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SUBSURFACE INVESTIGATION REPORT

Safeway Property
1153 Duane Street
Astoria, Oregon

December 16, 2003

Prepared for:

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HAI Project No. 6167

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1.0 SUMMARY OF FINDINGS

Subsurface investigation activities were conducted at the Safeway Store property, 1153 Duane Street, Astoria, Oregon, to evaluate soil and groundwater beneath the site as required by a *Purchase and Sale Agreement.* Specifically, the objectives of the work activities were to evaluate the nature, extent, and sources of solvents in site groundwater, as well as petroleum hydrocarbons in soils exposed within subgrade (basement level) areas of the property. In October 2003, eight push probe borings were installed for the collection of groundwater samples, and shallow soil samples were collected from 17 subgrade locations. This work supplements previous investigation activities conducted at the property in early 2003. A summary of the findings relating to the subsurface investigation activities is presented below.

1) The site has been variously filled with predominantly sands and silts above a former tidal flat surface located at a depth of about 18 feet below current street level. Subgrade areas east of the current Safeway store have been filled only up to a depth of approximately 9.5 feet below street level. Below the former tidal flat surface are alternating zones of native alluvial sands and silts.

2) Uppermost groundwater occurs in the sand fill unit typically at depths of 12 to 14 feet below street level. Net groundwater flow direction is inferred to be north towards the Columbia River.

3) Testing of the exposed subgrade soils detected petroleum hydrocarbons, polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), and lead as elevated levels.

    a) The lateral extent of petroleum contamination appears adequately defined and does not appear to extend off the subject property.

    b) The vertical extent of petroleum contamination does not appear to extend more than 4 feet below the basement level.

    c) The source of the detected petroleum contamination in shallow subgrade soils is not known.

    d) The soils could pose a risk for direct contact with a residential receptor for PCBs and PAHs, or an occupational receptor for

PAHs. However, no current unacceptable human health risk is identified with respect to the contaminated soils, as long as access to the unfinished basement level continues to be restricted.

4) Groundwater testing indicates volatile organic compounds (VOCs), predominantly chlorinated solvents, are present in groundwater

   a) It is interpreted that at least two plumes and sources for VOCs are present in groundwater beneath the site

      i) A central VOC plume, composed predominantly of vinyl chloride, originates near the southern property boundary near the American Legion property, and extends north beneath the Safeway store and off the site beneath Duane Street. This plume is limited to the saturated sand fill unit.

      ii) A western VOC plume, composed entirely of low levels of vinyl chloride, is present on the western margin of the property, and is interpreted to originate off-site. This plume appears to be present in both the sand fill unit and the upper alluvial deposits.

   b) The lateral and vertical extent of the two identified VOC plumes appear to be adequately defined on the Safeway property.

   c) A preliminary evaluation of risk for the VOCs in groundwater indicates possible unacceptable risk to future potential residents due to vapor intrusion into buildings by vinyl chloride at one location. No unacceptable risks were preliminarily identified under current use conditions or future uses of the site for commercial or other non-residential activities.

2.0 RECOMMENDATIONS

Based on the results of the subsurface investigation activities, the following recommendations are presented:

1) Subgrade Petroleum Contaminated Soils

   a) If left in-place, undisturbed, cleanup actions do not appear necessary with respect to the identified petroleum-contaminated

soils, as long as access to the unfinished basement level continues to be restricted.

b) If excess soils are generated during future re-development of this area, then special management of these soils will be necessary.

c) If cleanup of the impacted soils were deemed appropriate, the most feasible remedial options would be removal, capping, or some combination of the two.

2) VOCs in Groundwater

a) If left in-place, undisturbed, cleanup actions do not appear necessary with respect to the identified VOCs in groundwater, as long as site use does not change.

b) If residential uses are contemplated for the property, then cleanup actions would likely be necessary to reduce the VOC levels in groundwater, or to prevent vapor intrusion into structures through the use of engineering controls, such as vapor barriers or other vapor resistant construction methods.

c) If excess groundwater is generated by dewatering during re-development in the plume areas, then special management of this water will be necessary.

d) Activities that may exacerbate the spread of contamination should be avoided at the property, such as the installation of deep utility trenches, or the installation of water wells for any purpose.

3) Other Issues

a) In the absence of any cleanup actions for soil or groundwater at the property, a deed restriction preventing residential uses of the property may be warranted.

b) If the Oregon Department of Environmental Quality (DEQ) were asked to issue a letter of "no further action" for this site, the agency would most likely require a additional Remedial Investigation (RI), Risk Assessment (RA), and Feasibility Study (FS) activities for the property.

3.0 INTRODUCTION

Safeway Inc. retained Hahn and Associates, Inc. (HAI) to conduct subsurface investigation activities at the Safeway Store property, located at 1153 Duane Street, Astoria, Oregon (Figures 1 and 2).

The work activities were conducted to evaluate the nature, extent, and sources of solvents in site groundwater, as well as petroleum hydrocarbons in soils exposed within subgrade (basement level) areas of the property. Decommissioning of an underground storage tank (UST) and an above-ground storage tank (AST), both located in the subgrade area of the site, was conducted concurrent with the subsurface investigation activities, but is documented in a separate report.

The above work activities were required to be completed by Safeway as part of a *First Amendment to Purchase and Sale Agreement* between Safeway and the City of Astoria. This report satisfies the requirement of that Agreement for preparation of a "Petroleum Delineation Report" and a "VOCs Delineation Report".

4.0 BACKGROUND

In January 2003, HAI conducted a Phase I ESA[1] for the City of Astoria of the entire block bounded by 11th, 12th, Duane, and Exchange Streets, which includes the Safeway property and the American Legion property. The Phase I report identified potential environmental conditions at the property that warranted further assessment. In February and March 2003, HAI conducted a Phase II ESA[2] for the City of Astoria to further evaluate the identified environmental conditions. The identified environmental conditions, as well as a brief summary of the Phase II ESA testing results are summarized below:

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[1] Hahn and Associates, Inc. (2003). *A Phase I Environmental Site Assessment, Approximate 1.48-Acre Safeway/America Legion Property,* 1153 Duane Street/1132 Exchange Street, Astoria, Oregon (HAI Project No. 6039). January 17, 2003.

[2] Hahn and Associates, Inc. (2003). *Phase II Environmental Site Assessment Report, 1.48-Acre Safeway/America Legion Property, 1153 Duane Street and 1132 Exchange Street, Astoria, Oregon* (HAI Project No. 6081). April 14, 2003.

1) Baseline Groundwater Testing Due to Historical Uses The subject property was historically occupied by several commercial tenants, including an automobile repair garage and paint shop, a used car sales business, a dry cleaning establishment, and a newspaper printing company, which may have used hazardous materials as part of business operations.

   Phase II baseline assessment of groundwater was conducted to evaluate these potential sources of contamination. Analytical testing of groundwater samples collected from 14 borings at the site indicated several volatile organic hydrocarbons (VOCs), in particular chlorinated solvents, were detected at concentrations exceeding U.S. Environmental Protection Agency (EPA) Region 9 Preliminary Remedial Goals (PRGs) for tap water (October 2002). Additional investigation was deemed necessary to determine the full nature, extent, and sources of solvents in site groundwater.

2) Shallow Soils in Subgrade Areas As part of the baseline assessment of the property due to historical uses, exposed soils within the subgrade area beneath two former printers and a former automobile painting operation were sampled during the Phase II ESA. Diesel- and oil-range petroleum hydrocarbons were detected in the shallow soils at total concentrations up to 8,390 ppm, which exceeds the Oregon Department of Environmental Quality (DEQ) Level 2 Soil Matrix Cleanup Standard of 500 ppm (OAR 340-122-0335). The source of the detected petroleum hydrocarbons was not certain. Additional investigation was deemed necessary to determine the full nature, extent, and sources of petroleum hydrocarbons in the shallow soils of this area.

3) Above-Ground Storage Tank An AST was identified beneath the sidewalk of Exchange Street south of the Safeway store within the open subgrade area. At the time of the Phase II ESA, the referenced AST was thought to be a heating oil tank. Subsequently, it was found that this 500-gallon tank did not likely store petroleum product, but more likely stored water. Thus, the actual use of this tank is not known. Phase II soil testing detected low levels of petroleum hydrocarbons (up to 382 parts per million [ppm]) in shallow soils adjacent to this tank. Further evaluation of the Safeway AST was not deemed necessary since the detected petroleum hydrocarbon concentrations are below the DEQ

Level 2 Soil Matrix Cleanup Standard of 500 ppm. However, decommissioning of the AST was recommended.

4) Safeway Heating Oil Tank An UST was suspected to be present beneath a concrete slab within the subgrade area to the south of the Safeway store near the Exchange Street sidewalk. The geophysical survey did confirm the presence of an UST beneath the concrete slab. Subsequently, it was determined that this 675-gallon tank was used to store heating oil. Phase II soil testing adjacent and below the north end of the Safeway UST did not identify petroleum impacts beneath the tank. However, sampling beneath the south end of the tank was not possible due to refusal in hard material. Decommissioning of the UST and further soil assessment for this tank was recommended.

5) American Legion Heating Oil Tank An heating oil UST was located beneath the southern end of the American Legion building. Phase II soil testing adjacent and below this tanks did not identify petroleum impacts Decommissioning of the heating oil tank was recommended.

6) "Gas and Oils" Area Research indicated that "gas and oils", which may have been contained in ASTs or USTs, were stored at a commercial automobile garage formerly located on the property's northern portion. Building plans for the existing Safeway store indicated that existing tanks, which may have been associated with the commercial garage, were to be removed from beneath the Duane Street sidewalk during construction of the Safeway building. Since the removal of these tanks could not be confirmed, a geophysical survey was recommended.

   The geophysical survey did not identify the presence of USTs below the basement level of the Duane Street sidewalk. It appears that any tanks associated with the former "gas and oils" area along Duane Street were removed and were most likely ASTs.

7) Asbestos Suspect asbestos-containing materials were noted in the American Legion building. An asbestos survey of the Safeway store, completed in 1991, identified the presence of asbestos in various areas of the store. The asbestos survey did not include the exterior portions of the store, including the roof. An asbestos survey of building materials was recommended for the subject property.

5.0 PROJECT OBJECTIVES

The *First Amendment to Purchase and Sale Agreement* between Safeway and the City of Astoria required Safeway to address Conditions 1 through 4 listed in Section 4.0 above. The objectives of the work for each environmental condition are summarized as follows:

1) Characterize the nature, magnitude, extent, and sources of solvents (VOCs) in groundwater beneath the Safeway property
2) Characterize the nature, magnitude, extent, and sources of petroleum hydrocarbons in shallow soils within subgrade areas of the Safeway property
3) Decommission the Safeway AST
4) Decommission the Safeway heating oil UST.

Only the first two objectives are part of the investigation activities discussed in this report. The decommissioning of the Safeway AST and heating oil UST is presented in a separate report. Decommissioning of the American Legion heating oil tank, and an asbestos survey of site structures were not part of this project.

6.0 FIELD ACTIVITIES

The work activities completed in October 2003 involved the installation of eight push probe borings for the collection of groundwater samples, and the collection of shallow soil samples from 17 locations at basement level of the Safeway property. It should be noted that sampling of subsurface soils and groundwater on the eastern portion of the property is severely hampered by the open subgrade area, which has difficult access and is considered a potential confined space.

6.1 Groundwater Investigation Activities

6.1.1 Drilling Locations and Rational

In October 2003, eight push probe borings (B-19 through B-25, and B-28) were installed on and surrounding the Safeway property for the collection of groundwater samples. Because of the open subgrade area to the east of the Safeway store and below the sidewalks at the site, installation of push

probes from street level in these areas is not feasible. Further, because of confined space issues, access to the subgrade areas with push probe equipment was not practicable. Previous groundwater samples collected from the subgrade areas (B-4, B-6, and B-7) were collected using a post-hole digger, a method that cannot collect representative groundwater samples below the top of the water table or at any significant depth. Boring B-28 (like B-3 previously) was installed through the floor of the Safeway basement (not a confined space) using hand-held push probe equipment. Proposed borings B-26 and B-27, slated for installation in 12th Street, were not installed because of the discovery of subsurface utility tunnels that are present beneath the street.

Previous testing of the groundwater at the site took place near the top of the water table within a fill unit, typically at depths of 12 to 16 feet below street level or ground surface (bgs). With respect to further characterization, there was some concern the identified VOC plumes could be passing below the shallow screen intervals, undetected, outside of the source areas. Accordingly, the October 2003 investigation was designed to collect geologic information, so that screen intervals could be placed deeper at the base of the fill unit (typically 16 to 20 feet bgs). Further, three locations (B-19, B-21, and B-24) were selected to collect samples at greater depths within the upper alluvial deposits (26 to 30 feet bgs) to determine the vertical extent of the plumes. The October 2003 push probes were placed near previous locations so that vertical profiling could be accomplished. Borings B-24 and B-25 were placed in Exchange Street in inferred up-gradient locations from areas where elevated levels of VOCs were previously detected (B-2 and B-4) to better determine potential contribution from off-site up-gradient sources.

6.1.2 Drilling and Soil Sampling Procedures

On October 30 and 31, 2003, push probe borings were installed at street level at seven locations (B-19 through B-25). The push probe borings were installed with a truck-mounted Geo-Probe Systems hydraulic hammer unit using 2-inch outside diameter (OD) hydraulically-driven steel probes. Boring B-28 was installed through the Safeway basement floor with a hand-held roto-hammer unit equipped with 1-inch diameter steel rod and large bore sampler. The borings were installed by Geo-Tech Explorations, Inc. of Tualatin, Oregon. Groundwater samples were collected from all eight locations, with two depth-discrete samples collected at each of three locations (B-19, B-21, and B-24).

At each location, a boring was first installed for geologic logging. Continuous soil cores were collected using a 4-foot long, 2-inch OD Macro-Core Sampler. The properties of each soil core were noted in the field by the HAI scientist (Appendix A). This first borehole was abandoned, and a second boring was installed immediately adjacent to collect the groundwater samples.

Following completion of the groundwater sampling activities, the well screens were pulled and the borings were backfilled with 3/8-inch bentonite chips to within 6 inches of the ground surface. Concrete was placed in the upper 6 inches of the boring to match the surrounding land surface.

All boring installation work was performed by an Oregon-bonded and licensed monitoring well constructor. The boring installations were completed in accordance with the Oregon Groundwater Law (Oregon Revised Statute (ORS) Chapter 537) and the Rules for Construction and Maintenance of Monitoring Wells and Other Holes in Oregon (Oregon Administrative Rules (OAR) Chapter 690, Division 240).

Field boring logs, summarizing the push probe boring installations, soil types encountered, and field screening results, are included in Appendix A.

6.1.3 Groundwater Sampling Procedures

Groundwater samples were collected from all eight locations at depths corresponding to the base of the fill unit, typically 16 to 20 feet bgs. The screen depth was chosen based on field interpretation of the base of the fill unit. Further, groundwater samples were collected from three locations (B-19, B-21, and B-24) at greater depths within the upper alluvial deposits (26 to 30 feet bgs).

To collect the groundwater samples, a 4-foot section of 1-inch OD, 0.004-inch slotted stainless steel well screen was pushed directly to the targeted sampling depth to assure a good seal for depth-discrete sampling. Water was detected at typical depths of 12 to 14 feet bgs in well points.

The groundwater samples were collected from the well points with new disposable bailer tubing following purging of approximately one liter of water with a vacuum pump. Sample containers were completely filled such that no headspace was present that would allow for the loss of volatiles. The

sample containers were then labeled and transferred to a chilled container for shipment to the analytical laboratory.

6.2 Soil Investigation

On October 31, 2003, shallow soil samples were collected from 14 locations (SS-6 through SS-19) within the subgrade area of the Safeway property (i.e. east of the Safeway basement). The exposed soils in this area were sampled by Stayton Environmental, Inc. of Portland, Oregon, a contractor experienced with working in confined spaces. The sample locations were based on a 10- to 15-foot grid near the previously detected contamination, and a 30-foot grid further out. The subgrade soil sample locations are depicted on Figure 3.

The soils at each location were excavated with hand tools to a depth of 1.0 feet below basement level (bbl), or approximately 10.5 feet below street level, where a composite sample was collected by hand. One location (SS-7) was excavated to a depth of 3 feet bbl, where a second deeper sample was collected.

On October 30, 2003, shallow soil samples were collected from 3 locations (B-29 through B-31) through the concrete floor of the Safeway basement. These borings were installed with a hand-held roto-hammer unit to a depth of 4 feet bbl by Geo-Tech Explorations, Inc. A continuous soil core was collected from each boring using a 4-foot long, 2-inch OD Macro-Core Sampler. The properties of each soil core were noted in the field by the HAI scientist (Appendix A). A soil sample was collected from each core at a depth of 1 to 2 feet bgs.

Upon collection, each soil sample was immediately placed in a 4-ounce sample jar and capped with a teflon-lined lid. The sample jars were then labeled and transferred to a chilled container for shipment to the analytical laboratory. Standard sampling protocols, including the use of chain-of-custody documentation, were followed for all sampling procedures.

6.3 Decontamination Procedures

All reusable drilling and soil and groundwater sampling equipment was steam cleaned with potable water prior to use, and between boring locations, to prevent cross-contamination. All soil sampling equipment was decontaminated after each sample by using a detergent solution wash, and

two potable water rinses. New disposable tubing was used for each groundwater sample.

6.4 Investigative Derived Waste

Soil cuttings were not generated during the investigative activities. Since a sheen was not observed on the equipment decontamination water, it was placed on bare ground near the drilling locations for percolation.

7.0 ANALYTICAL TESTS

The soil and groundwater samples were shipped with chain-of-custody documentation in sealed and chilled containers to Specialty Analytical, Inc. located in Portland, Oregon.

Seventeen shallow soil samples were analyzed for diesel- and oil-range total petroleum hydrocarbons (TPH) by Northwest Method TPH-Dx. Two select samples were also analyzed for waste profile and risk parameters, including VOCs by EPA Method 8260, polynuclear aromatic hydrocarbons (PAHs), by EPA Method 8270 SIM, polychlorinated biphenyls (PCBs) by EPA Method 8082, and RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) by EPA Method 6010/7000 Series.

The groundwater samples were all analyzed for the presence of VOCs by EPA Method 8260.

The results of the soil analytical testing are summarized on Tables 1 and 2, including the results of previous testing at the site. The results of current and previous groundwater analytical testing are summarized on Table 3. The laboratory reports and chain-of-custody documentation for the soil and groundwater sampling activities are included in Appendices B and C, respectively.

8.0 RESULTS AND DISCUSSION

8.1 Subsurface Conditions

Native Soils Historic maps of the area show the Safeway property is situated in an area that was once tidal flats of the Columbia River. The estimated historic tide line is shown on Figure 2. The top of a native silt unit

that is typically encountered at depths of 18 feet below street level (bgs) is interpreted to be the former tidal flat surface. To the south (at B-2) and southwest (at B-21), the silt unit rises to depths of 16.5 and 14.5 feet bgs, respectively, which is consistent with the proximity of the tide line in these areas. Below the silt unit are alternating zones of native alluvial sands and silts to depths of at least 30 feet bgs.

Fill Soils The eastern portion of the site, including beneath the Safeway store, has been filled in with medium sand (possibly dredge spoils) to the basement level of approximately 9.5 feet bgs. These are the sands that are exposed and were sampled in the eastern subgrade portion of the site. On the western portion of the site (west of the Safeway store), and in most of the streets surrounding the site (but not beneath the sidewalks), the site has been filled to street level with predominantly silts and clayey silts, and occasional sands and gravels.

Groundwater Uppermost groundwater is present in the sand fill unit typically at depths of 12 to 14 feet bgs. Based on topography and local hydrogeologic features, it is inferred that uppermost net groundwater flow direction is generally to the north towards the Columbia River. Based on the arcing tide line in this area (see Figure 2), which likely mirrors historic topography in the area, it is possible there is localized shallow groundwater flow, perpendicular to this line. Groundwater flow direction was not confirmed by direct measurement from monitoring wells. Because of the filled nature of the site and area, and the close proximity to the Columbia River, a major hydrogeologic feature that displays seasonal and tidal variations, groundwater flow beneath the property may not be straightforward, possibly fluctuating seasonally and daily.

8.2 Soil Testing Results

8.2.1 Petroleum Hydrocarbons

Petroleum hydrocarbons were detected in the 15 samples collected in October 2003 from the exposed soils in the open subgrade area (sand fill at 0 to 1.0 feet bbl, or 9.5 to 10.5 feet bgs). The diesel- and oil-range petroleum hydrocarbons were detected at total concentrations ranging from 57 ppm (SS-14) to 3,323 ppm (SS-10) (Table 1). Previous testing detected diesel- and oil-range petroleum hydrocarbons at total concentrations up to 8,390 ppm (SS-2). Testing of the shallow soils beneath the Safeway

basement floor to the west at B-29 and B-31 did not detect petroleum hydrocarbons.

8.2.2 Lateral and Vertical Extent

Lateral Extent The lateral extent of petroleum impact appears generally defined to a concentration of 500 ppm (the DEQ Level 2 Soil Cleanup Standard). The interpreted extent of petroleum contamination in the shallow soils is shown on Figure 4. Although direct delineation to the east of SS-15 and to the north of SS-6 has not been accomplished with existing data, the rate of attenuation, as determined with existing data, suggests the petroleum hydrocarbon levels will decline to below 500 ppm before reaching the property boundaries.

Vertical Extent Vertical profiling gives conflicting results with respect to the hydrocarbons in subgrade soil. At boring B-4, located in the southeast portion of the site, the 448 ppm TPH detected at 0.5 to 1.0 feet bbl declines to below detectable levels by 1.5 to 2.0 feet bbl. Closer to a suspected source area in the northwestern open subgrade area (SS-7), the 1,481 ppm TPH detected at 0.0 to 1.0 feet bbl increases to 1,969 ppm at 2.0 to 3.0 feet bbl. However, compared to the shallow sample results at the adjacent SS-2, located less than 2 feet from SS-7, the 8,390 ppm TPH detected at 1.0 to 1.5 feet bbl declines to 1,969 ppm at 2.0 to 3.0 feet bbl. Based on this rate of decline, the petroleum levels should drop below 500 ppm by a depth of 4 feet bbl. This evaluation, in combination with the shallow water table (only 2 to 4 feet bbl), suggests the vertical extent of soil contamination is adequately defined.

8.2.3 Possible Sources

Although an exact source of the detected petroleum contamination in shallow subgrade soils cannot be determined, a possible source area may be present in the vicinity of location SS-7, where the highest levels were detected. Potential sources include: 1) the contamination was imported with the soils when they were used to fill the site; 2) the contamination is from former auto garage activities that took place at the site, with waste liquids possibly discharged to the subgrade area; and/or 3) the contamination is from street and parking lot runoff that currently discharges to the subgrade area. If the contamination was imported to the site with the fill, then it is possible for contamination to extend below the water table.

8.2.4 *Other Parameters*

With respect to other parameters analyzed in the two select soil samples (SS-6 and SS-9), VOCs were not detected above method detection limits, but PCBs, PAHs, and metals were detected (Table 1).

PCBs were detected at total concentrations of 0.386 ppm (SS-9) and 1.304 ppm (SS-6), with the latter exceeding the Residential Protective Level of 1.2 ppm, as listed in the DEQ *Generic Remedies for Soils Contaminated with PCBs*, December 1997.

PAHs were detected at total concentrations of 0.34 ppm (SS-9) and 8.33 ppm (SS-6), with the latter having some PAHs exceed DEQ Risk-Based Concentrations (RBCs) (September 2003) (Table 2). Specifically, benzo(a)pyrene and benzo(b)fluoranthene were detected in soil at SS-9 at concentrations exceeding RBCs for direct contact with residential and occupational receptors (humans).

With the exception of lead, all metals were found at concentrations that are consistent with naturally-occurring background levels. Lead was detected at concentrations of 92.2 ppm (SS-6) and 133 ppm (SS-9), which exceed the default background concentration of 17 ppm, but are below the EPA PRG for residential soil of 400 ppm. The detected lead concentrations do exceed the DEQ RBC for Leaching to Groundwater of 30 ppm.

