	**0.16 J**	0.2 U	**0.29 J**	**0.29 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200			14	1200	0.045 U	0.2 U	0.029 U	0.2 U	0.2 U
Dibutyl Phthalate	SW8270C	84-74-2								670	0.063 U	**0.027 J**	0.071 U	0.032 U	0.044 U
Diethyl Phthalate	SW8270C	84-66-2			NR	13000				11000	0.044 U	0.024 U	0.042 U	**0.96 J**	**0.066 J**
Dimethyl Phthalate	SW8270C	131-11-3			NR	16000					0.05 U	0.2 U	0.05 U	0.2 U	0.2 U
Hexachlorocyclopentadiene	SW8270C	77-47-4			NR	18				22	**0.6 R**	**0.96 R**	**0.6 R**	**0.96 R**	**0.96 R**
Naphthalene	SW8270C	91-20-3		160	NR	160			0.14	6.10	0.05 U	0.2 U	0.05 U	0.05 U	0.2 U
Pyridine	SW8270C	110-86-1			NR	8				15	2 U	**4.8 R**	2 U	**4.8 R**	**4.8 R**
Polynuclear Aromatic Hydrocarbon (ug/L)															
Fluorene	SW8270CSIM	86-73-7	NR		NR	640				220	0.0041 U		0.005 U		
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR			0.029		0.005 U		0.005 U		
Low-level Volatile Organic Compounds (ug/L)															
Vinyl Chloride	SW8260BSIM	75-01-4	2	0.2	0.029	24			0.015	36		20 U		20 U	20 U
Total Organic Carbon	EPA415.1	NA													
Field Parameters															
Total Dissolved Solids (g/l)											0.065	0.082	0.057	0.06	0.06
Oxidation Reduction Potential (mV)											150.2	-12.0	122	-24.7	-24.7
Temperature (^{o}C)											9.67	9.92	9.83	9.84	9.84

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										IC	IC	IC	IC	IC
	Sample Location										MW-15	MW-15	MW-16	MW-16	MW-16
	Sample Date										12/15/2011	12/17/2010	12/13/2011	12/18/2010	12/18/2010
	Sample Number										IC:MW-15: 76	IC:MW-15:54	IC:MW-16:70	IC:MW-16:55	IC:MW-16:56
Analyte	**Method**	**CAS #**													
Specific Conductivity (mS/cm)											100.0	125.0	88.0	91.0	91.0
Dissolved Oxygen (mg/L)											2.14	5.11	8.28	7.96	7.96
pH											5.64	6.47	5.94	5.71	5.71
Turbidity (NTU)											4.40	11.0	2.9	16.6	16.6
Color											clear	clear	clear	clear	clear

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**OP**
	Sample Location										**MW-17**	**MW-17**	**P-12a**	**P-13**	**P-17**
	Sample Date										**12/14/2011**	**1/6/2011**	**3/28/2009**	**3/28/2009**	**4/3/2009**
	Sample Number										**IC:MW-17: 74**	**IC:MW-17:62**	**IC:P-12a:03**	**IC:P-13:02**	**OW:P-17:18:34**
Analyte	**Method**	**CAS #**													
Petroleum Hydrocarbons (mg/L)															
Diesel Range Organics	NWTPH-Dx	SW333		500								260 U			
Oil Range Organics	NWTPH-Dx	SW444		500								32 U			
Metals (ug/L)															
Arsenic	EPA200.8	7440-38-2	10	5	0.058	4.8			0.045	4.7		**0.2 J**			
Barium	EPA200.8	7440-39-3								2900					
Cadmium	EPA200.8	7440-43-9	5	5	NR	8				6.9		**0.012 J**			
Chromium	EPA200.8	7440-47-3	100	50	NR	NR						**2.08**			
Iron	EPA200.8	7439-89-6	NR		NR	NR				11000		**1010**			
Lead	EPA200.8	7439-92-1	15	15	NR	NR						**0.216**	**0.112**	**0.395**	**0.172**
Lead Dissolved	EPA200.8	7439-92-1	15	15	NR	NR									
Manganese	EPA200.8	7439-96-5								320		**100**			
Selenium	EPA200.8	7782-49-2								78		1 U			
Silver	EPA200.8	7440-22-4								71		0.02 U	0.02 U	0.02 U	0.02 U
Volatile Organic Compounds (ug/L)															
2-Butanone	SW8260B	78-93-3								4900		20 U	20 U	20 U	20 U
2-Chlorotoluene	SW8260B	95-49-8								180		2 U	2 U	2 U	2 U
4-Chlorotoluene	SW8260B	106-43-4								190		2 U	2 U	2 U	2 U
Acetone	SW8260B	67-64-1	NR		NR	800				12000		20 U	2.7 U	5.5 U	20 U
Acrylonitrile	SW8260B	107-13-1	NR		0.081	8			0.045	4.1		50 U	50 U	50 U	50 U
Benzene	SW8260B	71-43-2	NR	5	0.8	32	2.40	100	0.390	29		0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	SW8260B	108-86-1								54		2 U	2 U	2 U	2 U
Bromochloromethane	SW8260B	74-97-5										0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	SW8260B	75-25-2	80		5.5	160			7.9	290		0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	SW8260B	74-83-9	NR		NR	11				7.0		0.5 U	0.5 U	0.5 U	0.5 U
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800				720		0.5 U	0.5 U	0.5 U	**0.08 J**
Carbon Tetrachloride	SW8260B	56-23-5	5		0.625	32	0.22		0.390	40		**0.4 J**	0.5 U	0.5 U	0.5 U
Chlorobenzene	SW8260B	108-90-7	100		NR	160				72		0.5 U	0.5 U	0.5 U	0.5 U
Chloroethane	SW8260B	75-00-3										0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	SW8260B	67-66-3	80		7.2	80			0.19	84		0.5 U	0.5 U	0.5 U	0.5 U
Chloromethane	SW8260B	74-87-3	NR		3.0	NR				190		**0.09 J**	0.06 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	SW8260B	156-59-2						160		28		0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	SW8260B	124-48-1										0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	SW8260B	74-95-3								7.9		0.5 U	0.5 U	0.5 U	0.5 U
Dichlorobromomethane	SW8260B	75-27-4	80		0.52	160			0.120	290		0.5 U	0.5 U	0.5 U	0.5 U

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**OP**
	Sample Location										**MW-17**	**MW-17**	**P-12a**	**P-13**	**P-17**
	Sample Date										**12/14/2011**	**1/6/2011**	**3/28/2009**	**3/28/2009**	**4/3/2009**
	Sample Number										**IC:MW-17: 74**	**IC:MW-17:62**	**IC:P-12a:03**	**IC:P-13:02**	**OW:P-17:18:34**
Analyte	**Method**	**CAS #**													
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800		2800	1.3	670		0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	SW8260B	87-68-3	NR		0.56	1.6			0.26	4.7		2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	SW8260B	98-82-8								390		2 U	2 U	0.04 U	2 U
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000				190		0.5 U	0.5 U	0.5 U	0.5 U
Methyl isobutyl ketone	SW8260B	108-10-1								1000		20 U	20 U	20 U	20 U
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR						2 U	0.04 U	0.05 U	2 U
Styrene	SW8260B	100-42-5	100		1.5	1600				1100		0.5 U	0.5 U	0.5 U	0.5 U
tert-Butylbenzene	SW8260B	98-06-6	NR		NR	NR						2 U	2 U	2 U	2 U
Tetrachloroethene	SW8260B	127-18-4	5	5	0.081	80	1	40	0.07	84		0.5 U	0.5 U	0.5 U	0.5 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		1500		860		0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	SW8260B	156-60-5						130		86		0.5 U	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	SW8260B	10061-02-6							0.41	38		0.5 U	0.5 U	0.5 U	0.5 U
trans-1,4-Dichloro-2-butene	SW8260B	110-57-6							0.001			10 U	10 U	10 U	10 U
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.42	67	0.44	2.6		0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	SW8260B	75-01-4	2		0.029	24	0.35	57	0.015	36		0.5 U			
Semi-volatile Organic Compounds (ug/L)															
1-Methylnaphthalene	SW8270C	90-12-0			NR	NR			0.97	460	0.05 U	0.2 U	0.2 U	0.21 U	0.2 U
2,4-Dimethylphenol	SW8270C	105-67-9			NR	160				270	3 U	3.9 UJ	4 U	4.1 U	3.9 U
2,4-Dinitrophenol	SW8270C	51-28-5			NR	32				30	2 U	3.9 U	4 U	4.1 U	3.9 U
3,3'-Dichlorobenzidine	SW8270C	91-94-1			0.20	NR			0.11		2 U	**2 R**	2 U	2.1 U	2 U
4-Chloroaniline	SW8270C	106-47-8			NR	32			0.32	59	0.05 U	**0.2 R**	0.2 U	0.21 U	0.2 U
Aniline	SW8270C	62-53-3			7.7	NR			12.00	110	0.1 U	**0.96 R**	0.99 U	1.1 U	0.96 U
Benzoic Acid	SW8270C	65-85-0			NR	64000				58000	3 U	4.8 U	5 U	5.2 U	4.8 U
Benzyl Alcohol	SW8270C	100-51-6			NR	2400				1500	0.15 U	0.48 U	0.5 U	0.52 U	**0.22 J**
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.3	320			0.071	4.6	0.84 U	0.27 U	**0.38 J**	**0.17 J**	**0.27 J**
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200			14	1200	0.061 U	0.025 U	0.2 U	0.21 U	**7.2**
Dibutyl Phthalate	SW8270C	84-74-2								670	0.074 U	0.043 U	0.051 U	0.081 U	**0.23**
Diethyl Phthalate	SW8270C	84-66-2			NR	13000				11000	0.044 U	0.028 U	0.2 U	0.026 U	**0.033 J**
Dimethyl Phthalate	SW8270C	131-11-3			NR	16000					0.05 U	0.2 U	0.2 U	0.21 U	**0.16 J**
Hexachlorocyclopentadiene	SW8270C	77-47-4			NR	18				22	**0.6 R**	**0.96 R**	0.99 U	1.1 U	0.96 U
Naphthalene	SW8270C	91-20-3		160	NR	160			0.14	6.10	**0.035 J**	0.2 U	0.2 U	0.21 U	0.2 U
Pyridine	SW8270C	110-86-1			NR	8				15	2 U	**4.8 R**	5 U	5.2 U	4.8 U
Polynuclear Aromatic Hydrocarbon (ug/L)															
Fluorene	SW8270CSIM	86-73-7	NR		NR	640				220	**0.0048 J**		0.02 U	0.021 U	0.019 U
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR			0.029		0.005 U		0.02 U	0.021 U	0.019 U
Low-level Volatile Organic Compounds (ug/L)															
Vinyl Chloride	SW8260BSIM	75-01-4	2	0.2	0.029	24			0.015	36		20 U	20 U	20 U	20 U
Total Organic Carbon	EPA415.1	NA											**0.45 J**	**0.5**	**0.25 J**
Field Parameters															
Total Dissolved Solids (g/l)											0.075	0.087	0.131	0.061	0.095
Oxidation Reduction Potential (mV)											174.9	184.2	-158.5	178.4	73
Temperature (^{o}C)											10.05	10.22	8.55	10.03	15.54

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1					
	Study Area										**IC**	**IC**	**IC**	**IC**	**OP**
	Sample Location										**MW-17**	**MW-17**	**P-12a**	**P-13**	**P-17**
	Sample Date										**12/14/2011**	**1/6/2011**	**3/28/2009**	**3/28/2009**	**4/3/2009**
	Sample Number										**IC:MW-17: 74**	**IC:MW-17:62**	**IC:P-12a:03**	**IC:P-13:02**	**OW:P-17:18:34**
Analyte	**Method**	**CAS #**													
Specific Conductivity (mS/cm)											114.0	135.0	204.0	94.0	146.0
Dissolved Oxygen (mg/L)											4.92	9.11	0.04	8.31	1.00
pH											6.03	6.09	7.79	6.17	8.09
Turbidity (NTU)											5.30	20.0	2.34	0.60	0.00
Color											clear	clear	clear	clear	clear

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1			
	Study Area **Sample Location** **Sample Date** **Sample Number**										**IC** **NNW** **12/14/2011** **IC:NNW:72**	**IC** **NNW** **12/14/2011** **IC:NNW:73**	**IC** **Ni** **12/18/2010** **IC:Ni:58**
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/L)													
Diesel Range Organics	NWTPH-Dx	SW333		500							**44 J**	**39 J**	
Oil Range Organics	NWTPH-Dx	SW444		500							73 U	78 U	
Metals (ug/L)													
Arsenic	EPA200.8	7440-38-2	10	5	0.058	4.8			0.045	4.7	0.1 U	**0.2 J**	
Barium	EPA200.8	7440-39-3								2900			
Cadmium	EPA200.8	7440-43-9	5	5	NR	8				6.9	0.01 U	0.01 U	
Chromium	EPA200.8	7440-47-3	100	50	NR	NR							
Iron	EPA200.8	7439-89-6	NR		NR	NR				11000	**3680 J**	**5770 J**	
Lead	EPA200.8	7439-92-1	15	15	NR	NR					0.024 U	0.016 U	
Lead Dissolved	EPA200.8	7439-92-1	15	15	NR	NR							
Manganese	EPA200.8	7439-96-5								320	**60.4**	**50.5**	
Selenium	EPA200.8	7782-49-2								78			
Silver	EPA200.8	7440-22-4								71			
Volatile Organic Compounds (ug/L)													
2-Butanone	SW8260B	78-93-3								4900	4 U	4 U	20 UJ
2-Chlorotoluene	SW8260B	95-49-8								180	0.2 U	0.2 U	2 UJ
4-Chlorotoluene	SW8260B	106-43-4								190	0.2 U	0.2 U	2 UJ
Acetone	SW8260B	67-64-1	NR		NR	800				12000	10 U	10 U	20 UJ
Acrylonitrile	SW8260B	107-13-1	NR		0.081	8			0.045	4.1	0.8 U	0.8 U	50 UJ
Benzene	SW8260B	71-43-2	NR	5	0.8	32	2.40	100	0.390	29	0.1 U	0.1 U	0.5 UJ
Bromobenzene	SW8260B	108-86-1								54	0.2 U	0.2 U	2 UJ
Bromochloromethane	SW8260B	74-97-5									0.2 U	0.2 U	0.5 UJ
Bromoform	SW8260B	75-25-2	80		5.5	160			7.9	290	0.5 U	0.5 U	0.5 UJ
Bromomethane	SW8260B	74-83-9	NR		NR	11				7.0	0.3 U	0.3 U	0.5 UJ
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800				720	0.2 U	0.2 U	0.5 UJ
Carbon Tetrachloride	SW8260B	56-23-5	5		0.625	32	0.22		0.390	40	**0.12 J**	**0.14 J**	**3.4 J**
Chlorobenzene	SW8260B	108-90-7	100		NR	160				72	0.2 U	0.2 U	0.5 UJ
Chloroethane	SW8260B	75-00-3									0.2 U	0.2 U	0.5 UJ
Chloroform	SW8260B	67-66-3	80		7.2	80			0.19	84	0.2 U	0.2 U	**0.08 J**
Chloromethane	SW8260B	74-87-3	NR		3.0	NR				190	0.2 U	0.2 U	**0.4 J**
cis-1,2-Dichloroethene	SW8260B	156-59-2						160		28	0.2 U	0.2 U	0.5 UJ
Dibromochloromethane	SW8260B	124-48-1									0.5 U	0.5 U	0.5 UJ
Dibromomethane	SW8260B	74-95-3								7.9	0.5 U	0.5 U	0.5 UJ
Dichlorobromomethane	SW8260B	75-27-4	80		0.52	160			0.120	290	0.3 U	0.3 U	0.5 UJ

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1			
	Study Area										**IC**	**IC**	**IC**
	Sample Location										**NNW**	**NNW**	**Ni**
	Sample Date										**12/14/2011**	**12/14/2011**	**12/18/2010**
	Sample Number										**IC:NNW:72**	**IC:NNW:73**	**IC:Ni:58**
Analyte	**Method**	**CAS #**											
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800		2800	1.3	670	0.1 U	0.1 U	0.5 UJ
Hexachlorobutadiene	SW8260B	87-68-3	NR		0.56	1.6			0.26	4.7	0.3 U	0.3 U	2 UJ
Isopropylbenzene (Cumene)	SW8260B	98-82-8								390	0.2 U	0.2 U	2 UJ
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000				190	0.2 U	0.2 U	0.5 UJ
Methyl isobutyl ketone	SW8260B	108-10-1								1000	10 U	10 U	20 UJ
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR					0.1 U	0.1 U	2 UJ
Styrene	SW8260B	100-42-5	100		1.5	1600				1100	0.2 U	0.2 U	0.5 UJ
tert-Butylbenzene	SW8260B	98-06-6	NR		NR	NR					0.2 U	0.2 U	2 UJ
Tetrachloroethene	SW8260B	127-18-4	5	5	0.081	80	1	40	0.07	84	0.2 U	0.2 U	0.5 UJ
Toluene	SW8260B	108-88-3	1000	1000	NR	640		1500		860	0.1 U	0.1 U	0.5 UJ
trans-1,2-Dichloroethene	SW8260B	156-60-5						130		86	0.2 U	0.2 U	0.5 UJ
trans-1,3-Dichloropropene	SW8260B	10061-02-6							0.41	38	0.2 U	0.2 U	0.5 UJ
trans-1,4-Dichloro-2-butene	SW8260B	110-57-6							0.001		1 U	1 U	10 UJ
Trichloroethene	SW8260B	79-01-6	5	5	0.11	2.4	0.42	67	0.44	2.6	0.1 U	0.1 U	0.5 UJ
Vinyl Chloride	SW8260B	75-01-4	2		0.029	24	0.35	57	0.015	36	0.1 U	0.1 U	0.5 UJ
Semi-volatile Organic Compounds (ug/L)													
1-Methylnaphthalene	SW8270C	90-12-0			NR	NR			0.97	460	0.05 U	0.05 U	
2,4-Dimethylphenol	SW8270C	105-67-9			NR	160				270	3 U	3 U	
2,4-Dinitrophenol	SW8270C	51-28-5			NR	32				30	2 U	2 U	
3,3'-Dichlorobenzidine	SW8270C	91-94-1			0.20	NR			0.11		2 U	2 U	
4-Chloroaniline	SW8270C	106-47-8			NR	32			0.32	59	0.05 U	0.05 U	
Aniline	SW8270C	62-53-3			7.7	NR			12.00	110	0.1 U	0.1 U	
Benzoic Acid	SW8270C	65-85-0			NR	64000				58000	3 U	3 U	
Benzyl Alcohol	SW8270C	100-51-6			NR	2400				1500	0.15 U	0.15 U	
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7			6.3	320			0.071	4.6	0.23 U	0.2 U	
Butyl Benzyl Phthalate	SW8270C	85-68-7			NR	3200			14	1200	0.053 U	0.044 U	
Dibutyl Phthalate	SW8270C	84-74-2								670	0.071 U	0.061 U	
Diethyl Phthalate	SW8270C	84-66-2			NR	13000				11000	0.04 U	0.036 U	
Dimethyl Phthalate	SW8270C	131-11-3			NR	16000					0.05 U	0.05 U	
Hexachlorocyclopentadiene	SW8270C	77-47-4			NR	18				22	**0.6 R**	**0.6 R**	
Naphthalene	SW8270C	91-20-3		160	NR	160			0.14	6.10	0.034 U	0.05 U	
Pyridine	SW8270C	110-86-1			NR	8				15	2 U	2 U	
Polynuclear Aromatic Hydrocarbon (ug/L)													
Fluorene	SW8270CSIM	86-73-7	NR		NR	640				220	0.005 U	0.005 U	
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR			0.029		0.005 U	0.005 U	
Low-level Volatile Organic Compounds (ug/L)													
Vinyl Chloride	SW8260BSIM	75-01-4	2	0.2	0.029	24			0.015	36	15 UJ	15 UJ	20 U
Total Organic Carbon	EPA415.1	NA											
Field Parameters													
Total Dissolved Solids (g/l)											0.061	0.061	0.061
Oxidation Reduction Potential (mV)											161.7	161.7	178.4
Temperature (^{o}C)											10.10	10.10	10.03

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIALS WELLS, INDUSTRIAL COMPLEX AREA

			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	Washington Groundwater Screening Levels Method B - Carcinogen for the protection against vapor intrusion	Washington Groundwater Screening Levels Method B - Non-Carcinogen for the protection against vapor intrusion	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 0.1			
	Study Area										**IC**	**IC**	**IC**
	Sample Location										**NNW**	**NNW**	**Ni**
	Sample Date										**12/14/2011**	**12/14/2011**	**12/18/2010**
	Sample Number										**IC:NNW:72**	**IC:NNW:73**	**IC:Ni:58**
Analyte	**Method**	**CAS #**											
Specific Conductivity (mS/cm)											115.0	115.0	94.0
Dissolved Oxygen (mg/L)											5.34	5.34	8.31
pH											6.00	6.00	6.17
Turbidity (NTU)											9.48	9.48	0.60
Color											sl. red	sl. red	clear

TABLE 6-27
DETECTED ANALYTES IN MONITORING AND RESIDENTIAL WELLS,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

g/l = grams per liter

µg/l = micrograms per liter

mg/l = milligrams per liter

mV = millivolts

°C = degrees centigrade

mS/cm = millisiemens per centimeter

NR = not researched

NTU = nephelometric turbidity units

The Washington State groundwater screening levels for protection against vapor intrusion are provided for informational purposes and were not used for screening of COIs.

Data Validation Qualifiers:

B = The analyte was found in the associated method blank at a level that is significant relative to the sample result.

J = The analyte was positively identified; the associated numerical value in the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-28
DETECTED ANALYTES IN GRAB AND GEOPROBE WATER SAMPLES,
INDUSTRIAL COMPLEX AREA

			SCREENING CRITERIA FOR GROUNDWATER										
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1					
	Building Sample Location Sample Date Sample Number								B10 GW 11/14/2009 B10:GW:500	B20 GW-2-18 11/8/2009 B20:GW-2-18:296	B41 W-1 11/14/2009 B41:W-1:502	B41 W-2 11/14/2009 B41:W-2:503	B41 W-3 11/14/2009 B41:W-3:504
Analyte	**Method**	**CAS #**											
Petroleum Hydrocarbons (mg/L)													
Diesel Range Organics	NWTPH-Dx	SW333		500					63 UJ		**360 J**	**320 J**	**330 J**
Oil Range Organics	NWTPH-Dx	SW444		500					**150 J**		**340 J**	**280 J**	**290 J**
Volatile Organic Compounds (ug/L)													
1,2,4-Trimethylbenzene	SW8260B	95-63-6	NR		NR	400		15	2 U	2 U	**2.6**	**2.8**	**2.7**
1,3,5-Trimethylbenzene	SW8260B	108-67-8	NR		NR	400		87	2 U	2 U	2 U	**0.1 J**	**0.1 J**
Acetone	SW8260B	67-64-1	NR		NR	800		12000	20 U	**7.2 J**	**4.1 J**	**4 J**	**3.8 J**
Benzene	SW8260B	71-43-2	NR	5	0.8	32	0.39	29	0.5 U	**0.54**	0.5 U	0.5 U	0.5 U
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800		720	0.5 U	**0.19 J**	**0.11 J**	0.5 U	0.5 U
Chloroform	SW8260B	67-66-3	80		7.2	80	0.19	84	0.5 U	**0.08 J**	0.5 U	0.5 U	0.5 U
Chloromethane	SW8260B	74-87-3	NR		3.0	NR		190	0.5 U	**0.26 J**	0.5 U	0.5 U	0.5 U
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800	1.3	670	0.5 U	**0.07 J**	**0.08 J**	**0.08 J**	**0.08 J**
Isopropylbenzene (Cumene)	SW8260B	98-82-8						390	2 U	2 U	**0.21 J**	**0.22 J**	**0.21 J**
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000		190	0.5 U	**0.25 J**	**0.32 J**	**0.32 J**	**0.3 J**
Naphthalene	SW8260B	91-20-3	NR	160	NR	160	0.14	6.1	2 U	2 U	**0.31 J**	**0.32 J**	**0.32 J**
o-Xylene	SW8260B	95-47-6	NR	1000	NR	16000		190	0.5 U	**0.09 J**	0.5 U	0.5 U	0.5 U
p-Isopropyltoluene	SW8260B	99-87-6							2 U	2 U	**0.11 J**	**0.13 J**	**0.13 J**
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR			2 U	2 U	**0.19 J**	**0.18 J**	**0.17 J**
Toluene	SW8260B	108-88-3	1000	1000	NR	640		860	0.5 U	**0.55**	**0.3 J**	**0.32 J**	**0.35 J**
Semi-volatile Organic Compounds (ug/L)													
Naphthalene	SW8270C	91-20-3		160	NR	160	0.14	6.1	2 U	2 U	**0.31 J**	**0.32 J**	**0.32 J**
Polynuclear Aromatic Hydrocarbons (ug/L)													
Acenaphthene	SW8270CSIM	83-32-9	NR		NR	960		400	0.019 U		**0.0077 J**	0.019 U	0.019 U
Acenaphthylene	SW8270CSIM	208-96-8							0.019 U		0.019 U	0.019 U	0.019 U
Anthracene	SW8270CSIM	120-12-7	NR		NR	4800		1300	0.019 U		0.019 U	0.019 U	0.019 U
Benzo(b)fluoranthene	SW8270CSIM	205-99-2	NR		*	NR		0.029	0.019 U		0.019 U	0.019 U	0.019 U
Benzo(ghi)perylene	SW8270CSIM	191-24-2							**0.014 J**		0.019 U	0.019 U	0.019 U
Fluoranthene	SW8270CSIM	206-44-0	NR		NR	640		630	**0.0075 J**		0.019 U	0.019 U	0.019 U
Fluorene	SW8270CSIM	86-73-7	NR		NR	640		220	0.019 U		**0.011 J**	0.019 U	**0.011 J**
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR	0.029		0.019 U		0.019 U	0.019 U	0.019 U
Pyrene	SW8270CSIM	129-00-0	NR		NR	480		87	**0.0075 J**		0.019 U	0.019 U	0.019 U

TABLE 6-28
DETECTED ANALYTES IN GRAB AND GEOPROBE WATER SAMPLES,
INDUSTRIAL COMPLEX AREA

			SCREENING CRITERIA FOR GROUNDWATER								
			Groundwater Federal MCL	Washington Groundwater Method A	Washington Groundwater Method B Carcinogen	Washington Groundwater Method B Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1			
	Building Sample Location Sample Date Sample Number								B5 W 11/14/2009 B5:W:505	B5 W 11/14/2009 B5:W:506	Q4 Pond 11/14/2009 Q4:Pond:507
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/L)											
Diesel Range Organics	NWTPH-Dx	SW333		500					**390 J**	**350 J**	
Oil Range Organics	NWTPH-Dx	SW444		500					**540 J**	**470 J**	
Volatile Organic Compounds (ug/L)											
1,2,4-Trimethylbenzene	SW8260B	95-63-6	NR		NR	400		15	**0.22 J**	**0.19 J**	2 U
1,3,5-Trimethylbenzene	SW8260B	108-67-8	NR		NR	400		87	2 U	2 U	2 U
Acetone	SW8260B	67-64-1	NR		NR	800		12000	20 U	**4.2 J**	20 U
Benzene	SW8260B	71-43-2	NR	5	0.8	32	0.39	29	0.5 U	0.5 U	0.5 U
Carbon Disulfide	SW8260B	75-15-0	NR		NR	800		720	0.5 U	0.5 U	0.5 U
Chloroform	SW8260B	67-66-3	80		7.2	80	0.19	84	0.5 U	0.5 U	0.5 U
Chloromethane	SW8260B	74-87-3	NR		3.0	NR		190	0.5 U	**0.12 J**	0.5 U
Ethylbenzene	SW8260B	100-41-4	700	700	NR	800	1.3	670	0.5 U	0.5 U	0.5 U
Isopropylbenzene (Cumene)	SW8260B	98-82-8						390	2 U	2 U	2 U
m, p-Xylene	SW8260B	133-020-7	NR	1000	NR	16000		190	0.5 U	0.5 U	0.5 U
Naphthalene	SW8260B	91-20-3	NR	160	NR	160	0.14	6.1	2 U	2 U	2 U
o-Xylene	SW8260B	95-47-6	NR	1000	NR	16000		190	0.5 U	0.5 U	0.5 U
p-Isopropyltoluene	SW8260B	99-87-6							2 U	2 U	2 U
sec-Butylbenzene	SW8260B	135-98-8	NR		NR	NR			2 U	2 U	2 U
Toluene	SW8260B	108-88-3	1000	1000	NR	640		860	0.5 U	0.5 U	0.5 U
Semi-volatile Organic Compounds (ug/L)											
Naphthalene	SW8270C	91-20-3		160	NR	160	0.14	6.1	2 U	2 U	2 U
Polynuclear Aromatic Hydrocarbons (ug/L)											
Acenaphthene	SW8270CSIM	83-32-9	NR		NR	960		400	**0.0067 J**	**0.0071 J**	
Acenaphthylene	SW8270CSIM	208-96-8							**0.0036 J**	0.019 U	
Anthracene	SW8270CSIM	120-12-7	NR		NR	4800		1300	**0.0093 J**	**0.009 J**	
Benzo(b)fluoranthene	SW8270CSIM	205-99-2	NR		*	NR		0.029	**0.0041 J**	0.019 U	
Benzo(ghi)perylene	SW8270CSIM	191-24-2							0.019 U	**0.0039 J**	
Fluoranthene	SW8270CSIM	206-44-0	NR		NR	640		630	**0.01 J**	**0.0067 J**	
Fluorene	SW8270CSIM	86-73-7	NR		NR	640		220	**0.012 J**	**0.013 J**	
Indeno(1,2,3-cd)pyrene	SW8270CSIM	193-39-5	NR		*	NR	0.029		0.019 U	**0.0041 J**	
Pyrene	SW8270CSIM	129-00-0	NR		NR	480		87	**0.0098 J**	**0.0069 J**	

TABLE 6-28
DETECTED ANALYTES IN GRAB AND GEOPROBE WATER SAMPLES,
NOTES PAGE

Notes:

Bold text indicates a detected analyte

Shaded text indicates concentration exceeds a screening value or regulatory criteria

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/l = milligrams per liter

µg/l = micrograms per liter

NR = not researched

Data Validation Qualifiers:

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 31, 40, AND 41, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Depth Sample Date Sample Number							B41 RS-1 10 11/29/2010 B41:RS-1:10:426	B41 RS-1 22 11/29/2010 B41:RS-1:22:427	B41 RS-1 109 12/1/2010 B41:RS-1:109:428	B40 RS-2 9 12/3/2010 B40:RS-2:9:429
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**6.8 J**	**1500 J**	**4.2 J**	**4.8 J**
Oil Range Organics	NWTPH-Dx	SW444	2000					**51 J**	**150 J**	**31 J**	**30 J**
Metals (mg/kg)											
Arsenic	SW6010B	7440-38-2	20	0.67	24	0.39	22	**6.05**	**3.65**	**1.95**	**3.75**
Barium	SW6010B	7440-39-3					15000	**43.8**	**102**	**94.9**	**35.1**
Cadmium	SW6010B	7440-43-9	2	NR	80	1800	70	**0.08**	**0.178**	**0.077**	**0.198 J**
Chromium	SW6010B	7440-47-3	2000	NR	NR			**42.5**	**56.2**	**37.1**	**62.4**
Copper	SW6010B	7440-50-8			3000		3100	**32.1 ***	**71.3 ***	**30.4 ***	**73.5**
Iron	SW6010B	7439-89-6		NR	NR		55000	**32300**	**45900**	**32800**	**52100**
Lead	SW6010B	7439-92-1	250	NR	NR		400	**6.26**	**4.4**	**3.82**	**4.36**
Manganese	SW6010B	7439-96-5		NR	NR			**353**	**903**	**386**	**918**
Mercury	SW7471A	7439-97-6	2	NR	24		10	**0.044**	**0.076**	**0.039**	**0.106**
Selenium	SW6010B	7782-49-2					390	**0.3 J**	**0.4 J**	1 U	**0.7 J**
Silver	SW6010B	7440-22-4					390	2 U	2 U	2 U	19.9 U
Volatile Organic Compounds (µg/kg)											
1,2,4-Trimethylbenzene	SW8260B	95-63-6		NR	4000000		62000	16 U	**0.64 J**	15 U	21 U
2-Butanone	SW8260B	78-93-3					28000000	**3 J**	**6 J**	**5.2 J**	**3.5 J**
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	4 U	**1.4 J**	**2.1 J**	**0.33 J**
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	4 U	**2.6 J**	**0.78 J**	5.1 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	0.79 U	**0.8 J**	0.71 U	1.1 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	4 U	**0.59 J**	3.6 U	5.1 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000	4 UJ	4.4 UJ	**0.63 J**	5.1 U
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	4 U	**0.42 J**	3.6 U	5.1 U
Isopropylbenzene (Cumene)	SW8260B	98-82-8					2100000	16 U	18 U	15 U	21 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	**0.48 J**	**1.3 J**	**0.46 J**	**0.7 J**
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	4 U	**0.51 J**	**0.18 J**	**0.23 J**
p-Isopropyltoluene	SW8260B	99-87-6						16 U	18 U	15 U	21 U
sec-Butylbenzene	SW8260B	135-98-8		NR	NR			16 U	**1.8 J**	15 U	21 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.62 J**	**2.2 J**	**1.1 J**	**1.2 J**

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 31, 40, AND 41, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Depth Sample Date Sample Number							B41 RS-1 10 11/29/2010 B41:RS-1:10:426	B41 RS-1 22 11/29/2010 B41:RS-1:22:427	B41 RS-1 109 12/1/2010 B41:RS-1:109:428	B40 RS-2 9 12/3/2010 B40:RS-2:9:429
Analyte	**Method**	**CAS #**									
Semi-volatile Organic Compounds (µg/kg)											
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	10 UJ	100 UJ	10 U	6.1 U
2,4-Dimethylphenol	SW8270C	105-67-9	RND	NR	1600000		1200000	50 UJ	500 UJ	50 U	31 UJ
Benzo(b)fluoranthene	SW8270C	205-99-2			NR	150		10 UJ	100 UJ	**1.7 J**	6.1 U
Benzo(ghi)perylene	SW8270C	191-24-2						10 UJ	100 UJ	**1.8 J**	6.1 U
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	200 UJ	2000 UJ	200 UJ	130 R
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	100 UJ	1000 UJ	**43 J**	**51 J**
Chrysene	SW8270C	218-01-9			NR	15000		10 UJ	100 UJ	**2.4 J**	6.1 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	10 UJ	100 UJ	10 U	6.1 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			10 UJ	100 UJ	**1.2 J**	6.1 U
Fluoranthene	SW8270C	206-44-0		NR	3200000		2300000	10 UJ	100 UJ	**2.4 J**	6.1 U
Fluorene	SW8270C	86-73-7		NR	3200000		2300000	10 UJ	**68 J**	10 U	6.1 U

