ATTACHMENT A

Phase II ESA Report: Anderson & Middleton and Aberdeen Log Yard Properties

Phase II Environmental Site Assessment

Anderson & Middleton Property
Aberdeen Log Yard Property

Prepared for

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Acronyms and Abbreviations

A&M	Anderson & Middleton
ALY	Aberdeen Log Yard
ASTM	American Society for Testing and Materials
bgs	below ground surface
CUL	cleanup level
Ecology	Washington State Department of Ecology
EDR	Environmental Data Resources, Inc.
ESA	Environmental Site Assessment
IDD #1	Industrial Development District parcel #1
µg/L	microgram per liter
mg/kg	milligram per kilogram
mg/L	milligrams per liter
µm	micrometer
MTCA	Model Toxics Control Act
NWTPH-Dx	Northwest total petroleum hydrocarbon – diesel extended range
NWTPH-G	Northwest total petroleum hydrocarbon – gasoline range
PAH	polyaromatic hydrocarbons
PCB	polychlorinated biphenyl
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
REC	recognized environmental condition
SAP	Sampling and Analysis Plan
SIM	select ion monitoring
SVOC	semivolatile organic compound
SWQC	surface water quality criteria
TDS	total dissolved solids
TEF	toxicity equivalent factor
TEQ	toxicity equivalent
TOC	total organic carbon

TPH	total petroleum hydrocarbon
TPH-Dx	total petroleum hydrocarbon-diesel range
TPH-Gx	total petroleum hydrocarbon-gasoline range
TSS	total suspended solids
USCS	Unified Soil Classification System
USGS	United States Geological Survey
VOC	volatile organic compound
WAC	*Washington Administrative Code*
WSDOT	Washington Department of Transportation

1.0 Introduction

1.1 Purpose and Organization

On behalf of Washington State Department of Transportation (WSDOT), CH2M HILL has prepared this *Phase II Environmental Site Assessment Report* (Phase II ESA Report) for the Anderson & Middleton (A&M) Property located at 815 8th Street in Hoquiam, Washington, and the Aberdeen Log Yard (ALY) Property located at 400 East Terminal Way in Aberdeen, Washington. This Phase II ESA has been conducted in support of the alternative site selection for the SR 520 Pontoon Construction project. The objective of the Phase II ESA is to evaluate the potential for environmental contamination in the subsurface soil and groundwater from historical activities at the sites. A secondary objective is to assess the potential dewatering issues that might be encountered as a result of discharge of dewatering water into a surface water body. The general site vicinity map is presented as Figure 1-1.

The remainder of Section 1.0 provides a site description, project background, and a summary of the areas evaluated in this Phase II ESA. The field investigation and analytical methods are described in Section 2.0, and analytical results are presented in Section 3.0. Section 4.0 contains discussion and conclusions and Section 5.0 presents recommendations**.** References cited in this report are listed in full in Section 6.0, and figures and tables referenced in the text are presented at the end of the main text.

Appendixes to this report include the Sampling and Analysis Plan (SAP), complete analytical laboratory reports, and quality assurance/quality control (QA/QC) results (Appendixes A – C, respectively).

1.2 Site Description and Background

This section provides a general description of the site and vicinity, an overview of adjacent properties, and historical activities at the sites

1.2.1 Anderson & Middleton Property

The A&M Property, currently owned by the Anderson Middleton Company, consists of approximately 105 acres located on the north shore of Grays Harbor in Hoquiam, Washington. The site occupies the parcel east of 6th Street, south of railroad tracks, west of 10th Street, and north of Grays Harbor. The only building on the property is an office building located on the northern edge of the property adjacent to 8th Street. The property contains an asphalt pad near the center portion of the site, and the remaining area is unpaved. Currently, the site is unused, vacant land, which may occasionally be used to store or sort logs (WSDOT, 2006).

The site is located in an industrial area that has historically supported the lumber industry. A sawmill, originally owned by the Grays Harbor Lumber Company, was located on the

property. The sawmill was active from the early 1900s through approximately the 1960s. The sawmill and related structures were demolished in between 1957 and 1973.

1.2.2 Aberdeen Log Yard Property

The ALY Property, currently owned and operated by the Weyerhaeuser Company (Weyerhaeuser), consists of one parcel approximately 44 acres located in an industrial area on the north shore of the Chehalis River in Aberdeen, Washington. The property occupies the parcel east of East Terminal Road, south of the Northern Pacific Railroad, north of the Chehalis River, and west of the City of Aberdeen's Wastewater Treatment Plant located on State Street. The only building on the property is a small storage shed. The property contains asphalt-paved road providing access from East Terminal Road in the west and State Street in the north. The property is currently used for log bucking and log storage. All utilities on the site were shut off prior to 1993 (CH2M HILL, 2008).

Past uses of the ALY Property include lumber and saw mill companies (Hart-Wood Lumber Company and Western Lumber Company, early to mid-1900s, and Boise Cascade Corporation). Weyerhaeuser has owned the property since 1985 when it was purchased from Boise Cascade. Most of the saw mill and related structures were demolished in the late 1980s and early 1990s.

1.3 Previous Evaluations

This section provides an overview of previous evaluations completed at the site. No previous sampling of the soil or groundwater at either site is known.

1.3.1 Anderson & Middleton Property

A Modified Phase I ESA report was completed by WSDOT Environmental Services Office in September 2006 for the A&M Property. This report includes the following: an environmental database search using an Environmental Data Resources, Inc. (EDR) report, Washington State Department of Ecology (Ecology) records review, interview with the Hoquiam Fire Department, review of historical aerial photos, review of historical U.S. Geological Survey (USGS) maps, and review of Sanborn Fire Insurance maps, and review of site photos taken from adjacent properties. This Phase I ESA is modified because an owner interview and a site reconnaissance were not conducted as required in a standard Phase I ESA.

The Modified Phase I ESA for the A&M Property found the following potential recognized environmental conditions (RECs):

- Potential presence of dioxins in subsurface soils and sediments from historical lumber mill smokestack emissions
- Potential metals and pentachlorophenol used for wood preservation
- Potential methane gas produced as a byproduct from subsurface decaying wood waste
- Potential metals, polychlorinated biphenyls (PCBs) and polyaromatic hydrocarbons (PAHs) from use, maintenance, and repair of machinery

- Potential petroleum from storage tanks, equipment and vehicle fueling, and heating operations

1.3.2 Aberdeen Log Yard Property

A Draft Hazardous Material Alternative Site Screening Technical Memorandum was completed by CH2M HILL in October 2008 for the ALY Property. The purpose of this report was to evaluate the environmental conditions at the property and included the following scope: regulatory database search using an EDR report, Ecology records review, a review of historical USGS maps, site reconnaissance and an interview with the present owner, operator, or occupant. This report found the following potential RECs at the ALY Property:

- Potential dioxins in the soil due to historical saw mill operations
- Potential chlorophenols, PAHs, and metals from the presence of wood treatment chemicals
- Potential petroleum hydrocarbons, metals, chlorinated compounds, and PAHs from past industrial uses
- Potential offsite migration of contaminant(s) from adjacent properties
- Potential wood debris in nearshore sediments

2.0 Field Investigation

This section describes the Phase II ESA field activities that were conducted at the two subject properties.

Soil and groundwater samples were collected at A&M and ALY Properties in December 2008. Additional groundwater sampling was conducted on January 22, 2009 and is discussed in Section 2.2.3 below. The activities and analyses were conducted according to the procedures outlined in *Phase II Environmental Site Assessment Sampling and Analysis Plan* SAP (CH2M HILL, 2008), except as noted.

The sampling locations at each parcel are shown in Figures 2-1 and 2-2. Sample numbers, sample media, soil depths, and parameters analyzed from the December 2008 sampling event are presented in Tables 2-1 and 2-2 for the A&M Property and the ALY Property, respectively. Table 2-3 presents similar information for the January 2009 sampling event.

Washington State One-Call representatives marked all public utilities in areas of proposed boring locations prior to conducting intrusive subsurface sampling. A private utility locator surveyed the area around each of the proposed subsurface sampling locations to locate existing private utilities on December 11, 2008. Sample locations were adjusted accordingly.

The following subsections describe soil and groundwater sampling at the A&M and ALY Properties.

2.1 Soil Sampling

Soil samples were obtained from soil cores, collected at 4-foot intervals, in an acetate liner using direct-push sampling methods and direct-push drilling provided by Cascade Drilling of Woodinville, Washington. Soil encountered during drilling was classified according to the Unified Soil Classification System (USCS; American Society for Testing and Materials [ASTM] D 2488). The soil in the shallow subsurface (8 to 12 feet below ground surface [bgs]) for both the A&M and ALY sites consisted of silty-sand and sandy-silt (USCS classification SM) with varying amounts of gravel and wood debris. This shallow layer is identified as fill material that varies in thickness from 10 to 15 feet at the A&M site and from 3 to 12 feet or more at the ALY site (Landau, 2009). The fill layer overlies Soil Unit 1, a silt layer. At the A&M site, Soil Unit 1 overlies Soil Units 2A (sandy silt) and 2B (silty sand). At the ALY, site Soil Unit 1 overlies Soil Unit 2C (silt).

Soils were visually inspected for signs of contamination as well as field-screened for volatile organic compounds (VOCs) and total petroleum hydrocarbons (TPH) using a photoionization detector. For diesel range-TPH (TPH-Dx), metals, PCBs, PAHs, and dioxin analyses, soil samples were collected using a stainless steel spoon. For VOCs and gasoline range-TPH (TPH-Gx), the soil samples were collected directly from the acetate liner using a plunger to minimize volatilization. Where multiple sample containers had to be filled, sample containers for volatile analysis were filled first. The remaining soil was then homogenized by mixing gently in a stainless steel bowl prior to filling the other sample

containers. Samples were collected from the near surface (0 to 3 feet bgs) and just above the groundwater table (3 to 11 feet bgs).

After the soil sample collection was complete and groundwater samples were collected (see Section 2.3, Groundwater Sampling), the boreholes were abandoned by backfilling with bentonite chips in accordance with state requirements (*Washington Administrative Code* [WAC] 173-160). The surface was repaired with soil or a fresh asphalt patch to match the surrounding surface.

2.1.1 Anderson & Middleton Property

A total of 24 soil samples were collected from 12 soil borings at the A&M Property. Figure 2-1 shows these sampling locations. The samples were analyzed for Northwest total petroleum hydrocarbons-gasoline range (NWTPH-Gx); NWTPH-Dx (-Diesel range extended); VOCs; PAHs; metals; PCBs (shallow soil samples); and dioxins and furans (selected shallow soil samples) as summarized in Table 2-1. Matrix spike/matrix spike duplicate (MS/MSD) samples were collected from the upper sampling interval at boring AM-SB-9 (1 to 3 feet bgs) and analyzed for NWTPH-Gx; NWTPH-Dx; VOCs; PAHs; metals; and PCBs. There were not any deviations from the SAP.

2.1.2 Aberdeen Log Yard Property

A total of 24 soil samples were collected from 12 soil borings at the ALY Property. Figure 2-2 shows these sampling locations. The samples were analyzed for NWTPH-Gx; NWTPH-Dx; VOCs; metals; PCBs (shallow soil samples); and dioxins and furans (selected shallow soil samples) as summarized in Table 2-2. MS/MSD samples were collected from the lower sampling interval at boring ALY-SB-7 (10 to 11 feet bgs) and analyzed for NWTPH-Gx; VOCs; PAHs; NWTPH-Dx; and metals. There were no deviations from the SAP.

2.2 Groundwater Sampling

Groundwater sampling events were conducted in December 2008 and again in January 2009. These sampling events are described below.

2.2.1 December 2008 Groundwater Sampling

Eleven groundwater samples were collected from the borings at the locations shown in Figures 2-1 to 2-2. Samples were collected from the boreholes using a direct push drill rig with 2-inch inside diameter rods.

Temporary wells were installed by a licensed driller and consisted of Schedule 40, flush-threaded 0.75-inch-diameter polyvinyl chloride (PVC) casing. The wells were screened with 5 feet of 0.01-inch-slot PVC well screen. Each temporary well was developed by purging with a low-flow peristaltic pump, with subsequent purging and sample collection as described below.

Groundwater samples were collected from the 11 borings using a peristaltic pump and disposable polyethylene tubing. If the well went dry during purging, a groundwater sample was collected upon sufficient recovery. During purging, and prior to sample collection, water quality parameters were measured (that is, temperature, conductivity, dissolved

oxygen, pH, and turbidity) and recorded in the field log book. All purge water was collected in labeled 55-gallon drums for later offsite disposal.

All groundwater samples were collected directly from the pump discharge tubing. The samples were analyzed for NWTPH-Gx; NWTPH-Dx; VOCs; metals; and PAHs (selected boring locations). Significant particulate matter in the groundwater was observed after the temporary wells had been purged at some of the sampling locations.

2.2.1.1 Anderson & Middleton Property

In December 2008, six groundwater samples were collected from soil borings at the A&M Property. Groundwater samples were collected from AM-SB-1, AM-SB-5, AM-SB-6, AM-SB-9, AM-SB-11, and AM-SB-12 as shown in Figure 2-1. The groundwater sample ID, location, and analyses are summarized in Table 2-2.

There were no deviations from the SAP.

2.2.1.2 Aberdeen Log Yard Property

In December 2008, five groundwater samples were collected from soil borings at the A&M Property. Groundwater samples were collected from ALY-SB-2, ALY-SB-3, ALY-SB-7, ALY-SB-11, and ALY-SB-12 as shown in Figure 2-2. The groundwater sample ID, location, and analyses are summarized in Table 2-3.

Deviations from the SAP include the following:

- A field duplicate was scheduled for boring ALY-SB-12, but was not collected
- Groundwater was not sampled at boring ALY-SB-1
- Only soil samples were collected at boring ALY-SB-1

These deviations to the SAP were due to adverse weather conditions (that is, poor road conditions leading to a late start time, sub-freezing temperatures, and snow). As a result, sampling could not be completed and the driller was not available the following day to complete the sampling.

2.2.3 January 2009 Groundwater Sampling

Additional groundwater samples were collected from the A&M Property, ALY Property and Industrial Development District parcel #1 (IDD #1) on January 22, 2009. A total of six groundwater samples and two field duplicate samples were submitted to the laboratory for analysis.

The additional samples were collected from existing monitoring wells and piezometers to confirm the December 2008 analytical results for metals in groundwater and to obtain geochemical parameters for potential dewatering system design and treatment. These groundwater samples were submitted to the laboratory for analysis of total and dissolved metals, hexavalent chromium, total organic carbon (TOC), total dissolved solids (TDS), and total suspended solids (TSS). Dissolved metal samples were filtered in the field using a 0.45-micrometer (µm) filter.

2.3 Analytical Methods

Soil and groundwater samples were delivered under chain of custody procedures to the Bothell, Washington, laboratory of TestAmerica.

The analytical methods used for analysis of the soil and groundwater samples included the following:

- Diesel- and oil-range TPHs using the NWTPH-Dx Method
- Gasoline-range TPHs using the NWTPH-Gx Method
- VOCs using EPA Method 8260B
- PAHs using EPA Method 8270 and select ion monitoring (SIM) where appropriate
- Metals (total and dissolved) using EPA Method 6010/6020/7000
- PCBs using EPA Method 8082 (shallow soils only)
- Dioxins and furans using EPA Method 1613B (selected shallow soils only)
- Hexavalent Chromium using EPA Method 7196 (January 2009 groundwater samples only)
- TOC using EPA Method 415.2 (January 2009 groundwater samples only)
- TDS using EPA Method 160.1 (January 2009 groundwater samples only)
- TSS using EPA Method 160.2 (January 2009 groundwater samples only)

3.0 Investigation Results

This section presents the results of the Phase II ESA sampling of soil and groundwater. Results of a QA/QC review are presented first, followed by a description of the evaluation criteria that were used in the analysis. The results are then presented for all compounds detected in soil and groundwater for each of the three properties investigated.

Tables 3-1 through 3-7 present analytical results for soil and groundwater. Complete laboratory reports, including detection limits for constituents that were not detected, are provided in Appendix B.

3.1 Quality Assurance/Quality Control Review

A QA/QC review of the field and laboratory data procedures was conducted. The results of the QA/QC review are summarized below, and a full discussion of the review of the laboratory data is presented in Appendix C.

3.1.1 Field Procedures

The field sample handling, preservation, storage, and custody were performed according to the procedures specified in the SAP, based on a review of the field logs, chain of custody forms, and laboratory cooler receipt forms.

3.1.2 Laboratory Data

All samples were analyzed by TestAmerica laboratory, located in Bothell, Washington. Laboratory deliverables included chain of custody forms, case narrative, measurement criteria or QA/QC summaries, and sample data. This information is included in Appendix B.

All samples were analyzed within the holding time limits and in accordance with the analytical methods and procedures specified in the SAP. The data quality measurement criteria (that is, accuracy, precision, and completeness) reported by the analytical laboratory indicate that the sample results for all analyses should be considered appropriate for quantitative usage except for those sample results qualified as estimated. Data qualifiers assigned as a result of the QA/QC review were incorporated into this Phase II ESA and the project database.

3.2 Evaluation Criteria

Evaluation criteria were used in this investigation for comparison purposes only. The detected soil and groundwater constituents were compared to corresponding cleanup levels (CULs) established under the Model Toxics Control Act (MTCA) (WAC 173-340), Washington State's cleanup regulation.

As a general rule, MTCA provides the following three basic methods for establishing chemical-specific CULs:

- **Method A:** This method applies to simple sites undergoing routine cleanup, or sites with relatively few hazardous substances.
- **Method B: Universal Method.** This method is applicable to all sites (WAC 173-340-705(1)) unless one or more of the conditions for using Method A or Method C (see below) are demonstrated to exist and the person conducting the cleanup action elects to use that method.
- **Method C: Conditional Method.** This method is applicable to sites where application of Method A or B may be impossible to achieve or may cause greater environmental harm. Method C industrial soil cleanup levels may also be established at industrial properties that meet the criteria in WAC 173-340-745.

For this Phase II ESA, the soil analytical data were compared to MTCA Method B CULs for soil. If no MTCA Method B CUL exists, then the MTCA Method A CUL was used (for example, petroleum hydrocarbons).

The groundwater samples, which include samples collected using screened PVC installed temporarily in the borehole, were also compared to MTCA Method B CULs. Where a MTCA Method B CUL was not available, the Method A groundwater CUL was used.

In addition to MTCA cleanup levels, the groundwater data collected in January 2009 was also compared to marine chronic surface water quality criteria (SWQC) in WAC 173-201A because the groundwater from these deeper levels is more representative of the water that may potentially be discharged to Grays Harbor as part of the construction dewatering operation.

3.3 Anderson & Middleton Property

The December 2008 soil and groundwater results for the A&M Property are presented below.

3.3.1 Soil Analytical Results

The soil samples collected at the A&M Property were analyzed for VOCs, PAHs, PCBs (shallow soil samples), TPH (gasoline-, diesel-, and oil-range), metals, and dioxins/furans (selected shallow soil samples). Table 3-1 presents the soil analytical results for the Anderson Middleton Property.

VOCs, PAHs, and PCBs were either not detected or detected below MTCA CULs.

Total Petroleum Hydrocarbons

Gasoline-range TPH was not detected in any samples. Diesel-range TPH was detected in 13 of the 24 samples submitted for analysis. The detected concentrations ranged from 23.3 to 183 milligrams per kilogram (mg/kg). All detected concentrations of diesel-range TPHs were below the MTCA Method A CUL of 2,000 mg/kg. Oil-range TPHs were detected in 12

of the 24 samples at concentrations ranging from 42.3 to 1,580 mg/kg. These detected concentrations of oil-range TPH were all below the MTCA Method A CUL of 2,000 mg/kg.

Metals

Arsenic was detected in 20 of the 24 soil samples collected at the A&M Property. Detected concentrations of arsenic ranged from 0.599 to 8.53 mg/kg, and 14 of the 20 detected concentrations exceeded the MTCA Method B CUL of 0.67 mg/kg for arsenic. The background concentration for arsenic in soil is 8.47 mg/kg in the southwest region of Washington State (Ecology, 1994). Arsenic concentrations were below the MTCA Method A CUL of 20 mg/kg.4

Dioxins and Furans

Three shallow soil samples were analyzed for dioxins and furans at the A&M Property. Table 3-6 presents the laboratory analytical results. Toxicity equivalent (TEQ) values were calculated using toxicity equivalent factors (TEFs) for each dioxin/furan compound (Van den Berg et al., 2006). The sample at AM-SB-11-1.0-2.0 had a detected concentration of 6.5 picograms per gram (pg/g) for 2,3,7,8-TCDD, which is below the MTCA Method B CUL of 11 pg/g for 2,3,7,8-TCDD. There are no additional MTCA CULs for other dioxins/furans.

3.3.2 December 2008 Groundwater Analytical Results

Six groundwater samples were collected at the A&M Property and were analyzed for VOCs, TPH (gasoline-, diesel-, and oil-range), PAHs (selected samples), and total metals. Table 3-3 presents the groundwater analytical results.

VOCs, TPH (gasoline-, diesel-, and oil-range), and PAHs were either not detected or detected below MTCA CULs.

Metals

The concentrations of the following metals were either not detected or detected below MTCA CULs: antimony, barium, beryllium, cadmium, cobalt, copper, mercury, molybdenum, nickel, selenium, silver, thallium, titanium, and zinc.

Arsenic was detected in all groundwater samples exceeding the MTCA Method B CUL of 0.058 micrograms per liter (µg/L). Concentrations of arsenic in groundwater ranged from 3.67 to 49.3 µg/L.

Chromium was detected in all of the groundwater samples ranging from 5.68 to 205 µg/L. The concentration of one sample, AM-W-11 (205 µg/L), exceeded the MTCA Method A CUL of 50 µg/L.

Lead was detected at concentrations ranging from 1.13 to 56.1 µg/L. One groundwater sample, AM-W-11 (56.1 mg/L), exceeded the MTCA Method A CUL for lead in groundwater of 15 µg/L.

Manganese was detected at concentrations ranging from 684 to 7,660 µg/L. Three groundwater sample locations (AM-W-6, AM-W-11, and AM-W-12) exceeded the MTCA Method B CUL for manganese of 2,200 µg/L.

Detected concentrations of vanadium in groundwater ranged from 12.9 to 261 µg/L with one groundwater sample, AM-W-11 (261 milligrams per liter [mg/L]), exceeding the MTCA Method B CUL of 110 µg/L.

The December 2008 groundwater data were not compared to surface water quality standards because these samples were unfiltered from temporary well points that were minimally developed and were somewhat turbid. As a result, the metals concentrations are probably not representative of what would be discharge to surface water from appropriately constructed dewatering wells.

It is believed that the additional groundwater samples taken in January 2009 are more representative of what might be discharged during dewatering (see Section 3.5).

3.4 Aberdeen Log Yard Property

The December 2008 soil and groundwater results for the Aberdeen Log Yard property are presented below.

3.4.1 Soil Analytical Results

The soil samples collected at the ALY Property were analyzed for VOCs, PCBs (shallow soil samples), PAHs, TPHs (gasoline-, diesel-, and oil-range), metals, and dioxins/furans (selected shallow soil samples).

VOCs and PCBs were either not detected or detected below MTCA CULs. Table 3-2 presents the soil analytical results.

Polyaromatic Hydrocarbons

Benzo(a)pyrene (PAH compound) was detected in 5 of the 24 soil samples. The concentration of benzo(a)pyrene exceeded the MTCA Method B CUL of 0.14 mg/kg at soil boring ALY-SB-7 (10 to 11 feet bgs). Other PAH compounds were either not detected or detected below MTCA CULs in the remaining samples.

Total Petroleum Hydrocarbons

Gasoline-range TPHs were detected in 3 of the 24 soil samples. Detected concentrations of gasoline-range TPHs were below MTCA Method A CULs. Diesel-range TPHs were detected in 18 of the 24 samples submitted for analysis. The detected concentrations ranged from 12 to 454 mg/kg. All detected concentrations of diesel-range TPHs were below the MTCA Method A CUL of 2,000 mg/kg. Oil-range TPHs were detected in 15 of the 24 samples at concentrations that range from 27.8 to 1,310 mg/kg. The detected concentrations of oil-range TPHs were below the MTCA Method A CUL of 2,000 mg/kg.

Metals

Arsenic was detected in 23 of the 24 samples collected at the ALY Property. Detected concentrations of arsenic ranged from 0.51 to 6.59 mg/kg, and 16 of the 23 detected concentrations exceeded the MTCA Method B CUL of 0.67 mg/kg for arsenic. The background concentration for arsenic in soil is 8.47 mg/kg in the southwest region of

Washington State (Ecology, 1994). Arsenic concentrations were below the MTCA Method A CUL of 20 mg/kg.

Dioxins and Furans

Three shallow soil samples were analyzed for dioxins and furans at the ALY Property. Table 3-7 presents the laboratory analytical results. TEQ values were calculated using TEFs for each compound (Van den Berg et al., 2006). No samples results detected concentrations of 2,3,7,8-TCDD. There are no additional MTCA CULs for other dioxin/furans. Two samples had detected TEQ values of 0.043 and 0.8 pg/g.

3.4.2 December 2008 Groundwater Analytical Results

Five groundwater samples were collected in December 2008 at the A&M Property and were analyzed for VOCs, PAHs (selected samples), TPH (gasoline-, diesel-, and oil-range), and total metals. VOCs, PAHs, and TPH (gasoline-, diesel-, and oil-range) were either not detected or detected below MTCA CULs. Table 3-4 presents the groundwater analytical results.

The concentrations of the following metals were either not detected or detected below MTCA CULs: antimony, barium, beryllium, cadmium, cobalt, copper, mercury, molybdenum, nickel, selenium, silver, thallium, titanium, and zinc.

Arsenic was detected in all groundwater samples exceeding the MTCA Method B CUL of 0.058 µg/L. Concentrations of arsenic in groundwater ranged from 3.58 to 29.7 µg/L.

Chromium was detected in all of the groundwater samples ranging from 7.43 to 144 µg/L. The concentration of two groundwater samples exceeded the MTCA Method A CUL of 50 µg/L.

Lead was detected at concentrations ranging from 1.47 to 72.3 µg/L. Three groundwater samples exceeded the MTCA Method A CUL for lead in groundwater of 15 µg/L. Manganese was detected at concentrations ranging from 1,210 to 5,130 µg/L. Three groundwater sample locations exceeded the MTCA Method B CUL for manganese of 2,200 µg/L. Detected concentrations of vanadium in groundwater ranged from 17.5 to 399 µg/L with two groundwater samples exceeding the MTCA Method B CUL of 110 µg/L.

3.5 January 2009 Groundwater Sampling

Six groundwater samples were collected in January 2009. Two samples each were collected at the A&M Property, ALY Property, and IDD #1. The A&M piezometers sampled are both screened from 30 to 40 feet bgs. The ALY piezometers sampled are screened from about 23 to 33 feet and from 30 to 40 feet bgs. Based on geologic cross-sections created for all three sites by Landau (2009), the piezometer screening interval at the ALY site is located within a silt layer (Soil Unit 2C). At the A&M site, the screened interval is located within a silty-sand/sandy-silt layer (Soil Unit 2A/2B). A low permeable layer is not observed between the upper fill/silt layer (Soil Unit 1) and the underlying soil of unit 2; therefore, the groundwater sampled from the shallower depths may be hydrologically similar to the samples collected at the deeper depths but further investigation is needed.

The groundwater samples were analyzed for total and dissolved metals, hexavalent chromium, and general chemistry parameters including TOC, TSS, and TDS. Table 3-5 presents the groundwater analytical results for the additional groundwater sampling.

Concentrations of total metals were either not detected or detected below MTCA CULs except for total arsenic.

Detected concentrations of arsenic ranged from 1.78 to 3.02 µg/L, all samples exceeded the MTCA Method B CUL for arsenic in groundwater of 0.058 µg/L.

Hexavalent chromium was detected in four of the six groundwater samples at concentrations ranging from 5 to 22 µg/L; all detections were below MTCA Method B CUL of 50 µg/L.

All metals were below marine chronic SWQC, except for copper, which exceeded marine chronic SWQC in one groundwater sample from the A&M Property and one groundwater sample from the IDD #1 Property. The dissolved copper exceedances were 3.7 µg/L from H-8P-08 at A&M and 3.3 µg/L from MW-1 at IDD #1. Both results are slightly above the marine chronic SWQC of 3.1 µg/L.

In selected samples, the dissolved metals concentrations for chromium, selenium, and vanadium are higher than the total metals concentrations. This discrepancy in total and dissolved concentrations is attributed to matrix interference in the dissolved samples. The dissolved samples were not acid digested as the total samples were. The acid digestion step helps to eliminate matrix interference. Chromium, selenium, and vanadium are analytes that can be susceptible to matrix interference (see Appendix C). These results have been qualified as estimated. Since none of these metals exceed MTCA Method B or surface water quality standards, no additional corrective actions are taken.

The general chemistry parameters are not discussed in this report, but may be used for future dewatering treatment and design, if needed.

4.0 Discussion

This section presents CH2M HILL's professional judgment regarding the field and analytical results presented in Section 3.0. The subsections below present this evaluation for each of the three areas that were evaluated.

4.1 Anderson & Middleton Property

Soil samples from the A&M Property did not contain levels of TPH, VOCs, PAHs, PCBs, dioxins/furans, and metals above MTCA CULs or regional background concentrations. Based on these results and the findings of the modified Phase I ESA (WSDOT, 2006), there is no evidence to indicate soils within the property have been adversely impacted.

Groundwater samples taken in December 2008 did not contain levels of TPH, VOCs, or PAHs above MTCA CULs. Detected concentrations of arsenic, chromium, lead, manganese, and vanadium exceeded MTCA CULs for groundwater. Arsenic exceeded MTCA method B CULs in all samples. Concentrations of chromium, lead, and vanadium exceeded MTCA CULs in groundwater at boring AM-SB-11. Detected concentrations of manganese exceeded MTCA Method B CULs at borings AM-SB-6, AM-SB-11, and AM-SB-12.

Dissolved metal samples were not taken during the December 2008 sampling event. The December 2008 groundwater samples were collected from temporary wells leading to more suspended solids in the samples. It is likely that the relatively high metal concentrations are due to elevated turbidity and suspended solids in the groundwater samples.

Additional groundwater sampling, completed in January 2009 and discussed in Section 4.3, show that lower turbidity samples also had reduced metal concentrations. Copper was the only metal detected in groundwater during this sampling event that exceeded the SWMC. Arsenic was detected in all groundwater samples above MTCA CULs but below the SWMC. The arsenic detections are most likely representative of background conditions for the region. The potential exists for metals contamination in groundwater above the SWMC as a result of dewatering activities. Therefore, treatment may be required before groundwater discharge to Grays Harbor.

4.2 Aberdeen Log Yard Property

Soil samples from the ALY Property did not contain levels of TPH, VOCs, PCBs, dioxins/furans, or metals above MTCA CULs or regional background concentrations. Of the 24 soil samples analyzed, only one soil sample AM-SB-7 (10 to 11 feet bgs), detected at 0.38 mg/kg, exceeded the MTCA B CUL concentration for benzo(a)pyrene of 0.14 mg/kg. Other PAH compounds were also detected in this sample but did not exceed MTCA Method B CULs. Potential sources of PAHs in the environment include wood treatment chemicals, diesel exhaust, coal tar, burnt wood, and asphalt production. At the ALY, possible sources of PAHs include historic activities such as wood treatment and burning hog fuel as well as

current activity such as heavy diesel truck traffic. However, there is no evidence to indicate that there is widespread PAH contamination of soils within the property.