8.2.5 *Potential Risk*

Exposed subgrade soils at the property are contaminated with diesel- and oil-range petroleum hydrocarbons that could pose a risk for direct contact with a residential receptor for PCBs and PAHs, and with an occupational receptor for PAHs. However, since the soils are present in an unfinished subgrade area with restricted access beneath a commercial property, exposure to residential or occupational receptors is not reasonable likely.

With respect to leaching to groundwater, only lead was identified at a concentration of potential concern. However, since the use of groundwater for drinking purposes in this area of Astoria does not appear reasonably likely, the leaching to groundwater pathway would not appear to be of concern with respect to human health.

Based on the preceding, no current unacceptable human health risk is identified with respect to the contaminated soils.

8.2.6 Potential Future Actions

If left in-place, undisturbed, it does not appear any cleanup actions would be necessary with respect to the identified petroleum-contaminated soils, as long as access to the unfinished basement level continues to be restricted. However, if excess soils are generated during future re-development of this area, then special management of these soils will be necessary. If cleanup of the impacted soils were deemed appropriate, the most feasible remedial options would likely be removal, capping, or some combination of the two.

8.3 Groundwater Testing Results

8.3.1 VOCs in Groundwater

Analytical testing of groundwater samples obtained from the site in February, March, and October 2003 indicates VOCs were detected above method detection limits at 10 locations (B-2, B-4, B-8, B-11, B-13, B-14, B-19, B-21, B-24, and B-28) (Table 3, Figure 5). The VOCs detected above method detection limits included benzene, 4-isopropyltoluene (4-IPT), chloromethane, cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride.

VOCs detected at concentrations above EPA PRGs for tap water, are benzene (3.75 ppb at B-13), chloromethane (17.6 ppb at B-2 and 3.96 ppb at B-4), cis-1,2-DCE (81.4 at B-2), PCE (7.42 ppb at B-4), TCE (3.29 ppb at B-4), and vinyl chloride (1.03 to 90 ppb at B-2, B-8, B-11, B-14, B-19, B-21, and B-28).

With the exception of boring B-21, all VOCs are interpreted to be present within the sand fill unit above the tidal flat silt zone. At B-21, the VOCs are interpreted to be present in an alluvial sand just below the tidal flat silt zone. VOCs were not detected in any of the three deep groundwater samples collected from the alluvial deposits at 26 to 30 feet bgs, indicating the vertical extent of VOC plumes appears to be defined.

8.3.2 *VOC Suites*

The PCE/TCE/DCE/vinyl chloride suite of VOCs is a common suite of chemicals found where natural degradation of dry cleaning solvent (PCE) and/or de-greasing solvents (PCE or TCE) has occurred. Chloromethane is a degradation product of methylene chloride (a de-greasing solvent) or carbon tetrachloride (an historical dry cleaning solvent). Benzene and 4-IPT are most often found to be related to a release of gasoline. The high percentage of degradation products (chloromethane, DCE, and vinyl chloride) to primary solvents in groundwater at the site appears to suggest a relatively high level of degradation of the original release has occurred. However, vinyl chloride is also used as a chemical in its own right, and may not necessarily be the product of the degradation of another solvent.

8.3.3 *VOC Plumes and Sources*

Based on an analysis of the magnitude and distribution of VOCs, as well as the suite of VOCs detected in groundwater beneath the site, it is interpreted that at least two, or possibly three, plumes and sources for VOCs are present in groundwater beneath the site.

The highest concentration of VOCs in groundwater at the site was detected at boring B-2, located at the UST on the southern boundary of the American Legion property, where 190 ppb total VOCs (predominantly vinyl chloride) were detected. Up-gradient sampling at borings B-16 and B-24 indicate the detected VOCs do not appear to originate off-site. VOCs detected at borings B-14 (17.6 ppb) and B-19 (8.4 ppb), located in Duane Street north of the site, are of similar composition and located down-gradient of boring B-2. Accordingly, these VOC detections are interpreted to be a single north-south trending plume with a source near boring B-2 (hereafter referred to as the central VOC plume). This plume is shown on Figure 5. Note the plume is shown to pass through boring B-3 where no VOCs were detected; it is interpreted that the plume extends below the shallow screen interval at this location. The central VOC plume appears to be vertically limited to the saturated sand fill unit.

The 17.8 ppb VOCs detected at boring B-4 near the Safeway UST, are interpreted to also be part of the central VOC plume. However, the suite of VOCs at B-4 show more primary solvents to degradation products, yet at lower total concentrations than at B-2. Thus, the VOCs at B-4 could be from a potential separate source.

The exact source or source area of the central VOC plume is not known. The presence of a former dry cleaner and printers on the southern portion of the property could represent possible sources. However, the levels of VOCs found in groundwater are not that high, and could be from any minor de-greasing operation that may have occurred at the site, including that of servicing the American Legion UST, where the highest levels of VOCs are found.

The low levels of vinyl chloride detected at borings B-8, B-11, and B-21 along the western portion of the site are interpreted to be a separate plume (hereafter referred to as the western VOC plume) that likely originates off-site. This interpretation is based on the lack of halogenated VOCs detected in borings that separate the two plumes (B-9, B-10, B-13, B-22, and B-23).

The isolated occurrences of benzene in groundwater at boring B-13, and 4-IPT at boring B-24, do not appear to indicate any significant plume of contamination for either of these chemicals.

8.3.4 Extent of VOC Plumes

Although the lateral extent of VOCs in the central VOC plume is generally defined, the full off-site extent to the north of B-14 and B-19 is not known. The central VOC plume appears to be vertically limited to the saturated sand fill unit.

The eastern extent of the western VOC plume is generally defined by the existing data. The western VOC plume appears to be present in both the sand fill unit (12 to 16 feet bgs), and the upper alluvial deposits at 17 to 21 feet bgs, but is not detected at 26 to 30 feet bgs, indicating it is vertically defined.

8.3.5 Potential Risk

A preliminary risk screening was conducted to determine potential exposure pathways and potential unacceptable risks that may be present under various land use scenarios at the property. Since the use of groundwater for drinking purposes in this area of Astoria does not appear reasonably likely, this exposure pathway can be preliminarily eliminated from consideration. Because groundwater is located below the basement level of the site, direct contact with occupational workers or future residents also does not appear reasonably likely. However, because of the shallow nature of groundwater

beneath the basement level, exposure to future construction workers or excavation workers should be considered. Likewise, vapor intrusion into buildings and volatilization to outdoor air are exposure pathways that need to be evaluated.

A preliminary evaluation of risk for the VOCs in groundwater utilizing risk screening criteria (DEQ RBCs) indicates the VOCs in groundwater should not pose an unacceptable risk to construction or excavation workers, nor to outdoor air. The risk screening does indicate potential unacceptable risk to future potential residents due to vapor intrusion into buildings by vinyl chloride at one location (B-2). Unacceptable risks were not identified by this pathway for occupation workers. Thus, no unacceptable risks were preliminarily identified under current use conditions or future uses of the site for commercial or other non-residential activities.

8.3.6 Potential Future Actions

If left in-place, undisturbed, it does not appear any cleanup actions would be necessary with respect to the identified VOCs in groundwater, as long as site use does not change. Accordingly, in the absence of any cleanup actions for VOCs in groundwater at the property, a deed restriction preventing residential uses of the property appears warranted. If residential uses are contemplated for the property, then cleanup actions would likely be necessary to reduce the VOC levels in groundwater, or to prevent vapor intrusion into structures through the use of engineering controls, such as vapor barriers or other vapor resistant construction methods.

If excess groundwater is generated by dewatering during re-development in the plume areas, then special management of this water will be necessary. Activities that may exacerbate the spread of contamination should be avoided at the property, such as the installation of deep utility trenches, or the installation of water wells for any purpose.

Finally, if DEQ were to become involved in order to issue a letter of "no further action", the agency would most likely require a full Remedial Investigation (RI), Risk Assessment (RA), and Feasibility Study (FS) for the property, which is a potential financial liability to owners of the property.

9.0 LIMITATIONS AND SIGNATURES

The information presented in this report was collected, analyzed, and interpreted following the standards of care, skill, and diligence ordinarily provided by a professional in the performance of similar services as of the time the services were performed. This report and the conclusions and/or recommendations contained in it are based solely upon research and/or observations, and physical sampling and analytical activities that were conducted.

The information presented in this report is based only upon activities witnessed by HAI or its contractors, and/or upon information provided to HAI by the Client and/or its contractors. The analytical data presented in this report document only the concentrations of the target analytes in the particular sample, and not the property as a whole.

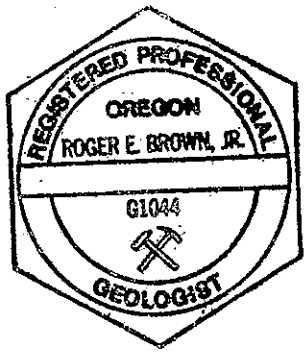
Unless otherwise specified in writing, this report has been prepared solely for the use by the Client and for use only in connection with the evaluation of the subject property. Any other use by the Client or any use by any other person shall be at the user's sole risk, and HAI shall have neither liability nor responsibility with respect to such use.

Hahn and Associates, Inc.

Prepared by:

Roger E Brown

Roger E. Brown, R.G.
Principal



Date 12/16/03

10.0 GLOSSARY OF ABBREVIATIONS

AST	above-ground storage tank
bbl	below basement level
bgs	below existing ground surface
DCE	dichloroethene
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
HAI	Hahn and Associates, Inc.
IPT	isopropyltoluene
NW	Northwest
OAR	Oregon Administrative Rules
DEQ	Oregon Department of Environmental Quality
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
ppb	parts per billion
ppm	parts per million
PRG	EPA Region 9 Preliminary Remedial Goal
RBCs	DEQ Risk-Based Concentrations
TCE	trichloroethene
TPH	total petroleum hydrocarbons
UST	underground storage tank
VOCs	volatile organic compounds

TABLES

TABLE 1 – Summary of Basement Level Soil Testing Results

Sample Location	Sample Number	Sample Date	Sample Depth (feet bbl)	Laboratory Analytical Testing Results in mg/kg (ppm)														
				NW TPH-HCID	NW TPH-Dx			EPA 8260	EPA 8270	EPA 8082	RCRA Metals by EPA 6010/7000							
					Diesel-Range	Oil-Range	Diesel + Oil	VOCs	PAHs	PCBs	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
Reference Levels [1] ==>					2,800. [2]	500. [3]			Table 2	1.2 [4]	0.39	5,400.	37.	30.	400.	6.1	390.	390.
013	6081-030220-013	20-Feb-03	1.0 - 1.5	Diesel, Oil	537.	**2,290.**	2,827.											
B-4	6081-030220-009	20-Feb-03	0.5 - 1.0	ND														
B-6	6081-030220-010	20-Feb-03	0.5 - 1.0	Oil	16. U	448.	448.											
	6081-030220-011	20-Feb-03	1.5 - 2.0	ND														
	6081-030220-012	20-Feb-03	3.0 - 3.5	ND														
B-7	6081-030220-014	20-Feb-03	1.0 - 1.5	ND														
B-29	6167-031030-076	30-Oct-03	1.0 - 2.0		18.4 U	61.2 U	ND											
B-31	6167-031030-079	30-Oct-03	1.0 - 2.0		16.1 U	55.4 U	ND											
SS-1	6081-030318-050	18-Mar-03	1.0 - 1.5		238.	**1,010.**	1,248.											
SS-2	6081-030318-051	18-Mar-03	1.0 - 1.5		2,000.	**6,390.**	8,390.											
SS-3	6081-030318-052	18-Mar-03	1.0 - 1.5		129.	110.	239.											
SS-4	6081-030318-053	18-Mar-03	1.0 - 1.5		15.6 U	124.	124.											
SS-5	6081-030318-054	18-Mar-03	1.0 - 1.5		195. U	**2,520.**	2,520.											
SS-6	6167-031031-056	31-Oct-03	0.0 - 1.0		367.	**1,980.**	2,347.	ND	**8.33**	**1.304**	1.67 U	51.6	0.2	9.29	92.2	0.109	1.67 U	1.67 U
SS-7	6167-031031-057	31-Oct-03	0.0 - 1.0		251.	**1,230.**	1,481.											
	6167-031031-058	31-Oct-03	2.0 - 3.0		329.	**1,640.**	1,969.											
SS-8	6167-031031-059	31-Oct-03	0.0 - 1.0		134.	**704.**	838.											
SS-9	6167-031031-060	31-Oct-03	0.0 - 1.0		28.6	201.	230.	ND	0.34	0.386	1.72 U	93.7	1.18	11.3	133.	0.119	1.72 U	1.72 U
SS-10	6167-031031-061	31-Oct-03	0.0 - 1.0		473.	**2,850.**	3,323.											
SS-11	6167-031031-062	31-Oct-03	0.0 - 1.0		55.4	364.	419.											
SS-12	6167-031031-063	31-Oct-03	0.0 - 1.0		22.1	118.	140.											
SS-13	6167-031031-064	31-Oct-03	0.0 - 1.0		479.	**1,850.**	2,329.											
SS-14	6167-031031-065	31-Oct-03	0.0 - 1.0		17. U	57.3	57.											
SS-15	6167-031031-066	31-Oct-03	0.0 - 1.0		133.	**983.**	1,116.											
SS-16	6167-031031-067	31-Oct-03	0.0 - 1.0		18.9	121.	140.											
SS-17	6167-031031-068	31-Oct-03	0.0 - 1.0		200.	**1,320.**	1,520.											
SS-18	6167-031031-069	31-Oct-03*	0.0 - 1.0		33.9	196.	230.											
SS-19	6161-031031-070	31-Oct-03	0.0 - 1.0		19.2	146.	165.											

Notes:

bbl = below basement level (9.5 feet below street level)
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
HCID = hydrocarbon identification
mg/kg = milligrams/kilogram
ND = not detected
NW = Northwest Method
PAHs = polynuclear aromatic hydrocarbons
PCBs = polychlorinated biphenyls
ppm = parts per million
TPH = total petroleum hydrocarbons
U = not detected above concentration indicated
VOCs = volatile organic compounds

1 = EPA Region 9 Preliminary Remedial Goal (PRG) for Residential Soil, October 2002, unless otherwise indicated
2 = Based on most stringent DEQ Risk-Based Concentration (RBC), September 2003
3 = DEQ Level 2 Soil Matrix Cleanup Standard (OAR 340-122-0335)
4 = DEQ Residential Protective Level, Generic Remedies for Soils Contaminated with PCBs, December 1997
Bold = Detected concentration exceeds Reference Level

TABLE 2

Summary of Soil Testing Results: Polynuclear Aromatic Hydrocarbons (PAHs) by EPA 8270 SIM

Analytical Parameters	Analytical Testing Results in mg/kg (ppm)		Reference Levels [1]
Sample Location ==>	SS-6	SS-9	Lowest
Sample Number ==>	6167-031031-056	6167-031031-060	DEQ RBC
Sample Date ==>	31-Oct-03	31-Oct-03	
Depth (feet bbl) ==>	0.0 - 1.0	0.0 - 1.0	
Non-Carcinogenic PAHs			
Acenaphthene	0.0067 U	0.0067 U	2,900.
Acenaphthylene	0.131	0.0087	
Anthracene	0.119	0.0067 U	21,000.
Fluoranthene	1.45	0.0347	2,300.
Fluorene	0.0287	0.0067 U	2,600.
Naphthalene	0.67	0.0167	3.8
Phenanthrene	0.966	0.0267	
Pyrene	1.65	0.0327	1,700.
Carcinogenic PAHs			
Benzo (a) anthracene	0.337	0.014	0.62
Benzo (a) pyrene	**0.761**	0.03	0.062
Benzo (b) fluoranthene	**0.891**	0.0473	0.62
Benzo (ghi) perylene	0.38	0.0547	
Benzo (k) fluoranthene	0.23	0.0147	6.2
Chrysene	0.391	0.0187	62.
Dibenzo (a,h) anthracene	0.052	0.0087	0.062
Indeno (1,2,3-cd) pyrene	0.276	0.0373	0.62
Total Carcinogenic PAHs	3.32	0.23	
Total PAHs	8.33	0.34	

Note:

bbl = below basement level (9.5 feet below street level)
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
mg/kg = milligrams/kilogram
PAHs = polynuclear aromatic hydrocarbons
ppm = parts per million
U = not detected above concentration indicated

1 = Based on most stringent DEQ Risk-Based Concentrations (RBCs), September 2003
Bold = Concentration exceeds Reference Level

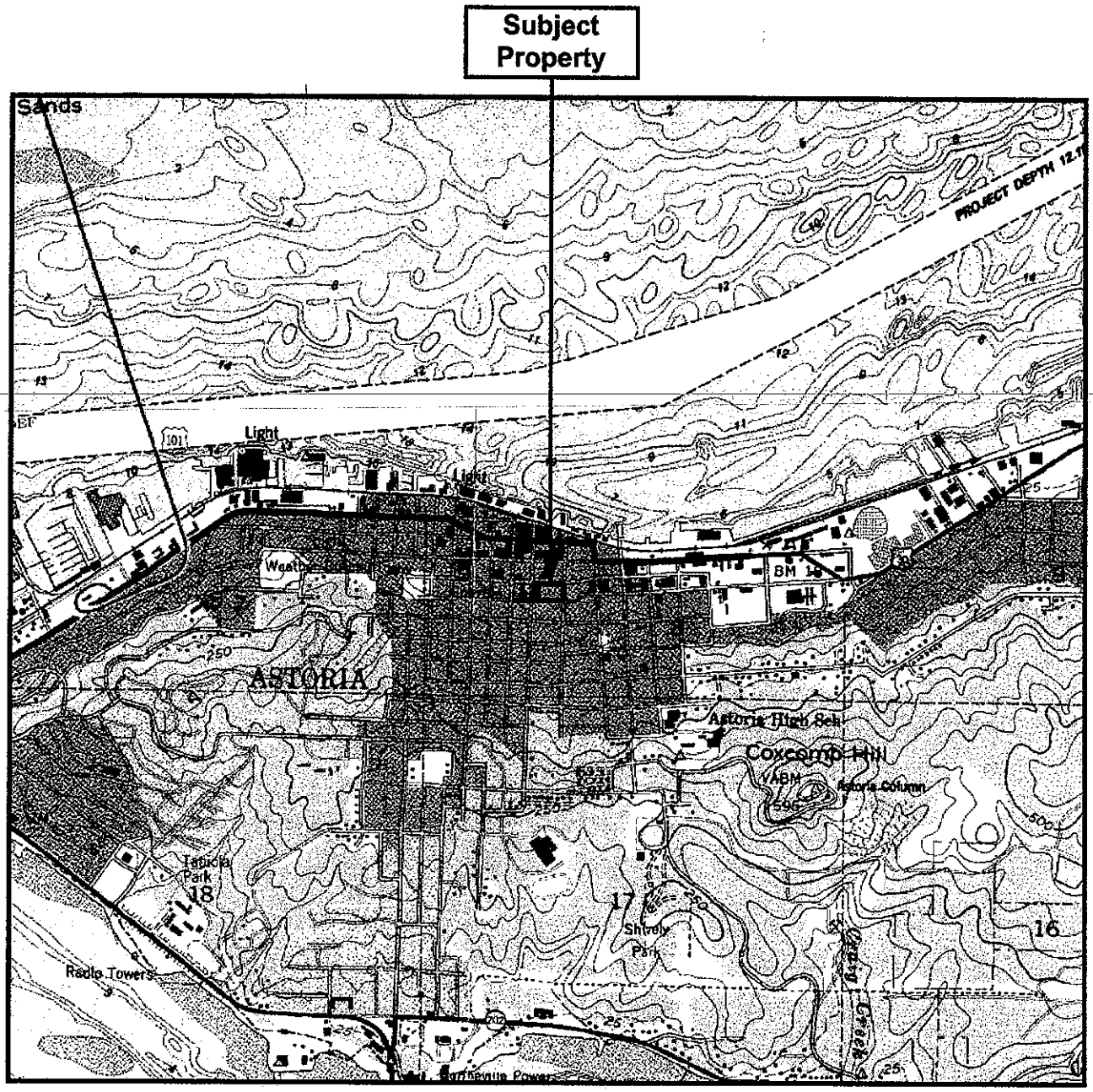
TABLE 3 – Summary of Groundwater Testing Results

Sample Location	Sample Number	Sample Date	Screen Interval (feet bgs)	Laboratory Analytical Testing Results in ug/L (ppb)									
				EPA Method 8260									
				BTEX Benzene	4-IPT	Chloromethane	cis-1,2-DCE	trans-1,2-DCE	PCE	TCE	Vinyl Chloride	Other VOCs	Total HVOCs
		Reference Levels [1] ==>		0.34		1.5	61.	120.	0.66	0.028	0.02		
B-2 [2]	6081-030219-100	19-Feb-03	13.5 - 18.5	0.4 U	1. U	**17.6**	**81.4**	1.27	1. U	1. U	**90.**	U	190.
B-3 [2]	6081-030219-101	19-Feb-03	10.5 - 14.5	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-4 [2]	6081-030220-102	20-Feb-03	9.5 - 14.5	0.4 U	1. U	**3.96**	3.1	1. U	**7.42**	**3.29**	1. U	U	17.8
B-6 [2]	6081-030220-104	20-Feb-03	9.5 - 14.5	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-7 [2]	6081-030220-103	20-Feb-03	9.5 - 14.5	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-8	6081-030318-105	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	**3.12**	U	3.1
B-9	6081-030318-106	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-10	6081-030318-107	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-11	6081-030318-108	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	**3.04**	U	3.
B-13	6081-030318-109	18-Mar-03	12.0 - 16.0	U **3.75**	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-14	6081-030318-110	18-Mar-03	12.0 - 16.0	0.4 U	1. U	1. U	2.51	1. U	1. U	1. U	**15.1**	U	17.6
B-15	6081-030318-111	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-16	6081-030318-112	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-17	6081-030318-113	18-Mar-03	12.0 - 16.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-19	6167-031030-116	30-Oct-03	17.0 - 21.0	0.4 U	1. U	1. U	1.07	1. U	1. U	1. U	**7.28**	U	8.4
	6167-031030-117	30-Oct-03	26.0 - 30.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-20	6167-031031-125	31-Oct-03	16.0 - 20.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-21	6167-031031-123	31-Oct-03	17.0 - 21.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	**3.73**	U	3.7
	6167-031031-124	31-Oct-03	26.0 - 30.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-22	6167-031030-119	30-Oct-03	15.0 - 19.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-23	6167-031030-118	30-Oct-03	16.0 - 20.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-24	6167-031031-126	31-Oct-03	15.5 - 19.5	U 0.4 U	65.5	1. U	1. U	1. U	1. U	1. U	1. U	U	U
	6167-031031-127	31-Oct-03	26.0 - 30.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-25	6167-031031-122	31-Oct-03	16.0 - 20.0	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	1. U	U	U
B-28 [2]	6167-031030-115	30-Oct-03	15.5 - 19.5	U 0.4 U	1. U	1. U	1. U	1. U	1. U	1. U	**1.03**	U	1.

bgs = below ground surface
DCE = dichloroethene
DEQ = Oregon Department of Environmental Quality
EPA = U.S. Environmental Protection Agency
HVOCs = halogenated volatile organic compounds
IPT = isopropyltoluene
PCE = tetrachloroethene
ppb = parts per billion
TCE = trichloroethene
U = not detected above concentration indicated
ug/l = micrograms/liter
VOCs = volatile organic compounds

1 = Borings installed at basement level approximately 9.5 feet below street level (depths are adjusted to street level)
2 = EPA Region 9 Preliminary Remedial Goal (PRG) for Tap Water, October 2002
Bold = Detected concentration exceeds Reference Level

FIGURES



Note: Base Map from the Astoria (1984), Oregon/Washington
USGS 7.5-Minute Quadrangle
Contour Interval: 50 Feet