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 31, 40, AND 41, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Depth Sample Date Sample Number							B40 RS-2 17 12/3/2010 B40:RS-2:17:430	B40 RS-2 107 12/7/2010 B40:RS-2:107:431	BE120 RS-4 8 12/15/2010 BE120:RS-4:8:439	BE120 RS-4 18 12/15/2010 BE120:RS-4:18:440
Analyte	**Method**	**CAS #**									
Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NWTPH-Dx	SW333	2000					**1.8 J**	**3.5 J**	**3.5 J**	
Oil Range Organics	NWTPH-Dx	SW444	2000					6.7 U	**29 J**	**29 J**	
Metals (mg/kg)											
Arsenic	SW6010B	7440-38-2	20	0.67	24	0.39	22	**2.76**	**2.21**	**4.98**	**4.67**
Barium	SW6010B	7440-39-3					15000	**56.7**	**110**	**41.3**	**187**
Cadmium	SW6010B	7440-43-9	2	NR	80	1800	70	**0.184 J**	**0.051 J**	**0.075**	**0.157**
Chromium	SW6010B	7440-47-3	2000	NR	NR			**42.8**	**37.9**	**37.4**	**83.4 J**
Copper	SW6010B	7440-50-8			3000		3100	**76.7**	**34.4**	**34.1**	**99.1**
Iron	SW6010B	7439-89-6		NR	NR		55000	**58800**	**35100**	**28000**	**55600**
Lead	SW6010B	7439-92-1	250	NR	NR		400	**3.95**	**3.89**	**5.1**	**4.88**
Manganese	SW6010B	7439-96-5		NR	NR			**1120**	**326**	**446**	**1510**
Mercury	SW7471A	7439-97-6	2	NR	24		10	**0.096**	**0.04**	**0.028**	**0.12**
Selenium	SW6010B	7782-49-2					390	**0.6 J**	**0.3 J**	**0.5 J**	**0.5 J**
Silver	SW6010B	7440-22-4					390	19.8 U	24.4 U	2 U	**0.5 J**
Volatile Organic Compounds (µg/kg)											
1,2,4-Trimethylbenzene	SW8260B	95-63-6		NR	4000000		62000	19 U	13 U	21 U	24 U
2-Butanone	SW8260B	78-93-3					28000000	**0.99 J**	**2.7 J**	21 R	**1.5 J**
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.25 J**	**0.52 J**	5.1 U	**0.58 J**
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	4.8 U	3.3 U	5.1 U	5.8 U
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	0.95 U	0.65 U	1.1 U	1.2 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	4.8 U	3.3 U	5.1 U	5.8 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000	4.8 UJ	3.3 U	5.1 U	5.8 U
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	4.8 U	3.3 U	5.1 U	5.8 U
Isopropylbenzene (Cumene)	SW8260B	98-82-8					2100000	19 U	13 U	21 U	24 U
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	4.8 U	3.3 U	**0.6 J**	**1 J**
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	4.8 U	3.3 U	5.1 U	**0.32 J**
p-Isopropyltoluene	SW8260B	99-87-6						19 U	13 U	**2.4 J**	**2 J**
sec-Butylbenzene	SW8260B	135-98-8		NR	NR			19 U	13 U	21 U	24 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**0.86 J**	0.72 U	**0.87 J**	**2 J**

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 31, 40, AND 41, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL								
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1				
	Study Area Sample Location Sample Depth Sample Date Sample Number							B40 RS-2 17 12/3/2010 B40:RS-2:17:430	B40 RS-2 107 12/7/2010 B40:RS-2:107:431	BE120 RS-4 8 12/15/2010 BE120:RS-4:8:439	BE120 RS-4 18 12/15/2010 BE120:RS-4:18:440
Analyte	**Method**	**CAS #**									
Semi-volatile Organic Compounds (µg/kg)											
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	5.5 U	10 U	5.6 U	**2.5 J**
2,4-Dimethylphenol	SW8270C	105-67-9	RND	NR	1600000		1200000	28 UJ	50 U	28 R	35 R
Benzo(b)fluoranthene	SW8270C	205-99-2			NR	150		5.5 U	10 U	5.6 U	**3.5 J**
Benzo(ghi)perylene	SW8270C	191-24-2						5.5 U	10 U	5.6 U	**1.9 J**
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	110 R	200 UJ	120 U	140 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	55 U	**14 J**	56 U	69 U
Chrysene	SW8270C	218-01-9			NR	15000		5.5 U	10 U	5.6 U	**3.2 J**
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	5.5 U	10 U	5.6 U	6.9 U
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			5.5 U	10 U	5.6 U	6.9 U
Fluoranthene	SW8270C	206-44-0		NR	3200000		2300000	5.5 U	10 U	5.6 U	6.9 U
Fluorene	SW8270C	86-73-7		NR	3200000		2300000	5.5 U	10 U	5.6 U	6.9 U

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 31, 40, AND 41, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Study Area Sample Location Sample Depth Sample Date Sample Number							BE120 RS-4 18 12/15/2010 BE120:RS-4:18:441	BE120 RS-4 100 12/17/2010 BE120:RS-4:100:442
Analyte	**Method**	**CAS #**							
Petroleum Hydrocarbons (mg/kg)									
Diesel Range Organics	NWTPH-Dx	SW333	2000						
Oil Range Organics	NWTPH-Dx	SW444	2000						
Metals (mg/kg)									
Arsenic	SW6010B	7440-38-2	20	0.67	24	0.39	22	**4.05**	**2.29**
Barium	SW6010B	7440-39-3					15000	**141**	**130**
Cadmium	SW6010B	7440-43-9	2	NR	80	1800	70	**0.111**	**0.077**
Chromium	SW6010B	7440-47-3	2000	NR	NR			**53 J**	**55**
Copper	SW6010B	7440-50-8			3000		3100	**78.3**	**40.1**
Iron	SW6010B	7439-89-6		NR	NR		55000	**46500**	**33200**
Lead	SW6010B	7439-92-1	250	NR	NR		400	**4.47**	**4.31**
Manganese	SW6010B	7439-96-5		NR	NR			**1610**	**565**
Mercury	SW7471A	7439-97-6	2	NR	24		10	**0.117**	**0.048**
Selenium	SW6010B	7782-49-2					390	**0.5 J**	**0.4 J**
Silver	SW6010B	7440-22-4					390	**0.3 J**	**0.3 J**
Volatile Organic Compounds (µg/kg)									
1,2,4-Trimethylbenzene	SW8260B	95-63-6		NR	4000000		62000	20 U	19 U
2-Butanone	SW8260B	78-93-3					28000000	**6 J**	**7.1 J**
Benzene	SW8260B	71-43-2	30	18000	320000	1100	86000	**0.66 J**	**1.6 J**
Carbon Disulfide	SW8260B	75-15-0		NR	8000000		820000	4.9 U	**0.46 J**
Carbon Tetrachloride	SW8260B	56-23-5		7700	56000	610	110000	0.97 U	0.94 U
Chloroform	SW8260B	67-66-3		160000	800000	290	210000	4.9 U	4.7 U
Chloromethane	SW8260B	74-87-3		77000	NR		120000	4.9 U	4.7 U
Ethylbenzene	SW8260B	100-41-4	6000	NR	8000000	5400	3500000	4.9 U	**0.36 J**
Isopropylbenzene (Cumene)	SW8260B	98-82-8					2100000	20 U	**0.14 J**
m, p-Xylene	SW8260B	133-020-7	9000	NR	160000000		590000	**1 J**	**1.2 J**
o-Xylene	SW8260B	95-47-6		NR	160000000		690000	**0.34 J**	**0.38 J**
p-Isopropyltoluene	SW8260B	99-87-6						**1.8 J**	**1.8 J**
sec-Butylbenzene	SW8260B	135-98-8		NR	NR			20 U	19 U
Toluene	SW8260B	108-88-3	7000	NR	6400000		5000000	**1.7 J**	**2.3 J**

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 31, 40, AND 41, SUBSURFACE SOIL ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL						
			Soil Washington Method A Unrestricted Land Use	Soil Washington Method B-Carcinogen	Soil Washington Method B-Non-Carcinogen	EPA Regional Screening Level Carcinogenic Target Risk (TR) = 1E-06	EPA Regional Screening Level Noncancer Hazard Index (HI) = 1		
	Study Area Sample Location Sample Depth Sample Date Sample Number							BE120 RS-4 18 12/15/2010 BE120:RS-4:18:441	BE120 RS-4 100 12/17/2010 BE120:RS-4:100:442
Analyte	**Method**	**CAS #**							
Semi-volatile Organic Compounds (µg/kg)									
1-Methylnaphthalene	SW8270C	90-12-0	NR	NR	NR	22000	5500000	5.6 UJ	6.2 U
2,4-Dimethylphenol	SW8270C	105-67-9	RND	NR	1600000		1200000	28 R	31 R
Benzo(b)fluoranthene	SW8270C	205-99-2			NR	150		**1.9 J**	6.2 U
Benzo(ghi)perylene	SW8270C	191-24-2						5.6 U	**1.9 J**
Benzoic Acid	SW8270C	65-85-0	RND	NR	320000000		240000000	120 U	130 U
Bis(2-ethylhexyl) Phthalate	SW8270C	117-81-7	RND	71000	1600000	35000	1200000	56 U	**140**
Chrysene	SW8270C	218-01-9			NR	15000		**2.4 J**	6.2 U
Diethyl Phthalate	SW8270C	84-66-2	RND	NR	64000000		49000000	5.6 U	**1.4 J**
Dimethyl Phthalate	SW8270C	131-11-3	RND	NR	80000000			5.6 U	6.2 U
Fluoranthene	SW8270C	206-44-0		NR	3200000		2300000	5.6 U	6.2 U
Fluorene	SW8270C	86-73-7		NR	3200000		2300000	5.6 U	6.2 U

TABLE 6-29
INDUSTRIAL COMPLEX AREA - BUILDINGS 30, 40, AND 41
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

mg/kg = milligrams per kilogram

µg/kg = micrograms per kilogram

NR = not researched

RND = researched - no data

Data Validation Qualifiers:

* The result is an outlier. See case narrative.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

TABLE 6-30
INDUSTRIAL COMPLEX AREA
BUILDINGS 33, 44, AND THE NIELSON PUMPHOUSE,
SOIL, GAS, AND AMBIENT AIR ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL GAS AND AMBIENT AIR											
			EPA Regional Screening Level - Carcinogen (µg/m^3)	EPA Regional Screening Level - Non-carcinogen (µg/m^3)	Washington Indoor Air Clean Up Levels Method B - Carcinogen (µg/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (µg/m3)	Washington Groundwater Screening Levels Method B - Carcinogen (µg/L)	Washington Groundwater Screening Levels Method B - Non-Carcinogen (µg/L)	Washington Soil Gas Screening Levels Method B - Carcinogen (µg/m^3)***	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (µg/m^3)***				
	Study Area										**B44**	**B44**	**B44**	**B44**
	Sample Location										**SV-1**	**SV-1**	**SV-1**	**SV-1**
	Sample Depth										**6**	**13**	**13**	**18**
	Sample Date										**11/12/2010**	**11/12/2010**	**11/12/2010**	**11/12/2010**
	Sample Number										**B44:SV-1:6:422**	**B44:SV-1:13:418**	**B44:SV-1:13:419**	**B44:SV-1:18:421**
Analyte	**Method**	**CAS #**												
Volatile Organic Compounds (µg/m^3)														
1,1,1-Trichloroethane	EPA-TO-15	71-55-6		5200		4800		11000		48,000/480,000	0.78 U	1.9 U	1.9 U	1.9 U
1,1,2,2-Tetrachloroethane	EPA-TO-15	79-34-5	0.042		0.043		6.2		0.43/4.3		0.99 U	2.4 U	2.4 U	2.4 U
1,1,2-Trichloroethane	EPA-TO-15	79-00-5	0.15	0.21	0.16		7.9		1.6/16		0.78 U	1.9 U	1.9 U	1.9 U
1,1-Dichloroethane	EPA-TO-15	75-34-3	1.5			320		2300		3,200/32,000	0.58 U	1.4 U	1.4 U	1.4 U
1,1-Dichloroethene	EPA-TO-15	75-35-4		210						910/9,100	0.28 U	0.69 U	0.69 U	0.69 U
1,2-Dichloroethane	EPA-TO-15	107-06-2	0.094	7.3	0.096	2.2	4.2	98	0.96/9.6	22/220	0.58 U	1.4 U	1.4 U	1.4 U
Benzene	EPA-TO-15	71-43-2	0.31	31	0.32	14	2.4	100	3.2/32	140/1,400	1.2 U	2.8 U	2.8 U	2.8 U
Carbon Tetrachloride	EPA-TO-15	56-23-5	0.41	100	0.17		0.22		1.7/17		**380**	**1700**	**1400**	**1900**
Cis-1,2-Dichloroethene	EPA-TO-15	156-59-2				16		160		160/1,600	0.57 U	1.4 U	1.4 U	1.4 U
Ethylbenzene	EPA-TO-15	100-41-4	0.97	1000		460		2800		4,600/46,000	0.62 U	**1.5**	1.5 U	1.5 U
Methyl tert-butyl ether	EPA-TO-15	1634-04-4	9.4	3100	9.6	1400	610	86000	96/960	14,000/140,000	2.6 U	6.3 U	6.3 U	6.3 U
Methylene Chloride	EPA-TO-15	75-09-2	5.2	1100			94	24000	53/530	14000/140000	5 U	12 U	12 U	12 U
o-Xylene	EPA-TO-15	95-47-6		100		46		440		460/4,600	0.62 U	1.5 U	1.5 U	1.5 U
Tetrachloroethene	EPA-TO-15	127-18-4	0.41	280	0.42	16	1	40	4.2/42	160/1,600	**770**	**1800**	**1400**	**1300**
Toluene	EPA-TO-15	108-88-3		5200		2200		15000		22,000/220,000	**1.7**	**3.8**	**4**	1.3 U
Trans-1,2-Dichloroethene	EPA-TO-15	156-60-5		63		32		130		320/3200	2.8 U	6.9 U	6.9 U	6.9 U
Trichloroethene	EPA-TO-15	79-01-6	0.43	2.1	0.1	16	0.42	67	1/10	160/1600	0.77 U	**2.7**	**2.4**	**5.7**
Vinyl Chloride	EPA-TO-15	75-01-4	0.16	100	0.28	46	0.35	57	2.8/28	460/4600	0.18 U	0.44 U	0.44 U	0.44 U

TABLE 6-30
INDUSTRIAL COMPLEX AREA
BUILDINGS 33, 44, AND THE NIELSON PUMPHOUSE,
SOIL, GAS, AND AMBIENT AIR ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL GAS AND AMBIENT AIR											
			EPA Regional Screening Level - Carcinogen (µg/m^3)	EPA Regional Screening Level - Non-carcinogen (µg/m^3)	Washington Indoor Air Clean Up Levels Method B - Carcinogen (µg/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (µg/m3)	Washington Groundwater Screening Levels Method B - Carcinogen (µg/L)	Washington Groundwater Screening Levels Method B - Non-Carcinogen (µg/L)	Washington Soil Gas Screening Levels Method B - Carcinogen (µg/m^3)***	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (µg/m^3)***				
	Study Area										**B44**	**B44**	**B44**	**B44**
	Sample Location										**SV-2**	**SV-2**	**SV-2**	**UT-1**
	Sample Depth										**6**	**13**	**18**	
	Sample Date										**11/13/2010**	**11/13/2010**	**11/13/2010**	**12/14/2011**
	Sample Number										**B44:SV-2:6:423**	**B44:SV-2:13:424**	**B44:SV-2:18:425**	**B44:UT-1:487**
Analyte	**Method**	**CAS #**												
Volatile Organic Compounds (µg/m^3)														
1,1,1-Trichloroethane	EPA-TO-15	71-55-6		5200		4800		11000		48,000/480,000	0.16 U	1 U	1.6 U	**0.041 J**
1,1,2,2-Tetrachloroethane	EPA-TO-15	79-34-5	0.042		0.043		6.2		0.43/4.3		0.2 U	1.3 U	2 U	0.035 U
1,1,2-Trichloroethane	EPA-TO-15	79-00-5	0.15	0.21	0.16		7.9		1.6/16		0.16 U	1 U	1.6 U	0.11 U
1,1-Dichloroethane	EPA-TO-15	75-34-3	1.5			320		2300		3,200/32,000	0.12 U	0.75 U	1.2 U	0.081 U
1,1-Dichloroethene	EPA-TO-15	75-35-4		210						910/9,100	0.059 U	0.37 U	0.59 U	0.04 U
1,2-Dichloroethane	EPA-TO-15	107-06-2	0.094	7.3	0.096	2.2	4.2	98	0.96/9.6	22/220	0.12 U	0.75 U	1.2 U	**0.12**
Benzene	EPA-TO-15	71-43-2	0.31	31	0.32	14	2.4	100	3.2/32	140/1,400	**0.48**	**12**	**2.9**	**0.37**
Carbon Tetrachloride	EPA-TO-15	56-23-5	0.41	100	0.17		0.22		1.7/17		**18**	**730**	**1200**	**0.48**
Cis-1,2-Dichloroethene	EPA-TO-15	156-59-2				16		160		160/1,600	0.12 U	0.74 U	1.2 U	0.079 U
Ethylbenzene	EPA-TO-15	100-41-4	0.97	1000		460		2800		4,600/46,000	**0.33**	**0.86**	1.3 U	**0.074 J**
Methyl tert-butyl ether	EPA-TO-15	1634-04-4	9.4	3100	9.6	1400	610	86000	96/960	14,000/140,000	0.54 U	3.4 U	5.4 U	0.36 U
Methylene Chloride	EPA-TO-15	75-09-2	5.2	1100			94	24000	53/530	14000/140000	1 U	6.5 U	10 U	0.35 U
o-Xylene	EPA-TO-15	95-47-6		100		46		440		460/4,600	**0.28**	**0.84**	1.3 U	**0.092 J**
Tetrachloroethene	EPA-TO-15	127-18-4	0.41	280	0.42	16	1	40	4.2/42	160/1,600	**7.2**	**13**	**120**	**0.061 J**
Toluene	EPA-TO-15	108-88-3		5200		2200		15000		22,000/220,000	**1.5**	**12**	**3.4**	**0.54**
Trans-1,2-Dichloroethene	EPA-TO-15	156-60-5		63		32		130		320/3200	0.59 U	3.7 U	5.9 U	0.4 U
Trichloroethene	EPA-TO-15	79-01-6	0.43	2.1	0.1	16	0.42	67	1/10	160/1600	0.16 U	1 U	1.6 U	0.11 U
Vinyl Chloride	EPA-TO-15	75-01-4	0.16	100	0.28	46	0.35	57	2.8/28	460/4600	**0.046**	0.24 U	0.38 U	0.026 U

TABLE 6-30
INDUSTRIAL COMPLEX AREA
BUILDINGS 33, 44, AND THE NIELSON PUMPHOUSE,
SOIL, GAS, AND AMBIENT AIR ANALYTICAL RESULTS

			SCREENING CRITERIA FOR SOIL GAS AND AMBIENT AIR											
			EPA Regional Screening Level - Carcinogen (µg/m^3)	EPA Regional Screening Level - Non-carcinogen (µg/m^3)	Washington Indoor Air Clean Up Levels Method B - Carcinogen (µg/m3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (µg/m3)	Washington Groundwater Screening Levels Method B - Carcinogen (µg/L)	Washington Groundwater Screening Levels Method B - Non-Carcinogen (µg/L)	Washington Soil Gas Screening Levels Method B - Carcinogen (µg/m^3)***	Washington Soil Gas Screening Levels Method B - Non-Carcinogen (µg/m^3)***				
	Study Area **Sample Location** **Sample Depth** **Sample Date** **Sample Number**										**B44** **UT-1** **12/14/2011** **B44:UT-1:488**	**B44** **AMI** **12/14/2011** **B44:AMI:489**	**NI** **SV-1** **6** **12/15/2011** **NI:SV-1:6:490**	**NR** **SV-1** **6** **12/15/2011** **NR:SV-1:6:490**
Analyte	**Method**	**CAS #**												
Volatile Organic Compounds (µg/m^3)														
1,1,1-Trichloroethane	EPA-TO-15	71-55-6		5200		4800		11000		48,000/480,000	**0.042 J**	0.028 U	**0.034 J**	**0.029 J**
1,1,2,2-Tetrachloroethane	EPA-TO-15	79-34-5	0.042		0.043		6.2		0.43/4.3		0.14 U	0.14 U	0.14 U	**0.42**
1,1,2-Trichloroethane	EPA-TO-15	79-00-5	0.15	0.21	0.16		7.9		1.6/16		0.11 U	0.11 U	0.11 U	0.11 U
1,1-Dichloroethane	EPA-TO-15	75-34-3	1.5			320		2300		3,200/32,000	0.081 U	0.081 U	0.081 U	0.081 U
1,1-Dichloroethene	EPA-TO-15	75-35-4		210						910/9,100	0.04 U	0.04 U	0.04 U	0.04 U
1,2-Dichloroethane	EPA-TO-15	107-06-2	0.094	7.3	0.096	2.2	4.2	98	0.96/9.6	22/220	**0.13**	**0.14**	**0.087 J**	**0.16**
Benzene	EPA-TO-15	71-43-2	0.31	31	0.32	14	2.4	100	3.2/32	140/1,400	**0.34**	**0.42**	**0.74**	**2.2**
Carbon Tetrachloride	EPA-TO-15	56-23-5	0.41	100	0.17		0.22		1.7/17		**0.45**	**0.4**	**1.2**	**0.19**
Cis-1,2-Dichloroethene	EPA-TO-15	156-59-2				16		160		160/1,600	0.079 U	0.079 U	0.079 U	0.079 U
Ethylbenzene	EPA-TO-15	100-41-4	0.97	1000		460		2800		4,600/46,000	**0.081 J**	**0.094 J**	**1.2**	**0.16**
Methyl tert-butyl ether	EPA-TO-15	1634-04-4	9.4	3100	9.6	1400	610	86000	96/960	14,000/140,000	0.36 U	0.36 U	0.36 U	0.36 U
Methylene Chloride	EPA-TO-15	75-09-2	5.2	1100			94	24000	53/530	14000/140000	0.3 U	0.28 U	0.32 U	1.7 U
o-Xylene	EPA-TO-15	95-47-6		100		46		440		460/4,600	**0.081 J**	**0.086 J**	**1.4**	**0.14**
Tetrachloroethene	EPA-TO-15	127-18-4	0.41	280	0.42	16	1	40	4.2/42	160/1,600	**0.06 J**	**0.026 J**	**0.18 J**	**0.037 J**
Toluene	EPA-TO-15	108-88-3		5200		2200		15000		22,000/220,000	**0.52**	**0.6**	**5.9**	**4**
Trans-1,2-Dichloroethene	EPA-TO-15	156-60-5		63		32		130		320/3200	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	EPA-TO-15	79-01-6	0.43	2.1	0.1	16	0.42	67	1/10	160/1600	0.11 U	0.11 U	**0.031 J**	**0.022 J**
Vinyl Chloride	EPA-TO-15	75-01-4	0.16	100	0.28	46	0.35	57	2.8/28	460/4600	0.026 U	0.026 U	0.026 U	**0.039**

TABLE 6-30
BUILDINGS 33, 34, AND THE NIELSON PUMPHOUSE,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

Shaded text indicates concentration exceeds a screening value or regulatory criteria.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

µg/m^3 = micrograms per cubic meter

µg/l = micrograms per liter

Data Validation Qualifiers:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-31
INDUSTRIAL COMPLEX AREA - BUILDING 44,
PHASE 2A AMBIENT AIR ANALYTICAL RESULTS

			SCREENING CRITERIA FOR AIR						
			Washington Indoor Air Clean Up Levels Method B - Carcinogen (ug/m^3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (ug/m^3)	Washington Groundwater Screening Levels Method B-Carcinogen (ug/L)	Washington Groundwater Screening Levels Method B - Non-Carcinogen (ug/L)	EPA/Washington Soil Gas Screening Levels Method B-Carcinogen (ug/m^3)***	EPA/Washington Soil Gas Screening Levels Method B - Non-Carcinogen (ug/m^3)***	
	Study Area **Sample Location** **Sample Depth** **Sample Date** **Sample Number**								**B44** **B44:AM** **ambient air** **11/12/2010** **B44:AM:420**
Analyte	**Method**	**CAS#**							
Volatile Organic Compounds (ug/m^3)									
1,1,1-Trichloroethane	Modified TO-15	71-55-6		4800		11000		48000/480000	4 U
1,1,2,2-Tetrachloroethane	Modified TO-15	79-34-5	0.043		6.2		0.43/4.3		5 U
1,1,2-Trichloroethane	Modified TO-15	79-00-5	0.16		7.9		1.6/16		4 U
1,1-Dichloroethane	Modified TO-15	75-34-3		320		2300		3200/32000	3 U
1,1-Dichloroethene	Modified TO-15	75-35-4		91		130		910/9100	2.9 U
1,2,4-Trichlorobenzene	Modified TO-15	120-82-1		91		3900		910/9100	22 U
1,2,4-Trimethylbenzene	Modified TO-15	95-63-6		2.7		24		27/270	3.6 U
1,2-Dibromoethane (EDB)	Modified TO-15	106-93-4	0.011	0.16	0.74	10	0.11/1.1	1.6/16	5.6 U
1,2-Dichlorobenzene	Modified TO-15	95-50-1		64		1800		640/6400	4.4 U
1,2-Dichloroethane	Modified TO-15	107-06-2	0.096	2.2	4.2	98	0.96/9.6	22/220	3 U
1,2-Dichloropropane	Modified TO-15	78-87-5		1.8		28		18/180	3.4 U
1,3,5-Trimethylbenzene	Modified TO-15	108-67-8		2.7		25		27/270	3.6 U
1,3-Butadiene	Modified TO-15	106-99-0	0.08	0.91	0.037	0.42	0.8/8	9.1/91	1.6 U
1,3-Dichlorobenzene	Modified TO-15	541-73-1							4.4 U
1,4-Dichlorobenzene	Modified TO-15	106-46-7		370		7900		3700/37000	4.4 U
1,4-Dioxane	Modified TO-15	123-91-1							10 U
2,2,4-Trimethylpentane	Modified TO-15	540-84-1							3.4 U
2-Butanone (Methyl Ethyl Ketone)	Modified TO-15	78-93-3		460		350000		4600/46000	2.2 U
2-Hexanone	Modified TO-15	591-78-6							12 U
2-Propanol	Modified TO-15	8013-70-5							7.2 U
3-Chloropropene	Modified TO-15	107-05-1							9.1 U
4-Ethyltoluene	Modified TO-15	622-96-8							3.6 U
4-Methyl-2-pentanone	Modified TO-15	108-10-1		32		11000		320/3200	3 U
Acetone	Modified TO-15	67-64-1							6.9 U
alpha-Chlorotoluene	Modified TO-15	100-44-7	0.052		6.2		0.52/5.2		3.8 U
Benzene	Modified TO-15	71-43-2	0.32	14	2.4	100	3.1/31	310/3100	2.3 U
Bromodichloromethane	Modified TO-15	75-27-4	0.0033		0.09		0.033/0.33		4.9 U
Bromoform	Modified TO-15	75-25-2	2.3		200		23/230		7.5 U
Bromomethane	Modified TO-15	74-83-9		2.3		13		23/230	2.8 U
Carbon Disulfide	Modified TO-15	75-15-0		320		400		3200/32000	2.3 U
Carbon Tetrachloride	Modified TO-15	56-23-5	0.17		0.22		4.1/41		4.6 U

TABLE 6-31
INDUSTRIAL COMPLEX AREA - BUILDING 44,
PHASE 2A AMBIENT AIR ANALYTICAL RESULTS

			SCREENING CRITERIA FOR AIR						
			Washington Indoor Air Clean Up Levels Method B - Carcinogen (ug/m^3)	Washington Indoor Air Clean Up Levels Method B - Non-Carcinogen (ug/m^3)	Washington Groundwater Screening Levels Method B- Carcinogen (ug/L)	Washington Groundwater Screening Levels Method B - Non-Carcinogen (ug/L)	EPA/Washington Soil Gas Screening Levels Method B- Carcinogen (ug/m^3)***	EPA/Washington Soil Gas Screening Levels Method B - Non-Carcinogen (ug/m^3)***	
	Study Area **Sample Location** **Sample Depth** **Sample Date** **Sample Number**								**B44** **B44:AM** **ambient air** **11/12/2010** **B44:AM:420**
Analyte	**Method**	**CAS#**							
Chlorobenzene	Modified TO-15	108-90-7		8		100		80/800	3.4 U
Chloroethane	Modified TO-15	75-00-3	3	4600	12	18000	30/300	46000/460000	1.9 U
Chloroform	Modified TO-15	67-66-3	0.11		1.2		1.1/11		3.6 U
Chloromethane	Modified TO-15	74-87-3	1.4		5.2		14/140		6 U
cis-1,2-Dichloroethene	Modified TO-15	156-59-2		16		160		160/1600	2.9 U
cis-1,3-Dichloropropene	Modified TO-15	542-75-6	0.63	9.1	1.6	23	6.3/63	91/910	3.3 U
Isopropylbenzene (Cumene)	Modified TO-15	98-82-8		180		720		1800/18000	3.6 U
Cyclohexane	Modified TO-15	110-82-7							2.5 U
Dibromochloromethane	Modified TO-15	124-48-1	0.0045		0.22		0.045/0.45		6.2 U
Ethanol	Modified TO-15	64-17-5							5.5 U
Ethylbenzene	Modified TO-15	100-41-4		460		2800		4600/46000	3.2 U
CFC-11	Modified TO-15	75-69-4		320		120		3200/32000	4.1 U
CFC-113	Modified TO-15	76-113-1							5.6 U
CFC- 114	Modified TO-15	76-14-2							5.1 U
CFC-12	Modified TO-15	75-71-8		80		9.9		800/8000	3.6 U
Heptane	Modified TO-15	142-82-5							3 U
Hexachlorobutadiene	Modified TO-15	87-68-3	0.11		0.81		1.1/11		31 U
Hexane	Modified TO-15	110-54-3		320		7.8		3200/32000	2.6 U
m, p-Xylene	Modified TO-15	108-38-3		46		310		7300/73000	3.2 U
Methyl t-butyl ether	Modified TO-15	1634-04-4	9.6	1400	610	86000	96/960	14000/140000	2.6 U
Methylene Chloride	Modified TO-15	75-09-2	5.3	1400	94	24000	53/530	14000/140000	2.5 U
o-Xylene	Modified TO-15	95-47-6		46		440		7300/73000	3.2 U
Benzene, Propyl-	Modified TO-15	103-65-1							3.6 U
Styrene	Modified TO-15	100-42-5	4.4	460	78	8200	44/440	4600/46000	3.1 U
Tetrachloroethene	Modified TO-15	127-18-4	0.42	16	1	40	4.1/41	160/1600	5 U
Tetrahydrofuran	Modified TO-15	109-99-9							2.2 U
Toluene	Modified TO-15	108-88-3		2200		15000		52000/520000	2.8 U
trans-1,2-Dichloroethene	Modified TO-15	156-60-5		32		130		320/3200	2.9 U
trans-1,3-Dichloropropene	Modified TO-15	542-75-6	0.63	9.1	1.6	23	6.3/63	91/910	3.3 U
Trichloroethene	Modified TO-15	79-01-6	0.1	16	0.42	67	12/120	160/1600	3.9 U
Vinyl Chloride	Modified TO-15	75-01-4	0.28	46	0.35	57	2.8/28	460/4600	1.9 U

TABLE 6-31
INDUSTRIAL COMPLEX AREA - BUILDING 44,
NOTES PAGE

Notes:

Bold text indicates a detected analyte.

