The Riley Group, Inc.

Geotechnical Engineering • Environmental • Wetland Services

PHASE II SUBSURFACE SOIL INVESTIGATION

PROPOSED NEPTUNE APARTMENTS: FORMER JARVIE PROPERTY
760 NORTH ALOHA STREET
SEATTLE, WASHINGTON 98109

REVISED APRIL 26, 2001

PREPARED BY:

The Riley Group, Inc.
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PREPARED FOR:

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Attention: Mr. Scott Surdyke

Project No. 2000-178

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1. INTRODUCTION

This report summarizes The Riley Group, Inc.'s (Riley's) findings, conclusions, and recommendations regarding our literature review and subsurface soil investigation performed at the former Jarvie Paint Manufacturing building located at 760 Aloha Street, Seattle, Washington (herein referred to as "the site"); Figure 1.

The site includes an 8,463 square-foot rectangular parcel located on the northeast corner of Aloha Street and Dexter Avenue North (Figure 1). The site includes an approximately 6,715 square foot two-story concrete block building and small parking lot located just east of Dexter Avenue North. The Jarvie building consists of two levels. The upper level, the west half of the building, is level with the parking lot (with a finished floor elevation of 46.46 feet). The lower level has a finished floor elevation of 42.28 feet. The existing topography slopes to the east.

Three groundwater-monitoring wells are located in the parking lot. These wells were installed as part of a site investigation and remedial action performed on the site in the mid- to late-1990s.

At the time of our investigation, *Power R* owned the site and leased the building to a woodworking company. Simpson Housing Limited Partnership (Simpson Housing) anticipated purchasing the site from Power R and the adjoining property to the north (the *former Diamond Tank property*) for redevelopment. Riley's Phase II findings, conclusions and recommendations for the Diamond Tank property are presented under separate cover.

Riley understands that Simpson Housing's redevelopment plans included constructing a mixed-use multi-story building with two levels of underground parking on the Jarvie and adjoining property to the north.

The scope of work for this project was performed in general accordance with Riley's Master Services Agreement's, dated August 23, 2000 and per subsequent conversations and meetings with Simpson Housing and Power R.

2. PROJECT BACKGROUND

A project background discussion and summary of previous environmental site work performed by others is given below.

2.1 LITERATURE REVIEW

In October 2000, Riley, on behalf of Simpson Housing, reviewed previous environmental site investigation reports, remedial action reports and other related correspondence prepared by others for the site. Riley reviewed these documents at the Power R office (located adjacent to the Jarvie building) and at the Washington State Department of Ecology (Ecology) located in Bellevue, Washington.

The reports reviewed considered most pertinent to the site history and previous environmental investigation findings and activities are as follows:

- Site Assessment Summary, prepared for Mr. Curtis Bailey (former site owner), by Specialized Environmental Consulting, Inc., dated October 11, 1994.
- Phase I Environmental Site Assessment, prepared for Mr. Curtis Bailey, by Environmental Management Resources (EMR), dated September 13, 1996.
- Aloha Property Vault Cleaning, prepared for Mr. Bailey, by EMR, dated September 13, 1996.
- Petroleum Contaminated Remediation Final Report, prepared for Power R (site owner), by Pacific Specialty Construction, Inc., dated December 11, 1998.

2.2 Summary of Former Site Uses

Prior to 1942, the site was a Seattle City Light transformer/distribution station. Based on Riley's discussions with environmental specialists with the Seattle City Light and Tacoma Public Utility, the likelihood that significant volumes of polychlorinated biphenyl (PCBs) containing oil were used or stored on site is relatively low.

From approximately 1942 to 1989, Jarvie Paint Manufacturing occupied the site. A total of seven 1,000 to 7,000 gallon underground storage tanks (USTs) were installed in the parking lot area, presumably in the early 1940s to early 1950s for storing heating oil, xylene, toluene, paint thinners and alkyd resins. The USTs were removed, except for the heating oil UST, in 1994 (discussed in section 2.4). The former and existing UST locations are shown in Figure 2.

2.3 Alkyd Resin Spill Event

In the late 1960s to early 1970s an alkyd resin spill reportedly occurred and partially filled a concrete vault located in the building's lower level. Based on the vault's size (15 ft by 15 ft.) and reported thickness of resin in the vault, the spill incident included approximately 2,000 gallons of resin. The resin remained in the vault for approximately 20 years and was cleaned out in July 1996. A drain was reportedly observed in the bottom of the vault. No soil sampling was performed at that time to verify if soils underlying the vault had been adversely affected by the spill, however, it was noted that the concrete was in good condition and showed no visible signs of cracks or excessive pitting.