N

0 2000 4000

Scale in Feet

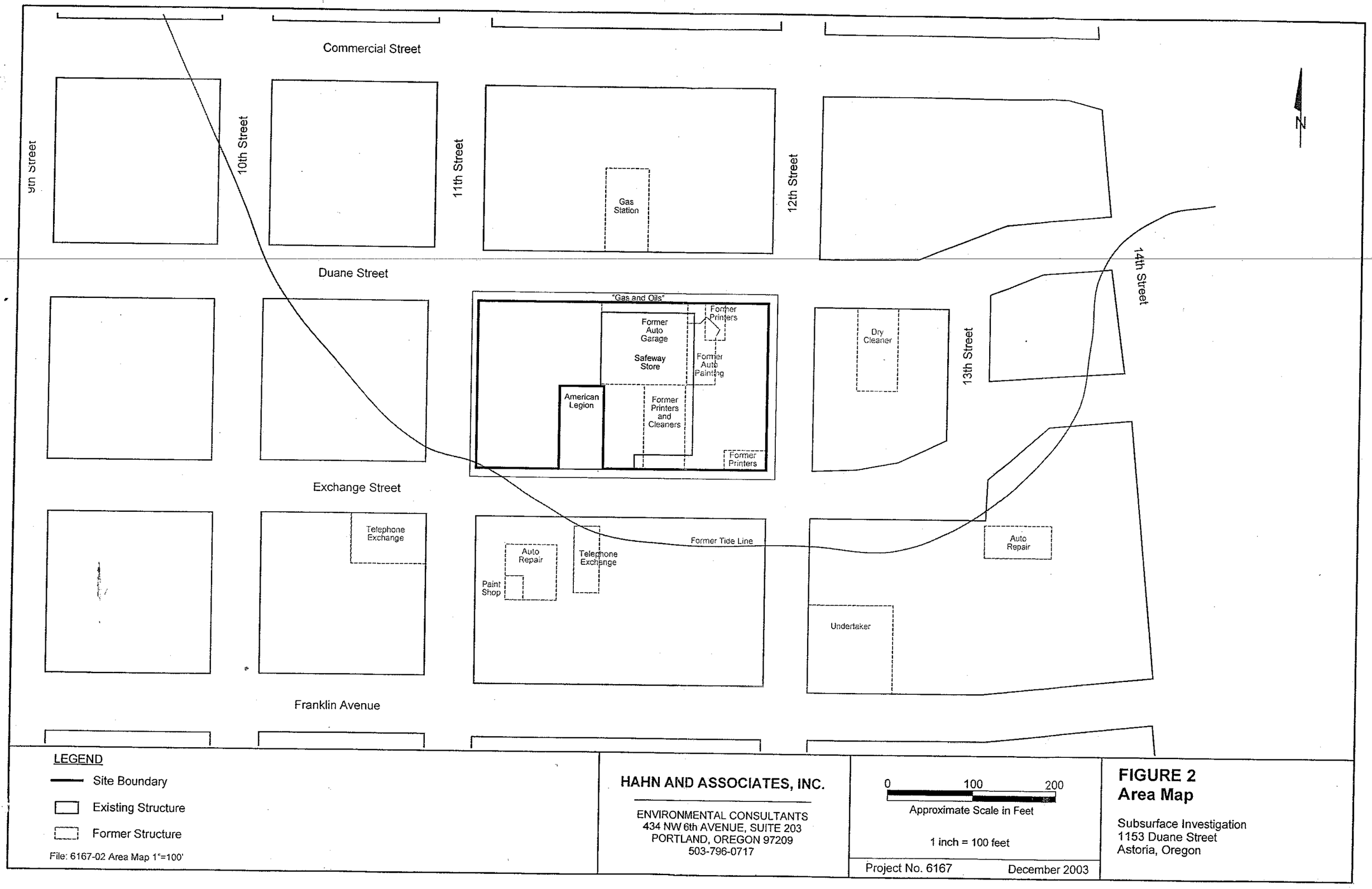
FIGURE 1
Location Map

Subsurface Investigation
1153 Duane Street
Astoria, Oregon

HAHN AND ASSOCIATES, INC.

Project No. 6167 December 2003

File: 6167-01 Location Map



LEGEND

- Site Boundary
- Existing Structure
- Former Structure

File: 6167-02 Area Map 1"=100'

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
434 NW 6th AVENUE, SUITE 203
PORTLAND, OREGON 97209
503-796-0717

0 100 200

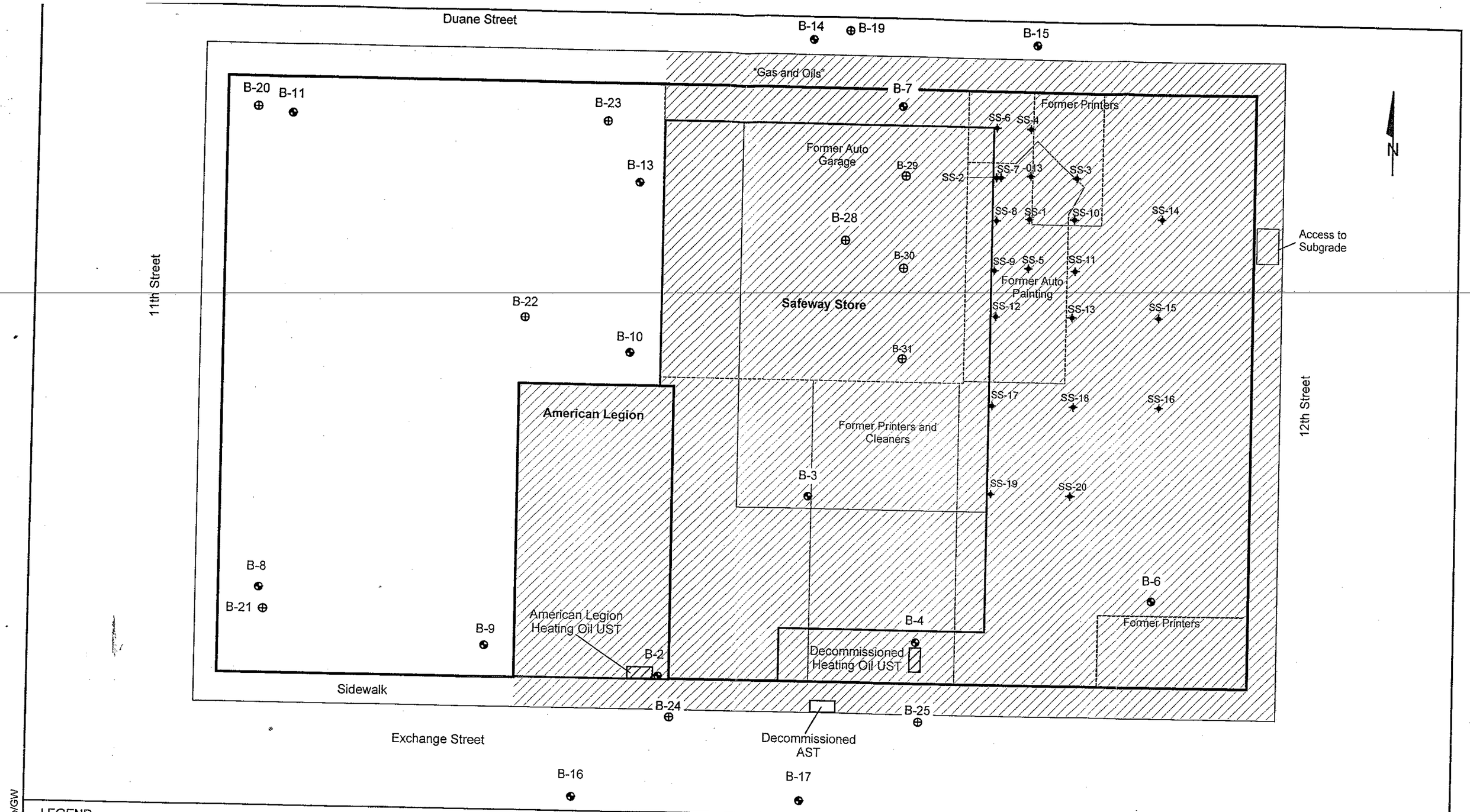
Approximate Scale in Feet

1 inch = 100 feet

Project No. 6167 December 2003

FIGURE 2
Area Map

Subsurface Investigation
1153 Duane Street
Astoria, Oregon



LEGEND

- Site Boundary
- Existing Structure
- Former Structure
- Area with Basement Level
- Push Probe w Groundwater Sample (Oct 2003)
- Push Probe w Groundwater Sample (Feb/Mar 2003)
- Soil Grab Sample Location

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
434 NW 6th AVENUE, SUITE 203
PORTLAND, OREGON 97209
503-796-0717

0 30 60

Approximate Scale in Feet

1 inch = 30 feet

Project No. 6167 December 2003

FIGURE 3
Site Map

Subsurface Investigation
1153 Duane Street
Astoria, Oregon

File: 6167-...05 Site Map/GW

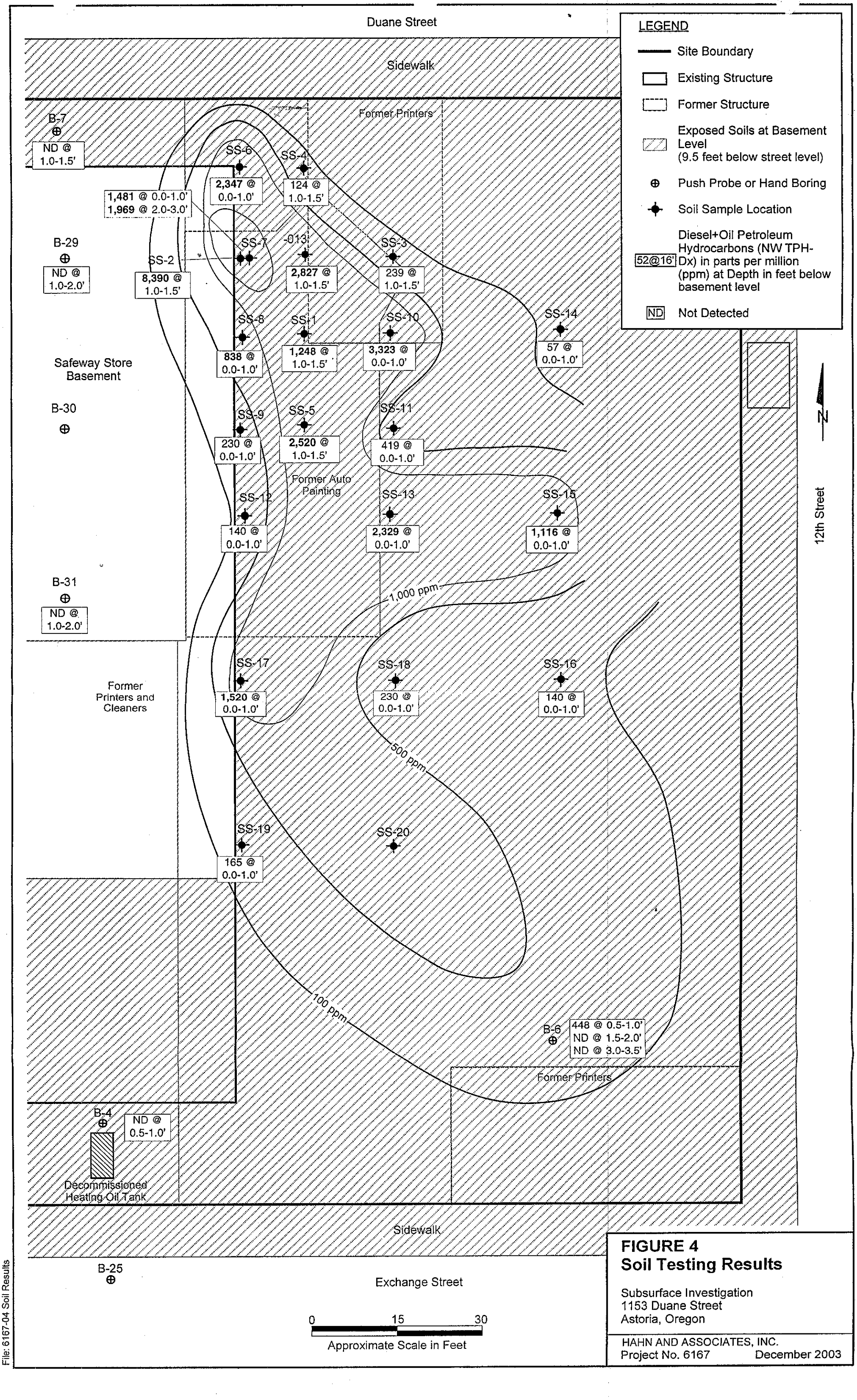
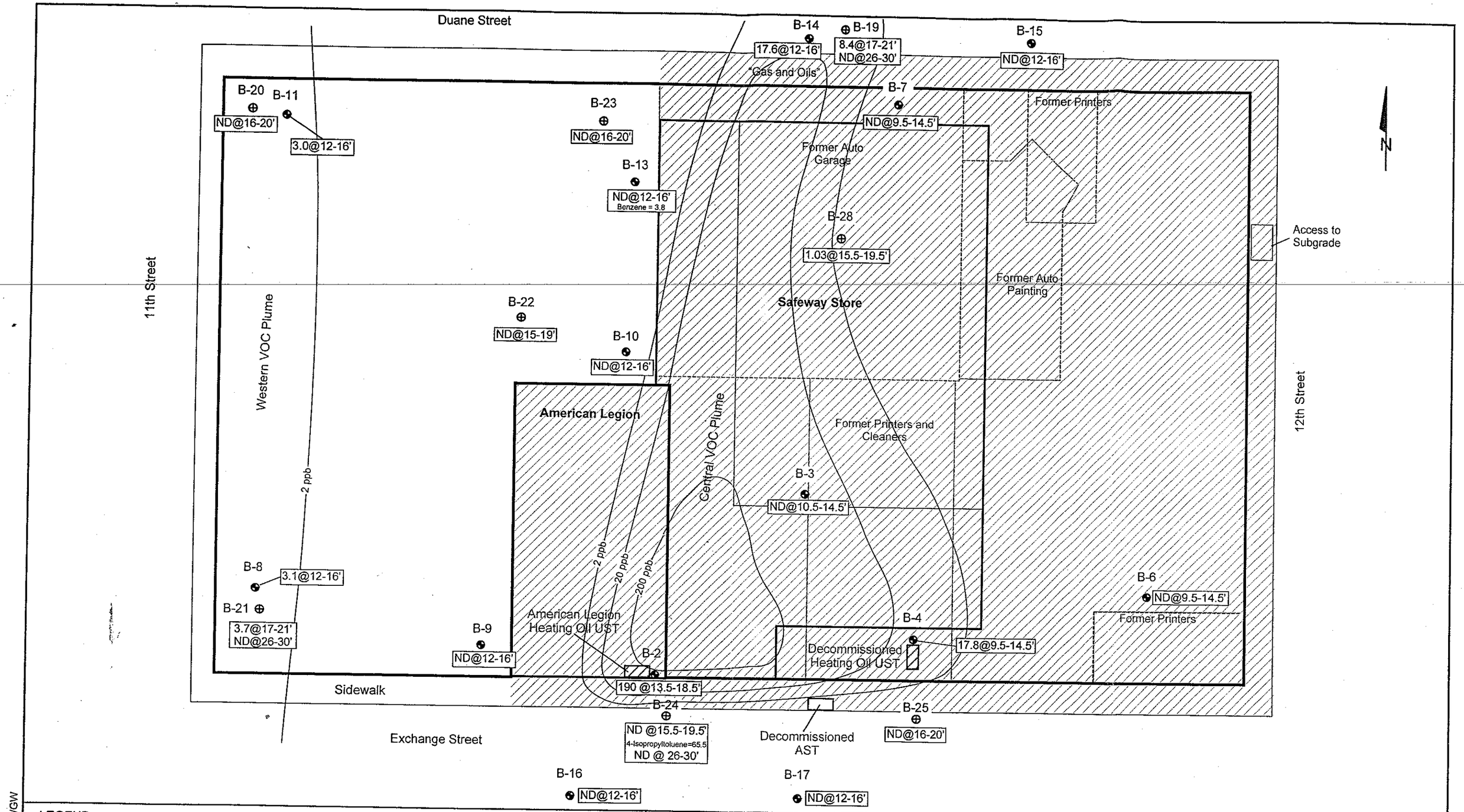


FIGURE 4
Soil Testing Results

Subsurface Investigation
1153 Duane Street
Astoria, Oregon

HAHN AND ASSOCIATES, INC.
Project No. 6167 December 2003

File: 6167-04 Soil Results



LEGEND

- Site Boundary
- Existing Structure
- Former Structure
- Area with Basement Level
- ⊕ Push Probe w Groundwater Sample (Oct 2003)
- ● Push Probe w Groundwater Sample (Feb/Mar 2003)
- 3.1@16' Total HVOCs in Groundwater (ppb) at screen depth (feet bgs)
- ND Not Detected

HAHN AND ASSOCIATES, INC.

ENVIRONMENTAL CONSULTANTS
434 NW 6th AVENUE, SUITE 203
PORTLAND, OREGON 97209
503-796-0717

0 30 60
Approximate Scale in Feet

1 inch = 30 feet

Project No. 6167 December 2003

FIGURE 5
Groundwater Testing Results

Subsurface Investigation
1153 Duane Street
Astoria, Oregon

File: 6167-03/6... Site Map/GW

APPENDICES

APPENDIX A

Field Soil Boring Logs

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-19

HAI LOGGER: Jill Betts
SAMPLING METHOD: Cont'd SV Cores
DRILLING METHOD: Direct Push
EQUIPMENT TYPE: 6600 - GeoProbe
DRILLER: Neil Kranz
DRILLING CONTRACTOR: Geo-Tech

DRILL START	DRILL FINISH
Time: 1115	Time: 1205
Date: 27-Oct-03	Date: 27-Oct-03

BORING DIAMETER: 2"
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Asphalt / Concrete Chips							1			SP	ASPHALT W/ GRAVEL SAND - light gray to lt. brwn, damp, med dense, No O,S,D
							2				
							3				SILT lenses .5" & 1" @ 1.5' bgs
							4				SILT - Brown, moist, sl plastic, No OSD
							5				
							6			SP	SAND - AA
							7	?		ML	SILT - Olive gray, very moist, Soft,
			0.0							SP	1" layer angular & rounded gravel @ ML/SP Contact @ 6.5'
							8				micaceous, plastic, No OSD
							9				SP - AA
							10				
							11			SP	SAND - AA
							12				
			0.0				13	▽			SAND - AA, except olive gray
							14				
							15				NEIL - Beginning to heave
							16			SP	SAND - AA, except wet, very micaceous
							17				
							18				@ 18', .5" ML layer - same as @ 6-6.5'.
							19			ML	
							20			?	

* Sample No. Prefix: 6167-031030-

AA = as above

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PUSH PROBE NUMBER B-19

Page 2 of 2

PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

		DRILL START	DRILL FINISH
HAI LOGGER:	Jill Betts		
SAMPLING METHOD:	Con't 5' Cores		
DRILLING METHOD:	Direct Push	Time:	Time:
EQUIPMENT TYPE	GeoProbe 6600	1115	1 08
DRILLER:	Neil Kranz	Date:	Date:
DRILLING CONTRACTOR:	Geo-Tech	30 ~~27~~-Oct-03	30 ~~27~~-Oct-03

BORING DIAMETER: 2"
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips					20–25	20–24	21			ML	SILT - Olive gray, wet w/ very fine sand, 10% micaceous, soft, sl. plastic, NO OSD
							22				
							23				
							24				
							25				
					25–30	25–29.5	26			SP	SAND - AA, loose to 26.5'
							27				SAND - AA, med dense
							28				
							29				
							30				
							31				REB: 1' into silt. Do not screen > 1' into ML
							32				
							33				
							34				116 - Purged ~1 L, cleared up ~~to~~
							35				
							36				117 - Purged ~1 Qt/to clear, Slight TBS
							37				
							38				
							39				
							40				

4' SCREEN - ~~19~~ ~~24~~ 17-21 (-116)
4' SCREEN - 26-30 (-117)

* Sample No. Prefix: 6167-031030-

AA = as above

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-20

Page 1 of 1

HAI LOGGER: Jill Betts
SAMPLING METHOD: Cont 5' Core
DRILLING METHOD: Direct Push
EQUIPMENT TYPE Geoprobe 6600
DRILLER: Neil Kranz
DRILLING CONTRACTOR: Geo-Tech

DRILL START	DRILL FINISH
Time: 1220	Time:
Date: 27-Oct-03	Date: 27-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Asp							1			FILL	Asphalt & Gravel
							2			ML	SILT - lt brown w/ ltgray & brown mottling. Gravel ~10%. SILT is damp, med. stiff, sl plastic, No OSD
							3				
							4				
							5				
							6			ML	SILT - AA except lt gray clasts, oxidation mottling,
							7				White crystals observed on clay/gravel clasts
							8				Oxid. @ ML/SP contact
							9			SP	SAND - Lt gray, damp, loose poorly graded, No ODS
							10				
							11			SP	SAND - AA
							12				Oxidation (rust colored) 11-11.5'
							13			SP	SAND - Lt gray, ~~damp~~ damp loose poorly graded, No ODS
							14	▽			AA - Wet
							15				
							16			SP	SAND - AA
							17				
							18				
							19			ML	SILT - Dk gray, soft, damp, ~~to~~ plastic - sl plastic
							20				SILT w/ WOODS 18.5-20

Bentonite Chips

perforated interval Screen 16-20 in sampler for hole

* Sample No. Prefix: 6167-031031-

AA = as above

OSD = odor, sheen by sheen test, discoloration

#125 Purge 1 Gal No OS

HAHN AND ASSOCIATES, INC.
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PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-21

HAI LOGGER: Jill Betts
SAMPLING METHOD: Cont 5' Cores
DRILLING METHOD: Direct Push
EQUIPMENT TYPE: Geoprobe 6600
DRILLER: Neil Kranz
DRILLING CONTRACTOR: Geo-Tech

DRILL START	DRILL FINISH
Time: 915	Time: 1015
Date: 27-Oct-03	Date: 27-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							1				CONCRETE / ASPHALT FILL
							2			ML	CLAYEY SILT - Lt brown w/ dk grey mottling & dk grey chips, Stiff, Sl. plastic, No OSD, Wood debris 2.5 → 3.0', Minor gravels (subangular)
							3				
							4				
			0.0				5				
							6				AA, no wood debris, mottling is less, & is rusty colored & dk grey
							7			ML	
							8				
							9				
			0.0				10				
							11			ML	AA
			0.0				12				
							13	▽		PT	1" gravel layer, ORGANIC - Black, Wet, Wood debris
							14			SP	SAND - DK gray, Wet, loose, NS OSD
							15				
							16			ML/SM	SILT w/ very fine sand - DK gray, wet, med dense, Micaceous
							17				
			0.0				18			ML & SW	SILT w/ WOOD - DK gray, wet, AA FINE SAND w/ GRAVEL - dk gray, wet, loose, Wood debris, Gravels angular to subrounded 1/4" - 1" GLASS
							19				
							20				

* Sample No. Prefix:

AA = as above

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-21

HAI LOGGER: Jill Betts
SAMPLING METHOD:
DRILLING METHOD:
EQUIPMENT TYPE
DRILLER:
DRILLING CONTRACTOR:

DRILL START	DRILL FINISH
Time:	Time: 1015
Date: 31-Oct-03	Date: 31-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips							21			SW	FINE SAND W/ GRAVEL - FILL
							22			ML	SILT - Dk gray, wet (very), ~~too~~ soft, plastic → sl plastic, No OSD, Minor wood debris
							23				SILT W/ WOOD
							24			ML	SILT - Same as 15-17'
							25				
							26			SP	SAND - Dk gray, micaceous, wet, loose, No OSD
							27				
							28			ML	SILT W/ Very fine sand - Same as 15-17
							29				
							30				
							31				DMT, 17-21 & From same boring
							32				
							33				
							34				
							35				
							36				
							37				
							38				
							39				
							40				

GW taken from same hole, not soil screen hole.