CAS # = Chemical Abstracts Service registration number

EPA = U.S. Environmental Protection Agency

µg/m^3 = micrograms per cubic meter

µg/l = micrograms per liter

Data Validation Qualifiers:

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

TABLE 6-32
TOTAL ORGANIC CARBON ANALYTICAL RESULTS

Buiding	Sample ID	Matrix	Date Sampled	Result	Unit
Building 44	B44:SB-7A:18:412	Soil	11/11/10	1.44	%
Building 44	B44:SB-7B:6:413	Soil	11/11/10	1.24	%
Building 44	B44:SB-7C:13:414	Soil	11/11/10	0.704	%
Building 44	B44:SB-8A:18:415	Soil	11/12/10	0.205	%
Building 44	B44:SB-8B:13:416	Soil	11/12/10	0.194	%
Building 44	B44:SB-8C:6:417	Soil	11/12/10	0.792	%
Building 44	B44:RS-3:6:432	Soil	12/13/10	1.67	%
Building 44	B44:RS-3:12:433	Soil	12/13/10	0.52	%
Building 44	B44:RS-3:18:434	Soil	12/13/10	0.178	%
Building 44	B44:RS-3:25:435	Soil	12/13/10	0.17	%
Building 44	B44:RS-3:70:436	Soil	12/14/10	0.082	%
Building 44	B44:RS-3:70:437	Soil	12/14/10	0.079	%
Building 44	B44:RS-3:90:438	Soil	12/14/10	0.091	%
Nielson Propoerty	NI:SB-1:12:480	Soil	12/13/11	0.225	%
Nielson Propoerty	NI:SB-1:18:481	Soil	12/13/11	0.167	%
Nielson Propoerty	NI:SB-2:12:482	Soil	12/13/11	0.242	%
Nielson Propoerty	NI:SB-2:18:484	Soil	12/13/11	0.042	%
Nielson Propoerty	NI:SB-3:12:485	Soil	12/13/11	0.272	%
Nielson Propoerty	NI: SB-4:6:488	Soil	12/14/11	0.75	%
Building 33	NR: SB-1:6:487	Soil	12/14/11	8.84	%
Tetraethyl Lead Disposal Area	TL:SB-1:5:335	Soil	11/11/09	9.35	%
Tetraethyl Lead Disposal Area	TL:SB-1:10:336	Soil	11/11/09	1.14	%
Tetraethyl Lead Disposal Area	TL:SB-1:10:337	Soil	11/11/09	0.803	%
Tetraethyl Lead Disposal Area	TL:SB-1:15:338	Soil	11/11/09	0.416	%
Tetraethyl Lead Disposal Area	TL:SB-1:20:339	Soil	11/11/09	0.157	%
Tetraethyl Lead Disposal Area	TL:SB-1:25:340	Soil	11/11/09	0.148	%
Tetraethyl Lead Disposal Area	TL:SB-2:5:341	Soil	11/11/09	8.28	%
Tetraethyl Lead Disposal Area	TL:SB-2:10:342	Soil	11/11/09	1.05	%
Tetraethyl Lead Disposal Area	TL:SB-2:15:343	Soil	11/11/09	0.33	%
Tetraethyl Lead Disposal Area	TL:SB-2:20:344	Soil	11/11/09	0.202	%
Tetraethyl Lead Disposal Area	TL:SB-2:25:345	Soil	11/11/09	0.157	%
Tetraethyl Lead Disposal Area	TL:SB-3:5:346	Soil	11/11/09	6.75	%
Tetraethyl Lead Disposal Area	TL:SB-3:5:347	Soil	11/11/09	6.46	%
Tetraethyl Lead Disposal Area	TL:SB-3:10:348	Soil	11/11/09	0.801	%
Tetraethyl Lead Disposal Area	TL:SB-3:15:349	Soil	11/11/09	1.01	%
Tetraethyl Lead Disposal Area	TL:SB-3:20:350	Soil	11/11/09	0.135	%
Tetraethyl Lead Disposal Area	TL:SB-3:25:351	Soil	11/11/09	0.137	%
Tetraethyl Lead Disposal Area	TL:SB-4:5:352	Soil	11/11/09	5.8	%
Tetraethyl Lead Disposal Area	TL:SB-4:10:353	Soil	11/11/09	0.807	%
Tetraethyl Lead Disposal Area	TL:SB-4:15:354	Soil	11/11/09	0.646	%
Tetraethyl Lead Disposal Area	TL:SB-4:20:355	Soil	11/11/09	0.172	%
Tetraethyl Lead Disposal Area	TL:SB-4:25:356	Soil	11/11/09	0.128	%

TABLE 6-32
TOTAL ORGANIC CARBON ANALYTICAL RESULTS

Buiding	Sample ID	Matrix	Date Sampled	Result	Unit
Building 4	B4:SS-1:79	Soil	3/29/09	4.79	%
Building 4	B4:SS-2:80	Soil	3/29/09	4.41	%
Building 4	B4:SS-3:81	Soil	3/29/09	5.2	%
Building 4	B4:SS-4:82	Soil	3/29/09	13.3	%
Building 4	B4:SS-5:83	Soil	3/29/09	8.06	%
Building 4	B4:SS-6:84	Soil	3/29/09	4.84	%
Building 4	B4:SS-7:85	Soil	3/29/09	7.2	%
Building 4	B4:SS-8:86	Soil	3/29/09	10.2	%
Building 4	B4:SS-9:87	Soil	3/29/09	7.03	%
Building 4	B4:SS-10:88	Soil	3/29/09	2.5	%
Building 4	B4:SS-11:89	Soil	3/29/09	5.76	%
Building 4	B4:SS-12:90	Soil	3/29/09	14	%
Building 119	B119:SS-3:111	Soil	3/29/09	12.1	%
Building 119	B119:SS-4:112	Soil	3/29/09	9.83	%
Building 5	B5:SS-1:168	Soil	4/2/09	2.18	%
Building 5	B5:SS-2:169	Soil	4/2/09	4.2	%
Building 5	B5:SS-3:170	Soil	4/2/09	21.2	%
Building 5	B5:SS-4:171	Soil	4/2/09	32.4	%
Building 5	B5:SS-5:172	Soil	4/2/09	8.64	%
Building 5	B5:SS-6:173	Soil	4/2/09	9.96	%
Building 5	B5:SS-7:174	Soil	4/2/09	3.64	%
Building 5	B5:SS-8:175	Soil	4/2/09	5.2	%
Building 5	B5:SS-9:176	Soil	4/2/09	6.89	%
Building 5	B5:SS-10:177	Soil	4/2/09	3.92	%
Building 5	B5:SS-11:178	Soil	4/2/09	4.44	%
Building 5	B5:SS-12:179	Soil	4/2/09	1.91	%
Building 17	B17:SS-1:181	Soil	4/3/09	7.91	%
Building 17	B17:SS-2:182	Soil	4/3/09	5.05	%
Building 17	B17:SS-3:183	Soil	4/3/09	9.03	%
Building 17	B17:SS-4:184	Soil	4/3/09	9.01	%
Building 17	B17:SS-5:185	Soil	4/3/09	10.7	%
Building 17	B17:SS-6:186	Soil	4/3/09	6.73	%
Building 17	B17:SS-7:187	Soil	4/3/09	7.65	%
Building 17	B17:SS-8:188	Soil	4/3/09	14	%
Building 17	B17:SS-9:189	Soil	4/3/09	1.7	%
Building 17	B17:SS-10:190	Soil	4/3/09	6.93	%
Building 29	B29:SS-1:191	Soil	4/3/09	8.98	%
Building 29	B29:SS-2:192	Soil	4/3/09	8.17	%
Building 29	B29:SS-3:193	Soil	4/3/09	10.2	%
Building 29	B29:SS-4:194	Soil	4/3/09	6.39	%
Building 29	B29:SS-5:195	Soil	4/3/09	6.9	%
Building 29	B29:SS-6:196	Soil	4/3/09	6.93	%
Building 29	B29:SS-7:197	Soil	4/3/09	3.39	%
Building 29	B29:SS-8:198	Soil	4/3/09	3.34	%

TABLE 6-32
TOTAL ORGANIC CARBON ANALYTICAL RESULTS

Buiding	Sample ID	Matrix	Date Sampled	Result	Unit
Building 29	B29:SS-9:199	Soil	4/3/09	13.2	%
Building 29	B29:SS-10:200	Soil	4/3/09	12.9	%
Building 10	B10:SS-1:114	Soil	3/30/09	13.2	%
Building 10	B10:SS-2:115	Soil	3/30/09	10.7	%
Building 10	B10:SS-3:116	Soil	3/30/09	8.08	%
Building 10	B10:SS-4:117	Soil	3/30/09	8.68	%
Building 10	B10:SS-5:118	Soil	3/30/09	9.25	%
Building 10	B10:SS-6:119	Soil	3/30/09	8.46	%
Building 10	B10:SS-7:120	Soil	3/30/09	9.31	%
Building 10	B10:SS-8:121	Soil	3/30/09	0.4	%
Building 10	B10:SS-9:122	Soil	3/30/09	8.17	%
Building 10	B10:SS-10:123	Soil	3/30/09	8.22	%
Building 10	B10:SS-11:124	Soil	3/30/09	8.6	%
Building 10	B10:SS-12:125	Soil	3/30/09	6.45	%
Building 10	B10:SS-13:126	Soil	3/30/09	12.1	%
Building 10	B10:SS-14:127	Soil	3/30/09	11.2	%
Building 18	B18:SS-1:75	Soil	3/29/09	9.08	%
Building 18	B18:SS-2:76	Soil	3/29/09	8.62	%
Building 18	B18:SS-3:77	Soil	3/29/09	4.3	%
Building 18	B18:SS-4:78	Soil	3/29/09	5.19	%
Building 19	B19:SS-1:72	Soil	3/29/09	7.75	%
Building 19	B19:SS-2:73	Soil	3/29/09	6.23	%
Building 19	B19:SS-3:74	Soil	3/29/09	6.06	%
Building 20	B20:SS-1:129	Soil	3/30/09	2.92	%
Building 20	B20:SS-2:130	Soil	3/30/09	5.94	%
Building 20	B20:SS-3:131	Soil	3/30/09	5.13	%
Building 20	B20:SS-4:132	Soil	3/30/09	8.81	%
Building 12	B12:SS-1:60	Soil	3/28/09	5.52	%
Building 12	B12:SS-2:61	Soil	3/28/09	6.19	%
Building 12	B12:SS-3:62	Soil	3/28/09	7.75	%
Building 12	B12:SS-4:63	Soil	3/28/09	5.88	%
Building 12	B12:SS-5:64	Soil	3/28/09	8.81	%
Building 12	B12:SS-6:65	Soil	3/28/09	7.7	%
Building 12	B12:SS-7:66	Soil	3/28/09	8.37	%
Building 12	B12:SS-8:67	Soil	3/28/09	6.96	%
Building 12	B12:SS-9:68	Soil	3/28/09	8.13	%
Building 12	B12:SS-10:69	Soil	3/28/09	7.65	%
Building 12	B12:SS-11:70	Soil	3/28/09	7.16	%
Building 12	B12:SS-12:71	Soil	3/29/09	7.85	%

TABLE 6-33A
SUMMARY OF CHEMICALS OF INTEREST - SOIL

Area/ Building Number	Soil Samples		Soil Gas Sample	Former Use	Comments	Table Reference(s)
	Near Surface	Subsurface				
EAST PARCELS AREA						
Buildings 101 and 102	DRO, ORO, PCBs, PAHs, and cPAHs	--	--	Radio and Standby Generator Building		Table 6-24
ADMINISTRATION AND OPERATIONS AREA						
Liquid Disposal Area	--	ORO, Lead, Silver, VOCs, SVOCs, PAHs	--	Alleged dump area off southwest end of Runway 2		Table 6-1
WEST PARCELS AREA						
	--	--	--			
INDUSTRIAL COMPLEX AREA						
Building 4, Public Work Shop	**Lead, Pentachlorophenol, cPAHs**, PAHs, SVOCs, DRO, Silver, and ORO	--	--	Public Works - Former Paint Shop	Lead contamination potentially associated with deterioration of lead-based paint.	Table 6-2, Table 6-32
Building 5	**Naphthalene, cPAHs, Pyrene,** DRO, ORO, Lead, Silver, SVOCs, and PAHS	--	--	Transportation Building	Oiled hardstand / PAHs / upper 6 inches of soil profile	Table 6-5, Table 6-32
Building 6	--	VOCs	--	Fire Station		Table 6-12
Building 9	**Lead,** SVOCs, PAHs, cPAHs, Silver, DRO, and ORO	--	--	Blacksmith Shop - Maintenance Shop	Lead contamination potentially associated with deterioration of lead-based paint.	Table 6-3
Building 10	**Lead, Pentachlorophenol, cPAHs,** Silver, DRO, ORO, SVOCs, and PAHs	--	--	Gunnery Training Building	Lead contamination potentially associated with deterioration of lead-based paint.	Table 6-7, Table 6-32

TABLE 6-33A
SUMMARY OF CHEMICALS OF INTEREST - SOIL

Area/ Building Number	Soil Samples		Soil Gas Sample	Former Use	Comments	Table Reference(s)
	Near Surface	Subsurface				
Building 12	**Lead,** DRO, ORO, Silver, SVOCs, PAHs, and cPAHs	VOCs	--	Class C Overhaul Shop/Accessory Shop	Lead contamination potentially associated with deterioration of lead-based paint. Potential source of carbon tetrachloride due to industrial cleaning materials/degreasers.	Table 6-8, Table 6-15, Table 6-32
Building 17	**cPAHs,** DRO, ORO, Lead, Silver, SVOCs, and PAHs	--	--	Wash Rack and Shelter		Table 6-6, Table 6-32
Buildings 18 and 19	ORO, DRO, Lead, Silver, SVOCs, PAHs, and cPAHs	VOCs	--	Paint Shops		Table 6-9, Table 6-16, Table 6-32
Building 20	cPAH, PAHs, Lead, Silver, DRO, ORO, and SVOCs	VOCs	--	Hanger		Table 6-10, Table 6-17, Table 6-32
Building 29	**cPAHs,** PAHs, Lead, Silver, SVOCs, and DRO	VOCs	--	Photography Laboratory		Table 6-11A, Table 6-11B, Table 6-32
Building 31	--	**Arsenic, Iron,** Metals, DRO, ORO VOCs, SVOCs	--	Barracks		Table 6-29
Building 40	--	**Arsenic**, **Iron**, Metals, DRO, ORO, VOCs, SVOCs	--	Barracks		Table 6-29
Building 33	--	--	**1,1,2,2-Tetrachloroethane, 1,2-Dicloroethane, Benzene,** VOCs	Nielson Residence (former Barracks)	Possible discharge of bleach-containing household cleaning products into septic system.	Table 6-30, Table 6-32

TABLE 6-33A
SUMMARY OF CHEMICALS OF INTEREST - SOIL

Area/ Building Number	Soil Samples		Soil Gas Sample	Former Use	Comments	Table Reference(s)
	Near Surface	Subsurface				
Nielson Pumphouse	--	VOCs	**Benzene, Carbon Tetrachloride,**			Table 6-14, Table 6-32
Building 44	--	**Methylene Chloride, Tetrachloroethene ,** VOCs	**1,2-Dicloroethane, Benzene, Carbon Tetrachloride, Ethylbenzene, Tetrachloroethene, Trichloroethene,** VOCs	Laundry with dry cleaning operations	Carbon tetrachloride and PCE contamination likely associated with use as a former laundry/dry cleaning facility. Reported disposal of carbon tetrachloride cleaning fluid into surface soil by present owner. Possible discharge of bleach-containing household cleaning products into septic system.	Table 6-18, Table 6-30, Table 6-31, Table 6-32
Building 119 and 119A	PAHs, cPAHs, SVOCs, Lead, Silver, DRO, and ORO	VOCs	--	Paint Shops		Table 6-4A, Table 6-4B, Table 6-32
Building E-120	--	**Arsenic, Iron,** VOCs	--	Fire Station		Table 6-13
Tetraethyl Lead Disposal Area	--	Lead, VOCs, SVOCs, PAHs, cPAHs	--		Analytical results show no potential source of soil or groundwater contamination	Table 6-25, Table 6-32

TABLE 6-33A
SUMMARY OF CHEMICALS OF INTEREST - SOIL

Area/ Building Number	Soil Samples		Soil Gas Sample	Former Use	Comments	Table Reference(s)
	Near Surface	Subsurface				
Transformer/Generator Buildings (Buildings 7, 11, 41, 49, and 65)						
Building 7	DRO, ORO, PCBs, PAHs and cPAHs	--	--	Transformer Vault		Table 6-19
Building 11	PAHs, cPAHs, PCBs, DRO, and ORO	--	--	Radio and Radar Building		Table 6-20
Building 41	PAHS, cPAHs, ORO, DRO, and PCBs	**Arsenic,** DRO, ORO, Metals, VOCs, SVOCs	--	Boiler and Generator Building	Oiled hardstand	Table 6-21, Table 6-29
Building 49	PAHs, cPAHs, DRO, and ORO	--	--	Auxiliary Generator Building		Table 6-22
Building 65	PAHs, cPAHs, and ORO	--	--	Auxiliary Generator Building		Table 6-23

Notes :

-- No samples collected

Bold = exceeded one or more screening criteria

COI in **bold**; detections below screening criteria in plain text.

Non-bold text = chemical detections that did not exceed screening criteria

cPAHS = carcinogenic Polynuclear Aromatic Hydrocarbons

DRO = Diesel-range Organics

ORO = Oil-range Organics

PAHs = Polynuclear Aromatic Hydrocarbons

SVOCs = Semi-volatile Organic Compounds

VOCs = Volatile Organic Compounds

TABLE 6-33B
SUMMARY OF CHEMICALS OF INTEREST - GROUNDWATER

Area/Building Number	Groundwater	Former Use	Comments	Table Reference(s)
EAST PARCELS AREA				
MW-8	**Bis(2-ethylhexyl) Phthalate,** Lead, and SVOCs	Monitoring Well		Table 6-26
ADMINISTRATION AND OPERATIONS AREA				
Airport	**Bis(2-ethylhexyl) Phthalate,** Lead, and Silver	Former DoD Well		Table 6-26
B-14	**Bis(2-ethylhexyl) Phthalate,** Lead, Silver, and SVOCs	Residential Well	Located in the West Parcels area	Table 6-26
B-21	**Arsenic (total), Arsenic (dissolved), Bis(2-ethylhexyl) Phthalate, Trichlorehence,** Metals, VOCs, and SVOCs	Residential Well	Located in the West Parcels area. TCE exceedance occurred in April 2009, but was not observed in November 2009 sampling.	Table 6-26
B-26	Lead (Total)**,** VOCs, and SVOCs	Residential Well	Located in the West Parcels area	Table 6-26
B-6	Lead (Total), SVOCs, and PAHs	Residential Well	Located in the West Parcels area	Table 6-26
B-24	**Arsenic (total), Bis(2-ethylhexyl) Phthalate,** Metals, and SVOCs	Residential Well	Located in the West Parcels area	Table 6-26
MW-10 (Borrow Pit)	**Arsenic (total), Arsenic (dissolved), Iron (total), Lead (total), Bis(2-ethylhexyl) Phthalate,** Metals, VOCs, SVOCs, and PAHs	Monitoring Well		Table 6-26
MW-7 (Borrow Pit)	**Bis(2-ethylhexyl) Phthalate,** Metals, and SVOCs	Monitoring Well		Table 6-26

TABLE 6-33B
SUMMARY OF CHEMICALS OF INTEREST - GROUNDWATER

Area/Building Number	Groundwater	Former Use	Comments	Table Reference(s)
MW-9	**Bis(2-ethylhexyl) Phthalate**, Lead, Silver, and SVOCs	Monitoring Well		Table 6-26
INDUSTRIAL COMPLEX AREA				
DOD-Ni (Nielson Pumphouse Well)	**Carbon Tetrachloride,** Lead**,** VOCs, and SVOCs	Former DoD Well		Table 6-27
MW-1	**Carbon Tetrachloride**	Monitoring Well	Surrounding Nielson Pumphouse Well	Table 6-27
MW-2	**Carbon Tetrachloride and** SVOCs	Monitoring Well	Adjacent to Former Building E120 (Surrounding Nielson Pumphouse Well)	Table 6-27
MW-3	**Carbon Tetrachloride**, VOCs, and SVOCs	Monitoring Well	Surrounding Nielson Pumphouse Well	Table 6-27
MW-11	Lead, Silver, VOCs, SVOCs, and PAHs	Monitoring Well	Near Building 20	Table 6-27
MW-12	VOCs and SVOCs	Monitoring Well	Near Parcel-K Pond	Table 6-27
MW-13	Lead and SVOCs	Monitoring Well	Near Buildings 5 and 10	Table 6-27
MW-14 (Building 41)	**Arsenic**, Metals, VOCs, SVOCs, and PAHs	Monitoring Well	Near Building 41 former boiler and generator building. UST closed in place nearby.	Table 6-27
MW-15 (Building 40)	**Arsenic**, Metals, VOCs, and 'SVOCs	Monitoring Well	Near Building 40 and Stout Residential Well	Table 6-27
MW-16 (Building 44)	**Arsenic, Carbon Tetrachloride, Tetrachloroethene,** DRO, ORO**,** Metals, and SVOCs	Monitoring Well	Near Building 44, former laundry building. Groundwater contamination of PCE and Carbon Tetrachloride is consistent with potential dry cleaning operations and/or disposal of household cleaners containing carbon tetrachloride or bleach.	Table 6-27

TABLE 6-33B
SUMMARY OF CHEMICALS OF INTEREST - GROUNDWATER

Area/Building Number	Groundwater	Former Use	Comments	Table Reference(s)
MW-17	**Arsenic,** VOCs, Metals, SVOCs, and PAHs	Monitoring Well	Near Building 31 (Nielson Property)	Table 6-27
New Nielson Well	**Arsenic,** Metals, DRO, and VOCs	Residential Well	New Nielson Residential Well (Installed December 2011)	Table 6-27
P-12A	Lead and SVOCs	Residential Well	Stout Residential Well	Table 6-27
P-13	Lead and SVOCs	Residential Well	Fields Residential Well	Table 6-27
P-17	Lead, VOCs, and SVOCs	Residential Well		Table 6-27
WEST PARCELS				
MW-6	Lead (total), Lead (dissolved), VOCs, SVOCs, and PAHs	Monitoring Well		Table 6-26

TABLE 6-33B
SUMMARY OF CHEMICALS OF INTEREST - GROUNDWATER

Area/Building Number	Groundwater	Former Use	Comments	Table Reference(s)
GRAB SAMPLES				
W-1 (Building 41)	**Naphthalene,** VOCs, SVOCs, DRO, ORO, and PAHs		Grab sample collected near Boiler and Generator Building - Building 41	Table 6-28
W-2 (Building 41)	**Naphthalene,** VOCs, SVOC, DRO, and ORO		Grab sample collected near Boiler and Generator Building - Building 41	Table 6-28
W-3 (Building 41)	**Naphthalene,** VOCs, SVOCs, DRO, ORO, and PAHs		Grab sample collected near Boiler and Generator Building - Building 41	Table 6-28
W (Building 5)	DRO, ORO**,** VOCs, and PAHs	Transportation and Maintenance Shop	Grab sample collected at Building 5	Table 6-28
B10 (B10:GW:500)	ORO and PAHs	Gunnery Training Building	Grab sample collected at Building 10	Table 6-28
B20 (B20:GW:2-18:296)	VOCs	Hangar	Grab sample collected in Geoprobe boring adjacent to Building 20	Table 6-28
Q4	*		Parcel K Pond	Table 6-28

Notes:

-- No samples collected

* No analytes detected

COI in **bold**; detections below screening criteria in plain text.

Bold = Exceeded one or more screening criteria

Non-bold text = chemical detections that did not exceed screening criteria

cPAHS = carcinogenic Polynuclear Aromatic Hydrocarbons

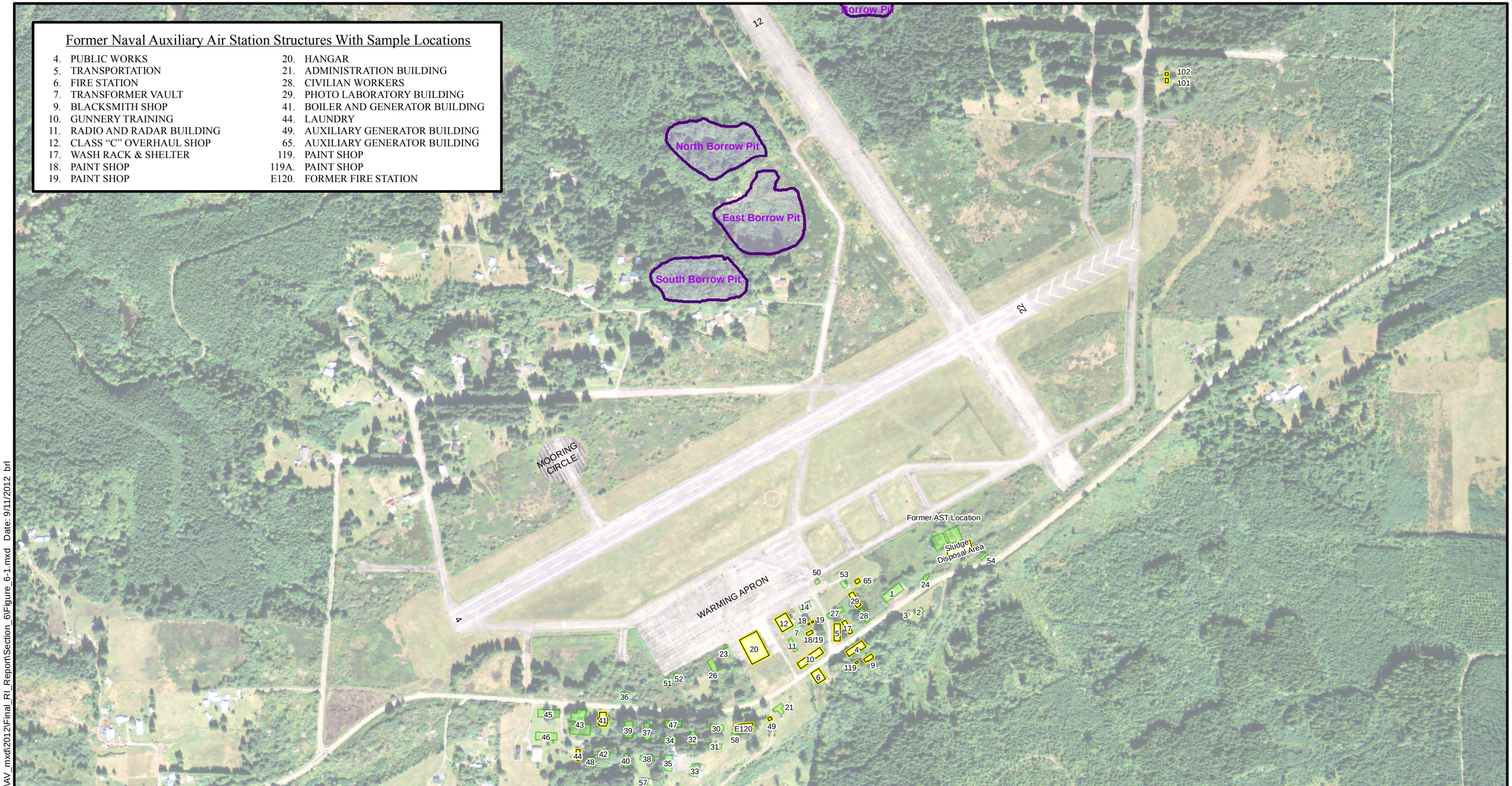
DRO = Diesel-range Organics

ORO = Oil-range Organics

PAHs = Polynuclear Aromatic Hydrocarbons

SVOCs = Semi-volatile Organic Compounds

VOCs = Volatile Organic Compounds



LEGEND

- Potential Source Areas
- Approximate Location: Structures
- Approximate Location: Borrow Pits

NOTE

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.

N W E S

0 600 1,200 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

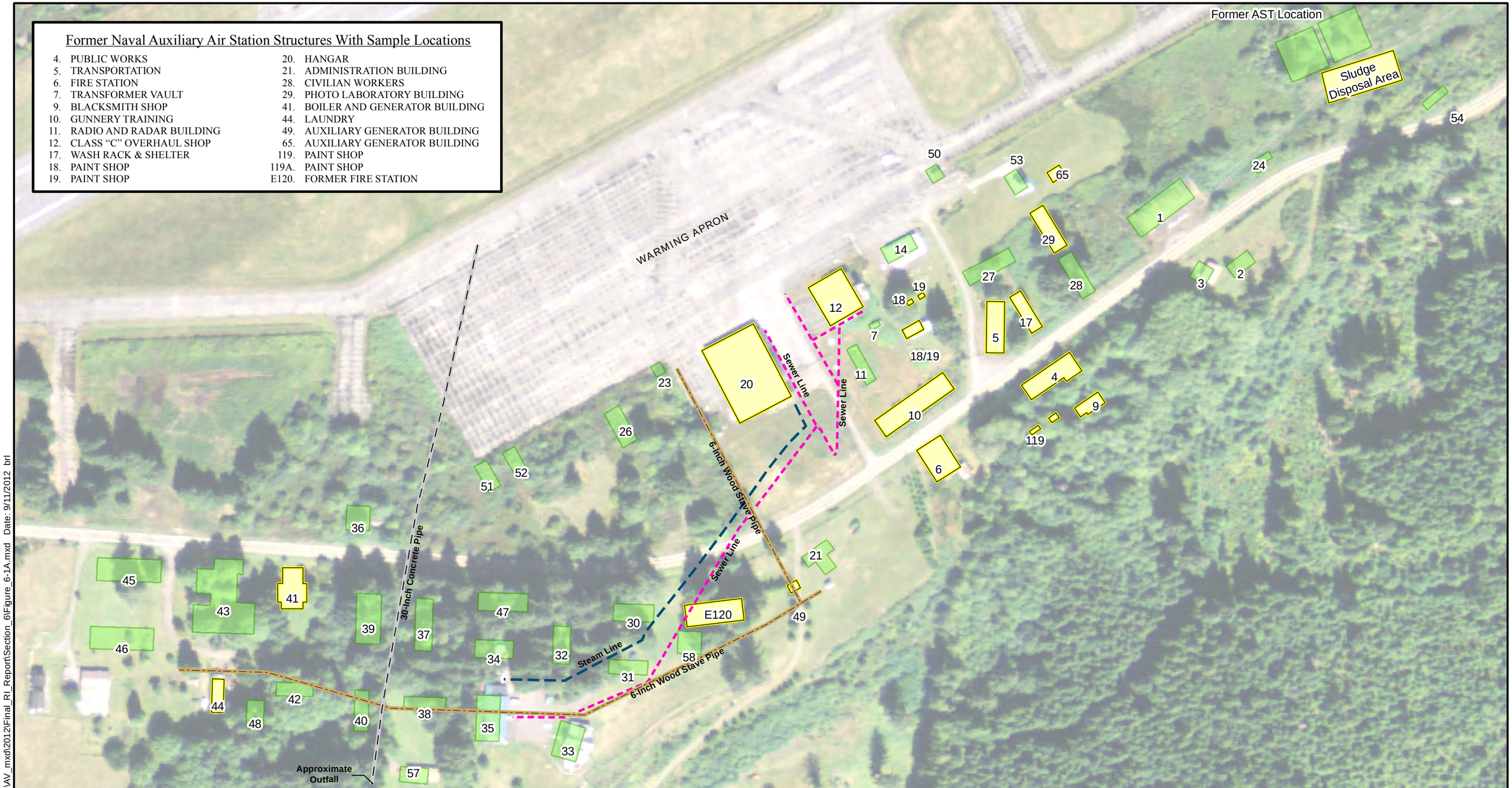
POTENTIAL SOURCE AREAS
NAAS QUILLAYUTE

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-1

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-1.mxd Date: 9/11/2012 brl



LEGEND

Potential Source Areas

Approximate Location: Structures

NOTE

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 200 400 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

INDUSTRIAL COMPLEX AREA POTENTIAL SOURCE AREAS NAAS QUILLAYUTE

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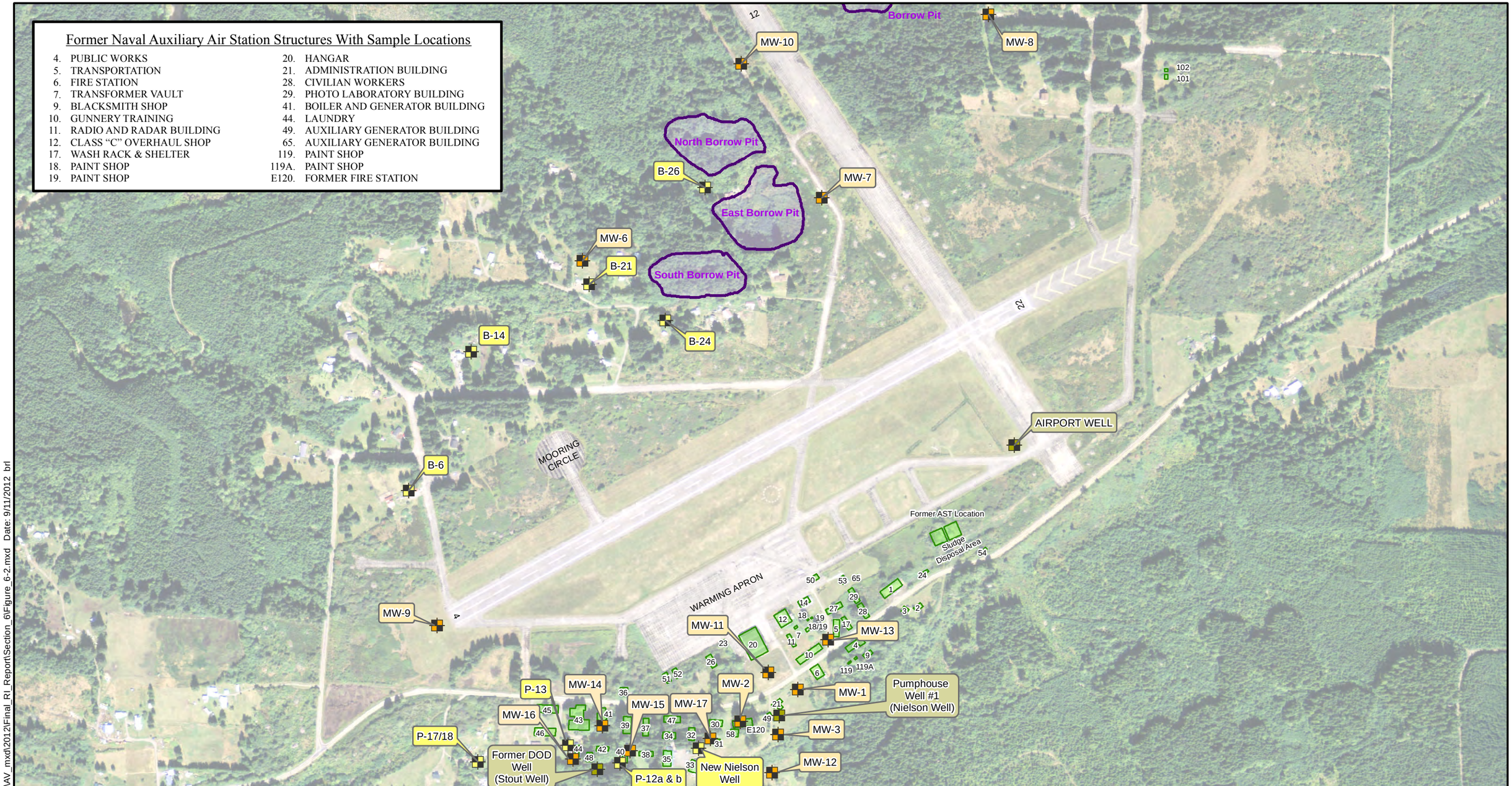
FIG. 6-1A

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-1A.mxd Date: 9/11/2012 brl



LEGEND

- Approximate Location: Residential Groundwater Supply Well
- Approximate Location: Monitoring Well
- Approximate Location: Former DOD Supply Well
- Approximate Location: Structures
- Approximate Location: Borrow Pits

NOTE

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.

N W E S

0 600 1,200 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

MONITORING AND RESIDENTIAL WELLS

September 2012 21-1-16506-004

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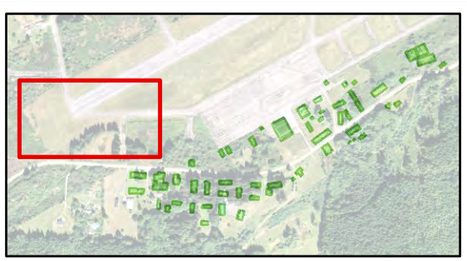
FIG. 6-2

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-2.mxd Date: 9/11/2012 brl



LEGEND

Soil Sample

B9:SS-1 ID

Detected Analyte

Monitoring Wells

NOTE
1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-1 for further analytical results.

N
W E
S

0 80 160
Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

LIQUID DISPOSAL AREA
SOIL BORING LOCATIONS

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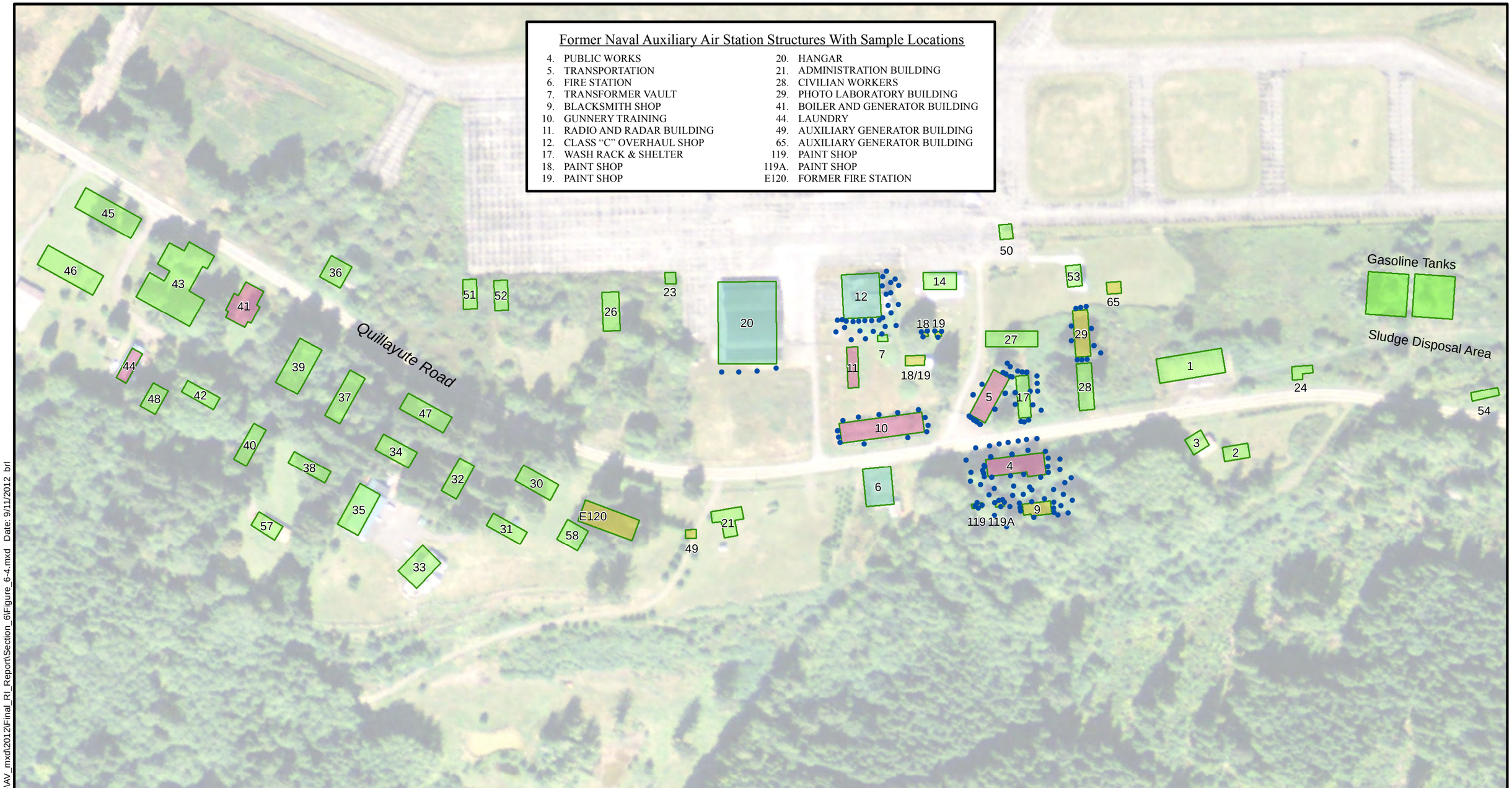
FIG. 6-3

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-3.mxd Date: 9/11/2012 brl



LEGEND

- Near Surface Sample
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.
3. Sample locations should be considered approximate and are for visualization purposes only.