2.4 Paint Solvent UST Removal Activities

In September 1994, a total of seven solvent and alkyd resin USTs were removed for the property. However, the heating oil UST was not removed at that time is currently in-use. The results of the 1994 UST site assessment indicated that a confirmed release of xylene, toluene and other petroleum hydrocarbons in the gasoline range had occurred. Concentrations of the contaminants of concern ranged up to 24,000 parts per million (ppm) in soil. Groundwater was reportedly not encountered during tank removals. The tank excavation was reportedly backfilled with sand.

2.5 SUBSEQUENT ENVIRONMENTAL INVESTIGATION & SITE CLEANUP ACTIVITIES

Between March and May 1995, several groundwater monitoring wells and up to16 vapor extraction wells were installed in the vicinity of the former solvent USTs. It appears that the soil vapor extraction system was never completed. During this time, groundwater was encountered at depths of 12 to 17 feet bgs. Groundwater was reportedly attributed to surface water infiltration and containment within the porous UST backfill material. Analytical results indicated that groundwater underlying the parking lot had elevated concentrations of gasoline range total petroleum hydrocarbons (herein referred to as "gasoline TPH"). Gasoline TPH concentrations in groundwater ranged up to 320,000 parts per billion (ppb).

Between March and April 1996, Pacific Specialty Contractors, Inc. (PSCI) was retained by Power R to perform additional investigations and to recommend and install the selected remedial technology. PSCI proposed to bring site soils and groundwater into compliance with Ecology's Model Toxics Control Act (MTCA) Method A Soil Cleanup Levels using in-situ bioremediation techniques.

In May 1996, PSCI installed a total of 121 injection points in the parking lot area to inject nutrients, oxygen, and bacteria to the petroleum hydrocarbon affected subsurface soil and groundwater. In-situ bioremediation treatment was performed for approximately 6 months, from May to October 1996.

During 1998 and 1999, soil and groundwater sampling events were performed by PSCI and/or EMR to determine and document the effectiveness of the in-situ bioremediation effort. PSCI concluded in their final remediation report, dated October 5, 1999 that petroleum hydrocarbon-affected site soils and groundwater had been remediated to concentrations below the Ecology MTCA Method A Soil Cleanup Levels. The report was submitted to Ecology for review under the Voluntary Cleanup Program (VCP).

Based on Ecology's review of the submitted reports, Ecology issued a "no further action" (NFA), dated October 8th, 1999, stating that no further remedial action was necessary and that the site would be removed from their contaminated sites databases.

3. PROJECT OBJECTIVES

The initial Phase II objective for this project was to:

1. Determine if the existing heating oil UST had released diesel petroleum to the subsurface environment; and
2. Verify that soils in the vicinity of the former paint/solvent USTs had in fact been remediated to concentrations below the Ecology MTCA Method A Soil Cleanup Levels.

However, based on initial Phase II investigation and findings (results of which are presented herein), the scope of work was expanded to include the following:

1. Determine the relative extent and magnitude of subsurface soils underlying the Jarvie property with residual concentrations of petroleum hydrocarbons;

2. Estimate the volume of petroleum hydrocarbon-affected soil with concentrations above MTCA Method A cleanup levels and soils with trace concentrations, but less than MTCA Method A cleanup levels; and
3. Propose options for the handling, storage, treatment and/or disposal of petroleum contaminated soil and possibly groundwater.

Riley's scope of work did not include sampling of soils directly beneath the concrete vault due to restricted vault. The vault was covered by very heavy woodworking equipment.

The tasks performed were meant to provide some general constraints on the extent and magnitude of subsurface soil contamination and the associated site development issues. The tasks performed for this project were not necessarily meant to encompass nor foresee all possible environmental aspects associated with the proposed project but were based on our current project understanding, experience with similar projects and upon available information at the time of preparing this report.

4. PHASE II SUBSURFACE INVESTIGATION

On November 20 and December 29, 2000, Riley drilled a total of seven test borings (borings B-1 to B-4 and B-6 to B-9) to depths of 16 to 28 feet bgs at the subject site. Test boring locations are shown in Figure 2.