(123) 17-21 Purge 2 Qt No sheen, O

* Sample No. Prefix: 0167-031031-

AA = as above

OSD = odor, sheen by sheen test, discoloration

1204 (121) 21-24 Purge 2 Qt No OS

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
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(503) 796-0717

PUSH PROBE NUMBER B-22

PROJECT: Safeway, Inc. 1153 Duane Street Astoria, Oregon	HAI LOGGER: Jill Betts	DRILL START	DRILL FINISH
	SAMPLING METHOD: Con't 5' Core		
	DRILLING METHOD: Direct Push	Time: 2[40]	Time: 3[25]
	EQUIPMENT TYPE: Geoprobe 6600		
	DRILLER: Neil Kranz	Date: ~~27~~ 30-Oct-03	Date: ~~27~~ 30-Oct-03
PROJECT No. 6167	DRILLING CONTRACTOR: Geo-Tech		

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Asph					0–5	0–3				FILL	Asphalt
Bentonite Chips							1			ML	SILT w/ GRAVEL & 10% medium-grained sand - light brwn, moist, med stiff, sl plastic, No OSD
			0.0				2				
							3				Contained clasts of: clay - lt gray; black stone chips; gravel - angular, gray; ~~yel.~~ orange - rounded, gray
							4				
							5				
					5–10	5–9.5	6			ML	SILT - ~~lt brown~~ moist, med stiff, sl. plastic, No OSD. Mottled w/ yellow/orange (lter) Clay clast 1" thick @ 6.5', 6.5' Broke apart w/ pressure. Angular clasts dk gray clay 8-8.5' bgs
			0.0				7				
			B				8				
							9				
							10			SP	Burn layer 1.5" thick - black, contained sand & charcoal. 9-9.5 - SAND - Lt gray-white, poorly graded, No OSD, loose
			0.0		10–15	10–13	11				10-11'4" - AA, except lt brwn ~~Mottl~~ Oxid. @ lt brwn/dk gray
							12	▽			SP-SAND 11.5'-13' AA except med stiff, dk gray, wet
							13				
							14				
							15				
					15–20	15–20	16			SP	SAND - dk gray, wet, ~~med stiff~~ ~~stiffness ↗ w/depth~~ loose, poorly graded, No OSD
							17				
							18			ML	SAND SILT - dk grey, wet, No OSD, very fine sand, sl plastic, soft
			0.0				19			ML	SILT - dk grey, wet, soft, sl plastic, No OSD. Contained ? white material & wood @ 19', Wd @ 19.5'
							20				

Screen set @ 19

* Sample No. Prefix: 6167-031030

AA = as above

OSD = odor, sheen by sheen test, discoloration

GW Sample-19 collected from ~~same~~ soil screening b...

HAHN AND ASSOCIATES, INC.
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(503) 796-0717

PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-23

Page 1 of 1

HAI LOGGER: Jill Betts
SAMPLING METHOD: Cont. 5' cores
DRILLING METHOD: Direct Push
EQUIPMENT TYPE: Geoprobe 6600
DRILLER: Neil Kiang
DRILLING CONTRACTOR: Eco-Tech

DRILL START	DRILL FINISH
Time: 135	Time: 230
Date: 27-Oct-03	Date: 27-Oct-03

BORING DIAMETER: 2"
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Asph. Cement, Chips							1			FILL	Asphalt, Gravel, Concrete Fill
							2				
							3				
							4				
							5				
							6			SP	Wood debris @ 5'6" SAND - Lt. brwn, damp, med dense, poorly gded, No OSD
			2.3				7				
							8				CONCRETE - 8" 3" SAND (AA) BRICK 1" Red Brick
							9				
							10				
							11			SP	SP - Lt brwn, damp, med dense, but less so than shallower sand, no OSD
			3.9				12	▽			SP - @ 11'10" - dark gray, wet, med dense, No OSD
							13				
							14				Oxidation 2" above ▽ & @ ▽
							15				
							16			SP	AA - @ 17'2" - 1st SILT layer, SH is dk gray, moist, sl plastic, No OSD
							17				
							18			ML	ML
			2.6				19			ML	SILT - Dk gray, moist, sl plastic contains (very fine Sand, No OSD Contained very small wood fragments & some brick fragments. No OSD oyster shell fragmnt.
							20				

▽ = 11.5'

AA = as above

OSD = odor, sheen by sheen test, discoloration

No sheen on gw

* Sample No. Prefix: 6167-B1030-

Screen set 16-20', GW Sample 118

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PUSH PROBE NUMBER B24

PROJECT: Safeway, Inc. 1153 Duane Street Astoria, Oregon	HAI LOGGER: Jill Betts	DRILL START	DRILL FINISH
	SAMPLING METHOD: Con't 5' cores	Time: 6	Time:
	DRILLING METHOD: Direct Push		
	EQUIPMENT TYPE: Geoprobe 6600		
	DRILLER: Neil Kranz	Date: 31-Oct-03	Date: 31-Oct-03
PROJECT No. 6167	DRILLING CONTRACTOR: Geo-Tech		

BORING DIAMETER: 2"
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Asph					0-5	0-3					Asphalt, gravel, sand FILL
Bentonite Chips							1-5			ML	CLAYEY SILT - Yellowish orange & lt brown, damp, soft, sl plastic, No OSD
			0.0 (9)		5-10	5-8	6-10			ML	1" ML AA; 1" GRAVEL FILL; ~~SILT~~ CLAYEY SILT - AA, but w/ med stiff clay clasts @ 7'-7'4" is olive gray, damp, med stiff, sl plastic, No sheen. Odor of sewage. Contained clay clasts @ 8' Dk gray / gray concrete
					10-15	10-14.5	11-14	▽ (13)		ML / SP	AA @ 10'5" is an charcoal & cement layer (~1"). SAND - Light gray w/ lt brown mottling, med dense, damp, micaceous, poorly graded, oxidation (rust) @ 11'3"-11'10" & @ ▽. 1/2" (coarse sand) @ 13'. Below ▽ dk gray wet, AA
			0.0 (13)				14-15			ML	SILT - 1", dk gray, micaceous, soft, sl plastic. No OSD. CLAY SILT - dk gray wet to damp, clay clasts, med stiff, sl plastic
					15-20	15-18.5	16-20			GM / ML / GM / GP / ML?	16' - 2" GRAVEL w/ SILT, dk gray, wet, No OSD; then 1" SILT, dk grey, micaceous, soft, until 16'5". 16'6" → 18' - SILT, ~~dk gray~~ w/ wood. Black. 18-18'6" → GRAVEL w SILT, DK gray, No OSD

* Sample No. Prefix: 067-031031-

AA = as above

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**PUSH PROBE NUMBER** B-24		Page 2 of 2
PROJECT: Safeway, Inc. 1153 Duane Street Astoria, Oregon	HAI LOGGER: Jill Betts SAMPLING METHOD: DRILLING METHOD: EQUIPMENT TYPE DRILLER:	DRILL START Time: Date: ~~27~~ 31-Oct-03	DRILL FINISH Time: Date: ~~27~~ 31-Oct-03
PROJECT No. 6167	DRILLING CONTRACTOR:		

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Bentonite Chips (20–30)			0.0 ~~0.0~~		↓ (20–25)	↓ (20–25)				ML	SILT - lt gray, damp, med stiff, clay dists, No OSD, sl plastic
							21	▽		~~ML~~	SILTY ~~SANDY SILT~~ SAND - Dk gray, soft, plastic, wet. Sand is fine to very fine. ↗ very fine sand w/ depth. No OSD
							22			SM	
							23				
							24			GM	@24.5 ~~25'~~ GRAVEL W/SILT, Same as 18-18.5' 24-25
							25			ML	SILT - dk gray, micaceous, damp, soft, sl plastic, No OSD
					↓ (25–30)	↓ (25–28)	26				
							27				
							28			GM	GRAVEL W/SILT @ 27'9"
							29				
							30				
							31				Screen 15.5-19.5
							32				-126 Purge 2Qt 215 No O,S
							33				
							34				
							35				-127 Screen 26-30 Purged dry after 1Q ~~215~~ 300
							36				
							37				
							38				
							39				
							40				

7:25 GW-120 Screen 11-15'. No sheen, odor. New hole (2...) 2Qts purged

* Sample No. Prefix: 6167-031031-

AA = as above

OSD = odor, sheen by sheen test, discoloration

7:45 GW-121 screen 21-25 New hole [illegible]

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
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PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-25

HAI LOGGER: Jill Betts
SAMPLING METHOD: Con't 5' Cores
DRILLING METHOD: Direct Push
EQUIPMENT TYPE: Geoprobe 6600
DRILLER: Neil Kranz
DRILLING CONTRACTOR: GeoTech

DRILL START	DRILL FINISH
Time: 8:15	Time: 9:00
Date: 31-Oct-03	Date: 31-Oct-03

BORING DIAMETER: 2"
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
Asp							1				Asphalt & Concrete Fill
							2			ML	~~Lt. brwn~~ SILT - Lt. brwn, damp, med stiff, sl. plastic, No OSD. Clay clasts (dk gray), 10% very fine sand.
							3				
							4				
							5				
							6			ML	AA
							7				
							8				SILT - AA, ~~except dk gray~~
			0.0				9				
							10				
							11				
							12				SILT - AA, except dk gray
	031	920	0.0				13				
							14				
							15				
Bentonite Chips							16	▽		GM	GRAVEL & SILT - dk gray, Wet, No OSD
							17				@ 17' 3" is white fill SAND (3" thick)
							18				@ 17' 6" is Wood debris @ 17' 10" is GRAVEL & SILT
							19				in shoe is ~~sand~~ - lt gray, loose, damp
							20			SP	

Screen Set 16→20
Purge Volume = 10 gal

* Sample No. Prefix: 6167-B31031

AA = as above

OSD = odor, sheen by sheen test, discoloration

No odor, sheen 8:55

HAHN AND ASSOCIATES, INC.
434 NW Sixth Avenue
Portland, Oregon 97209
(503) 796-0717

PROJECT:
Safeway, Inc.
1153 Duane Street
Astoria, Oregon
PROJECT No. 6167

PUSH PROBE NUMBER B-28

Page 1 of 1

HAI LOGGER: Jill Betts
SAMPLING METHOD:
DRILLING METHOD:
EQUIPMENT TYPE Rotohammer
DRILLER: Neil Kranz
DRILLING CONTRACTOR:

DRILL START	DRILL FINISH
Time: 8:40	Time: 9:00
Date: 27-Oct-03	Date: 27-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
CONCRETE											
Bentonite Chips							1				
	077	910	2.0				2	▽		SP	SAND – Light brown, damp, med dense, No OSD
	078	915	1.5				3	▽			AA – except dark grey, Wet Mottling (rusty) @ 1' (2')
	079						4				Muscovite present.
							5			SP	AA
							6				
							7				
							8				
							9			~~SP~~ ML	~~AA~~ SILT – Dark gray, Wet, soft,
							10				
							11				
							12				
							13				
							14				
							15				
							16				
							17				
							18				
							19				
							20				

* Sample No. Prefix: 6167-031030-

AA = as above

OSD = odor, sheen by sheen test, discoloration

Purged 1L. Sample cldy, tan gray, No OSD
- Screen set 6'-10' bgs

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**PUSH PROBE NUMBER** B-29	Page 1 of 1	
PROJECT: Safeway, Inc. 1153 Duane Street Astoria, Oregon PROJECT No. 6167	HAI LOGGER: Jill Betts SAMPLING METHOD: 1 DRILLING METHOD: Rotohammer EQUIPMENT TYPE DRILLER: Neil Kranz DRILLING CONTRACTOR: Geo-Tech	DRILL START Time: 815 Date: 27-Oct-03	DRILL FINISH Time: 830 Date: 27-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
CONCRETE Bentonite Chips	076	845	2.2				1 2 3 4 5	▽		SP SW	SAND - Light brown, fine-grained damp, No OSD, medium dense AA except olive dark grey & wet
							6 7 8 9 10				
							11 12 13 14 15				
							16 17 18 19 20				

* Sample No. Prefix: 6167-031030- ~~0330~~

AA = as above

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**PUSH PROBE NUMBER** B-30	Page 1 of 1
PROJECT: Safeway, Inc. 1153 Duane Street Astoria, Oregon PROJECT No. 6167	HAI LOGGER: Jill Betts SAMPLING METHOD: DRILLING METHOD: EQUIPMENT TYPE: Rotohammer DRILLER: Neil Kranz DRILLING CONTRACTOR: Geo-Tech	DRILL START: Time: 905, Date: 27-Oct-03 DRILL FINISH: Time: 920, Date: 27-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
CONC. Bentonite Chips	030	1005	1.2				1			SP	SAND - light brown, damp, med dense, No OSD
							2				
							3				AA - except dark gray @ 3' bgs to 4' bgs
							4	▽			
							5				
							6				
							7				
							8				
							9				
							10				
							11				
							12				
							13				
							14				
							15				
							16				
							17				
							18				
							19				
							20				

* Sample No. Prefix: 6167-031030-

AA = as above

OSD = odor, sheen by sheen test, discoloration

HAHN AND ASSOCIATES, INC. 434 NW Sixth Avenue Portland, Oregon 97209 (503) 796-0717	**PUSH PROBE NUMBER** B-31	Page 1 of 1	
PROJECT: Safeway, Inc. 1153 Duane Street Astoria, Oregon PROJECT No. 6167	HAI LOGGER: Jill Betts SAMPLING METHOD: DRILLING METHOD: EQUIPMENT TYPE Rotohammer DRILLER: Neil Kranz DRILLING CONTRACTOR:	DRILL START Time: 920 Date: 27-Oct-03	DRILL FINISH Time: 940 Date: 27-Oct-03

BORING DIAMETER:
CASING DIAMETER: N/A
SURFACE ELEVATION: Not Surveyed
TOP OF CASING ELEVATION: N/A

ABANDONMENT DETAILS	SAMPLE NUMBER *	TIME	HEADSPACE (ppm)	LAB RESULT NWTPH-Dx (ppm)	CORE INTERVAL	% RECOVERY	DEPTH (feet bgs)	GROUNDWATER	IMPACTED ZONE	STRATA (USCS)	SOIL DESCRIPTION
CONCRETE Bentonite Chips	079	950	1.2				1 2 3 4 5	▽		SP	SAND - Light brown w/ micaceous, damp, med dense, poorly graded, No OSI AA - But wet & dark gray @ soil/water interface was large mica grains.
							6 7 8 9 10				
							11 12 13 14 15				
							16 17 18 19 20				

* Sample No. Prefix: 6167-031030

AA = as above

OSD = odor, sheen by sheen test, discoloration

B

APPENDIX B

Laboratory Analytical Reports and Chain-of-Custody Documentation
Soil Samples

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: Specialty Analytical
503-612-9007
Lab Project No.: 031013

CHAIN OF CUSTODY
Chain of Custody No.: 1 of 1

Project Manager: Dennis Terzian
Project No.: 6167
Project Name: Astoria
Collected by: Jill Betts

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 6167- 031030 - (076 - 080)
-031031 - (081)

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: TPH - Dx	RUSH	Remarks
	~~085~~										
C1	076	10/30/03	845	B-29 1-2	✓			2	X		
02	077		910	B-28 1-2							
03	078		915	2-3							
04	079		950	B-31 1-2							
05	080	↓	1005	B-30 1-3.5	↓			↓			
06	081	10/31	920	B-25 18'5"	✓			2			
	082										
	083										
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	206										
	207										

Relinquished by	Company	Date	Time	Received by	Company
	HAHN & ASSOC	11/4/03	12:15pm	Tony Dvorak	Specialty
		11/4/03	1:00pm	Tony Dvorak	Specialty

Specialty Analytical

19761 S.W. 95th Place
Tualatin, OR 97062
(503) 612-9007
Fax (503) 612-8572
1 (877) 612-9007

November 07, 2003

Dennis Terzian
Hahn and Associates, Inc.
434 NW Sixth Avenue
Suite 203
Portland, OR 97209

TEL: (503) 796-0717
FAX (503) 227-2209

RE: Astoria / 6167

Dear Dennis Terzian:

Order No.: 0311013

Specialty Analytical received 6 samples on 11/4/2003 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Ned Engleson
Project Manager

Technical Review

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311013
Project: Astoria / 6167

Lab ID: 0311013-01 **Collection Date:** 10/30/2003 8:45:00 AM
Client Sample ID: 6167-031030-076 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	ND	18.4		mg/Kg-dry	1	11/5/2003
Lube Oil	ND	61.2		mg/Kg-dry	1	11/5/2003
Surr: o-Terphenyl	74.6	50-150		%REC	1	11/5/2003

Lab ID: 0311013-02 **Collection Date:** 10/30/2003 9:10:00 AM
Client Sample ID: 6167-031030-077 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Lab ID: 0311013-03 **Collection Date:** 10/30/2003 9:15:00 AM
Client Sample ID: 6167-031030-078 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Lab ID: 0311013-04 **Collection Date:** 10/30/2003 9:50:00 AM
Client Sample ID: 6167-031030-079 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Lab ID: 0311013-05 **Collection Date:** 10/30/2003 10:05:00 AM
Client Sample ID: 6167-031030-080 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311013
Project: Astoria / 6167

Lab ID: 0311013-06 **Collection Date:** 10/31/2003 9:20:00 AM
Client Sample ID: 6167-031031-081 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Specialty Analytical

Date: *07-Nov-03*

CLIENT: Hahn and Associates, Inc.
Work Order: 0311013
Project: Astoria / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223233

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	25.33	1.00	33.33	0	76	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223234

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	158.3	15.0	167.6	0	94.4	76.3	122	0	0		
Lube Oil	155.3	50.0	167.6	0	92.6	69.9	127	0	0		

Sample ID 0311016-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223244

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	458.2	153	0	0	0	0	0	367.2	22.0	20	R
Lube Oil	2517	509	0	0	0	0	0	1975	24.1	20	R

Sample ID 0311013-01ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: 6167-031030-076	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223245

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	18.4	0	0	0	0	0	0	0	20	
Lube Oil	ND	61.2	0	0	0	0	0	0	0	20	

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223235

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311013
Project: Astoria / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223235

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	150.5	15.0	166.8	0	90.2	85	115	0	0		
Lube Oil	162.4	50.0	169.5	0	95.8	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A. This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1. This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2. This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against lube oil calibration standards.

A3. Results determined to be non detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B. The blank exhibited a positive result greater than the reporting limit for this compound.

C. The result confirmed by secondary column or GC/MS analysis.

CN. See case narrative.

CR. Result for this analyte maybe biased due to interferences. Confirmation by GC/MS or other technique is recommended.

D. Surrogate was diluted outside reporting range.

E. Result exceeds the calibration range for the compound. The result should be considered an estimate.

F. The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

G. Result may be biased high due to biogenic interferences. Silica gel clean-up recommended.

H. Sample was analyzed outside recommended holding times.

HT. At clients request, sample was analyzed outside method recommended holding time.

J. The result for this analyte is between the MDL and the PQL, and should be considered an estimated concentration.

K. Diesel result is biased high due to amount of oil contained in the sample.

L. Diesel result is biased high due to amount of gasoline contained in the sample.

M. Oil result is biased high due to amount of diesel contained in the sample.

MC. Sample concentration is greater than 4x the spiked value; the spiked value is considered insignificant.

MI. Outside control limits due to Matrix Interference.

MSA. Value determined by Method of Standard Addition.

N. Sample appears to contain biogenic material biasing quantification.

O. Laboratory Control Standard (LCS) exceeded laboratory control limits, meets CCV criteria. Data meets EPA requirements.

P. Detected levels of Methylene Chloride may be due to laboratory contamination, due to previous analysis or background levels.

Q. Detection limits elevated due to sample matrix.

R. RPD control limits were exceeded.

RF. Duplicate failed, due to result being at or near method reporting limit.

RP. Matrix spike values exceed established QC limits, post digestion spike is in control.

S. Recovery outside control limits.

*. The result for this parameter was greater than the maximum contaminant level or the TCLP regulatory limit.

rev. October 23, 2001

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: Specialty Analytical
503-612-9007
Lab Project No.: 031013

CHAIN OF CUSTODY

Chain of Custody No.: 1 of 1

Project Manager: Dennis Terzian
Project No.: 6167
Project Name: Astoria
Collected by: Jill Betts

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 6167-03 1030 - (076 - 080)
-031031 - (-081

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	TPH-Dx	TPH-Dx							RUSH	Remarks
	~~076~~																	
C1	076	10/30/03	845	B-29 1-2	✓			2	X									
02	077		910	B-28 1-2														
03	078		915	2-3														
04	079		950	B-31 1-2						X								
05	080	↓	1005	B-30 1-3.5	↓			↓										
06	081	10/31	920	B-25 12.5-13.5'	✓			2										
	082																	
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Relinquished by	Company	Date	Time	Received by	Company
	HAHN & ASSOC	11/4/03	12:15pm	Tony Dvnak	Specialty
		11/4/03	1:00pm	Tony Dvnak	Specialty

Specialty Analytical

19761 S.W. 95th Place
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1 (877) 612-9007

November 17, 2003

Dennis Terzian
Hahn and Associates, Inc.
434 NW Sixth Avenue
Suite 203
Portland, OR 97209

TEL: (503) 796-0717
FAX (503) 227-2209

RE: Astoria / 6167 (0311013)

Dear Dennis Terzian:

Order No.: 0311060

Specialty Analytical received 1 sample on 11/12/2003 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Ned Engleson
Project Manager

Technical Review

Specialty Analytical

Date: *17-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311060
Project: Astoria / 6167 (0311013)

Lab ID: 0311060-01 **Collection Date:** 10/30/2003 9:50:00 AM
Client Sample ID: 6167-031030-079 **Matrix:** SOIL

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		**NWTPH-DX**				Analyst: **btf**
Diesel	ND	16.6		mg/Kg-dry	1	11/13/2003
Lube Oil	ND	55.4		mg/Kg-dry	1	11/13/2003
Surr: o-Terphenyl	65.7	50-150		%REC	1	11/13/2003

Specialty Analytical

Date: *17-Nov-03*

CLIENT: Hahn and Associates, Inc.
Work Order: 0311060
Project: Astoria / 6167 (0311013)

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: ZZZZZ	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225033

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	25.96	1.00	33.33	0	77.9	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: ZZZZZ	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225034

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	154.4	15.0	167.7	0	92.1	76.3	122	0	0		
Lube Oil	165.5	50.0	167.7	0	98.7	69.9	127	0	0		

Sample ID 0311016-15ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: ZZZZZ	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225039

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	22.81	15.3	0	0	0	0	0	19.15	17.4	20	
Lube Oil	144.1	50.8	0	0	0	0	0	145.9	1.24	20	

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: ZZZZZ	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225035

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	310.9	15.0	333.6	0	93.2	85	115	0	0		
Lube Oil	254.9	50.0	250.7	0	102	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: Specialty Analytical
503-612-9007
Lab Project No. 0311016

CHAIN OF CUSTODY

Chain of Custody No. 1 of 1

Project Manager: Dennis Terzian
Project No. 6167
Project Name: Astoria – E. subgrade
Collected by: Jill Betts

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N) 8°C
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 6167- 03103i –

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: TPH - Dx	RUSH	Remarks
	056	10/31/03	1330	SS-6	X			2	X		
	057		1335	SS-7							
	058		1340	SS-7					X		
	059		1345	SS-8					X		
	060		1350	SS-9					X		
	061		1355	SS-10					X		
	062		2000	SS-11					X		
	063		2005	SS-12					X		
	064		2010	SS-13					X		
	065		2015	SS-14							
	066		2020	SS-15							
	067		2025	SS-16							
	068		2030	SS-17							
	069		2035	SS-18							
	070		2040	SS-19							
	071	↓	2045	SS-20	↓			↓			

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOC	11/03/03	12:15pm	[signature]	Specialty
Relinquished by	Company	Date	Time	Received by	Company
Relinquished by	Company	Date	Time	Received by	Company
		11/4/03	1:15pm	[signature]	Specialty

Specialty Analytical

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November 20, 2003

Dennis Terzian
Hahn and Associates, Inc.
434 NW Sixth Avenue
Suite 203
Portland, OR 97209

TEL: (503) 796-0717
FAX (503) 227-2209

RE: Astoria - E. Subgrade / 6167

Order No.: 0311016

Dear Dennis Terzian:

Specialty Analytical received 16 samples on 11/4/2003 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Ned Engleson
Project Manager