Groundwater samples taken in December 2008 did not contain levels of TPH, VOCs, or PAHs above MTCA CULs. Detected concentrations of arsenic, chromium, lead, manganese, and vanadium exceeded MTCA CULs for groundwater. Arsenic exceeded MTCA Method B CULs in all samples. Concentrations of chromium and vanadium exceeded MTCA CULs in groundwater at borings ALY-SB-3 and ALY-SB-7. Detected concentrations of manganese and lead exceeded MTCA CULs at borings ALY-SB-3, ALY-SB-7, and ALY-SB-12.

Dissolved metal samples were not taken during the December 2008 sampling event. The December 2008 groundwater samples were collected from temporary wells leading to more suspended solids in the samples. It is likely that the relatively high metal concentrations are due to elevated turbidity and suspended solids in the groundwater samples.

Additional groundwater sampling, completed in January 2009 and discussed in Section 4.3, show that lower turbidity samples also had reduced metal concentrations. Based on these results and no indication of metal contamination in soil samples, there is no evidence to indicate groundwater within the property has been adversely impacted.

4.3 Additional Groundwater Sampling

Additional groundwater samples taken from the A&M Property, ALY Property and IDD #1 did not contain levels of total or dissolved metals above MTCA CULs except for arsenic. Total arsenic was detected at concentrations above the MTCA B CUL for groundwater in all samples. Detected concentrations of arsenic were all below the MTCA Method A CUL of 5 µg/L.

It is likely that the relatively lower concentrations of metals in the groundwater samples collected in January 2009 was due to lower amounts of turbidity in the samples. The additional samples were collected from existing piezometers and monitoring wells that have been developed, and samples were collected using low-flow sampling techniques to reduce the suspended solids in the samples. These results further confirm that there is no evidence of contaminated groundwater at the A&M Property, ALY Property or IDD# 1.

4.4 Study Limitations

This investigation was conducted to evaluate the potential presence of hazardous materials or petroleum at the site. The conclusions contained in this document are based on review of available documents and on the analytical results from a limited sampling program. Any field investigation is necessarily limited in scope. Sampling was designed to look only at those locations deemed most likely to be impacted by a release, if one were to occur. Analytical results were compared to available MTCA CULs s described above, and a full-scale risk assessment was not conducted for the site.

The following topics were not addressed in this Phase II ESA:

- The presence of lead-based paint
- Issues pertaining to compliance with environmental regulations
- Identification or delineation of jurisdictional wetlands
- Identification of threatened or endangered species
- Identification of liabilities associated with offsite management of solid or hazardous substances or waste
- Identification of cultural or historical resources
- Identification of ecological resources

5.0 Conclusions and Recommendations

This Phase II ESA has been conducted to evaluate the shallow soil and groundwater conditions at the A&M and ALY Properties. Results of soil and groundwater samples indicate that there is not widespread soil and groundwater contamination on the upland portions of the properties. This report did not investigate sediments associated with either of these properties.

This investigation identified isolated locations with analyte concentrations above applicable MTCA CULs. The data does not show widespread soil or groundwater contamination at either the A&M Property or ALY Property. Arsenic concentrations do exceed MTCA Method B cleanup levels in groundwater; however, this may reflect a region wide problem rather than from any onsite sources.

The available data does not indicate limitations on disposal of groundwater pumped from the ALY, based on laboratory analysis of samples collected in January 2009. However, prior to disposal (or discharge) of any water, the specific requirements of the receiving entity should be reviewed and additional data collected (such as sample collection and analysis from a test dewatering well), as appropriate.

The available data does indicate potential limitations on disposal of groundwater pumped from the A&M Property, based on laboratory analysis of groundwater samples collected in January 2009. Dissolved cooper concentration in one of the two samples (6.84 µg/L) exceeded surface water quality marine chronic standard of 3.1 µg/L. It is recommended that additional evaluation be conducted to evaluate the need and the type of water treatment that may be needed in order to discharge to surface water. The specific requirements of the receiving entity should be reviewed and additional data collected (such as sample collection and analysis from a test dewatering well), as appropriate.

The available data do not indicate reuse or disposal limitations on soil excavated from the property, based on the Phase II ESA analytical results and applicable MTCA CULs and regional background concentrations (including the MTCA Methods A and B, soil cleanup levels for unrestricted land uses). However, the industrial history of the properties and potential liability associated with the receiving entity should be considered prior to disposal of any soil from the properties. It is recommended that any soil excavated for offsite disposal or reuse should be visually screened for potential contamination. If appropriate, based on observations during excavation screening, soil should be sampled and analyzed to meet the requirements of the receiving facility.

As discussed above there is potential for localized areas of soil contamination in areas of either property. If localized soil contamination is encountered during any additional investigations or excavation activities at the properties, special worker protection would be required. It is recommended that WSDOT consider the potential presence of localized contamination and any potential associated costs and/or schedule delays. This includes the notification in contract documents with accompanying specifications for materials handling and worker health and safety.

6.0 References

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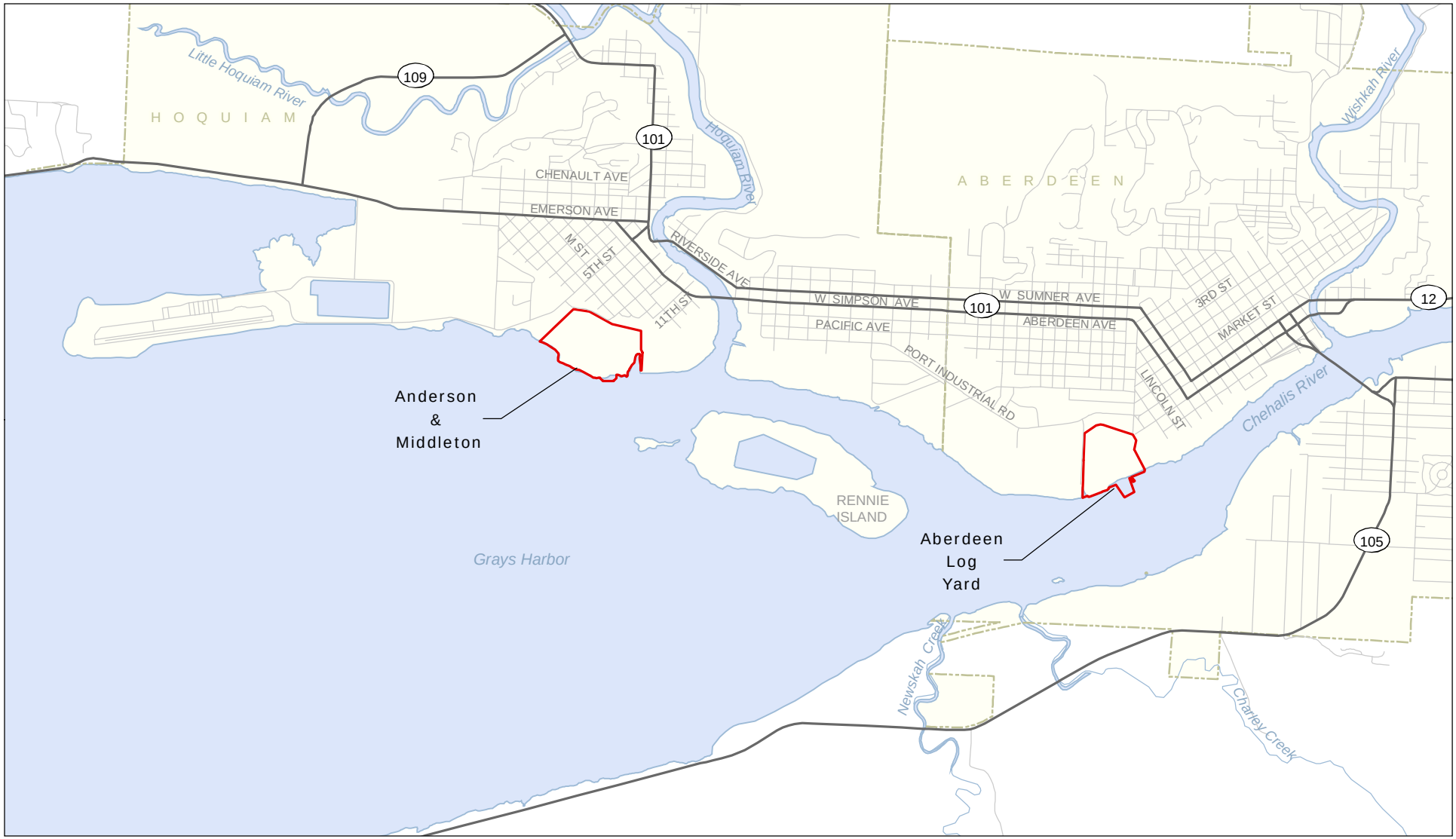
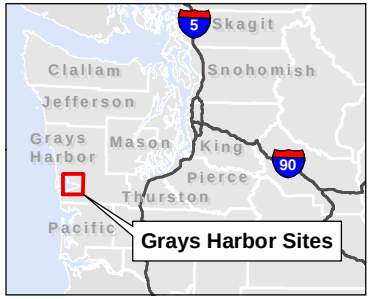
Figures





Project Alternative Site

City Limits

N

0 2,000 4,000 Feet

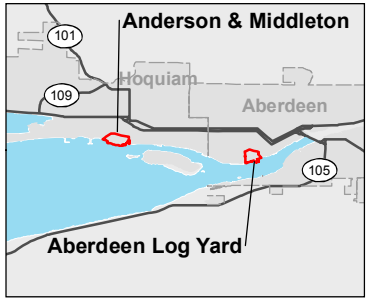
Source: Grays Harbor County (2007) GIS Data (Water Bodies and Streets). Horizontal datum for all layers is State Plane Washington South NAD 83, vertical datum for layers is NAVD88.

INTERNAL USE ONLY-DRAFT

Figure 1-1. **Site Vicinity Map**

SR 520 Pontoon Construction Project

Washington State Department of Transportation



INTERNAL USE ONLY-DRAFT

Source: Grays Harbor County (2007) GIS Data (Water Bodies and Streets). Horizontal datum for all layers is State Plane Washington South NAD 83, vertical datum for layers is NAVD88.

- Monitor Well Sample Location, January 2009
- Piezometer Sample Location, January 2009
- Soil Sample Location, December 2009
- Direct Push Soil and Groundwater Sample Location, Dec. 2008
- Project Alternative Site

N

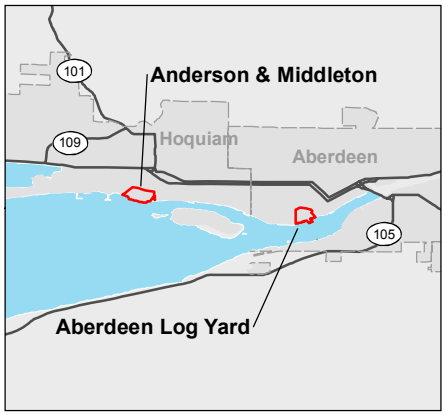
0 250 500 Feet

Figure 2-1. **Anderson & Middleton Phase II ESA Sampling Locations**

SR 520 Pontoon Construction Project

Washington State Department of Transportation

SEA \\SIMBA\PROJ\PARAMETRIX\180171\GIS\MAPFILES\PONTOON\SPECIALREQUESTS\HAZARDOUSMATERIALS\SITEINVERSTIGATIONPHASE2\PON_TM_HZ_SPR_AMIDD1_SGRWTSMPE_PHASE2.MXD PON_TM_HZ_SPR_AMIDD1_Fig2-1_SGRWTSMPE_PHASE2.PDF 2/17/2009



Piezometer Sample Location, January 2009

Soil Sample Location, December 2008

Direct Push Soil and Groundwater Sample Location, December 2008

Project Alternative Site

Source: WSDOT (2006) Aerial Photo and Grays Harbor County (2007) GIS Data (Streets). Horizontal datum for all layers is State Plane Washington South NAD 83, vertical datum for layers is NAVD88.

INTERNAL USE ONLY-DRAFT

Figure 2-2. **Aberdeen Log Yard Phase II ESA Sampling Locations**

SR 520 Pontoon Construction Project

Washington State Department of Transportation

Tables

TABLE 2-1

December 2008 Samples Used for Evaluation at the Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

				Analytical Methods					
Sample ID	**Sample Type**	**Sample Depths (feet)**	**Sample Date**	**METAL**	**PAH**	**PCB**	**TPH**	**VOC**	**DIOX/ FURN**
Soil									
AM-SB-1-1.0-2.0	N	1-2	15-Dec-08	X	X	X	X	X	
AM-SB-1-4.0-6.0	N	4-6	15-Dec-08	X	X		X	X	
AM-SB-2-1.0-2.0	N	1-2	15-Dec-08	X	X	X	X	X	
AM-SB-2-4.0-6.0	N	4-6	15-Dec-08	X	X		X	X	
AM-SB-3-0.0-1.0	N	0-1	15-Dec-08	X	X	X	X	X	
AM-SB-3-4.0-5.0	N	4-5	15-Dec-08	X	X		X	X	
AM-SB-4-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	
AM-SB-4-7.0-8.0	N	7-8	16-Dec-08	X	X		X	X	
AM-SB-5-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	
AM-SB-5-3.0-4.0	N	3-4	16-Dec-08	X	X		X	X	
AM-SB-6-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	
AM-SB-6-6.0-8.0	N	6-8	16-Dec-08	X	X		X	X	
AM-SB-7-1.5-3.0	N	1.5-3	15-Dec-08	X	X	X	X	X	X
AM-SB-7-6.0-7.0	N	6-7	15-Dec-08	X	X		X	X	
AM-SB-8-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	
AM-SB-8-8.0-10.0	N	8-10	16-Dec-08	X	X		X	X	
AM-SB-9-1.0-3.0	N	1-3	16-Dec-08	X	X	X	X	X	
AM-SB-9-4.0-5.0	N	4-5	16-Dec-08	X	X		X	X	
AM-SB-10-0.0-3.0	N	0-3	15-Dec-08	X	X	X	X	X	X
AM-SB-10-10.0-11.0	N	10-11	15-Dec-08	X	X		X	X	
AM-SB-11-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	X
AM-SB-11-4.0-6.0	N	4-6	16-Dec-08	X	X		X	X	
AM-SB-12-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	
AM-SB-12-9.0-10.0	N	9-10	16-Dec-08	X	X		X	X	
Groundwater									
AM-W-1	N	--	15-Dec-08	X	X		X	X	
AM-W-5	N	--	16-Dec-08	X			X	X	
AM-W-6	N	--	16-Dec-08	X			X	X	
AM-W-9	N	--	16-Dec-08	X			X	X	
AM-W-11	N	--	16-Dec-08	X			X	X	
AM-W-12	N	--	16-Dec-08	X	X		X	X	

Notes:

Metals = Total Metals using SW6020B and SW7470A.
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic hydrocarbons; includes Method SW8260B.
DIOX/FURN = Dioxins and Furans; includes Method SW 846 1613B
N = normal environmental sample

TABLE 2-2

December 2008 Samples Used for Evaluation at the Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

				Analytical Methods					
Sample ID	**Sample Type**	**Sample Depths (feet)**	**Sample Date**	**METAL**	**PAH**	**PCB**	**TPH**	**VOC**	**DIOX/ FURN**
Soil									
ALY-SB-1-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	
ALY-SB-1-3.0-4.0	N	3-4	17-Dec-08	X	X		X	X	
ALY-SB-2-1.0-3.0	N	1-3	17-Dec-08	X	X	X	X	X	
ALY-SB-2-4.0-5.0	N	4-5	17-Dec-08	X	X		X	X	
ALY-SB-3-1.0-3.0	N	1-3	17-Dec-08	X	X	X	X	X	
ALY-SB-3-3.0-4.0	N	3-4	17-Dec-08	X	X		X	X	
ALY-SB-4-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	
ALY-SB-4-3.0-4.0	N	3-4	17-Dec-08	X	X		X	X	
ALY-SB-5-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	
ALY-SB-5-3.0-4.0	N	3-4	17-Dec-08	X	X		X	X	
ALY-SB-6-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	
ALY-SB-6-3.0-4.0	N	3-4	17-Dec-08	X	X		X	X	
ALY-SB-7-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	
ALY-SB-7-10.0-11.0	N	10-11	17-Dec-08	X	X		X	X	
ALY-SB-8-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	X
ALY-SB-8-3.0-4.0	N	3-4	17-Dec-08	X	X		X	X	
ALY-SB-9-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	X
ALY-SB-9-7.0-8.0	N	7-8	17-Dec-08	X	X		X	X	
ALY-SB-10-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	X
ALY-SB-10-6.0-8.0	N	6-8	17-Dec-08	X	X		X	X	
ALY-SB-11-1.0-2.0	N	1-2	16-Dec-08	X	X	X	X	X	
ALY-SB-11-3.0-4.0	N	3-4	16-Dec-08	X	X		X	X	
ALY-SB-12-1.0-2.0	N	1-2	17-Dec-08	X	X	X	X	X	
ALY-SB-12-6.5-7.5	N	6.5-7.5	17-Dec-08	X	X		X	X	
Groundwater									
ALY-W-2	N	--	17-Dec-08	X			X	X	
ALY-W-3	N	--	17-Dec-08	X			X	X	
ALY-W-7	N	--	17-Dec-08	X			X	X	
ALY-W-11	N	--	16-Dec-08	X			X	X	
ALY-W-12	N	--	17-Dec-08	X	X		X	X	

Notes:

Metals = Total Metals using SW6020B and SW7470A.

PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.

PCB = polychlorinated biphenyl; includes Method SW8082.

TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.

VOC = volatile organic hydrocarbons; includes Method SW8260B.

DIOX/FURN = Dioxins and Furans; includes Method SW 846 1613B

N = normal environmental sample

TABLE 2-3

January 2009 Groundwater Samples Used for Evaluation

Pontoon Site, WSDOT SR 520

			Analytical Methods		
Sample ID	**Sample Type**	**Sample Date**	**METAL**	**METAL_D**	**CONV**
Anderson and Middleton Property					
H-5P-08	N	22-Jan-09	X	X	X
H-8P-08	N	22-Jan-09	X	X	X
FD-1 (H-8P-08)	FD	22-Jan-09	X	X	X
Aberdeen Log Yard Property					
H-2P-08	N	22-Jan-09	X	X	X
H-3P-08	N	22-Jan-09	X	X	X
FD-2 (H-3P-08)	FD	22-Jan-09	X	X	X
IDD#1					
MW-1	N	22-Jan-09	X	X	X
MW-2	N	22-Jan-09	X	X	X

Notes:

METAL = Total Metals using SW6020 and SW7470A.
METAL_D = Dissolved Metals using SW6020 and SW7470A.
CONV = conventional parameter

N = normal environmental sample
FD = field duplicate

TABLE 3-1

Soil Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-1-1.0-2.0	AM-SB-1-4.0-6.0	AM-SB-2-1.0-2.0	AM-SB-2-4.0-6.0	AM-SB-3-0.0-1.0	AM-SB-3-4.0-5.0	AM-SB-4-1.0-2.0	AM-SB-4-7.0-8.0	AM-SB-5-1.0-2.0
Sample Depth (feet)				1-2	4-6	1-2	4-6	0-1	4-5	1-2	7-8	1-2
Sample Date				15-Dec-08	15-Dec-08	15-Dec-08	15-Dec-08	15-Dec-08	15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**									
VOC	1,1,1,2-Tetrachloroethane	mg/kg	38	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	1,1,1-Trichloroethane	mg/kg	72,000	0.00238 UJ	0.00268 U	0.00195 U	0.00201 U	0.00169 U	0.00206 U	0.00195 U	0.00273 U	0.133
VOC	1,1,2,2-Tetrachloroethane	mg/kg	5	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	1,1,2-Trichloroethane	mg/kg	18	0.0019 UJ	0.00214 U	0.00156 U	0.00161 U	0.00135 U	0.00165 U	0.00156 U	0.00219 U	0.133
VOC	1,1-Dichloroethane	mg/kg	16,000	0.0019 UJ	0.00214 U	0.00156 U	0.00161 U	0.00135 U	0.00165 U	0.00156 U	0.00219 U	0.133
VOC	1,1-Dichloroethene	mg/kg	4,000	0.00286 UJ	0.00322 U	0.00234 U	**0.00321**	0.00202 U	0.00247 U	0.00234 U	0.00328 U	0.133
VOC	1,1-Dichloropropene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	1,2,3-Trichlorobenzene	mg/kg	--	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 UJ	0.00781 U	0.0109 UJ	2.66
VOC	1,2,3-Trichloropropane	mg/kg	0.14	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	1,2,4-Trichlorobenzene	mg/kg	800	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 UJ	0.00781 U	0.0109 UJ	1.33
VOC	1,2,4-Trimethylbenzene	mg/kg	4,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	1,2-Dibromo-3-chloropropane	mg/kg	0.71	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 UJ	0.00781 U	0.0109 UJ	0.665
VOC	1,2-Dibromoethane	mg/kg	0.012	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	1,2-Dichlorobenzene	mg/kg	7,200	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	1,2-Dichloroethane	mg/kg	11	0.00119 UJ	0.00134 U	0.000975 U	0.001 U	0.000843 U	0.00103 U	0.000977 U	0.00137 U	0.133
VOC	1,2-Dichloropropane	mg/kg	15	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	1,3,5-Trimethylbenzene	mg/kg	4,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	1,3-Dichlorobenzene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	1,3-Dichloropropane	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	1,4-Dichlorobenzene	mg/kg	42	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	2,2-Dichloropropane	mg/kg	--	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 U	0.00781 U	0.0109 U	0.133
VOC	2-Butanone	mg/kg	48,000	0.0286 UJ	**0.0369**	0.0234 U	**0.0338**	0.0202 U	0.0247 U	0.0234 U	**0.067**	6.65
VOC	2-Chlorotoluene	mg/kg	1,600	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	2-Hexanone	mg/kg	--	0.0286 UJ	0.0322 U	0.0234 U	0.0241 U	0.0202 U	0.0247 U	0.0234 U	0.0328 U	2.66
VOC	4-Chlorotoluene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	4-Methyl-2-pentanone	mg/kg	6,400	0.0286 UJ	0.0322 U	0.0234 U	0.0241 U	0.0202 U	0.0247 U	0.0234 U	0.0328 U	1.33
VOC	Acetone	mg/kg	8,000	0.0381 UJ	**0.163**	0.0312 U	**0.188**	0.027 U	0.033 U	0.0313 U	**0.336**	6.65
VOC	Benzene	mg/kg	18	0.00143 UJ	0.00161 U	0.00117 U	0.00121 U	0.00101 U	0.00124 U	0.00117 U	0.00164 U	0.0266
VOC	Bromobenzene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	Bromochloromethane	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Bromodichloromethane	mg/kg	16	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Bromoform	mg/kg	130	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Bromomethane	mg/kg	110	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 U	0.00781 U	0.0109 U	0.133
VOC	Carbon disulfide	mg/kg	8,000	0.00286 UJ	0.00322 U	0.00234 U	0.00241 U	0.00202 U	**0.00551**	0.00234 U	0.00328 U	0.133
VOC	Carbon tetrachloride	mg/kg	7.7	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Chlorobenzene	mg/kg	1,600	0.0019 UJ	0.00214 U	0.00156 U	0.00161 U	0.00135 U	0.00165 U	0.00156 U	0.00219 U	0.133
VOC	Chloroethane	mg/kg	350	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Chloroform	mg/kg	160	0.00238 UJ	0.00268 U	0.00195 U	0.00201 U	0.00169 U	0.00206 U	0.00195 U	0.00273 U	0.133
VOC	Chloromethane	mg/kg	77	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 U	0.00781 U	0.0109 U	0.665
VOC	cis-1,2-Dichloroethene	mg/kg	800	0.00286 UJ	0.00322 U	0.00234 U	0.00241 U	0.00202 U	0.00247 U	0.00234 U	0.00328 U	0.133
VOC	cis-1,3-Dichloropropene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Dibromochloromethane	mg/kg	12	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Dibromomethane	mg/kg	800	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Dichlorodifluoromethane	mg/kg	16,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 UJ	0.00337 U	0.00412 UJ	0.00391 UJ	0.00546 UJ	0.133

TABLE 3-1

Soil Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-1-1.0-2.0	AM-SB-1-4.0-6.0	AM-SB-2-1.0-2.0	AM-SB-2-4.0-6.0	AM-SB-3-0.0-1.0	AM-SB-3-4.0-5.0	AM-SB-4-1.0-2.0	AM-SB-4-7.0-8.0	AM-SB-5-1.0-2.0
Sample Depth (feet)				1-2	4-6	1-2	4-6	0-1	4-5	1-2	7-8	1-2
Sample Date				15-Dec-08	15-Dec-08	15-Dec-08	15-Dec-08	15-Dec-08	15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**									
VOC	Ethylbenzene	mg/kg	8,000	0.00381 UJ	0.00429 U	0.00312 U	0.00322 U	0.0027 U	0.0033 U	0.00313 U	0.00437 U	0.133
VOC	Hexachlorobutadiene	mg/kg	13	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 UJ	0.00781 U	0.0109 UJ	2.66
VOC	Isopropylbenzene	mg/kg	8,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	m,p-Xylene	mg/kg	160,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	--
VOC	Methyl tert-butyl ether	mg/kg	560	0.000952 UJ	0.00107 U	0.00078 U	0.000804 U	0.000674 U	0.000824 U	0.000781 U	0.00109 U	0.665
VOC	Methylene chloride	mg/kg	130	0.0114 UJ	0.0129 U	0.00936 U	0.00965 U	0.00809 U	0.00989 U	0.00938 U	0.0131 U	2.66
VOC	Naphthalene	mg/kg	1,600	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 UJ	0.00781 U	0.0109 UJ	2.66
VOC	n-Butylbenzene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.665
VOC	n-Hexane	mg/kg	4,800	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.665
VOC	n-Propylbenzene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	o-Xylene	mg/kg	160,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	--
VOC	p-Isopropyltoluene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	sec-Butylbenzene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.665
VOC	Styrene	mg/kg	33	0.00238 UJ	0.00268 U	0.00195 U	0.00201 U	0.00169 U	0.00206 U	0.00195 U	0.00273 U	0.133
VOC	tert-Butylbenzene	mg/kg	--	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 UJ	0.00391 U	0.00546 UJ	0.133
VOC	Tetrachloroethene	mg/kg	1.9	0.0019 UJ	0.00214 U	0.00156 U	0.00161 U	0.00135 U	0.00165 U	0.00156 U	0.00219 U	0.133
VOC	Toluene	mg/kg	6,400	0.00143 UJ	0.00161 U	0.00117 U	0.00121 U	0.00101 U	0.00124 U	0.00117 U	0.00164 U	0.133
VOC	Total Xylenes	mg/kg	16,000	0.00952 UJ	0.0107 U	0.0078 U	0.00804 U	0.00674 U	0.00824 U	0.00781 U	0.0109 U	0.399
VOC	trans-1,2-Dichloroethene	mg/kg	1,600	0.00238 UJ	0.00268 U	0.00195 U	0.00201 U	0.00169 U	0.00206 U	0.00195 U	0.00273 U	0.133
VOC	trans-1,3-Dichloropropene	mg/kg	--	0.00119 UJ	0.00134 U	0.000975 U	0.001 U	0.000843 U	0.00103 U	0.000977 U	0.00137 U	0.133
VOC	Trichloroethene	mg/kg	11	0.00238 UJ	0.00268 U	0.00195 U	0.00201 U	0.00169 U	0.00206 U	0.00195 U	0.00273 U	0.133
VOC	Trichlorofluoromethane	mg/kg	24,000	0.00476 UJ	0.00536 U	0.0039 U	0.00402 U	0.00337 U	0.00412 U	0.00391 U	0.00546 U	0.133
VOC	Vinyl chloride	mg/kg	0.67	0.00238 UJ	0.00268 U	0.00195 U	0.00201 U	0.00169 U	0.00206 U	0.00195 U	0.00273 U	0.133
PCB	PCB-1016	mg/kg	5.6	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1221	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1232	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1242	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1248	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1254	mg/kg	1.6	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1260	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1262	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
PCB	PCB-1268	mg/kg	--	0.0364 U	--	0.0358 U	--	0.037 U	--	0.0412 U	--	0.0368
TPH	Diesel Range Hydrocarbons	mg/kg	* 2,000	**37**	16 U	**45.6**	13.4 U	**183**	13.2 U	12.4 U	**76.7**	**79.6**
TPH	Gasoline Range Hydrocarbons	mg/kg	* 100	8.21 U	14.2 U	8.07 U	10.2 U	7.78 U	9.56 U	9.2 U	13.1 U	6.65
TPH	Lube Oil Range Hydrocarbons	mg/kg	* 2,000	**100**	40 UC	**45.4**	33.4 UC	**1580 J**	33 UC	31.1 U	**67.4**	**424**
PAH	1-Methylnaphthalene	mg/kg	--	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	**0.0315**
PAH	2-Methylnaphthalene	mg/kg	320	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	**0.0334**
PAH	Acenaphthene	mg/kg	4,800	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185
PAH	Acenaphthylene	mg/kg	--	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185
PAH	Anthracene	mg/kg	24,000	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185
PAH	Benzo (a) anthracene	mg/kg	--	0.00365 U	0.016 U	0.00358 U	**0.0141**	0.0183 U	0.0133 U	0.00408 U	0.0146 U	**0.026**
PAH	Benzo (a) pyrene	mg/kg	0.14	0.00365 U	0.016 U	0.00358 U	**0.0178**	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185
PAH	Benzo (b) fluoranthene	mg/kg	--	0.00365 U	0.016 U	0.00358 U	**0.016**	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185
PAH	Benzo (ghi) perylene	mg/kg	--	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185
PAH	Benzo (k) fluoranthene	mg/kg	--	0.00365 U	0.016 U	0.00358 U	0.0131 U	0.0183 U	0.0133 U	0.00408 U	0.0146 U	0.0185