Borings B-1 to B-4 were drilled on November 20th in the vicinity of the former solvent/paint UST area. Borings were drilled using a standard truck mounted hollow stem auger drill rig to depths of 18.5 to 28 feet bgs. Borings B-1, B-2 and B-3 were drilled to verify soil quality within the bioremediation treatment area. Boring B-4 was drilled adjacent to, and north of, the existing heating oil UST.

Borings B-6 to B-9 were drilled on December 29th inside the Jarvie building using a limited access hollow stem auger drill rig. Borings B-6 and B-7 were drilled in the building's lower level to depths of 16.8 feet and 21 feet bgs, respectively. Boring B-6 and B-7 was drilled in the general vicinity of the concrete vault (formerly the site of the alkyd resin spill). Borings B-8 and B-9 were drilled in the building's upper level to depths of 21 and 20.5 feet, respectively.

4.1 SITE CONDITIONS

In general, two to five feet of loose gravely sand fill underlie much of the site. Sand was used to backfill the UST excavation with depths of approximately 12 feet bgs. Native site soils consist of a dense to very dense silty sand to sand with some gravel. Perched groundwater was encountered at three of the four borings during drilling at depths of 7 to 13 bgs. Only boring B-6 did not encounter groundwater during drilling (to 17 feet bgs). Soil boring logs are included in Appendix A.

4.2 SOIL SAMPLING

Soil samples were collected at each boring at 2.5 to 5-foot sampling depth intervals using a standard split spoon sampler driven by a 140-pound hammer up to 18 inches into undisturbed soil.

A total of 39 discrete soil samples were collected during this project. In general, soil samples were collected at 2.5 to 5-foot sampling depth intervals (e.g., four to five samples per boring). All soil samples were inspected and classified in the field by Riley's geologist. Field screening techniques for samples collected included olfactory and visual inspections, water sheen tests, and headspace techniques using a portable gas analyzer equipped with a photo-ionization detector (PID).

No groundwater samples were collected during our subsurface investigation.

All soil samples were placed in laboratory supplied glass jars with Teflon-lined lids. Riley's standard soil sampling protocols, decontamination procedures and sample handling and delivery to the analytical laboratory were followed.

Soil cuttings were placed in 55-gallon drums pending characterization and disposal.

5. LABORATORY TEST METHODS

All samples were submitted to OnSite Environmental laboratories located in Redmond, WA for laboratory analysis under standard chain of custody procedures.

Based on field screening results and observations, 19 of the 36 samples collected were submitted for laboratory analysis. In general, soil samples with the highest field screening results and samples meant to document the extent of soil contamination were selected for laboratory analysis. Samples were analyzed to determine the concentration of petroleum hydrocarbons in the gasoline range (C_6 to C_{12}) and BTEX (benzene, toluene, ethylbenzene, and xylenes) and/or diesel range (C_{12} to C_{24}) using the Test Methods NWTPH-Gx/BTEX and NWTPH-Dx, respectively.

6. LABORATORY RESULTS

Analytical and field screening results for all soil samples collected for this project are summarized in Tables 1 and 2 and are discussed below. A copy of the laboratory report and chain of custody is included in Appendix B.

6.1 Existing Heating Oil UST (Jarvie Parking Lot)

Soils intercepted by boring B-4 had non-detectable concentrations of diesel TPH. Results indicate that the heating oil UST has not released a significant volume of diesel to the subsurface environment.

6.2 Former Paint/Solvent USTs Area (Jarvie Parking Lot)

All test borings drilled in the parking lot intercepted subsurface soils with detectable concentrations of gasoline TPH and/or BTEX. Based on field observations and laboratory analytical data, TPH/BTEX affected soils were encountered between

approximately 5 feet and 15 feet bgs. The vertical migration of TPH/BTEX was limited to depths of 15 to 18 feet bgs, due to the very dense glacial till underlying the site.

The highest gasoline TPH concentration observed was in boring B-1 at a depth of 12.5 feet bgs (8,600 ppm) and boring B-2 at a depth of 7.5 feet bgs (5,800 ppm). Benzene concentrations in soil were generally not detected at the analytical detection limit. Toluene and xylene concentrations in soil ranged up to 900 ppm and 154 ppm, respectively. The MTCA Method A Soil Cleanup level for gasoline TPH in soil is 100 ppm. The MTCA Method A Soil Cleanup level for toluene and xylene in soil is 40 ppm and 20 ppm, respectively.