N W E S

0 200 400 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

INDUSTRIAL COMPLEX AREA NEAR SURFACE SOIL SAMPLE LOCATIONS

September 2012 21-1-16506-004

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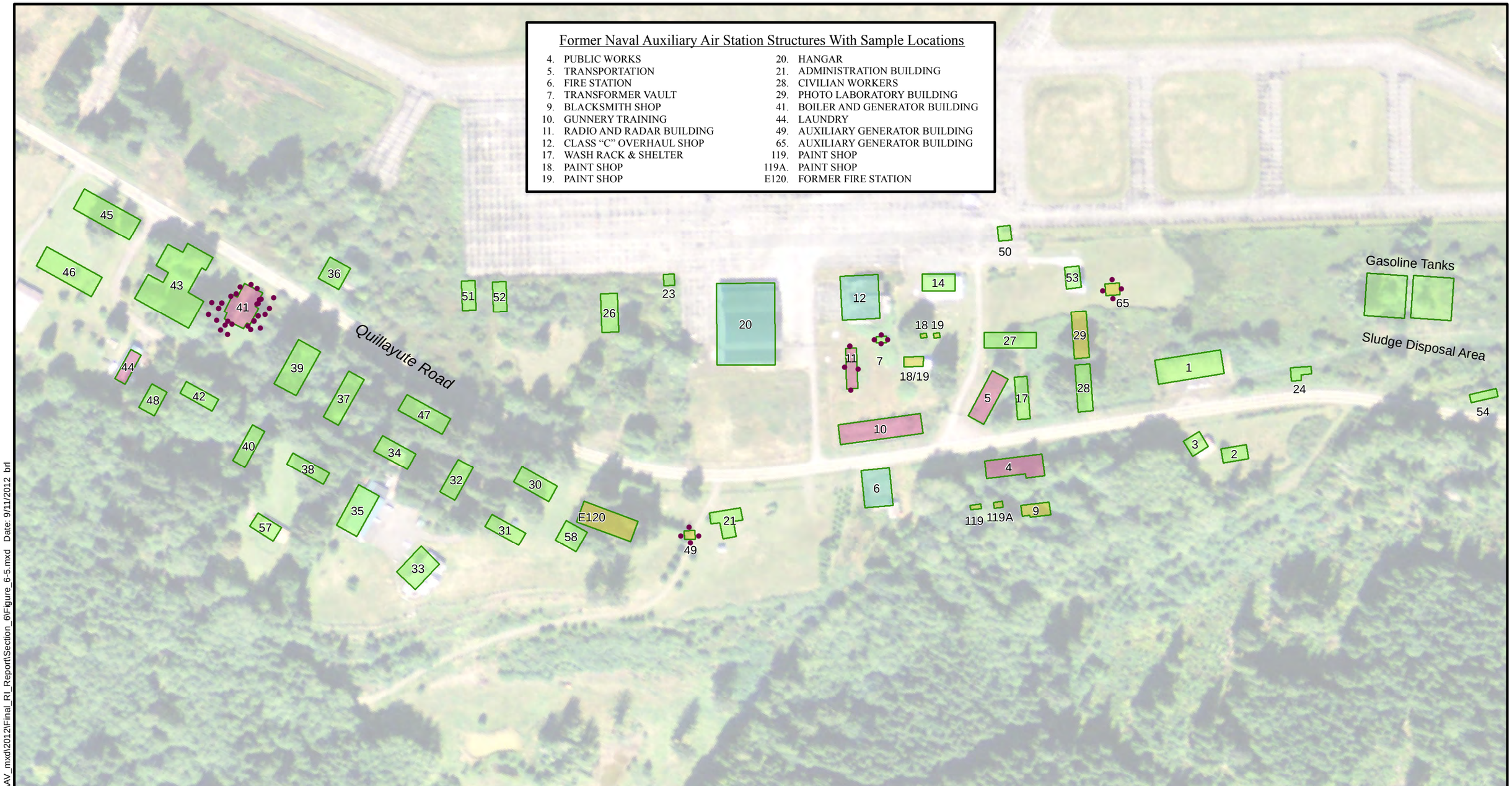
FIG. 6-4

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-4.mxd Date: 9/11/2012 brl



LEGEND

- Near Surface Sample
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building- location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.
3. Sample locations should be considered approximate and are for visualization purposes only.

0 200 400 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

INDUSTRIAL COMPLEX AREA TRANSFORMER/GENERATOR BUILDING NEAR SURFACE SOIL SAMPLE LOCATIONS

September 2012 21-1-16506-004

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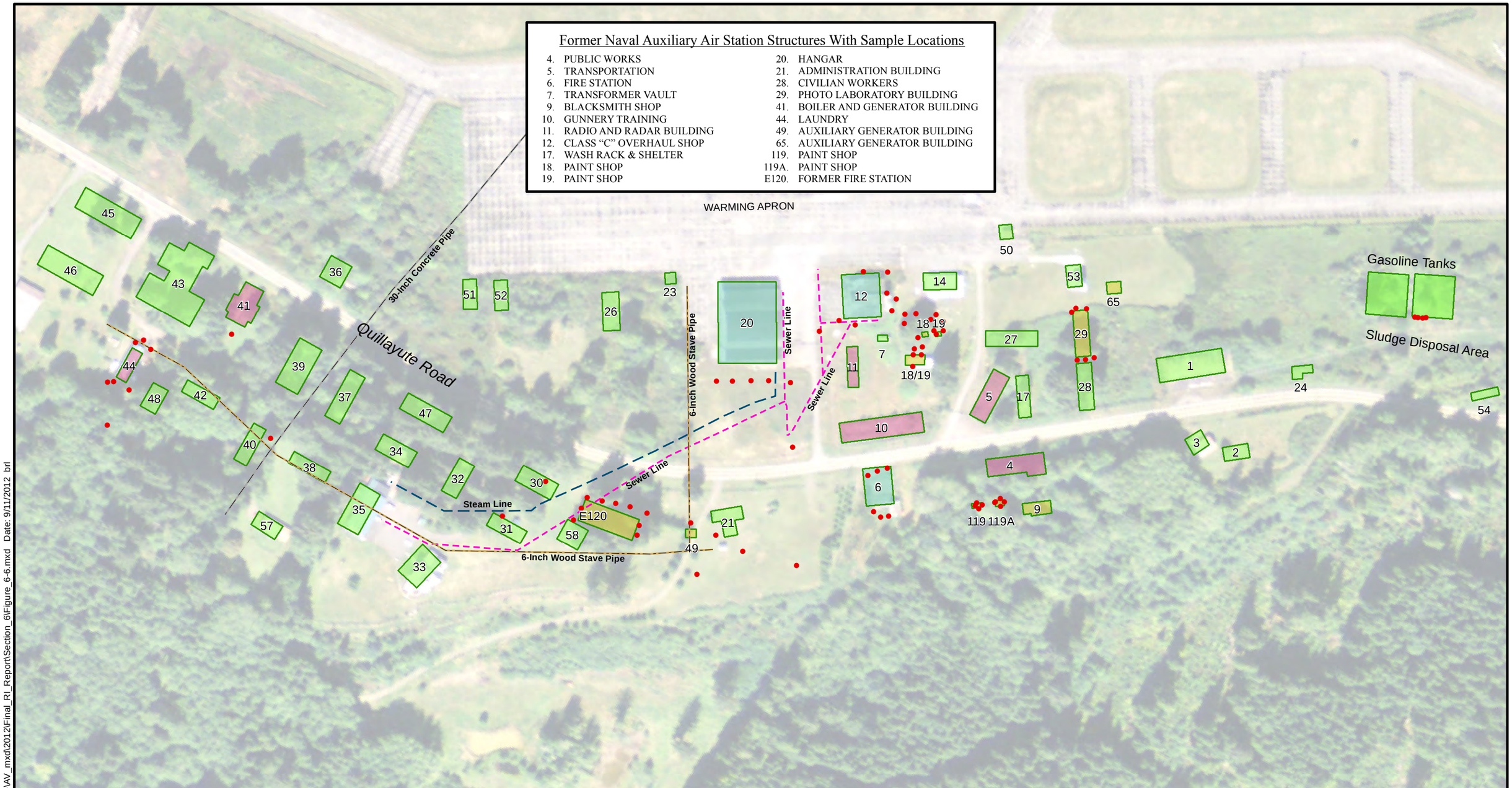
FIG. 6-5

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-5.mxd Date: 9/11/2012 brl



LEGEND

- Soil Boring Sample
- Approximate Location - Structures based on 1947 Navy map
- Approximate Location - Borrow Pit
- No evidence of building-location based on 1947 Navy map
- Building no longer exists - foundation mostly intact
- Existing structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Buildings not listed in callout box are listed in Shannon & Wilson, Inc. Historical Report.
3. Sample locations should be considered approximate and are for visualization purposes only.
4. Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

0 200 400 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

INDUSTRIAL COMPLEX AREA SUBSURFACE SOIL SAMPLE LOCATIONS

September 2012 21-1-16506-004

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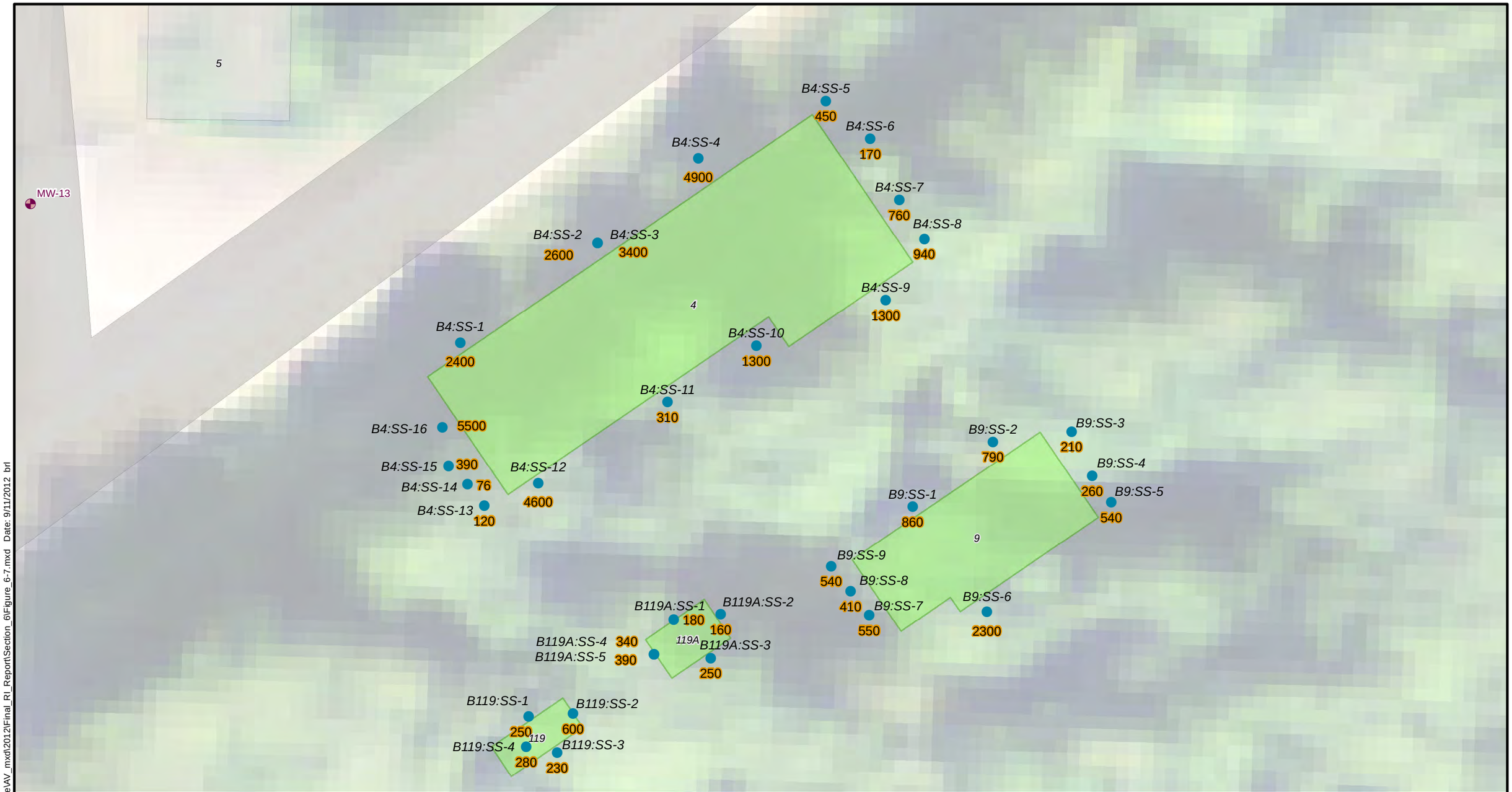
FIG. 6-6

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-6.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

Monitoring Wells

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-2, 6-3, and 6-4 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 4, 9, 119 & 119A ORO IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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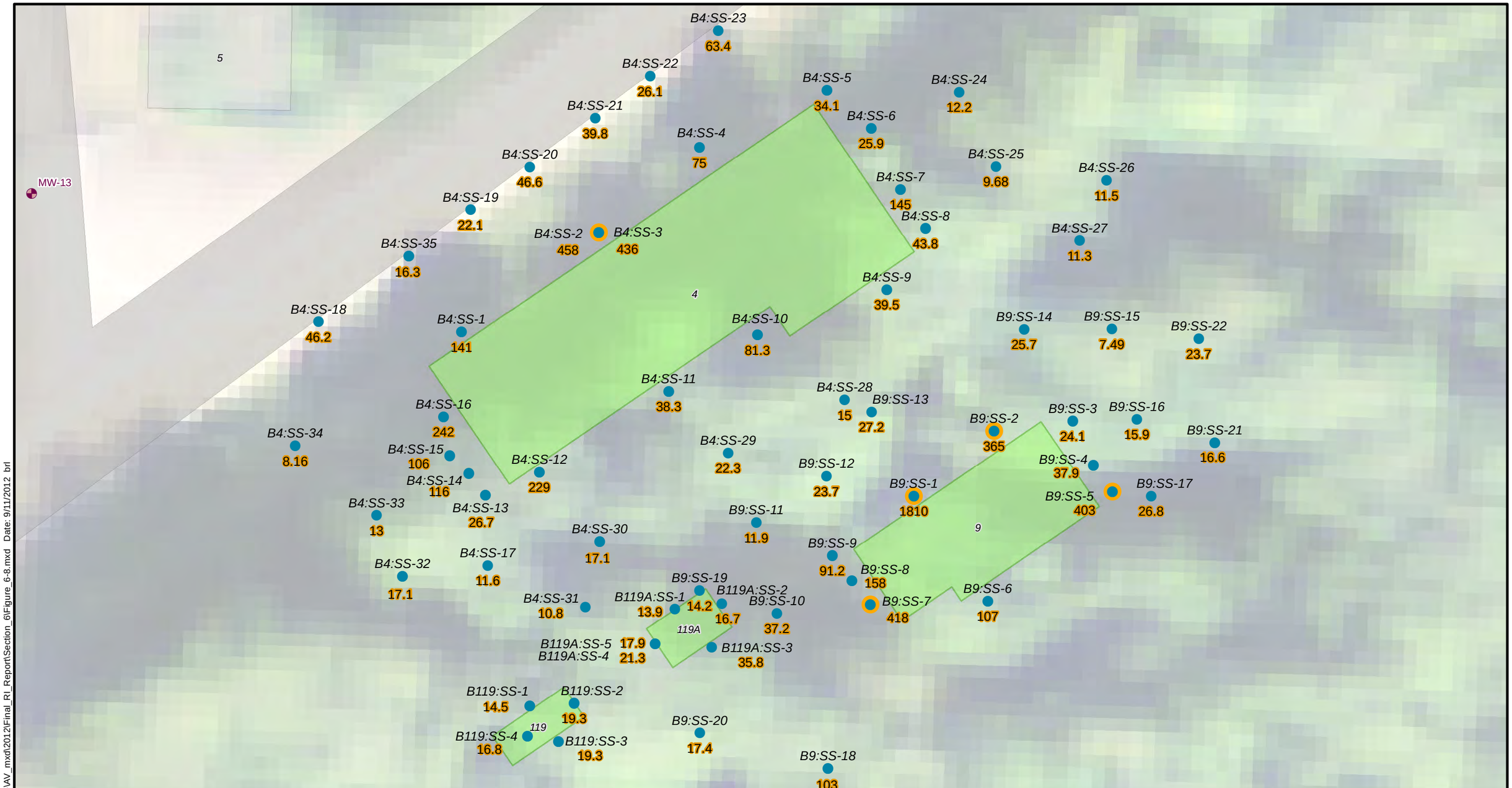
FIG. 6-7

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-7.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 ID
860 Concentration (mg/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-2, 6-3, and 6-4 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 4, 9, 119 & 119A
LEAD IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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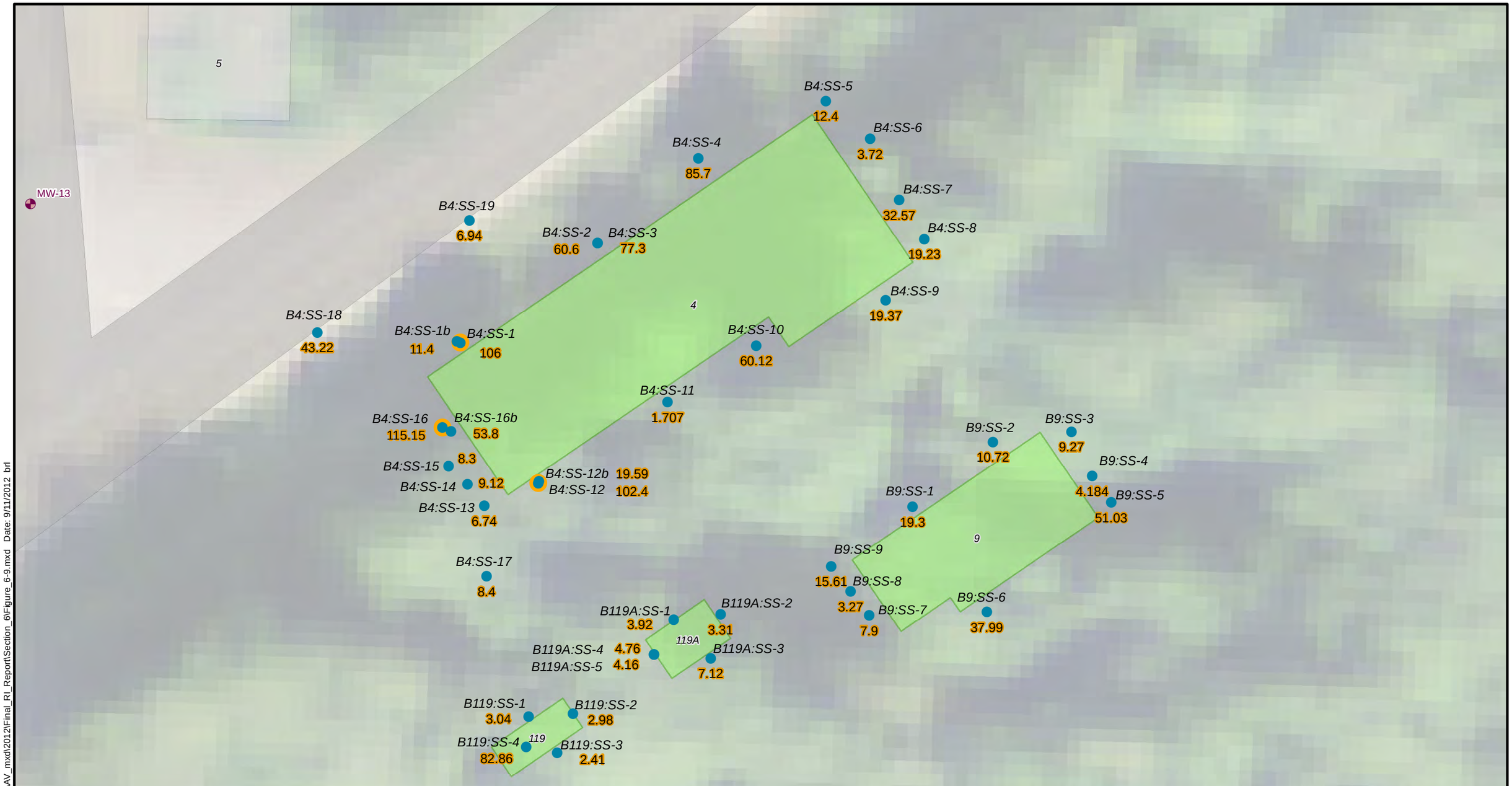
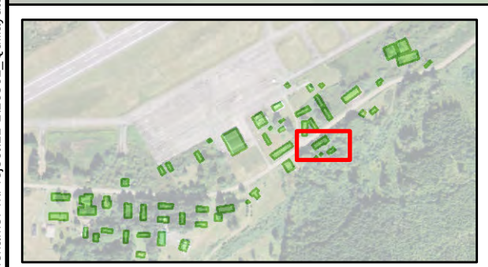
FIG. 6-8

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-8.mxd Date: 9/11/2012 brl





LEGEND

Near Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 ID

860 Concentration (ug/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-2, 6-3, and 6-4 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 4, 9, 119 & 119A
TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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FIG. 6-9

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-9.mxd Date: 9/11/2012 brl

LEGEND

Surface Sample

- No Detection
- Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-5 and 6-6 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 5 & 17
ORO IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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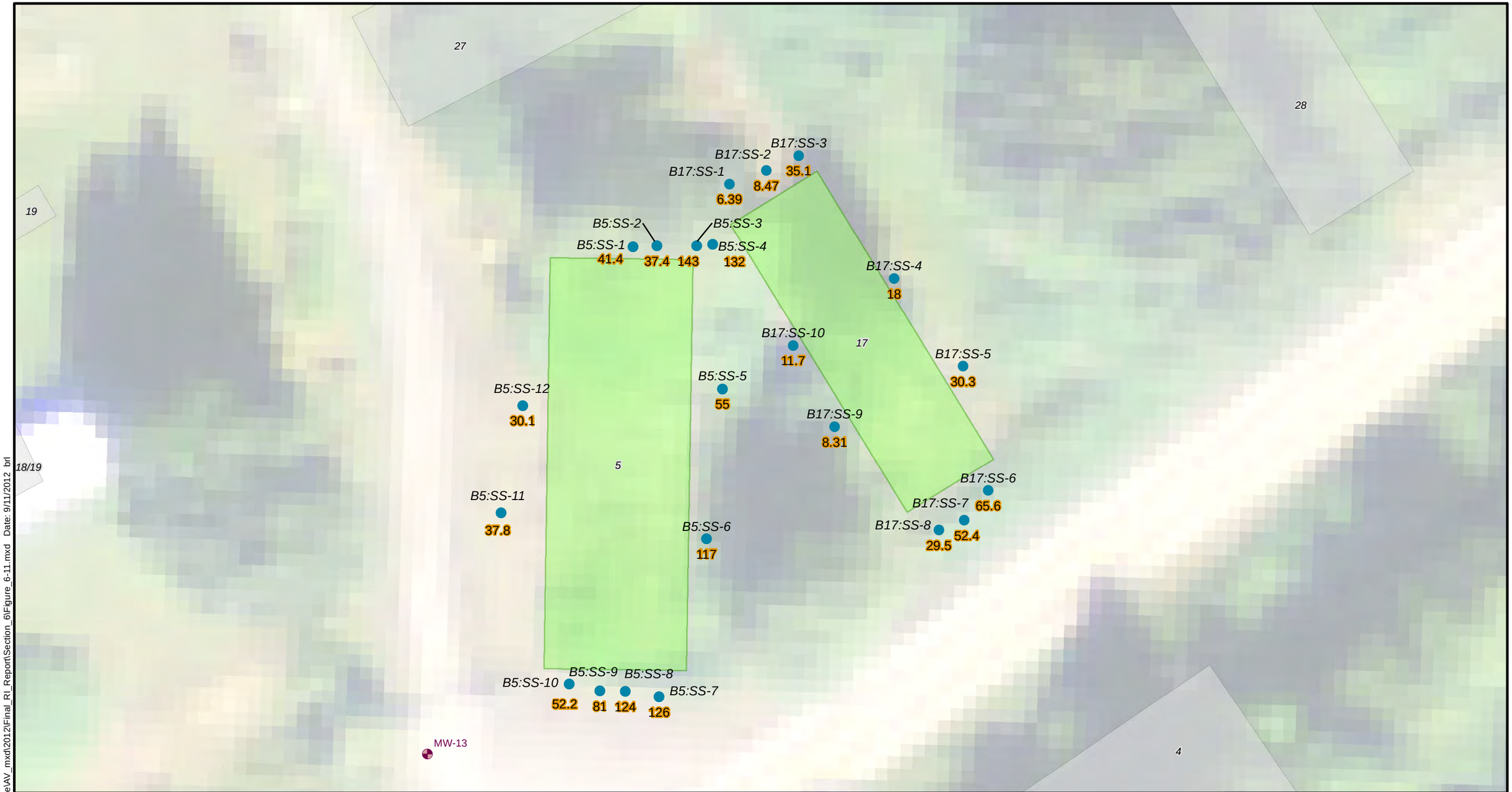
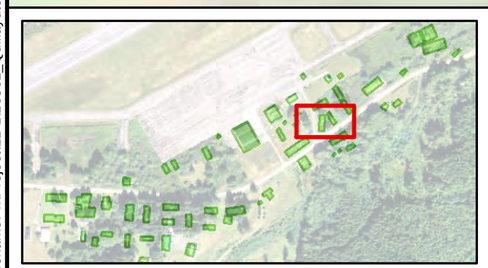
FIG. 6-10

Filename: T:\Project\21-1116502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-10.mxd Date: 9/11/2012 brl





LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

Monitoring Wells

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-5 and 6-6 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

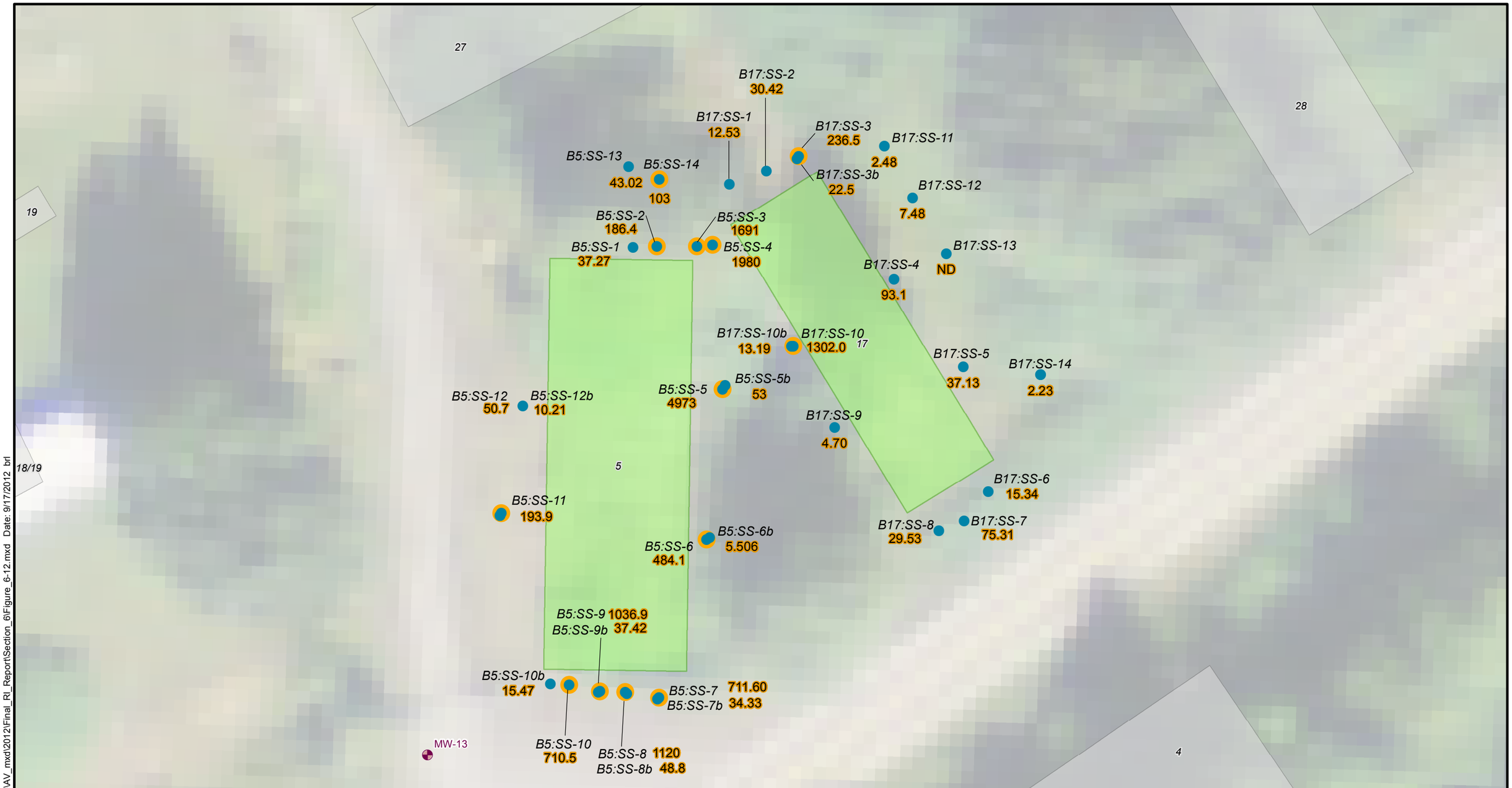
BUILDINGS 5 & 17
LEAD IN NEAR SURFACE SOIL

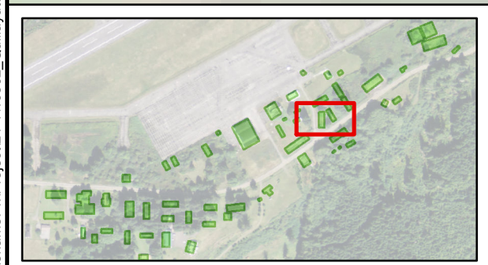
September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-11

Filename: T:\Project\21-1116502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-11.mxd Date: 9/11/2012 brl





LEGEND

Near Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 ID

860 Concentration (ug/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-5 and 6-6 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 5 & 17
TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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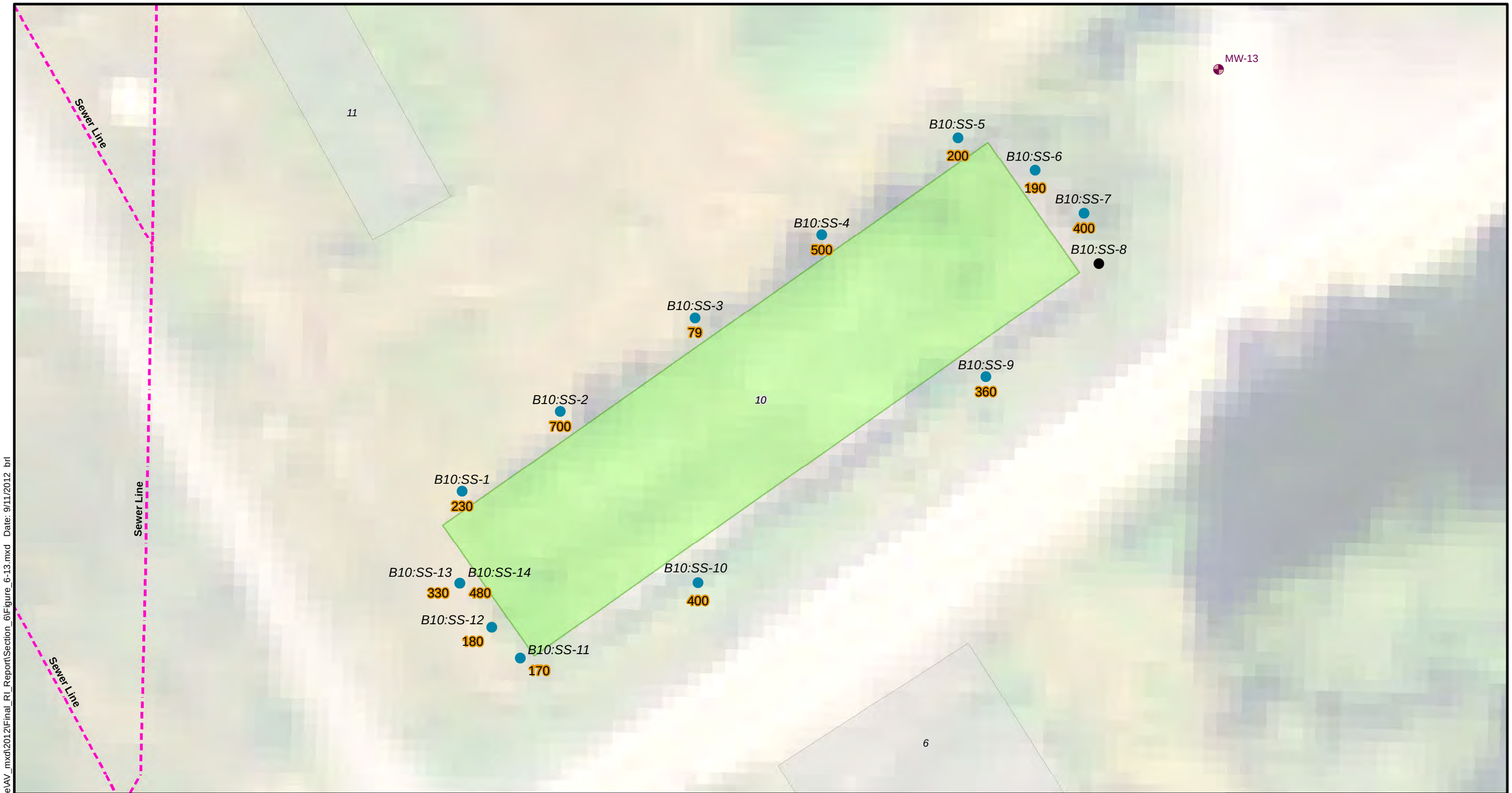
FIG. 6-12

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-12.mxd Date: 9/17/2012 brl



LEGEND

Near Surface Sample

- No Detection
- Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-7 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

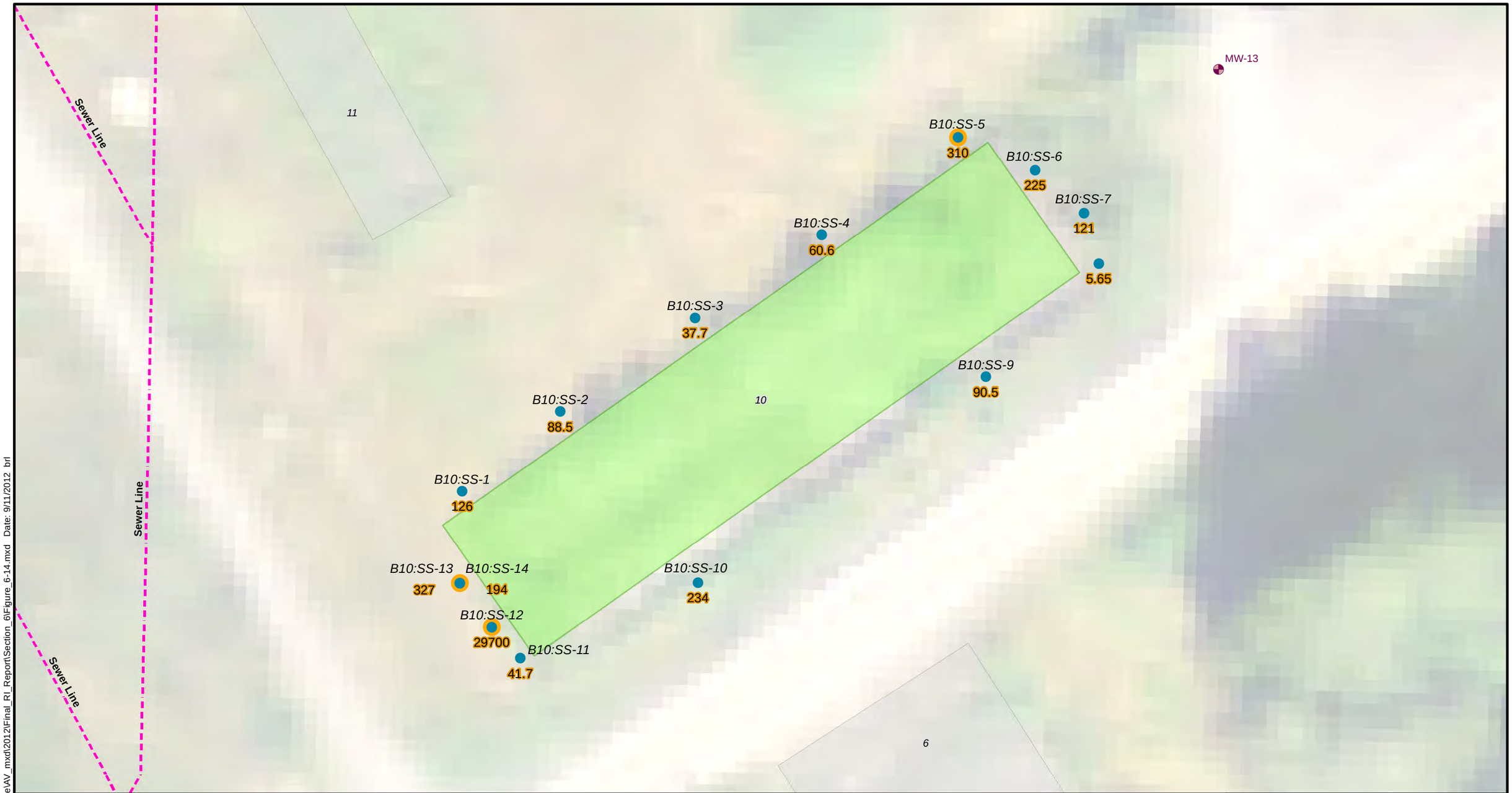
BUILDING 10
ORO IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-13