TABLE 3-1

Soil Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-1-1.0-2.0		AM-SB-1-4.0-6.0		AM-SB-2-1.0-2.0		AM-SB-2-4.0-6.0		AM-SB-3-0.0-1.0		AM-SB-3-4.0-5.0		AM-SB-4-1.0-2.0		AM-SB-4-7.0-8.0		AM-SB-5-1.0-2.0
Sample Depth (feet)				1-2		4-6		1-2		4-6		0-1		4-5		1-2		7-8		1-2
Sample Date				15-Dec-08		15-Dec-08		15-Dec-08		15-Dec-08		15-Dec-08		15-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**																	
PAH	Chrysene	mg/kg	--	**0.00438**		0.016	U	**0.00359**		**0.0181**		0.0183	U	0.0133	U	0.00408	U	0.0146	U	**0.0408**
PAH	Dibenz (a,h) anthracene	mg/kg	--	0.00365	U	0.016	U	0.00358	U	0.0131	U	0.0183	U	0.0133	U	0.00408	U	0.0146	U	0.0185
PAH	Fluoranthene	mg/kg	3,200	0.00365	U	0.016	U	0.00358	U	**0.0371**		0.0183	U	0.0133	U	**0.00939**		0.0146	U	**0.0297**
PAH	Fluorene	mg/kg	3,200	0.00365	U	0.016	U	0.00358	U	0.0131	U	0.0183	U	0.0133	U	0.00408	U	0.0146	U	0.0185
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	--	0.00365	U	0.016	UC	0.00358	U	0.0131	UC	0.0183	U	0.0133	UC	0.00408	U	0.0146	U	0.0185
PAH	Naphthalene	mg/kg	1,600	0.00365	U	0.016	U	0.00358	U	0.0131	U	0.0183	U	0.0133	U	0.00408	U	0.0146	U	0.0185
PAH	Phenanthrene	mg/kg	--	0.00365	U	0.016	U	0.00358	U	**0.0193**		0.0183	U	0.0133	U	**0.00817**		0.0146	U	**0.0593**
PAH	Pyrene	mg/kg	2,400	0.00365	U	0.016	U	0.00358	U	**0.0294**		0.0183	U	0.0133	U	**0.00817**		0.0146	U	**0.0519**
METAL	Antimony	mg/kg	32	1.58	UJ	2.1	U	1.35	U	1.72	U	1.62	U	1.83	U	1.72	U	1.97	U	1.57
METAL	Arsenic	mg/kg	0.67	**0.599**	**J**	**7.73**		**0.689**		**3.73**		**1.49**		**1.61**		**0.678**		**0.925**		**0.664**
METAL	Barium	mg/kg	16,000	**36.9**	**J**	**55.3**		**52.6**		**28.3**		**45.6**		**55.6**		**115**		**69.6**		**102**
METAL	Beryllium	mg/kg	160	**0.677**		**0.751**		**0.599**		0.574	U	0.54	U	**0.706**		**0.913**		0.656	U	0.523
METAL	Cadmium	mg/kg	--	0.525	U	0.702	U	0.451	U	0.574	U	0.54	U	0.609	U	0.574	U	**0.715**		0.523
METAL	Chromium	mg/kg	--	**29**		**48.7**		**14.2**		**31.9**		**33.1**		**46.9**		**84.6**		**29.6**		**10.1**
METAL	Cobalt	mg/kg	--	**34**		**15.2**		**27.2**		**15.7**		**22.1**		**34.3**		**48.8**		**27**		**18**
METAL	Copper	mg/kg	3,000	**143**	**J**	**71.8**		**174**		**37.7**		**82.3**		**115**		**186**		**126**		**53.2**
METAL	Lead	mg/kg	* 250	**0.793**	**J**	**17.8**		**1.87**		**4.66**		**2.47**		**3.09**		**4.67**		**3.83**		**4.66**
METAL	Manganese	mg/kg	11,000	**1490**		**488**		**1110**		**362**		**1030**		**1230**		**1960**		**1170**		**493**
METAL	Mercury	mg/kg	24	0.102	U	0.139	U	0.0902	U	0.112	U	0.103	U	0.115	U	0.109	U	0.134	U	0.0975
METAL	Molybdenum	mg/kg	400	2.63	U	3.51	U	2.25	U	2.87	U	2.7	U	3.04	U	2.87	U	3.28	U	2.61
METAL	Nickel	mg/kg	1,600	**41.1**		**31.8**		**40.7**		**28.7**		**46.2**		**48**		**71**		**38.1**		**15.7**
METAL	Selenium	mg/kg	400	1.05	U	1.4	U	0.901	U	1.15	U	1.08	U	1.22	U	1.15	U	1.31	U	1.05
METAL	Silver	mg/kg	400	0.525	U	**0.702**		0.451	U	0.574	U	0.54	U	0.609	U	0.574	U	0.656	U	0.523
METAL	Strontium	mg/kg	48,000	**105**	**J**	**53.1**		**216**		**31.5**		**88.9**		**56.1**		**190**		**79.6**		**57.5**
METAL	Thallium	mg/kg	5.6	0.525	U	0.702	U	0.451	U	0.574	U	0.54	U	0.609	U	0.574	U	0.656	U	0.523
METAL	Titanium	mg/kg	--	**4720**		**160**		**3700**		**2080**		**2360**		**3550**		**2880**		**1660**		**1960**
METAL	Vanadium	mg/kg	560	**235**		**97.6**		**137**		**81**		**118**		**189**		**171**		**154**		**86.9**
METAL	Zinc	mg/kg	24,000	**84.7**		**104**		**75.3**		**65.5**		**59.7**		**91.9**		**109**		**78.1**		**66.6**
CONV	% Dry Solids	Percent	--	**90.7**		--		**91.7**		--		**89.1**		--		**79.9**		--		**89.4**
CONV	Dry Weight	Percent	--	**90.7**		**62.5**		**91.7**		**75.1**		**89.1**		**75.4**		**79.9**		**68.1**		**89.4**

Notes:

mg/kg = milligrams per kilogram

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA screening levels.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-1
Soil Results at Anderson and Middleton Property
Pontoon Site, WSDOT SR 520

Sample ID					AM-SB-5-3.0-4.0		AM-SB-6-1.0-2.0		AM-SB-6-6.0-8.0		AM-SB-7-1.5-3.0		AM-SB-7-6.0-7.0		AM-SB-8-1.0-2.0		AM-SB-8-8.0-10.0		AM-SB-9-1.0-3.0	
Sample Depth (feet)					3-4		1-2		6-8		1.5-3		6-7		1-2		8-10		1-3	
Sample Date					16-Dec-08		16-Dec-08		16-Dec-08		15-Dec-08		15-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08	
Chemical Group	**Analyte**	**Units**	**MTCA B**																	
VOC	1,1,1,2-Tetrachloroethane	mg/kg	38	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	1,1,1-Trichloroethane	mg/kg	72,000	U	0.00207	U	0.00146	U	0.00219	UJ	0.00228	U	0.00245	UJ	0.00231	U	0.00179	U	0.00217	U
VOC	1,1,2,2-Tetrachloroethane	mg/kg	5	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	1,1,2-Trichloroethane	mg/kg	18	U	0.00165	U	0.00117	U	0.00175	U	0.00183	U	0.00196	UJ	0.00185	U	0.00143	U	0.00173	U
VOC	1,1-Dichloroethane	mg/kg	16,000	U	0.00165	U	0.00117	U	0.00175	UJ	0.00183	U	0.00196	UJ	0.00185	U	0.00143	U	0.00173	U
VOC	1,1-Dichloroethene	mg/kg	4,000	U	0.00248	U	**0.0021**		0.00263	UJ	0.00274	U	0.00294	UJ	0.00277	U	0.00215	U	0.0026	U
VOC	1,1-Dichloropropene	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	1,2,3-Trichlorobenzene	mg/kg	--	UC	0.00827	U	0.00585	U	0.00875	UJ	0.00913	U	0.0098	UJ	0.00923	U	0.00715	UJ	0.00867	U
VOC	1,2,3-Trichloropropane	mg/kg	0.14	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	1,2,4-Trichlorobenzene	mg/kg	800	U	0.00827	U	0.00585	U	0.00875	UJ	0.00913	U	0.0098	UJ	0.00923	U	0.00715	UJ	0.00867	U
VOC	1,2,4-Trimethylbenzene	mg/kg	4,000	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	1,2-Dibromo-3-chloropropane	mg/kg	0.71	U	0.00827	U	0.00585	U	0.00875	UJ	0.00913	U	0.0098	UJ	0.00923	U	0.00715	UJ	0.00867	U
VOC	1,2-Dibromoethane	mg/kg	0.012	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	1,2-Dichlorobenzene	mg/kg	7,200	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	1,2-Dichloroethane	mg/kg	11	U	0.00103	U	0.000732	U	0.00109	U	0.00114	U	0.00123	U	0.00115	U	0.000894	U	0.00108	U
VOC	1,2-Dichloropropane	mg/kg	15	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	U	0.00462	U	0.00358	U	0.00434	U
VOC	1,3,5-Trimethylbenzene	mg/kg	4,000	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	1,3-Dichlorobenzene	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	1,3-Dichloropropane	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	1,4-Dichlorobenzene	mg/kg	42	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	2,2-Dichloropropane	mg/kg	--	U	0.00827	U	0.00585	U	0.00875	UJ	0.00913	U	0.0098	UJ	0.00923	U	0.00715	U	0.00867	U
VOC	2-Butanone	mg/kg	48,000	U	**0.0273**		0.0176	U	10.4	U	0.0274	U	0.0294	UJ	**0.0371**		**0.0306**		0.026	U
VOC	2-Chlorotoluene	mg/kg	1,600	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	2-Hexanone	mg/kg	--	U	0.0248	U	0.0176	U	0.0263	U	0.0274	U	0.0294	UJ	0.0277	U	0.0215	U	0.026	U
VOC	4-Chlorotoluene	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	4-Methyl-2-pentanone	mg/kg	6,400	U	0.0248	U	0.0176	U	0.0263	U	0.0274	U	0.0294	U	0.0277	U	0.0215	U	0.026	U
VOC	Acetone	mg/kg	8,000	U	**0.275**		**0.107**		10.4	U	0.0365	U	12.1	U	**0.66**		**0.335**		**0.107**	
VOC	Benzene	mg/kg	18	U	0.00124	U	0.000878	U	0.00131	U	0.00137	U	0.00147	U	0.00138	U	0.00107	U	0.0013	U
VOC	Bromobenzene	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	Bromochloromethane	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	Bromodichloromethane	mg/kg	16	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	U	0.00462	U	0.00358	U	0.00434	U
VOC	Bromoform	mg/kg	130	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	UJ	0.00462	U	0.00358	UJ	0.00434	U
VOC	Bromomethane	mg/kg	110	U	0.00827	U	0.00585	U	0.00875	UJ	0.00913	U	0.0098	UJ	0.00923	U	0.00715	U	0.00867	U
VOC	Carbon disulfide	mg/kg	8,000	U	0.00248	U	0.00176	U	0.00263	UJ	0.00274	U	0.00294	UJ	0.00277	U	0.00215	U	0.0026	U
VOC	Carbon tetrachloride	mg/kg	7.7	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	U	0.00462	U	0.00358	U	0.00434	U
VOC	Chlorobenzene	mg/kg	1,600	U	0.00165	U	0.00117	U	0.00175	U	0.00183	U	0.00196	UJ	0.00185	U	0.00143	U	0.00173	U
VOC	Chloroethane	mg/kg	350	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	Chloroform	mg/kg	160	U	0.00207	U	0.00146	U	0.00219	UJ	0.00228	U	0.00245	UJ	0.00231	U	0.00179	U	0.00217	U
VOC	Chloromethane	mg/kg	77	U	0.00827	U	0.00585	U	0.00875	UJ	0.00913	U	0.0098	UJ	0.00923	U	0.00715	U	0.00867	U
VOC	cis-1,2-Dichloroethene	mg/kg	800	U	0.00248	U	0.00176	U	0.00263	U	0.00274	U	0.00294	UJ	0.00277	U	0.00215	U	0.0026	U
VOC	cis-1,3-Dichloropropene	mg/kg	--	U	0.00413	U	0.00293	U	0.00438	UJ	0.00456	U	0.0049	U	0.00462	U	0.00358	U	0.00434	U
VOC	Dibromochloromethane	mg/kg	12	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	U
VOC	Dibromomethane	mg/kg	800	U	0.00413	U	0.00293	U	0.00438	U	0.00456	U	0.0049	U	0.00462	U	0.00358	U	0.00434	U
VOC	Dichlorodifluoromethane	mg/kg	16,000	U	0.00413	UJ	0.00293	UJ	0.00438	UJ	0.00456	U	0.0049	UJ	0.00462	U	0.00358	U	0.00434	UJ

TABLE 3-1

Soil Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-5-3.0-4.0	AM-SB-6-1.0-2.0	AM-SB-6-6.0-8.0	AM-SB-7-1.5-3.0	AM-SB-7-6.0-7.0	AM-SB-8-1.0-2.0	AM-SB-8-8.0-10.0	AM-SB-9-1.0-3.0
Sample Depth (feet)				3-4	1-2	6-8	1.5-3	6-7	1-2	8-10	1-3
Sample Date				16-Dec-08	16-Dec-08	16-Dec-08	15-Dec-08	15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
VOC	Ethylbenzene	mg/kg	8,000 U	0.00331 U	0.00234 U	0.0035 U	0.00365 U	0.00392 UJ	0.00369 U	0.00286 U	0.00347 U
VOC	Hexachlorobutadiene	mg/kg	13 U	0.00827 U	0.00585 U	0.00875 UJ	0.00913 U	0.0098 UJ	0.00923 U	0.00715 UJ	0.00867 U
VOC	Isopropylbenzene	mg/kg	8,000 U	0.00413 U	0.00293 U	0.00438 U	0.00456 U	0.0049 UJ	0.00462 U	0.00358 U	0.00434 U
VOC	m,p-Xylene	mg/kg	160,000	0.00413 U	0.00293 U	0.00438 U	0.00456 U	0.0049 UJ	0.00462 U	0.00358 U	0.00434 U
VOC	Methyl tert-butyl ether	mg/kg	560 U	0.000827 U	0.000585 U	0.000875 UJ	0.000913 U	0.00098 UJ	0.000923 U	0.000715 U	0.000867 U
VOC	Methylene chloride	mg/kg	130 U	0.00992 U	0.00702 U	0.0105 UJ	0.011 U	0.0118 UJ	0.0111 U	0.00858 U	0.0104 U
VOC	Naphthalene	mg/kg	1,600 U	0.00827 U	0.00585 U	0.00875 UJ	0.00913 U	0.0098 UJ	0.00923 U	0.00715 UJ	0.00867 U
VOC	n-Butylbenzene	mg/kg	-- U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 UJ	0.00434 U
VOC	n-Hexane	mg/kg	4,800 U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 U	0.00434 U
VOC	n-Propylbenzene	mg/kg	-- U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 UJ	0.00434 U
VOC	o-Xylene	mg/kg	160,000	0.00413 U	0.00293 U	0.00438 U	0.00456 U	0.0049 UJ	0.00462 U	0.00358 U	0.00434 U
VOC	p-Isopropyltoluene	mg/kg	-- U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 UJ	0.00434 U
VOC	sec-Butylbenzene	mg/kg	-- U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 UJ	0.00434 U
VOC	Styrene	mg/kg	33 U	0.00207 U	0.00146 U	0.00219 U	0.00228 U	0.00245 UJ	0.00231 U	0.00179 U	0.00217 U
VOC	tert-Butylbenzene	mg/kg	-- U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 UJ	0.00434 U
VOC	Tetrachloroethene	mg/kg	1.9 U	0.00165 U	0.00117 U	0.00175 U	0.00183 U	0.00196 UJ	0.00185 U	0.00143 U	0.00173 U
VOC	Toluene	mg/kg	6,400 U	0.00124 U	0.000878 U	0.00131 U	0.00137 U	0.00147 UJ	0.00138 U	**0.00169**	0.0013 U
VOC	Total Xylenes	mg/kg	16,000 U	0.00827 U	0.00585 U	0.00875 U	0.00913 U	0.0098 UJ	0.00923 U	0.00715 U	0.00867 U
VOC	trans-1,2-Dichloroethene	mg/kg	1,600 U	0.00207 U	0.00146 U	0.00219 U	0.00228 U	0.00245 UJ	0.00231 U	0.00179 U	0.00217 U
VOC	trans-1,3-Dichloropropene	mg/kg	-- U	0.00103 U	0.000732 U	0.00109 UJ	0.00114 U	0.00123 UJ	0.00115 U	0.000894 U	0.00108 U
VOC	Trichloroethene	mg/kg	11 U	0.00207 U	0.00146 U	0.00219 U	0.00228 U	0.00245 U	0.00231 U	0.00179 U	0.00217 U
VOC	Trichlorofluoromethane	mg/kg	24,000 U	0.00413 U	0.00293 U	0.00438 UJ	0.00456 U	0.0049 UJ	0.00462 U	0.00358 U	0.00434 U
VOC	Vinyl chloride	mg/kg	0.67 U	0.00207 U	0.00146 U	0.00219 UJ	0.00228 U	0.00245 UJ	0.00231 U	0.00179 U	0.00217 U
PCB	PCB-1016	mg/kg	5.6 U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1221	mg/kg	-- U	--	0.0369 U	--	0.0659 U	--	0.0414 U	--	0.041 U
PCB	PCB-1232	mg/kg	-- U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1242	mg/kg	-- U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1248	mg/kg	-- U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1254	mg/kg	1.6 U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1260	mg/kg	-- U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1262	mg/kg	-- U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
PCB	PCB-1268	mg/kg	-- U	--	0.0369 U	--	0.033 U	--	0.0414 U	--	0.041 U
TPH	Diesel Range Hydrocarbons	mg/kg	* 2,000	**44.8**	**38.1**	13.7 U	13.3 U	**106**	**60.2**	**23.3**	12.3 U
TPH	Gasoline Range Hydrocarbons	mg/kg	* 100 U	9.94 U	6.53 U	10.5 U	10.5 U	12.3 U	9.86 U	7.75 U	11.4 U
TPH	Lube Oil Range Hydrocarbons	mg/kg	* 2,000	**117**	**144**	34.2 U	33.3 UC	**308**	**49.6**	30.2 UC	30.9 U
PAH	1-Methylnaphthalene	mg/kg	--	0.0128 U	0.00366 U	0.0137 U	0.0133 U	0.014 U	0.00416 U	0.0122 U	0.00401 U
PAH	2-Methylnaphthalene	mg/kg	320	0.0128 U	0.00366 U	0.0137 U	0.0133 U	0.014 U	0.00416 U	0.0122 U	0.00401 U
PAH	Acenaphthene	mg/kg	4,800 U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	0.014 U	0.00416 U	0.0122 U	0.00401 U
PAH	Acenaphthylene	mg/kg	-- U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	0.014 U	0.00416 U	0.0122 U	0.00401 U
PAH	Anthracene	mg/kg	24,000 U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	0.014 U	0.00416 U	0.0122 U	0.00401 U
PAH	Benzo (a) anthracene	mg/kg	--	0.0128 U	0.00366 U	0.0137 U	0.0133 U	**0.0457**	0.00416 U	0.0122 U	0.00401 U
PAH	Benzo (a) pyrene	mg/kg	0.14 U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	**0.0403**	0.00416 U	**0.0155**	0.00401 U
PAH	Benzo (b) fluoranthene	mg/kg	-- U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	**0.0255**	0.00416 U	0.0122 U	0.00401 U
PAH	Benzo (ghi) perylene	mg/kg	-- U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	**0.0147**	0.00416 U	0.0122 U	0.00401 U
PAH	Benzo (k) fluoranthene	mg/kg	-- U	0.0128 U	0.00366 U	0.0137 U	0.0133 U	**0.0291**	0.00416 U	0.0122 U	0.00401 U

TABLE 3-1

Soil Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID					AM-SB-5-3.0-4.0		AM-SB-6-1.0-2.0		AM-SB-6-6.0-8.0		AM-SB-7-1.5-3.0		AM-SB-7-6.0-7.0		AM-SB-8-1.0-2.0		AM-SB-8-8.0-10.0		AM-SB-9-1.0-3.0	
Sample Depth (feet)					3-4		1-2		6-8		1.5-3		6-7		1-2		8-10		1-3	
Sample Date					16-Dec-08		16-Dec-08		16-Dec-08		15-Dec-08		15-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08	
Chemical Group	**Analyte**	**Units**	**MTCA B**																	
PAH	Chrysene	mg/kg	--		0.0128	U	**0.0143**		0.0137	U	0.0133	U	**0.0593**		**0.00459**		**0.0145**		0.00401	U
PAH	Dibenz (a,h) anthracene	mg/kg	--	U	0.0128	U	0.00366	U	0.0137	U	0.0133	U	0.014	U	0.00416	U	0.0122	U	0.00401	U
PAH	Fluoranthene	mg/kg	3,200		**0.0163**		0.00366	U	0.0137	U	0.0133	U	**0.0223**		**0.00417**		**0.0299**		0.00401	U
PAH	Fluorene	mg/kg	3,200	U	0.0128	U	0.00366	U	0.0137	U	0.0133	U	0.014	U	0.00416	U	0.0122	U	0.00401	U
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	--	U	0.0128	U	0.00366	U	0.0137	U	0.0133	UC	**0.0169**		0.00416	U	0.0122	U	0.00401	U
PAH	Naphthalene	mg/kg	1,600	U	0.0128	U	0.00366	U	0.0137	U	0.0133	U	0.014	U	0.00416	U	0.0122	U	0.00401	U
PAH	Phenanthrene	mg/kg	--		**0.0152**		**0.0044**		0.0137	U	0.0133	U	0.014	U	**0.00459**		**0.025**		0.00401	U
PAH	Pyrene	mg/kg	2,400		**0.0178**		**0.00697**		0.0137	U	0.0133	U	**0.0235**		**0.00417**		**0.0277**		0.00401	U
METAL	Antimony	mg/kg	32	U	1.93	U	1.55	U	1.8	U	1.98	U	2	U	1.84	U	1.59	U	1.75	UJ
METAL	Arsenic	mg/kg	0.67		**2.88**		**1.02**		**3.13**		0.662	U	**8.53**		0.614	U	**3.44**		**0.996**	**J**
METAL	Barium	mg/kg	16,000		**111**		**47.5**		**28.1**		**73.5**		**36**		**95.5**		**40**		**192**	**J**
METAL	Beryllium	mg/kg	160	U	0.644	U	**0.568**		0.599	U	**1.16**		0.667	U	**1.06**		0.531	U	**0.938**	
METAL	Cadmium	mg/kg	--	U	0.644	U	0.516	U	0.599	U	**0.787**		0.667	U	**0.976**		0.531	U	**0.74**	
METAL	Chromium	mg/kg	--		**28.2**		**22.9**		**25.3**		**69.2**		**31.5**		**65.5**		**30.1**		**88.2**	**J**
METAL	Cobalt	mg/kg	--		**18.5**		**28.1**		**11.1**		**63.7**		**14.4**		**45.2**		**21.1**		**49.6**	
METAL	Copper	mg/kg	3,000		**42.7**		**124**		**20.3**		**290**		**39.7**		**207**		**76.5**		**170**	
METAL	Lead	mg/kg	* 250		**8.34**		**2.52**		**3.56**		**1.36**		**22.8**		**2.54**		**4.49**		**6.82**	**J**
METAL	Manganese	mg/kg	11,000		**536**		**1150**		**355**		**2590**		**463**		**1450**		**529**		**2210**	
METAL	Mercury	mg/kg	24	U	0.12	U	0.0997	U	0.122	U	0.118	U	0.121	U	0.112	U	0.114	U	0.109	U
METAL	Molybdenum	mg/kg	400	U	3.22	U	2.58	U	2.99	U	3.31	U	3.33	U	3.07	U	2.65	U	2.91	UJ
METAL	Nickel	mg/kg	1,600		**26.9**		**49.5**		**20.7**		**66.6**		**26.7**		**55.8**		**34**		**75.2**	
METAL	Selenium	mg/kg	400	U	1.29	U	1.03	U	1.2	U	1.32	U	1.33	U	1.23	U	1.06	U	1.16	UJ
METAL	Silver	mg/kg	400	U	0.644	U	0.516	U	0.599	U	0.662	U	0.667	U	0.614	U	0.531	U	0.582	U
METAL	Strontium	mg/kg	48,000		**42.2**		**174**		**27.3**		**82.4**		**37**		**44**		**50.1**		**139**	**J**
METAL	Thallium	mg/kg	5.6	U	0.644	U	0.516	U	0.599	U	0.662	U	0.667	U	0.614	U	0.531	U	0.582	U
METAL	Titanium	mg/kg	--		**2070**		**3160**		**1400**		**4590**		**1930**		**4740**		**2500**		**3000**	
METAL	Vanadium	mg/kg	560		**88**		**143**		**54.9**		**229**		**78.5**		**218**		**93.6**		**161**	**J**
METAL	Zinc	mg/kg	24,000		**74.1**		**71.8**		**58.6**		**144**		**77.1**		**116**		**75.7**		**112**	**J**
CONV	% Dry Solids	Percent	--		--		**89.7**		--		--		--		**79.9**		--		**81**	
CONV	Dry Weight	Percent	--		**77.6**		**89.7**		**72.6**		**74.8**		**71.4**		**79.9**		**81.9**		**81**	

Notes:

mg/kg = milligrams per kilogram

U = The analyte was analyzed for, but not detected. The associated numerical v
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM an
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NW
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA screening levels.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-1
Soil Results at Anderson and Middleton Property
Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-9-4.0-5.0		AM-SB-10-0.0-3.0		AM-SB-10-10.0-11.0		AM-SB-11-1.0-2.0		AM-SB-11-4.0-6.0		AM-SB-12-1.0-2.0		AM-SB-12-9.0-10.0	
Sample Depth (feet)				4-5		0-3		10-11		1-2		4-6		1-2		9-10	
Sample Date				16-Dec-08		15-Dec-08		15-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08	
Chemical Group	**Analyte**	**Units**	**MTCA B**														
VOC	1,1,1,2-Tetrachloroethane	mg/kg	38	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,1,1-Trichloroethane	mg/kg	72,000	0.321	U	0.0022	U	0.00209	U	0.00202	UJ	0.00224	U	0.00209	U	0.192	U
VOC	1,1,2,2-Tetrachloroethane	mg/kg	5	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,1,2-Trichloroethane	mg/kg	18	0.321	U	0.00176	U	0.00167	U	0.00161	UJ	0.00179	U	0.00167	U	0.192	U
VOC	1,1-Dichloroethane	mg/kg	16,000	0.321	U	0.00176	U	0.00167	U	0.00161	UJ	0.00179	U	0.00167	U	0.192	U
VOC	1,1-Dichloroethene	mg/kg	4,000	0.321	U	0.00265	U	0.00251	U	0.00242	UJ	0.00268	U	0.0025	U	0.192	U
VOC	1,1-Dichloropropene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,2,3-Trichlorobenzene	mg/kg	--	6.42	UC	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	3.84	UC
VOC	1,2,3-Trichloropropane	mg/kg	0.14	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,2,4-Trichlorobenzene	mg/kg	800	3.21	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	1.92	U
VOC	1,2,4-Trimethylbenzene	mg/kg	4,000	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,2-Dibromo-3-chloropropane	mg/kg	0.71	1.61	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	0.959	U
VOC	1,2-Dibromoethane	mg/kg	0.012	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,2-Dichlorobenzene	mg/kg	7,200	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,2-Dichloroethane	mg/kg	11	0.321	U	0.0011	U	0.00104	U	0.00101	UJ	0.00112	U	0.00104	U	0.192	U
VOC	1,2-Dichloropropane	mg/kg	15	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,3,5-Trimethylbenzene	mg/kg	4,000	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,3-Dichlorobenzene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,3-Dichloropropane	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	1,4-Dichlorobenzene	mg/kg	42	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	2,2-Dichloropropane	mg/kg	--	0.321	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	0.192	U
VOC	2-Butanone	mg/kg	48,000	16.1	U	0.0265	U	0.0251	U	0.0242	UJ	0.0268	U	0.025	U	9.59	U
VOC	2-Chlorotoluene	mg/kg	1,600	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	2-Hexanone	mg/kg	--	6.42	U	0.0265	U	0.0251	U	0.0242	UJ	0.0268	U	0.025	U	3.84	U
VOC	4-Chlorotoluene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	4-Methyl-2-pentanone	mg/kg	6,400	3.21	U	0.0265	U	0.0251	U	0.0242	UJ	0.0268	U	0.025	U	1.92	U
VOC	Acetone	mg/kg	8,000	16.1	U	**0.125**		**0.159**		8.12	U	**0.0873**		0.0334	U	9.59	U
VOC	Benzene	mg/kg	18	**0.353**		0.00132	U	0.00125	U	0.00121	UJ	0.00134	U	0.00125	U	**0.129**	
VOC	Bromobenzene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Bromochloromethane	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Bromodichloromethane	mg/kg	16	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Bromoform	mg/kg	130	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Bromomethane	mg/kg	110	0.321	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	0.192	U
VOC	Carbon disulfide	mg/kg	8,000	0.321	U	0.00265	U	0.00251	U	0.00242	UJ	0.00268	U	0.0025	U	0.192	U
VOC	Carbon tetrachloride	mg/kg	7.7	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Chlorobenzene	mg/kg	1,600	0.321	U	0.00176	U	0.00167	U	0.00161	UJ	0.00179	U	0.00167	U	0.192	U
VOC	Chloroethane	mg/kg	350	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Chloroform	mg/kg	160	0.321	U	0.0022	U	0.00209	U	0.00202	UJ	0.00224	U	0.00209	U	0.192	U
VOC	Chloromethane	mg/kg	77	1.61	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	0.959	U
VOC	cis-1,2-Dichloroethene	mg/kg	800	0.321	U	0.00265	U	0.00251	U	0.00242	UJ	0.00268	U	0.0025	U	0.192	U
VOC	cis-1,3-Dichloropropene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Dibromochloromethane	mg/kg	12	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Dibromomethane	mg/kg	800	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Dichlorodifluoromethane	mg/kg	16,000	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	UJ	0.192	U

TABLE 3-1
Soil Results at Anderson and Middleton Property
Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-9-4.0-5.0		AM-SB-10-0.0-3.0		AM-SB-10-10.0-11.0		AM-SB-11-1.0-2.0		AM-SB-11-4.0-6.0		AM-SB-12-1.0-2.0		AM-SB-12-9.0-10.0	
Sample Depth (feet)				4-5		0-3		10-11		1-2		4-6		1-2		9-10	
Sample Date				16-Dec-08		15-Dec-08		15-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08	
Chemical Group	**Analyte**	**Units**	**MTCA B**														
VOC	Ethylbenzene	mg/kg	8,000	0.321	U	0.00353	U	0.00334	U	0.00323	UJ	0.00358	U	0.00334	U	0.192	U
VOC	Hexachlorobutadiene	mg/kg	13	6.42	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	3.84	U
VOC	Isopropylbenzene	mg/kg	8,000	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	m,p-Xylene	mg/kg	160,000	--		0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	--	
VOC	Methyl tert-butyl ether	mg/kg	560	1.61	U	0.000882	U	0.000836	U	0.000807	UJ	0.000894	U	0.000834	U	0.959	U
VOC	Methylene chloride	mg/kg	130	6.42	U	0.0106	U	0.01	U	0.00968	UJ	0.0107	U	0.01	U	3.84	U
VOC	Naphthalene	mg/kg	1,600	6.42	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	3.84	U
VOC	n-Butylbenzene	mg/kg	--	1.61	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.959	U
VOC	n-Hexane	mg/kg	4,800	1.61	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.959	U
VOC	n-Propylbenzene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	o-Xylene	mg/kg	160,000	--		0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	--	
VOC	p-Isopropyltoluene	mg/kg	--	**0.401**		0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	sec-Butylbenzene	mg/kg	--	1.61	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.959	U
VOC	Styrene	mg/kg	33	0.321	U	0.0022	U	0.00209	U	0.00202	UJ	0.00224	U	0.00209	U	0.192	U
VOC	tert-Butylbenzene	mg/kg	--	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Tetrachloroethene	mg/kg	1.9	0.321	U	0.00176	U	0.00167	U	0.00161	UJ	0.00179	U	0.00167	U	0.192	U
VOC	Toluene	mg/kg	6,400	**1.21**		0.00132	U	0.00125	U	0.162	U	0.00134	U	0.00125	U	**0.77**	
VOC	Total Xylenes	mg/kg	16,000	0.963	U	0.00882	U	0.00836	U	0.00807	UJ	0.00894	U	0.00834	U	0.576	U
VOC	trans-1,2-Dichloroethene	mg/kg	1,600	0.321	U	0.0022	U	0.00209	U	0.00202	UJ	0.00224	U	0.00209	U	0.192	U
VOC	trans-1,3-Dichloropropene	mg/kg	--	0.321	U	0.0011	U	0.00104	U	0.00101	UJ	0.00112	U	0.00104	U	0.192	U
VOC	Trichloroethene	mg/kg	11	0.321	U	0.0022	U	0.00209	U	0.00202	UJ	0.00224	U	0.00209	U	0.192	U
VOC	Trichlorofluoromethane	mg/kg	24,000	0.321	U	0.00441	U	0.00418	U	0.00403	UJ	0.00447	U	0.00417	U	0.192	U
VOC	Vinyl chloride	mg/kg	0.67	0.321	U	0.0022	U	0.00209	U	0.00202	UJ	0.00224	U	0.00209	U	0.192	U
PCB	PCB-1016	mg/kg	5.6	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1221	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1232	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1242	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1248	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1254	mg/kg	1.6	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1260	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1262	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
PCB	PCB-1268	mg/kg	--	--		0.0383	U	--		0.0371	U	--		0.0397	U	--	
TPH	Diesel Range Hydrocarbons	mg/kg	* 2,000	**75.5**		11.7	U	**82.2**		11.2	U	12.4	U	12.1	U	**117**	
TPH	Gasoline Range Hydrocarbons	mg/kg	* 100	16.1	U	8.96	U	10.6	U	8.26	U	9.19	U	9.89	U	9.6	U
TPH	Lube Oil Range Hydrocarbons	mg/kg	* 2,000	**42.3**		29.2	UC	**203**		28	UC	31.1	UC	30.2	U	**215**	
PAH	1-Methylnaphthalene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	2-Methylnaphthalene	mg/kg	320	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Acenaphthene	mg/kg	4,800	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Acenaphthylene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Anthracene	mg/kg	24,000	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Benzo (a) anthracene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Benzo (a) pyrene	mg/kg	0.14	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	UC	0.004	U	0.0133	U
PAH	Benzo (b) fluoranthene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	**0.00511**		0.0125	U	0.004	U	0.0133	U
PAH	Benzo (ghi) perylene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	UC	0.004	U	0.0133	U
PAH	Benzo (k) fluoranthene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U