6.3 Soil Quality Beneath Jarvie Building

All soil samples collected from borings B-6 to B-9 had either non-detectable or trace concentrations of gasoline TPH/BTEX. Soils intercepted by borings B-6, B-7, B-8, and B-9 had concentrations below the MTCA Method A Soil Cleanup Levels. Findings for the lower and upper level are discussed in more detail below.

Lower Level

Borings B-6 and B-7 intercepted soils having non-detectable or trace concentrations of gasoline TPH/BTEX. All samples collected from boring B-6 (reaching a maximum depth of 17 feet bgs) had non-detectable concentrations of gasoline TPH/BTEX. Soils intercepted by boring B-7 had trace concentrations of gasoline TPH or BTEX at every sample depth interval from 5 to 20 feet bgs. The highest gasoline TPH concentration was observed in boring B-7 at 10 feet bgs (30 ppm).

Upper Level

Borings B-8 and B-9 intercepted soils having non-detectable or trace concentrations of gasoline TPH/BTEX. All concentrations were below the MTCA Method A soil cleanup levels. In general, trace concentrations were limited to the upper 15 feet. The highest gasoline TPH concentration was at boring B-9 at 15 feet bgs (27 ppm).

7. CLEANUP & WASTE CHARACTERIZATION REGULATIONS

Washington's hazardous waste cleanup law, the Model Toxics Control Act (RCW 70.105D) mandates that site cleanups protect human health and the environment. The MTCA Cleanup Regulation (WAC173-340) defines the approach for establishing cleanup requirements for individual sites, including the establishment of cleanup standards and selection of cleanup actions.

The MTCA regulation provides three options for establishing generic and site-specific cleanup levels for soil and groundwater. Method A cleanup levels have been adopted for specific purposes and are intended to provide conservative cleanup levels for sites undergoing routine site characterization or cleanup actions or those sites with relatively few hazardous substances. Method B and C cleanup levels are set using a site risk assessment, which focus on the use of "reasonable maximum exposure" assumptions based on site-specific characteristics and toxicity of the contaminants of concern.

Washington's waste characterization law, the Dangerous Waste Regulations (WAC 173-303) governs the characterization, transporting, treatment, disposal, and end use of wastes.

The analytical laboratory data for this project are compared to the MTCA Method A Soil Cleanup Levels (WAC 173-340) for the following reasons:

- The proposed redevelopment includes excavating a two level underground parking structure from essentially lot line to lot line;
- Essentially all known petroleum contaminated soils will be excavated. Therefore, all excavated petroleum contaminated soils will require off-site disposal and or treatment.

The MTCA Method A Soil Cleanup Levels are summarized in Tables 1 and 2.

In addition, since approximately 80% of all remediation projects are independent cleanups, Ecology formed the *Voluntary Cleanup Program* (VCP) in October 1997. The VCP program allows Ecology to provide guidance and review and make final or intermittent determinations, ranging from technical assistance to making site closure determinations.

8. DISCUSSION OF RESULTS & PROJECT CONCLUSIONS

Laboratory results indicate that a significant petroleum release to the subsurface environment from the existing heating oil UST has not occurred. However, as with all UST removal projects, Owner/Contractor should be prepared to encounter some petroleum contaminated soil in the immediate vicinity of the UST (such as around the fill pipe, tank sidewalls, etc.)

Results indicated that soil in the vicinity of the former paint/solvent UST locations, from approximately 5 to 18 feet bgs, had gasoline range TPH/BTEX concentrations exceeding the MTCA Method A Soil Cleanup Levels. Apparently, the bioremediation effort performed in 1996 did not bring soils into compliance with the MTCA Method A Soil Cleanup Levels. Petroleum hydrocarbon affected soils encountered in this area will have to be properly handled, stored, transported and disposed of in accordance with the applicable regulations (see section 8.4 and 8.5 of this report).

Laboratory results indicate that soil beneath the Jarvie building (to depths of 20 feet bgs) had either non-detectable concentrations or concentrations below the MTCA Method A Soil Cleanup Levels. However, the petroleum odors and/or trace TPH concentrations associated with these soils must be taken into account when selecting the appropriate off-site end use (see section 8.4 and 8.5 of this report).

8.1 EXTENT OF PETROLEUM CONTAMINATED SOIL & GROUNDWATER

The vertical migration of petroleum hydrocarbon affected soils was limited by the very dense glacial till underlying the Jarvie property. The petroleum hydrocarbon affected soil terminates at depths of 15 to 20 feet bgs. The excavations during the proposed

construction of a two level underground parking garage will essentially excavate these petroleum contaminated soils.