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-13.mxd Date: 9/11/2012 brl



LEGEND

Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 ID
860 Concentration (mg/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTE
1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-7 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

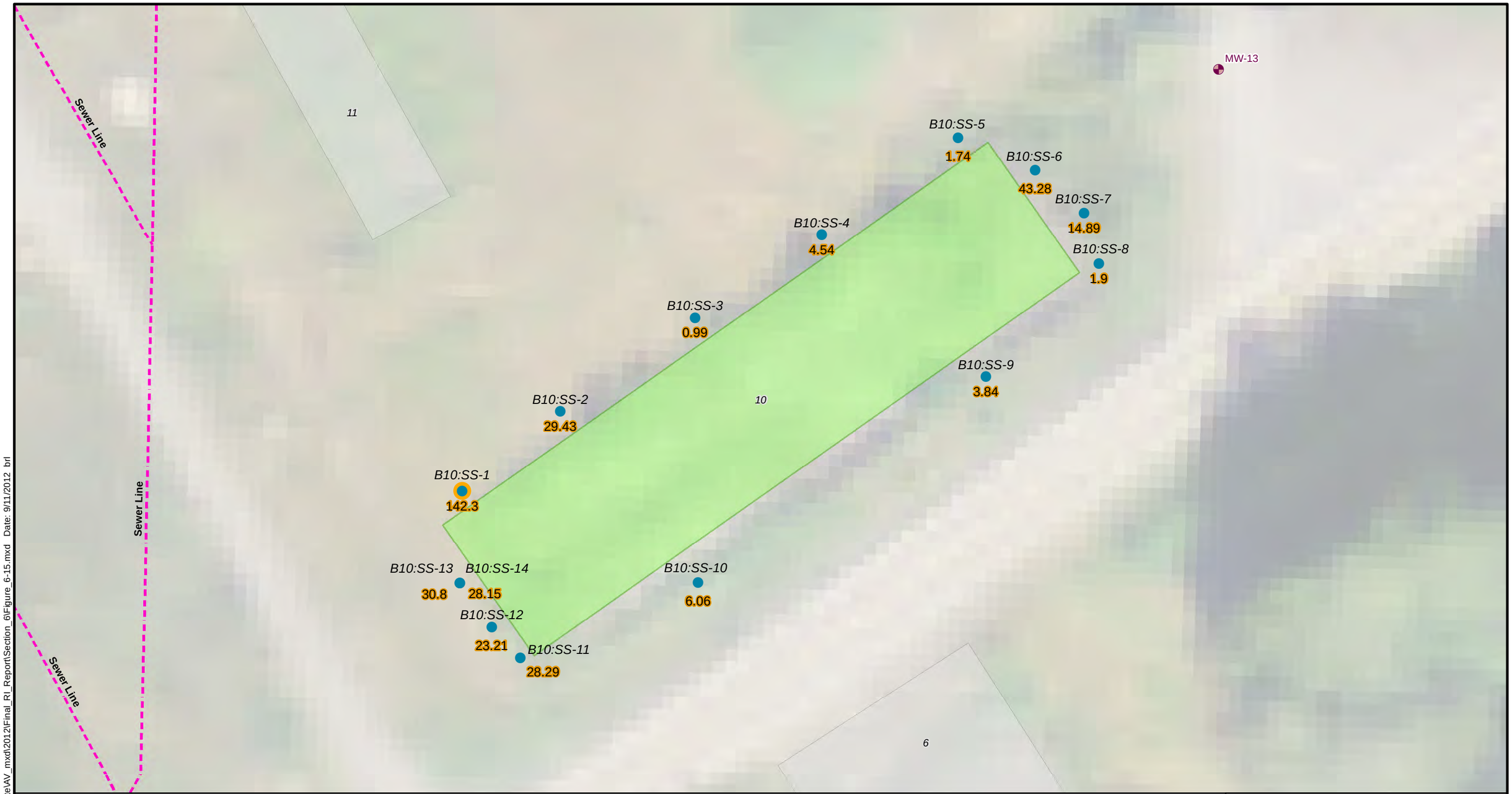
BUILDING 10
LEAD IN NEAR SURFACE SOIL

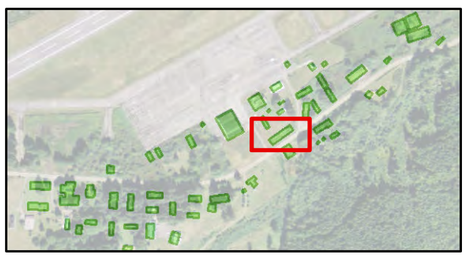
September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-14

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-14.mxd Date: 9/11/2012 brl





LEGEND

Near Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 ID

860 Concentration (ug/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTE

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-7 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 10
TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-15

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-15.mxd Date: 9/11/2012 brl

LEGEND

Near Surface Sample

- No Detection
- Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-8 and 6-9 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

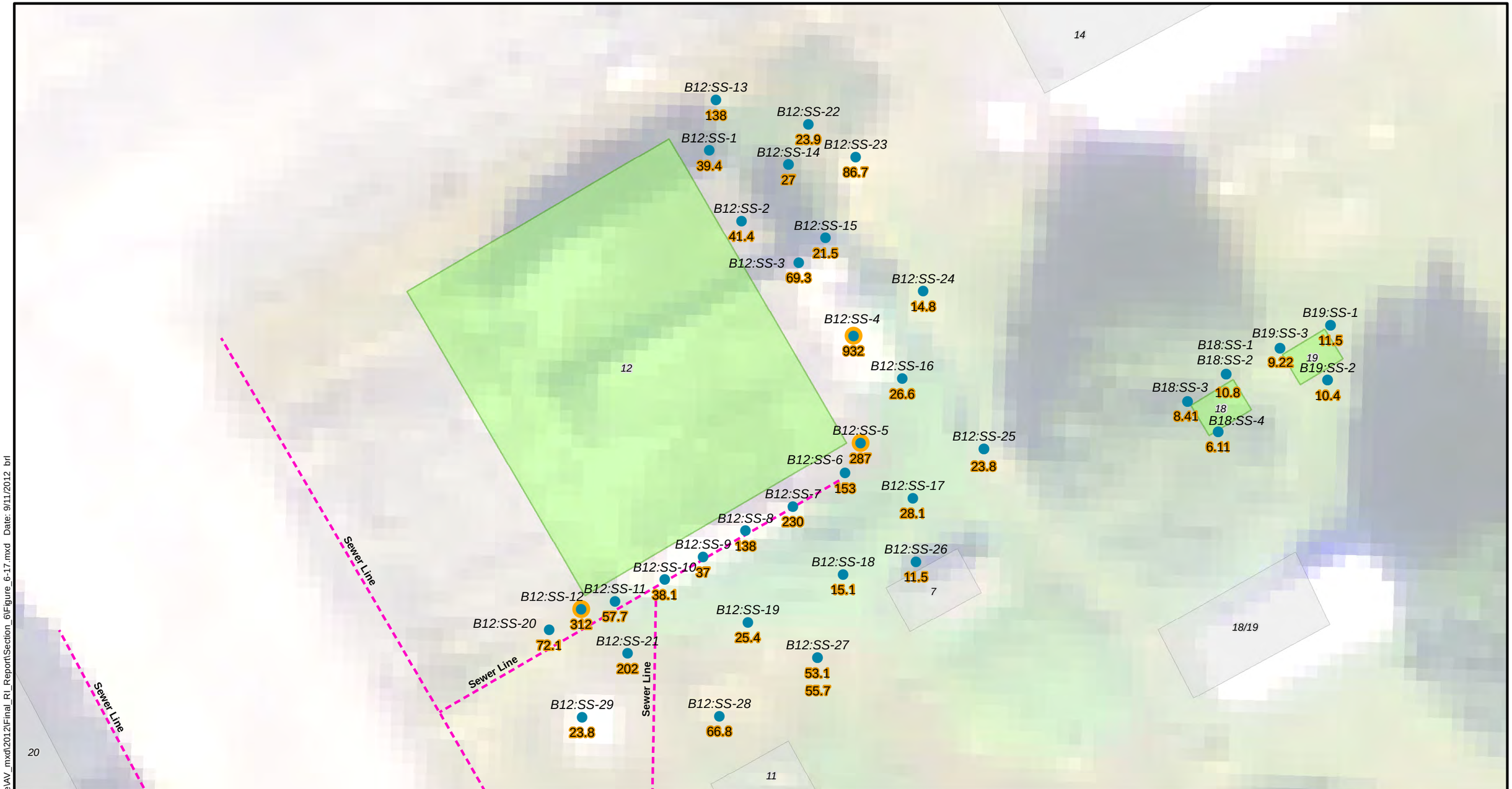
BUILDINGS 12, 18, & 19
ORO IN NEAR SURFACE SOIL

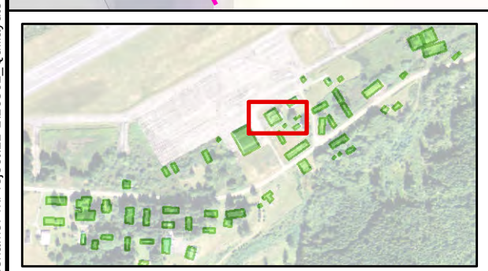
September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-16

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-16.mxd Date: 9/11/2012 brl





LEGEND

Near Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 ID
860 Concentration (mg/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-8 and 6-9 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

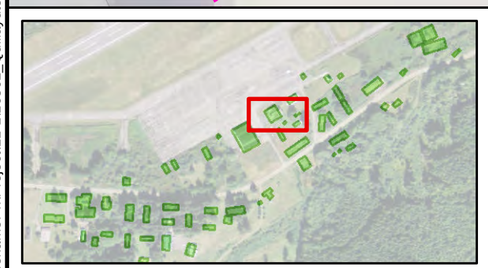
BUILDINGS 12, 18, & 19
LEAD IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-17

Filename: T:\Project\21-1116502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-17.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (ug/kg)

Monitoring Wells

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-8 and 6-9 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

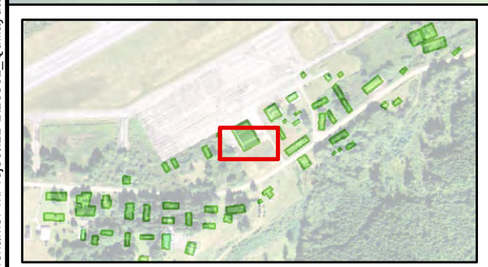
BUILDINGS 12, 18, & 19
TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-18

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-18.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-10 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 20
ORO IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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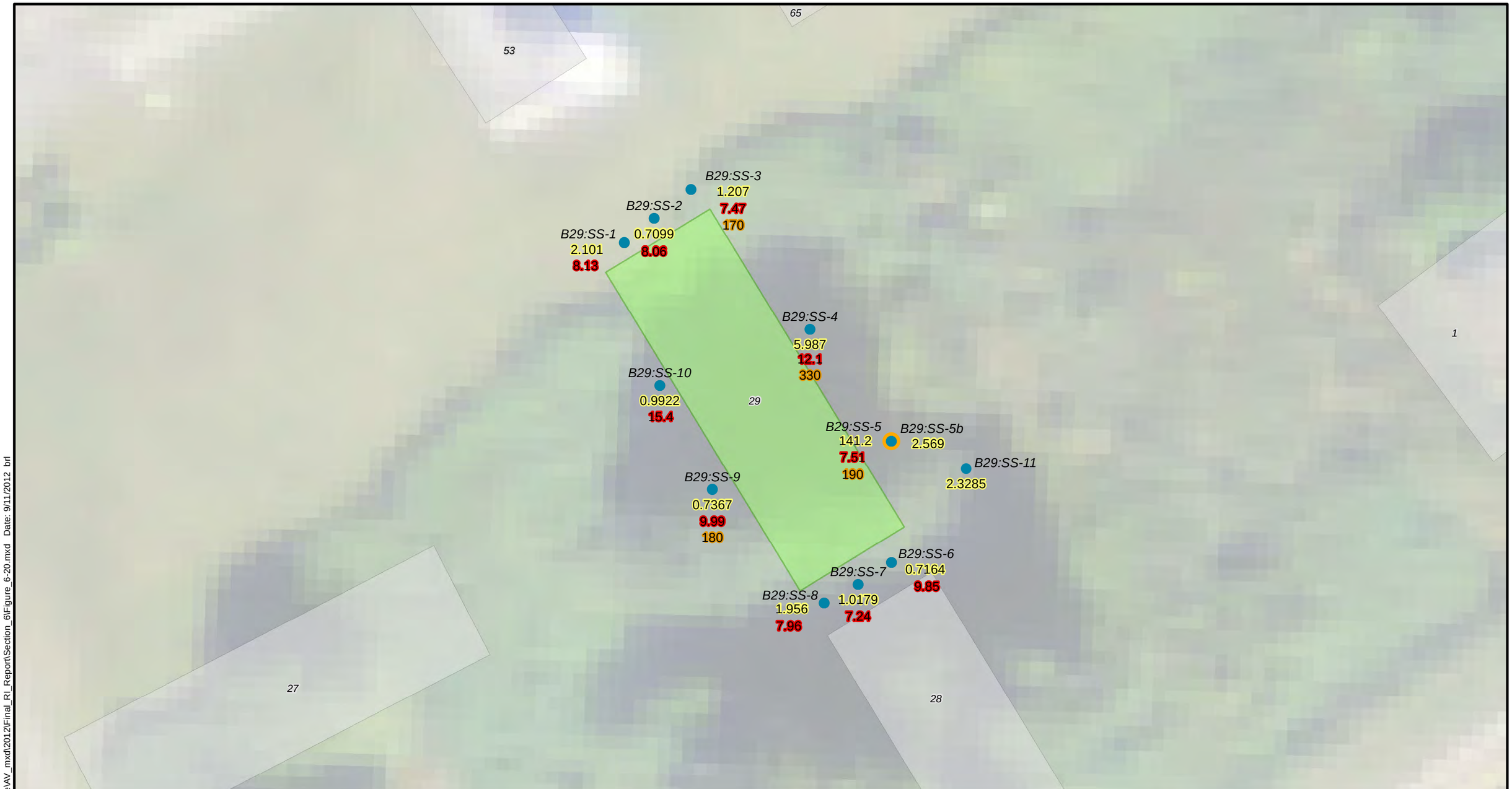
FIG. 6-19

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-19.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1	*ID*
	Detected Analyte
.002261	*PAH concentration (ug/kg)*
100	*Lead concentration (mg/kg)*
660	*ORO concentration (mg/kg)*

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-11 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 29
ORO, LEAD AND TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 | 21-1-16506-004

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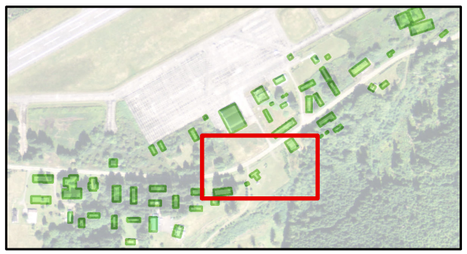
FIG. 6-20

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-20.mxd Date: 9/11/2012 brl



LEGEND

Soil Boring

B9:SS-1

Monitoring Wells

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-11, 6-12, and 6-13 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 6 & E120
VICINITY SOIL BORING LOCATIONS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-21

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-21.mxd Date: 9/18/2012 brl

LEGEND

Soil Boring

- No Detection
- Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (ug/kg)

- Monitoring Wells
- Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-15 and 6-16 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 12, 18 & 19
CARBON TETRACHLORIDE
IN SUBSURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-22

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-22.mxd Date: 9/11/2012 brl

LEGEND

Soil Boring

- No Detection
- Detected Analyte

Symbology

B20:SB-1 ID

0.59 Concentration (ug/kg)

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-17 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

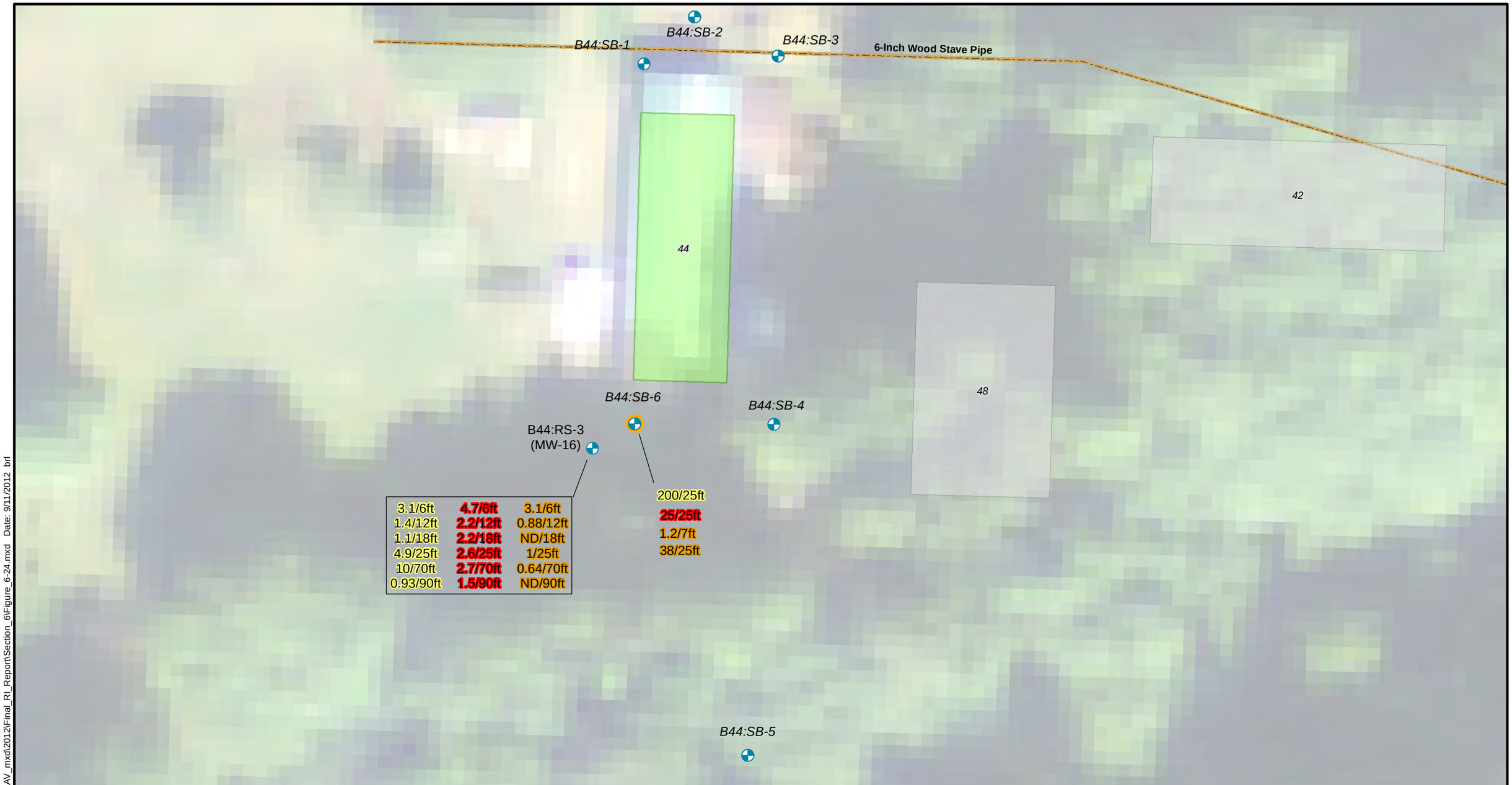
BUILDING 20
CARBON TETRACHLORIDE
IN SUBSURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-23

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-23.mxd Date: 9/11/2012 brl



LEGEND

Soil Boring

- Detected Analyte
- Detected Analyte with Exceedence

Symbology

B9:SS-1 *ID*

- Detected Analyte
- .002261 *Tetrachloroethene concentration (ug/Kg)*
- 100 *Methylene Chloride concentration (ug/Kg)*
- 660 *Carbon Tetrachloride concentration (ug/Kg)*

Approximate Location - Structures based on 1947 Navy map

NOTE

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-18 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 44
VOCS IN SUBSURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-24

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-24.mxd Date: 9/11/2012 brl

LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 *ID*

.002261 *Total PAHs concentration (ug/kg)*

.0784 *Total PCBs concentration* (mg/kg)*
**ND = No Detection*

660 *ORO concentration (mg/kg)*

Approximate Location - Structures based on 1947 Navy map

NOTE

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-19 and 6-20 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 7 & 11
ORO, TOTAL PCBS & TOTAL cPAHS IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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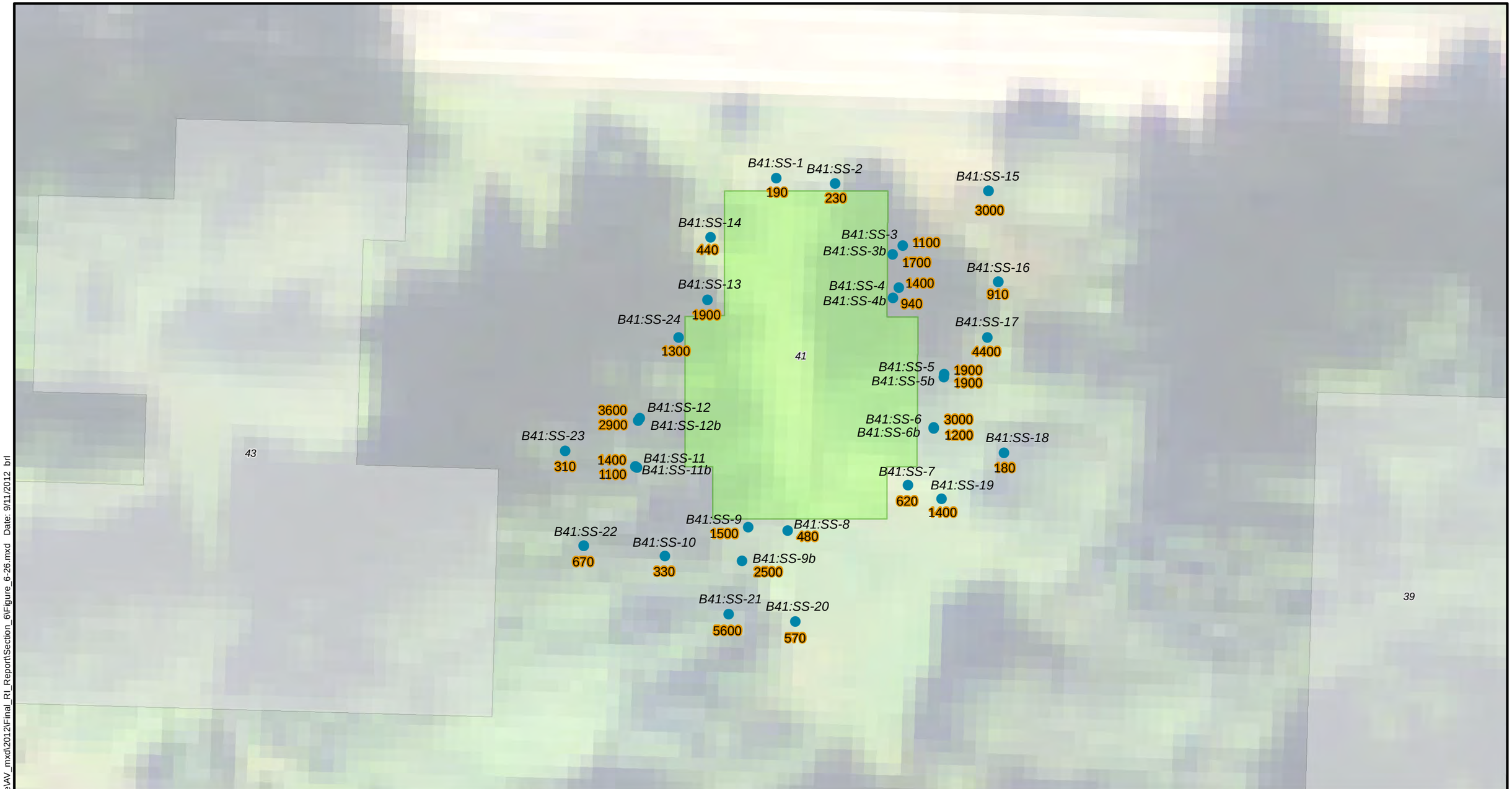
FIG. 6-25

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-25.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-21 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

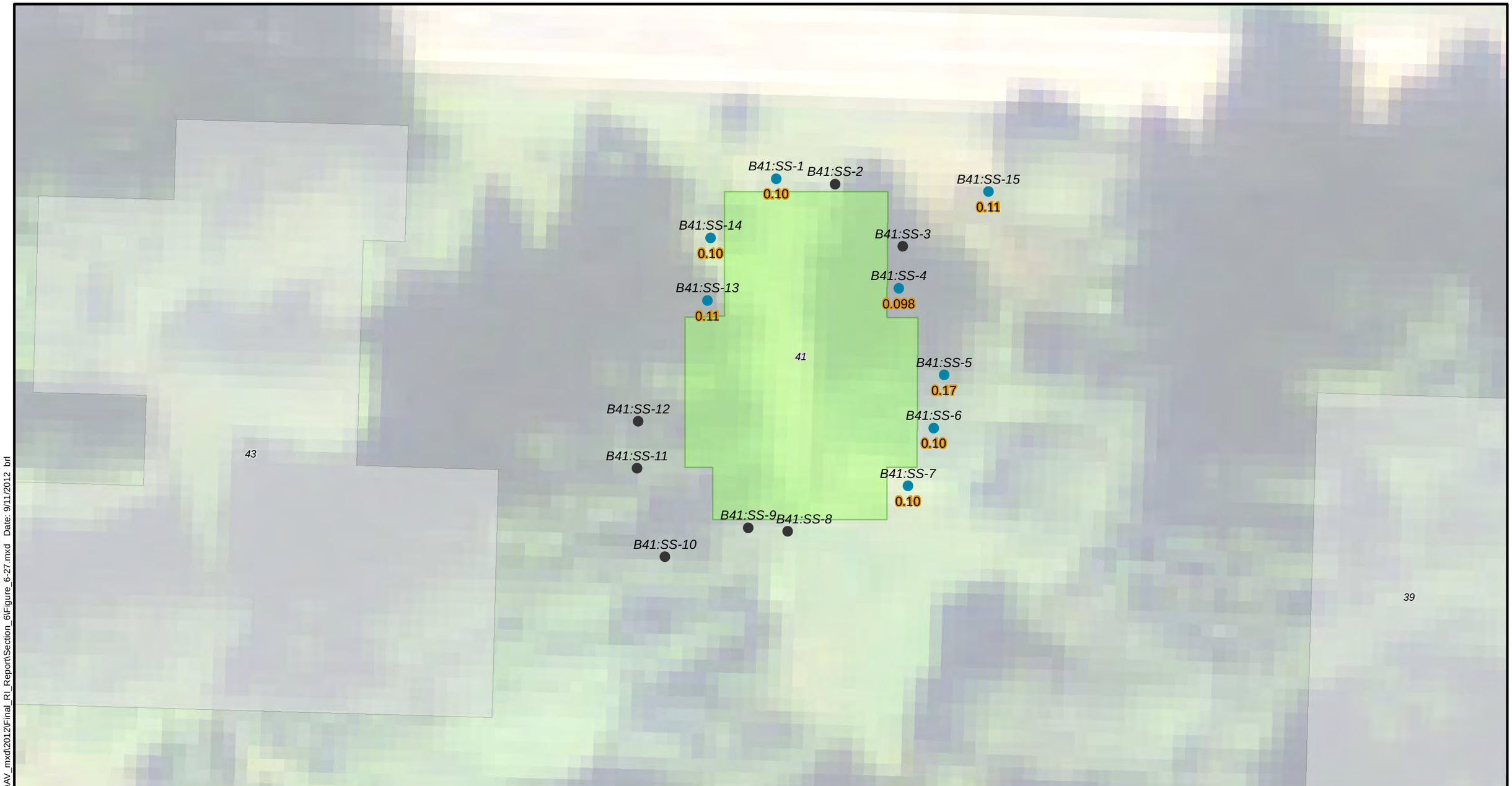
BUILDING 41
ORO IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-26

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-26.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

- No Detection
- Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (mg/kg)

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-21 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

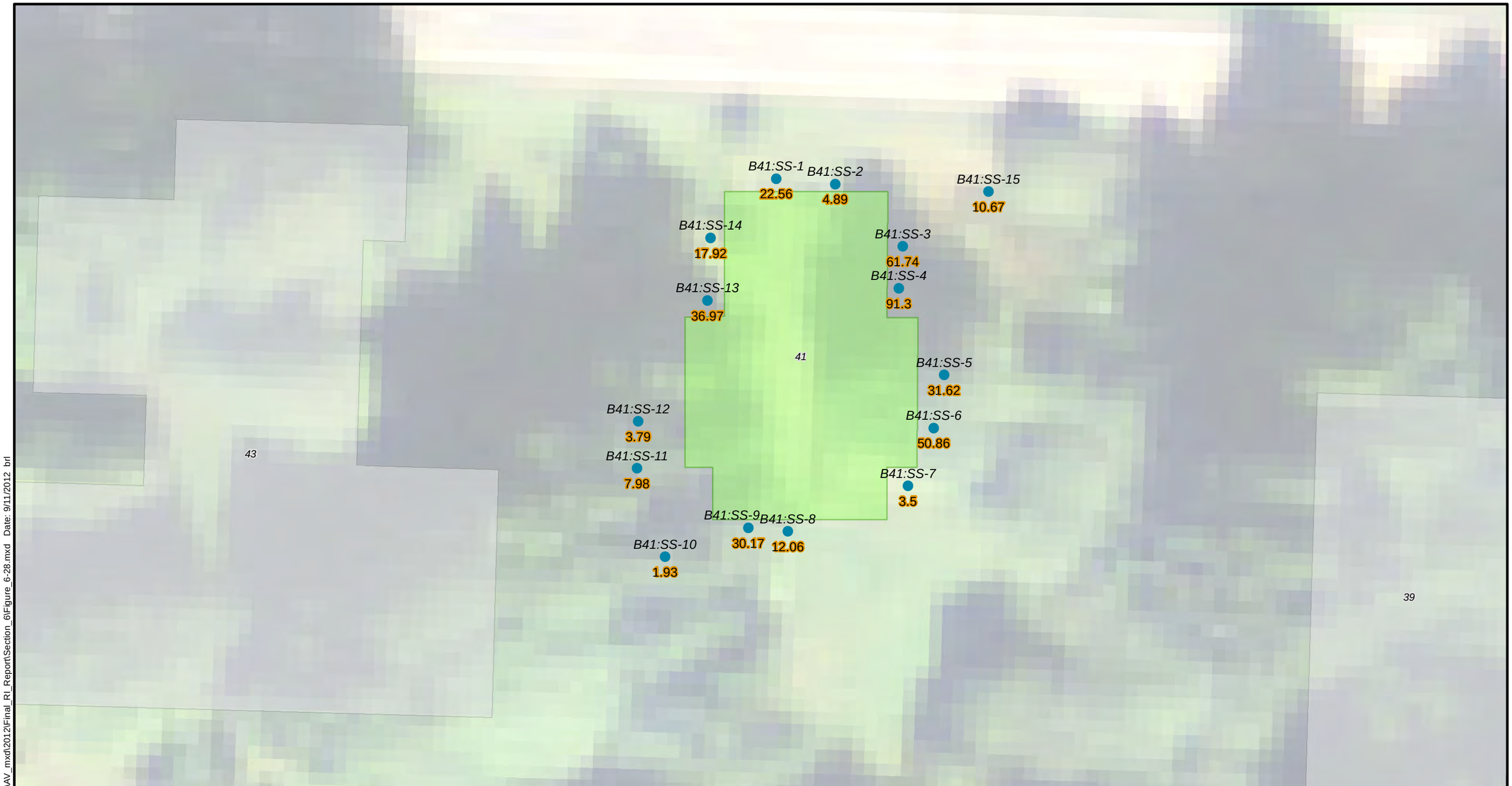
BUILDING 41
TOTAL PCBS
IN NEAR SURFACE SOIL

September 2012 | 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-27

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-27.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 ID

860 Concentration (ug/kg)

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-21 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 41
TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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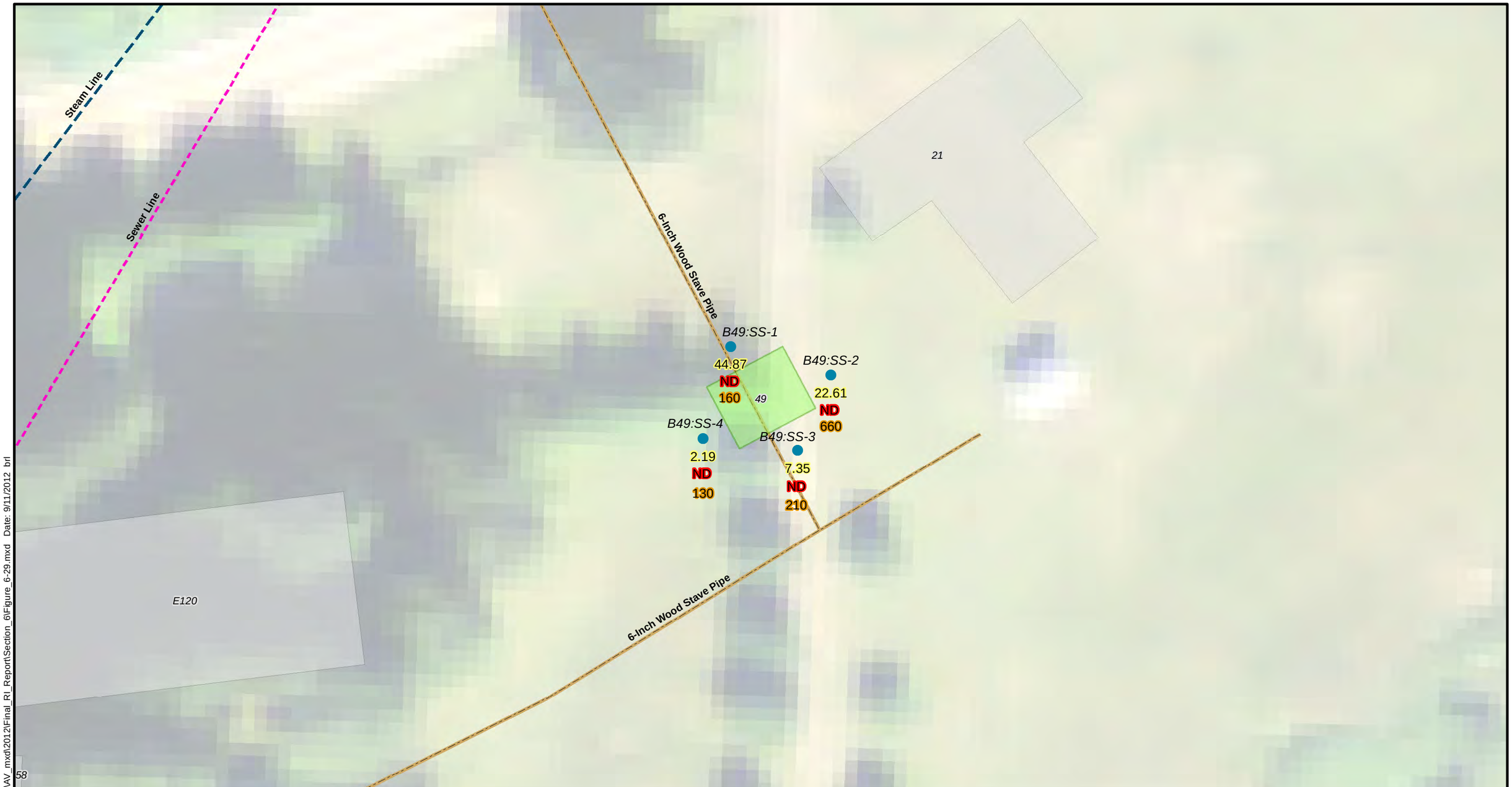
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-28