Technical Review

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
6167-031031-056	**0311016-01A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	367	153		mg/Kg-dry	10	11/5/2003
Lube Oil	1980	509		mg/Kg-dry	10	11/5/2003
Surr: o-Terphenyl	24.3	50-150	S,D	%REC	10	11/5/2003
6167-031031-056	**0311016-01B**			**Date Collected**		**10/31/2003**

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: skc
1,1,1,2-Tetrachloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,1,1-Trichloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,1,2,2-Tetrachloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,1,2-Trichloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,1-Dichloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,1-Dichloroethene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,1-Dichloropropene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2,3-Trichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2,3-Trichloropropane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2,4-Trichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2-Dichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,2-Dichloropropane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,3-Dichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,3-Dichloropropane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
1,4-Dichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
2,2-Dichloropropane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
2-Butanone	ND	40.0		µg/Kg	1	11/13/2003 11:27:00 AM
2-Chlorotoluene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
2-Hexanone	ND	20.0		µg/Kg	1	11/13/2003 11:27:00 AM
4-Chlorotoluene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
4-Isopropyltoluene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
4-Methyl-2-pentanone	ND	40.0		µg/Kg	1	11/13/2003 11:27:00 AM
Acetone	ND	100		µg/Kg	1	11/13/2003 11:27:00 AM
Benzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Bromobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Bromochloromethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Bromodichloromethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Bromoform	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Bromomethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Carbon disulfide	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Carbon tetrachloride	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Chlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Chloroethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Chloroform	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Chloromethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
cis-1,2-Dichloroethene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
cis-1,3-Dichloropropene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Dibromochloromethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Dibromomethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Ethylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Hexachlorobutadiene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Isopropylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
m,p-Xylene	ND	20.0		µg/Kg	1	11/13/2003 11:27:00 AM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Methylene chloride	ND	50.0		µg/Kg	1	11/13/2003 11:27:00 AM
n-Butylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
n-Propylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Naphthalene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
o-Xylene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
sec-Butylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Styrene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
tert-Butylbenzene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Tetrachloroethene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Toluene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
trans-1,2-Dichloroethene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Trichloroethene	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Trichlorofluoromethane	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Vinyl chloride	ND	10.0		µg/Kg	1	11/13/2003 11:27:00 AM
Surr: 1,2-Dichloroethane-d4	85.2	71.5-112		%REC	1	11/13/2003 11:27:00 AM
Surr: 4-Bromofluorobenzene	113	75.7-122		%REC	1	11/13/2003 11:27:00 AM
Surr: Dibromofluoromethane	99.1	64.3-124		%REC	1	11/13/2003 11:27:00 AM
Surr: Toluene-d8	95.9	74.9-120		%REC	1	11/13/2003 11:27:00 AM
6167-031031-056	**0311016-01C**				**Date Collected**	**10/31/2003**
MERCURY, TOTAL		**SW7471**				Analyst: **tlf**
Mercury	0.109	0.0147		mg/Kg	1	11/13/2003

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH'S BY GC/MS- LOW LEVEL		**8270SIM**				Analyst: **bda**
Acenaphthene	ND	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Acenaphthylene	131	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Anthracene	119	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Benz(a)anthracene	337	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Benzo(a)pyrene	761	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Benzo(b)fluoranthene	891	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Benzo(g,h,i)perylene	380	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Benzo(k)fluoranthene	230	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Chrysene	391	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Dibenz(a,h)anthracene	52.0	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Fluoranthene	1450	33.3		µg/Kg	5	11/14/2003 10:23:00 PM
Fluorene	28.7	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Indeno(1,2,3-cd)pyrene	276	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Naphthalene	670	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Phenanthrene	966	6.67		µg/Kg	1	11/14/2003 7:40:00 PM
Pyrene	1650	33.3		µg/Kg	5	11/14/2003 10:23:00 PM
Surr: 2-Fluorobiphenyl	47.6	42.6-128		%REC	1	11/14/2003 7:40:00 PM
Surr: Nitrobenzene-d5	38.0	21.7-155		%REC	1	11/14/2003 7:40:00 PM
Surr: p-Terphenyl-d14	48.3	44.9-155		%REC	1	11/14/2003 7:40:00 PM
PCB'S IN SOIL		**SW8082**				Analyst: **bda**
Aroclor 1016	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1221	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1232	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1242	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1248	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1254	903	50.0		µg/Kg	1	11/19/2003
Aroclor 1260	401	50.0		µg/Kg	1	11/19/2003
Surr: Decachlorobiphenyl	106	56.5-130		%REC	1	11/19/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Arsenic	ND	1.67		mg/Kg	1	11/13/2003 5:39:02 PM
Barium	51.6	0.833		mg/Kg	1	11/13/2003 5:39:02 PM
Cadmium	0.200	0.0833		mg/Kg	1	11/13/2003 5:39:02 PM
Chromium	9.29	0.417		mg/Kg	1	11/13/2003 5:39:02 PM
Lead	92.2	1.67		mg/Kg	1	11/14/2003 9:19:27 PM
Selenium	ND	1.67		mg/Kg	1	11/13/2003 5:39:02 PM
Silver	ND	1.67		mg/Kg	1	11/13/2003 5:39:02 PM

6167-031031-057 **0311016-02A** **Date Collected** **10/31/2003**

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	251	76.3		mg/Kg-dry	5	11/12/2003
Lube Oil	1230	254		mg/Kg-dry	5	11/12/2003
Surr: o-Terphenyl	58.0	50-150		%REC	5	11/12/2003
6167-031031-058	**0311016-03A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	329	152		mg/Kg-dry	10	11/5/2003
Lube Oil	1640	505		mg/Kg-dry	10	11/5/2003
Surr: o-Terphenyl	27.0	50-150	S,D	%REC	10	11/5/2003
6167-031031-059	**0311016-04A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	134	30.4		mg/Kg-dry	2	11/7/2003
Lube Oil	704	101		mg/Kg-dry	2	11/7/2003
Surr: o-Terphenyl	88.6	50-150		%REC	2	11/7/2003
6167-031031-060	**0311016-05A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	28.6	15.9		mg/Kg-dry	1	11/7/2003
Lube Oil	201	53.1		mg/Kg-dry	1	11/7/2003
Surr: o-Terphenyl	91.3	50-150		%REC	1	11/7/2003
6167-031031-060	**0311016-05B**			**Date Collected**		**10/31/2003**

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: skc
1,1,1,2-Tetrachloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,1,1-Trichloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,1,2,2-Tetrachloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,1,2-Trichloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,1-Dichloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,1-Dichloroethene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,1-Dichloropropene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2,3-Trichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2,3-Trichloropropane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2,4-Trichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2,4-Trimethylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2-Dibromo-3-chloropropane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2-Dibromoethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2-Dichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2-Dichloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,2-Dichloropropane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,3,5-Trimethylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,3-Dichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,3-Dichloropropane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
1,4-Dichlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
2,2-Dichloropropane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
2-Butanone	ND	40.0		µg/Kg	1	11/13/2003 12:01:00 PM
2-Chlorotoluene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
2-Hexanone	ND	20.0		µg/Kg	1	11/13/2003 12:01:00 PM
4-Chlorotoluene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
4-Isopropyltoluene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
4-Methyl-2-pentanone	ND	40.0		µg/Kg	1	11/13/2003 12:01:00 PM
Acetone	ND	100		µg/Kg	1	11/13/2003 12:01:00 PM
Benzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Bromobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Bromochloromethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Bromodichloromethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Bromoform	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Bromomethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Carbon disulfide	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Carbon tetrachloride	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Chlorobenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Chloroethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Chloroform	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Chloromethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
cis-1,2-Dichloroethene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
cis-1,3-Dichloropropene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
Dibromochloromethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Dibromomethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Dichlorodifluoromethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Ethylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Hexachlorobutadiene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Isopropylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
m,p-Xylene	ND	20.0		µg/Kg	1	11/13/2003 12:01:00 PM
Methyl tert-butyl ether	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Methylene chloride	ND	50.0		µg/Kg	1	11/13/2003 12:01:00 PM
n-Butylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
n-Propylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Naphthalene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
o-Xylene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
sec-Butylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Styrene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
tert-Butylbenzene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Tetrachloroethene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Toluene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
trans-1,2-Dichloroethene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
trans-1,3-Dichloropropene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Trichloroethene	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Trichlorofluoromethane	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Vinyl chloride	ND	10.0		µg/Kg	1	11/13/2003 12:01:00 PM
Surr: 1,2-Dichloroethane-d4	128	71.5-112	S	%REC	1	11/13/2003 12:01:00 PM
Surr: 4-Bromofluorobenzene	115	75.7-122		%REC	1	11/13/2003 12:01:00 PM
Surr: Dibromofluoromethane	148	64.3-124	S	%REC	1	11/13/2003 12:01:00 PM
Surr: Toluene-d8	98.1	74.9-120		%REC	1	11/13/2003 12:01:00 PM
6167-031031-060	**0311016-05C**			**Date Collected**		**10/31/2003**
MERCURY, TOTAL		**SW7471**				Analyst: **tlf**
Mercury	0.119	0.0157		mg/Kg	1	11/13/2003

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
PAH'S BY GC/MS- LOW LEVEL		**8270SIM**				Analyst: **bda**
Acenaphthene	ND	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Acenaphthylene	8.67	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Anthracene	ND	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Benz(a)anthracene	14.0	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Benzo(a)pyrene	30.0	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Benzo(b)fluoranthene	47.3	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Benzo(g,h,i)perylene	54.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Benzo(k)fluoranthene	14.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Chrysene	18.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Dibenz(a,h)anthracene	8.67	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Fluoranthene	34.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Fluorene	ND	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Indeno(1,2,3-cd)pyrene	37.3	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Naphthalene	16.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Phenanthrene	26.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Pyrene	32.7	6.67		µg/Kg	1	11/13/2003 11:11:00 PM
Surr: 2-Fluorobiphenyl	83.0	42.6-128		%REC	1	11/13/2003 11:11:00 PM
Surr: Nitrobenzene-d5	64.4	21.7-155		%REC	1	11/13/2003 11:11:00 PM
Surr: p-Terphenyl-d14	88.1	44.9-155		%REC	1	11/13/2003 11:11:00 PM
PCB'S IN SOIL		**SW8082**				Analyst: **bda**
Aroclor 1016	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1221	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1232	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1242	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1248	ND	50.0		µg/Kg	1	11/19/2003
Aroclor 1254	109	50.0		µg/Kg	1	11/19/2003
Aroclor 1260	277	50.0		µg/Kg	1	11/19/2003
Surr: Decachlorobiphenyl	95.9	56.5-130		%REC	1	11/19/2003
TOTAL METALS BY ICP		**E6010**				Analyst: **tlf**
Arsenic	ND	1.72		mg/Kg	1	11/13/2003 5:44:31 PM
Barium	93.7	1.72		mg/Kg	2	11/14/2003 9:24:56 PM
Cadmium	1.18	0.0862		mg/Kg	1	11/13/2003 5:44:31 PM
Chromium	11.3	0.431		mg/Kg	1	11/13/2003 5:44:31 PM
Lead	133	1.72		mg/Kg	1	11/14/2003 9:47:05 PM
Selenium	ND	1.72		mg/Kg	1	11/13/2003 5:44:31 PM
Silver	ND	1.72		mg/Kg	1	11/13/2003 5:44:31 PM

6167-031031-061 **0311016-06A** **Date Collected** **10/31/2003**

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	473	163		mg/Kg-dry	10	11/5/2003
Lube Oil	2850	544		mg/Kg-dry	10	11/5/2003
Surr: o-Terphenyl	23.5	50-150	S,D	%REC	10	11/5/2003
6167-031031-062	**0311016-07A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	55.4	34.5		mg/Kg-dry	2	11/7/2003
Lube Oil	364	115		mg/Kg-dry	2	11/7/2003
Surr: o-Terphenyl	75.2	50-150		%REC	2	11/7/2003
6167-031031-063	**0311016-08A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	22.1	16.0		mg/Kg-dry	1	11/7/2003
Lube Oil	118	53.5		mg/Kg-dry	1	11/7/2003
Surr: o-Terphenyl	83.6	50-150		%REC	1	11/7/2003
6167-031031-064	**0311016-09A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	479	152		mg/Kg-dry	10	11/5/2003
Lube Oil	1850	505		mg/Kg-dry	10	11/5/2003
Surr: o-Terphenyl	30.8	50-150	S,D	%REC	10	11/5/2003
6167-031031-065	**0311016-10A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	ND	17.0		mg/Kg-dry	1	11/12/2003
Lube Oil	57.3	56.6		mg/Kg-dry	1	11/12/2003
Surr: o-Terphenyl	79.6	50-150		%REC	1	11/12/2003
6167-031031-066	**0311016-11A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	133	76.5		mg/Kg-dry	5	11/12/2003
Lube Oil	983	255		mg/Kg-dry	5	11/12/2003
Surr: o-Terphenyl	48.0	50-150	S,D	%REC	5	11/12/2003
6167-031031-067	**0311016-12A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: **btf**
Diesel	18.9	17.8		mg/Kg-dry	1	11/12/2003
Lube Oil	121	59.2		mg/Kg-dry	1	11/12/2003
Surr: o-Terphenyl	84.4	50-150		%REC	1	11/12/2003

Specialty Analytical

Date: *20-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311016
Project: Astoria - E. Subgrade / 6167

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
6167-031031-068	**0311016-13A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	200	76.0		mg/Kg-dry	5	11/12/2003
Lube Oil	1320	253		mg/Kg-dry	5	11/12/2003
Surr: o-Terphenyl	58.0	50-150		%REC	5	11/12/2003
6167-031031-069	**0311016-14A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	33.9	15.5		mg/Kg-dry	1	11/12/2003
Lube Oil	196	51.6		mg/Kg-dry	1	11/12/2003
Surr: o-Terphenyl	67.2	50-150		%REC	1	11/12/2003
6167-031031-070	**0311016-15A**			**Date Collected**		**10/31/2003**
NWTPH-DX		NWTPH-DX				Analyst: btf
Diesel	19.2	15.3		mg/Kg-dry	1	11/13/2003
Lube Oil	146	50.8		mg/Kg-dry	1	11/13/2003
Surr: o-Terphenyl	78.5	50-150		%REC	1	11/13/2003
6167-031031-071	**0311016-16A**			**Date Collected**		**10/31/2003**
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID	MBLK-9959	SampType:	MBLK	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031113C
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/13/2003	SeqNo:	224976

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	2.00									
Cadmium	ND	0.100									
Chromium	ND	0.500									
Selenium	ND	2.00									
Silver	ND	2.00									

Sample ID	MBLK-9959	SampType:	MBLK	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031114A
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/14/2003	SeqNo:	225074

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	2.00									

Sample ID	MBLK-9959	SampType:	MBLK	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031114F
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/14/2003	SeqNo:	225317

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	0.41	1.00									J
Lead	ND	2.00									

Sample ID	LCS-9959	SampType:	LCS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031113C
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/13/2003	SeqNo:	224977

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	96.1	2.00	100	0	96.1	87.6	110	0	0		
Cadmium	4.95	0.100	5	0	99	90.8	109	0	0		
Chromium	23.22	0.500	25	0	92.9	91.7	114	0	0		
Selenium	99.99	2.00	100	0	100	90.2	112	0	0		
Silver	43.68	2.00	50	0	87.4	85.1	108	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID	LCS-9959	SampType:	LCS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031114A
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/14/2003	SeqNo:	225075

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	95.03	2.00	100	0	95	92.9	109	0	0		

Sample ID	LCS-9959	SampType:	LCS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031114F
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/14/2003	SeqNo:	225318

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	48.63	1.00	50	0.41	96.4	92.7	109	0	0		
Lead	97.04	2.00	100	0	97	92.9	109	0	0		

Sample ID	0311049-01BMS	SampType:	MS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031113C
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/13/2003	SeqNo:	224980

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	92.87	1.85	92.59	2.62	97.5	86.1	109	0	0		
Cadmium	4.704	0.0926	4.63	0	102	86.4	113	0	0		
Chromium	40.98	0.463	23.15	17.44	102	75	121	0	0		
Selenium	93.43	1.85	92.59	0	101	77.7	116	0	0		
Silver	41.59	1.85	46.3	0	89.8	75	123	0	0		

Sample ID	0311049-01BMS	SampType:	MS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031114A
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/14/2003	SeqNo:	225078

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	97.69	1.85	92.59	7.056	97.9	92.1	104	0	0		

Sample ID	0311049-01BMS	SampType:	MS	TestCode:	6010_S	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	TJA IRIS_031114F
Client ID:	ZZZZZ	Batch ID:	9959	TestNo:	E6010			Analysis Date:	11/14/2003	SeqNo:	225322

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	199.6	1.85	46.3	140.3	128	75	125	0	0		SE

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID 0311049-01BMS	SampType: MS	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225322

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	94.56	3.70	92.59	3.519	98.3	92.1	104	0	0		

Sample ID 0311049-01BMSD	SampType: MSD	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224981

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	88.85	1.79	89.29	2.62	96.6	86.1	109	92.87	4.43	20	
Cadmium	4.518	0.0893	4.464	0	101	86.4	113	4.704	4.03	20	
Chromium	40.57	0.446	22.32	17.44	104	75	121	40.98	1.01	20	
Selenium	91.25	1.79	89.29	0	102	77.7	116	93.43	2.36	20	
Silver	40.35	1.79	44.64	0	90.4	75	123	41.59	3.04	20	

Sample ID 0311049-01BMSD	SampType: MSD	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114A
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225079

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	94.73	1.79	89.29	7.056	98.2	92.1	104	97.69	3.07	20	

Sample ID 0311049-01BMSD	SampType: MSD	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225323

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	194.3	1.79	44.64	140.3	121	75	125	199.6	2.71	20	E
Lead	90.3	3.57	89.29	3.519	97.2	92.1	104	94.56	4.60	20	

Sample ID 0311049-01BDUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224979

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.593	1.85	0	0	0	0	0	2.62	1.07	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID 0311049-01BDUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224979

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	0.0926	0	0	0	0	0	0	0	20	
Chromium	17.16	0.463	0	0	0	0	0	17.44	1.61	20	
Selenium	ND	1.85	0	0	0	0	0	0	0	20	
Silver	ND	1.85	0	0	0	0	0	0	0	20	

Sample ID 0311049-01BDUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114A
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225077

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	5.176	1.85	0	0	0	0	0	7.056	30.7	20	RF

Sample ID 0311049-01BDUP	SampType: DUP	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225321

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	129.9	1.85	0	0	0	0	0	140.3	7.67	20	
Lead	ND	3.70	0	0	0	0	0	3.519	0	20	

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224975

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	94.16	2.00	100	0	94.2	90	110	0	0		
Cadmium	4.86	0.100	5	0	97.2	90	110	0	0		
Chromium	23.98	0.500	25	0	95.9	90	110	0	0		
Selenium	97.74	2.00	100	0	97.7	90	110	0	0		
Silver	48.7	2.00	50	0	97.4	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224990

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	96.68	2.00	100	0	96.7	90	110	0	0		
Barium	46.33	1.00	50	0	92.7	90	110	0	0		
Cadmium	4.89	0.100	5	0	97.8	90	110	0	0		
Chromium	26.41	0.500	25	0	106	90	110	0	0		
Selenium	100.8	2.00	100	0	101	90	110	0	0		
Silver	49.75	2.00	50	0	99.5	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224997

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	95.09	2.00	100	0	95.1	90	110	0	0		
Barium	45.27	1.00	50	0	90.5	90	110	0	0		
Cadmium	4.88	0.100	5	0	97.6	90	110	0	0		
Chromium	25.02	0.500	25	0	100	90	110	0	0		
Selenium	97.88	2.00	100	0	97.9	90	110	0	0		
Silver	49.81	2.00	50	0	99.6	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114A
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225081

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	97.07	2.00	100	0	97.1	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225316

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	48.73	1.00	50	0	97.5	90	110	0	0		
Lead	99.28	2.00	100	0	99.3	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225319

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	47.05	1.00	50	0	94.1	90	110	0	0		
Lead	93.9	2.00	100	0	93.9	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225330

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	46.97	1.00	50	0	93.9	90	110	0	0		
Lead	96.38	2.00	100	0	96.4	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225332

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	92.85	2.00	100	0	92.8	90	110	0	0		

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031113C
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/13/2003	SeqNo: 224974

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	95.77	2.00	100	0	95.8	90	110	0	0		
Cadmium	4.88	0.100	5	0	97.6	90	110	0	0		
Chromium	23.67	0.500	25	0	94.7	90	110	0	0		
Selenium	99.21	2.00	100	0	99.2	90	110	0	0		
Silver	50.55	2.00	50	0	101	90	110	0	0		

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114A
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225073

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114A
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225073

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	96.56	2.00	100	0	96.6	90	110	0	0		

Sample ID ICV	SampType: ICV	TestCode: 6010_S	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: TJA IRIS_031114F
Client ID: ZZZZZ	Batch ID: 9959	TestNo: E6010		Analysis Date: 11/14/2003	SeqNo: 225315

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Barium	48.34	1.00	50	0	96.7	90	110	0	0		
Lead	95.59	2.00	100	0	95.6	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8082_S

Sample ID MBLK-9979	SampType: MBLK	TestCode: 8082_S	Units: µg/Kg	Prep Date: 11/14/2003	Run ID: GCK_031119A
Client ID: ZZZZZ	Batch ID: 9979	TestNo: SW8082		Analysis Date: 11/19/2003	SeqNo: 226356

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	50.0									
Aroclor 1221	ND	50.0									
Aroclor 1232	ND	50.0									
Aroclor 1242	ND	50.0									
Aroclor 1248	ND	50.0									
Aroclor 1254	ND	50.0									
Aroclor 1260	ND	50.0									
Surr: Decachlorobiphenyl	40830	1.00	33330	0	122	56.5	130	0	0		

Sample ID LCS-9979	SampType: LCS	TestCode: 8082_S	Units: µg/Kg	Prep Date: 11/14/2003	Run ID: GCK_031119A
Client ID: ZZZZZ	Batch ID: 9979	TestNo: SW8082		Analysis Date: 11/19/2003	SeqNo: 226357

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1016/1260	746	50.0	833.3	0	89.5	44.3	137	0	0		
Aroclor 1260	857	0	833.3	0	103	44.3	137	0	0		

Sample ID 0311016-01CMS	SampType: MS	TestCode: 8082_S	Units: µg/Kg	Prep Date: 11/14/2003	Run ID: GCK_031119A
Client ID: 6167-031031-056	Batch ID: 9979	TestNo: SW8082		Analysis Date: 11/19/2003	SeqNo: 226361

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1016/1260	1178	50.0	833.3	0	141	56.6	123	0	0		S
Aroclor 1260	1275	0	833.3	400.6	105	56.6	123	0	0		

Sample ID 0311016-01CMSD	SampType: MSD	TestCode: 8082_S	Units: µg/Kg	Prep Date: 11/14/2003	Run ID: GCK_031119A
Client ID: 6167-031031-056	Batch ID: 9979	TestNo: SW8082		Analysis Date: 11/19/2003	SeqNo: 226362

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1016/1260	1293	50.0	833.3	0	155	56.6	123	1178	9.28	20	S
Aroclor 1260	1449	0	833.3	400.6	126	56.6	123	1275	12.8	20	S

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8082_S

Sample ID	CCV-9979	SampType:	CCV	TestCode:	8082_S	Units:	µg/Kg	Prep Date:		Run ID:	GCK_031119A
Client ID:	ZZZZZ	Batch ID:	9979	TestNo:	SW8082			Analysis Date:	11/19/2003	SeqNo:	226358

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1016/1260	622.7	50.0	666.7	0	93.4	85	115	0	0		
Aroclor 1254	733.2	50.0	666.7	0	110	85	115	0	0		
Aroclor 1260	660.7	50.0	666.7	0	99.1	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: ZZZZZ	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225048