Based on our literature review and Phase II findings the possibility may exist for some off-site migration of the contaminants of concern to the north, west and south. This is particularly true along the subject site's western property line (along Dexter Avenue) and, though less likely, along the site's southern property line (along Aloha Street).

The extent of groundwater contamination underlying the site is unknown at this time. Our literature review indicated that PSCI included laboratory data in their final report indicating that a groundwater grab sample collected from inside the Jarvie building (their boring B2) encountered perched groundwater with elevated concentrations of petroleum hydrocarbons. However PSCI reported that groundwater underlying the parking lot area had effectively been remediated. Our scope of work did not include a groundwater investigation.

8.3 PROPOSED SITE REDEVELOPMENT & ASSOCIATED ISSUES

Riley understands that Simpson Housing plans to demolish the existing Jarvie building to construct a multi-story mixed-use building with two levels of underground parking. The Owner and Contractor should be prepared to properly decommission and remove the existing 1,500 gallon heating oil UST. As with all UST removals, Owner/Contractor should be prepared to encounter some petroleum hydrocarbon contaminated soil.

In regards to the former paint/solvent UST locations, the Owner/Contractor should be prepared to handle, excavate, store, transport, and properly dispose of petroleum hydrocarbon affected soils and/or groundwater encountered during site earthwork.

The heating oil UST, contaminated soil and/or groundwater must be handled, transported, and disposed of in accordance with the following applicable regulations:

- Federal Occupations Safety and Health (OSHA) Chapters 296-24 WAC and *Hazardous Waste Operations and Emergency Response* WAC 296-62 Part P.
- Washington Industrial Safety and Health Act of 1970 (WISHA).
- Ecology Model Toxics Control Act Cleanup Regulations WAC 173-340.
- Washington State Department of Ecology UST Regulations WAC 173-360.
- Washington State Dangerous Waste Regulations (WAC 173-303).
- Guidance for Remediation of Petroleum Contaminated Soils (revised November 1995, publication 91-30).

The business risks associated with USTs and contaminated soil/groundwater include several factors. Contractor and worker safety special requirements will slow construction schedules. Project development costs will include, but are not necessarily limited to, the handling, transporting, permitting, treating and disposing of contaminated soil/groundwater. Environmental project oversight will be required during site excavations. Environmental project oversight activities may include, but are not necessarily limited to, the segregation of clean versus contaminated soils, the sampling

and treatment of contaminated groundwater, the documentation of soil quality following final excavations, etc.

8.4 END USES OF PETROLEUM CONTAMINATED SOILS

The end use of petroleum-contaminated soil is governed by the Solid Waste Management law (RCW 70.95) and the MTCA (RCW 70.105D). Petroleum contaminated soils are divided in four classifications based on their contaminant concentrations. The allowable end uses for petroleum-contaminated soils are based on their class.

End Use Criteria for Petroleum-Contaminated Soils

Analyte	Soil Class & Allowable Concentrations (ppm)			
	I	II	III	IV
Heavy Oil Range Hydrocarbons (C24 to C30)	< 60	60 - 200	200-2,000	> 2,000
Diesel Range Hydrocarbons (C12 to C24)	< 25	25-200	200-500	> 500
Gasoline Range Hydrocarbons (C6 to C12)	< 5	5 - 100	100-250	>250
Benzene	<0.005	0.005 -0.5	< 0.5	> 0.5
Toluene	<0.005	0.005 - 40	< 40	>40
Ethylbenzene	<0.005	0.005 - 20	< 20	> 20
Xylenes	<0.005	0.005 -20	< 20	> 20
Source: Ecology's Guidance of Remediation of Petroleum Contaminated Soils, pub. 91-30				

End uses for Class I soils include any use that will not cause threat to human health or the environment. Allowable end uses for Class II soils include backfill at the original site, fill in commercial or industrial areas, cover or fill in permitted landfills. End uses for Class III and Class IV soils include treatment and/or off-site disposal at an existing permitted municipal landfill or permitted treatment facility

Soils underlying the parking lot area classify as a Class III and Class IV soil and require off-site disposal and/or and treatment at a licensed and permitted facility (e.g., TPS Technologies, Rabanco Landfill, and others).