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-28.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 *ID*

Detected Analyte

.002261 *Total PAHs concentration (ug/kg)*

ND *Total PCBs - No Detection*

660 *ORO concentration (ug/kg)*

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-22 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

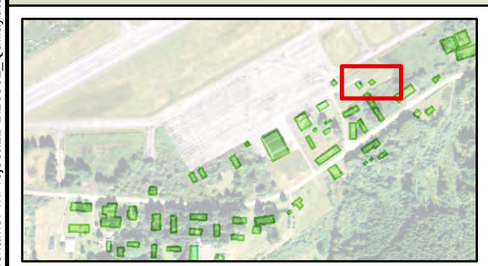
BUILDING 49
ORO, TOTAL PCBS
AND TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-29

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-29.mxd Date: 9/11/2012 brl



LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 *ID*

.002261 *Total PAHs concentration (ug/kg)*

ND *Total PCBs concentration - No Detection*

660 *ORO concentration (mg/kg)*

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-23 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 65
ORO, TOTAL PCBS
AND TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

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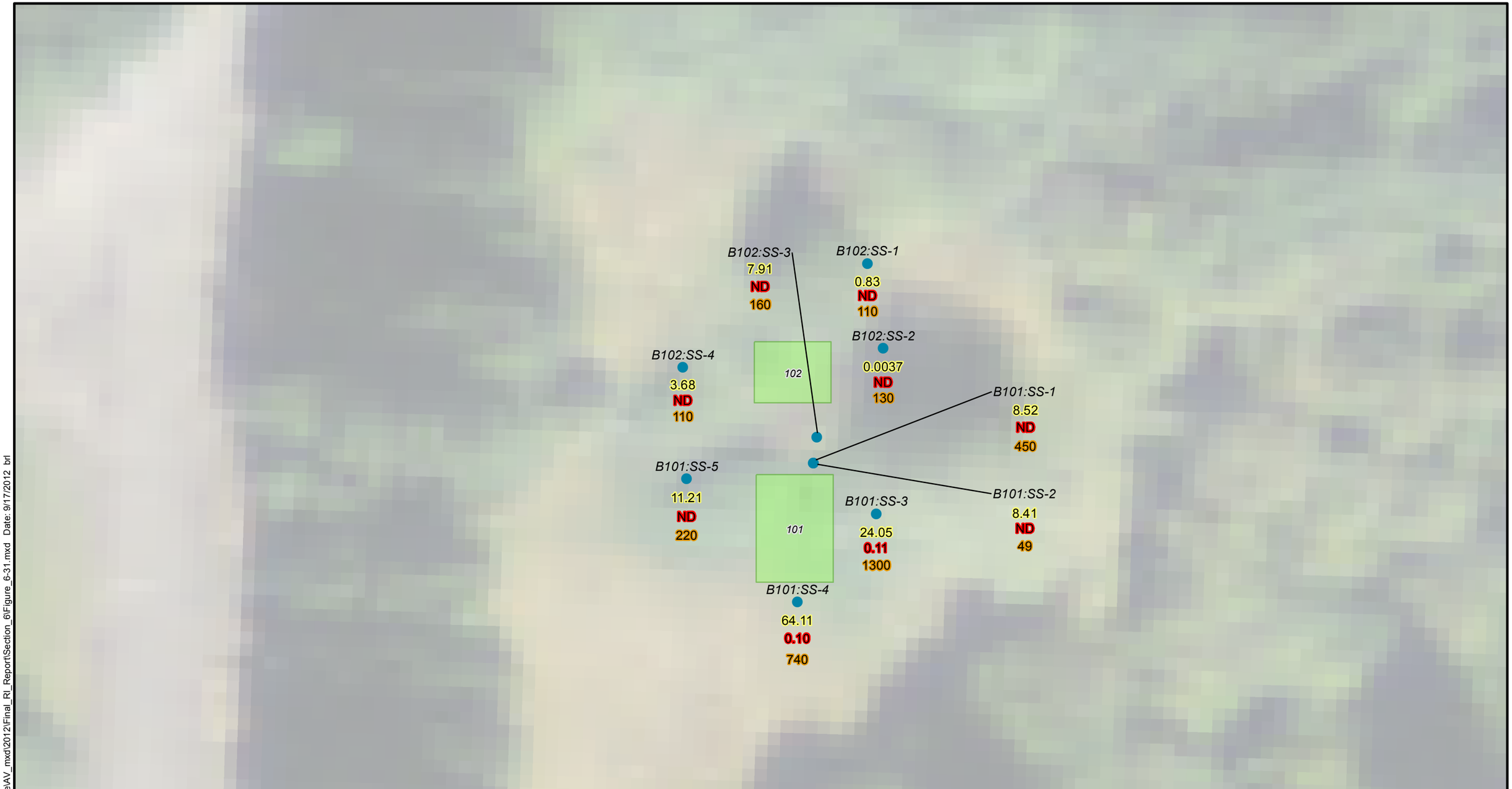
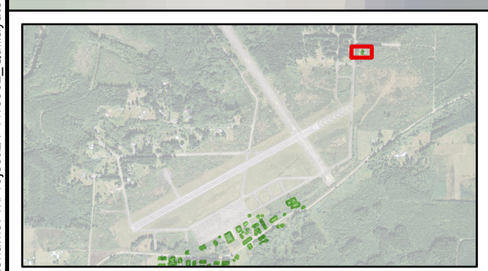
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-30

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-30.mxd Date: 9/11/2012 brl





LEGEND

Near Surface Sample

Detected Analyte

Symbology

B9:SS-1 *ID*

.002261 *Total PAHs concentration (ug/kg)*

100 *Total PCBs concentration* (ug/kg)*
** ND - No Detection*

660 *ORO concentration (mg/kg)*

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-24 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDINGS 101 & 102
ORO, TOTAL PCBS
AND TOTAL cPAHS
IN NEAR SURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-31

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-31.mxd Date: 9/17/2012 brl

LEGEND

Soil Boring

Detected Analyte

Symbology

B9:SB-1	*ID*
.002261	*Total PAHs concentration* (ug/kg)* **ND = No Detection*
34	*ORO concentration* (mg/kg)* **ND = No Detection*

Approximate Location - Structures based on 1947 Navy map

NOTES
1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-25 for further analytical results.

N W E S

0 25 50 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

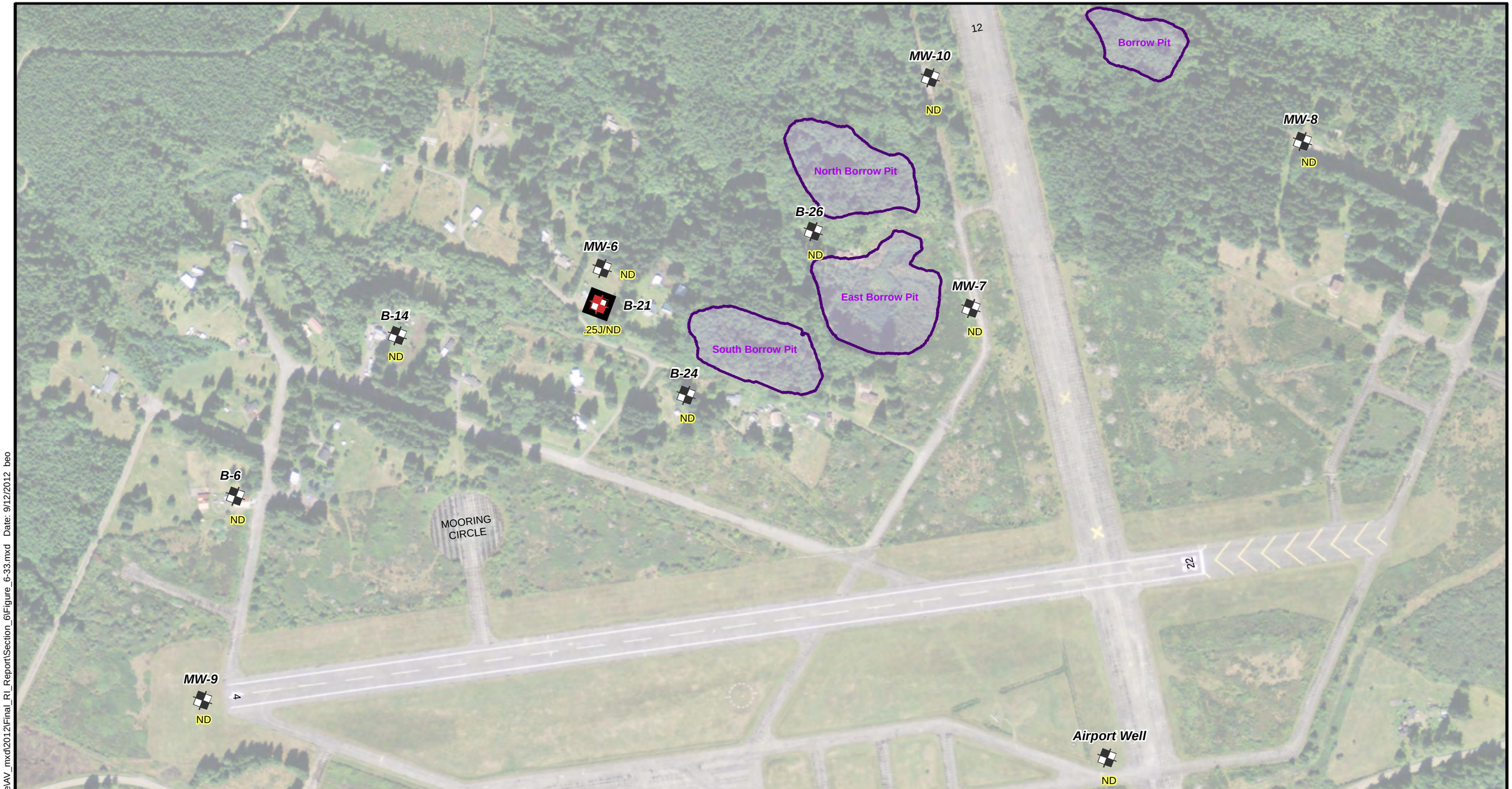
TETRAETHYL LEAD DISPOSAL AREA ORO & TOTAL cPAHS IN SUBSURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-32

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-32.mxd Date: 9/11/2012 brl



Residential and Monitoring Wells

- No Detection
- Analyte Detection
- Analyte Detection with Exceedence levels

Symbology

B-24 ID

0.25 Trichloroethene Concentration* (ug/L)
* ND = No Detection

Approximate Location - Structures based on 1947 Navy map

NOTES
1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Only levels with an exceedance are shown on figure. Refer to Table 6-26 for further analytical results.

0 200 400 800 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

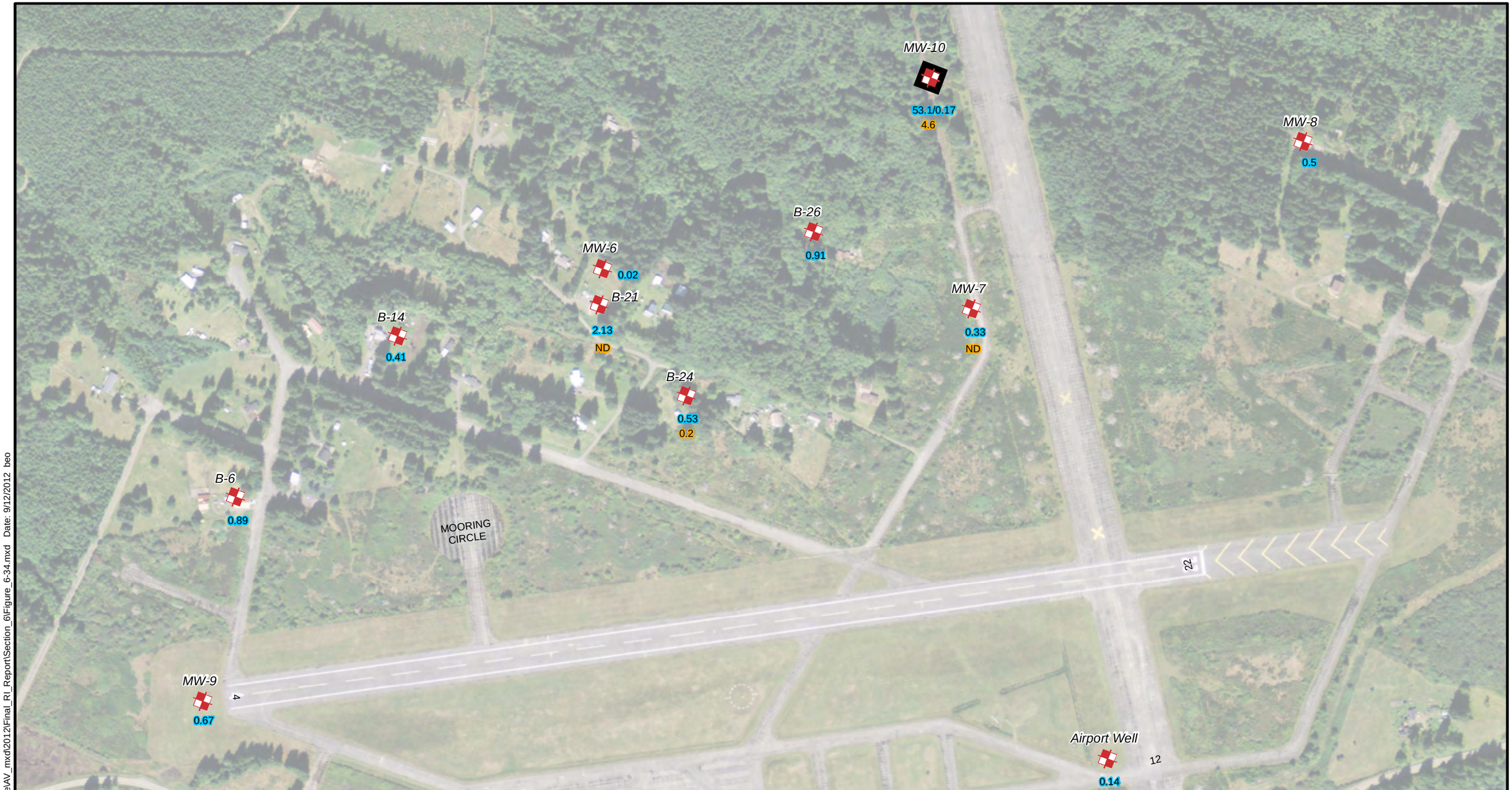
ADMINISTRATION & OPERATIONS AND EAST PARCEL RESIDENTIAL AND MONITORING WELLS: TRICHLOROETHENE RESULTS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-33

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-33.mxd Date: 9/12/2012 beo



Residential and Monitoring Wells

Analyte Detection

Analyte Detection with Exceedence levels

Symbology

B-24 ID

0.67 Lead Concentration (ug/L)

4.6 Arsenic Concentration* (ug/L)
* ND = No Detection

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Only levels with an exceedance are shown on figure. Refer to Table 6-26 for further analytical results.

N W E S

0 200 400 800 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

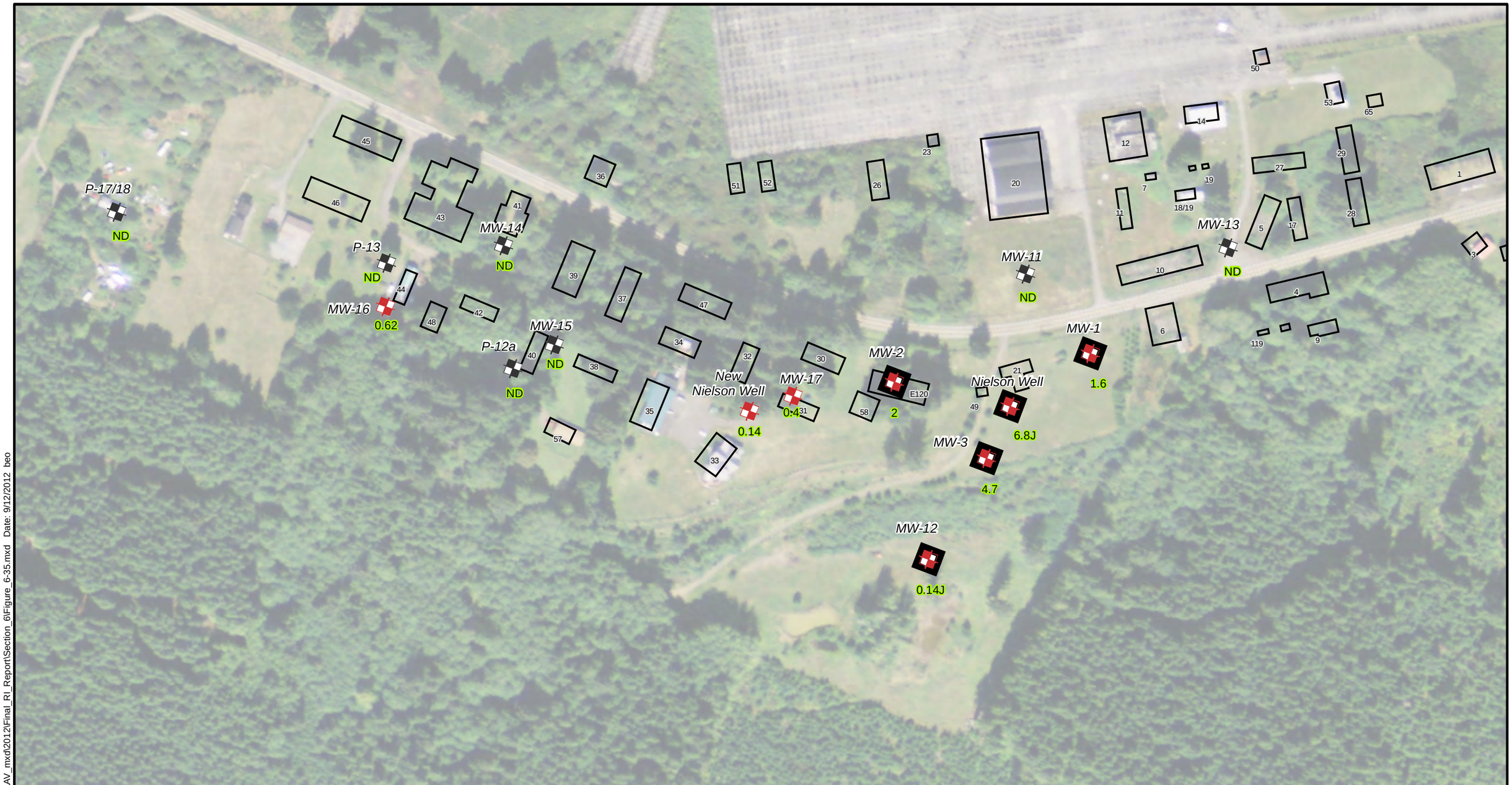
ADMINISTRATION & OPERATIONS AND EAST PARCEL RESIDENTIAL AND MONITORING WELLS: LEAD AND ARSENIC RESULTS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-34

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-34.mxd Date: 9/12/2012 beo



Residential and Monitoring Wells

- No Detection
- Analyte Detection
- Analyte Detection with Exceedence levels

Symbology

MW-3 ID

0.668 Carbon Tetrachloride Concentration (ug/L)

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Only levels with an exceedance are shown on figure. Refer to Table 6-27 for further analytical results.

0 100 200 400 Feet

N W E S

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

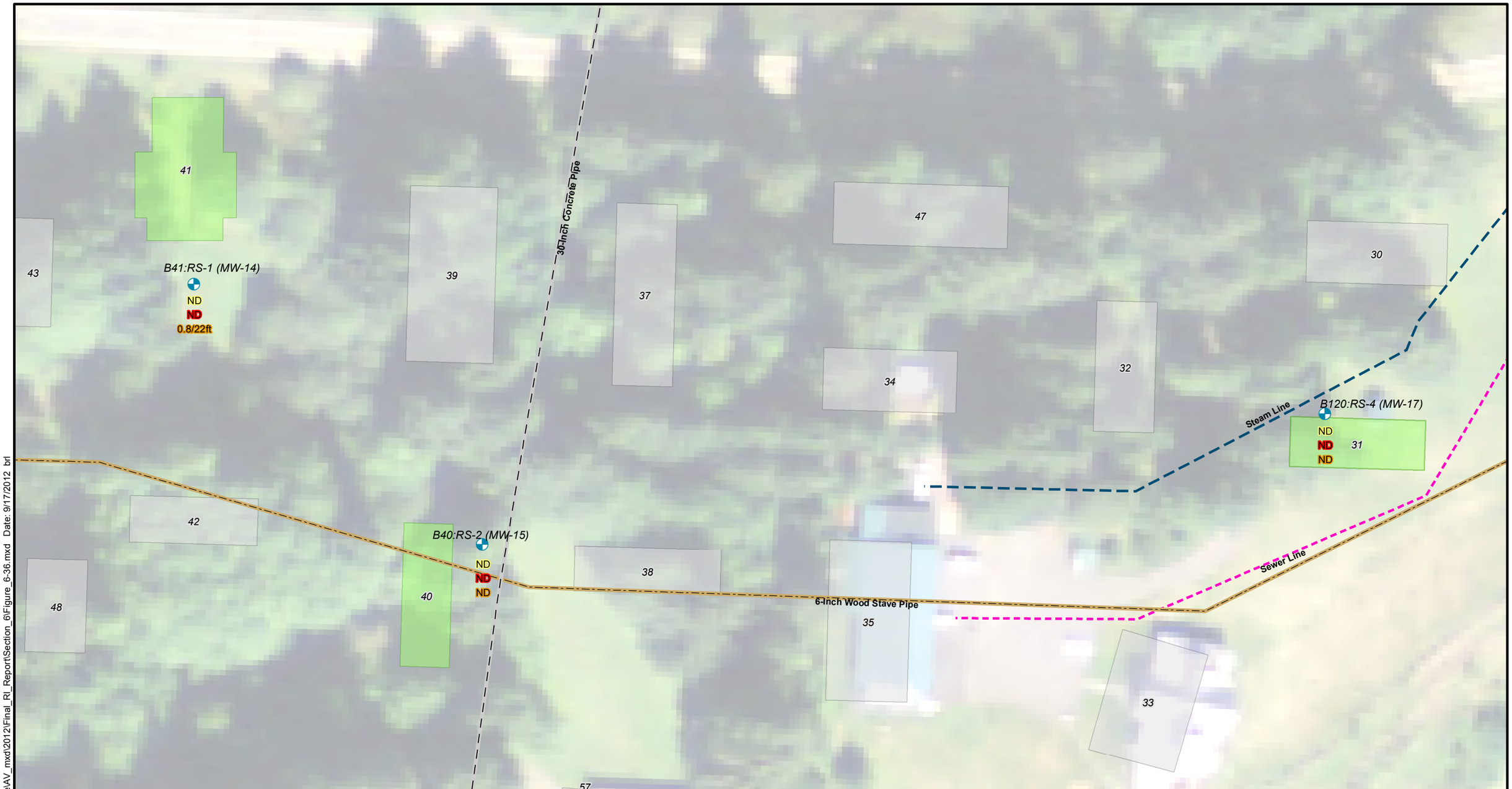
INDUSTRIAL COMPLEX RESIDENTIAL & MONITORING WELLS: MAXIMUM CARBON TETRACHLORIDE RESULTS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-35

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-35.mxd Date: 9/12/2012 beo



LEGEND

Soil Boring

Detected Analyte

Symbology

B9:SS-1 *ID*

Detected Analyte

.002261 *Tetrachloroethene concentration (ug/Kg)*

100 *Methylene Chloride concentration (ug/Kg)*

660 *Carbon Tetrachloride concentration (ug/Kg)*

Approximate Location - Structures based on 1947 Navy map

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Refer to Table 6-18 for further analytical results.
3. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

0 25 50 Feet

N E S W

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

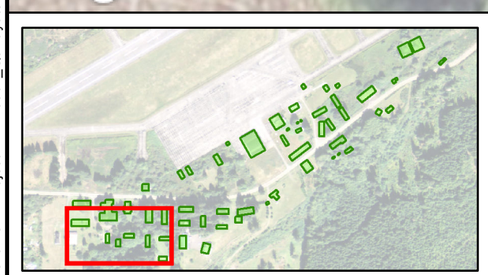
BUILDING 31, 40, AND 41
VOCS IN SUBSURFACE SOIL

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-36

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-36.mxd Date: 9/17/2012 brl



LEGEND

- Soil Vapor (SV) Locations
- Ambient Air Sample Locations
- Dectected Analyte With Exceedance

Symbology

0.37	*Benzene*
0.13	*1,2 Dichloroethane*
1800	*Tetrachloroethene concentration (ug/m³)*
1900	*Carbon Tetrachloride concentration (ug/m³)*

Approximate Location: Structures

NOTES

1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

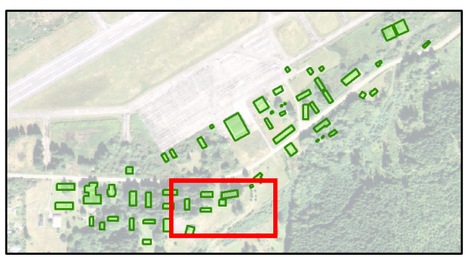
BUILDING 44
VOCS IN SOIL GAS
AND AMBIENT AIR

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-37

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-37.mxd Date: 9/17/2012 brl



LEGEND

▲ Soil Vapor (SV) Locations

Symbology

0.37	*Benzene*
0.13	*1,2 Dichloroethane*
1.2	*Carbon Tetrachloride concentration (ug/m³)*

Approximate Location: Structures

NOTES
1. Locations of structures should be considered approximate and are for visualization purposes only.
2. Locations of utility lines are approximate and based on Auxiliary Air Station, Quillayute, WA, Utility Layout Map, November, 1943, The Austin Company.

N W E S

0 50 100 Feet

US Army Corps of Engineers
Naval Auxiliary Air Station, Quillayute
Quillayute, Washington

BUILDING 33 AND NIELSON PUMPHOUSE WELL VOCS IN SOIL GAS

September 2012 21-1-16506-004

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6-38

Filename: T:\Project\21-1\16502_Quillayute\AV_mxd\2012\Final_RI_Report\Section_6\Figure_6-38.mxd Date: 9/17/2012 brl

7.0 CHEMICAL FATE AND TRANSPORT

This section provides an evaluation of the fate and transport of soil and groundwater potential contaminants at NAAS Quillayute. Primary fate and transport mechanisms occurring at the site are discussed, along with a more detailed discussion of groundwater conditions. This section focuses on the primary mechanisms affecting the distribution and migration of contaminants and the ultimate fate of these contaminants at the site. The discussion addresses oil-range hydrocarbons, PAHs, PCBs, lead, carbon tetrachloride, PCE, and methylene chloride.

7.1 Primary Fate and Transport Mechanisms

Primary fate and transport mechanisms for the site chemicals of interest include:

- Volatilization of chemicals from soil
- Degradation of chemicals in soil and groundwater
- Erosion of particulate-bound chemicals from soil, either by wind or surface water runoff
- Leaching from soil with infiltrating water
- Transport of chemicals with groundwater

7.1.1 Volatilization

Volatilization can significantly affect the distribution and concentration of a chemical in the environment over time. In soil, volatilization results in a decrease in the amount of a chemical as the chemical volatilizes to soil gas or directly to the atmosphere. Volatilization is typically most pronounced in surface or near-surface soils, but is also an important agent for highly volatile compounds in both the deeper unsaturated zone and in groundwater.

Chemical volatility is typically quantified by a chemical's Henry's Law constant, which is a function of the chemical's solubility, vapor pressure, and molecular weight; the higher the Henry's Law constant, the more volatile the chemical.

Most of the contamination that has been found at the site is in the near-surface soils and has resulted from spills or releases of PAHs, lead, ORO, and relatively low concentrations of PCBs. These chemicals all have low Henry's Law constants, so volatilization is not expected to have much influence on reducing the contaminant mass in soil. This may be especially true at this site, considering that the contaminants were released at the ground surface approximately 65 years ago.

In contrast, carbon tetrachloride and methylene chloride, and to a lesser degree PCE, have high Henry's Law constants and are highly volatile. These VOCs, which were detected at elevated concentrations in subsurface soil at Building 44, would be expected to give rise to vapor phase contamination in unsaturated soil, migrate as soil gas up through the unsaturated soil column, and discharge to the atmosphere. This process accounts for the detections of carbon tetrachloride, PCE, 1,2-dichloroethane, and benzene in subsurface soil gas samples and in ambient air samples collected at Building 44.

Carbon tetrachloride was also detected at concentrations below regulatory screening levels at Buildings 12, 18, 19, 20 and 41.

7.1.2 Degradation

The contaminants identified in site soil and groundwater degrade naturally as a result of biotic and abiotic reactions. The organic contaminants are subject to biodegradation in which naturally occurring microorganisms in the subsurface transform a chemical to another state, generally to less toxic forms. However, PCE degrades anaerobically by reductive dechlorination to a chain of breakdown products including vinyl chloride, which has a higher toxicity and is considerably more stable in the environment. Abiotic reactions include photodegradation, which can substantially reduce the concentrations of chemicals in surface soils that are in contact with sunlight; and hydrolysis, which involves a degradation reaction between a chemical and components of water in the saturated zone.

It is unlikely that degradation will substantially reduce the mass of contaminants at the site. Biodegradation processes are probably active on the petroleum-related compounds, but the resultant reduction in this contamination will occur only very gradually. Similarly, PCBs and PAHs also have some potential to degrade slowly by both biotic and abiotic processes, but these processes will not affect the fate of these compounds in the near term.

7.1.3 Erosive Processes

Active erosional processes can greatly affect the distribution of soil-bound chemicals in soil and surface water. Runoff resulting from heavy precipitation can scour fine-grained particles from surface soils and deposit them down slope or downstream as sediment. Similarly, high winds can scour fine particles from the ground surface and redistribute them downwind. Such erosion is generally the primary transport mechanism for relatively immobile chemicals such as lead, PCBs, and PAHs.

Although these mechanisms have some potential to mobilize contaminants at the site, they are not expected to be significant factors in contaminant transport. There are no established surface water drainages that lead from the contaminated areas, and neither surface water runoff nor overland flow has been observed in these areas.

The site experiences high winds, typically blowing eastward from the Pacific Ocean. However, because the site is heavily vegetated and the wind is usually accompanied by rainfall, the potential for wind erosion of surficial soils is also very limited.

7.1.4 Leaching

Chemicals in soil have the potential to migrate to depth, and potentially to groundwater, as a result of leaching by infiltrating water. The degree to which a chemical is susceptible to leaching is strongly influenced by the chemical's affinity to partition to solid or aqueous phases, which is largely a function of the chemical's solubility and particle affinity.

The solubility of a compound in water is an important factor in the transport of chemicals in the environment. Chemicals that can readily dissolve in water can be readily mobilized by infiltration through the contaminated soil matrix to groundwater. The chemicals that have been detected in near-surface soils (PAHs, ORO, lead, and PCBs) all have very low solubility and do not dissolve readily into water. This is evidenced by the general absence of these chemicals in site groundwater, despite the concentrations at which they have been detected in near-surface soils.

The chlorinated solvents PCE, carbon tetrachloride, and methylene chloride have relatively low solubility, so leaching by infiltrating water probably plays a lesser role in their vertical transport than does their low viscosity and high density. In concentrated liquid form, these compounds are denser and less viscous than water, which allows them to migrate rapidly down through the soil column. As a result of this mobility, based on the age of releases that occurred during DoD use of the facility, a substantial volume of these chemicals would likely have long since migrated downward into the groundwater. Because of their density, these solvents tend to settle through the groundwater column and could accumulate as pools of dense non-aqueous phase liquid (DNAPL) in low spots within the aquifer, from which they would gradually dissolve into the groundwater. No evidence of subsurface pools of DNAPL has been found at the site. This may be a function of the age and limited quantity of releases of chlorinated solvents.

7.1.5 Adsorption

Adsorption is the ability of a chemical to bind to the surface of soil particles. Once discharged into the environment, the site COI partition to soil particles to some degree. The tendency to be adsorbed to soil is a function of both the nature of the chemical and the site-specific soil properties.

Adsorption is the primary factor influencing the fate and transport of the lead, petroleum hydrocarbons, PCBs, and PAHs found in near-surface soils. These chemicals all exhibit low water solubility, strongly adsorb to natural organic carbon, and preferentially partition to soil. Not unexpectedly, the concentrations of these compounds in soil are substantially higher at the surface than only a few inches deeper in the soil profile. Adsorption tends to immobilize these chemicals, effectively sequestering them from environmental distribution.

In contrast, the chlorinated solvents have a relatively low degree of sorption, so there is little resistance to their downward migration through the soil column.

7.2 Groundwater Contaminant Transport

Carbon tetrachloride and PCE are the primary chemicals of interest in site groundwater. Carbon tetrachloride has consistently been detected in the Nielson Pumphouse well at a concentration slightly above the federal MCL, and at lower concentrations in three nearby surrounding monitoring wells. Lower concentrations of carbon tetrachloride were also detected in two new wells installed on the Nielson parcel in December 2010 and January 2011. Consistent distribution of carbon tetrachloride in these wells, including the two new wells, with the highest concentration at the Nielson Pumphouse well, suggests that the source of contamination is very local.

Carbon tetrachloride and PCE were also detected at the western end of the Industrial Complex Area in monitoring well MW-16, which was installed at Building 44 after chlorinated solvents were detected in the subsurface soil at that location. The detection of both carbon tetrachloride and PCE is consistent with the types of contamination that are associated with the former operation of the building as a dry cleaner. Based on the analytical results of groundwater samples from monitoring wells installed between the Nielson Pumphouse well and Building 44, the contamination at Building 44 is not the source of groundwater contamination in the central part of the Industrial Complex Area. Although Building 44 is generally upgradient from the Nielson well, contamination was not detected in the intermediate wells, suggesting there are separate sources for these areas of contaminated groundwater.

Carbon tetrachloride is characterized by a low octanol-water partitioning coefficient (K*oc*) value, which is an indication that an aqueous-phase contaminant plume would not be significantly retarded relative to the rate of groundwater flow. Considering the relatively high groundwater gradient in this area and the rapidity at which carbon tetrachloride can migrate in groundwater, it appears that the source of the contamination in both areas is very limited or substantially depleted.