TABLE 3-1

Soil Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				AM-SB-9-4.0-5.0		AM-SB-10-0.0-3.0		AM-SB-10-10.0-11.0		AM-SB-11-1.0-2.0		AM-SB-11-4.0-6.0		AM-SB-12-1.0-2.0		AM-SB-12-9.0-10.0	
Sample Depth (feet)				4-5		0-3		10-11		1-2		4-6		1-2		9-10	
Sample Date				16-Dec-08		15-Dec-08		15-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08		16-Dec-08	
Chemical Group	**Analyte**	**Units**	**MTCA B**														
PAH	Chrysene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	**0.00511**		0.0125	U	0.004	U	0.0133	U
PAH	Dibenz (a,h) anthracene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	UC	0.004	U	0.0133	U
PAH	Fluoranthene	mg/kg	3,200	0.0137	U	0.00385	U	**0.0152**		**0.00402**		0.0125	U	0.004	U	**0.0252**	
PAH	Fluorene	mg/kg	3,200	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	UC	0.004	U	0.0133	U
PAH	Naphthalene	mg/kg	1,600	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	0.0133	U
PAH	Phenanthrene	mg/kg	--	0.0137	U	0.00385	U	0.0131	U	0.00365	U	0.0125	U	0.004	U	**0.019**	
PAH	Pyrene	mg/kg	2,400	0.0137	U	0.00385	U	0.0131	U	**0.00548**		0.0125	U	0.004	U	0.0133	U
METAL	Antimony	mg/kg	32	1.98	U	1.6	U	1.55	U	1.55	U	1.83	U	1.62	U	1.93	U
METAL	Arsenic	mg/kg	0.67	**1.46**		0.534	U	**1.32**		**3.23**		**4.24**		0.539	U	**1.92**	
METAL	Barium	mg/kg	16,000	**81.1**		**39.2**		**129**		**52**		**64**		**27.9**		**55.5**	
METAL	Beryllium	mg/kg	160	0.659	U	0.534	U	**0.905**		0.517	U	0.609	U	**0.959**		0.644	U
METAL	Cadmium	mg/kg	--	0.659	U	0.534	U	**0.548**		0.517	U	0.609	U	**0.83**		**0.76**	
METAL	Chromium	mg/kg	--	**16.3**		**55.6**		**90.2**		**35.9**		**35.9**		**36.4**		**26.9**	
METAL	Cobalt	mg/kg	--	**16.9**		**31.2**		**26.6**		**15.3**		**14.1**		**40.3**		**18.6**	
METAL	Copper	mg/kg	3,000	**39.3**		**119**		**57.9**		**49.8**		**35.5**		**208**		**84**	
METAL	Lead	mg/kg	* 250	**8.88**		**2.31**		**4.26**		**3.94**		**9.24**		**0.878**		**9.07**	
METAL	Manganese	mg/kg	11,000	**632**		**971**		**630**		**664**		**373**		**740**		**520**	
METAL	Mercury	mg/kg	24	0.131	U	0.112	U	0.115	U	0.107	U	0.111	U	0.106	U	0.125	U
METAL	Molybdenum	mg/kg	400	3.3	U	2.67	U	2.59	U	2.58	U	3.05	U	2.69	U	3.22	U
METAL	Nickel	mg/kg	1,600	**18.4**		**78.9**		**34.8**		**28.4**		**24.7**		**47.2**		**31.3**	
METAL	Selenium	mg/kg	400	1.32	U	1.07	U	1.03	U	1.03	U	1.22	U	1.08	U	1.29	U
METAL	Silver	mg/kg	400	0.659	U	0.534	U	0.517	U	0.517	U	0.609	U	0.539	U	0.644	U
METAL	Strontium	mg/kg	48,000	**39.6**		**167**		**38.8**		**52**		**54.6**		**76**		**44.3**	
METAL	Thallium	mg/kg	5.6	0.659	U	0.534	U	0.517	U	0.517	U	0.609	U	0.539	U	0.644	U
METAL	Titanium	mg/kg	--	**2430**		**2430**		**2320**		**2510**		**1100**		**1800**		**2590**	
METAL	Vanadium	mg/kg	560	**74.7**		**100**		**164**		**65.9**		**59.1**		**156**		**98.1**	
METAL	Zinc	mg/kg	24,000	**63.9**		**68.7**		**63.2**		**68.4**		**76.1**		**99.9**		**82.6**	
CONV	% Dry Solids	Percent	--	--		**85.9**		--		**88.8**		--		**82.1**		--	
CONV	Dry Weight	Percent	--	**72.2**		**85.9**		**76.1**		**88.8**		**79.7**		**82.1**		**74.7**	

Notes:

mg/kg = milligrams per kilogram

U = The analyte was analyzed for, but not detected. The associated numerical v
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM an
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NW
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA screening levels.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-2

Soil Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-1-1.0-2.0		ALY-SB-1-3.0-4.0		ALY-SB-2-1.0-3.0		ALY-SB-2-4.0-5.0		ALY-SB-3-1.0-3.0		ALY-SB-3-3.0-4.0		ALY-SB-4-1.0-2.0		ALY-SB-4-3.0-4.0	
Sample Depth (feet)				1-2		3-4		1-3		4-5		1-3		3-4		1-2		3-4	
Sample Date				17-Dec-08		17-Dec-08		17-Dec-08		17-Dec-08		17-Dec-08		17-Dec-08		17-Dec-08		17-Dec-08	
Chemical Group	**Analyte**	**Units**	**MTCA B**																
VOC	1,1,1,2-Tetrachloroethane	mg/kg	38	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,1,1-Trichloroethane	mg/kg	72,000	0.238	U	0.00266	U	0.249	U	0.00295	U	0.00137	U	0.00227	U	0.00172	U	0.267	U
VOC	1,1,2,2-Tetrachloroethane	mg/kg	5	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,1,2-Trichloroethane	mg/kg	18	0.238	U	0.00213	U	0.249	U	0.00236	U	0.00109	U	0.00181	U	0.00138	U	0.267	U
VOC	1,1-Dichloroethane	mg/kg	16,000	0.238	U	0.00213	U	0.249	U	0.00236	U	0.00109	U	0.00181	U	0.00138	U	0.267	U
VOC	1,1-Dichloroethene	mg/kg	4,000	0.238	U	0.00319	U	0.249	U	**0.00501**		**0.00176**		0.00272	U	**0.0059**		0.267	U
VOC	1,1-Dichloropropene	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,2,3-Trichlorobenzene	mg/kg	--	4.77	U	0.0106	U	4.99	U	0.0118	U	0.00547	U	0.00907	U	0.00688	U	5.33	U
VOC	1,2,3-Trichloropropane	mg/kg	0.14	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,2,4-Trichlorobenzene	mg/kg	800	2.38	U	0.0106	U	2.49	U	0.0118	U	0.00547	U	0.00907	U	0.00688	U	2.67	U
VOC	1,2,4-Trimethylbenzene	mg/kg	4,000	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,2-Dibromo-3-chloropropane	mg/kg	0.71	1.19	U	0.0106	U	1.25	U	0.0118	U	0.00547	U	0.00907	U	0.00688	U	1.33	U
VOC	1,2-Dibromoethane	mg/kg	0.012	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,2-Dichlorobenzene	mg/kg	7,200	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,2-Dichloroethane	mg/kg	11	0.238	U	0.00133	U	0.249	U	0.00147	U	0.000683	U	0.00113	U	0.00086	U	0.267	U
VOC	1,2-Dichloropropane	mg/kg	15	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,3,5-Trimethylbenzene	mg/kg	4,000	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,3-Dichlorobenzene	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,3-Dichloropropane	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	1,4-Dichlorobenzene	mg/kg	42	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	2,2-Dichloropropane	mg/kg	--	0.238	U	0.0106	U	0.249	U	0.0118	U	0.00547	U	0.00907	U	0.00688	U	0.267	U
VOC	2-Butanone	mg/kg	48,000	11.9	U	0.0319	U	12.5	U	**0.072**		0.0164	U	0.0272	U	0.0206	U	13.3	U
VOC	2-Chlorotoluene	mg/kg	1,600	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	2-Hexanone	mg/kg	--	4.77	U	0.0319	U	4.99	U	0.0354	U	0.0164	U	0.0272	U	0.0206	U	5.33	U
VOC	4-Chlorotoluene	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	4-Methyl-2-pentanone	mg/kg	6,400	2.38	U	0.0319	U	2.49	U	0.0354	U	0.0164	U	0.0272	U	0.0206	U	2.67	U
VOC	Acetone	mg/kg	8,000	11.9	U	**0.1**		12.5	U	**0.242**		**0.204**		**0.0441**		**0.0477**		13.3	U
VOC	Benzene	mg/kg	18	0.0477	U	0.00159	U	0.0499	U	0.00177	U	0.00082	U	0.00136	U	0.00103	U	0.0533	U
VOC	Bromobenzene	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Bromochloromethane	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Bromodichloromethane	mg/kg	16	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Bromoform	mg/kg	130	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Bromomethane	mg/kg	110	0.238	U	0.0106	U	0.249	U	0.0118	U	0.00547	U	0.00907	U	0.00688	U	0.267	U
VOC	Carbon disulfide	mg/kg	8,000	0.238	U	0.00319	U	0.249	U	**0.00489**		0.00164	U	0.00272	U	**0.00215**		0.267	U
VOC	Carbon tetrachloride	mg/kg	7.7	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Chlorobenzene	mg/kg	1,600	0.238	U	0.00213	U	0.249	U	0.00236	U	0.00109	U	0.00181	U	0.00138	U	0.267	U
VOC	Chloroethane	mg/kg	350	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Chloroform	mg/kg	160	0.238	U	0.00266	U	0.249	U	0.00295	U	0.00137	U	0.00227	U	0.00172	U	0.267	U
VOC	Chloromethane	mg/kg	77	1.19	U	0.0106	UJ	1.25	U	0.0118	UJ	0.00547	U	0.00907	U	0.00688	UJ	1.33	U
VOC	cis-1,2-Dichloroethene	mg/kg	800	0.238	U	0.00319	U	0.249	U	0.00354	U	0.00164	U	0.00272	U	0.00206	U	0.267	U
VOC	cis-1,3-Dichloropropene	mg/kg	--	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Dibromochloromethane	mg/kg	12	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Dibromomethane	mg/kg	800	0.238	U	0.00531	U	0.249	U	0.00589	U	0.00273	U	0.00453	U	0.00344	U	0.267	U
VOC	Dichlorodifluoromethane	mg/kg	16,000	0.238	U	0.00531	UJ	0.249	U	0.00589	UJ	0.00273	UJ	0.00453	UJ	0.00344	UJ	0.267	U

TABLE 3-2

Soil Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-1-1.0-2.0	ALY-SB-1-3.0-4.0	ALY-SB-2-1.0-3.0	ALY-SB-2-4.0-5.0	ALY-SB-3-1.0-3.0	ALY-SB-3-3.0-4.0	ALY-SB-4-1.0-2.0	ALY-SB-4-3.0-4.0
Sample Depth (feet)				1-2	3-4	1-3	4-5	1-3	3-4	1-2	3-4
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
VOC	Ethylbenzene	mg/kg	8,000	0.238 U	0.00425 U	0.249 U	0.00471 U	0.00219 U	0.00363 U	0.00275 U	0.267 U
VOC	Hexachlorobutadiene	mg/kg	13	4.77 U	0.0106 U	4.99 U	0.0118 U	0.00547 U	0.00907 U	0.00688 U	5.33 U
VOC	Isopropylbenzene	mg/kg	8,000	0.238 U	0.00531 U	0.249 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	0.267 U
VOC	m,p-Xylene	mg/kg	160,000		0.00531 U	--	0.00589 U	0.00273 U	0.00453 U	0.00344 U	--
VOC	Methyl tert-butyl ether	mg/kg	560	1.19 U	0.00106 U	1.25 U	0.00118 U	0.000547 U	0.000907 U	0.000688 U	1.33 U
VOC	Methylene chloride	mg/kg	130	4.77 U	0.0128 U	4.99 U	0.0141 U	0.00656 U	0.0109 U	0.00825 U	5.33 U
VOC	Naphthalene	mg/kg	1,600	4.77 U	0.0106 U	4.99 U	0.0118 U	0.00547 U	0.00907 U	0.00688 U	5.33 U
VOC	n-Butylbenzene	mg/kg	--	1.19 U	0.00531 U	1.25 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	1.33 U
VOC	n-Hexane	mg/kg	4,800	1.19 U	0.00531 U	1.25 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	1.33 U
VOC	n-Propylbenzene	mg/kg	--	0.238 U	0.00531 U	0.249 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	0.267 U
VOC	o-Xylene	mg/kg	160,000		0.00531 U	--	0.00589 U	0.00273 U	0.00453 U	0.00344 U	--
VOC	p-Isopropyltoluene	mg/kg	--	0.238 U	0.00531 U	0.249 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	0.267 U
VOC	sec-Butylbenzene	mg/kg	--	1.19 U	0.00531 U	1.25 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	1.33 U
VOC	Styrene	mg/kg	33	0.238 U	0.00266 U	0.249 U	0.00295 U	0.00137 U	0.00227 U	0.00172 U	0.267 U
VOC	tert-Butylbenzene	mg/kg	--	0.238 U	0.00531 U	0.249 U	0.00589 U	0.00273 U	0.00453 U	0.00344 U	0.267 U
VOC	Tetrachloroethene	mg/kg	1.9	0.238 U	0.00213 U	0.249 U	0.00236 U	0.00109 U	0.00181 U	0.00138 U	0.267 U
VOC	Toluene	mg/kg	6,400	0.238 U	0.00159 U	0.249 U	0.00177 U	0.00082 U	0.00136 U	0.00103 U	0.267 U
VOC	Total Xylenes	mg/kg	16,000	0.715 U	0.0106 U	0.748 U	0.0118 U	0.00547 U	0.00907 U	0.00688 U	0.8 U
VOC	trans-1,2-Dichloroethene	mg/kg	1,600	0.238 U	0.00266 U	0.249 U	0.00295 U	0.00137 U	0.00227 U	0.00172 U	0.267 U
VOC	trans-1,3-Dichloropropene	mg/kg	--	0.238 U	0.00133 U	0.249 U	0.00147 U	0.000683 U	0.00113 U	0.00086 U	0.267 U
VOC	Trichloroethene	mg/kg	11	0.238 U	0.00266 U	0.249 U	0.00295 U	0.00137 U	0.00227 U	0.00172 U	0.267 U
VOC	Trichlorofluoromethane	mg/kg	24,000	0.238 U	0.00531 U	0.249 U	0.00589 U	0.00273 U	0.00453 U	**0.00406**	0.267 U
VOC	Vinyl chloride	mg/kg	0.67	0.238 U	0.00266 U	0.249 U	0.00295 U	0.00137 U	0.00227 U	0.00172 U	0.267 U
PCB	PCB-1016	mg/kg	5.6	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1221	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1232	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1242	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1248	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1254	mg/kg	1.6	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1260	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1262	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
PCB	PCB-1268	mg/kg	--	0.0442 U	--	0.0368 U	--	0.0367 U	--	0.0363 U	--
TPH	Diesel Range Hydrocarbons	mg/kg	* 2,000	**141**	**166**	**60.6**	**21.3**	11 U	**19.1**	**30.2**	**196**
TPH	Gasoline Range Hydrocarbons	mg/kg	* 100	11.9 U	**45.5**	12.2 U	12.3 U	6.03 U	10.2 U	7.06 U	13.1 U
TPH	Lube Oil Range Hydrocarbons	mg/kg	* 2,000	**217**	**132**	**83.6**	37.1 UC	27.6 U	**60.5**	27.6 UC	**369**
PAH	1-Methylnaphthalene	mg/kg	--	0.00431 U	**0.0727**	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	0.0143 U
PAH	2-Methylnaphthalene	mg/kg	320	0.00431 U	**0.0671**	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	0.0143 U
PAH	Acenaphthene	mg/kg	4,800	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	0.0121 U	**0.0239**	**0.0317**
PAH	Acenaphthylene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	0.0143 U
PAH	Anthracene	mg/kg	24,000	0.00431 U	0.0304 UC	0.00375 U	0.015 U	0.00363 U	**0.0133**	0.0184 U	0.0143 UC
PAH	Benzo (a) anthracene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	**0.0496**	0.0184 U	0.0143 U
PAH	Benzo (a) pyrene	mg/kg	0.14	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	**0.0378**	0.0184 U	**0.0143**
PAH	Benzo (b) fluoranthene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	**0.103**	0.0184 U	0.0143 U
PAH	Benzo (ghi) perylene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	0.0143 U
PAH	Benzo (k) fluoranthene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	**0.0569**	0.0184 U	0.0143 U

TABLE 3-2

Soil Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-1-1.0-2.0	ALY-SB-1-3.0-4.0	ALY-SB-2-1.0-3.0	ALY-SB-2-4.0-5.0	ALY-SB-3-1.0-3.0	ALY-SB-3-3.0-4.0	ALY-SB-4-1.0-2.0	ALY-SB-4-3.0-4.0
Sample Depth (feet)				1-2	3-4	1-3	4-5	1-3	3-4	1-2	3-4
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
PAH	Chrysene	mg/kg	--	**0.00474**	**0.0979**	0.00375 U	0.015 U	0.00363 U	**0.131**	**0.0184**	**0.0144**
PAH	Dibenz (a,h) anthracene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	0.0143 U
PAH	Fluoranthene	mg/kg	3,200	0.00431 U	0.0304 U	0.00375 U	0.015 U	**0.00655**	**0.311**	**0.0331**	**0.0451**
PAH	Fluorene	mg/kg	3,200	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	**0.0192**
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	--	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	**0.0164**	0.0184 U	0.0143 U
PAH	Naphthalene	mg/kg	1,600	0.00431 U	0.0304 U	0.00375 U	0.015 U	0.00363 U	0.0121 U	0.0184 U	0.0143 U
PAH	Phenanthrene	mg/kg	--	**0.00948**	**0.047**	**0.00901**	0.015 U	**0.0105**	**0.031**	0.0184 U	**0.0263**
PAH	Pyrene	mg/kg	2,400	**0.199**	**0.044**	0.00375 U	0.015 U	**0.00473**	**0.209**	**0.0571**	**0.0222**
METAL	Antimony	mg/kg	32	1.8 UJ	2.17 U	1.56 U	1.86 U	1.5 U	1.71 U	1.62 U	2.15 U
METAL	Arsenic	mg/kg	0.67	**1.46**	**3.28**	**0.736**	**4.93**	**1.61**	**1.63**	**0.701**	**1.91**
METAL	Barium	mg/kg	16,000	**135 J**	**74.6**	**108**	**69.7**	**85.2**	**127**	**92.6**	**147**
METAL	Beryllium	mg/kg	160	0.601 U	0.724 U	0.518 U	0.621 U	0.499 U	0.57 U	0.539 U	0.718 U
METAL	Cadmium	mg/kg	--	0.601 U	0.724 U	0.518 U	0.621 U	0.499 U	0.57 U	0.539 U	0.718 U
METAL	Chromium	mg/kg	--	**12.3**	**30.1**	**5.86**	**36**	**17.3**	**12.3**	**4.51**	**12.5**
METAL	Cobalt	mg/kg	--	**11.6**	**13.8**	**11.9**	**14.8**	**17.4**	**15.5**	**14.3**	**15.4**
METAL	Copper	mg/kg	3,000	**16.6**	**38**	**10.7**	**48.5**	**55.6**	**23.5**	**10**	**23.2**
METAL	Lead	mg/kg	* 250	**4.88**	**10.7**	**2.5**	**10.3**	**5.5**	**4.07**	**20**	**6.44**
METAL	Manganese	mg/kg	11,000	**403**	**367**	**272**	**356**	**470**	**425**	**372**	**375**
METAL	Mercury	mg/kg	24	0.137 U	0.145 U	0.109 U	0.139 U	0.0998 U	0.115 U	0.111 U	0.134 U
METAL	Molybdenum	mg/kg	400	3 UJ	3.62 U	2.59 U	3.11 U	2.5 U	2.85 U	2.69 U	3.59 U
METAL	Nickel	mg/kg	1,600	**9.35**	**22.1**	**6.79**	**22.6**	**21.4**	**11.7**	**5.92**	**10.6**
METAL	Selenium	mg/kg	400	1.2 U	1.45 U	1.04 U	1.24 U	0.999 U	1.14 U	1.08 U	1.44 U
METAL	Silver	mg/kg	400	0.601 U	0.724 U	0.518 U	0.621 U	0.499 U	0.57 U	0.539 U	0.718 U
METAL	Strontium	mg/kg	48,000	**60.8 J**	**45.4**	**40.1**	**43.1**	**31.1**	**47.6**	**35**	**48.7**
METAL	Thallium	mg/kg	5.6	0.601 U	0.724 U	0.518 U	0.621 U	0.499 U	0.57 U	0.539 U	0.718 U
METAL	Titanium	mg/kg	--	**1030**	**1460**	**1110**	**1590**	**1480**	**1310**	**688**	**1690**
METAL	Vanadium	mg/kg	560	**71.4**	**78.8**	**62.4**	**80**	**78.6**	**75.2**	**52.8**	**110**
METAL	Zinc	mg/kg	24,000	**60.8 J**	**66.5**	**41.1**	**85.5**	**55.3**	**50.9**	**40.8**	**51.7**
CONV	% Dry Solids	Percent	--	**75**	--	**88.5**	--	**89.4**	--	**90.1**	--
CONV	Dry Weight	Percent	--	**75**	**65.8**	**88.5**	**66.5**	**89.4**	**81.9**	**90.1**	**69.7**

Notes:

mg/kg = milligrams per kilogram

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA screening levels.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-2
Soil Results at Aberdeen Log Yard Property
Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-5-1.0-2.0	ALY-SB-5-3.0-4.0	ALY-SB-6-1.0-2.0	ALY-SB-6-3.0-4.0	ALY-SB-7-1.0-2.0	ALY-SB-7-10.0-11.0	ALY-SB-8-1.0-2.0	ALY-SB-8-3.0-4.0
Sample Depth (feet)				1-2	3-4	1-2	3-4	1-2	10-11	1-2	3-4
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
VOC	1,1,1,2-Tetrachloroethane	mg/kg	38	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	1,1,1-Trichloroethane	mg/kg	72,000	0.00209 UJ	0.00283 U	0.142 U	0.00168 U	0.00216 U	0.00193 U	0.0017 U	0.00454 U
VOC	1,1,2,2-Tetrachloroethane	mg/kg	5	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	1,1,2-Trichloroethane	mg/kg	18	0.00167 UJ	0.00227 UJ	0.142 U	0.00134 U	0.00173 U	0.00154 U	0.00136 U	0.00363 U
VOC	1,1-Dichloroethane	mg/kg	16,000	0.00167 UJ	0.00227 U	0.142 U	0.00134 U	0.00173 U	0.00154 U	0.00136 U	0.00363 U
VOC	1,1-Dichloroethene	mg/kg	4,000	0.00251 UJ	**0.0117**	0.142 U	0.00201 U	**0.00611**	0.00231 U	**0.00343**	0.00544 U
VOC	1,1-Dichloropropene	mg/kg	--	0.00418 UJ	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	1,2,3-Trichlorobenzene	mg/kg	--	0.00836 UJ	0.0113 UJ	2.85 U	0.00671 UJ	0.00864 U	0.00771 U	0.00681 U	0.0181 UJ
VOC	1,2,3-Trichloropropane	mg/kg	0.14	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	1,2,4-Trichlorobenzene	mg/kg	800	0.00836 UJ	0.0113 UJ	1.42 U	0.00671 UJ	0.00864 U	0.00771 U	0.00681 U	0.0181 UJ
VOC	1,2,4-Trimethylbenzene	mg/kg	4,000	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	1,2-Dibromo-3-chloropropane	mg/kg	0.71	0.00836 UJ	0.0113 UJ	0.711 U	0.00671 UJ	0.00864 U	0.00771 U	0.00681 U	0.0181 UJ
VOC	1,2-Dibromoethane	mg/kg	0.012	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	1,2-Dichlorobenzene	mg/kg	7,200	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	1,2-Dichloroethane	mg/kg	11	0.00104 U	0.00142 U	0.142 U	0.000839 U	0.00108 U	0.000964 U	0.000851 U	0.00227 U
VOC	1,2-Dichloropropane	mg/kg	15	0.00418 U	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	1,3,5-Trimethylbenzene	mg/kg	4,000	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	1,3-Dichlorobenzene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	1,3-Dichloropropane	mg/kg	--	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	1,4-Dichlorobenzene	mg/kg	42	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	2,2-Dichloropropane	mg/kg	--	0.00836 UJ	0.0113 U	0.142 U	0.00671 U	0.00864 U	0.00771 U	0.00681 U	0.0181 U
VOC	2-Butanone	mg/kg	48,000	9.8 U	**0.0718**	7.11 U	0.0201 U	0.0259 U	**0.0352**	0.0204 U	**0.183**
VOC	2-Chlorotoluene	mg/kg	1,600	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	2-Hexanone	mg/kg	--	0.0251 UJ	0.034 UJ	2.85 U	0.0201 U	0.0259 U	0.0231 U	0.0204 U	0.0544 U
VOC	4-Chlorotoluene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	4-Methyl-2-pentanone	mg/kg	6,400	0.0251 U	0.034 U	1.42 U	0.0201 U	0.0259 U	0.0231 U	0.0204 U	0.0544 U
VOC	Acetone	mg/kg	8,000	9.8 U	**0.724**	7.11 U	**0.0714**	**0.324**	**0.151**	**0.122**	**1.28**
VOC	Benzene	mg/kg	18	0.00125 U	0.0017 U	0.0285 U	0.00101 U	0.0013 U	0.00116 U	0.00102 U	0.00272 U
VOC	Bromobenzene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	Bromochloromethane	mg/kg	--	0.00418 UJ	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Bromodichloromethane	mg/kg	16	0.00418 U	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Bromoform	mg/kg	130	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Bromomethane	mg/kg	110	0.00836 UJ	0.0113 U	0.142 U	0.00671 U	0.00864 U	0.00771 U	0.00681 U	0.0181 U
VOC	Carbon disulfide	mg/kg	8,000	0.196 U	0.0034 U	0.142 U	0.00201 U	**0.00346**	**0.00274**	0.00204 U	**0.00844**
VOC	Carbon tetrachloride	mg/kg	7.7	0.00418 U	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Chlorobenzene	mg/kg	1,600	0.00167 UJ	0.00227 UJ	0.142 U	0.00134 U	0.00173 U	0.00154 U	0.00136 U	0.00363 U
VOC	Chloroethane	mg/kg	350	0.00418 UJ	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Chloroform	mg/kg	160	0.00209 UJ	0.00283 U	0.142 U	0.00168 U	0.00216 U	0.00193 U	0.0017 U	0.00454 U
VOC	Chloromethane	mg/kg	77	0.00836 UJ	0.0113 UJ	0.711 U	0.00671 UJ	0.00864 UJ	0.00771 UJ	0.00681 UJ	0.0181 UJ
VOC	cis-1,2-Dichloroethene	mg/kg	800	0.00251 UJ	0.0034 U	0.142 U	0.00201 U	0.00259 U	0.00231 U	0.00204 U	0.00544 U
VOC	cis-1,3-Dichloropropene	mg/kg	--	0.00418 U	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Dibromochloromethane	mg/kg	12	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Dibromomethane	mg/kg	800	0.00418 U	0.00567 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	Dichlorodifluoromethane	mg/kg	16,000	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 UJ	0.00386 UJ	0.0034 UJ	0.00907 UJ