The soil underlying the Jarvie building classifies as a Class I and II petroleum contaminated soil. One off-site disposal/treatment option for Class I & II soils includes Associated Sand & Gravel (ASG) located in Everett, WA. The cost for treating Class I and II soils at ASG is up to 1/3 the cost of typical Class III and IV off-site disposal/treatment costs.

8.5 Estimated Volume of Petroleum Contaminated Soils

Estimated volumes are summarized in Table 3 and shown schematically in Figure 2, Figure 3 and are discussed below.

Riley estimates 400 to 755 in-place cubic yards (600 to 1,150 tons, including an excavated fluff factor of 1.5 for glacial till) of soil underlying the parking lot area with petroleum hydrocarbon concentrations exceeding the MTCA Method A Soil Cleanup levels (i.e., Class III or IV soils).

Riley estimates 1,745 to 2,100 cubic yards (2,620 to 3,150 tons) underlying the Jarvie building may have trace concentrations of petroleum hydrocarbons (i.e., Class I to Class II soils) and may exhibit faint to strong petroleum hydrocarbon odors.

8.6 Groundwater as a Business Environmental Risk

Previous groundwater sampling results during 1998 and 1999 indicated that groundwater underlying the parking lot area had trace concentrations of gasoline TPH. For this reason, the Owner and Contractor should be prepared to handle, pump, store, treat, and/or dispose of petroleum contaminated groundwater in accordance with the applicable local and state water discharge regulations.

There are in general three options for discharge of contaminated water from cleanup sites: (1) discharge to surface water including storm sewer, (2) discharge to sanitary sewer, and (3) transport to a permitted, industrial waste water treatment facility.

8.6.1 Storm Sewer

Discharge to storm sewer will require a National Pollution Discharge Elimination System (NPDES) permit. Due to the site's location, storm sewer outfall likely goes to Lake Union, Lake Washington, or a tributary (needs to be verified). The likelihood of obtaining a NPDES permit for a one-time discharge to these surface waters is unlikely. In addition, the permit process may take up to 1 year or longer to obtain, if granted. For more information contact the Ecology Regional Water Quality staff for permitting requirements and application forms.

8.6.2 Sanitary Sewer Discharge

A discharge permit is required from the King County METRO Industrial Waste Program and City of Seattle Public Utilities (SPU), if contaminated or treated water is discharged to a municipal sewer system (Chapter 173-216 WAC). METRO and SPU write permits for discharge to their systems. Time frames and application and permit requirements vary depending on the situation and time of year of the proposed discharge.

Large volume discharges of greater than 25,000 gallons per day possibly may not be permitted during the wet months (November through April). Discharges of construction water to the sanitary sewer are not prohibited during the dry months (May to October). However, we do not anticipate that these large discharge volumes will be required for this project.

METRO maximum concentrations (screening levels) allowed for discharge are included in Table 4 for comparison. Based on 1998 and 1999 analytical data from existing wells on-site, the concentrations reported in groundwater are below METRO's screening levels. Therefore, treatment of groundwater prior to discharge should not be required. Groundwater may have to be pumped into a storage tank for settling of solids and testing prior to discharge. Discharge directly to sewer may be allowed as long as all discharge quality requirements are satisfied.

9. RECOMMENDATIONS

Riley's recommendations for the project are as follows:

- Since soils underlying the Jarvie parking lot area still have residual concentrations of petroleum hydrocarbons exceeding the MTCA Method A Soil Cleanup Levels, Riley advises the Owner to submit this report to Ecology. MTCA states that the Owner is responsible to notify Ecology of the discovery of contaminated soils or groundwater that exceed the cleanup levels (WAC 173-340-300{2}). The Ecology Northwest Regional office phone number is 425-649-7000.
- The existing 1,500-gallon heating oil UST should be pumped and cleaned of residual fuel and capped as soon as feasibly possible. This is to eliminate the possibility of the UST releasing fuel to the subsurface. The tank could then be removed in conjunction with the site earthwork.
- The Owner and Contractor should be prepared to excavate and transport off-site an estimated 600 to 1,150 tons of Class III/IV petroleum contaminated soil (from parking lot area) off-site for treatment and/or disposal at a licensed and permitted facility (TPS Technologies, Rabanco Landfill, and others).
- The Owner and Contractor should determine the ultimate end use(s) for an estimated 1,745 to 2,100 tons of Class I/II petroleum contaminated soils (soils with trace concentrations) underlying the Jarvie building. The presence of trace concentrations may prohibit their acceptance by local soil recyclers or similar end uses. Owner may consider transporting the Class I & II soils to Associated Sand and Gravel located in Everett, WA for treatment. The cost is approximately one-third the typical costs for Class III and IV soils disposal/treatment.
- The Owner and Contractor should be prepared to handle, pump, store and discharge petroleum contaminated groundwater encountered during excavation.
- Per our Master Services Contract, Riley's geologist/engineer will be on-site to monitor and direct all excavation related activities. In addition, following excavations, Riley will collect compliance soil samples to document final site conditions. Riley recommends that Owner seek a NFA determination from Ecology following earthwork and the resulting cleanup effort