8.0 CONCEPTUAL SITE MODEL (CSM)

A CSM was initially developed for each of the designated areas of NAAS Quillayute as a planning tool to evaluate potential source areas that could present exposure risks for human or ecological receptors if exposure pathways were present. The initial CSM (*Conceptual Site Model and Data Quality Objectives Technical Memorandum* prepared by Shannon & Wilson, 2007b), was developed in preparation for the RI. Historical records, aerial photographs, geologic and hydrogeologic data, observations made during site visits, and results of previous site investigations were reviewed to assist in identifying potential contamination source areas, the various exposure media, and likely exposure routes. This section provides an updated CSM based on the results of RI.

The initial CSM identified six areas where there was considered to be a potential for contaminant releases based on historical DoD use of the site. The six designated areas are:

- Administration and Operations Area
- Industrial Complex Area
- West Parcels Area
- East Parcels Area
- Cantonment/HOMOJA Housing Area
- Runway Approach Zones

Potential source areas and/or exposure routes/media that were determined to be incomplete in the initial CSMs were not further evaluated as part of the RI. These included:

- Exposure to humans and/or ecological (aquatic and terrestrial) receptors via contact with or ingestion of surface water and/or sediments, and the transport/migration of contaminants via overland flow of surface water or groundwater discharge to surface water for the East Parcels Area and West Parcels Area. This exposure pathway was considered incomplete because of the distance to the nearest surface water bodies and up- or cross-gradient location of these water bodies to the potential contaminant source areas, and because of the lack of surface water drainage pathways leading from the potential source areas within these designated areas of the site.
- Exposure via direct contact or particulate inhalation of contaminated soil, and ingestion of vegetation for humans at potential sources areas was also deemed as incomplete. These areas include the Administration and Operations Area, West Parcels Area, and portions of the Industrial Complex Area due to the presence of thick vegetation and/or through controlled access to these areas and the subsequent re-development and use of the West Parcels Area. The exposure pathway for ingestion by small burrowing receptors was considered potentially complete, as was

the potential pathway for ingestion by elk because these areas are accessible for grazing.

- Exposure of future residents, visitors, and recreationists via direct contact or ingestion to contaminated surface or shallow subsurface soil within the vicinity of the former Radio and Generator Buildings in the East Parcels Area, was considered incomplete because future site development would likely remove the potentially contaminated soils. There is a potential for exposure of adult construction workers to exposure to contaminated soil via inhalation and dermal contact of soil during future construction activities.
- No documentation regarding known or suspect source areas has been found nor have observations been made during previous site visits to indicate there are potential source areas in the Cantonment/ HOMOJA Housing Area and the Runway Approach Zones.

8.1 Potential Source Areas

The identification of potential source areas evaluated as part of the CSMs has evolved through the RI process. Initially, a large number of potential source areas were identified at the site, owing largely to the incomplete record of site use and uncertainties as to where releases of COI may have been used, spilled, or released. As additional information on site use and area-specific environmental data were obtained during the RI, the potential source areas and CSMs were refined to reflect the current understanding of site conditions. Section 8.1.1 describes potential source areas that were identified, both generally and specifically, in the initial CSMs, whereas Section 8.1.2 identifies the specific potential source areas that have been retained upon completion of the RI.

8.1.1 Initial Potential Source Area Identification

During the planning stages of the RI, each of the six designated areas was considered to have numerous potential source areas. These potential sources of contamination were largely identified based on both known and suspected land use during military occupation of the site in conjunction with limited environmental sampling that had been performed by the USACE of Engineers and Ecology. The potential source areas tentatively identified for each of the designated areas were as follows:

- Administration and Operations Area
  - Borrow pits where wastes or materials containing COI may have been disposed while the base was in operation.

- Alleged liquid disposal area south of Runway 2 that an anonymous caller reported in 2002.
- Surface water drainages, if present, adjacent to the alleged liquid disposal area, if it existed, where wastes or chemicals may have been disposed.

- Industrial Complex Area
  - Industrial buildings where chemicals/wastes containing potential contaminants were known or suspected to have been used, stored, handled, or disposed, and may have been released to the surrounding environment (Buildings 4, 5, 6, 9, 10, 12, 17, 18, 19, 26, 29, 44, 119, 119A, and E-120).
  - Former buildings/structures where generators, transformers, or other electrical equipment might have contained PCB oils that could have been released, spilled, or leaked to the ground surface (Buildings 7, 11, 41, 49, and 65).
  - The constructed pond located on Parcel K, if it is recharged by the same aquifer where contamination has previously been detected in one residential water supply well and three monitoring wells located on site.
  - The tetraethyl lead sludge burn/disposal area that was reportedly associated with the former large ASTs.
  - Surface water drainages, if present, adjacent to suspected or known areas where chemicals/wastes containing chemicals of interest were used, stored, handled, or disposed, or where releases/spills/leaks into these drainages may have occurred.
- West Parcels Area
  - Borrow pits where wastes or materials potentially containing contaminants may have been disposed while the base was in operation. Portions of these borrow pits are located in the Administration and Operations Area.
- East Parcels Area
  - Buildings 101 and 102 where generators, transformers, or other electrical equipment were located that might have contained PCB oils that could have been released, spilled, or leaked to the ground surface.

Schematic flow charts of the CSM for each designated area are provided in Figures 8-1 through Figure 8-4. These flow charts have been updated, as described below, based on the results of the RI.

8.1.2 Updated Potential Source Areas

Based on the results of the historical research and environmental sampling conducted during the RI, the following potential source areas have been retained. Table 6-33A also lists each location where COI were identified. COI, as defined in Section 5.7, refers to chemicals detected at concentrations exceeding screening level criteria.

- Administration and Operations Area
  - Borrow pits in this area may be a potential source area if wastes or materials containing COI were disposed there while the base was in operation. Limited access prevented a thorough visual inspection or soil sampling of the pits during the RI. Portions of these borrow pits are located in the West Parcels Area.
  - There is no known source area for sporadic detection of elevated concentrations of TCE (one occurrence) and arsenic (three occurrences) in wells in this area.
- Industrial Complex Area
  - Industrial buildings where PAHs were disposed, leaked, or released to the surrounding environment (Buildings 4, 5, 9, 10, 11, 12, 20, 26, 29, 41, and 49).
  - Industrial buildings where pentachlorophenol and or naphthalene were disposed, spilled, or released to the surrounding environment (Buildings 4, 5, and 10).
  - Industrial buildings where elevated lead was detected in surface soils (Buildings 4, 9, 10, and 12). Note that the distribution of lead at each building (decreasing greatly in concentration with distance from the building) indicates that deteriorating (decomposing) LBP is the likely source of the lead found in surface soils.
  - Building 44, a former laundry equipped for dry cleaning, where carbon tetrachloride and methylene chloride were detected in subsurface soil; carbon tetrachloride, ethylbenzene, tetrachloroethene, and TCE were detected in soil gas; benzene, 1,2-dichloroethane, and carbon tetrachloride were detected in ambient air samples; and carbon tetrachloride and tetrachloroethene were detected in groundwater. As both subsurface soil and groundwater (well MW-16) detections of PCE at Building 44 were above the DAF20-adjusted MCL-based SSL of 46 µg/kg and federal and state groundwater screening levels, respectively, the soil PCE contamination at Building 44 may represent a potential source for PCE contamination observed in groundwater at well MW-16.

    The potential source of contamination could include releases from both the military laundry/dry cleaner and from the current occupant who indicated he repeatedly released carbon tetrachloride cleaning fluid at the site in the 1960s. Vapor intrusion from this potential source area could result in a complete exposure pathway for future building inhabitants if a residential or commercial structure is constructed in their proximity. Similarly, installation and use of a well in the groundwater plume could provide a complete pathway via groundwater contamination.
  - The Nielson (Pumphouse) well area (and Building 33) vicinity, where benzene, 1,2-dichloroethane and carbon tetrachloride have been detected in soil gas, and carbon tetrachloride has been detected at concentrations that exceeded regulatory criteria in one residential well and three monitoring wells. Source areas for these COI have not been identified. Carbon tetrachloride was not detected in the subsurface samples adjacent to the Nielson Pumphouse well. The existing soil therefore does not appear to be an ongoing source for the carbon tetrachloride groundwater contamination observed in the Nielson well.

- West Parcels Area
  - Borrow pits in this area may be a potential source area if wastes or materials containing COI were disposed there while the base was in operation. Limited access prevented a thorough visual inspection or soil sampling of the pits during the RI.
- East Parcels Area
  - Carcinogenic PAHs were detected in surface soil around the former Radio and Generator buildings (Buildings 101 and 102) at concentrations above regulatory screening levels.

Schematic flow charts of the CSM for each designated area that were developed during the planning stages of the RI have been updated based on the results of the RI, and are provided in Figures 8-1 through 8-4.

8.2 Area-specific Conceptual Site Models (CSMs)

8.2.1 Administration and Operations Area

A graphic portrayal of the updated CSM for the Administration and Operations Area is provided in Figure 8-1. Tables 8-1 and 8-2 provide a synopsis of the basis for the exposure pathway evaluation. Single occurrences of arsenic in three wells and TCE in one well were detected at concentrations that are well below federal or state cleanup criteria, but exceed their corresponding screening levels for carcinogenic risk. In subsequent sampling, TCE was not detected in the well where it was initially detected. These occurrences are evidence for potential exposure pathways for current and future residents within the Administration and Operations Area that use groundwater as a source of household/drinking water. However, there is no known source area identified for this sporadic contamination.

The alleged liquid disposal area is no longer considered as a potential source area, based on an absence of any physical or chemical evidence of a contaminant release. Accordingly, all potential exposure pathways associated with this area are considered incomplete.

8.2.2 Industrial Complex Area

A graphic portrayal of the updated CSM for the Industrial Complex Area is provided in Figure 8-2. Tables 8-3 and 8-4 provide a synopsis of the basis for the exposure pathway evaluation. The following potentially complete exposure pathways were identified based on the results of the RI sampling:

- Current and future residents that use groundwater as a source of drinking water, based on the presence of COI in the groundwater supply in two residential and five monitoring wells, and the potential migration of these contaminants to the water supply from former industrial facilities/activities that are presumably upgradient from the water sources.
- Current and future workers and current adult residents who may come into contact with contaminants in surface soil, subsurface soil, or soil gas if the soil is brought to the surface during construction, clearing, grading, or excavation activities; near the former buildings/areas where PAHs, pentachlorophenol, and naphthalene and carbon tetrachloride were released.
- Current and future residents who reside in a structure where soil gas could be released into enclosed spaces.
- Wildlife receptors that have the potential to ingest contaminated vegetation/fruit, or have contact with contaminated surface soil.
- Burrowing animals that have the potential to contact or ingest surface or shallow subsurface soil containing contaminants, or inhale volatile chemicals in subsurface soil in the vicinity of former industrial facilities where a release or spill occurred.
- The indoor air pathway at the existing residential trailer located at the former Building 44 site was determined to be incomplete because the trailer is elevated, allowing for the free movement of air underneath the trailer. However, future construction of buildings used for human occupation at this location could result in a complete vapor intrusion exposure pathway.

8.2.3 West Parcels Area

A graphic portrayal of the updated CSM for the West Parcels Area is provided in Figure 8-3. Tables 8-5 and 8-6 provide a synopsis of the exposure pathway evaluation. Based on potentially complete exposure pathways identified from this model, the following current and future potential exposure scenarios have been identified:

- Current and future onsite and downgradient residents who use groundwater as a source of household water could have complete exposure pathways via ingestion, inhalation, and dermal contact.
- Livestock that use groundwater could have complete exposure pathways via ingestion, inhalation, and dermal contact.
- Future adult workers could have direct contact (inhalation and dermal) with contaminated subsurface soil (if present) that is brought to the surface during future site development in the borrow pits.

- Potential for ingestion of plant tissue (e.g., blackberries) for current/future residents, trespassers/visitors.
- Inhalation of airborne particulates and dermal contact and inhalation by adult workers during future site development if contaminated subsurface soil is present within the borrow pits.
- Aviary receptors and small terrestrial receptors foraging in potential source areas that could consume contaminated vegetation/fruit and/or come into contact with contaminated surface soil.
- Burrowing animals which may come into contact with or ingest surface or shallow subsurface soil contaminants, or inhale volatile contaminants that may be potentially present in subsurface soil within the borrow pits, if the pits were used by DoD for disposal of materials/wastes containing these chemicals.

Limited access prevented soil sampling in the borrow pits. Therefore, soil contamination in the borrow pits can be neither confirmed nor denied. Therefore, complete pathways associated with potentially contaminated subsurface soil in the borrow pits are considered uncertain.

8.2.4 East Parcels Area

A graphic portrayal of the updated CSM for the East Parcels Area is provided in Figure 8-4. Tables 8-7 and 8-8 provide a synopsis of the exposure pathway evaluation. Based on potentially complete exposure pathways identified from this model, the following current and future exposure scenarios have been identified:

- Current child and adult recreationists and trespassers, and future adult workers that have the potential for direct contact with contaminated surface soil and/or shallow subsurface soil that is brought to the surface during future site development in the vicinity of the former Radio and Generator Buildings.
- Wildlife receptors have the potential to ingest contaminated vegetation/fruit or have contact with contaminated surface soil in the vicinity of the former Radio and Generator Buildings.
- Inhalation of airborne particulates by adult workers and wildlife (burrowing animals) during future site development in the vicinity of the former Radio and Generator Buildings where carcinogenic PAHs have been detected above screening levels.
- Burrowing animals may come into contact with or ingest surface or shallow subsurface soil containing contaminants in the vicinity of the former Radio and Generator Buildings.

Potential future site development in the vicinity of the former Radio and Generator Buildings would be expected to remove potentially contaminated soils.

8.3 Uncertainties and Data Gaps

Based on the results of the RI and preceding site investigations, the physical location, existence, types, and extent of contaminants in near-surface soils, subsurface soils, soil gas, and groundwater have been identified. Uncertainties and data gaps that remain include the following:

- The source of carbon tetrachloride detected in residential wells and monitoring wells in the vicinity of the Nielson residence/Industrial Complex Area.
- The potential for VOCs in the groundwater, subsurface soil, soil gas, and ambient air at former Building 44 to migrate via vapor intrusion into future indoor air space. Indoor air sampling was not performed in a residential trailer currently at the site because of both the request of the resident/owner and the determination that the air flow between the trailer and concrete pad precludes a complete indoor air vapor intrusion pathway into the residence. Rather, ambient air sampling in an open space below the trailer was performed to evaluate the ambient air pathway.
- It is not known whether contaminants are present in soil within any of the borrow pits in the Administration and Operations area and West Parcels Area. Partial visual reconnaissance and an EM survey performed in accessible areas did not detect any evidence of waste disposal, nor is there evidence of groundwater contamination that can be linked to the borrow pits.
- The source or sources of sporadic exceedances of arsenic and TCE in the Administration and Operations Area wells have not been determined. The elevated arsenic concentrations may be naturally occurring, although no site-wide background concentration for this metal has been established.

TABLE 8-1
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
ADMINISTRATION AND OPERATIONS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Borrow Pits	Disposal	Subsurface soil	Biotic Uptake	NA	NA	Plant tissue	Ingestion	Edible Plants	Recreationist	Child/Adult	Current/Future	On-site	Yes	Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Ingestion	Edible plants	Trespasser/Visitor	Child/Adult	Current/Future	On-site	Yes	Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Ingestion	Edible plants	Resident	Child/Adult	Current/Future	On-site	Yes	Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
		Soil, Subsurface	Brought to the surface	NA	NA	Soil, Subsurface	Inhalation	Soil	Site Worker	Adult	Future	On-site	Yes	The future inhalation exposure pathway for site workers is considered to be complete if future development occurs and contaminated subsurface soils are brought to the surface. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Dermal	Soil	Site Worker	Adult	Current/Future	On-site	Yes	The future inhalation exposure pathway for site workers is considered to be complete if future development occurs and contaminated subsurface soils are brought to the surface. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
		Subsurface soil	Transport/ Migration	Groundwater	NA	Groundwater	Ingestion	Resisdential water supply wells	Resident	Child/Adult	Current/Future	On-site/Off-site	Yes	Chemicals of interest were sporadically found that had exceeded regulatory screening levels, however no known source area has been identified
							Inhalation	Residential water supply wells	Resident	Child/Adult	Current/Future	On-site/Off-site	Yes	Chemicals of interest were sporadically found that had exceeded regulatory screening levels, however no known source area has been identified
							Dermal	Residential water supply wells	Resident	Child/Adult	Current/Future	On-site/Off-site	Yes	Chemicals of interest were sporadically found that had exceeded regulatory screening levels, however no known source area has been identified
		Subsurface soil	Transport/ Migration	Groundwater	Transport/ Migration	Surface water	Ingestion	Surface water	Recreationist	Child/Adult	Current/Future	Off-site	No	No surface water drains from the borrow pits.
							Dermal	Surface water	Recreationist	Child/Adult	Current/Future	Off-site	No	No surface water drains from the borrow pits.
							Ingestion	Surface water	Trespasser/Visitor	Child/Adult	Current/Future	Off-site	No	No surface water drains from the borrow pits.
							Dermal	Surface water	Trespasser/Visitor	Child/Adult	Current/Future	Off-site	No	No surface water drains from the borrow pits.

TABLE 8-1
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
ADMINISTRATION AND OPERATIONS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Liquid Disposal Area	Release/Spills/ Leaks	Soil, Surface	Overland Flow	Surface water	NA	Surface water	Dermal	Surface water	Resident	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on visual and analytical results. No evidence of surface water.
							Dermal	Surface water	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on visual and analytical results. No evidence of surface water
							Dermal	Surface water	Recreationist	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on visual and analytical results. No evidence of surface water.
		Soil, Surface	Overland Flow	Sediment	NA	Sediment	Dermal	Sediment	Resident	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on visual and analytical results. No evidence of surface water or sediment deposition.
							Dermal	Sediment	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results. No evidence of surface water or sediment deposition.
							Dermal	Sediment	Recreationist	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results. No evidence of surface water or sediment deposition.
		Soil, Surface	Direct Contact	NA	NA	Soil	Ingestion	Surface soil	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
							Ingestion	Surface soil	Recreationist	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
							Ingestion	Surface soil	Resident	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
							Dermal	Surface soil	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
Liquid Disposal Area	Release/Spills/ Leaks	Soil, Surface	Direct Contact	NA	NA	Soil	Dermal	Surface soil	Recreationist	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
							Dermal	Surface soil	Resident	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
							Inhalation	Surface soil	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.
							Inhalation	Surface soil	Recreationist	Child/Adult	Current/Future	On-site	No	No evidence of soil contamination based on analytical results.

TABLE 8-1
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
ADMINISTRATION AND OPERATIONS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Liquid Disposal Area	Release/Spills/ Leaks						Inhalation	Surface soil	Resident	Child/Adult	Current/Future	On-site	No	Only one person currently lives on site. Future demographics are unknown. Also, the reported location of this area is heavily vegetated.
		Soil, Surface	Wind Erosion	NA	NA	Air (Particulates)	Inhalation	Air	Resident	Child/Adult	Current/Future	On-site	No	The reported location of this area is heavily vegetated thereby minimizing any particulate exposure.
							Inhalation	Air	Recreationist	Child/Adult	Current/Future	On-site	No	The area is fenced, secured, and heavily vegetated; thus, limiting the potential for recreationist to access the area and become exposed to chemicals of interest via airborne particulates.
							Inhalation	Air	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	The area is fenced, secured, and heavily vegetated; thus, limiting the potential for trespassers/visitors to access the area and become exposed to chemicals of interest via airborne particulates.
		Soil, Surface	Infiltration	Soil, subsurface	Biotic Uptake	Plant Tissue	Ingestion	Edible plants with roots extending into the subsurface soil	Recreationist	Child/Adult	Current/Future	On-site	No	With the exception of pilots using the runway, no other recreationists access this area. Because of the thick vegetation in the alleged area, recreationists would not typically venture into the area.
							Ingestion	Edible plants with roots extending into the subsurface soil	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	The area is fenced and secured. Because of the thick vegetation in the alleged area, trespassers would not typically venture into the area.
							Ingestion	Edible plants with roots extending into the subsurface soil	Resident	Child/Adult	Current/Future	On-site	No	Only one person lives on site. Also, fthe reported location of this area is heavily vegetated.
		Soil, Surface	Transport/ Migration	Groundwater	Transport/ Migration	Surface water	Ingestion	Surface water	Resident	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply. No evidence of surface water.
		Soil, Surface	Transport/ Migration	Groundwater	Transport/ Migration	Surface water	Ingestion	Surface water	Recreationist	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply. Also, this area is fences, secure, and heavily vegetated. No evidence of surface water.
		Soil, Surface	Transport/ Migration	Groundwater	Transport/ Migration	Surface water	Ingestion	Surface water	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply. Also, this area is fences, secure, and heavily vegetated. No evidence of surface water.

TABLE 8-1
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
ADMINISTRATION AND OPERATIONS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
					Transport/ Migration	Surface water	Dermal	Surface water	Resident	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply. Also, this area is fences, secure, and heavily vegetated. No evidence of surface water.
					Transport/ Migration	Surface water	Dermal	Surface water	Recreationist	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply. Also, this area is fences, secure, and heavily vegetated.
Liquid Disposal Area	Release/Spills/ Leaks	Soil, Surface	Transport/ Migration	Subsurface soil	Transport/ Migration	Surface water	Dermal	Surface water	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply. Also, this area is fenced, secure, and heavily vegetated. No evidence of surface water.
					Transport/ Migration	Groundwater	Ingestion	residential water supply	Resident	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply.
					Transport/ Migration	Groundwater	Inhalation	residential water supply	Resident	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply.
					Transport/ Migration	Groundwater	Dermal	residential water supply	Resident	Child/Adult	Current/Future	On-site	No	Results of previous sampling of water supply well have not identified chemicals of interest present in the on-site water supply.

TABLE 8-2
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
ADMINISTRATION AND OPERATIONS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Borrow Pits	Disposal	Subsurface soil	Biotic Uptake	NA	NA	Plant tissue	Ingestion	Edible plants growing with roots in contaminated subsurface soil	Voles/Deer/Elk/Aviary/Other (small burrowing animals)	Current/Future	On-site	Yes	Potential for biotic uptake of contaminants in subsurface soil into terrestrial vegetation that would be eaten by terrestrial receptors. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
		Subsurface soil	Transport/ Migration	Groundwater	NA	Groundwater	Ingestion	residential water supply wells	Livestock	Current/Future	Off-site	Yes	Exposure pathway is complete if groundwater is used as the water source for livestock (horses, ckickens, pigs,etc..). Chemicals of interest have been sporadically detected.
							Inhalation	Residential water supply	Livestock	Current/Future	Off-site	Yes	Exposure pathway is complete if groundwater is used as the water source for livestock (horses, ckickens, pigs,etc..). Chemicals of interest have been sporadically detected.
						Groundwater	Dermal	residential water supply wells	Livestock	Current/Future	Off-site	Yes	Exposure pathway is complete if groundwater is used as the water source for livestock (horses, ckickens, pigs,etc..). Chemicals of interest have been sporadically detected.
		Subsurface soil	Direct contact	NA	NA	Soil, Subsurface	Inhalation	Soil, Subsurface	Burrowing Animals	Current/Future	On-site	Yes	If volatile organic compounds are present in shallow subsurface soil, burrowing animals may be exposed via inhalation.
						Soil, Subsurface	Dermal	Soil, Subsurface	Burrowing Animals	Current/Future	On-site	Yes	If chemicals of interest are present in shallow subsurface soil, burrowing animals may be exposed via contact with contaminated soil.
						Soil, Subsurface	Ingestion	Soil, Subsurface	Burrowing Animals	Current/Future	On-site	Yes	If chemicals of interest are present in shallow subsurface soil, burrowing animals may be exposed via ingestion of soil.
		Subsurface soil	Brought to the surface	NA	NA	Soil, Subsurface	Ingestion	Soil	Voles/Deer/Elk/Eagles/Other (burrowing species)	Current/Future	On-site	Yes	Current potential exposure to chemicals of interest in shallow subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Inhalation	Soil	Voles/Deer/Elk/Eagles/Other (burrowing species)	Current/Future	On-site	Yes	Current potential exposure to chemicals of interest in shallow subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Dermal	Soil	Voles/Deer/Elk/Eagles/Other (burrowing species)	Current/Future	Off-site	Yes	Current potential exposure to chemicals of interest in shallow subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Ingestion	Soil	Livestock	Current/Future	Off-Site	No	The steep sides of the borrow pits and dense woody vegetation would discourage livestock from entering the pits for grazing.
							Inhalation	Soil	Livestock	Current/Future	Off-Site	No	The steep sides of the borrow pits and dense woody vegetation would discourage livestock from entering the pits for grazing.
							Dermal	Soil	Livestock	Current/Future	Off-Site	No	The steep sides of the borrow pits and dense woody vegetation would discourage livestock from entering the pits for grazing.
		Subsurface soil	Transport/ Migration	Groundwater	Transport/ Migration	Surface water	Ingestion	Surface water	Salmonid	Current/Future	Off-site	No	No surface water drains from the borrow pits.
						Surface Water	Dermal	Surface water	Salmonid	Current/Future	Off-site	No	No surface water drains from the borrow pits.
						Surface Water	Ingestion	Surface water	Voles/Deer/Elk/Aviary/Other	Current/Future	Off-site	No	No surface water drains from the borrow pits.
						Surface Water	Dermal	Surface water	Voles/Deer/Elk/Aviary/Other	Current/Future	Off-site	No	No surface water drains from the borrow pits.

TABLE 8-2
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
ADMINISTRATION AND OPERATIONS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Liquid Disposal Area	Release/Spills/ Leaks	Soil, Surface	Overland Flow	Surface water	NA	Surface water	Ingestion	Surface water drainage pathways/ponding water	Burrowing Animals	Current/Future	On-site	No	Analytical results indicate contaminants are not present above screening levels
						Surface Water	Dermal	Surface water drainage pathways/ponding water	Burrowing Animals	Current/Future	On-site	No	Analytical results indicate contaminants are not present above screening levels
		Soil, Surface	Direct contact	NA	NA	Soil, Surface	Ingestion	Surface soil	Burrowing Animals	Current/Future	On-site	No	Analytical results indicate contaminants are not present above screening levels
						Soil, Surface	Dermal	Surface soil	Burrowing Animals	Current/Future	On-site	No	Analytical results indicate contaminants are not present above screening levels
		Soil, Surface	Wind Erosion	NA	NA	Air (Particulates)	Inhalation	Air	Voles/Deer/Elk/Aviary/Other	Current/Future	On-site	No	Analytical results indicate contaminants are not present above screening levels.
Liquid Disposal Area	Release/Spills/ Leaks	Soil, Surface	Overland Flow	Sediment	NA	Sediment	Ingestion	Sediment within surface water drainage pathways	Voles/Deer/Elk/Aviary/Other (small burrowing animals)	Current/Future	On-site	No	No known surface water bodies are located nearby.
						Sediment	Dermal	Sediment within surface water drainage pathways	Voles/Deer/Elk/Aviary/Other (small burrowing animals)	Current/Future	On-site	No	No known surface water bodies are located nearby.
		Soil, Surface	Infiltration	Subsurface soil	Biotic Uptake	Plant Tissue	Ingestion	Edible plants	Voles/Deer/Elk/Aviary/Other (small burrowing animals)	Current/Future	On-site	No	Analytical results indicate contaminants are not present above screening levels.
		Subsurface soil	Transport/ Migration	Groundwater	Transport/ Migration	Surface Water	Ingestion	Surface water	Salmonid	Current/Future	Off-site	No	No known surface water bodies that support aquatic salmonid life are located nearby.
						Surface Water	Dermal	Surface water	Salmonid	Current/Future	Off-site	No	No known surface water bodies that support aquatic salmonid life are located nearby.

TABLE 8-3
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
INDUSTRIAL COMPLEX AREA

Potential Source Areas	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Quanternary Sources	Quanternary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Industrial Facilities likely to handle, use, store haz waste/subs.	Release/Spills /Leaks	Soil, Surface	Overland Flow	NA	NA	NA	NA	Sediment	Dermal	Sediment	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No surface water drainages from contaminated sites.
									Dermal	Sediment	Resident	Child/Adult	Current/Future	On-site	No	No surface water drainages from contaminated sites.
									Dermal	Sediment	Recreationist	Child/Adult	Current/Future	On-site	No	No surface water drainages from contaminated sites.
		Soil, Surface	Wind Erosion	NA	NA	NA	NA	Air	Inhalation	Surface Soil	Resident	Child/Adult	Current/Future	On-site	No	Potential for contaminants in surface soil to become airborne is considered to be low given the amount of vegetation covering the ground.
									Inhalation	Surface Soil	Resident	Child/Adult	Current/Future	Off-site	No	Potential for contaminants in surface soil to become airborne is considered to be low given the amount of vegetation covering the ground.
									Inhalation	Surface Soil	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	Potential for contaminants in surface soil to become airborne is considered to be low given the amount of vegetation covering the ground.
									Inhalation	Surface Soil	Recreationist	Child/Adult	Current/Future	On-site	No	Potential for contaminants in surface soil to become airborne is considered to be low given the amount of vegetation covering the ground.
		Soil, Surface	Overland Flow	NA	NA	NA	NA	Surface Water	Dermal	Surface Water	Recreationist	Child/Adult	Current/Future	On-site	No	No surface water drainages from contaminated sites.
									Dermal	Surface Water	Resident	Child/Adult	Current/Future	On-site	No	No surface water drainages from contaminated sites.
									Dermal	Surface Water	Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	No surface water drainages from contaminated sites.
		Soil, Surface	Direct Contact	NA	NA	NA	NA	Soil, Surface	Dermal	Surface Soil	Resident	Child/Adult	Future	On-site	Yes	Exposure to contaminants in surface soils via dermal contact is considered to be low given the vegetative covering that is present. Future use of the site north of Quillayute Road is unknown.
									Ingestion	Surface Soil	Resident	Child	Future	Onsite	Yes	Exposure to contaminants in surface soils via ingestion contact is considered to be low given the vegetative covering that is present. Future use of the site north of Quillayute Road is unknown.
									Dermal	Surface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	Landscaping/performing maintenance/etc. in areas where former bldgs were located could potentially expose workers to contaminants in surface soil.
									Dermal	Surface Soil	Recreationist	Child/Adult	Current/Future	On-site	Yes	Exposure to contaminants in surface soil via dermal contact is considered to be low given the vegetative covering that is present where buildings were or currently are located.
									Dermal	Surface Soil	Trespasser/Visitor	Child/Adult	Current/Future	On-site	Yes	Exposure to contaminants in surface soil via dermal contact is considered to be low given the vegetative covering that is present where buildings were or currently are located.
		Soil, Surface	Direct Contact	NA	NA	NA	NA	Soil, Surface	Inhalation	Surface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	Landscaping/performing maintenance/etc. in areas where former bldgs were located could potentially expose workers to contaminants, if present in surface soil.

TABLE 8-3
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
INDUSTRIAL COMPLEX AREA

Potential Source Areas	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Quanternary Sources	Quanternary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Industrial Facilities likely to handle, use, store haz waste/subs.									Inhalation	Surface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	Landscaping/performing maintenance/etc. in areas where former bldgs were located could potentially expose workers to contaminants, if present in surface soil.
		Soil, Surface	Infiltration	Groundwater	Transport/ Migration	NA	NA	Groundwater	Ingestion	Residential water supply wells	Resident	Child/Adult	Current/Future	On-site	Yes	Contaminated groundwater used as a drinking water source; exposure is considered low given the sampling results.
									Inhalation	Residential water supply wells	Resident	Child/Adult	Current/Future	On-site	Yes	Contaminated groundwater used as a drinking water source; exposure is considered low given the sampling results.
									Dermal	Downgradient (east-northeast) residential water wells	Resident	Child/Adult	Current/Future	Off-site	Yes	Potential for contaminants in groundwater to be flowing downgradient to residential wells that have not been sampled.
		Soil, Surface	Infiltration	Groundwater	Transport/ Migration	Surface Water	Discharge	Surface Water	Dermal	Surface Water/Sediment	Recreationist	Child/Adult	Future	On-site	No	No contamination detected in the manmade pond.
								Surface Water	Dermal	Surface Water/Sediment	Trespasser/Visitor	Child/Adult	Future	On-site	No	No contamination detected in the manmade pond.
								Surface Water	Dermal	Surface Water	Resident	Child/Adult	Future	On-site	No	No contamination detected in the manmade pond.
		Soil, Surface	Percolation	Subsurface Soil	Excavation/ Landscaping	NA	NA	Soil, Subsurface	Dermal	Subsurface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	If subsurface soils are brought to the surface during excavation for construction or landscaping activities.
								Soil, Subsurface	Inhalation	Subsurface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	If subsurface soils are brought to the surface during excavation for construction or landscaping activities.
	Direct Discharge	On Site Surface Water Drainage Features	Runoff	NA	NA	NA	NA	Surface Water	Dermal	Surface Water/Sediment	Resident	Child/Adult	Current/Future	Off-site	Yes	Contact with surface water flowing from Industrial Complex area via the drainage system and discharging to the ravine behind the Parcel K residence.
											Resident	Child/Adult	Current/Future	On-site	Yes	Contact with surface water flowing from Industrial Complex area via the drainage system and discharging to the ravine behind the Parcel K residence.
Tetraethyl Lead Disposal Area	Placed in unit	Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Inhalation	Subsurface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	No	No contamination detected in subsurface.
		Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Dermal	Subsurface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	No	No contamination detected in subsurface.
		Soil, Subsurface	Percolation	Groundwater	Transport/ Migration	NA	NA	Groundwater	Ingestion	Downgradient (east-northeast) residential water supply wells.	Resident	Child/Adult	Current/Future	Off-site	No	No contamination detected in subsurface.
									Inhalation	Downgradient (east-northeast) residential water supply wells.	Resident	Child/Adult	Current/Future	Off-site	No	No contamination detected in subsurface.
									Dermal	Downgradient (east-northeast) residential water supply wells.	Resident	Child/Adult	Current/Future	Off-site	No	No contamination detected in subsurface.
Bldgs 7, 11, 41, and 49 (PAHs)	Release/Spills /Leaks	Soil, Surface	Direct Contact	NA	NA	NA	NA	Soil, Surface	Dermal	Surface/Shallow Subsurface Soil	Resident	Child/Adult	Current/Future	On-site	Yes	PAHs present in surface/shallow subsurface soils in the vicinity of these former bldgs.
										Surface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	Contact with contaminated surface soil.

TABLE 8-3
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
INDUSTRIAL COMPLEX AREA

Potential Source Areas	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Quanternary Sources	Quanternary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Building 44 (VOCs - former laundry/dry cleaner)	Release/Spills /Leaks	Soil, Surface	Biotic Uptake	NA	NA	NA	NA	Plant Tissue	Ingestion	Plants	Resident	Child/Adult	Current/Future	On-site	No	Contact with contaminated vegetation is unlikely given the chemicals of interest are PCBs, PAHs, and oils.
		Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Inhalation	Subsurface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	Subsurface soil brought to the surface during maintenance or redevelopment in the area.
		Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Dermal	Subsurface Soil	Industrial/Commercial Worker	Adult	Current/Future	On-site	Yes	Subsurface soil brought to the surface during maintenance or redevelopment in the area.
			Percolation	Groundwater	Transport/ Migration	NA	NA	Groundwater	Ingestion	Downgradient (east-northeast) residential water supply wells.	Resident	Child/Adult	Future	On-site	Yes	Infiltration of contaminants to groundwater and ttransport to downgradient residential water supply wells.
									Inhalation	Downgradient (east-northeast) residential water supply wells.	Resident	Child/Adult	Future	On-site	Yes	Infiltration of contaminants to groundwater and transport to downgradient residential water supply wells.
									Dermal	Downgradient (east-northeast) residential water supply wells.	Resident	Child/Adult	Future	On-site	Yes	Infiltration of contaminants to groundwater and transport to downgradient residential water supply wells.
		Soil, Subsurface	Volatilization	Soil vapor	NA	NA	NA	Air	Inhalation	Indoor and ambient air	Resident					
								Ambient Air				Child/Adult	Current/Future	On-site	Yes	Detection of VOCs in ambient air.
								Indoor Air				Child/Adult	Future	On-site	Yes	Potential for migration of soil vapor to indoor air space.