TABLE 3-2
Soil Results at Aberdeen Log Yard Property
Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-5-1.0-2.0	ALY-SB-5-3.0-4.0	ALY-SB-6-1.0-2.0	ALY-SB-6-3.0-4.0	ALY-SB-7-1.0-2.0	ALY-SB-7-10.0-11.0	ALY-SB-8-1.0-2.0	ALY-SB-8-3.0-4.0
Sample Depth (feet)				1-2	3-4	1-2	3-4	1-2	10-11	1-2	3-4
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
VOC	Ethylbenzene	mg/kg	8,000	0.196 U	0.00453 UJ	0.142 U	0.00268 U	0.00346 U	**0.00623**	0.00272 U	**0.0579**
VOC	Hexachlorobutadiene	mg/kg	13	0.00836 UJ	0.0113 UJ	2.85 U	0.00671 UJ	0.00864 U	0.00771 U	0.00681 U	0.0181 UJ
VOC	Isopropylbenzene	mg/kg	8,000	0.00418 UJ	0.158 U	0.142 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	**0.0125**
VOC	m,p-Xylene	mg/kg	160,000	0.00418 UJ	0.00567 UJ	--	0.00336 U	0.00432 U	0.00386 U	0.0034 U	**0.0753**
VOC	Methyl tert-butyl ether	mg/kg	560	0.000836 UJ	0.00113 U	0.711 U	0.000671 U	0.000864 U	0.000771 U	0.000681 U	0.00181 U
VOC	Methylene chloride	mg/kg	130	0.01 UJ	0.0136 U	2.85 U	0.00805 U	0.0104 U	0.00926 U	0.00817 U	0.0218 U
VOC	Naphthalene	mg/kg	1,600	0.00836 UJ	0.0113 UJ	2.85 U	0.00671 UJ	0.00864 U	0.00771 U	0.00681 U	0.0181 UJ
VOC	n-Butylbenzene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.711 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	n-Hexane	mg/kg	4,800	0.00418 UJ	0.00567 U	0.711 U	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	n-Propylbenzene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	o-Xylene	mg/kg	160,000	0.00418 UJ	0.00567 UJ	--	0.00336 U	0.00432 U	0.00386 U	0.0034 U	0.00907 U
VOC	p-Isopropyltoluene	mg/kg	--	0.196 U	0.158 U	0.142 U	0.00336 UJ	**0.0142**	0.00386 U	0.0034 U	**0.697**
VOC	sec-Butylbenzene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.711 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	Styrene	mg/kg	33	0.00209 UJ	0.00283 UJ	0.142 U	0.00168 U	0.00216 U	0.00193 U	0.0017 U	0.00454 U
VOC	tert-Butylbenzene	mg/kg	--	0.00418 UJ	0.00567 UJ	0.142 U	0.00336 UJ	0.00432 U	0.00386 U	0.0034 U	0.00907 UJ
VOC	Tetrachloroethene	mg/kg	1.9	0.00167 UJ	0.00227 UJ	0.142 U	0.00134 U	0.00173 U	0.00154 U	0.00136 U	0.00363 U
VOC	Toluene	mg/kg	6,400	0.196 U	0.0017 UJ	0.142 U	0.00101 U	0.0013 U	0.00116 U	0.00102 U	**0.00354**
VOC	Total Xylenes	mg/kg	16,000	0.00836 UJ	0.0113 UJ	0.427 U	0.00671 U	0.00864 U	0.00771 U	0.00681 U	**0.0766**
VOC	trans-1,2-Dichloroethene	mg/kg	1,600	0.00209 UJ	0.00283 U	0.142 U	0.00168 U	0.00216 U	0.00193 U	0.0017 U	0.00454 U
VOC	trans-1,3-Dichloropropene	mg/kg	--	0.00104 UJ	0.00142 UJ	0.142 U	0.000839 U	0.00108 U	0.000964 U	0.000851 U	0.00227 U
VOC	Trichloroethene	mg/kg	11	0.00209 U	0.00283 U	0.142 U	0.00168 U	0.00216 U	0.00193 U	0.0017 U	0.00454 U
VOC	Trichlorofluoromethane	mg/kg	24,000	0.00418 UJ	**0.00845**	0.142 U	0.00336 U	**0.00442**	0.00386 U	0.0034 U	0.00907 U
VOC	Vinyl chloride	mg/kg	0.67	0.00209 UJ	0.00283 U	0.142 U	0.00168 U	0.00216 U	0.00193 U	0.0017 U	0.00454 U
PCB	PCB-1016	mg/kg	5.6	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1221	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1232	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1242	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1248	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1254	mg/kg	1.6	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1260	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1262	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
PCB	PCB-1268	mg/kg	--	0.0355 U	--	0.0356 U	--	0.0372 U	--	0.0366 U	--
TPH	Diesel Range Hydrocarbons	mg/kg	* 2,000	**52.4**	**139**	**123**	11.7 U	**36**	**16.1**	**41.6**	**454**
TPH	Gasoline Range Hydrocarbons	mg/kg	* 100	9.49 U	7.9 U	7.05 U	7.75 U	9.55 U	9.93 U	12.2 U	24 U
TPH	Lube Oil Range Hydrocarbons	mg/kg	* 2,000	**41.2**	**112**	**1310**	29.2 U	**54**	**70.4 J**	**27.8**	**309**
PAH	1-Methylnaphthalene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.0184**	0.00366 U	**0.0381**
PAH	2-Methylnaphthalene	mg/kg	320	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.0236**	0.00366 U	**0.0253**
PAH	Acenaphthene	mg/kg	4,800	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.0167**	0.00366 U	0.0181 U
PAH	Acenaphthylene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.166 J**	0.00366 U	0.0181 U
PAH	Anthracene	mg/kg	24,000	0.00355 U	0.0115 UC	0.0179 U	0.0115 U	0.00379 U	**0.127**	0.00366 U	0.0181 U
PAH	Benzo (a) anthracene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.386 J**	0.00366 U	0.0181 U
PAH	Benzo (a) pyrene	mg/kg	0.14	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.379 J**	0.00366 U	0.0181 U
PAH	Benzo (b) fluoranthene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.272**	0.00366 U	0.0181 U
PAH	Benzo (ghi) perylene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.29**	0.00366 U	0.0181 U
PAH	Benzo (k) fluoranthene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.317 J**	0.00366 U	0.0181 U

TABLE 3-2

Soil Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-5-1.0-2.0	ALY-SB-5-3.0-4.0	ALY-SB-6-1.0-2.0	ALY-SB-6-3.0-4.0	ALY-SB-7-1.0-2.0	ALY-SB-7-10.0-11.0	ALY-SB-8-1.0-2.0	ALY-SB-8-3.0-4.0
Sample Depth (feet)				1-2	3-4	1-2	3-4	1-2	10-11	1-2	3-4
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
PAH	Chrysene	mg/kg	--	**0.00498**	0.0115 U	**0.0467**	0.0115 U	0.00379 U	**0.474**	0.00366 U	0.0181 U
PAH	Dibenz (a,h) anthracene	mg/kg	--	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.0686**	0.00366 U	0.0181 U
PAH	Fluoranthene	mg/kg	3,200	**0.00996**	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.751**	0.00366 U	**0.0605**
PAH	Fluorene	mg/kg	3,200	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.0227**	0.00366 U	**0.0283**
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	--	**0.00427**	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.242 J**	0.00366 U	0.0181 U
PAH	Naphthalene	mg/kg	1,600	0.00355 U	0.0115 U	0.0179 U	0.0115 U	0.00379 U	**0.0759 J**	0.00366 U	0.0181 U
PAH	Phenanthrene	mg/kg	--	**0.00427**	0.0115 U	0.0179 U	0.0115 U	**0.00493**	**0.265 J**	**0.00366**	**0.0607**
PAH	Pyrene	mg/kg	2,400	**0.0206**	**0.0308**	0.0179 U	0.0115 U	0.00379 U	**1.16**	0.00366 U	**0.0682**
METAL	Antimony	mg/kg	32	1.5 U	1.73 U	1.6 U	1.63 U	1.72 U	1.97 U	1.64 U	2.61 U
METAL	Arsenic	mg/kg	0.67	**0.51**	**1.23**	**1.03**	**0.657**	**0.596**	**4.29**	0.548 U	**1.33**
METAL	Barium	mg/kg	16,000	**88.7**	**143**	**125**	**132**	**110**	**88.3**	**137**	**200**
METAL	Beryllium	mg/kg	160	0.5 U	0.578 U	0.535 U	**0.576**	0.573 U	0.656 U	0.548 U	0.869 U
METAL	Cadmium	mg/kg	--	0.5 U	0.578 U	0.535 U	0.543 U	0.573 U	0.656 U	0.548 U	0.869 U
METAL	Chromium	mg/kg	--	**6.03**	**7.46**	**12.9**	**30.9**	**3.89**	**28.8**	**4.21**	**10.1**
METAL	Cobalt	mg/kg	--	**11.6**	**11.7**	**13.8**	**15.9**	**16**	**16.7**	**18.3**	**12.3**
METAL	Copper	mg/kg	3,000	**14.2**	**9.09**	**25**	**50.6**	**16.9**	**44.8**	**18**	**17.8**
METAL	Lead	mg/kg	* 250	**1.52**	**6.17**	**6.96**	**4.09**	**2.73**	**50.2**	**3.01**	**4.85**
METAL	Manganese	mg/kg	11,000	**309**	**729**	**385**	**357**	**609**	**353**	**438**	**269**
METAL	Mercury	mg/kg	24	0.101 U	0.114 U	0.105 U	0.111 U	0.111 U	0.132 U	0.116 U	0.189 U
METAL	Molybdenum	mg/kg	400	2.5 U	2.89 U	2.67 U	2.72 U	2.86 U	3.28 U	2.74 U	4.35 U
METAL	Nickel	mg/kg	1,600	**6.41**	**5.85**	**12.7**	**24.7**	**6.54**	**24.7**	**6.71**	**8.23**
METAL	Selenium	mg/kg	400	1 U	1.16 U	1.07 U	1.09 U	1.15 U	1.31 U	1.1 U	1.74 U
METAL	Silver	mg/kg	400	0.5 U	0.578 U	0.535 U	0.543 U	0.573 U	0.656 U	0.548 U	0.869 U
METAL	Strontium	mg/kg	48,000	**33.3**	**61.7**	**35.2**	**53.6**	**41.2**	**37.1**	**45**	**48.6**
METAL	Thallium	mg/kg	5.6	0.5 U	0.578 U	0.535 U	0.543 U	0.573 U	0.656 U	0.548 U	0.869 U
METAL	Titanium	mg/kg	--	**1480**	**728**	**2310**	**2240**	**2580**	**1520**	**1710**	**1130**
METAL	Vanadium	mg/kg	560	**52.5**	**66.9**	**78.4**	**84.1**	**77.2**	**90**	**75**	**86.1**
METAL	Zinc	mg/kg	24,000	**34.3**	**46.3**	**54.2**	**53**	**50.3**	**112**	**51.2**	**57.5**
CONV	% Dry Solids	Percent	--	**91.8**	--	**92.6**	--	**87.3**	**76.3**	**89.5**	--
CONV	Dry Weight	Percent	--	**91.8**	**86.5**	**92.6**	**86**	**87.3**	**76.3**	**89.5**	**54.8**

Notes:

mg/kg = milligrams per kilogram

U = The analyte was analyzed for, but not detected. The associated numerical val
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and S
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTP
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Le
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA screening levels.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-2

Soil Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-9-1.0-2.0	ALY-SB-9-7.0-8.0	ALY-SB-10-1.0-2.0	ALY-SB-10-6.0-8.0	ALY-SB-11-1.0-2.0	ALY-SB-11-3.0-4.0	ALY-SB-12-1.0-2.0	ALY-SB-12-6.5-7.5
Sample Depth (feet)				1-2	7-8	1-2	6-8	1-2	3-4	1-2	6.5-7.5
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	16-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
VOC	1,1,1,2-Tetrachloroethane	mg/kg	38	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	1,1,1-Trichloroethane	mg/kg	72,000	0.00164 UJ	0.00174 U	0.00221 UJ	0.0023 U	0.00171 U	0.00137 U	0.00241 U	0.417 U
VOC	1,1,2,2-Tetrachloroethane	mg/kg	5	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	1,1,2-Trichloroethane	mg/kg	18	0.00131 UJ	0.00139 U	0.00177 UJ	0.00184 U	0.00137 U	0.00109 U	0.00193 U	0.417 U
VOC	1,1-Dichloroethane	mg/kg	16,000	0.00131 UJ	0.00139 U	0.00177 UJ	0.00184 U	0.00137 U	0.00109 U	0.00193 U	0.417 U
VOC	1,1-Dichloroethene	mg/kg	4,000	**0.0115**	**0.00434**	0.219 U	0.00276 U	**0.00348**	**0.00243**	**0.0126**	0.417 U
VOC	1,1-Dichloropropene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	1,2,3-Trichlorobenzene	mg/kg	--	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 UJ	0.00546 U	0.00965 UJ	8.35 U
VOC	1,2,3-Trichloropropane	mg/kg	0.14	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	1,2,4-Trichlorobenzene	mg/kg	800	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 UJ	0.00546 U	0.00965 UJ	4.17 U
VOC	1,2,4-Trimethylbenzene	mg/kg	4,000	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	1,2-Dibromo-3-chloropropane	mg/kg	0.71	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 UJ	0.00546 U	0.00965 UJ	2.09 U
VOC	1,2-Dibromoethane	mg/kg	0.012	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	1,2-Dichlorobenzene	mg/kg	7,200	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	1,2-Dichloroethane	mg/kg	11	0.000821 U	0.00087 U	0.00111 U	0.00115 U	0.000854 U	0.000683 U	0.00121 U	0.417 U
VOC	1,2-Dichloropropane	mg/kg	15	0.00328 U	0.00348 U	0.00443 U	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	1,3,5-Trimethylbenzene	mg/kg	4,000	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	1,3-Dichlorobenzene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	1,3-Dichloropropane	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	1,4-Dichlorobenzene	mg/kg	42	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	2,2-Dichloropropane	mg/kg	--	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 U	0.00546 U	0.00965 U	0.417 U
VOC	2-Butanone	mg/kg	48,000	**0.0563**	0.0209 U	10.9 U	**0.0491**	**0.0902**	0.0164 U	**0.029**	20.9 U
VOC	2-Chlorotoluene	mg/kg	1,600	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	2-Hexanone	mg/kg	--	0.0197 UJ	0.0209 U	0.0266 UJ	0.0276 U	0.0205 U	0.0164 U	0.029 U	8.35 U
VOC	4-Chlorotoluene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	4-Methyl-2-pentanone	mg/kg	6,400	0.0197 U	0.0209 U	0.0266 U	0.0276 U	0.0205 U	0.0164 U	0.029 U	4.17 U
VOC	Acetone	mg/kg	8,000	**0.528**	**0.0429**	10.9 U	**0.186**	**0.324**	**0.174**	**0.53**	20.9 U
VOC	Benzene	mg/kg	18	0.000985 U	0.00104 U	0.00133 U	0.00138 U	0.00103 U	0.00082 U	0.00145 U	0.0835 U
VOC	Bromobenzene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	Bromochloromethane	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Bromodichloromethane	mg/kg	16	0.00328 U	0.00348 U	0.00443 U	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Bromoform	mg/kg	130	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Bromomethane	mg/kg	110	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 U	0.00546 U	0.00965 U	0.417 U
VOC	Carbon disulfide	mg/kg	8,000	0.00288 U	0.00209 U	0.219 U	0.00276 U	**0.00972**	0.00164 U	0.0029 U	0.417 U
VOC	Carbon tetrachloride	mg/kg	7.7	0.00328 U	0.00348 U	0.00443 U	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Chlorobenzene	mg/kg	1,600	0.00131 UJ	0.00139 U	0.00177 UJ	0.00184 U	0.00137 U	0.00109 U	0.00193 U	0.417 U
VOC	Chloroethane	mg/kg	350	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Chloroform	mg/kg	160	0.00164 UJ	0.00174 U	0.00221 UJ	0.0023 U	0.00171 U	0.00137 U	0.00241 U	0.417 U
VOC	Chloromethane	mg/kg	77	0.00657 UJ	0.00696 UJ	0.00885 UJ	0.00921 UJ	0.00684 U	0.00546 U	0.00965 UJ	2.09 U
VOC	cis-1,2-Dichloroethene	mg/kg	800	0.00197 UJ	0.00209 U	0.00266 UJ	0.00276 U	0.00205 U	0.00164 U	0.0029 U	0.417 U
VOC	cis-1,3-Dichloropropene	mg/kg	--	0.00328 U	0.00348 U	0.00443 U	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Dibromochloromethane	mg/kg	12	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Dibromomethane	mg/kg	800	0.00328 U	0.00348 U	0.00443 U	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	Dichlorodifluoromethane	mg/kg	16,000	0.00328 UJ	0.00348 UJ	0.00443 UJ	0.00461 UJ	0.00342 UJ	0.00273 UJ	0.00483 UJ	0.417 U

TABLE 3-2
Soil Results at Aberdeen Log Yard Property
Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-9-1.0-2.0	ALY-SB-9-7.0-8.0	ALY-SB-10-1.0-2.0	ALY-SB-10-6.0-8.0	ALY-SB-11-1.0-2.0	ALY-SB-11-3.0-4.0	ALY-SB-12-1.0-2.0	ALY-SB-12-6.5-7.5
Sample Depth (feet)				1-2	7-8	1-2	6-8	1-2	3-4	1-2	6.5-7.5
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	16-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
VOC	Ethylbenzene	mg/kg	8,000	0.00263 UJ	0.00278 U	0.00354 UJ	0.00368 U	0.00273 U	0.00219 U	**0.0148**	0.417 U
VOC	Hexachlorobutadiene	mg/kg	13	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 UJ	0.00546 U	0.00965 UJ	8.35 U
VOC	Isopropylbenzene	mg/kg	8,000	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	0.417 U
VOC	m,p-Xylene	mg/kg	160,000	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	--
VOC	Methyl tert-butyl ether	mg/kg	560	0.000657 UJ	0.000696 U	0.000885 UJ	0.000921 U	0.000684 U	0.000546 U	0.000965 U	2.09 U
VOC	Methylene chloride	mg/kg	130	0.00788 UJ	0.00835 U	0.0106 UJ	0.0111 U	0.0082 U	0.00656 U	0.0116 U	8.35 U
VOC	Naphthalene	mg/kg	1,600	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 UJ	0.00546 U	0.00965 UJ	8.35 U
VOC	n-Butylbenzene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	2.09 U
VOC	n-Hexane	mg/kg	4,800	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	2.09 U
VOC	n-Propylbenzene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	o-Xylene	mg/kg	160,000	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	0.00483 U	--
VOC	p-Isopropyltoluene	mg/kg	--	**1.17**	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	**7.16**	0.417 U
VOC	sec-Butylbenzene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	2.09 U
VOC	Styrene	mg/kg	33	0.00164 UJ	0.00174 U	0.00221 UJ	0.0023 U	0.00171 U	0.00137 U	0.00241 U	0.417 U
VOC	tert-Butylbenzene	mg/kg	--	0.00328 UJ	0.00348 U	0.00443 UJ	0.00461 U	0.00342 UJ	0.00273 U	0.00483 UJ	0.417 U
VOC	Tetrachloroethene	mg/kg	1.9	0.00131 UJ	0.00139 U	0.00177 UJ	0.00184 U	0.00137 U	0.00109 U	0.00193 U	0.417 U
VOC	Toluene	mg/kg	6,400	0.000985 UJ	0.00104 U	0.00133 UJ	0.00138 U	0.00103 U	0.00082 U	**0.0108**	0.417 U
VOC	Total Xylenes	mg/kg	16,000	0.00657 UJ	0.00696 U	0.00885 UJ	0.00921 U	0.00684 U	0.00546 U	0.00965 U	1.25 U
VOC	trans-1,2-Dichloroethene	mg/kg	1,600	0.00164 UJ	0.00174 U	0.00221 UJ	0.0023 U	0.00171 U	0.00137 U	0.00241 U	0.417 U
VOC	trans-1,3-Dichloropropene	mg/kg	--	0.000821 UJ	0.00087 U	0.00111 UJ	0.00115 U	0.000854 U	0.000683 U	0.00121 U	0.417 U
VOC	Trichloroethene	mg/kg	11	0.00164 U	0.00174 U	0.00221 U	0.0023 U	0.00171 U	0.00137 U	0.00241 U	0.417 U
VOC	Trichlorofluoromethane	mg/kg	24,000	**0.00742**	0.00348 U	0.00443 UJ	0.00461 U	0.00342 U	0.00273 U	**0.00772**	0.417 U
VOC	Vinyl chloride	mg/kg	0.67	0.00164 UJ	0.00174 U	0.00221 UJ	0.0023 U	0.00171 U	0.00137 U	0.00241 U	0.417 U
PCB	PCB-1016	mg/kg	5.6	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1221	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1232	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1242	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1248	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1254	mg/kg	1.6	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1260	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1262	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
PCB	PCB-1268	mg/kg	--	0.0668 U	--	0.0366 U	--	0.0368 U	--	0.0365 U	--
TPH	Diesel Range Hydrocarbons	mg/kg	* 2,000	**253**	11.4 U	**18.6**	14.7 U	**12**	11.5 U	**170**	19.2 U
TPH	Gasoline Range Hydrocarbons	mg/kg	* 100	**43 J**	7.27 U	11.1 U	13.1 U	6.32 U	6.92 U	**46.6**	20.3 U
TPH	Lube Oil Range Hydrocarbons	mg/kg	* 2,000	**107**	28.6 U	**33.6**	36.8 UC	28 U	28.8 U	**106**	48 U
PAH	1-Methylnaphthalene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	0.00374 U	0.0114 U	0.00363 U	0.0191 U
PAH	2-Methylnaphthalene	mg/kg	320	0.00414 U	0.0114 U	0.0184 U	0.0147 U	0.00374 U	0.0114 U	0.00363 U	0.0191 U
PAH	Acenaphthene	mg/kg	4,800	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.00486**	0.0114 U	0.00363 U	0.0191 U
PAH	Acenaphthylene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	0.00374 U	0.0114 U	0.00363 U	0.0191 U
PAH	Anthracene	mg/kg	24,000	0.00414 U	0.0114 U	0.0184 U	0.0147 UC	**0.0438**	0.0114 U	0.00363 U	0.0191 U
PAH	Benzo (a) anthracene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.0674**	0.0114 U	0.00363 U	**0.0201**
PAH	Benzo (a) pyrene	mg/kg	0.14	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.0423**	0.0114 U	0.00363 U	**0.0215**
PAH	Benzo (b) fluoranthene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.0329**	0.0114 U	0.00363 U	0.0191 U
PAH	Benzo (ghi) perylene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.0202**	0.0114 U	0.00363 U	0.0191 U
PAH	Benzo (k) fluoranthene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.0397**	0.0114 U	0.00363 U	0.0191 U

TABLE 3-2

Soil Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-SB-9-1.0-2.0	ALY-SB-9-7.0-8.0	ALY-SB-10-1.0-2.0	ALY-SB-10-6.0-8.0	ALY-SB-11-1.0-2.0	ALY-SB-11-3.0-4.0	ALY-SB-12-1.0-2.0	ALY-SB-12-6.5-7.5
Sample Depth (feet)				1-2	7-8	1-2	6-8	1-2	3-4	1-2	6.5-7.5
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	16-Dec-08	17-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**								
PAH	Chrysene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.095**	0.0114 U	0.00363 U	**0.0285**
PAH	Dibenz (a,h) anthracene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.00748**	0.0114 U	0.00363 U	0.0191 U
PAH	Fluoranthene	mg/kg	3,200	0.00414 U	0.0114 U	0.0184 U	**0.0153**	**0.184**	0.0114 U	0.00363 U	**0.0351**
PAH	Fluorene	mg/kg	3,200	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.00748**	0.0114 U	0.00363 U	0.0191 U
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	--	0.00414 U	0.0114 U	0.0184 U	0.0147 U	**0.021**	0.0114 U	0.00363 U	0.0191 U
PAH	Naphthalene	mg/kg	1,600	0.00414 U	0.0114 U	0.0184 U	0.0147 U	0.00374 U	0.0114 U	0.00363 U	0.0191 U
PAH	Phenanthrene	mg/kg	--	**0.0133**	0.0114 U	0.0184 U	0.0147 U	**0.113**	0.0114 U	0.00363 U	**0.0311**
PAH	Pyrene	mg/kg	2,400	**0.0995**	0.0114 U	0.0184 U	0.0147 U	**0.314 J**	0.0114 U	0.00363 U	**0.0484**
METAL	Antimony	mg/kg	32	1.77 U	1.69 U	1.49 U	2.21 U	1.68 U	1.54 U	1.54 U	2.34 U
METAL	Arsenic	mg/kg	0.67	**1.35**	**1.82**	**0.706**	**4.95**	**1.7**	**1.9**	**0.987**	**6.59**
METAL	Barium	mg/kg	16,000	**111**	**94.4**	**130**	**47.2**	**38.6**	**191**	**131**	**1010**
METAL	Beryllium	mg/kg	160	0.59 U	0.563 U	0.497 U	0.735 U	0.558 U	**0.908**	0.514 U	0.78 U
METAL	Cadmium	mg/kg	--	0.59 U	0.563 U	0.497 U	0.735 U	0.558 U	**0.554**	0.514 U	0.78 U
METAL	Chromium	mg/kg	--	**8.39**	**26.9**	**5.14**	**38.8**	**21.8**	**47**	**8.29**	**26.3**
METAL	Cobalt	mg/kg	--	**13.3**	**12.7**	**11.4**	**11.5**	**15**	**20.5**	**13**	**8.4**
METAL	Copper	mg/kg	3,000	**18.8**	**31.6**	**10.3**	**51.8**	**63**	**51**	**11**	**135**
METAL	Lead	mg/kg	* 250	**4.83**	**4.13**	**1.86**	**9.82**	**2.67**	**4.26**	**2.64**	**87.7**
METAL	Manganese	mg/kg	11,000	**862**	**293**	**300**	**285**	**345**	**631**	**633**	**4630**
METAL	Mercury	mg/kg	24	0.114 U	0.107 U	0.109 U	0.136 U	0.106 U	0.099 U	0.101 U	0.183 U
METAL	Molybdenum	mg/kg	400	2.95 U	2.82 U	2.48 U	3.68 U	2.79 U	2.57 U	2.57 U	3.9 U
METAL	Nickel	mg/kg	1,600	**9.13**	**20.3**	**5.29**	**25.4**	**28.4**	**32.1**	**6.23**	**28.3**
METAL	Selenium	mg/kg	400	1.18 U	1.13 U	0.994 U	1.47 U	1.12 U	1.03 U	1.03 U	1.56 U
METAL	Silver	mg/kg	400	0.59 U	0.563 U	0.497 U	0.735 U	0.558 U	0.513 U	0.514 U	0.78 U
METAL	Strontium	mg/kg	48,000	**52.2**	**27.7**	**69.6**	**43.8**	**27.9**	**28.9**	**54.7**	**578**
METAL	Thallium	mg/kg	5.6	0.59 U	0.563 U	0.497 U	0.735 U	0.558 U	0.513 U	0.514 U	0.78 U
METAL	Titanium	mg/kg	--	**1100**	**1570**	**1060**	**1370**	**1990**	**2190**	**1110**	**1150**
METAL	Vanadium	mg/kg	560	**75**	**62.4**	**61.1**	**73.8**	**76.1**	**116**	**69.6**	**48.4**
METAL	Zinc	mg/kg	24,000	**42.5**	**42.6**	**38.9**	**78.1**	**50.9**	**57.7**	**45.3**	**250**
CONV	% Dry Solids	Percent	--	**78.5**	--	**90.6**	--	**88.7**	--	**90.9**	--
CONV	Dry Weight	Percent	--	**78.5**	**87.1**	**90.6**	**67.4**	**88.7**	**87**	**90.9**	**52.1**

Notes:

mg/kg = milligrams per kilogram

U = The analyte was analyzed for, but not detected. The associated numerical val
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and S
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTP
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Le
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA screening levels.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-3

December 2008 Groundwater Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				**AM-W-1**	**AM-W-5**	**AM-W-6**	**AM-W-9**	**AM-W-11**	**AM-W-12**
Sample Date				15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**						
VOC	1,1,1,2-Tetrachloroethane	ug/L	1.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1,1-Trichloroethane	ug/L	7,200	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1,2,2-Tetrachloroethane	ug/L	0.22	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	1,1,2-Trichloroethane	ug/L	0.77	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1-Dichloroethane	ug/L	1,600	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1-Dichloroethene	ug/L	400	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1-Dichloropropene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2,3-Trichlorobenzene	ug/L	--	1 U	1 U	1 U	1 U	1 U	1 U
VOC	1,2,3-Trichloropropane	ug/L	0.0063	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	1,2,4-Trichlorobenzene	ug/L	80	1 U	1 U	1 U	1 U	1 U	1 U
VOC	1,2,4-Trimethylbenzene	ug/L	400	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dibromo-3-chloropropane	ug/L	0.031	1 U	1 U	1 U	1 U	1 U	1 U
VOC	1,2-Dibromoethane	ug/L	0.00051	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dichlorobenzene	ug/L	720	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dichloroethane	ug/L	0.48	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dichloropropane	ug/L	0.64	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,3,5-Trimethylbenzene	ug/L	400	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	1,3-Dichlorobenzene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,3-Dichloropropane	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,4-Dichlorobenzene	ug/L	1.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	2,2-Dichloropropane	ug/L	--	0.5 UC	0.5 UC	0.5 UC	0.5 UC	0.5 UC	0.5 UC
VOC	2-Butanone	ug/L	4,800	2 U	2 U	2 U	2 U	2 U	2 U
VOC	2-Chlorotoluene	ug/L	160	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	2-Hexanone	ug/L	--	2 U	2 U	2 U	2 U	2 U	2 U
VOC	4-Chlorotoluene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	4-Methyl-2-pentanone	ug/L	640	2 U	2 U	2 U	2 U	2 U	2 U
VOC	Acetone	ug/L	800	10 U	10 U	10 U	10 U	**16.2**	10 U
VOC	Benzene	ug/L	0.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Bromobenzene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Bromochloromethane	ug/L	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
VOC	Bromodichloromethane	ug/L	0.71	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Bromoform	ug/L	5.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

TABLE 3-3

December 2008 Groundwater Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID				**AM-W-1**	**AM-W-5**	**AM-W-6**	**AM-W-9**	**AM-W-11**	**AM-W-12**
Sample Date				15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**						
VOC	Bromomethane	ug/L	11	2 U	2 U	2 U	2 U	2 U	2 U
VOC	Carbon disulfide	ug/L	800	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Carbon tetrachloride	ug/L	0.34	0.2 UC	0.2 UC	0.2 UC	0.2 UC	0.2 UC	0.2 UC
VOC	Chlorobenzene	ug/L	160	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Chloroethane	ug/L	15	1 U	1 U	1 U	1 U	1 U	1 U
VOC	Chloroform	ug/L	7.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Chloromethane	ug/L	3.4	1 U	1 U	1 U	1 U	1 U	1 U
VOC	cis-1,2-Dichloroethene	ug/L	80	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	cis-1,3-Dichloropropene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Dibromochloromethane	ug/L	0.52	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Dibromomethane	ug/L	80	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Dichlorodifluoromethane	ug/L	1,600	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
VOC	Ethylbenzene	ug/L	800	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Hexachlorobutadiene	ug/L	0.56	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ
VOC	Isopropylbenzene	ug/L	800	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	m,p-Xylene	ug/L	16,000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Methyl tert-butyl ether	ug/L	24	1 U	1 U	1 U	1 U	1 U	1 U
VOC	Methylene chloride	ug/L	5.8	5 U	5 U	5 U	5 U	5 U	5 U
VOC	Naphthalene	ug/L	160	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
VOC	n-Butylbenzene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	n-Hexane	ug/L	480	1 U	1 U	1 U	1 U	1 U	1 U
VOC	n-Propylbenzene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	o-Xylene	ug/L	16,000	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
VOC	p-Isopropyltoluene	ug/L	--	0.2 U	0.2 U	**0.38**	0.2 U	0.2 U	0.2 U
VOC	sec-Butylbenzene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Styrene	ug/L	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	tert-Butylbenzene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Tetrachloroethene	ug/L	0.081	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

TABLE 3-3

December 2008 Groundwater Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID					AM-W-1	AM-W-5	AM-W-6	AM-W-9	AM-W-11	AM-W-12
Sample Date					15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**		**MTCA B**						
VOC	Toluene	ug/L		640	0.2 U	0.2 U	**0.55**	0.2 U	**0.47**	0.2 U
VOC	Total Xylenes	ug/L		1,600	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
VOC	trans-1,2-Dichloroethene	ug/L		160	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	trans-1,3-Dichloropropene	ug/L		--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Trichloroethene	ug/L		0.49	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Trichlorofluoromethane	ug/L		2,400	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Vinyl chloride	ug/L		0.029	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TPH	Diesel Range Hydrocarbons	ug/L	*	500	250 U	248 U	243 U	245 U	240 U	248 U
TPH	Gasoline Range Hydrocarbons	ug/L	*	1,000	50 U	50 U	50 U	50 U	50 U	50 U
TPH	Lube Oil Range Hydrocarbons	ug/L	*	500	500 U	495 U	485 U	490 U	481 U	495 U
PAH	1-Methylnaphthalene	ug/L		--	0.098 UJ	--	--	--	--	0.099 U
PAH	2-Methylnaphthalene	ug/L		32	0.098 UJ	--	--	--	--	0.099 U
PAH	Acenaphthene	ug/L		960	0.098 UJ	--	--	--	--	0.099 U
PAH	Acenaphthylene	ug/L		--	0.098 UJ	--	--	--	--	0.099 U
PAH	Anthracene	ug/L		4,800	0.098 UJ	--	--	--	--	0.099 U
PAH	Benzo (a) anthracene	ug/L		--	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Benzo (a) pyrene	ug/L		0.012	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Benzo (b) fluoranthene	ug/L		--	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Benzo (ghi) perylene	ug/L		--	0.098 UJ	--	--	--	--	0.099 U
PAH	Benzo (k) fluoranthene	ug/L		--	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Chrysene	ug/L		--	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Dibenz (a,h) anthracene	ug/L		--	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Fluoranthene	ug/L		640	0.098 UJ	--	--	--	--	0.099 U
PAH	Fluorene	ug/L		640	0.098 UJ	--	--	--	--	0.099 U
PAH	Indeno (1,2,3-cd) pyrene	ug/L		--	0.0098 UJ	--	--	--	--	0.0099 U
PAH	Naphthalene	ug/L		160	0.098 UJ	--	--	--	--	**0.204**
PAH	Phenanthrene	ug/L		--	0.098 UJ	--	--	--	--	0.099 U
PAH	Pyrene	ug/L		480	0.098 UJ	--	--	--	--	0.099 U
METAL	Antimony	ug/L		6.4	3 U	3 U	3 U	3 U	3 U	3 U
METAL	Arsenic	ug/L		0.058	**49.3**	**3.67**	**6.62**	**39.4**	**21.7**	**4.37**
METAL	Barium	ug/L		3,200	**29.4**	**49.2**	**29.2**	**20.2**	**214**	**274**