10. LIMITATIONS

This report is the property of the Riley Group, Inc., and Simpson Housing and was prepared in a manner consistent with the level of skill and care ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. This report is intended for specific application to the proposed redevelopment of the Jarvie Building Property located at 760 Aloha Street, in Seattle, Washington. No other warranty, expressed or implied, is made.

The analyses and recommendations presented in this report are based upon data obtained from test borings drilled on-site. Conditional changes may occur through time by natural or man-made process on this or adjacent properties. Additional change may occur in legislative standards, which may or may not be applicable to this report. These changes, beyond Riley's control, may render this report invalid, partially or wholly. If variations appear evident, the Riley Group, Inc. should be requested to reevaluate the recommendations in this report prior to proceeding with construction.

Any questions regarding our work or this report, the presentation of information, or interpretation of data are welcome and should be referred to the undersigned.

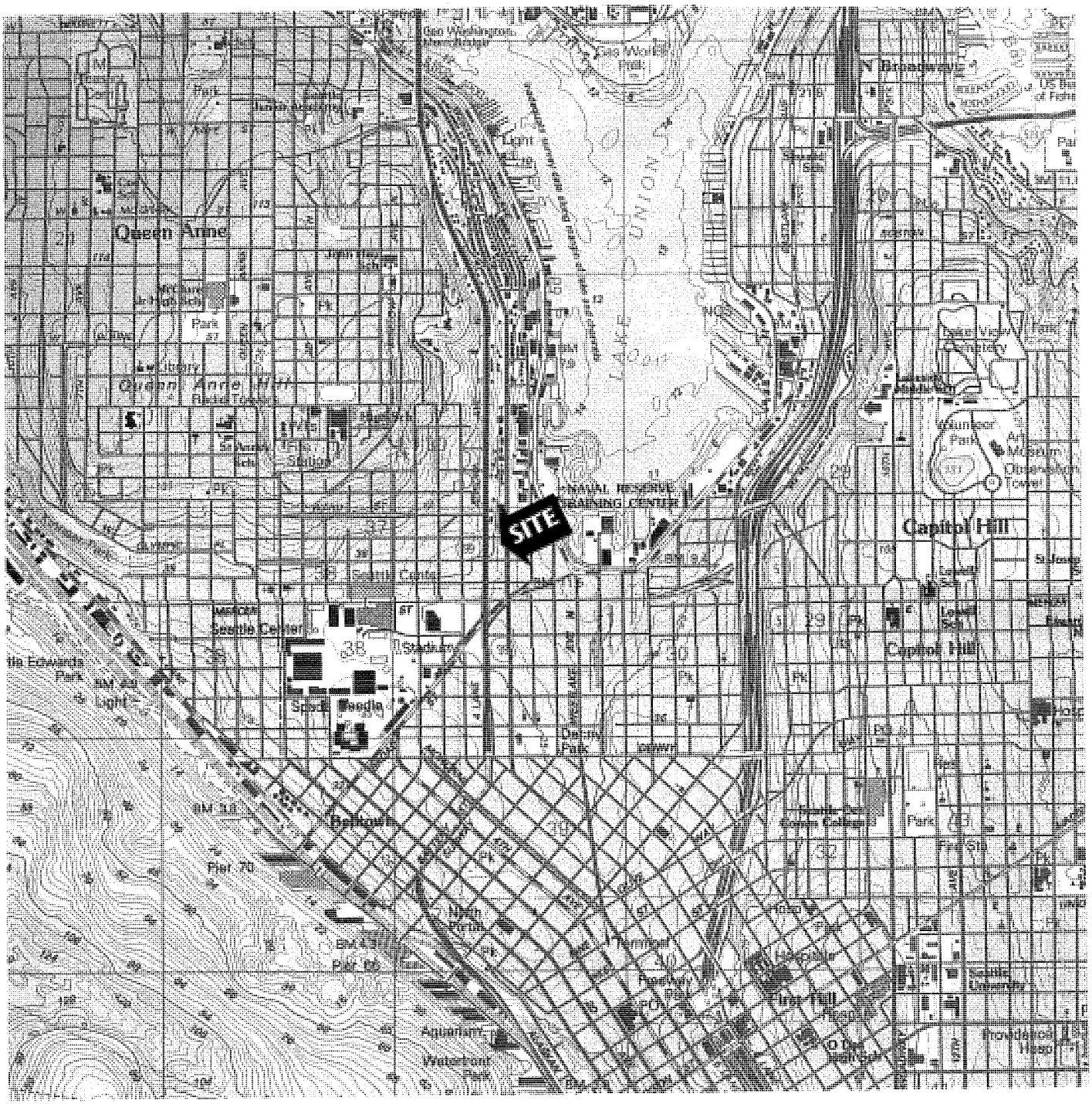
Sincerely,
THE RILEY GROUP, INC.