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	10.0									
1,1,1-Trichloroethane	ND	10.0									
1,1,2,2-Tetrachloroethane	ND	10.0									
1,1,2-Trichloroethane	ND	10.0									
1,1-Dichloroethane	ND	10.0									
1,1-Dichloroethene	ND	10.0									
1,1-Dichloropropene	ND	10.0									
1,2,3-Trichlorobenzene	ND	10.0									
1,2,3-Trichloropropane	ND	10.0									
1,2,4-Trichlorobenzene	ND	10.0									
1,2,4-Trimethylbenzene	ND	10.0									
1,2-Dibromo-3-chloropropane	ND	10.0									
1,2-Dibromoethane	ND	10.0									
1,2-Dichlorobenzene	ND	10.0									
1,2-Dichloroethane	ND	10.0									
1,2-Dichloropropane	ND	10.0									
1,3,5-Trimethylbenzene	ND	10.0									
1,3-Dichlorobenzene	ND	10.0									
1,3-Dichloropropane	ND	10.0									
1,4-Dichlorobenzene	ND	10.0									
2,2-Dichloropropane	ND	10.0									
2-Butanone	ND	40.0									
2-Chlorotoluene	ND	10.0									
2-Hexanone	ND	20.0									
4-Chlorotoluene	ND	10.0									
4-Isopropyltoluene	ND	10.0									
4-Methyl-2-pentanone	ND	40.0									
Acetone	ND	100									
Benzene	ND	10.0									
Bromobenzene	ND	10.0									
Bromochloromethane	ND	10.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: ZZZZZ	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225048

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromodichloromethane	ND	10.0									
Bromoform	ND	10.0									
Bromomethane	ND	10.0									
Carbon disulfide	ND	10.0									
Carbon tetrachloride	ND	10.0									
Chlorobenzene	ND	10.0									
Chloroethane	ND	10.0									
Chloroform	ND	10.0									
Chloromethane	ND	10.0									
cis-1,2-Dichloroethene	ND	10.0									
cis-1,3-Dichloropropene	ND	10.0									
Dibromochloromethane	ND	10.0									
Dibromomethane	ND	10.0									
Dichlorodifluoromethane	ND	10.0									
Ethylbenzene	ND	10.0									
Hexachlorobutadiene	ND	10.0									
Isopropylbenzene	ND	10.0									
m,p-Xylene	ND	20.0									
Methyl tert-butyl ether	ND	10.0									
Methylene chloride	ND	50.0									
n-Butylbenzene	ND	10.0									
n-Propylbenzene	ND	10.0									
Naphthalene	2.25	10.0									J
o-Xylene	ND	10.0									
sec-Butylbenzene	ND	10.0									
Styrene	ND	10.0									
tert-Butylbenzene	ND	10.0									
Tetrachloroethene	ND	10.0									
Toluene	5.13	10.0									J
trans-1,2-Dichloroethene	ND	10.0									
trans-1,3-Dichloropropene	ND	10.0									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID MB	SampType: MBLK	TestCode: 8260_S	Units: µg/Kg	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: ZZZZZ	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225048

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Trichloroethene	ND	10.0									
Trichlorofluoromethane	ND	10.0									
Vinyl chloride	ND	10.0									
Surr: 1,2-Dichloroethane-d4	101.2	1.00	100	0	101	71.5	112	0	0		
Surr: 4-Bromofluorobenzene	109.2	1.00	100	0	109	75.7	122	0	0		
Surr: Dibromofluoromethane	116.1	1.00	100	0	116	64.3	124	0	0		
Surr: Toluene-d8	93.83	1.00	100	0	93.8	74.9	120	0	0		

Sample ID LCS	SampType: LCS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: ZZZZZ	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225047

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	77.92	10.0	80	0	97.4	65.4	133	0	0		
Benzene	77.23	10.0	80	0	96.5	78	123	0	0		
Chlorobenzene	78.99	10.0	80	0	98.7	79.5	125	0	0		
Toluene	76.54	10.0	80	5.13	89.3	77.5	132	0	0		
Trichloroethene	73.4	10.0	80	0	91.8	72.4	124	0	0		

Sample ID 0311016-01BMS	SampType: MS	TestCode: 8260_S	Units: µg/Kg	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: 6167-031031-056	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225051

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	35.48	10.0	40	0	88.7	69.2	158	0	0		
Benzene	39.17	10.0	40	0	97.9	71.7	147	0	0		
Chlorobenzene	42.21	10.0	40	0	106	85.6	148	0	0		
Toluene	42.74	10.0	40	0	107	75.8	153	0	0		
Trichloroethene	40.23	10.0	40	0	101	77.1	138	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_S

Sample ID 0311016-01BMSD	SampType: MSD	TestCode: 8260_S	Units: µg/Kg-dry	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: 6167-031031-056	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225052

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	42.39	10.0	40	0	106	69.2	158	35.48	17.7	20	
Benzene	40.32	10.0	40	0	101	71.7	147	39.17	2.89	20	
Chlorobenzene	40.13	10.0	40	0	100	85.6	148	42.21	5.05	20	
Toluene	40.98	10.0	40	0	102	75.8	153	42.74	4.20	20	
Trichloroethene	41.32	10.0	40	0	103	77.1	138	40.23	2.67	20	

Sample ID CCV	SampType: CCV	TestCode: 8260_S	Units: µg/Kg	Prep Date: 11/13/2003	Run ID: 5973J_031113A
Client ID: ZZZZZ	Batch ID: 9973	TestNo: SW8260B		Analysis Date: 11/13/2003	SeqNo: 225046

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	46.78	10.0	50	0	93.6	80	120	0	0		
1,2-Dichloropropane	48.27	10.0	50	0	96.5	80	120	0	0		
Chloroform	45.86	10.0	50	0	91.7	80	120	0	0		
Ethylbenzene	51.59	10.0	50	0	103	80	120	0	0		
Toluene	47.45	10.0	50	0	94.9	80	120	0	0		
Vinyl chloride	58.54	10.0	50	0	117	80	120	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: HG_CTS

Sample ID	MBLK	SampType:	MBLK	TestCode:	HG_CTS	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	CVAA_031113A
Client ID:	ZZZZZ	Batch ID:	9961	TestNo:	SW7471			Analysis Date:	11/13/2003	SeqNo:	224805

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.0167									

Sample ID	MBLK	SampType:	MBLK	TestCode:	HG_CTS	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	CVAA_031113A
Client ID:	ZZZZZ	Batch ID:	9961	TestNo:	SW7471			Analysis Date:	11/13/2003	SeqNo:	224867

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.0167									

Sample ID	LCS	SampType:	LCS	TestCode:	HG_CTS	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	CVAA_031113A
Client ID:	ZZZZZ	Batch ID:	9961	TestNo:	SW7471			Analysis Date:	11/13/2003	SeqNo:	224806

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.2037	0.0167	0.208	0	98	88.2	113	0	0		

Sample ID	LCS	SampType:	LCS	TestCode:	HG_CTS	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	CVAA_031113A
Client ID:	ZZZZZ	Batch ID:	9961	TestNo:	SW7471			Analysis Date:	11/13/2003	SeqNo:	224868

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.2133	0.0167	0.208	0	103	88.2	113	0	0		

Sample ID	0311032-01BMS	SampType:	MS	TestCode:	HG_CTS	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	CVAA_031113A
Client ID:	ZZZZZ	Batch ID:	9961	TestNo:	SW7471			Analysis Date:	11/13/2003	SeqNo:	224803

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.2138	0.0147	0.1835	0.01654	107	78.1	125	0	0		

Sample ID	0311032-01BMSD	SampType:	MSD	TestCode:	HG_CTS	Units:	mg/Kg	Prep Date:	11/12/2003	Run ID:	CVAA_031113A
Client ID:	ZZZZZ	Batch ID:	9961	TestNo:	SW7471			Analysis Date:	11/13/2003	SeqNo:	224804

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: HG_CTS

Sample ID 0311032-01BMSD	SampType: MSD	TestCode: HG_CTS	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: CVAA_031113A
Client ID: ZZZZZ	Batch ID: 9961	TestNo: SW7471		Analysis Date: 11/13/2003	SeqNo: 224804

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.2348	0.0157	0.195	0.01654	112	78.1	125	0.2138	9.37	20	

Sample ID 0311032-01BDUP	SampType: DUP	TestCode: HG_CTS	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: CVAA_031113A
Client ID: ZZZZZ	Batch ID: 9961	TestNo: SW7471		Analysis Date: 11/13/2003	SeqNo: 224802

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.02018	0.0147	0	0	0	0	0	0.01654	19.8	20	

Sample ID CCV	SampType: CCV	TestCode: HG_CTS	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: CVAA_031113A
Client ID: ZZZZZ	Batch ID: 9961	TestNo: SW7471		Analysis Date: 11/13/2003	SeqNo: 224807

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.2002	0.0167	0.208	0	96.2	90	110	0	0		

Sample ID CCV	SampType: CCV	TestCode: HG_CTS	Units: mg/Kg	Prep Date: 11/12/2003	Run ID: CVAA_031113A
Client ID: ZZZZZ	Batch ID: 9961	TestNo: SW7471		Analysis Date: 11/13/2003	SeqNo: 224869

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.2127	0.0167	0.208	0	102	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223233

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	25.33	1.00	33.33	0	76	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031107B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/7/2003	SeqNo: 223904

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	30.8	1.00	33.33	0	92.4	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031112A
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/12/2003	SeqNo: 224638

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	30.56	1.00	33.33	0	91.7	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031112B
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/12/2003	SeqNo: 224754

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	28.03	1.00	33.33	0	84.1	50	150	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031113A
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 224845

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	29.36	1.00	33.33	0	88.1	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: ZZZZZ	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225033

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	25.96	1.00	33.33	0	77.9	50	150	0	0		

Sample ID MBLK	SampType: MBLK	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031113C
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225040

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	ND	15.0									
Lube Oil	ND	50.0									
Surr: o-Terphenyl	25.96	1.00	33.33	0	77.9	50	150	0	0		

Sample ID LCS	SampType: LCS	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223234

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	158.3	15.0	167.6	0	94.4	76.3	122	0	0		
Lube Oil	155.3	50.0	167.6	0	92.6	69.9	127	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID	LCS	SampType:	LCS	TestCode:	NWTPHDX_S	Units:	mg/Kg	Prep Date:	11/13/2003	Run ID:	GC-M_031113B	
Client ID:	ZZZZZ	Batch ID:	9965	TestNo:	NWTPH-Dx			Analysis Date:	11/13/2003	SeqNo:	225034	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel		154.4	15.0	167.7	0	92.1	76.3	122	0	0		
Lube Oil		165.5	50.0	167.7	0	98.7	69.9	127	0	0		

Sample ID	0311016-01ADUP	SampType:	DUP	TestCode:	NWTPHDX_S	Units:	mg/Kg-dry	Prep Date:	11/4/2003	Run ID:	GC-M_031105B	
Client ID:	6167-031031-056	Batch ID:	9908	TestNo:	NWTPH-Dx			Analysis Date:	11/5/2003	SeqNo:	223244	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel		458.2	153	0	0	0	0	0	367.2	22.0	20	R
Lube Oil		2517	509	0	0	0	0	0	1975	24.1	20	R

Sample ID	0311013-01ADUP	SampType:	DUP	TestCode:	NWTPHDX_S	Units:	mg/Kg-dry	Prep Date:	11/4/2003	Run ID:	GC-M_031105B	
Client ID:	ZZZZZ	Batch ID:	9908	TestNo:	NWTPH-Dx			Analysis Date:	11/5/2003	SeqNo:	223245	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel		ND	18.4	0	0	0	0	0	0	0	20	
Lube Oil		ND	61.2	0	0	0	0	0	0	0	20	

Sample ID	0311016-11ADUP	SampType:	DUP	TestCode:	NWTPHDX_S	Units:	mg/Kg-dry	Prep Date:	11/11/2003	Run ID:	GC-M_031112A	
Client ID:	6167-031031-066	Batch ID:	9945	TestNo:	NWTPH-Dx			Analysis Date:	11/12/2003	SeqNo:	224646	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel		178.8	76.5	0	0	0	0	0	133.4	29.1	20	RF
Lube Oil		1132	255	0	0	0	0	0	983.1	14.1	20	

Sample ID	0311049-02ADUP	SampType:	DUP	TestCode:	NWTPHDX_S	Units:	mg/Kg-dry	Prep Date:	11/11/2003	Run ID:	GC-M_031112B	
Client ID:	ZZZZZ	Batch ID:	9945	TestNo:	NWTPH-Dx			Analysis Date:	11/12/2003	SeqNo:	224760	
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel		18.94	19.5	0	0	0	0	0	20.45	0	20	J
Lube Oil		78.21	64.9	0	0	0	0	0	82.45	5.27	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID 0311016-15ADUP	SampType: DUP	TestCode: NWTPHDX_S	Units: mg/Kg-dry	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: 6167-031031-070	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225039

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	22.81	15.3	0	0	0	0	0	19.15	17.4	20	
Lube Oil	144.1	50.8	0	0	0	0	0	145.9	1.24	20	

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031105B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/5/2003	SeqNo: 223235

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	150.5	15.0	166.8	0	90.2	85	115	0	0		
Lube Oil	162.4	50.0	169.5	0	95.8	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/4/2003	Run ID: GC-M_031107B
Client ID: ZZZZZ	Batch ID: 9908	TestNo: NWTPH-Dx		Analysis Date: 11/7/2003	SeqNo: 223905

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	168	15.0	166.8	0	101	85	115	0	0		
Lube Oil	191.3	50.0	169.5	0	113	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031112A
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/12/2003	SeqNo: 224639

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	629.5	15.0	667.2	0	94.3	85	115	0	0		
Lube Oil	287.5	50.0	250.6	0	115	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031112B
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/12/2003	SeqNo: 224755

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	646.8	15.0	667.3	0	96.9	85	115	0	0		
Lube Oil	278.9	50.0	250.7	0	111	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: NWTPHDX_S

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031113A
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 224846

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Kerosene	364.1	15.0	334	0	109	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/13/2003	Run ID: GC-M_031113B
Client ID: ZZZZZ	Batch ID: 9965	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225035

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	310.9	15.0	333.6	0	93.2	85	115	0	0		
Lube Oil	254.9	50.0	250.7	0	102	85	115	0	0		

Sample ID CCV	SampType: CCV	TestCode: NWTPHDX_S	Units: mg/Kg	Prep Date: 11/11/2003	Run ID: GC-M_031113C
Client ID: ZZZZZ	Batch ID: 9945	TestNo: NWTPH-Dx		Analysis Date: 11/13/2003	SeqNo: 225041

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel	310.9	15.0	333.6	0	93.2	85	115	0	0		
Lube Oil	254.9	50.0	250.6	0	102	85	115	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID MB-9960	SampType: MBLK	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/12/2003	Run ID: 5973G_031113B
Client ID: ZZZZZ	Batch ID: 9960	TestNo: 8270SIM		Analysis Date: 11/13/2003	SeqNo: 224942

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	ND	6.67									
Acenaphthylene	ND	6.67									
Anthracene	ND	6.67									
Benz(a)anthracene	ND	6.67									
Benzo(a)pyrene	ND	6.67									
Benzo(b)fluoranthene	ND	6.67									
Benzo(g,h,i)perylene	ND	6.67									
Benzo(k)fluoranthene	ND	6.67									
Chrysene	ND	6.67									
Dibenz(a,h)anthracene	ND	6.67									
Fluoranthene	ND	6.67									
Fluorene	ND	6.67									
Indeno(1,2,3-cd)pyrene	ND	6.67									
Naphthalene	ND	6.67									
Phenanthrene	ND	6.67									
Pyrene	ND	6.67									
Surr: 2-Fluorobiphenyl	5911	0	6667	0	88.7	42.6	128	0	0		
Surr: Nitrobenzene-d5	5345	0	6667	0	80.2	21.7	155	0	0		
Surr: p-Terphenyl-d14	5945	0	6667	0	89.2	44.9	155	0	0		

Sample ID LCS-9960	SampType: LCS	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/12/2003	Run ID: 5973G_031113B
Client ID: ZZZZZ	Batch ID: 9960	TestNo: 8270SIM		Analysis Date: 11/13/2003	SeqNo: 224943

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	114.7	6.67	166.7	0	68.8	40.4	107	0	0		
Benzo(g,h,i)perylene	149.3	6.67	166.7	0	89.6	44.6	125	0	0		
Chrysene	134	6.67	166.7	0	80.4	59.9	121	0	0		
Naphthalene	102	6.67	166.7	0	61.2	33.5	96.1	0	0		
Phenanthrene	131.3	6.67	166.7	0	78.8	52.2	108	0	0		
Pyrene	122.7	6.67	166.7	0	73.6	53.8	120	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID 0311049-01BMS	SampType: MS	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/12/2003	Run ID: 5973G_031113B
Client ID: ZZZZZ	Batch ID: 9960	TestNo: 8270SIM		Analysis Date: 11/13/2003	SeqNo: 224945

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	89.33	6.67	166.7	0	53.6	33.7	107	0	0		
Benzo(g,h,i)perylene	110.7	6.67	166.7	3.333	64.4	15	128	0	0		
Chrysene	103.3	6.67	166.7	3.333	60	37.5	125	0	0		
Naphthalene	79.33	6.67	166.7	3.333	45.6	27.7	108	0	0		
Phenanthrene	108	6.67	166.7	4.667	62	20.2	139	0	0		
Pyrene	98.67	6.67	166.7	4.667	56.4	26.8	134	0	0		

Sample ID 0311049-01BMS	SampType: MSD	TestCode: PAHLL_S	Units: µg/Kg	Prep Date: 11/12/2003	Run ID: 5973G_031113B
Client ID: ZZZZZ	Batch ID: 9960	TestNo: 8270SIM		Analysis Date: 11/13/2003	SeqNo: 224946

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	100.7	6.67	166.7	0	60.4	33.7	107	89.33	11.9	20	
Benzo(g,h,i)perylene	121.3	6.67	166.7	3.333	70.8	15	128	110.7	9.20	20	
Chrysene	117.3	6.67	166.7	3.333	68.4	37.5	125	103.3	12.7	20	
Naphthalene	86	6.67	166.7	3.333	49.6	27.7	108	79.33	8.06	20	
Phenanthrene	121.3	6.67	166.7	4.667	70	20.2	139	108	11.6	20	
Pyrene	112.7	6.67	166.7	4.667	64.8	26.8	134	98.67	13.2	20	

Sample ID CCV-9960	SampType: CCV	TestCode: PAHLL_S	Units: µg/Kg	Prep Date:	Run ID: 5973G_031113B
Client ID: ZZZZZ	Batch ID: 9960	TestNo: 8270SIM		Analysis Date: 11/13/2003	SeqNo: 224941

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	118	6.67	133.3	0	88.5	70	130	0	0		
Acenaphthylene	126.7	6.67	133.3	0	95	70	130	0	0		
Anthracene	148.7	6.67	133.3	0	112	70	130	0	0		
Benz(a)anthracene	116.7	6.67	133.3	0	87.5	70	130	0	0		
Benzo(a)pyrene	136.7	6.67	133.3	0	103	70	130	0	0		
Benzo(b)fluoranthene	131.3	6.67	133.3	0	98.5	70	130	0	0		
Benzo(g,h,i)perylene	132.7	6.67	133.3	0	99.5	70	130	0	0		
Benzo(k)fluoranthene	134	6.67	133.3	0	101	70	130	0	0		
Chrysene	116.7	6.67	133.3	0	87.5	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311016
Project: Astoria - E. Subgrade / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: PAHLL_S

Sample ID CCV-9960	SampType: CCV	TestCode: PAHLL_S	Units: µg/Kg	Prep Date:	Run ID: 5973G_031113B
Client ID: ZZZZZ	Batch ID: 9960	TestNo: 8270SIM		Analysis Date: 11/13/2003	SeqNo: 224941

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dibenz(a,h)anthracene	145.3	6.67	133.3	0	109	70	130	0	0		
Fluoranthene	116.7	6.67	133.3	0	87.5	70	130	0	0		
Fluorene	123.3	6.67	133.3	0	92.5	70	130	0	0		
Indeno(1,2,3-cd)pyrene	134	6.67	133.3	0	101	70	130	0	0		
Naphthalene	107.3	6.67	133.3	0	80.5	70	130	0	0		
Phenanthrene	123.3	6.67	133.3	0	92.5	70	130	0	0		
Pyrene	112.7	6.67	133.3	0	84.5	70	130	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A. This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1. This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2. This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against lube oil calibration standards.

A3. Results determined to be non detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B. The blank exhibited a positive result greater than the reporting limit for this compound.

C. The result confirmed by secondary column or GC/MS analysis.

CN. See case narrative.

CR. Result for this analyte maybe biased due to interferences. Confirmation by GC/MS or other technique is recommended.

D. Surrogate was diluted outside reporting range.

E. Result exceeds the calibration range for the compound. The result should be considered an estimate.

F. The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

G. Result may be biased high due to biogenic interferences. Silica gel clean-up recommended.

H. Sample was analyzed outside recommended holding times.

HT. At clients request, sample was analyzed outside method recommended holding time.

J. The result for this analyte is between the MDL and the PQL, and should be considered an estimated concentration.

K. Diesel result is biased high due to amount of oil contained in the sample.

L. Diesel result is biased high due to amount of gasoline contained in the sample.

M. Oil result is biased high due to amount of diesel contained in the sample.

MC. Sample concentration is greater than 4x the spiked value; the spiked value is considered insignificant.

MI. Outside control limits due to Matrix Interference.

MSA. Value determined by Method of Standard Addition.

N. Sample appears to contain biogenic material biasing quantification.

O. Laboratory Control Standard (LCS) exceeded laboratory control limits, meets CCV criteria. Data meets EPA requirements.

P. Detected levels of Methylene Chloride may be due to laboratory contamination, due to previous analysis or background levels.

Q. Detection limits elevated due to sample matrix.

R. RPD control limits were exceeded.

RF. Duplicate failed, due to result being at or near method reporting limit.

RP. Matrix spike values exceed established QC limits, post digestion spike is in control.