TABLE 3-3

December 2008 Groundwater Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID					AM-W-1	AM-W-5	AM-W-6	AM-W-9	AM-W-11	AM-W-12
Sample Date					15-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08	16-Dec-08
Chemical Group	**Analyte**	**Units**		**MTCA B**						
METAL	Beryllium	ug/L		32	1 U	1 U	1 U	1 U	**1.73**	1 U
METAL	Cadmium	ug/L		8	1 U	1 U	1 U	1 U	**1.63**	1 U
METAL	Chromium	ug/L	*	50	**31.2**	**5.68**	**9.19**	**13**	**205**	**23.4**
METAL	Cobalt	ug/L		--	**8.48**	**3.52**	**6.61**	**6.47**	**54.1**	**7.29**
METAL	Copper	ug/L		590	**45**	**6.91**	**11.9**	**22.4**	**213**	**35.4**
METAL	Lead	ug/L	*	15	**4.63**	**1.13**	**1.69**	**4.26**	**56.1**	**14.6**
METAL	Manganese	ug/L		2,200	**692**	**1990**	**7660**	**684**	**3850**	**2220**
METAL	Mercury	ug/L		4.8	0.2 U	0.2 U	0.2 U	**0.384**	**0.275**	0.2 U
METAL	Molybdenum	ug/L		80	**5.46**	5 U	5 U	5 U	**23.3**	5 U
METAL	Nickel	ug/L		--	**16.4**	**4.48**	**8.35**	**10.9**	**114**	**14.5**
METAL	Selenium	ug/L		80	**1.8**	**1.46**	1 U	1 U	**2.81**	**3.96**
METAL	Silver	ug/L		80	1 UJ	1 U	1 U	1 U	1 U	1 U
METAL	Thallium	ug/L		1.1	1 U	1 U	1 U	1 U	1 U	1 U
METAL	Titanium	ug/L		--	**1360**	**293**	**606**	**910**	**5400**	**1230**
METAL	Vanadium	ug/L		110	**78.2**	**12.9**	**21.6**	**32.2**	**261**	**57.7**
METAL	Zinc	ug/L		4,800	**48.9**	**12.8**	**21.3**	**25.6**	**547**	**77.1**

Notes:

ug/L = micrograms per liter

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-4

December 2008 Groundwater Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				ALY-W-2	ALY-W-3	ALY-W-7	ALY-W-11	ALY-W-12
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**					
VOC	1,1,1,2-Tetrachloroethane	ug/L	1.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1,1-Trichloroethane	ug/L	7,200	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1,2,2-Tetrachloroethane	ug/L	0.22	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	1,1,2-Trichloroethane	ug/L	0.77	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1-Dichloroethane	ug/L	1,600	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1-Dichloroethene	ug/L	400	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,1-Dichloropropene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2,3-Trichlorobenzene	ug/L	--	1 U	1 U	1 U	1 U	1 U
VOC	1,2,3-Trichloropropane	ug/L	0.0063	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	1,2,4-Trichlorobenzene	ug/L	80	1 U	1 U	1 U	1 U	1 U
VOC	1,2,4-Trimethylbenzene	ug/L	400	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dibromo-3-chloropropane	ug/L	0.031	1 U	1 U	1 U	1 U	1 U
VOC	1,2-Dibromoethane	ug/L	0.00051	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dichlorobenzene	ug/L	720	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dichloroethane	ug/L	0.48	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,2-Dichloropropane	ug/L	0.64	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,3,5-Trimethylbenzene	ug/L	400	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	1,3-Dichlorobenzene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,3-Dichloropropane	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	1,4-Dichlorobenzene	ug/L	1.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	2,2-Dichloropropane	ug/L	--	0.5 UC	0.5 UC	0.5 UC	0.5 UC	0.5 UC
VOC	2-Butanone	ug/L	4,800	2 U	2 U	2 U	2 U	2 U
VOC	2-Chlorotoluene	ug/L	160	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	2-Hexanone	ug/L	--	2 U	2 U	2 U	2 U	2 U
VOC	4-Chlorotoluene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	4-Methyl-2-pentanone	ug/L	640	2 U	2 U	2 U	2 U	2 U

TABLE 3-4

December 2008 Groundwater Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				**ALY-W-2**	**ALY-W-3**	**ALY-W-7**	**ALY-W-11**	**ALY-W-12**
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**					
VOC	Acetone	ug/L	800	10 U	10 U	10 U	10 U	10 U
VOC	Benzene	ug/L	0.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Bromobenzene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Bromochloromethane	ug/L	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
VOC	Bromodichloromethane	ug/L	0.71	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Bromoform	ug/L	5.5	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
VOC	Bromomethane	ug/L	11	2 U	2 U	2 U	2 U	2 U
VOC	Carbon disulfide	ug/L	800	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Carbon tetrachloride	ug/L	0.34	0.2 UC	0.2 UC	0.2 UC	0.2 UC	0.2 UC
VOC	Chlorobenzene	ug/L	160	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Chloroethane	ug/L	15	1 U	1 U	1 U	1 U	1 U
VOC	Chloroform	ug/L	7.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Chloromethane	ug/L	3.4	1 U	1 U	1 U	1 U	1 U
VOC	cis-1,2-Dichloroethene	ug/L	80	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	cis-1,3-Dichloropropene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Dibromochloromethane	ug/L	0.52	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Dibromomethane	ug/L	80	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Dichlorodifluoromethane	ug/L	1,600	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
VOC	Ethylbenzene	ug/L	800	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Hexachlorobutadiene	ug/L	0.56	2.5 U	2.5 U	2.5 U	2.5 U	2.5 UJ
VOC	Isopropylbenzene	ug/L	800	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	m,p-Xylene	ug/L	16,000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Methyl tert-butyl ether	ug/L	24	1 U	1 U	1 U	1 U	1 U
VOC	Methylene chloride	ug/L	5.8	5 U	5 U	5 U	5 U	5 U
VOC	Naphthalene	ug/L	160	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
VOC	n-Butylbenzene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

TABLE 3-4

December 2008 Groundwater Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				**ALY-W-2**	**ALY-W-3**	**ALY-W-7**	**ALY-W-11**	**ALY-W-12**
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**					
VOC	n-Hexane	ug/L	480	1 U	1 U	1 U	1 U	1 U
VOC	n-Propylbenzene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	o-Xylene	ug/L	16,000	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
VOC	p-Isopropyltoluene	ug/L	--	0.2 U	**0.54**	**2.86**	0.2 U	**10.4**
VOC	sec-Butylbenzene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Styrene	ug/L	1.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	tert-Butylbenzene	ug/L	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Tetrachloroethene	ug/L	0.081	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Toluene	ug/L	640	**0.29**	**2.06**	**0.34**	0.2 U	0.2 U
VOC	Total Xylenes	ug/L	1,600	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
VOC	trans-1,2-Dichloroethene	ug/L	160	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	trans-1,3-Dichloropropene	ug/L	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Trichloroethene	ug/L	0.49	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
VOC	Trichlorofluoromethane	ug/L	2,400	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
VOC	Vinyl chloride	ug/L	0.029	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
TPH	Diesel Range Hydrocarbons	ug/L	* 500	250 U	248 U	243 U	243 U	248 U
TPH	Gasoline Range Hydrocarbons	ug/L	* 1,000	50 U	50 U	50 U	50 U	50 U
TPH	Lube Oil Range Hydrocarbons	ug/L	* 500	500 U	495 U	485 U	485 U	495 U
PAH	1-Methylnaphthalene	ug/L	--	--	--	--	--	0.1 U
PAH	2-Methylnaphthalene	ug/L	32	--	--	--	--	0.1 U
PAH	Acenaphthene	ug/L	960	--	--	--	--	0.1 U
PAH	Acenaphthylene	ug/L	--	--	--	--	--	0.1 U
PAH	Anthracene	ug/L	4,800	--	--	--	--	0.1 U
PAH	Benzo (a) anthracene	ug/L	--	--	--	--	--	0.01 U
PAH	Benzo (a) pyrene	ug/L	0.012	--	--	--	--	0.01 U

TABLE 3-4

December 2008 Groundwater Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				**ALY-W-2**	**ALY-W-3**	**ALY-W-7**	**ALY-W-11**	**ALY-W-12**
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**					
PAH	Benzo (b) fluoranthene	ug/L	--	--	--	--	--	0.01 U
PAH	Benzo (ghi) perylene	ug/L	--	--	--	--	--	0.1 U
PAH	Benzo (k) fluoranthene	ug/L	--	--	--	--	--	0.01 U
PAH	Chrysene	ug/L	--	--	--	--	--	0.01 U
PAH	Dibenz (a,h) anthracene	ug/L	--	--	--	--	--	0.01 U
PAH	Fluoranthene	ug/L	640	--	--	--	--	0.1 U
PAH	Fluorene	ug/L	640	--	--	--	--	0.1 U
PAH	Indeno (1,2,3-cd) pyrene	ug/L	--	--	--	--	--	0.01 U
PAH	Naphthalene	ug/L	160	--	--	--	--	0.1 U
PAH	Phenanthrene	ug/L	--	--	--	--	--	0.1 U
PAH	Pyrene	ug/L	480	--	--	--	--	0.1 U
METAL	Antimony	ug/L	6.4	3 U	6 U	3 U	3 U	**5.43**
METAL	Arsenic	ug/L	0.058	**15.6**	**13.8**	**29.7**	**3.58**	**6.56**
METAL	Barium	ug/L	3,200	**22.2**	**626**	**221**	**142**	**538**
METAL	Beryllium	ug/L	32	1 U	2 U	**1.49**	1 U	1 U
METAL	Cadmium	ug/L	8	1 U	2 U	**1.15**	1 U	1 U
METAL	Chromium	ug/L *	50	**7.43**	**130**	**144**	**35.5**	**14**
METAL	Cobalt	ug/L	--	**3.39**	**75.4**	**39.1**	**16.4**	**6.53**
METAL	Copper	ug/L	590	**10.7**	**133**	**131**	**62.3**	**45.2**
METAL	Lead	ug/L *	15	**1.47**	**38.8**	**72.3**	**8.45**	**19.9**
METAL	Manganese	ug/L	2,200	**2080**	**3940**	**4220**	**1210**	**5130**
METAL	Mercury	ug/L	4.8	**1.36**	0.2 U	0.2 U	0.2 U	0.2 U
METAL	Molybdenum	ug/L	80	5 U	**11.4**	**16.3**	5 U	5 U
METAL	Nickel	ug/L	--	**5.22**	**78**	**61**	**29.9**	**11.8**
METAL	Selenium	ug/L	80	1 U	**4.98**	**9.99**	**1.16**	**3.13**
METAL	Silver	ug/L	80	1 U	2 U	1 U	1 U	1 U

TABLE 3-4

December 2008 Groundwater Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID				**ALY-W-2**	**ALY-W-3**	**ALY-W-7**	**ALY-W-11**	**ALY-W-12**
Sample Date				17-Dec-08	17-Dec-08	17-Dec-08	16-Dec-08	17-Dec-08
Chemical Group	**Analyte**	**Units**	**MTCA B**					
METAL	Thallium	ug/L	1.1	1 U	2 U	2 U	1 U	1 U
METAL	Titanium	ug/L	--	**427**	**8290**	**6080**	**3160**	**964**
METAL	Vanadium	ug/L	110	**17.5**	**399**	**350**	**108**	**59.3**
METAL	Zinc	ug/L	4,800	**12.5**	**309**	**227**	**68.3**	**56.9**

Notes:

ug/L = micrograms per liter

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).
J = The analyte was positively identified; the quantitation is an estimation.
CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
* MTCA = Model Toxics Control Act Method A Cleanup Level.

= detected results exceeds MTCA.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-5

January 2009 Groundwater Results for All Properties

Pontoon Site, WSDOT SR 520

					Aberdeen Log Yard			Anderson & Middleton			IDD#1	
Sample ID					**H-2P-08**	**H-3P-08**	**FD-2 (H-3P-08)**	**H-5P-08**	**H-8P-08**	**FD-1 (H-8P-08)**	**MW-1**	**MW-5**
Sample Date					22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09
Chemical Group	**Analyte**	**Units**	**MTCA B**	**SW Marine Chronic**								
METAL	Antimony	ug/L	6.4	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
METAL	Arsenic	ug/L	0.058	36	**2.98**	**2.37**	**2.76**	**2.03**	**3.02**	**2.86**	**2.31**	**1.78**
METAL	Barium	ug/L	3,200	--	**124**	**82.2**	**85**	**50.1**	**77.9**	**83.2**	**43.4**	**54.1**
METAL	Beryllium	ug/L	32	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL	Cadmium	ug/L	8	9.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL	Chromium	ug/L	50	50	**2.13**	**2.76**	**2.72**	**2.54 J**	**4.59 J**	**4.76 J**	**1.34 J**	**1.99 J**
METAL	Cobalt	ug/L	--	--	**1.56**	**2.63**	**2.78**	**3.26**	**3.01**	**3.14**	**1.77**	**1.46**
METAL	Copper	ug/L	590	3.1	**2.51**	**2.76**	**2.61**	**2.14**	**6.84**	**7.55**	**3.5**	**1.73**
METAL	Lead	ug/L	15	8.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL	Manganese	ug/L	2,200	--	**1030**	**867**	**925**	**115**	**322**	**335**	**1040**	**331**
METAL	Mercury	ug/L	4.8	0.025	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 UJ	0.2 UJ	0.2 U	0.2 U
METAL	Molybdenum	ug/L	80	--	**7.61**	**5.07**	**5.5**	5 U	5 U	5 U	5 U	5 U
METAL	Nickel	ug/L	320	8.2	**1.98**	**2.16**	**2.18**	**1.18**	**3.96**	**3.96**	**2.14**	**1.36**
METAL	Selenium	ug/L	80	71	**7.96 J**	**8.87 J**	**10.1 J**	**9.7 J**	**13.6 J**	**13.4 J**	**12.5 J**	**10.4 J**
METAL	Silver	ug/L	80	1.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL	Strontium	ug/L	9,600	--	**1750**	**1300**	**1390**	**1560**	**3120**	**3370**	**2630**	**1480**
METAL	Thallium	ug/L	1.1	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL	Titanium	ug/L	--	--	**19.8**	**29.2**	**29**	**27.7**	**221**	**224 J**	**10.2**	**10.9**
METAL	Vanadium	ug/L	110	--	**2.42 J**	**4.06 J**	**4.14 J**	**4.69 J**	**8.1 J**	**8.72 J**	**1.52 J**	**2.78 J**
METAL	Zinc	ug/L	4,800	81	**28.7**	20 U	**28.7**	20 U	**21.5**	**17.8**	**21.5**	20 U
METAL_D	Antimony	ug/L	6.4	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
METAL_D	Arsenic	ug/L	0.058	36	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
METAL_D	Barium	ug/L	3,200	--	**122**	**75.6**	**76.3**	**32.7**	**74**	**76**	**27.9**	**51.4**
METAL_D	Beryllium	ug/L	32	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL_D	Cadmium	ug/L	8	9.3	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL_D	Chromium	ug/L *	50	50	10 U	10 U	10 U	**13.2 J**	**13.2 J**	**12.6 J**	**13.9 J**	**11.8 J**
METAL_D	Cobalt	ug/L	--	--	**1.38**	**2.34**	**2.39**	**3.08**	**1.96**	**1.89**	**1.59**	**1.4**
METAL_D	Copper	ug/L	590	3.1	**1.88**	**1.35**	**1.4**	**1.73**	**3.73**	**3.63**	**3.28**	**1.59**
METAL_D	Lead	ug/L *	15	8.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL_D	Manganese	ug/L	2,200	--	**946**	**814**	**814**	**115**	**328**	**333**	**930**	**345**
METAL_D	Mercury	ug/L	4.8	0.025	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ	0.2 U	0.2 U
METAL_D	Molybdenum	ug/L	80	--	**6.64**	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METAL_D	Nickel	ug/L	320	8.2	**1.73**	**1.65**	**1.63**	1 U	**2.21**	**2.08**	**1.94**	**1.27**
METAL_D	Selenium	ug/L	80	71	**19.4 J**	**18 J**	**16 J**	**17.8 J**	**41.6 J**	**41.7 J**	**27.9 J**	**21.8 J**
METAL_D	Silver	ug/L	80	1.9	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TABLE 3-5

January 2009 Groundwater Results for All Properties

Pontoon Site, WSDOT SR 520

					Aberdeen Log Yard			Anderson & Middleton			IDD#1	
Sample ID					**H-2P-08**	**H-3P-08**	**FD-2 (H-3P-08)**	**H-5P-08**	**H-8P-08**	**FD-1 (H-8P-08)**	**MW-1**	**MW-5**
Sample Date					22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09	22-Jan-09
Chemical Group	**Analyte**	**Units**	**MTCA B**	**SW Marine Chronic**								
METAL_D	Strontium	ug/L	9,600	--	**1750**	**1280**	**1300**	**1440**	**3120**	**3150**	**2520**	**1460**
METAL_D	Thallium	ug/L	1.1	--	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METAL_D	Titanium	ug/L	--	--	**6.99**	**7.23**	**8.44**	**14.4**	**11.4**	**12.4**	**5.18**	**10.1**
METAL_D	Vanadium	ug/L	110	--	**12.4 J**	**13.6 J**	**13.1 J**	**18.7 J**	**16.8 J**	**15.4 J**	**13.5 J**	**15 J**
METAL_D	Zinc	ug/L	4,800	81	10 U	10 U	10 U	10 U	10 U	10 U	**12.2**	10 U
CONV	Hexavalent Chromium	ug/L	--	--	**19**	5 U	--	**5**	**22 J**	**8 J**	**6**	5 U
CONV	Total Dissolved Solids	ug/L	--	--	**5100000**	**4200000**	--	**7000000**	**13000000**	--	**8300000**	**5700000**
CONV	Total Organic Carbon	ug/L	--	--	**29000**	**28000**	--	**29000**	**21000**	--	**39000**	**24000**
CONV	Total Suspended Solids	ug/L	--	--	**72000**	**62000**	--	**14000**	**120000**	--	**40000**	**16000**

Notes:

ug/L = micrograms per liter

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).
J = The analyte was positively identified; the quantitation is an estimation.

METAL = Total Metals using SW6020 and SW7470A.
METAL_D = Dissolved Metals using SW6020 and SW7470A.
CONV = general chemistry

SW Marine chronic = Surface water criteria marine chronic (WAC 173-201A Table 240(3) Toxics Subsurances Criteria), except for silver which is acute.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
* MTCA = Model Toxics Control Act Method A Cleanup Level.
= detected results exceeds MTCA.
= detected results exceeds SW Marine Chronic.
= detected results exceeds both MTCA and SW Marine Chronic.
BOLDED results = detected at or above laboratory reporting limits

TABLE 3-6

Soil Dioxin/Furans Analytical Results at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Sample ID			**AM-SB-7-1.5-3.0**	**AM-SB-10-0.0-3.0**	**AM-SB-11-1.0-2.0**
Sample Depth (feet)			1.5-3	0-3	1-2
Sample Date			15-Dec-08	15-Dec-08	16-Dec-08
Analyte	**Units**	**MTCA B**			
1,2,3,4,6,7,8-HpCDD	pg/g	--	0.15 U	0.63 U	**3.9**
Total TCDF	pg/g	--	0.82 U	0.55 U	0.47 U
Total HpCDF	pg/g	--	0.1 U	0.64 U	0.39 U
1,2,3,7,8,9-HxCDD	pg/g	--	0.17 U	0.14 U	1.7 U
Total HpCDD	pg/g	--	0.23 U	0.65 U	**12**
1,2,3,4,6,7,8-HpCDF	pg/g	--	0.1 U	0.4 U	0.39 U
1,2,3,4,7,8-HxCDD	pg/g	--	0.2 U	0.16 U	0.69 U
1,2,3,4,7,8,9-HpCDF	pg/g	--	0.087 U	0.11 U	0.088 U
1,2,3,6,7,8-HxCDD	pg/g	--	0.17 U	0.15 U	0.54 U
1,2,3,4,7,8-HxCDF	pg/g	--	0.19 U	0.14 U	0.15 U
1,2,3,6,7,8-HxCDF	pg/g	--	0.17 U	0.14 U	0.15 U
Total HxCDD	pg/g	--	0.2 U	0.16 U	**14**
1,2,3,7,8,9-HxCDF	pg/g	--	0.16 U	0.14 U	0.15 U
Total HxCDF	pg/g	--	0.19 U	0.14 U	0.15 U
OCDD	pg/g	--	1 U	**7.6**	**22**
OCDF	pg/g	--	0.35 U	0.84 U	0.44 U
1,2,3,7,8-PeCDD	pg/g	--	0.32 U	0.31 U	0.95 U
2,3,4,6,7,8-HxCDF	pg/g	--	0.16 U	0.11 U	0.14 U
Total PeCDD	pg/g	--	0.32 U	0.31 U	**8**
1,2,3,7,8-PeCDF	pg/g	--	0.19 U	0.15 U	0.18 U
2,3,4,7,8-PeCDF	pg/g	--	0.2 U	0.16 U	0.19 U
2,3,7,8-TCDF	pg/g	--	0.82 U	0.55 U	0.47 U
Total PeCDF	pg/g	--	0.7 U	0.54 U	0.47 U
2,3,7,8-TCDD	pg/g	11	0.38 U	0.36 U	**6.5**
Total TCDD	pg/g	--	0.38 U	0.36 U	**13**
TEQ*	pg/g	--	ND	**0.0023**	**6.5**
Percent Moisture	percent	--	**25.4**	**12.8**	**14.4**

Notes:

pg/g = picograms per gram

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).

BOLDED results = detected at or above laboratory reporting limits

* TEQ = Toxicity Equivalent [calculated using WHO 2005 toxic equivalency factors (TEFs)]

TABLE 3-7

Soil Dioxin/Furans Analytical Results at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Sample ID			**ALY-SB-8-1.0-2.0**	**ALY-SB-9-1.0-2.0**	**ALY-SB-12-1.0-2.0**
Sample Depth (feet)			1-2	1-2	1-2
Sample Date			17-Dec-08	17-Dec-08	17-Dec-08
Analyte	**Units**	**MTCA B**			
1,2,3,4,6,7,8-HpCDD	pg/g	--	**5.6 J**	**3.5**	0.4 U
Total TCDF	pg/g	--	10 UJ	**17 J**	0.42 U
Total HpCDF	pg/g	--	**9.8 J**	1.3 U	0.31 U
1,2,3,7,8,9-HxCDD	pg/g	--	**3.3 J**	0.37 U	0.12 U
Total HpCDD	pg/g	--	**5.6 J**	**7.8**	0.46 U
1,2,3,4,6,7,8-HpCDF	pg/g	--	**6.4 J**	0.8 U	0.2 U
1,2,3,4,7,8-HxCDD	pg/g	--	2.2 UJ	0.16 U	0.13 U
1,2,3,4,7,8,9-HpCDF	pg/g	--	**3.4 J**	0.13 U	0.072 U
1,2,3,6,7,8-HxCDD	pg/g	--	2.6 UJ	0.15 U	0.12 U
1,2,3,4,7,8-HxCDF	pg/g	--	2.6 UJ	0.13 U	0.11 U
1,2,3,6,7,8-HxCDF	pg/g	--	2.6 UJ	0.13 U	0.11 U
Total HxCDD	pg/g	--	**3.3 J**	0.83 U	0.2 U
1,2,3,7,8,9-HxCDF	pg/g	--	2.4 UJ	0.14 U	0.1 U
Total HxCDF	pg/g	--	**3 J**	0.32 U	0.11 U
OCDD	pg/g	--	**28 J**	**27**	2.4 U
OCDF	pg/g	--	**13 J**	1.2 U	0.36 U
1,2,3,7,8-PeCDD	pg/g	--	2.2 UJ	0.27 U	0.26 U
2,3,4,6,7,8-HxCDF	pg/g	--	**3 J**	0.13 U	0.1 U
Total PeCDD	pg/g	--	2.2 UJ	0.28 U	0.26 U
1,2,3,7,8-PeCDF	pg/g	--	1.5 UJ	0.18 U	0.13 U
2,3,4,7,8-PeCDF	pg/g	--	2 UJ	0.2 U	0.15 U
2,3,7,8-TCDF	pg/g	--	0.88 UJ	4.5 U	0.42 U
Total PeCDF	pg/g	--	7.2 UJ	2.4 U	0.36 U
2,3,7,8-TCDD	pg/g	11	0.7 UJ	0.79 U	0.24 U
Total TCDD	pg/g	--	3.5 UJ	**7.4 J**	0.24 U
TEQ*	pg/g	--	**0.80**	**0.043**	ND
Percent Moisture	percent	--	**12.4**	**26.2**	**9.2**

Notes:

pg/g = picograms per gram

U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the sample-specific method detection limit (MDL).

BOLDED results = detected at or above laboratory reporting limits

* TEQ = Toxicity Equivalent [calculated using WHO 2005 toxic equivalency factors (TEFs)]

TABLE 4-1

Summary of Constituents Detected in Soil at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B	Number of Detects > MTCA B	Number of Nondetects > MTCA B
										MTCA B		
VOC	1,1-Dichloroethene	mg/kg	2	24	8%	0.00202	0.321	0.0021	0.00321	4,000	--	--
VOC	2-Butanone	mg/kg	6	24	25%	0.0176	16.1	0.0273	0.067	48,000	--	--
VOC	Acetone	mg/kg	11	24	46%	0.027	16.1	0.0873	0.66	8,000	--	--
VOC	Benzene	mg/kg	2	24	8%	0.000878	0.0266	0.129	0.353	18	--	--
VOC	Carbon disulfide	mg/kg	1	24	4%	0.00176	0.321	0.00551	0.00551	8,000	--	--
VOC	p-Isopropyltoluene	mg/kg	1	24	4%	0.00293	0.192	0.401	0.401	--	--	--
VOC	Toluene	mg/kg	3	24	13%	0.000878	0.162	0.00169	1.21	6,400	--	--
TPH	Diesel Range Hydrocarbons	mg/kg	13	24	54%	11.2	16	23.3	183	2,000	--	--
TPH	Lube Oil Range Hydrocarbons	mg/kg	12	24	50%	28	40	42.3	1580	2,000	--	--
PAH	1-Methylnaphthalene	mg/kg	1	24	4%	0.00358	0.0183	0.0315	0.0315	--	--	--
PAH	2-Methylnaphthalene	mg/kg	1	24	4%	0.00358	0.0183	0.0334	0.0334	320	--	--
PAH	Benzo (a) anthracene	mg/kg	3	24	13%	0.00358	0.0183	0.0141	0.0457	--	--	--
PAH	Benzo (a) pyrene	mg/kg	3	24	13%	0.00358	0.0185	0.0155	0.0403	0.14	--	--
PAH	Benzo (b) fluoranthene	mg/kg	3	24	13%	0.00358	0.0185	0.00511	0.0255	--	--	--
PAH	Benzo (ghi) perylene	mg/kg	1	24	4%	0.00358	0.0185	0.0147	0.0147	--	--	--
PAH	Benzo (k) fluoranthene	mg/kg	1	24	4%	0.00358	0.0185	0.0291	0.0291	--	--	--
PAH	Chrysene	mg/kg	9	24	38%	0.00385	0.0183	0.00359	0.0593	--	--	--
PAH	Fluoranthene	mg/kg	10	24	42%	0.00358	0.0183	0.00402	0.0371	3,200	--	--
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	1	24	4%	0.00358	0.0185	0.0169	0.0169	--	--	--
PAH	Phenanthrene	mg/kg	8	24	33%	0.00358	0.0183	0.0044	0.0593	--	--	--
PAH	Pyrene	mg/kg	9	24	38%	0.00358	0.0183	0.00417	0.0519	2,400	--	--
METAL	Arsenic	mg/kg	20	24	83%	0.534	0.662	0.599	8.53	0.67	18	--
METAL	Barium	mg/kg	24	24	100%	--	--	27.9	192	16,000	--	--
METAL	Beryllium	mg/kg	11	24	46%	0.517	0.667	0.568	1.16	160	--	--
METAL	Cadmium	mg/kg	7	24	29%	0.451	0.702	0.548	0.976	--	--	--
METAL	Chromium	mg/kg	24	24	100%	--	--	10.1	90.2	--	--	--
METAL	Cobalt	mg/kg	24	24	100%	--	--	11.1	63.7	--	--	--
METAL	Copper	mg/kg	24	24	100%	--	--	20.3	290	3,000	--	--

TABLE 4-1

Summary of Constituents Detected in Soil at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B: MTCA B	MTCA B: Number of Detects > MTCA B	MTCA B: Number of Nondetects > MTCA B
METAL	Lead	mg/kg	24	24	100%	--	--	0.793	22.8	250	--	--
METAL	Manganese	mg/kg	24	24	100%	--	--	355	2590	11,000	--	--
METAL	Nickel	mg/kg	24	24	100%	--	--	15.7	78.9	1,600	--	--
METAL	Silver	mg/kg	1	24	4%	0.451	0.667	0.702	0.702	400	--	--
METAL	Strontium	mg/kg	24	24	100%	--	--	27.3	216	48,000	--	--
METAL	Titanium	mg/kg	24	24	100%	--	--	160	4740	--	--	--
METAL	Vanadium	mg/kg	24	24	100%	--	--	54.9	235	560	--	--
METAL	Zinc	mg/kg	24	24	100%	--	--	58.6	144	24,000	--	--
CONV	% Dry Solids	percent	11	11	100%	--	--	79.9	91.7	--	--	--
CONV	Dry Weight	percent	24	24	100%	--	--	62.5	91.7	--	--	--

Notes:

mg/kg = milligrams per kilogram

CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
MDL = method detection limit
= detected results exceeds MTCA or SW Marine Chronic.