TABLE 8-4
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
INDUSTRIAL COMPLEX AREA

Primary Source Area	Primary Release Mechanism	Seconday Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Quanternary Sources	Quanternary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Industrial facilities likely to handle, use, store, or dispose of waste/materials containing chemicals of interest.	Release/Spills /Leaks	Soil, Surface	Overland Flow	NA	NA	NA	NA	Sediment	Ingestion	Sediment	Salmonid	Current/Future	Off-site	No	Nearest surface water body is more than a half mile away.
									Dermal	Sediment	Salmonid	Current/Future	Off-site	No	Nearest surface water body is more than a half mile away.
									Dermal	Sediment	Deer/Elk/Other	Current/Future	Off-site	No	No surface drainage from contaminated sites
									Ingestion	Sediment	Bald Eagle/Aviary	Current/Future	On-site	No	No surface drainage from contaminated sites
									Dermal	Sediment	Bald Eagle/Aviary	Current/Future	On-site	No	No surface drainage from contaminated sites
									Ingestion	Sediment	Bald Eagle/Aviary	Current/Future	Off-site	No	No surface drainage from contaminated sites
									Dermal	Sediment	Bald Eagle/Aviary	Current/Future	Off-site	No	No surface drainage from contaminated sites
									Inhalation	Sediment	Burrowing Animals	Current/Future	On-site	No	No surface drainage from contaminated sites
									Inhalation	Sediment	Burrowing Animals	Current/Future	Off-Site	No	No surface drainage from contaminated sites
									Ingestion	Sediment	Burrowing Animals	Current/Future	On-site	No	No surface drainage from contaminated sites
									Dermal	Sediment	Burrowing Animals	Current/Future	On-site	No	No surface drainage from contaminated sites
									Ingestion	Sediment	Burrowing Animals	Current/Future	Off-site	No	No surface drainage from contaminated sites.
									Dermal	Sediment	Burrowing Animals	Current/Future	Off-site	No	No surface drainage from contaminated sites.
		Soil, Surface	Biotic Uptake	NA	NA	NA	NA	Plant Tissue	Ingestion	Plants	Bald Eagle/Aviary	Current/Future	On-site	Yes	Potential for aviary species to ingest or contact contaminated plants.
									Dermal	Plants	Bald Eagle/Aviary	Current/Future	On-site	Yes	Potential for aviary species to ingest or contact contaminated plants.
		Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Inhalation	Subsurface Soil	Burrowing Animals	Current/Future	On-site	Yes	Contact with chemicals of interest located in shallow subsurface soil.
									Ingestion	Subsurface Soil	Burrowing Animals	Current/Future	On-site	Yes	Contact with chemicals of interest located in shallow subsurface soil.
									Dermal	Subsurface Soil	Burrowing Animals	Current/Future	On-site	Yes	Contact with chemicals of interest located in shallow subsurface soil.
		Soil, Surface	Overland Flow	NA	NA	NA	NA	Surface Water	Ingestion	Surface Water	Deer/Elk/Other	Current/Future	Off-site	No	No surface water drainage was observed from contaminated sites.
									Dermal	Surface Water	Deer/Elk/Other	Current/Future	Off-site	No	No surface water drainage was observed from contaminated sites.
									Ingestion	Surface Water	Bald Eagle/Aviary	Current/Future	On-site	No	No surface water drainage was observed from contaminated sites.
									Dermal	Surface Water	Bald Eagle/Aviary	Current/Future	On-site	No	No surface water drainage was observed from contaminated sites.
									Ingestion	Surface Water	Burrowing animals	Current/Future	On-site	No	No surface water drainage was observed from contaminated sites.
									Dermal	Surface Water	Burrowing animals	Current/Future	On-site	No	No surface water drainage was observed from contaminated sites.
									Ingestion	Surface Water	Salmonid	Current/Future	Off-site	No	Nearest surface water body is more than a half mile away.
									Dermal	Surface Water	Salmonid	Current/Future	Off-site	No	Nearest surface water body is more than a half mile away.

TABLE 8-4
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
INDUSTRIAL COMPLEX AREA

Primary Source Area	Primary Release Mechanism	Seconday Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Quanternary Sources	Quanternary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
		Soil, Surface	Direct Contact	NA	NA	NA	NA	Soil, Surface	Ingestion	Surface Soil	Burrowing animals	Current/Future	On-site	Yes	Exposure to burrowing animals from contaminated surface soil.
									Inhalation	Surface Soil	Burrowing animals	Current/Future	On-site	Yes	Exposure to burrowing animals from contaminated surface soil.
									Dermal	Surface Soil	Burrowing animals	Current/Future	On-site	Yes	Exposure to burrowing animals from contaminated surface soil.
									Dermal	Surface Soil	Deer/Elk/Other	Current/Future	On-site	Yes	Areas where most of these buildings are located are secured by a fence and a locked gate and are typically heavily vegetated.
		Soil, Surface	Biotic Uptake	NA	NA	NA	NA	Plant Tissue	Ingestion	Plants	Bald Eagle/Aviary	Current/Future	On-site	Yes	Potential for contact with contaminated plants.
									Ingestion	Plants	Deer/Elk/Other	Current/Future	On-site	Yes	Area where most of these bldgs are located is secured by a fence and a locked gate.
		Soil, Surface	Infiltration	Groundwater	Transport/ Migration	Surface Water	Discharge	Surface Water	Ingestion	Surface Water	Salmonid	Future	On-site	No	No chemicals of interest detected in manmade pond.
									Dermal	Surface Water	Salmonid	Future	On-site	No	No chemicals of interest detected in manmade pond.
									Ingestion	Surface Water	Bald Eagle/Aviary	Future	On-site	No	No chemicals of interest detected in manmade pond.
									Dermal	Surface Water	Bald Eagle/Aviary	Future	On-site	No	No chemicals of interest detected in manmade pond.
									Ingestion	Surface Water	Deer/Elk/Other	Future	On-site	No	No chemicals of interest detected in manmade pond.
									Dermal	Surface Water	Deer/Elk/Other	Future	On-site	No	No chemicals of interest detected in manmade pond.
	Direct Discharge	On Site Surface Water Features	Runoff	NA	NA	NA	NA	Surface Water	Ingestion	Surface Water	Deer/Elk/Other	Current/Future	On-site	No	No chemicals of interest detected in manmade pond.
									Dermal	Surface Water	Deer/Elk/Other	Current/Future	On-site	No	No chemicals of interest detected in manmade pond.
									Ingestion	Surface Water	Bald Eagle/Aviary	Current/Future	On-site	No	No chemicals of interest detected in manmade pond.
									Dermal	Surface Water	Bald Eagle/Aviary	Current/Future	On-site	No	No chemicals of interest detected in manmade pond.
Tetraethyl Lead Disposal Area	Placed in Unit	Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Inhalation	Subsurface Soil	Burrowing Animals	Current/Future	On-site	No	No contamination has been detected at this location
									Ingestion	Subsurface Soil	Burrowing Animals	Current/Future	On-site	No	No contamination has been detected at this location
		Soil, Subsurface	Brought to the surface	NA	NA	NA	NA	Soil, Subsurface	Dermal	Subsurface Soil	Burrowing Animals	Current/Future	On-site	No	No contamination has been detected at this location

TABLE 8-4
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
INDUSTRIAL COMPLEX AREA

Primary Source Area	Primary Release Mechanism	Seconday Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Quanternary Sources	Quanternary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Bldgs 7, 11, 41, and 49 (PAHs)	Release/Spills /Leaks	Soil, Surface	Direct Contact	NA	NA	NA	NA	Soil, Surface	Ingestion	Surface/Shallow Subsurface Soils	Burrowing animals	Current/Future	On-site	Yes	Potential for exposure to PAHs in surface/shallow subsurface soils.
									Dermal	Surface/Shallow Subsurface Soils	Burrowing animals	Current/Future	On-site	Yes	Potential for exposure to PAHs in surface/shallow subsurface soils.
		Soil, Surface	Overland Flow	NA	NA	NA	NA	Surface Water	Ingestion	Surface Water	Salmonid	Current/Future	Off-site	No	Nearest surface water body is more than a half mile away.
									Dermal	Surface Water	Salmonid	Current/Future	Off-site	No	Nearest surface water body is more than a half mile away.
									Ingestion	Surface Water	Deer/Elk/Other	Current/Future	Off-site	No	No surface water drainage from contaminated sites.
									Dermal	Surface Water	Deer/Elk/Other	Current/Future	Off-site	No	No surface water drainage from contaminated sites.
									Ingestion	Surface Water	Bald Eagle/Aviary	Current/Future	On-site	No	No surface water drainage from contaminated sites.
									Dermal	Surface Water	Bald Eagle/Aviary	Current/Future	On-site	No	No surface water drainage from contaminated sites.
		Soil, Surface	Overland Flow	NA	NA	NA	NA	Sediment	Ingestion	Sediments	Burrowing animals	Current/Future	On-site	No	No overland flow observed from contaminated sites
									Dermal	Sediments	Burrowing animals	Current/Future	On-site	No	No overland flow observed from contaminated sites
									Ingestion	Sediments	Bald Eagles/Aviary	Current/Future	On-site	No	Ingestion is not considered a likely exposure scenario for aviary species.
									Dermal	Sediments	Bald Eagles/Aviary	Current/Future	On-site	No	Potential for aviary species to have contact with contaminated sediments.
		Soil, Surface	Biotic Uptake	NA	NA	NA	NA	Plant Tissue	Ingestion	Plants	Bald Eagle/Aviary	Current/Future	On-site	Yes	Potential for aviary species to ingest or contact contaminated plants.
									Dermal	Plants	Bald Eagle/Aviary	Current/Future	On-site	Yes	Potential for aviary species to ingest or contact contaminated plants.
									Ingestion	Plants	Burrowing Animals	Current/Future	On-site	Yes	Potential for burrowing animals to ingest contaminated plants
									Dermal	Plants	Burrowing Animals	Current/Future	On-site	Yes	Potential for burrowing animals to contact contaminated plants.

TABLE 8-5
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
WEST PARCELS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Borrow Pits	Disposal	Soil, Subsurface	Biotic Uptake	NA	NA	Plant Tissue	Ingestion	Edible Plants	Recreationist	Child/Adult	Current/Future	On-site	Yes	Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
									Resident	Child/Adult	Current/Future	On-site	Yes	Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
									Trespasser/Visitor	Child/Adult	Current/Future	On-site	Yes	Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
		Soil, Subsurface	Brought to the surface	NA	NA	Soil, Subsurface	Inhalation	Soil	Site Worker	Adult	Future	On-site	Yes	The future inhalation exposure pathway for site workers is considered to be potentially complete if future development occurs and contaminated subsurface soils are brought to the surface. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Dermal	Soil	Site Worker	Adult	Current/Future	On-site	Yes	The future dermal exposure pathway for site workers is considered to be potentially complete if future development occurs and contaminated subsurface soils are brought to the surface. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
		Soil, Subsurface	Transport/ Migration	Groundwater	Transport/ Migration	Groundwater	Ingestion	Residential water supply	Resident	Child/Adult	Current/Future	On-site	No	No associated chemicals of interest in groundwater.
						Groundwater	Inhalation	Residential water supply	Resident	Child/Adult	Current/Future	On-site	No	No associated chemicals of interest in groundwater
						Groundwater	Dermal	Residential water supply	Resident	Child/Adult	Current/Future	On-site	No	No associated chemicals of interest in groundwater
		Soil, Subsurface	Transport/ Migration	Groundwater	Transport/ Migration	Surface Water	Ingestion	Surface Water	Recreationist	Child/Adult	Current/Future	Off-site	No	No associated chemicals of interest in groundwater. Distance to nearest surface water body is greater than 1/2-mile away.
							Dermal	Surface Water	Recreationist	Child/Adult	Current/Future	Off-site	No	No associated chemicals of interest in groundwater. Distance to nearest surface water body is greater than 1/2-mile away.

TABLE 8-6
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
WEST PARCELS AREA

Potential Source Area	Primary Release Mechanism	Secondary Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Borrow Pits	Disposal	Subsurface soil	Biotic Uptake	NA	NA	Plant Tissue	Ingestion	Edible portions of plants	Voles/Deer/Elk/Eagles/Other	Current/Future	On-site	Yes	Potential for biotic uptake of contaminants in subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
		Subsurface soil	Transport/ Migration	Groundwater	Transport/ Migration	Groundwater	Ingestion	Residential water supply	Livestock	Current/Future	Off-site	Yes	Exposure pathway is complete if groundwater is used as the water source for livestock (horses, ckickens, pigs,etc..). Chemicals of interest have been sporadically detected.
							Inhalation	Residential water supply	Livestock	Current/Future	Off-site	Yes	Exposure pathway is complete if groundwater is used as the water source for livestock (horses, ckickens, pigs,etc..). Chemicals of interest have been sporadically detected.
							Dermal	Residential water supply	Livestock	Current/Future	Off-site	Yes	Exposure pathway is complete if groundwater is used as the water source for livestock (horses, ckickens, pigs,etc..). Chemicals of interest have been sporadically detected.
		Subsurface soil	Brought to the surface	NA	NA	Soil, Subsurface	Ingestion	Soil	Voles/Deer/Elk/Eagles/Other (burrowing species)	Current/Future	On-site	Yes	Current potential exposure to chemicals of interest in shallow subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Inhalation	Soil	Voles/Deer/Elk/Eagles/Other (burrowing species)	Current/Future	On-site	Yes	Current potential exposure to chemicals of interest in shallow subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Dermal	Soil	Voles/Deer/Elk/Eagles/Other (burrowing species)	Current/Future	Off-site	Yes	Current potential exposure to chemicals of interest in shallow subsurface soil. Lack of sampling neither confirms nor denies soil contamination, hence related exposure pathways are considered complete, but uncertain.
							Ingestion	Soil	Livestock	Current/Future	Off-Site	No	The steep sides of the borrow pits and dense woody vegetation would discourage livestock from entering the pits for grazing.
							Inhalation	Soil	Livestock	Current/Future	Off-Site	No	The steep sides of the borrow pits and dense woody vegetation would discourage livestock from entering the pits for grazing.
							Dermal	Soil	Livestock	Current/Future	Off-Site	No	The steep sides of the borrow pits and dense woody vegetation would discourage livestock from entering the pits for grazing.
		Subsurface soil	Transport/ Migration	Groundwater	Transport/ Migration	Surface Water	Ingestion	Surface water	Salmonid	Current/Future	Off-site	No	Distance to nearest surface water body is greater than 1/2-mile away.
							Dermal	Surface water	Salmonid	Current/Future	Off-site	No	Distance to nearest surface water body is greater than 1/2-mile away.

TABLE 8-7
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
EAST PARCELS AREA

Primary Source Area	Primary Release Mechanism	Seconday Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Buildings 101 and 102-Radio/Generator Facilities	Release/Spills /Leaks	Soil, Surface	Biotic Uptake	NA	NA	Plant Tissue	Ingestion	Edible Plants	Recreationist	Child/Adult	Current	On-site	Yes	The exposure risk to human receptors from eating vegetation that contains chemicals of interest is considered to be low.
									Construction Worker	Adult	Future	On-site	No	The pathway for construction is incomplete because it is unlikely that they would eat vegatation.
									Trespasser/Visitor	Child/Adult	Current	On-site	Yes	The exposure risk to human receptors from eating vegetation that contains chemicals of interest is considered to be low.
		Soil, Surface	Overland Flow	NA	NA	Surface Water	Ingestion	Surface Water	Recreationist	Child/Adult	Current	On-site	No	No surface water bodies located on site. Future development of area would remove the source area.
									Construction Worker	Adult	Future	On-site	No	No surface water bodies located on site. Future development of area would remove the source area.
									Resident	Child/Adult	Future	On-site	No	With future development of area, contaminated surface soil would be removed or covered with fill materials thereby eliminating potential exposure of surface water containing contaminated soil particles.
									Trespasser/Visitor	Child/Adult	Current	On-site	No	No surface water bodies located on site. Future development of area would remove the source area.
		Soil, Surface	Overland Flow	NA	NA	Surface Water	Dermal	Surface Water	Recreationist	Child/Adult	Current	On-site	No	No surface water bodies located on site. Future development of area would remove the source area.
									Construction Worker	Adult	Future	On-site	No	No surface water bodies located on site. Future development of area would remove the source area.
									Resident	Child/Adult	Future	On-site	No	With future development of area, contaminated surface soil would be removed or covered with fill materials thereby eliminating potential exposure of surface water containing contaminated soil particles.
									Trespasser/Visitor	Child/Adult	Current	On-site	No	No surface water bodies located on site. Future development of area would remove the source area.
		Soil, Surface	Overland Flow	NA	NA	Sediment	Ingestion	Sediment	Construction Worker	Adult	Future	On-site	No	No surface water bodies observed on site.
									Recreationist	Child/Adult	Current	On-site	No	No surface water bodies or drainage pathways observed on site. Future development of area would remove source.
									Resident	Child/Adult	Future	On-site	No	Redevelopment would likely remove the source (surface soil) thus eliminating the exposure potential.
		Soil, Surface	Overland Flow	NA	NA	Sediment	Dermal	Sediment	Construction Worker	Adult	Future	On-site	No	No surface water bodies observed on site.
									Recreationist	Child/Adult	Current	On-site	No	No surface water bodies or drainage pathways observed on site. Future development of area would remove source.
									Resident	Child/Adult	Future	On-site	No	Redevelopment would likely remove the source (surface soil) thus eliminating the exposure potential.
		Soil, Surface	Wind Erosion	NA	NA	Air (Particulates)	Inhalation	Air	Construction Worker	Adult	Future	On-site	Yes	Exposure is considered complete during future constrution because of the disruption of potentially contaminated soil.

TABLE 8-7
SELECTION OF EXPOSURE PATHWAYS FOR HUMAN RECEPTORS
EAST PARCELS AREA

Primary Source Area	Primary Release Mechanism	Seconday Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Receptor Age	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Buildings 101 and 102-Radio/Generator Facilities	Release/Spills/ Leaks								Resident	Child/Adult	Future	On-site	No	Exposure is considered low based on lack of exposed surface soils.
									Trespasser/Visitor	Child/Adult	Current	On-site	No	Exposure is considered low based on lack of exposed surface soils.
									Recreationist	Child/Adult	Current	On-site	No	Exposure is considered low based on lack of exposed surface soils.
		Soil, Surface	Deposition	NA	NA	Soil, Surface	Ingestion	Surface Soil	Construction Worker	Adult	Future	On-site	No	Contaminated surface soil would be removed during development of the parcels. Exposure during development via ingestion is considered to be an incomplete pathway.
									Resident	Child/Adult	Future	On-site	No	Contaminated surface soil would be removed during development of the parcels.
									Trespasser/Visitor	Child/Adult	Current/Future	On-site	No	Contaminated surface soil would be removed during development of the parcels.
		Soil, Surface	Deposition	NA	NA	Soil, Surface	Dermal	Surface Soil	Construction Worker	Adult	Future	On-site	Yes	If contact with contaminated surface soil or excavation of contaminated subsurface soil occurs during future development of the area..
									Resident	Child/Adult	Future	On-site	No	Contaminated surface soil would be removed during development of the parcels.
									Recreationist	Child/Adult	Current	On-site	Yes	Potential for contact with contaminated surface soil.
									Trespasser/Visitor	Child/Adult	Current	On-site	Yes	Potential for contact with contaminated surface soil.
		Soil, Surface	Deposition	NA	NA	Soil, Surface	Inhalation	Surface Soil	Construction Worker	Adult	Future	On-site	Yes	The inhalation exposure pathway for site workers is considered to be potentially complete during future development of the area.

TABLE 8-8
SELECTION OF EXPOSURE PATHWAYS FOR ECOLOGICAL RECEPTORS
EAST PARCELS AREA

Primary Source Area	Primary Release Mechanism	Seconday Sources (Medium)	Secondary Release Mechanism	Tertiary Sources	Tertiary Release Mechanism	Exposure Medium	Exposure Route	Exposure Point	Receptor Population	Scenario Timeframe	On-Site/ Off-Site	Complete Exposure Pathway	Rationale for Selection or Exclusion of Exposure Pathway
Buildings 101 and 102-Radio/Generator Facilities	Release/Spills /Leaks	Soil, Surface	Biotic Uptake	NA	NA	Plant Tissue	Ingestion	Plants	Voles/Burrowing Animals	Current	On-site	Yes	Potential for plants to uptake chemicals of interest from contaminated soil. Future development would remove contaminated soils and vegetation.
									Deer/Elk/Eagles/Other	Current	On-site	Yes	Potential for plants to uptake chemicals of interest from contaminated soil. During development contaminated soils and vegetation would likely be removed.
		Soil, Surface	Overland Flow	NA	NA	Surface Water	Ingestion	Surface Water	Salmonid	Current	On-site	No	No surface water bodies or drainages observed on site.
							Dermal	Surface Water	Salmonid	Current	On-site	No	No surface water bodies or drainages observed on site.
							Ingestion	Surface Water	Deer/Elk/Eagles/Other	Current	On-site	No	No surface water bodies or drainages observed on site. Future development of area would remove the source area.
							Dermal	Surface Water	Deer/Elk/Eagles/Other	Current	On-site	No	No surface water bodies or drainages observed on site. Future development of area would remove the source area.
		Soil, Surface	Overland Flow	NA	NA	Sediment	Ingestion	Sediment	Salmonid	Current	On-site	No	No surface water bodies or drainages observed on site.
							Dermal	Sediment	Salmonid	Current	On-site	No	No surface water bodies or drainages observed on site.
							Ingestion	Sediment	Deer/Elk/Eagles/Other	Current	On-site	No	No surface water bodies or drainages observed on site. Future development of area would remove the source area.
							Dermal	Sediment	Deer/Elk/Eagles/Other	Current	On-site	No	No surface water bodies or drainages observed on site. Future development of area would remove the source area.
		Soil, Surface	Wind Erosion	NA	NA	Air (Particulates)	Inhalation	Air	Voles/Burrowing Animals	Current	On-site	No	Exposure is considered low based on lack of exposed surface soils.
		Soil, Surface	Deposition	NA	NA	Soil, Surface	Ingestion	Surface Soil	Voles/Burrowing Animals	Current	On-site	Yes	Burrowing species could be exposed to contaminated subsurface soils.
							Inhalation	Surface Soil	Voles/Burrowing Animals	Current	On-site	Yes	Inhalation exposure to volatile organics is considered to be potentially complete for burrowing species.
							Dermal	Surface Soil	Voles/Burrowing Animals	Current	On-site	Yes	Burrowing species could be exposed to contaminated subsurface soils.

FIGURE 8-1
CONCEPTUAL SITE MODEL
ADMINISTRATION AND OPERATIONS AREA

PRIMARY SOURCES	PRIMARY RELEASE MECHANISM	SECONDARY SOURCES	SECONDARY RELEASE MECHANISM	TERTIARY SOURCES	TERTIARY RELEASE MECHANISM	PATHWAYS (Exposure Media)	EXPOSURE ROUTE	RECEPTORS Current/Future: Salmonid Ecological (Aquatic)	Livestock Ecological (Terrestrial)	Voles/Deer/Elk/Aviary/Other Ecological (Terrestrial)	Future Site Workers[d]	Child/Adult Recreationist	Child/Adult Resident[g]	Child/Adult Trespasser/Visitor
Borrow pits	Disposal	Soil, Subsurface	Biotic Uptake			Plant Tissue	Ingestion	---	---	○	---	○ [a]	○ [a]	○ [a]
			Transport/Migration	Groundwater	Transport/Migration	Groundwater[b]	Ingestion	---	○	○	---	---	○	---
							Inhalation	---	---	---	---	---	○	---
							Dermal	---	---	---	---	---	○	---
					Transport/Migration	Surface Water[c]	Ingestion	---	---	---	---	---	---	---
							Dermal	---	---	---	---	---	---	---
			Infiltration			Soil, Subsurface	Ingestion	---	---	○[a]	---	---	---	---
							Dermal	---	---	○[a]	---	---	---	---
			Brought to the surface[d]			Soil	Ingestion	---	---	○[a]	---	---	---	---
							Inhalation	---	---	○[a]	○[a]	---	---	---
							Dermal	---	---	○[a]	○[a]	---	---	---
Liquid Disposal Area [d]	Release/Spill/Leak	Soil, Surface[e]	Overland Flow			Surface Water	Dermal	---	---	---	---	---	---	---
							Ingestion	---	---	---	---	---	---	---
			Direct contact			Soil, Surface	Inhalation	---	---	---	---	---	---	---
							Dermal	---	---	---	---	---	---	---
							Ingestion	---	---	---	---	---	---	---
			Wind Erosion			Air (Particulates)	Inhalation	---	---	---	---	---	---	---
			Overland Flow			Sediment	Ingestion	---	---	---	---	---	---	---
							Dermal	---	---	---	---	---	---	---
			Infiltration	Soil, Subsurface	Biotic Uptake	Plant Tissue	Ingestion	---	---	---	---	---	---	---
			Transport/Migration	Groundwater	Transport/Migration	Surface Water	Ingestion	---	---	---	---	---	---	---
							Dermal	---	---	---	---	---	---	---
					Transport/Migration	Groundwater	Ingestion	---	---	---	---	---	---	---
							Inhalation	---	---	---	---	---	---	---
							Dermal	---	---	---	---	---	---	---

Symbols		
●	=	Complete Pathway
○	=	Complete Pathway Uncertain
---	=	Incomplete Pathway

Notes
a - Lack of soil sampling in the borrow pits neither confirms nor denies presence of soil contamination; hence related exposure pathways are condsidered complete but uncertain.
b - Pathway is potneitally complete based on the sporadic occarance of COIs that maybe assoicated with borrow pits in groundwater from wells used as a drinking water source source by residents downgradient of the pits.
c - Surface water in the borrow pits infiltrates. No surface water leaves the pits. No surface water bodies are located within a 1/4-mile from the borrow pits.
d - No documentation has been found supporting the anonymous caller's claim of disposal of liquid wastes to the ground surface while the base was operational.
e - Sampling in the area where the anonymous caller indicated the liquid disposal area revealed no evidence of contamination or releases of chemicals so this pathway is considerd incomplete.
g - Currently one onsite resident and several offsite residents use groundwater as a drinking water source. Future use of the site is unknown but may be residential.

FIGURE 8-2
CONCEPTUAL SITE MODEL
INDUSTRIAL COMPLEX AREA

PRIMARY SOURCES	PRIMARY RELEASE MECHANISM	SECONDARY SOURCES	SECONDARY RELEASE MECHANISM	TERTIARY SOURCES	TERTIARY RELEASE MECHANISM	QUATERNARY SOURCES	QUATERNARY RELEASE MECHANISM	PATHWAYS (Exposure Media)	EXPOSURE ROUTE	RECEPTORS Current/Future: Burrowing Animals[d]	Salmonid[e] Ecological (Aquatic)	Bald Eagle/Aviary Ecological (Terrestrial)	Deer/Elk/Other Ecological (Terrestrial)	Adult Industrial/Commercial Worker	Child/Adult Recreationist	Child/Adult Resident	Child/Adult Trespasser/Visitor
Industrial Facilities likely to handle/use/store materials/waste containing chemicals of interest.	Release/Spill/Leak	Soil, Surface	Overland Flow					Sediment	Ingestion	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
									Inhalation	---	---	---	---	---	---	---	---
			Wind Erosion[b]					Air	Inhalation	---	---	---	---	---	---	---	---
			Overland Flow					Surface Water	Ingestion	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
			Direct Contact					Soil, Surface	Dermal	●	---	---	---	●	●	●	●
									Ingestion	●	---	●	---	---	---	●	---
									Inhalation	●	---	---	---	●	---	---	---
			Biotic Uptake					Plant Tissue	Ingestion	●	---	○	○	---	---	---	---
			Infiltration	Groundwater	Transport/Migration			Groundwater	Ingestion	---	---	---	---	---	---	●	---
									Inhalation	---	---	---	---	---	---	●	---
									Dermal	---	---	---	---	---	---	●	---
					Transport/Migration	Surface Water	Discharge	Surface Water[c,d]	Ingestion	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
			Percolation	Soil, Subsurface	Excavation/Landscaping			Soil, Subsurface	Inhalation	○	---	---	---	○	---	---	---
									Dermal	○	---	---	---	○	---	---	---
									Ingestion	○	---	---	---	---	---	---	---
	Direct Discharge	Surface Water Drainages	Runoff					Surface Water	Ingestion	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
Tetraethyl lead burn/disposal area	Placed in Unit	Soil, Subsurface	Direct Contact					Soil, Subsurface	Inhalation	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
									Ingestion	---	---	---	---	---	---	---	---
			Percolation	Groundwater	Transport/Migration			Groundwater	Ingestion	---	---	---	---	---	---	---	---
									Inhalation	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
Bldgs 7, 11, 41, 49, and 65 (former generator/ transformer bldgs with potential PCBs)	Release/Spill/Leak	Soil, Surface	Direct Contact					Soil, Surface	Dermal	●	---	---	---	●	---	●	---
									Ingestion	●	---	---	---	---	---	●	---
			Overland Flow					Surface Water	Ingestion	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
			Overland Flow					Sediment	Ingestion	---	---	---	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
			Biotic Uptake					Plant Tissue	Ingestion	●	---	●	---	---	---	---	---
									Dermal	---	---	---	---	---	---	---	---
Building 44 (former laundry/dry cleaning)	Release/Spill/Leak	Soil, Subsurface	Direct Contact[c]					Soil, Subsurface	Inhalation	●	---	---	---	●	---	---	---
									Dermal	●	---	---	---	●	---	---	---
									Ingestion	●	---	---	---	---	---	---	---
			Volatilization	Soil Vapor	Transport/Migration			Air	Inhalation	---	---	---	---	●	●	●[f]	●
			Infiltration	Groundwater	Transport/Migration			Groundwater	Ingestion	---	---	---	---	---	---	●	---
									Inhalation	---	---	---	---	---	---	●	---
									Dermal	---	---	---	---	---	---	●	---

Symbols		
●	=	Complete Pathway
○	=	Complete Pathway Uncertain
---	=	Incomplete Pathway

Notes

a - Former industrial facilities include bldgs 4, 5, 6, 9, 10, 17, 18, 19, 20, 26, 29, 44, 119, 119A, and E-120

b - Given the dense vegetation in most of the areas where former industrial facilities were located, exposure via airborne particulates is considered incomplete.

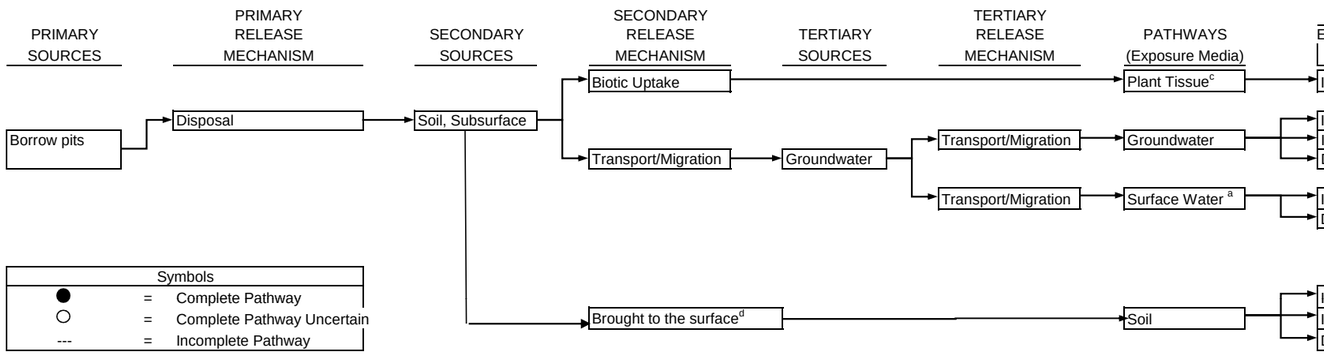
c - If the subsurface soils are brought to the surface during future renovation or excavation work.

d - The exposure pathways for small, burrowing animals are considered to be potentially complete for surface and shallow subsurface soils scenarios.

e - With the exception of the manmade pond, no surface water bodies are located within a 1/4-mile of the Industrial Complex Area.

f - Infiltration pathway is potentially complete for future use if dwellings are placed above areas with soil gas.

FIGURE 8-3
CONCEPTUAL SITE MODEL
WEST PARCELS AREA



Symbols		
●	=	Complete Pathway
○	=	Complete Pathway Uncertain
---	=	Incomplete Pathway

		RECEPTORS						
		Current/Future						
PATHWAYS (Exposure Media)	EXPOSURE ROUTE	Salmonid Ecological (Aquatic)	Livestock Ecological (Terrestrial)	Voles/Deer/Elk/Eagles/Other Ecological (Terrestrial)	Future Site Workers[d]	Child/Adult Recreationist	Child/Adult Resident	Child/Adult Trespasser/Visitor
Plant Tissue[c]	Ingestion	---	---	○[b]	---	○[b]	○[b]	○[b]
Groundwater	Ingestion	---	●	---	---	---	---	---
	Inhalation	---	●	---	---	---	---	---
	Dermal	---	●	---	---	---	---	---
Surface Water[a]	Ingestion	---	---	---	---	---	---	---
	Dermal	---	---	---	---	---	---	---
Soil	Ingestion	---	---	○[b]	---	---	---	---
	Inhalation	---	---	○[b]	○[b]	---	---	---
	Dermal	---	---	○[b]	○[b]	---	---	---

Notes

a - Surface water in the borrow pits infiltrates. No surface water drainage pathways from the borrow pits exist.

b - Lack of soil sampling in the borrow pits neither confirms nor denies presence of soil contaminant; hence related exposure pathways are considered complete but uncertain.

c- Given the configuration of the borrow pits, domestic livestock are not likely to enter into the pits to forage.
Potential exposure of small terrestrial receptors and deer/elk is considered to be potentially complete.

d - Potential inhalation and dermal exposure to future site workers if subsurface soil is contaminated and it is brought to the surface.

FIGURE 8-4
CONCEPTUAL SITE MODEL
EAST PARCELS AREA

PRIMARY SOURCES	PRIMARY RELEASE MECHANISM	SECONDARY SOURCES	SECONDARY RELEASE MECHANISM	PATHWAYS (Exposure Media)	EXPOSURE ROUTE	RECEPTORS: Current: Salmonid Ecological (Aquatic)	Current: Deer/Elk/Eagles/Other Ecological (Terrestrial)	Current: Voles/Burrowing Animals Ecological (Terrestrial)	Current: Child/Adult Recreationist	Current: Child/Adult Trespasser/Visitor	Future: Adult Construction Worker	Future: Child/Adult Resident
Buildings 101 and 102-Radio/Radar	Release/Spill/Leak	Soil, Surface	Biotic Uptake	Plant Tissue	Ingestion	---	●	●	●	●	---	---
			Overland Flow	Surface Water	Ingestion	---	---	---	---	---	---	---
					Dermal	---	---	---	---	---	---	---
			Overland Flow	Sediment	Ingestion	---	---	---	---	---	---	---
					Dermal	---	---	---	---	---	---	---
			Wind Erosion	Air (Particulates)	Inhalation	---	---	---	---	---	● [a]	---
			Deposition	Soil, Surface	Ingestion	---	---	●	---	---	---	---
					Dermal	---	---	● [b]	● [b]	● [b]	● [c]	---
					Inhalation	---	---	● [d]	---	---	● [d]	---

Symbols		
●	=	Complete Pathway
○	=	Complete Pathway Uncertain
---	=	Incomplete Pathway

Notes
a - There is a potential for exposure of future site workers to air particulates during development of the area.
b - The current dermal pathway is considered potentially complete for trespassers/visitors/recreationists and terrestrial receptors. This pathway would be removed during future development of the area.
c - There is a potential for dermal exposure of future site workers during development of the area.
d - The current inhalation pathway scenario is considered to be potentially complete for burrowing animals and for future site workers. This pathway would be removed during future development of the area.

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