S. Recovery outside control limits.

*. The result for this parameter was greater than the maximum contaminant level or the TCLP regulatory limit.

rev. October 23, 2001

APPENDIX C

Laboratory Analytical Reports and Chain-of-Custody Documentation
Groundwater Samples

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: Specialty Analytical
503-612-9007
Lab Project No. 031017

CHAIN OF CUSTODY

Chain of Custody No. 1 of 1

Project Manager: Dennis Terzian
Project No. 6167
Project Name: Astoria — Groundwater
Collected by: Jill Betts

Liquid with Sediment Sample: ____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample: ____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N) 8°C
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 6167-031030 —

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: 8260	RUSH	Remarks
	115	10/30	1010	B-28		✓		3	X		
	116		1248	B-19 17-21		↓		↓	X		
	117		105	B-19 26-30		↓		↓	X		
	118		230	B-23 15.5-16.5		✓		3	X		
	119	↓	325	B-22		✓		3	X		

Relinquished by	Company	Date	Time	Received by	Company
[signature]	HAHN & ASSOC	11/03/03	1215pm	[signature] Drake	Specialty
Relinquished by	Company	Date	Time	Received by	Company
Relinquished by	Company	Date 11/4/03	Time 115pm	Received by [signature] Drake	Company Specialty

Specialty Analytical

19761 S.W. 95th Place
Tualatin, OR 97062
(503) 612-9007
Fax (503) 612-8572
1 (877) 612-9007

November 10, 2003

Dennis Terzian
Hahn and Associates, Inc.
434 NW Sixth Avenue
Suite 203
Portland, OR 97209

TEL: (503) 796-0717
FAX (503) 227-2209

RE: Astoria - Groundwater / 6167

Dear Dennis Terzian:

Order No.: 0311017

Specialty Analytical received 5 samples on 11/4/2003 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Ned Engleson
Project Manager

Technical Review

Specialty Analytical

Date: *10-Nov-03*

CLIENT:	Hahn and Associates, Inc.	**Client Sample ID:**	6167-031030-115
Lab Order:	0311017	**Collection Date:**	10/30/2003 10:10:00 AM
Project:	Astoria - Groundwater / 6167		
Lab ID:	0311017-01	**Matrix:**	GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: skc
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 1:35:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 1:35:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 1:35:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 1:35:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 1:35:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 1:35:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 1:35:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Chloroform	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Chloromethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-01

Client Sample ID: 6167-031030-115
Collection Date: 10/30/2003 10:10:00 AM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Dibromochloromethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Dibromomethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Dichlorodifluoromethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Ethylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Hexachlorobutadiene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Isopropylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
m,p-Xylene	ND	2.00		µg/L	1	11/6/2003 1:35:00 AM
Methyl tert-butyl ether	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Methylene chloride	ND	20.0		µg/L	1	11/6/2003 1:35:00 AM
n-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
n-Propylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Naphthalene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
o-Xylene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
sec-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Styrene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
tert-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Tetrachloroethene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Toluene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Trichloroethene	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Trichlorofluoromethane	ND	1.00		µg/L	1	11/6/2003 1:35:00 AM
Vinyl chloride	1.03	1.00		µg/L	1	11/6/2003 1:35:00 AM
Surr: 1,2-Dichloroethane-d4	84.1	72.8-113		%REC	1	11/6/2003 1:35:00 AM
Surr: 4-Bromofluorobenzene	104	83.4-125		%REC	1	11/6/2003 1:35:00 AM
Surr: Dibromofluoromethane	91.0	79.4-124		%REC	1	11/6/2003 1:35:00 AM
Surr: Toluene-d8	115	88.6-129		%REC	1	11/6/2003 1:35:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT:	Hahn and Associates, Inc.	**Client Sample ID:**	6167-031030-116
Lab Order:	0311017	**Collection Date:**	10/30/2003 12:48:00 PM
Project:	Astoria - Groundwater / 6167		
Lab ID:	0311017-02	**Matrix:**	GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 2:09:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 2:09:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 2:09:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 2:09:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 2:09:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 2:09:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 2:09:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Chloroform	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Chloromethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-02

Client Sample ID: 6167-031030-116
Collection Date: 10/30/2003 12:48:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
cis-1,2-Dichloroethene	1.07	1.00		µg/L	1	11/6/2003 2:09:00 AM
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Dibromochloromethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Dibromomethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Dichlorodifluoromethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Ethylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Hexachlorobutadiene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Isopropylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
m,p-Xylene	ND	2.00		µg/L	1	11/6/2003 2:09:00 AM
Methyl tert-butyl ether	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Methylene chloride	ND	20.0		µg/L	1	11/6/2003 2:09:00 AM
n-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
n-Propylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Naphthalene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
o-Xylene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
sec-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Styrene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
tert-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Tetrachloroethene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Toluene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Trichloroethene	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Trichlorofluoromethane	ND	1.00		µg/L	1	11/6/2003 2:09:00 AM
Vinyl chloride	7.28	1.00		µg/L	1	11/6/2003 2:09:00 AM
Surr: 1,2-Dichloroethane-d4	94.0	72.8-113		%REC	1	11/6/2003 2:09:00 AM
Surr: 4-Bromofluorobenzene	99.9	83.4-125		%REC	1	11/6/2003 2:09:00 AM
Surr: Dibromofluoromethane	90.6	79.4-124		%REC	1	11/6/2003 2:09:00 AM
Surr: Toluene-d8	111	88.6-129		%REC	1	11/6/2003 2:09:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-03

Client Sample ID: 6167-031030-117
Collection Date: 10/30/2003 1:05:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: skc
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 2:43:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 2:43:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 2:43:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 2:43:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 2:43:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 2:43:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 2:43:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Chloroform	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Chloromethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-03

Client Sample ID: 6167-031030-117
Collection Date: 10/30/2003 1:05:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Dibromochloromethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Dibromomethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Dichlorodifluoromethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Ethylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Hexachlorobutadiene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Isopropylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
m,p-Xylene	ND	2.00		µg/L	1	11/6/2003 2:43:00 AM
Methyl tert-butyl ether	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Methylene chloride	ND	20.0		µg/L	1	11/6/2003 2:43:00 AM
n-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
n-Propylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Naphthalene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
o-Xylene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
sec-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Styrene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
tert-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Tetrachloroethene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Toluene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Trichloroethene	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Trichlorofluoromethane	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Vinyl chloride	ND	1.00		µg/L	1	11/6/2003 2:43:00 AM
Surr: 1,2-Dichloroethane-d4	90.5	72.8-113		%REC	1	11/6/2003 2:43:00 AM
Surr: 4-Bromofluorobenzene	97.7	83.4-125		%REC	1	11/6/2003 2:43:00 AM
Surr: Dibromofluoromethane	92.8	79.4-124		%REC	1	11/6/2003 2:43:00 AM
Surr: Toluene-d8	110	88.6-129		%REC	1	11/6/2003 2:43:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-04

Client Sample ID: 6167-031030-118
Collection Date: 10/30/2003 2:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 3:16:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 3:16:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 3:16:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 3:16:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 3:16:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 3:16:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 3:16:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Chloroform	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Chloromethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-04

Client Sample ID: 6167-031030-118
Collection Date: 10/30/2003 2:30:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Dibromochloromethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Dibromomethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Dichlorodifluoromethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Ethylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Hexachlorobutadiene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Isopropylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
m,p-Xylene	ND	2.00		µg/L	1	11/6/2003 3:16:00 AM
Methyl tert-butyl ether	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Methylene chloride	ND	20.0		µg/L	1	11/6/2003 3:16:00 AM
n-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
n-Propylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Naphthalene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
o-Xylene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
sec-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Styrene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
tert-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Tetrachloroethene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Toluene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Trichloroethene	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Trichlorofluoromethane	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Vinyl chloride	ND	1.00		µg/L	1	11/6/2003 3:16:00 AM
Surr: 1,2-Dichloroethane-d4	91.1	72.8-113		%REC	1	11/6/2003 3:16:00 AM
Surr: 4-Bromofluorobenzene	98.2	83.4-125		%REC	1	11/6/2003 3:16:00 AM
Surr: Dibromofluoromethane	91.9	79.4-124		%REC	1	11/6/2003 3:16:00 AM
Surr: Toluene-d8	111	88.6-129		%REC	1	11/6/2003 3:16:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-05

Client Sample ID: 6167-031030-119
Collection Date: 10/30/2003 3:25:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 3:50:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 3:50:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 3:50:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 3:50:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 3:50:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 3:50:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 3:50:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Chloroform	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Chloromethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Lab Order: 0311017
Project: Astoria - Groundwater / 6167
Lab ID: 0311017-05

Client Sample ID: 6167-031030-119
Collection Date: 10/30/2003 3:25:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: skc
cis-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
cis-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Dibromochloromethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Dibromomethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Dichlorodifluoromethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Ethylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Hexachlorobutadiene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Isopropylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
m,p-Xylene	ND	2.00		µg/L	1	11/6/2003 3:50:00 AM
Methyl tert-butyl ether	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Methylene chloride	ND	20.0		µg/L	1	11/6/2003 3:50:00 AM
n-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
n-Propylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Naphthalene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
o-Xylene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
sec-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Styrene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
tert-Butylbenzene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Tetrachloroethene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Toluene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
trans-1,2-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
trans-1,3-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Trichloroethene	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Trichlorofluoromethane	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Vinyl chloride	ND	1.00		µg/L	1	11/6/2003 3:50:00 AM
Surr: 1,2-Dichloroethane-d4	96.7	72.8-113		%REC	1	11/6/2003 3:50:00 AM
Surr: 4-Bromofluorobenzene	97.3	83.4-125		%REC	1	11/6/2003 3:50:00 AM
Surr: Dibromofluoromethane	96.6	79.4-124		%REC	1	11/6/2003 3:50:00 AM
Surr: Toluene-d8	108	88.6-129		%REC	1	11/6/2003 3:50:00 AM

Specialty Analytical

Date: *10-Nov-03*

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date: **11/7/2003**	Run ID: **5973J_031105A**
Client ID: **ZZZZZ**	Batch ID: **9931**	TestNo: **SW8260B**		Analysis Date: **11/5/2003**	SeqNo: **223679**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.00									
1,1,1-Trichloroethane	ND	1.00									
1,1,2,2-Tetrachloroethane	ND	1.00									
1,1,2-Trichloroethane	ND	1.00									
1,1-Dichloroethane	ND	1.00									
1,1-Dichloroethene	ND	1.00									
1,1-Dichloropropene	ND	1.00									
1,2,3-Trichlorobenzene	ND	1.00									
1,2,3-Trichloropropane	ND	1.00									
1,2,4-Trichlorobenzene	ND	1.00									
1,2,4-Trimethylbenzene	ND	1.00									
1,2-Dibromo-3-chloropropane	ND	1.00									
1,2-Dibromoethane	ND	1.00									
1,2-Dichlorobenzene	ND	1.00									
1,2-Dichloroethane	ND	1.00									
1,2-Dichloropropane	ND	1.00									
1,3,5-Trimethylbenzene	ND	1.00									
1,3-Dichlorobenzene	ND	1.00									
1,3-Dichloropropane	ND	1.00									
1,4-Dichlorobenzene	ND	1.00									
2,2-Dichloropropane	ND	1.00									
2-Butanone	ND	10.0									
2-Chlorotoluene	ND	1.00									
2-Hexanone	ND	10.0									
4-Chlorotoluene	ND	1.00									
4-Isopropyltoluene	ND	1.00									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Acrylonitrile	ND	5.00									
Benzene	ND	0.400									

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: **µg/L**	Prep Date: **11/7/2003**	Run ID: **5973J_031105A**
Client ID: **ZZZZZ**	Batch ID: **9931**	TestNo: **SW8260B**		Analysis Date: **11/5/2003**	SeqNo: **223679**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	ND	1.00									
Bromochloromethane	ND	1.00									
Bromodichloromethane	ND	1.00									
Bromoform	ND	1.00									
Bromomethane	ND	1.00									
Carbon disulfide	ND	2.00									
Carbon tetrachloride	ND	1.00									
Chlorobenzene	ND	1.00									
Chloroethane	ND	1.00									
Chloroform	ND	1.00									
Chloromethane	ND	1.00									
cis-1,2-Dichloroethene	ND	1.00									
cis-1,3-Dichloropropene	ND	1.00									
Dibromochloromethane	ND	1.00									
Dibromomethane	ND	1.00									
Dichlorodifluoromethane	ND	1.00									
Ethylbenzene	ND	1.00									
Hexachlorobutadiene	ND	1.00									
Isopropylbenzene	ND	1.00									
m,p-Xylene	ND	2.00									
Methyl tert-butyl ether	ND	1.00									
Methylene chloride	2.85	20.0									J
n-Butylbenzene	ND	1.00									
n-Propylbenzene	ND	1.00									
Naphthalene	0.41	1.00									J
o-Xylene	ND	1.00									
sec-Butylbenzene	ND	1.00									
Styrene	ND	1.00									
tert-Butylbenzene	ND	1.00									
Tetrachloroethene	ND	1.00									
Toluene	ND	1.00									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223679

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,2-Dichloroethene	ND	1.00									
trans-1,3-Dichloropropene	ND	1.00									
Trichloroethene	ND	1.00									
Trichlorofluoromethane	ND	1.00									
Vinyl chloride	ND	1.00									
Surr: 1,2-Dichloroethane-d4	102.6	1.00	100	0	103	72.8	113	0	0		
Surr: 4-Bromofluorobenzene	99.57	1.00	100	0	99.6	83.4	125	0	0		
Surr: Dibromofluoromethane	106.3	1.00	100	0	106	79.4	124	0	0		
Surr: Toluene-d8	106.5	1.00	100	0	106	88.6	129	0	0		

Sample ID LCS	SampType: LCS	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223678

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	48.83	1.00	40	0	122	69.8	154	0	0		
Benzene	42.84	0.400	40	0	107	73.7	114	0	0		
Chlorobenzene	42.68	1.00	40	0	107	88.2	109	0	0		
Toluene	41.69	1.00	40	0	104	89.5	114	0	0		
Trichloroethene	45.16	1.00	40	0	113	63.4	120	0	0		

Sample ID 0311021-02AMS	SampType: MS	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223688

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	18.17	1.00	20	0	90.8	51.4	176	0	0		
Benzene	15.62	0.400	20	0	78.1	71.5	118	0	0		
Chlorobenzene	14.72	1.00	20	0	73.6	79.8	114	0	0		S
Toluene	14.77	1.00	20	0	73.8	79.6	121	0	0		S
Trichloroethene	13.37	1.00	20	0.33	65.2	73.6	120	0	0		S

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID 0311021-02AMSD	SampType: MSD	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223689

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	22.52	1.00	20	0	113	51.4	176	18.17	21.4	20	R
Benzene	18.61	0.400	20	0	93	71.5	118	15.62	17.5	20	
Chlorobenzene	17.46	1.00	20	0	87.3	79.8	114	14.72	17.0	20	
Toluene	17.68	1.00	20	0	88.4	79.6	121	14.77	17.9	20	
Trichloroethene	15.85	1.00	20	0.33	77.6	73.6	120	13.37	17.0	20	

Sample ID 0311021-02ADUP	SampType: DUP	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223687

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1,1-Trichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1,2,2-Tetrachloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1,2-Trichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1-Dichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1-Dichloroethene	ND	1.00	0	0	0	0	0	0	0	20	
1,1-Dichloropropene	ND	1.00	0	0	0	0	0	0	0	20	
1,2,3-Trichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,2,3-Trichloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,2,4-Trichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,2,4-Trimethylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dibromo-3-chloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dibromoethane	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dichlorobenzene	ND	1.00	0	0	0	0	0	0.14	0	20	
1,2-Dichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dichloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,3,5-Trimethylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,3-Dichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,3-Dichloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,4-Dichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
2,2-Dichloropropane	ND	1.00	0	0	0	0	0	0	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID 0311021-02ADUP	SampType: DUP	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223687

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Butanone	ND	10.0	0	0	0	0	0	0	0	20	
2-Chlorotoluene	ND	1.00	0	0	0	0	0	0	0	20	
2-Hexanone	ND	10.0	0	0	0	0	0	0	0	20	
4-Chlorotoluene	ND	1.00	0	0	0	0	0	0	0	20	
4-Isopropyltoluene	ND	1.00	0	0	0	0	0	0	0	20	
4-Methyl-2-pentanone	ND	20.0	0	0	0	0	0	0	0	20	
Acetone	23.36	50.0	0	0	0	0	0	19.09	0	20	J
Acrylonitrile	ND	5.00	0	0	0	0	0	0	0	20	
Benzene	ND	0.400	0	0	0	0	0	0	0	20	
Bromobenzene	ND	1.00	0	0	0	0	0	0	0	20	
Bromochloromethane	ND	1.00	0	0	0	0	0	0	0	20	
Bromodichloromethane	ND	1.00	0	0	0	0	0	0	0	20	
Bromoform	ND	1.00	0	0	0	0	0	0	0	20	
Bromomethane	ND	1.00	0	0	0	0	0	0	0	20	
Carbon disulfide	ND	2.00	0	0	0	0	0	0	0	20	
Carbon tetrachloride	ND	1.00	0	0	0	0	0	0	0	20	
Chlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
Chloroethane	ND	1.00	0	0	0	0	0	0	0	20	
Chloroform	ND	1.00	0	0	0	0	0	0	0	20	
Chloromethane	ND	1.00	0	0	0	0	0	0	0	20	
cis-1,2-Dichloroethene	ND	1.00	0	0	0	0	0	0.43	0	20	
cis-1,3-Dichloropropene	ND	1.00	0	0	0	0	0	0	0	20	
Dibromochloromethane	ND	1.00	0	0	0	0	0	0	0	20	
Dibromomethane	ND	1.00	0	0	0	0	0	0	0	20	
Dichlorodifluoromethane	ND	1.00	0	0	0	0	0	0	0	20	
Ethylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Hexachlorobutadiene	ND	1.00	0	0	0	0	0	0	0	20	
Isopropylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
m,p-Xylene	ND	2.00	0	0	0	0	0	0	0	20	
Methyl tert-butyl ether	ND	1.00	0	0	0	0	0	0	0	20	
Methylene chloride	ND	20.0	0	0	0	0	0	0	0	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID 0311021-02ADUP	SampType: DUP	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223687

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Butylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
n-Propylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Naphthalene	0.21	1.00	0	0	0	0	0	0.22	0	20	J
o-Xylene	ND	1.00	0	0	0	0	0	0	0	20	
sec-Butylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Styrene	ND	1.00	0	0	0	0	0	0	0	20	
tert-Butylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Tetrachloroethene	ND	1.00	0	0	0	0	0	0	0	20	
Toluene	ND	1.00	0	0	0	0	0	0	0	20	
trans-1,2-Dichloroethene	ND	1.00	0	0	0	0	0	0	0	20	
trans-1,3-Dichloropropene	ND	1.00	0	0	0	0	0	0	0	20	
Trichloroethene	0.28	1.00	0	0	0	0	0	0.33	0	20	J
Trichlorofluoromethane	ND	1.00	0	0	0	0	0	0	0	20	
Vinyl chloride	ND	1.00	0	0	0	0	0	0	0	20	

Sample ID CCV	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223677

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	52.39	1.00	50	0	105	80	120	0	0		
1,2-Dichloropropane	57.27	1.00	50	0	115	80	120	0	0		
Chloroform	52.44	1.00	50	0	105	80	120	0	0		
Ethylbenzene	53.43	1.00	50	0	107	80	120	0	0		
Toluene	52.7	1.00	50	0	105	80	120	0	0		
Vinyl chloride	51.14	1.00	50	0	102	80	120	0	0		

Sample ID CCV	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223693

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	56.88	1.00	50	0	114	80	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311017
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID CCV	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223693

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloropropane	53.93	1.00	50	0	108	80	120	0	0		
Chloroform	46.43	1.00	50	0	92.9	80	120	0	0		
Ethylbenzene	54.69	1.00	50	0	109	80	120	0	0		
Toluene	52.09	1.00	50	0	104	80	120	0	0		
Vinyl chloride	51.56	1.00	50	0	103	80	120	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A. This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1. This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2. This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against lube oil calibration standards.

A3. Results determined to be non detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B. The blank exhibited a positive result greater than the reporting limit for this compound.

C. The result confirmed by secondary column or GC/MS analysis.

CN. See case narrative.

CR. Result for this analyte maybe biased due to interferences. Confirmation by GC/MS or other technique is recommended.

D. Surrogate was diluted outside reporting range.

E. Result exceeds the calibration range for the compound. The result should be considered an estimate.

F. The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

G. Result may be biased high due to biogenic interferences. Silica gel clean-up recommended.

H. Sample was analyzed outside recommended holding times.

HT. At clients request, sample was analyzed outside method recommended holding time.

J. The result for this analyte is between the MDL and the PQL, and should be considered an estimated concentration.

K. Diesel result is biased high due to amount of oil contained in the sample.

L. Diesel result is biased high due to amount of gasoline contained in the sample.

M. Oil result is biased high due to amount of diesel contained in the sample.

MC. Sample concentration is greater than 4x the spiked value; the spiked value is considered insignificant.

MI. Outside control limits due to Matrix Interference.

MSA. Value determined by Method of Standard Addition.

N. Sample appears to contain biogenic material biasing quantification.

O. Laboratory Control Standard (LCS) exceeded laboratory control limits, meets CCV criteria. Data meets EPA requirements.

P. Detected levels of Methylene Chloride may be due to laboratory contamination, due to previous analysis or background levels.

Q. Detection limits elevated due to sample matrix.

R. RPD control limits were exceeded.

RF. Duplicate failed, due to result being at or near method reporting limit.

RP. Matrix spike values exceed established QC limits, post digestion spike is in control.

S. Recovery outside control limits.

*. The result for this parameter was greater than the maximum contaminant level or the TCLP regulatory limit.

rev. October 23, 2001

HAHN AND ASSOCIATES, INC.
Environmental Management
434 NW Sixth Avenue, Suite 203 • Portland OR 97209
(503) 796-0717 • Fax (503) 227-2209

Laboratory: Specialty Analytical
503-612-9007
Lab Project No.:

CHAIN OF CUSTODY

Chain of Custody No. 1 of 1

Project Manager: Dennis Terzian
Project No.: 6167
Project Name: Astoria – Groundwater
Collected by: Jill Betts

Liquid with Sediment Sample
____ Test Filtrate ____ Test Sediment ____ Test Both
Multi-Phase Sample
____ Test One (which) ____ Test Separately ____ Shake

Samples Received at 4C (Y or N)
Appropriate Containers Used (Y or N)
Provide Verbal Results (Y or N)
Provide Preliminary Fax Results

Sample Number Prefix: 6167-031031-

Lab ID	Sample #	Date	Time	Sample Description	Matrix: Soil	Matrix: Water	Matrix: Other	Number of Containers	Analyses to be Performed: 8260	RUSH	Remarks
	~~115~~			~~B-28~~		✓		~~3~~			
	~~116~~			~~B-19 17-21~~		✓					
	~~117~~			~~B-19 26-30~~		✓					
	~~118~~			~~B-23~~							
	120	10/31/03	7:25	B-24 11-15'		✓		3			
	121		7:45	↓ 21-25		✓		3			
	122		8:55	B-25 ~~17-21~~		✓		3	X		
	123		11:15	B-21 ~~17-21~~		✓		3	X		
	124		12:45	B-21 26-30		✓		3	X		
	125		1:05	B-20		✓		3	X		
	126		2:15	B-24 15.5-19		✓		3	X		
	127		3:00	B-24 26-30		✓		3	X		
	~~128~~										
	~~129~~										

Relinquished by	Company	Date	Time	Received by	Company
	HAHN & ASSOC	11/03/03	12:15 pm		Specialty
Relinquished by	Company	Date	Time	Received by	Company
Relinquished by	Company	Date	Time	Received by	Company

Specialty Analytical

19761 S.W. 95th Place
Tualatin, OR 97062
(503) 612-9007
Fax (503) 612-8572
1 (877) 612-9007

November 12, 2003

Dennis Terzian
Hahn and Associates, Inc.
434 NW Sixth Avenue
Suite 203
Portland, OR 97209

TEL: (503) 796-0717
FAX (503) 227-2209

RE: Astoria - Groundwater / 6167

Dear Dennis Terzian:

Order No.: 0311018

Specialty Analytical received 8 samples on 11/4/2003 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Ned Engleson
Project Manager

Technical Review

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc.
Project: Astoria - Groundwater / 6167
Lab Order: 0311018

Lab ID: 0311018-01
Client Sample ID: 6167-031031-120
Collection Date: 10/31/2003 7:25:00 AM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Lab ID: 0311018-02
Client Sample ID: 6167-031031-121
Collection Date: 10/31/2003 7:45:00 AM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
HOLD PER CLIENT REQUEST		PER CLIENT				Analyst: ADM
Hold	HOLD				1	11/7/2003

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

Lab ID: 0311018-03 **Collection Date:** 10/31/2003 8:55:00 AM
Client Sample ID: 6167-031031-122 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 4:23:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 4:23:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 4:23:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 4:23:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 4:23:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 4:23:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 4:23:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 4:23:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

VOLATILES BY GC/MS		SW8260B			Analyst: skc
Chloroform	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Chloromethane	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
cis-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
cis-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Dibromochloromethane	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Dibromomethane	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Dichlorodifluoromethane	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Ethylbenzene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Hexachlorobutadiene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Isopropylbenzene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
m,p-Xylene	ND	2.00	µg/L	1	11/6/2003 4:23:00 AM
Methyl tert-butyl ether	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Methylene chloride	ND	20.0	µg/L	1	11/6/2003 4:23:00 AM
n-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
n-Propylbenzene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Naphthalene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
o-Xylene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
sec-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Styrene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
tert-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Tetrachloroethene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Toluene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
trans-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
trans-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Trichloroethene	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Trichlorofluoromethane	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Vinyl chloride	ND	1.00	µg/L	1	11/6/2003 4:23:00 AM
Surr: 1,2-Dichloroethane-d4	97.5	72.8-113	%REC	1	11/6/2003 4:23:00 AM
Surr: 4-Bromofluorobenzene	101	83.4-125	%REC	1	11/6/2003 4:23:00 AM
Surr: Dibromofluoromethane	97.3	79.4-124	%REC	1	11/6/2003 4:23:00 AM
Surr: Toluene-d8	110	88.6-129	%REC	1	11/6/2003 4:23:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