TABLE 4-2

Summary of Constituents Detected in Soil at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B: MTCA B	MTCA B: Number of Detects > MTCA B	MTCA B: Number of Nondetects > MTCA B
VOC	1,1-Dichloroethene	mg/kg	11	24	46%	0.00201	0.417	0.00176	0.0126	4,000	--	--
VOC	2-Butanone	mg/kg	8	24	33%	0.0164	20.9	0.029	0.183	48,000	--	--
VOC	Acetone	mg/kg	17	24	71%	7.11	20.9	0.0429	1.28	8,000	--	--
VOC	Carbon disulfide	mg/kg	6	24	25%	0.00164	0.417	0.00215	0.00972	8,000	--	--
VOC	Ethylbenzene	mg/kg	3	24	13%	0.00219	0.417	0.00623	0.0579	8,000	--	--
VOC	Isopropylbenzene	mg/kg	1	24	4%	0.00273	0.417	0.0125	0.0125	8,000	--	--
VOC	m,p-Xylene	mg/kg	1	19	5%	0.00273	0.00589	0.0753	0.0753	160,000	--	--
VOC	p-Isopropyltoluene	mg/kg	4	24	17%	0.00273	0.417	0.0142	7.16	--	--	--
VOC	Toluene	mg/kg	2	24	8%	0.00082	0.417	0.00354	0.0108	6,400	--	--
VOC	Total Xylenes	mg/kg	1	24	4%	0.00546	1.25	0.0766	0.0766	16,000	--	--
VOC	Trichlorofluoromethane	mg/kg	5	24	21%	0.00273	0.417	0.00406	0.00845	24,000	--	--
TPH	Diesel Range Hydrocarbons	mg/kg	18	24	75%	11	19.2	12	454	2,000	--	--
TPH	Gasoline Range Hydrocarbons	mg/kg	3	24	13%	6.03	24	43	46.6	100	--	--
TPH	Lube Oil Range Hydrocarbons	mg/kg	15	24	63%	27.6	48	27.8	1310	2,000	--	--
PAH	1-Methylnaphthalene	mg/kg	3	24	13%	0.00355	0.0191	0.0184	0.0727	--	--	--
PAH	2-Methylnaphthalene	mg/kg	3	24	13%	0.00355	0.0191	0.0236	0.0671	320	--	--
PAH	Acenaphthene	mg/kg	4	24	17%	0.00355	0.0304	0.00486	0.0317	4,800	--	--
PAH	Acenaphthylene	mg/kg	1	24	4%	0.00355	0.0304	0.166	0.166	--	--	--
PAH	Anthracene	mg/kg	3	24	13%	0.00355	0.0304	0.0133	0.127	24,000	--	--
PAH	Benzo (a) anthracene	mg/kg	4	24	17%	0.00355	0.0304	0.0201	0.386	--	--	--
PAH	Benzo (a) pyrene	mg/kg	5	24	21%	0.00355	0.0304	0.0143	0.379	0.14	1	--
PAH	Benzo (b) fluoranthene	mg/kg	3	24	13%	0.00355	0.0304	0.0329	0.272	--	--	--
PAH	Benzo (ghi) perylene	mg/kg	2	24	8%	0.00355	0.0304	0.0202	0.29	--	--	--
PAH	Benzo (k) fluoranthene	mg/kg	3	24	13%	0.00355	0.0304	0.0397	0.317	--	--	--
PAH	Chrysene	mg/kg	10	24	42%	0.00363	0.0184	0.00474	0.474	--	--	--
PAH	Dibenz (a,h) anthracene	mg/kg	2	24	8%	0.00355	0.0304	0.00748	0.0686	--	--	--
PAH	Fluoranthene	mg/kg	10	24	42%	0.00363	0.0304	0.00655	0.751	3,200	--	--
PAH	Fluorene	mg/kg	4	24	17%	0.00355	0.0304	0.00748	0.0283	3,200	--	--
PAH	Indeno (1,2,3-cd) pyrene	mg/kg	4	24	17%	0.00363	0.0304	0.00427	0.242	--	--	--
PAH	Naphthalene	mg/kg	1	24	4%	0.00355	0.0304	0.0759	0.0759	1,600	--	--

TABLE 4-2

Summary of Constituents Detected in Soil at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B: MTCA B	MTCA B: Number of Detects > MTCA B	MTCA B: Number of Nondetects > MTCA B
PAH	Phenanthrene	mg/kg	14	24	58%	0.00363	0.0184	0.00366	0.265	--	--	--
PAH	Pyrene	mg/kg	13	24	54%	0.00363	0.0184	0.00473	1.16	2,400	--	--
METAL	Arsenic	mg/kg	23	24	96%	0.548	0.548	0.51	6.59	0.67	20	--
METAL	Barium	mg/kg	24	24	100%	--	--	38.6	1010	16,000	--	--
METAL	Beryllium	mg/kg	2	24	8%	0.497	0.869	0.576	0.908	160	--	--
METAL	Cadmium	mg/kg	1	24	4%	0.497	0.869	0.554	0.554	--	--	--
METAL	Chromium	mg/kg	24	24	100%	--	--	3.89	47	--	--	--
METAL	Cobalt	mg/kg	24	24	100%	--	--	8.4	20.5	--	--	--
METAL	Copper	mg/kg	24	24	100%	--	--	9.09	135	3,000	--	--
METAL	Lead	mg/kg	24	24	100%	--	--	1.52	87.7	250	--	--
METAL	Manganese	mg/kg	24	24	100%	--	--	269	4630	11,000	--	--
METAL	Nickel	mg/kg	24	24	100%	--	--	5.29	32.1	1,600	--	--
METAL	Strontium	mg/kg	24	24	100%	--	--	27.7	578	48,000	--	--
METAL	Titanium	mg/kg	24	24	100%	--	--	688	2580	--	--	--
METAL	Vanadium	mg/kg	24	24	100%	--	--	48.4	116	560	--	--
METAL	Zinc	mg/kg	24	24	100%	--	--	34.3	250	24,000	--	--
CONV	% Dry Solids	percent	13	13	100%	--	--	75	92.6	--	--	--
CONV	Dry Weight	percent	24	24	100%	--	--	52.1	92.6	--	--	--

Notes:

mg/kg = milligrams per kilogram

CONV = conventional parameter
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C_SIM and SW8270C.
PCB = polychlorinated biphenyl; includes Method SW8082.
TPH = total petroleum hydrocarbons; includes Methods: NWTPHDX-G and NWTPHGX.
VOC = volatile organic compounds includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
MDL = method detection limit
= detected results exceeds MTCA or SW Marine Chronic.

TABLE 4-3

Summary of Constituents Detected in December 2008 in Groundwater at Anderson and Middleton Property

Pontoon Site, WSDOT SR 520

Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B		
										MTCA B	Number of Detects > MTCA B	Number of Nondetects > MTCA B
VOC	Acetone	ug/L	1	6	17%	10	10	16.2	16.2	800	--	--
VOC	p-Isopropyltoluene	ug/L	1	6	17%	0.2	0.2	0.38	0.38	--	--	--
VOC	Toluene	ug/L	2	6	33%	0.2	0.2	0.47	0.55	640	--	--
PAH	Naphthalene	ug/L	1	2	50%	0.098	0.098	0.204	0.204	160	--	--
METAL	Arsenic	ug/L	6	6	100%	--	--	3.67	49.3	0.058	6	--
METAL	Barium	ug/L	6	6	100%	--	--	20.2	274	3,200	--	--
METAL	Beryllium	ug/L	1	6	17%	1	1	1.73	1.73	32	--	--
METAL	Cadmium	ug/L	1	6	17%	1	1	1.63	1.63	8	--	--
METAL	Chromium	ug/L	6	6	100%	--	--	5.68	205	*50	1	--
METAL	Cobalt	ug/L	6	6	100%	--	--	3.52	54.1	--	--	--
METAL	Copper	ug/L	6	6	100%	--	--	6.91	213	590	--	--
METAL	Lead	ug/L	6	6	100%	--	--	1.13	56.1	*15	1	--
METAL	Manganese	ug/L	6	6	100%	--	--	684	7660	2,200	3	--
METAL	Mercury	ug/L	2	6	33%	0.2	0.2	0.275	0.384	4.8	--	--
METAL	Molybdenum	ug/L	2	6	33%	5	5	5.46	23.3	80	--	--
METAL	Nickel	ug/L	6	6	100%	--	--	4.48	114	--	--	--
METAL	Selenium	ug/L	4	6	67%	1	1	1.46	3.96	80	--	--
METAL	Titanium	ug/L	6	6	100%	--	--	293	5400	--	--	--
METAL	Vanadium	ug/L	6	6	100%	--	--	12.9	261	110	1	--
METAL	Zinc	ug/L	6	6	100%	--	--	12.8	547	4,800	--	--

Notes:

ug/L = micrograms per liter

VOC = volatile organic hydrocarbons; includes Method SW8260B.
PAH = polynuclear aromatic hydrocarbons; includes Method SW8270C.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MDL = method detection limit

MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
= detected results exceeds MTCA or SW Marine Chronic.

TABLE 4-4

Summary of Constituents Detected in December 2008 in Groundwater at Aberdeen Log Yard Property

Pontoon Site, WSDOT SR 520

Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B: MTCA B	MTCA B: Number of Detects > MTCA B	MTCA B: Number of Nondetects > MTCA B
VOC	p-Isopropyltoluene	ug/L	3	5	60%	0.2	0.2	0.54	10.4	--	--	--
VOC	Toluene	ug/L	3	5	60%	0.2	0.2	0.29	2.06	640	--	--
METAL	Antimony	ug/L	1	5	20%	3	6	5.43	5.43	6.4	--	--
METAL	Arsenic	ug/L	5	5	100%	--	--	3.58	29.7	0.058	5	--
METAL	Barium	ug/L	5	5	100%	--	--	22.2	626	3,200	--	--
METAL	Beryllium	ug/L	1	5	20%	1	2	1.49	1.49	32	--	--
METAL	Cadmium	ug/L	1	5	20%	1	2	1.15	1.15	8	--	--
METAL	Chromium	ug/L	5	5	100%	--	--	7.43	144	*50	2	--
METAL	Cobalt	ug/L	5	5	100%	--	--	3.39	75.4	--	--	--
METAL	Copper	ug/L	5	5	100%	--	--	10.7	133	590	--	--
METAL	Lead	ug/L	5	5	100%	--	--	1.47	72.3	*15	3	--
METAL	Manganese	ug/L	5	5	100%	--	--	1210	5130	2,200	3	--
METAL	Mercury	ug/L	1	5	20%	0.2	0.2	1.36	1.36	4.8	--	--
METAL	Molybdenum	ug/L	2	5	40%	5	5	11.4	16.3	80	--	--
METAL	Nickel	ug/L	5	5	100%	--	--	5.22	78	--	--	--
METAL	Selenium	ug/L	4	5	80%	1	1	1.16	9.99	80	--	--
METAL	Titanium	ug/L	5	5	100%	--	--	427	8290	--	--	--
METAL	Vanadium	ug/L	5	5	100%	--	--	17.5	399	110	2	--
METAL	Zinc	ug/L	5	5	100%	--	--	12.5	309	4,800	--	--

Notes:

ug/L = micrograms per liter

VOC = volatile organic hydrocarbons; includes Method SW8260B.
METAL = Total Metals using Method SW846 6020 and SW7470A.
MDL = method detection limit

MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level
= detected results exceeds MTCA or SW Marine Chronic.

TABLE 4-5

Summary of Constituents Detected in Groundwater in January 2009

Pontoon Site, WSDOT SR 520

										MTCA B			SW Marine Chronic (SWMC)		
Chemical Group	Analyte	Units	Number of Detects	Number of Samples	Frequency of Detection	Minimum MDL	Maximum MDL	Minimum Detected Value	Maximum Detected Value	MTCA B	Number of Detects > MTCA B	Number of Nondetects > MTCA B	SWMC	Number of Detects > SWMC	Number of Nondetects > SWMC
METAL	Arsenic	ug/L	8	8	100%	--	--	1.78	3.02	0.058	8	--	36	--	--
METAL	Barium	ug/L	8	8	100%	--	--	43.4	124	3200	--	--	--	--	--
METAL	Chromium	ug/L	8	8	100%	--	--	1.34	4.76	50	--	--	50	--	--
METAL	Cobalt	ug/L	8	8	100%	--	--	1.46	3.26	--	--	--	--	--	--
METAL	Copper	ug/L	8	8	100%	--	--	1.73	7.55	590	--	--	3.1	3	--
METAL	Manganese	ug/L	8	8	100%	--	--	115	1040	2200	--	--	--	--	--
METAL	Molybdenum	ug/L	3	8	38%	5	5	5.07	7.61	80	--	--	--	--	--
METAL	Nickel	ug/L	8	8	100%	--	--	1.18	3.96	--	--	--	8.2	--	--
METAL	Selenium	ug/L	8	8	100%	--	--	7.96	13.6	80	--	--	71	--	--
METAL	Strontium	ug/L	8	8	100%	--	--	1300	3370	9600	--	--	--	--	--
METAL	Titanium	ug/L	8	8	100%	--	--	10.2	224	--	--	--	--	--	--
METAL	Vanadium	ug/L	8	8	100%	--	--	1.52	8.72	110	--	--	--	--	--
METAL	Zinc	ug/L	5	8	63%	20	20	17.8	28.7	4800	--	--	81	--	--
METAL_D	Barium	ug/L	8	8	100%	--	--	27.9	122	3200	--	--	--	--	--
METAL_D	Chromium	ug/L	5	8	63%	10	10	11.8	13.9	50	--	--	50	--	--
METAL_D	Cobalt	ug/L	8	8	100%	--	--	1.38	3.08	--	--	--	--	--	--
METAL_D	Copper	ug/L	8	8	100%	--	--	1.35	3.73	590	--	--	3.1	3	--
METAL_D	Manganese	ug/L	8	8	100%	--	--	115	946	2200	--	--	--	--	--
METAL_D	Molybdenum	ug/L	1	8	13%	5	5	6.64	6.64	80	--	--	--	--	--
METAL_D	Nickel	ug/L	7	8	88%	1	1	1.27	2.21	--	--	--	8.2	--	--
METAL_D	Selenium	ug/L	8	8	100%	--	--	16	41.7	80	--	--	71	--	--
METAL_D	Strontium	ug/L	8	8	100%	--	--	1280	3150	9600	--	--	--	--	--
METAL_D	Titanium	ug/L	8	8	100%	--	--	5.18	14.4	--	--	--	--	--	--
METAL_D	Vanadium	ug/L	8	8	100%	--	--	12.4	18.7	110	--	--	--	--	--
METAL_D	Zinc	ug/L	1	8	13%	10	10	12.2	12.2	4800	--	--	81	--	--
CONV	Hexavalent Chromium	ug/L	5	7	71%	5	5	5	22	--	--	--	--	--	--
CONV	Total Dissolved Solids	ug/L	6	6	100%	--	--	4.20E+06	1.30E+07	--	--	--	--	--	--
CONV	Total Organic Carbon	ug/L	6	6	100%	--	--	21,000	39,000	--	--	--	--	--	--
CONV	Total Suspended Solids	ug/L	6	6	100%	--	--	14,000	120,000	--	--	--	--	--	--

Notes:

ug/L = micrograms per liter

METAL = total metals
METAL_D = dissolved metals
CONV = general chemistry
MDL = method detection limit

SW Marine chronic = Surface water criteria marine chronic (WAC 173-201A Table 240(3) Toxics Subsurances Criteria), except for silver which is acute.
MTCA B = Model Toxics Control Act Method B (Unrestricted Landuse) Cleanup Level

= detected results exceeds MTCA or SW Marine Chronic.

APPENDIX A

Sampling and Analysis Plan

Sampling and Analysis Plan for Anderson & Middleton and Aberdeen Log Yard Properties Aberdeen/Hoquiam, WA

Prepared for

Washington State Department of Transportation

DECEMBER 2008

CH2MHILL
CH2M HILL
P.O. Box 91500
Bellevue, WA 98004

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1.0 Introduction

This Sampling and Analysis Plan (SAP) has been prepared for Washington State Department of Transportation (WSDOT) to investigate soil and groundwater conditions at the Anderson & Middleton Property located at 815 8th Street in Hoquiam, Washington and the Aberdeen Log Yard located at 400 East Terminal Way in Aberdeen, Washington. A total of 24 borings (12 borings at each site) will be drilled. Soil and groundwater will be sampled for constituents that have the potential to exceed cleanup criteria provided in the Washington State Model Toxics Control Act (MTCA) regulations. The general project location is shown on Figure 1.

This work plan provides instructions to the field team and instructions for laboratory analysis and QA/QC.

1.1 Background and Objective

The Aberdeen Log Yard Property consists of one parcel approximately 55 acres located in an industrial area on the north shore of the Chehalis River in Aberdeen. The property occupies the parcel east of East Terminal Road, south of the Northern Pacific Railroad, north of the Chehalis River, and west of the City of Aberdeen's Wastewater Treatment Plant located on State Street. No buildings exist on the property with the exception of one small storage shed. The property contains asphalt paved road access from East Terminal Road in the west and State Street in the north. The property is currently used for log bucking and log storage. All utilities on the site were terminated prior to 1993 (CH2M HILL, 2008).

The Aberdeen Log Yard Property past uses included lumber and saw mill companies (Hart-Wood Lumber Company and Western Lumber Company, early to mid-1900s, and Boise Cascade Corporation [Boise]). Weyerhaeuser Company (Weyerhaeuser) has owned the property since 1985 when it was purchased from Boise Cascade Corporation. Most of the saw mill related structures were demolished in the late 1980s and early 1990s.

The Anderson & Middleton Property consist of approximately 60 acres located on the north shore of Grays Harbor in Hoquiam. The property occupies the parcel approximately east of 6th Street, south of railroad tracks, west of 10th Street, and north of Grays Harbor. No buildings exist on the property. The property contains an asphalt pad (former log storage area). Currently, the site is unused, vacant land that may occasionally be used to store or sort logs (WSDOT, 2006).

The Anderson & Middleton Property is located in an industrial area that has historically supported the lumber industry. A sawmill, originally owned by Grays Harbor Lumber Company, was located on the property. The sawmill was active from the early 1900s through approximately the 1960s.

The objective of this soil and groundwater investigation is to evaluate for the presence of total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), semivolatile

organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs), Resource Conservation and Recover Act (RCRA) metals, polychlorinated biphenyls (PCBs), and dioxins and furans.

1.2 Work Plan Organization

This Work Plan contains the following sections:

- **Section 1, Introduction.** Provides project background and the objectives of the investigation.
- **Section 2, Project Approach.** Briefly outlines the planned field sampling and analysis activities, data evaluation, and reporting to be performed for the Phase I Environmental Investigation.
- **Section 3, Subcontractors**. Outlines the subcontractors that will be required to complete the investigation.
- **Section 4, Project Schedule**. Briefly outlines the schedule for field work, laboratory analysis, and reporting.
- **Section 5, References**. Cites the references used in this Work Plan.
- **Attachment A, Field Sampling Plan**. Outlines the field procedures to be used as well as the quality control (QC) sampling requirements, analytical requirements, subcontractor project activities, and data management and review.
- **Attachment B, Health and Safety Plan**. Includes project specific health and safety plan covering CH2M HILL staff on the project site.

2.0 Project Approach

Section 2.1 discusses the field sampling and analytical approach, and Sections 2.2 and 2.3 briefly describe the data evaluation (comparison to cleanup levels) and reporting, respectively.

2.1 Field Sampling and Analysis

This section provides a brief description of the sampling and analytical approach for each boring location. The proposed sampling locations are shown in Figure 2 for the Anderson & Middleton Property and Figure 3 for the Aberdeen Log Yard Property. The locations of these borings are subject to change due to design needs and actual field conditions. A sampling and analytical matrix showing number and type of samples, and types of analyses, is shown in Table 1 and 2. Underground utilities clearance will be obtained for each proposed boring location. CH2M HILL will mark the boring locations with white paint and contact the Washington Utility Notification Center a minimum of 48 hours prior beginning the field investigation. A private locator will also be contracted to survey the boring locations for subsurface utilities. Specific field sampling procedures are outlined in the Field Sampling Plan in Attachment A. The Health and Safety Plan is provided in Attachment B.

As shown in Figures 2 and 3, soil and groundwater samples will be obtained from 24 borings located on the Anderson & Middleton Property and Aberdeen Log Yard. The borings will be completed using direct-push technology (DPT) to a maximum depth of approximately 12 feet below ground surface (bgs). Drilling depth will be dependent on field conditions and depth to groundwater.

Soil samples will be collected and screened with a photo-ionization detector (PID). The soil sample with the highest PID readings or other evidence of contamination (such as odors or staining) from each boring will be sampled and analyzed. A second soil sample will be collected from approximately 1 to 2 feet bgs. Selected samples will be sent to a laboratory for analysis of the following constituents: petroleum hydrocarbons using NWTPH-Gx and NWTPH-Dx, VOCs using U.S. Environmental Protection Agency (EPA) method 8260, PAHs using EPA method SW-8270-SIM (soil samples only), RCRA metals using EPA method 6010, PCBs using EPA Method 8082 (shallow soil sample only), and dioxins and furans using EPA Method 1613B. At each site, dixoins and furans will only be analyzed in three shallow soil samples collected from borings located near former mill refuse burners.

If no PID readings above background are observed, one sample will be collected from just below ground surface (approximately 1 to 2 feet bgs) and a second soil sample will be collected just above the water table (estimated to be 5 to 7 feet bgs).

If obvious signs of contamination are observed (such as staining and petroleum odor), additional soil samples may be collected at the discretion of the field sampling team to further delineate the vertical extent of contamination.

Groundwater samples will be collected using temporary well points installed in the borings. A total of 12 groundwater samples will be collected (six from each site). The temporary well points will be advanced approximately 4 feet into the water table. The well points will consist of a ¾-inch, Schedule 40 polyvinyl chloride, 10-slot well screen placed in the open borehole. Groundwater samples will be collected from the well points using a peristaltic pump and disposable polyethylene tubing. Based on the previous field investigations near the sites, groundwater is expected to be encountered between 3.5 and 7.0 feet bgs.

If light on-aqueous phase liquid (LNAPL) is detected, no groundwater samples will be collected. The temporary well points will be abandoned in accordance with applicable Washington statutes.

Groundwater samples will be analyzed for petroleum hydrocarbons using NWTPH-Gx and NWTPH-Dx, VOCs using EPA method 8260, SVOCs using EPA method 8270, and RCRA metals using EPA method 6010. SVOCs will only be analyzed at two locations at each site.

Investigation derived waste (IDW) will be placed in labeled 55-gallon drums and secured at each. IDW will be collected and stored separately at each site.

2.2 Data Evaluation

Soil analytical results will be compared to MTCA Method A and B cleanup levels, which are considered protective of human health for residential land use. If Method A or B cleanup levels are exceeded, other cleanup values may be used if they are determined to be more appropriate for comparison, such as those developed for industrial land use.

2.3 Reporting

A report will be prepared to document the field investigation findings at each of the boring locations. The report will contain the following information:

- Map of soil boring locations
- Map of LNAPL occurrence (if encountered)
- Map showing area and depth of contaminant detections (if encountered)
- Sample collection and analytical results summary tables
- Text description of field investigation procedures, observations, findings, and deviations from the work plan
- Conclusion and recommendations

3.0 Subcontractors

Subcontractors who will participate in the implementation of this project are listed below. They have been selected based on an evaluation of competitive bids. Additional subcontractors may be used during the course of the project. The project-specific FSP (Attachment A to this Work Plan) provides details of the subcontractors' facilities and points of contact.

- Laboratory analysis of environmental soil samples: TestAmerica, Seattle, Washington; Curtis Armstrong, 425-420-9200
- Private Utility Locator: Applied Professional Services, Washington, Bill Phillips, 425-888-2590
- Drilling Subcontractor: Cascade Drilling, Inc., Woodinville, Washington; Jim Nice, 425-485-8908

4.0 Project Schedule

Collection of soil and groundwater samples is planned for December 2008. Standard laboratory turnaround time (10 working days) will be requested for all analyses except for dioxins and furans which have 15 working day turnaround time. A draft report will be submitted to the WSDOT for review three weeks after the receipt of all of the laboratory data.

5.0 References

CH2M HILL. 2008. Draft Hazardous Material Alternative Site Screening Technical Memorandum. Prepared for WSDOT. October 2008.

Landau Associates. 2006. Work Plan, Environmental Site Investigation, Industrial Development District Property #1. Prepared for WSDOT. June 2006.

Landau Associates. 2007. Modified Preliminary Site Investigation, WSDOT, Special Projects Construction Site, Port of Grays Harbor, Hoquiam, Washington. Prepared for WSDOT, Urban Corridor Office. February 5, 2007.

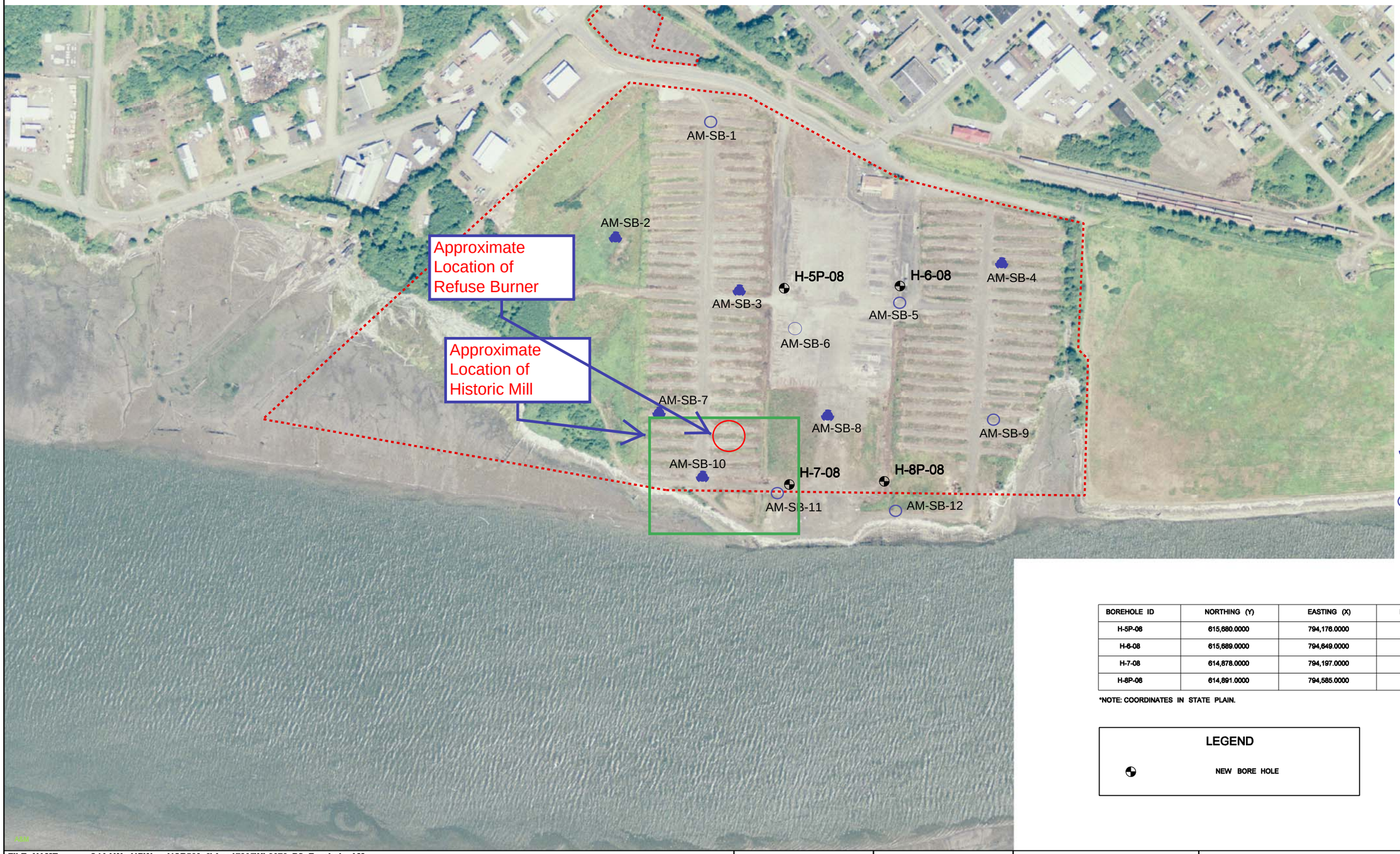
WSDOT Environmental Services Office. 2006. Modified Phase I Environmental Site Assessment. Prepared for WSDOT SR520 Project Office. September 2006.

Figures

Figure 1 – Vicinity Map

T. 17N. R.10W. W.M.

FIGURE 2



N

Phase II ESA

Soil Sampling Locations

Soil and Groundwater Sampling Locations

BOREHOLE ID	NORTHING (Y)	EASTING (X)	ELEVATION (FT)
H-5P-08	615,680.0000	794,176.0000	3.06
H-6-08	615,689.0000	794,649.0000	-4.22
H-7-08	614,878.0000	794,197.0000	-3.49
H-8P-08	614,891.0000	794,585.0000	-6.45

*NOTE: COORDINATES IN STATE PLAIN.

LEGEND

NEW BORE HOLE

0 200 400
SCALE IN FEET

FILE NAME	C:\AAWork\PWwork\SR520v2\dms17835\XL2672_PS_Borehole_AM
TIME	2:15:29 PM
DATE	11/20/2008
PLOTTED BY	palisor
DESIGNED BY	E. FERLUGA
ENTERED BY	R. PALISOC
CHECKED BY	J. SLAVICEK
PROJ. ENGR.	A. CHAN
REGIONAL ADM.	C. STONE

REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO.

JOB NUMBER XL2672

CONTRACT NO. | LOCATION NO.

PRELIMINARY
NOT FOR CONSTRUCTION

DATE
P.E. STAMP BOX

DATE
P.E. STAMP BOX

Washington State Department of Transportation

SR 520
BRIDGE REPLACEMENT AND HOV PROJECT
PONTOON CONSTRUCTION PROJECT

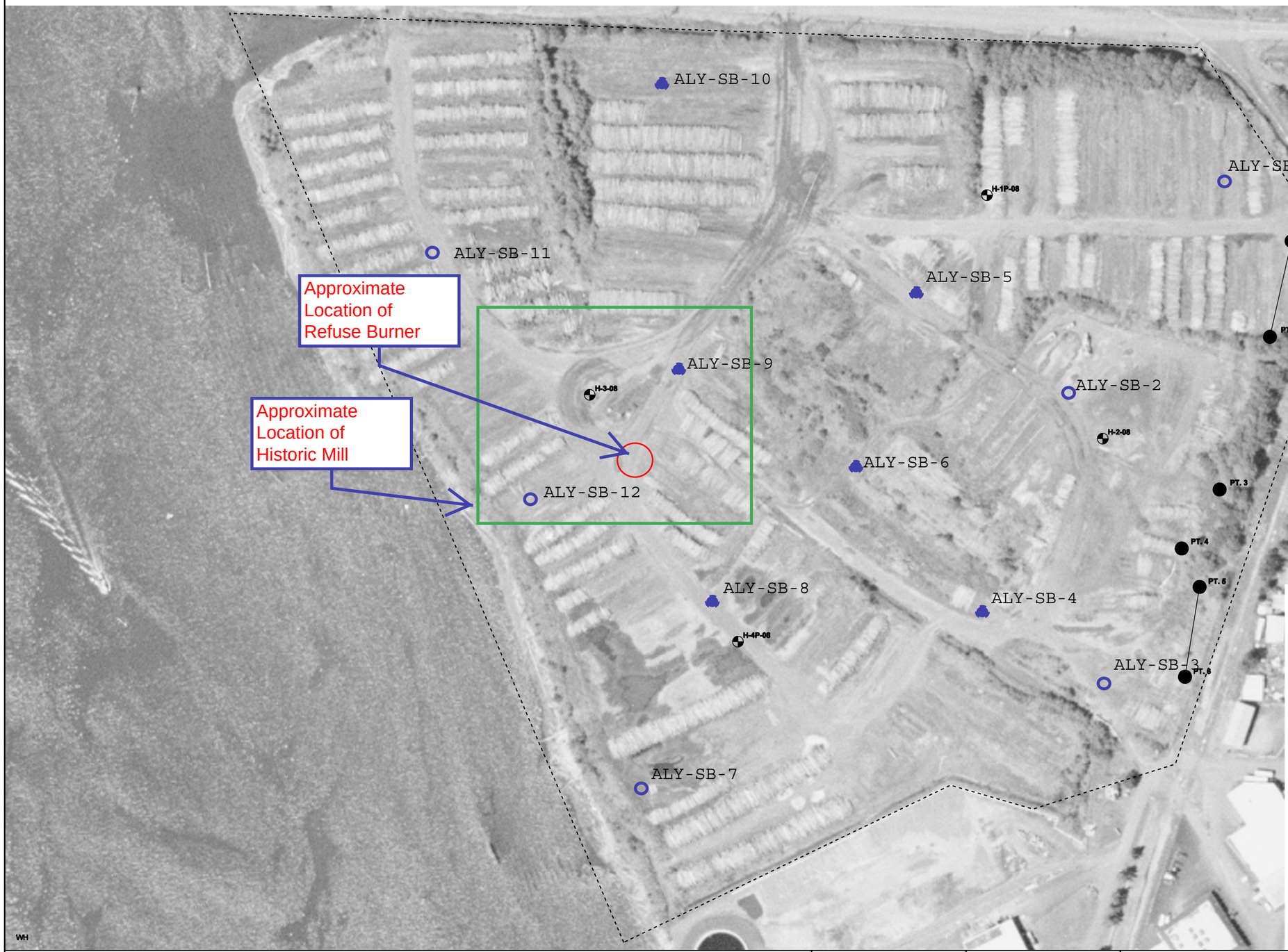
SITE INVESTIGATION – A & M SITE

BH1

SHEET OF SHEETS

FIGURE 3

T. 17N. R. 9W. W.M.



Phase II ESA

- Soil Sampling Locations
- Soil and Groundwater Sampling Locations

BOREHOLE ID	NORTHING (Y)	EASTING (X)	ELEVATION (FT)
H-1P-08	612,732.0000	807,926.0000	9.72
H-2-08	612,946.0000	808,376.0000	2.34
H-3-08	611,998.0000	808,295.0000	10.27
H-4P-08	612,272.0000	808,751.0000	1.47
PT. 1	613,295.0000	808,011.0000	
PT. 2	613,255.0000	808,188.0000	
PT. 3	613,162.0000	808,470.0000	
PT. 4	613,092.0000	808,579.0000	
PT. 5	613,125.0000	808,650.0000	
PT. 6	613,098.0000	808,816.0000	

*NOTE: COORDINATES IN STATE PLAIN.