Lab ID: 0311018-04 **Collection Date:** 10/31/2003 11:15:00 AM
Client Sample ID: 6167-031031-123 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 4:56:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 4:56:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 4:56:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 4:56:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 4:56:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 4:56:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 4:56:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 4:56:00 AM

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

VOLATILES BY GC/MS		SW8260B			Analyst: skc
Chloroform	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Chloromethane	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
cis-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
cis-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Dibromochloromethane	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Dibromomethane	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Dichlorodifluoromethane	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Ethylbenzene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Hexachlorobutadiene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Isopropylbenzene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
m,p-Xylene	ND	2.00	µg/L	1	11/6/2003 4:56:00 AM
Methyl tert-butyl ether	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Methylene chloride	ND	20.0	µg/L	1	11/6/2003 4:56:00 AM
n-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
n-Propylbenzene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Naphthalene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
o-Xylene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
sec-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Styrene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
tert-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Tetrachloroethene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Toluene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
trans-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
trans-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Trichloroethene	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Trichlorofluoromethane	ND	1.00	µg/L	1	11/6/2003 4:56:00 AM
Vinyl chloride	3.73	1.00	µg/L	1	11/6/2003 4:56:00 AM
Surr: 1,2-Dichloroethane-d4	96.4	72.8-113	%REC	1	11/6/2003 4:56:00 AM
Surr: 4-Bromofluorobenzene	105	83.4-125	%REC	1	11/6/2003 4:56:00 AM
Surr: Dibromofluoromethane	95.7	79.4-124	%REC	1	11/6/2003 4:56:00 AM
Surr: Toluene-d8	115	88.6-129	%REC	1	11/6/2003 4:56:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

Lab ID: 0311018-05 **Collection Date:** 10/31/2003 12:04:00 PM
Client Sample ID: 6167-031031-124 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 5:30:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 5:30:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 5:30:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 5:30:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 5:30:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 5:30:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 5:30:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 5:30:00 AM

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

VOLATILES BY GC/MS		SW8260B			Analyst: skc
Chloroform	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Chloromethane	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
cis-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
cis-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Dibromochloromethane	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Dibromomethane	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Dichlorodifluoromethane	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Ethylbenzene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Hexachlorobutadiene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Isopropylbenzene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
m,p-Xylene	ND	2.00	µg/L	1	11/6/2003 5:30:00 AM
Methyl tert-butyl ether	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Methylene chloride	ND	20.0	µg/L	1	11/6/2003 5:30:00 AM
n-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
n-Propylbenzene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Naphthalene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
o-Xylene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
sec-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Styrene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
tert-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Tetrachloroethene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Toluene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
trans-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
trans-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Trichloroethene	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Trichlorofluoromethane	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Vinyl chloride	ND	1.00	µg/L	1	11/6/2003 5:30:00 AM
Surr: 1,2-Dichloroethane-d4	100	72.8-113	%REC	1	11/6/2003 5:30:00 AM
Surr: 4-Bromofluorobenzene	100	83.4-125	%REC	1	11/6/2003 5:30:00 AM
Surr: Dibromofluoromethane	99.4	79.4-124	%REC	1	11/6/2003 5:30:00 AM
Surr: Toluene-d8	111	88.6-129	%REC	1	11/6/2003 5:30:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

Lab ID: 0311018-06 **Collection Date:** 10/31/2003 1:08:00 PM
Client Sample ID: 6167-031031-125 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		SW8260B				Analyst: skc
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 6:03:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 6:03:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 6:03:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 6:03:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 6:03:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 6:03:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 6:03:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 6:03:00 AM

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

VOLATILES BY GC/MS		SW8260B			Analyst: skc
Chloroform	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Chloromethane	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
cis-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
cis-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Dibromochloromethane	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Dibromomethane	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Dichlorodifluoromethane	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Ethylbenzene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Hexachlorobutadiene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Isopropylbenzene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
m,p-Xylene	ND	2.00	µg/L	1	11/6/2003 6:03:00 AM
Methyl tert-butyl ether	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Methylene chloride	ND	20.0	µg/L	1	11/6/2003 6:03:00 AM
n-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
n-Propylbenzene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Naphthalene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
o-Xylene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
sec-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Styrene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
tert-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Tetrachloroethene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Toluene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
trans-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
trans-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Trichloroethene	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Trichlorofluoromethane	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Vinyl chloride	ND	1.00	µg/L	1	11/6/2003 6:03:00 AM
Surr: 1,2-Dichloroethane-d4	101	72.8-113	%REC	1	11/6/2003 6:03:00 AM
Surr: 4-Bromofluorobenzene	105	83.4-125	%REC	1	11/6/2003 6:03:00 AM
Surr: Dibromofluoromethane	101	79.4-124	%REC	1	11/6/2003 6:03:00 AM
Surr: Toluene-d8	114	88.6-129	%REC	1	11/6/2003 6:03:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

Lab ID: 0311018-07 **Collection Date:** 10/31/2003 2:15:00 PM
Client Sample ID: 6167-031031-126 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
2-Butanone	ND	10.0		µg/L	1	11/6/2003 6:37:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/6/2003 6:37:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
4-Isopropyltoluene	65.5	10.0		µg/L	10	11/10/2003 9:57:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/6/2003 6:37:00 AM
Acetone	ND	50.0		µg/L	1	11/6/2003 6:37:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/6/2003 6:37:00 AM
Benzene	ND	0.400		µg/L	1	11/6/2003 6:37:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Bromoform	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Bromomethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/6/2003 6:37:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM
Chloroethane	ND	1.00		µg/L	1	11/6/2003 6:37:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc.
Project: Astoria - Groundwater / 6167

Lab Order: 0311018

VOLATILES BY GC/MS		SW8260B			Analyst: skc
Chloroform	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Chloromethane	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
cis-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
cis-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Dibromochloromethane	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Dibromomethane	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Dichlorodifluoromethane	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Ethylbenzene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Hexachlorobutadiene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Isopropylbenzene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
m,p-Xylene	ND	2.00	µg/L	1	11/6/2003 6:37:00 AM
Methyl tert-butyl ether	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Methylene chloride	ND	20.0	µg/L	1	11/6/2003 6:37:00 AM
n-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
n-Propylbenzene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Naphthalene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
o-Xylene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
sec-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Styrene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
tert-Butylbenzene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Tetrachloroethene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Toluene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
trans-1,2-Dichloroethene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
trans-1,3-Dichloropropene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Trichloroethene	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Trichlorofluoromethane	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Vinyl chloride	ND	1.00	µg/L	1	11/6/2003 6:37:00 AM
Surr: 1,2-Dichloroethane-d4	93.7	72.8-113	%REC	1	11/6/2003 6:37:00 AM
Surr: 4-Bromofluorobenzene	106	83.4-125	%REC	1	11/6/2003 6:37:00 AM
Surr: Dibromofluoromethane	93.7	79.4-124	%REC	1	11/6/2003 6:37:00 AM
Surr: Toluene-d8	111	88.6-129	%REC	1	11/6/2003 6:37:00 AM

Specialty Analytical

Date: *12-Nov-03*

CLIENT: Hahn and Associates, Inc.
Project: Astoria - Groundwater / 6167
Lab Order: 0311018

Lab ID: 0311018-08
Client Sample ID: 6167-031031-127
Collection Date: 10/31/2003 3:00:00 PM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
VOLATILES BY GC/MS		**SW8260B**				Analyst: **skc**
1,1,1,2-Tetrachloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,1,1-Trichloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,1,2,2-Tetrachloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,1,2-Trichloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,1-Dichloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,1-Dichloroethene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,1-Dichloropropene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2,3-Trichlorobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2,3-Trichloropropane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2,4-Trichlorobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2,4-Trimethylbenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2-Dibromo-3-chloropropane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2-Dibromoethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2-Dichlorobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2-Dichloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,2-Dichloropropane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,3,5-Trimethylbenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,3-Dichlorobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,3-Dichloropropane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
1,4-Dichlorobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
2,2-Dichloropropane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
2-Butanone	ND	10.0		µg/L	1	11/10/2003 9:23:00 AM
2-Chlorotoluene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
2-Hexanone	ND	10.0		µg/L	1	11/10/2003 9:23:00 AM
4-Chlorotoluene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
4-Isopropyltoluene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
4-Methyl-2-pentanone	ND	20.0		µg/L	1	11/10/2003 9:23:00 AM
Acetone	ND	50.0		µg/L	1	11/10/2003 9:23:00 AM
Acrylonitrile	ND	5.00		µg/L	1	11/10/2003 9:23:00 AM
Benzene	ND	0.400		µg/L	1	11/10/2003 9:23:00 AM
Bromobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Bromochloromethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Bromodichloromethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Bromoform	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Bromomethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Carbon disulfide	ND	2.00		µg/L	1	11/10/2003 9:23:00 AM
Carbon tetrachloride	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Chlorobenzene	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM
Chloroethane	ND	1.00		µg/L	1	11/10/2003 9:23:00 AM

CLIENT: Hahn and Associates, Inc. **Lab Order:** 0311018
Project: Astoria - Groundwater / 6167

VOLATILES BY GC/MS		SW8260B			Analyst: skc
Chloroform	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Chloromethane	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
cis-1,2-Dichloroethene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
cis-1,3-Dichloropropene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Dibromochloromethane	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Dibromomethane	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Dichlorodifluoromethane	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Ethylbenzene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Hexachlorobutadiene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Isopropylbenzene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
m,p-Xylene	ND	2.00	µg/L	1	11/10/2003 9:23:00 AM
Methyl tert-butyl ether	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Methylene chloride	ND	20.0	µg/L	1	11/10/2003 9:23:00 AM
n-Butylbenzene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
n-Propylbenzene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Naphthalene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
o-Xylene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
sec-Butylbenzene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Styrene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
tert-Butylbenzene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Tetrachloroethene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Toluene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
trans-1,2-Dichloroethene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
trans-1,3-Dichloropropene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Trichloroethene	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Trichlorofluoromethane	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Vinyl chloride	ND	1.00	µg/L	1	11/10/2003 9:23:00 AM
Surr: 1,2-Dichloroethane-d4	95.1	72.8-113	%REC	1	11/10/2003 9:23:00 AM
Surr: 4-Bromofluorobenzene	100	83.4-125	%REC	1	11/10/2003 9:23:00 AM
Surr: Dibromofluoromethane	100	79.4-124	%REC	1	11/10/2003 9:23:00 AM
Surr: Toluene-d8	109	88.6-129	%REC	1	11/10/2003 9:23:00 AM

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: µg/L		Prep Date: **11/7/2003**			Run ID: **5973J_031105A**			
Client ID: **ZZZZZ**	Batch ID: **9931**	TestNo: **SW8260B**			Analysis Date: **11/5/2003**			SeqNo: **223679**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.00									
1,1,1-Trichloroethane	ND	1.00									
1,1,2,2-Tetrachloroethane	ND	1.00									
1,1,2-Trichloroethane	ND	1.00									
1,1-Dichloroethane	ND	1.00									
1,1-Dichloroethene	ND	1.00									
1,1-Dichloropropene	ND	1.00									
1,2,3-Trichlorobenzene	ND	1.00									
1,2,3-Trichloropropane	ND	1.00									
1,2,4-Trichlorobenzene	ND	1.00									
1,2,4-Trimethylbenzene	ND	1.00									
1,2-Dibromo-3-chloropropane	ND	1.00									
1,2-Dibromoethane	ND	1.00									
1,2-Dichlorobenzene	ND	1.00									
1,2-Dichloroethane	ND	1.00									
1,2-Dichloropropane	ND	1.00									
1,3,5-Trimethylbenzene	ND	1.00									
1,3-Dichlorobenzene	ND	1.00									
1,3-Dichloropropane	ND	1.00									
1,4-Dichlorobenzene	ND	1.00									
2,2-Dichloropropane	ND	1.00									
2-Butanone	ND	10.0									
2-Chlorotoluene	ND	1.00									
2-Hexanone	ND	10.0									
4-Chlorotoluene	ND	1.00									
4-Isopropyltoluene	ND	1.00									
4-Methyl-2-pentanone	ND	20.0									
Acetone	ND	50.0									
Acrylonitrile	ND	5.00									
Benzene	ND	0.400									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID **MB**	SampType: **MBLK**	TestCode: **8260_W**	Units: µg/L	Prep Date: **11/7/2003**	Run ID: **5973J_031105A**
Client ID: **ZZZZZ**	Batch ID: **9931**	TestNo: **SW8260B**		Analysis Date: **11/5/2003**	SeqNo: **223679**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bromobenzene	ND	1.00									
Bromochloromethane	ND	1.00									
Bromodichloromethane	ND	1.00									
Bromoform	ND	1.00									
Bromomethane	ND	1.00									
Carbon disulfide	ND	2.00									
Carbon tetrachloride	ND	1.00									
Chlorobenzene	ND	1.00									
Chloroethane	ND	1.00									
Chloroform	ND	1.00									
Chloromethane	ND	1.00									
cis-1,2-Dichloroethene	ND	1.00									
cis-1,3-Dichloropropene	ND	1.00									
Dibromochloromethane	ND	1.00									
Dibromomethane	ND	1.00									
Dichlorodifluoromethane	ND	1.00									
Ethylbenzene	ND	1.00									
Hexachlorobutadiene	ND	1.00									
Isopropylbenzene	ND	1.00									
m,p-Xylene	ND	2.00									
Methyl tert-butyl ether	ND	1.00									
Methylene chloride	2.85	20.0									J
n-Butylbenzene	ND	1.00									
n-Propylbenzene	ND	1.00									
Naphthalene	0.41	1.00									J
o-Xylene	ND	1.00									
sec-Butylbenzene	ND	1.00									
Styrene	ND	1.00									
tert-Butylbenzene	ND	1.00									
Tetrachloroethene	ND	1.00									
Toluene	ND	1.00									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID MB	SampType: MBLK	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223679

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
trans-1,2-Dichloroethene	ND	1.00									
trans-1,3-Dichloropropene	ND	1.00									
Trichloroethene	ND	1.00									
Trichlorofluoromethane	ND	1.00									
Vinyl chloride	ND	1.00									
Surr: 1,2-Dichloroethane-d4	102.6	1.00	100	0	103	72.8	113	0	0		
Surr: 4-Bromofluorobenzene	99.57	1.00	100	0	99.6	83.4	125	0	0		
Surr: Dibromofluoromethane	106.3	1.00	100	0	106	79.4	124	0	0		
Surr: Toluene-d8	106.5	1.00	100	0	106	88.6	129	0	0		

Sample ID LCS	SampType: LCS	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223678

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	48.83	1.00	40	0	122	69.8	154	0	0		
Benzene	42.84	0.400	40	0	107	73.7	114	0	0		
Chlorobenzene	42.68	1.00	40	0	107	88.2	109	0	0		
Toluene	41.69	1.00	40	0	104	89.5	114	0	0		
Trichloroethene	45.16	1.00	40	0	113	63.4	120	0	0		

Sample ID 0311021-02AMS	SampType: MS	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223688

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	18.17	1.00	20	0	90.8	51.4	176	0	0		
Benzene	15.62	0.400	20	0	78.1	71.5	118	0	0		
Chlorobenzene	14.72	1.00	20	0	73.6	79.8	114	0	0		S
Toluene	14.77	1.00	20	0	73.8	79.6	121	0	0		S
Trichloroethene	13.37	1.00	20	0.33	65.2	73.6	120	0	0		S

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID 0311021-02AMSD	SampType: MSD	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223689

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	22.52	1.00	20	0	113	51.4	176	18.17	21.4	20	R
Benzene	18.61	0.400	20	0	93	71.5	118	15.62	17.5	20	
Chlorobenzene	17.46	1.00	20	0	87.3	79.8	114	14.72	17.0	20	
Toluene	17.68	1.00	20	0	88.4	79.6	121	14.77	17.9	20	
Trichloroethene	15.85	1.00	20	0.33	77.6	73.6	120	13.37	17.0	20	

Sample ID 0311021-02ADUP	SampType: DUP	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223687

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1,1,2-Tetrachloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1,1-Trichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1,2,2-Tetrachloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1,2-Trichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1-Dichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,1-Dichloroethene	ND	1.00	0	0	0	0	0	0	0	20	
1,1-Dichloropropene	ND	1.00	0	0	0	0	0	0	0	20	
1,2,3-Trichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,2,3-Trichloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,2,4-Trichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,2,4-Trimethylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dibromo-3-chloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dibromoethane	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dichlorobenzene	ND	1.00	0	0	0	0	0	0.14	0	20	
1,2-Dichloroethane	ND	1.00	0	0	0	0	0	0	0	20	
1,2-Dichloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,3,5-Trimethylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,3-Dichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
1,3-Dichloropropane	ND	1.00	0	0	0	0	0	0	0	20	
1,4-Dichlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
2,2-Dichloropropane	ND	1.00	0	0	0	0	0	0	0	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID **0311021-02ADUP**	SampType: **DUP**	TestCode: **8260_W**	Units: µg/L		Prep Date: **11/7/2003**			Run ID: **5973J_031105A**			
Client ID: **ZZZZZ**	Batch ID: **9931**	TestNo: **SW8260B**			Analysis Date: **11/5/2003**			SeqNo: **223687**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Butanone	ND	10.0	0	0	0	0	0	0	0	20	
2-Chlorotoluene	ND	1.00	0	0	0	0	0	0	0	20	
2-Hexanone	ND	10.0	0	0	0	0	0	0	0	20	
4-Chlorotoluene	ND	1.00	0	0	0	0	0	0	0	20	
4-Isopropyltoluene	ND	1.00	0	0	0	0	0	0	0	20	
4-Methyl-2-pentanone	ND	20.0	0	0	0	0	0	0	0	20	
Acetone	23.36	50.0	0	0	0	0	0	19.09	0	20	J
Acrylonitrile	ND	5.00	0	0	0	0	0	0	0	20	
Benzene	ND	0.400	0	0	0	0	0	0	0	20	
Bromobenzene	ND	1.00	0	0	0	0	0	0	0	20	
Bromochloromethane	ND	1.00	0	0	0	0	0	0	0	20	
Bromodichloromethane	ND	1.00	0	0	0	0	0	0	0	20	
Bromoform	ND	1.00	0	0	0	0	0	0	0	20	
Bromomethane	ND	1.00	0	0	0	0	0	0	0	20	
Carbon disulfide	ND	2.00	0	0	0	0	0	0	0	20	
Carbon tetrachloride	ND	1.00	0	0	0	0	0	0	0	20	
Chlorobenzene	ND	1.00	0	0	0	0	0	0	0	20	
Chloroethane	ND	1.00	0	0	0	0	0	0	0	20	
Chloroform	ND	1.00	0	0	0	0	0	0	0	20	
Chloromethane	ND	1.00	0	0	0	0	0	0	0	20	
cis-1,2-Dichloroethene	ND	1.00	0	0	0	0	0	0.43	0	20	
cis-1,3-Dichloropropene	ND	1.00	0	0	0	0	0	0	0	20	
Dibromochloromethane	ND	1.00	0	0	0	0	0	0	0	20	
Dibromomethane	ND	1.00	0	0	0	0	0	0	0	20	
Dichlorodifluoromethane	ND	1.00	0	0	0	0	0	0	0	20	
Ethylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Hexachlorobutadiene	ND	1.00	0	0	0	0	0	0	0	20	
Isopropylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
m,p-Xylene	ND	2.00	0	0	0	0	0	0	0	20	
Methyl tert-butyl ether	ND	1.00	0	0	0	0	0	0	0	20	
Methylene chloride	ND	20.0	0	0	0	0	0	0	0	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID 0311021-02ADUP	SampType: DUP	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223687

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
n-Butylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
n-Propylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Naphthalene	0.21	1.00	0	0	0	0	0	0.22	0	20	J
o-Xylene	ND	1.00	0	0	0	0	0	0	0	20	
sec-Butylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Styrene	ND	1.00	0	0	0	0	0	0	0	20	
tert-Butylbenzene	ND	1.00	0	0	0	0	0	0	0	20	
Tetrachloroethene	ND	1.00	0	0	0	0	0	0	0	20	
Toluene	ND	1.00	0	0	0	0	0	0	0	20	
trans-1,2-Dichloroethene	ND	1.00	0	0	0	0	0	0	0	20	
trans-1,3-Dichloropropene	ND	1.00	0	0	0	0	0	0	0	20	
Trichloroethene	0.28	1.00	0	0	0	0	0	0.33	0	20	J
Trichlorofluoromethane	ND	1.00	0	0	0	0	0	0	0	20	
Vinyl chloride	ND	1.00	0	0	0	0	0	0	0	20	

Sample ID CCV	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223677

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	52.39	1.00	50	0	105	80	120	0	0		
1,2-Dichloropropane	57.27	1.00	50	0	115	80	120	0	0		
Chloroform	52.44	1.00	50	0	105	80	120	0	0		
Ethylbenzene	53.43	1.00	50	0	107	80	120	0	0		
Toluene	52.7	1.00	50	0	105	80	120	0	0		
Vinyl chloride	51.14	1.00	50	0	102	80	120	0	0		

Sample ID CCV	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223693

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,1-Dichloroethene	56.88	1.00	50	0	114	80	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; J - Analyte detected below quantitation limits; S - Spike Recovery outside accepted recovery limits; R - RPD outside accepted recovery limits; B - Analyte detected in the associated Method Blank

CLIENT: Hahn and Associates, Inc.
Work Order: 0311018
Project: Astoria - Groundwater / 6167

ANALYTICAL QC SUMMARY REPORT

TestCode: 8260_W

Sample ID CCV	SampType: CCV	TestCode: 8260_W	Units: µg/L	Prep Date: 11/7/2003	Run ID: 5973J_031105A
Client ID: ZZZZZ	Batch ID: 9931	TestNo: SW8260B		Analysis Date: 11/5/2003	SeqNo: 223693

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,2-Dichloropropane	53.93	1.00	50	0	108	80	120	0	0		
Chloroform	46.43	1.00	50	0	92.9	80	120	0	0		
Ethylbenzene	54.69	1.00	50	0	109	80	120	0	0		
Toluene	52.09	1.00	50	0	104	80	120	0	0		
Vinyl chloride	51.56	1.00	50	0	103	80	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A. This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1. This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2. This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against lube oil calibration standards.

A3. Results determined to be non detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B. The blank exhibited a positive result greater than the reporting limit for this compound.

C. The result confirmed by secondary column or GC/MS analysis.

CN. See case narrative.

CR. Result for this analyte maybe biased due to interferences. Confirmation by GC/MS or other technique is recommended.

D. Surrogate was diluted outside reporting range.

E. Result exceeds the calibration range for the compound. The result should be considered an estimate.

F. The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

G. Result may be biased high due to biogenic interferences. Silica gel clean-up recommended.

H. Sample was analyzed outside recommended holding times.

HT. At clients request, sample was analyzed outside method recommended holding time.

J. The result for this analyte is between the MDL and the PQL, and should be considered an estimated concentration.

K. Diesel result is biased high due to amount of oil contained in the sample.

L. Diesel result is biased high due to amount of gasoline contained in the sample.

M. Oil result is biased high due to amount of diesel contained in the sample.

MC. Sample concentration is greater than 4x the spiked value; the spiked value is considered insignificant.

MI. Outside control limits due to Matrix Interference.

MSA. Value determined by Method of Standard Addition.

N. Sample appears to contain biogenic material biasing quantification.

O. Laboratory Control Standard (LCS) exceeded laboratory control limits, meets CCV criteria. Data meets EPA requirements.

P. Detected levels of Methylene Chloride may be due to laboratory contamination, due to previous analysis or background levels.

Q. Detection limits elevated due to sample matrix.

R. RPD control limits were exceeded.

RF. Duplicate failed, due to result being at or near method reporting limit.

RP. Matrix spike values exceed established QC limits, post digestion spike is in control.

S. Recovery outside control limits.

*. The result for this parameter was greater than the maximum contaminant level or the TCLP regulatory limit.

rev. October 23, 2001