LEGEND

- NEW BORE HOLE
- CLEAR FOR TEST PIT
- CLEAR FOR DIGGING TEST PIT

0 100 200
SCALE IN FEET

FILE NAME	C:\AAWork\PWwork\SR520v2\dms17834\XL2672_PS_BOREHOLE.DGN
TIME	1:06:59 PM
DATE	11/17/2008
PLOTTED BY	palisor
DESIGNED BY	E. FERLUGA
ENTERED BY	R. PALISOC
CHECKED BY	J. SLAVICEK
PROJ. ENGR.	A. CHAN
REGIONAL ADM.	C. STONE

REVISION | DATE | BY

REGION NO. 10 | STATE WASH | FED.AID PROJ.NO.

JOB NUMBER XL2672

CONTRACT NO. | LOCATION NO.

PRELIMINARY
NOT FOR CONSTRUCTION

DATE
P.E. STAMP BOX

DATE
P.E. STAMP BOX

Washington State Department of Transportation

SR 520
BRIDGE REPLACEMENT AND HOV PROJECT
PONTOON CONSTRUCTION PROJECT

SITE INVESTIGATION–ABERDEEN LOGYARD

BH1

SHEET OF SHEETS

Tables

TABLE 1
Soil Sampling and Analytical Summary

Location	Soil Boring	Sample Type	Depth	NWTPH-Gx	NWTPH-Dx	VOCs	PAHs	Dioxins/ Furans	RCRA Metals	PCBs
CHB-ALY	1	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	2	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	3	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	4	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	5	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	6	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	7	N	Upper	X	X	X	X		X	X
		MS/MSD	Lower	X	X	X	X		X	
CHB-ALY	8	N	Upper	X	X	X	X	X	X	X
			Lower	X	X	X	X		X	
CHB-ALY	9	N	Upper	X	X	X	X	X	X	X
			Lower	X	X	X	X		X	
CHB-ALY	10	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	11	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-ALY	12	N	Upper	X	X	X	X	X	X	X
			Lower	X	X	X	X		X	
CHB-AM	1	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	2	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	3	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	4	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	5	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	6	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	7	N	Upper	X	X	X	X	X	X	X
			Lower	X	X	X	X		X	
CHB-AM	8	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
CHB-AM	9	MS/MSD	Upper	X	X	X	X		X	X
		N	Lower	X	X	X	X		X	
CHB-AM	10	N	Upper	X	X	X	X	X	X	X
			Lower	X	X	X	X		X	
CHB-AM	11	N	Upper	X	X	X	X	X	X	X
			Lower	X	X	X	X		X	
CHB-AM	12	N	Upper	X	X	X	X		X	X
			Lower	X	X	X	X		X	
Total				48	48	48	48	6	48	24

Notes:
A field duplicate sample will not be collected due to anticipated variation in sample results.
N = normal
Depth = To be determined (based on photo-ionization detector [PID] readings or other evidence of contamination);

NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Dx extended = Diesel and oil ranged TPH; VOCs = volatile organic compounds; PAHs = polyaromatic hydrocarbons; PCBs=polychlorinated biphenols

TABLE 2
Groundwater Sampling and Analytical Summary

Location	Soil Boring	Sample Type	NWTPH-Gx	NWTPH-Dx	VOCs	RCRA Metals	SVOCs
CHB-ALY	1	N	X	X	X	X	X
CHB-ALY	2	N	X	X	X	X	
CHB-ALY	3	N	X	X	X	X	
CHB-ALY	7	N	X	X	X	X	
CHB-ALY	11	N	X	X	X	X	
CHB-ALY	12	N	X	X	X	X	X
CHB-ALY	12D	FD	X	X	X	X	X
CHB-AM	1	N	X	X	X	X	X
CHB-AM	5	N	X	X	X	X	
CHB-AM	6	N	X	X	X	X	
CHB-AM	9	N	X	X	X	X	
CHB-AM	11	N	X	X	X	X	
CHB-AM	12	N	X	X	X	X	X
Total			13	13	13	13	5

Notes:
A project-specific MS/MSD will not be requested.
FD = field duplicate; N = normal;
NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Dx extended = Diesel and oil ranged TPH; VOCs=volatile organic compounds; PAHs = polyaromatic hydrocarbons; PCB = polychlorinated biphenols

TABLE A-1

Soil Sampling and Analytical Summary

Location	Soil Boring	Sample Type	Sample ID (depth TBD)	Depth	NWTPH-Gx	NWTPH-Dx	VOCs	PAHs	Dioxins/ Furans	RCRA Metals	PCBs
AYL-SB	1	N	AYL-SB-1-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-1-XX-XX	Lower	X	X	X	X		X	
AYL-SB	2	N	CHB-AYL-2-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-2-XX-XX	Lower	X	X	X	X		X	
AYL-SB	3	N	CHB-AYL-3-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-3-XX-XX	Lower	X	X	X	X		X	
AYL-SB	4	N	CHB-AYL-4-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-4-XX-XX	Lower	X	X	X	X		X	
AYL-SB	5	N	CHB-AYL-5-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-5-XX-XX	Lower	X	X	X	X		X	
AYL-SB	6	N	CHB-AYL-6-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-6-XX-XX	Lower	X	X	X	X		X	
AYL-SB	7	N	CHB-AYL-7-XX-XX	Upper	X	X	X	X		X	X
		MS/MSD	CHB-AYL-7-XX-XX	Lower	X	X	X	X		X	
AYL-SB	8	N	CHB-AYL-8-XX-XX	Upper	X	X	X	X	X	X	X
		N	CHB-AYL-8-XX-XX	Lower	X	X	X	X		X	
AYL-SB	9	N	CHB-AYL-9-XX-XX	Upper	X	X	X	X	X	X	X
		N	CHB-AYL-9-XX-XX	Lower	X	X	X	X		X	
AYL-SB	10	N	CHB-AYL-10-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-10-XX-XX	Lower	X	X	X	X		X	
AYL-SB	11	N	CHB-AYL-11-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AYL-11-XX-XX	Lower	X	X	X	X		X	
AYL-SB	12	N	CHB-AYL-12-XX-XX	Upper	X	X	X	X	X	X	X
		N	CHB-AYL-12-XX-XX	Lower	X	X	X	X		X	
AM-SB	1	N	CHB-AM-1-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-1-XX-XX	Lower	X	X	X	X		X	
AM-SB	2	N	CHB-AM-2-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-2-XX-XX	Lower	X	X	X	X		X	
AM-SB	3	N	CHB-AM-3-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-3-XX-XX	Lower	X	X	X	X		X	
AM-SB	4	N	CHB-AM-4-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-4-XX-XX	Lower	X	X	X	X		X	
AM-SB	5	N	CHB-AM-5-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-5-XX-XX	Lower	X	X	X	X		X	
AM-SB	6	N	CHB-AM-6-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-6-XX-XX	Lower	X	X	X	X		X	
AM-SB	7	N	CHB-AM-7-XX-XX	Upper	X	X	X	X	X	X	X
		N	CHB-AM-7-XX-XX	Lower	X	X	X	X		X	
AM-SB	8	N	CHB-AM-8-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-8-XX-XX	Lower	X	X	X	X		X	
AM-SB	9	MS/MSD	CHB-AM-9-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-9-XX-XX	Lower	X	X	X	X		X	
AM-SB	10	N	CHB-AM-10-XX-XX	Upper	X	X	X	X	X	X	X
		N	CHB-AM-10-XX-XX	Lower	X	X	X	X		X	
AM-SB	11	N	CHB-AM-11-XX-XX	Upper	X	X	X	X	X	X	X
		N	CHB-AM-11-XX-XX	Lower	X	X	X	X		X	
AM-SB	12	N	CHB-AM-12-XX-XX	Upper	X	X	X	X		X	X
		N	CHB-AM-12-XX-XX	Lower	X	X	X	X		X	
Total					48	48	48	48	6	48	48

Notes:

N = normal

Depth = To be determined (based on photo-ionization detector [PID] readings or other evidence of contamination);

NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Dx extended = Diesel and oil ranged TPH; VOCs = volatile organic compounds; PAHs = polyaromatic hydrocarbons; PCBs = polychlorinated biphenols

TABLE A-2

Groundwater Sampling and Analytical Summary

Location	Soil Boring	Sample Type	Sample ID	NWTPH-Gx	NWTPH-Dx	VOCs	RCRA Metals	SVOCs
CHB-AYL	AYL-SB-1	N	AYL-W-1	X	X	X	X	X
CHB-AYL	AYL-SB-2	N	AYL-W-2	X	X	X	X	
CHB-AYL	AYL-SB-3	N	AYL-W-3	X	X	X	X	
CHB-AYL	AYL-SB-7	N	AYL-W-7	X	X	X	X	
CHB-AYL	AYL-SB-11	N	AYL-W-11	X	X	X	X	
CHB-AYL	AYL-SB-12	N	AYL-W-12	X	X	X	X	X
CHB-AYL	AYL-SB-12D	FD	AYL-W-12D	X	X	X	X	X
CHB-AM	AM-SB-1	N	AM-W-1	X	X	X	X	X
CHB-AM	AM-SB-5	N	AM-W-5	X	X	X	X	
CHB-AM	AM-SB-6	N	AM-W-6	X	X	X	X	
CHB-AM	AM-SB-9	N	AM-W-9	X	X	X	X	
CHB-AM	AM-SB-11	N	AM-W-11	X	X	X	X	
CHB-AM	AM-SB-12	N	AM-W-12	X	X	X	X	X
Trip Blank				X		X		
Total				13	13	13	13	5

Notes:

FD = field duplicate

NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Gx = Gasoline-ranged total petroleum hydrocarbons; NWTPH-Dx extended = Diesel and oil ranged TPH; VOCs = volatile organic compounds; SVOCs = semivolatile organic compounds; PAHs = polyaromatic aromatic hydrocarbons; PCBs = polychlorinated biphenols

TABLE A-3

Requirements for Container Types, Preservation Techniques, Sample Volumes, and Holding Times

Name	Analytical Method	Container	Preservation	Minimum Sample Volume	Maximum Holding Time
NWTPH-Gx	NWTPH-Gx by EPA 5035	Soil: (1)-40 mL vial Water: (3)-40 mL vial	S: MEOH; 4 ± 2° C W: HCl	S: 10g in 10ml of MeOH(can be combined with VOCs) W: 80 mL	S, W: 14 days preserved
NWTPH-Dx	NWTPH-Dx	Soil: (1)-8oz jar Water: (2)-1 L Amber glass	S: 4 ± 2° C W: HCl	S: 8oz (can be combined with SVOCs and total lead) W: 1 L	S: 14 days W: 14 days preserved
VOCs	EPA 8260 by EPA 5035	Soil: (3)-40 mL vial Water: (3)-40 mL vial	S: 1 MEOH,2 stir bar W: HCl	S: 10g in 10ml of Meoh and 2 5g stirbar vials(can be combined with TPH-G) W: 80 mL	S, W: 14 days preserved
Metals	EPA SW 846 6010B/7470A	Soil: (1) 8oz jar Water: (1)-250mL Polyethlene	S: 4 ± 2° C W: HNO_3	S: 8oz (can be combinde with Dx, lead, PAHs and SVOCs) W: 250ml	180 days, 28 days for Mercury
PCBs	EPA 8020	Soil: (1) 8oz jar	S: 4 ± 2° C	S: 8oz (can be combinde with Dx, lead, PAHs and SVOCs)	S: 14 days
Dioxins/ Furans	EPA 1613B	Soil: (1) 4oz jar	S: 4 ± 2° C	S: 4oz	S: 30 days
PAHs	EPA SW-846-8310 SIM	Soil: (1) 8oz jar Water: (2)-1 L Amber glass	S: 4 ± 2° C W: 4 ± 2° C	S: 8oz (can be combinde with Dx, lead, PAHs and SVOCs) W: 1 L	S, W: 14 days preserved
SVOCs	EPA SW-846-8270	Water: (2)-1 L Amber glass	W: 4 ± 2° C	W: 1 L	S, W: 14 days preserved

ATTACHMENT A

Field Sampling Plan

A.1 Introduction

This Field Sampling Plan (FSP) describes the field investigation activities planned for the environmental investigation to be conducted at 24 boring locations at the Anderson & Middleton Property in Hoquiam, Washington and the Aberdeen Log Yard in Aberdeen, Washington.

Field activities will be conducted in accordance with a Health and Safety Plan (HSP) that has been prepared for this field investigation (Attachment B). Wastes generated during the project will be minimized to the extent possible and handled in accordance with waste management procedures identified in this FSP.

The subsequent sections of this FSP are organized as follows:

- **Section A.2**, **Field Investigation Activities**, describes the overall field investigation activities and sampling programs planned for each parcel.
- **Section A.3, Quality Control Sampling**, describes the quality control (QC) sampling requirements for the field investigation.
- **Section A.4, Sample Volumes, Container Types, Preservation Requirements, and Holding Times,** lists these requirements for the field investigation.
- **Section A.5, Detailed Field Procedures,** describes specific field procedures that will be implemented during collection of field and analytical data for the work described in Section A.2**.**
- **Section A.6, Subcontractor Project Activities**, lists the investigation activities that will require the procurement of subcontractors.
- **Section A.7, Data Management,** lists data management and quality review procedures.

A.2 Field Investigation Activities

The field activities are described in the Work Plan, Section 2.1. The Anderson & Middleton Property and the Aberdeen Log Yard Property will be investigated by sampling subsurface soil and groundwater. Soil boring locations are shown in Figures 2 and 3 from the Work Plan. The primary constituents of concern are petroleum hydrocarbons, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polyaromatic hydrocarbons (PAHs), Resource Conservation and Recovery Act (RCRA) metals, polychlorinated biphenols (PCBs), and dioxins and furans.

A.3 Quality Control Sampling

The QC samples to be obtained for the field investigations include field duplicates and trip blanks. The frequency of collection for each QC sample type will be as follows:

- Field duplicates will be collected at a frequency of 10 percent (approximately) for each water matrix. Field duplicates for soil will not be collected due to the anticipated heterogeneity of the soil matrix.
- A trip blank will be placed in each cooler where VOC samples are placed.
- Project-specific matrix spike/matrix spike duplicate (MS/MSD) samples will not be provided. However, non-project specific MS/MSD results from the lab will be requested from the lab.

A summary of normal and field duplicate sampling matrix is provided in Table A-1 (soil) and A-2 (groundwater).

A.4 Sample Volumes, Container Types, Preservation Requirements, and Holding Times

Sample volumes, container types, and preservation requirements for the analytical methods performed on the soil and groundwater samples are listed in Table A-3. Tracking of sample holding times will begin with the collection of samples and continue until the analyses are complete.

A.5 Detailed Field Procedures

A.5.1 Site Reconnaissance, Preparation, and Restoration Procedures

The environmental soil and groundwater sampling is being conducted at the Anderson & Middleton Property is a vacant site and the Aberdeen Log Yard is an active business. Access to the Anderson & Middleton Property will be coordinated with WSDOT and Weyerhaeuser. Work conducted at the both sites, including utility locating and drilling, will be coordinated with WSDOT.

Underground utilities clearance will be obtained for each proposed boring location. CH2M HILL will mark the boring locations with white paint and contact the Washington Utility Notification Center a minimum of 48 hours prior beginning the field investigation. A private locator will also be contracted to survey the boring locations for subsurface utilities.

All investigation-derived waste (IDW) will be properly documented, containerized in a 55-gallon steel drum, and temporarily stored at each site pending final characterization and disposition.

A.5.1.1 Required Equipment

The following is a list of required equipment:

- Field Sampling Plan

- Field Logbook
- Indelible black ink pens and markers
- Sample tags/labels and containers (as specified in Table A-2)
- Insulated coolers, chain of custody forms and seals, Ziploc® bags
- Digital Camera
- Portable global positioning system (GPS)
- Multi-gas Meter (includes photo-ionization detector)
- Sampling equipment (as required)
- Decontamination equipment (as required)

A.5.1.2 Preparation

The following preparation tasks will be performed:

- Conduct health and safety briefing
- Calibrate field instrumentation (if needed)
- Move equipment and supplies to the boring location

A.5.2 Subsurface Soil Sampling

The following sections describe the activities required for collection of subsurface soil samples by direct-push methods.

A.5.2.1 Direct-push Geoprobe

Direct-push Geoprobe borings will be drilled, sampled, and a temporary monitoring well will be installed at the locations shown in Figures 2 and 3. Drilling equipment used to complete the borings will follow the guidelines listed below:

- All down hole tools, samplers, and other devices will be decontaminated to the satisfaction of the CH2M HILL site representative prior to use. Water generated by decontamination will be collected and transferred to 55-gallon drums pending analysis and disposal.

- Subsurface soil samples will be obtained from a Teflon sampler. Continuous samples will be taken for each boring. Drilling activities will conform to state and local regulations and will be supervised by a qualified geologist or engineer. CH2M HILL will obtain permits, applications, and other documents required by state and local authorities.

- The drill rig must not leak any fluids that may enter the borehole or contaminate equipment placed in the hole. For each boring, the documentation record and forms will include the following information:

  Identification of the boring or the well
  Purpose of the boring (for example, soil sampling)
  Location of the boring in relation to an easily identifiable landmark
  Names of the drilling contractor and the logger
  Start and finish dates and times
  Drilling method
  Types of drilling fluids (if any) and the depths at which they were used

Depth(s) at which saturated conditions are encountered (if applicable)
Lithologic descriptions and the depths of lithologic boundaries (see Section A.5.2.3)
Sampling-interval depths
Zones of caving or heaving
Drilling rate and drilling rig reactions such as chatter, rod drops, or bouncing

A log of drilling activities will be kept in a bound field logbook with sequentially numbered pages. Information in the logbook will include the drilling location, the time on site, personnel and equipment present, down time, materials used, samples collected, measurements taken, calibration of air monitoring and other equipment, and any other observations or information that would be necessary to reconstruct field activities at a later date.

A.5.2.2 Soil Sampling

Soil samples will be collected using a Teflon sampler using direct-push Geoprobe drilling. The auger will be advanced in 4-foot intervals. A stainless steel core barrel will be advanced. After the Teflon sampler is removed from the boring it is opened and the soil will be monitored for organic vapors using a PID. Air monitoring results will be recorded on the boring log and in the field logbook.

Samples for chemical analysis will be collected and placed in laboratory prepared jars. Soil samples to be analyzed for NWTPH-Gx and VOCs will be collected using EPA Method 5035. Method 5035 requires using an Encore or similar soil sampling tool to obtain the sample from the barrel before being transferred to the sampling jar. Soil with large gravel or debris will not be used. A soil sample will also be collected and analyzed for NWTPH-Dx, PAHs, RCRA metals, PCBs (shallow soil sample only), and dioxins and furans. The jars will then be labeled and transferred to an iced cooler held at a temperature below 4°Centigrade.

If initial screening results indicate the presence of organic vapors, a headspace analysis will be conducted on remaining portions of the sample. The results of the headspace analysis will be documented in the field logbook.

If obvious signs of contamination are observed (such as staining and petroleum odor), additional soil samples may be collected at the discretion of the field sampling team to further delineate the vertical extent of contamination.

A.5.2.3 Lithologic Logging

The lithology in all boreholes will be logged to the extent practical. Information on the boring log form includes the borehole location; drilling information; sampling information such as sample intervals and recovery; and descriptions of samples collected.

Lithologic descriptions of unconsolidated materials encountered in the boreholes will generally be described in accordance with ASTM D-2488-93 (1993) "Practice for Description and Identification of Soils (Visual-Manual Procedure)." Descriptive information to be recorded in the field will include:

- Predominant particle size and of the range of particle sizes
- Maximum particle size or dimension
- Percentages of gravel, sand, and/or fines

- Information on the grading and sorting of coarse particles
- Angularity and shape of the particles

Descriptive information on soil will include:

- Color
- Moisture (dry, wet, or moist)
- Consistency of fine-grained soils
- Structure of consolidated materials
- Cementation (weak, moderate, or strong)

The USCS group symbol will be identified for each sample. Additional information to be recorded includes:

- The depth to the water table (if encountered)
- Caving or sloughing of the borehole
- Changes in the drilling rate
- Depths of laboratory samples
- Presence of organic materials
- Presence of fractures or voids in consolidated materials
- Other noteworthy observations or conditions such as the locations of geologic boundaries

A.5.3 Groundwater Sampling

A.5.3.1 Purging

A ¾-inch diameter temporary monitoring well will be installed at each boring location. Each temporary monitoring well will be purged and sampled using a peristaltic pump equipped with new, disposable polyethylene tubing. Tubing will be changed between each sampling location. Clean, new tubing will be inserted into the screened interval of the monitoring well during purging.

Care will be taken to purge at a sustainable pumping rate that does not cause excessive drawdown in the well. Even at low purge rates, monitoring wells in low permeability zones might go dry during purging. If a monitoring well goes dry during purging, it is considered ready to sample upon sufficient water recovery for sampling. Field parameters will be measured at 3- to 5-minute intervals as described in Field Parameters section below.

Purge water will be placed into graduated buckets and then transferred to a 55-gallon drum. The drum will be moved to a secure area of the site until laboratory analysis is completed.

A.5.3.2 Field Parameters

The temperature, pH, specific conductance, dissolved oxygen, redox potential, turbidity, and appearance of the purged water will be measured and recorded in the field logbook

prior to groundwater sampling. The temporary well will be purged until turbidity has stabilized. The total volume of water purged will be recorded in the field logbook.

The following procedure will be used for measuring pH, specific conductance, dissolved oxygen, redox potential, turbidity, and temperature:

- Calibrate instruments according to the manufacturer's instructions. Record instrument make, model number, serial number, and calibration comments in the field logbook.
- Insert decontaminated and calibrated probes into the flow cell and allow the instrument to equilibrate.
- Record the results of each analysis in the field logbook.

A.5.3.3 Groundwater Sample Collection

Groundwater samples will be collected after purging is completed. Groundwater samples will be collected using a peristaltic pump equipped with the new, disposable tubing that was used for purging. The entire tubing assembly will be changed between borings (flex and sampling tubing).

Groundwater samples will be collected into laboratory-cleaned, pre-labeled sample bottles. After collection, all samples will be placed in coolers with enough ice to maintain an internal temperature of 4°C for the duration of the sampling and transportation period. Samples will be delivered to the TestAmerica Seattle located in Bothell, Washington, for analysis following CH2M HILL's standard chain of custody procedures.

A.5.4 Documentation and Field Observations

This section includes the requirements for sample identification and labeling, field log books, sample chain of custody, shipping, and packing.

A.5.4.1 Sample Identification and Labeling

Each sample will be designated by a unique identifier according to the following scheme. Sample labels will be completed using waterproof-ink pens and affixed to containers at the time of sampling. Soil sample designation numbers will contain, at a minimum, the following identifiers (example: ALY-SB-1-2.0-4.0):

- Site ID = ALY (Aberdeen Log Yard) or AM (Anderson & Middleton
- Soil Boring = SB
- 1 = Location number (one or two digits)
- 2.0-4.0 = Depth in feet

Groundwater sample designation numbers will contain, at a minimum, the following identifiers (example: ALY-W-1):

- Site ID = ALY or AM
- W = Water Sample
- 1 = Location number (one or two digits)

Sample numbers will be recorded in the field logbook, on sample container labels, and chain of custody forms. Other information recorded on the sample container labels includes:

- Date and time the sample was collected
- Initials of sampler(s)
- Laboratory analyses to be performed
- Preservatives used, if any

A.5.4.2 Corrections to Documentation

All entries in field and laboratory notebooks will be written in waterproof ink. No accountable serialized documents will be destroyed or thrown away, even when they are illegible or contain inaccuracies that require a replacement document. When an error is made on an accountable document, the person who made the error will make the correction by crossing a line through the error and entering the correct information. The erroneous information should not be obliterated. Any subsequent error discovered on an accountable document should be corrected by the person who made the entry. All corrections will be initialed and dated.

A.5.4.3 Sample Chain of Custody and Shipment

The management of samples collected in the field involves specific procedures that must be followed to ensure field sample integrity and custody. The possession of samples must be traceable from the time they are collected through the time they are analyzed by the contract laboratory.

The chain of custody of a sample is defined by the following criteria:

- The sample is in a person's possession, or is in his/her view after being in his/her possession.
- The sample was in a person's possession and was locked up or transferred to a designated secure area by him/her.

Each time the samples change hands, both the sender and receiver will sign and date a chain of custody form and specify which item(s) has changed hands. When a sample shipment is sent to the laboratory, the top signature copy will be enclosed in plastic with the sample documentation and secured to the inside of the sample shipment containers. The second copy of the chain of custody form will be retained in the project files. A chain of custody record will be completed for each shipping container.

The following information is included on the chain of custody form:

- Sample number
- Signature of sampler
- Date and time of collection
- Project name and number
- Type of sample
- Number and type of container
- Inclusive dates of possession
- Signature of receiver

In addition to the labels, seals, and chain of custody form, other sample tracking components include the field logbook, sample request sheet, sample shipment receipt, and

laboratory logbook. Before packaging samples, field personnel will make certain that the exterior of the sample container is clean and that the sample label is legible.

A.5.4.4 Sample Packing

The sample packaging and shipping containers will be assembled and packed to meet the following requirements:

- There will be no release of materials to the environment.
- Inner containers that are breakable must be packaged to prevent breakage and leakage. The cushioning and absorbent material used will not be reactive with the sample contents.
- The packaging procedures will be in compliance with all DOT and commercial carrier regulations. Only waterproof ice chests or coolers (supplied by the analytical laboratory) will be considered acceptable shipping containers.

Samples for shipment will be packed using the following procedures:

- Seal the drain plug in the cooler inside and outside with duct tape or equivalent.
- Pack, secure, or cushion sample containers in a way that prevents breaking or leaking and that controls movement of the inner containers within the package during normal shipping conditions. Wrap glass bottles with bubble wrap or Styrofoam wrapping; place them inside Ziploc-type plastic bags and then place them in the cooler.
- Add absorbent or cushioning material. Cushioning material will be used that does not react with or be deleteriously affected by the contents of the inner packages if the contents leak.
- Add ice in double-bagged Ziploc-type plastic bags.
- Place the shipping list chain of custody form in a plastic bag attached to the inside of the cooler lid.
- Attach two chain of custody seals (front and back of container) so that the seals must be broken if the cooler is opened.
- Place the name and address of the receiving laboratory in a position clearly visible on the outside of the cooler.
- Secure the lid with fiber tape
- Pack soil sample container designated for dioxins and furans analysis in a separate cooler and separate chain of custody as these samples will be analyzed by TestAmerica in Sacramento. TestAmerica in Seattle is responsible for the transport and following proper chain of custody procedure.

All shipments for analysis will be transported directly to the laboratory or shipped to the laboratory via overnight courier. In either case, the laboratory will be notified immediately when samples are shipped.

Laboratory address:

Test America, Inc.
11720 North Creek Pkwy. N., Suite 400
Bothell, WA 98011

Contact information:

Curtis Armstrong, Project Manager
Telephone number: 425-420-9200 or 425-420-9233

A.5.5 Decontamination

This section describes the decontamination procedures to be followed in preparing down hole drilling and field sampling equipment for use at the site. Decontamination is used to minimize the potential for transfer of potentially contaminated materials to uncontaminated areas, to minimize the exposure of personnel to hazardous substances, and to reduce the possibility of cross-contamination between samples.

Decontamination procedures for personal protective equipment (PPE) are included in the HSP.

Whenever possible, dedicated field equipment will be used. Non-dedicated field equipment decontamination procedures are based on the known or suspected contaminants present as well as the analytical data objectives.

All down hole tools such as augers and samplers will be decontaminated to the satisfaction of the CH2M HILL site representative prior to use. Water generated by decontamination will be collected and transferred to 55-gallon drums.

Any non-dedicated sampling equipment, including sampling tools, that comes in contact with soil will be decontaminated before and after each use. Decontamination procedures for sampling equipment are presented in detail below.

1. Set up a decontamination station using two wash basins containing the wash water used to decontaminate equipment. It may be useful to set up a small table to make it easier to handle the equipment once it has been cleaned.
2. The first wash basin should be half filled with a detergent and water solution. A half-cup of Liquinox or Alconox should be used per 10 gallons of potable water. The second basin should be filled with potable water only.
3. The sampling equipment should be decontaminated by disassembling and washing each part thoroughly in the detergent solution.
4. Rinse equipment thoroughly in the potable tap water basin.
5. Rinse using distilled or deionized water.
6. Air-dry, if possible, then completely wrap equipment in unused aluminum foil (shiny side out) for the next use.

A.6 Subcontractor Project Activities

The following activities will be conducted by subcontractors under CH2M HILL direction:

- Laboratory analysis and reporting – TestAmerica, Seattle
- Private Utility Locator – Applied Professional Services, Inc.
- Drilling Subcontractor – Cascade Drilling, Inc.

A.7 Data Reviews and Data Management

Data reviews will be performed by the laboratory and by CH2M HILL as part of the QA/QC process. Laboratory data will be reviewed in general for technical soundness. Laboratory-provided QC data such as blanks, surrogates, duplicates, matrix spikes, and laboratory control samples will be reviewed for conformance with tolerance limits. Individual data points will only be flagged if the review indicates a need for further validation. The review findings will be summarized in a memo to the project files.

Data management will involve sample tracking, entry of the reviewed results into the project database, comparing results with appropriate action levels, and preparation of data tables for the final report.