David Holmes
Senior Project Geologist

Paul D. Riley
Principal

Attachments

Report Distribution *Simpson Housing (two copies)*
Weber Thompson Architects (one copy)



0 1/2 1 MILES

approximate graphical scale

N

SCALE 1: 25 000
CONTOUR INTERVAL 5 METERS

USGS 7.5 X 15 MINUTE QUADRANGLE
SEATTLE SOUTH, 1983

The Riley Group, Inc.
10728 LAKE CITY WAY NE
SEATTLE, WASHINGTON 98125

Jarvie Property

Site Vicinity Map | *Figure 1*

Site Address: Dexter and Aloha, Seattle, Washington

B-4						
depth	G	B	T	E	X	D
12.5'	95	ND	ND	ND	ND	ND
17.5'	ND	ND	ND	ND	ND	NA

B-3					
depth	G	B	T	E	X
7.5'	95	ND	ND	ND	0.11
17.5'	ND	ND	ND	ND	ND

B-2					
depth	G	B	T	E	X
7.5'	5,800	0.68	900	33	154
17.5'	ND	ND	0.09	ND	ND

B-1					
depth	G	B	T	E	X
12.5'	8,600	ND	780	30	144
22.5'	ND	ND	ND	ND	ND

B-9					
depth	G	B	T	E	X
10'	ND	ND	ND	ND	ND
15'	ND	ND	2.8	ND	0.75
20'	ND	ND	ND	ND	ND

B-7					
depth	G	B	T	E	X
10'	30	ND	ND	0.064	ND
15'	ND	ND	2.5	ND	0.29
20'	ND	ND	ND	0.072	0.20

B-8					
depth	G	B	T	E	X
10'	ND	ND	0.39	0.13	0.352
15'	27	ND	4.9	0.55	2.88
20'	ND	ND	ND	ND	ND

B-6					
depth	G	B	T	E	X
10'	ND	ND	ND	ND	ND
16'	ND	ND	ND	ND	ND

Estimated areal extent of soils containing petroleum hydrocarbons above MTCA Method A cleanup guidelines

Concrete pad over presumed location of heating oil UST

Estimated areal extent of soils exhibiting odors of hydrocarbons -concentrations below MTCA Method A soil cleanup levels

Proposed Neptune Apartments property boundary

Dexter Avenue North

North Aloha Street

Jarvie Building

Power R building
(not part of subject site)

Approximate location of "vault" formerly filled with resin

B-4 B-3 MW-2 B-2 B-1 MW-3 MW-1 B-9 B-7 B-8 B-6

B1 B2 B3 B4 B5 B6

T-1 T-2 T-3 T-4 T-5 T-6

upper level lower level

A A'

KEY

B1 — Location of Geoprobe soil boring completed by others in 1996

Location of catchbasin

T-1

Jarve Building Former Underground Storage Tanks (USTs):
T-1 = 2,700 gal. alkyd resin;
T-2 = 2,700 gal. lacquer thinner;
T-3 = 1,000 gal. petroleum distillates;
T-4 = 1,000 gal. xylenes;
T-5 = 6,000 gal. toluene;
T-6 = 7,000 gal. mineral spirits

MW-1 — Location of existing monitoring well (MW) completed by others

B-1

B-1					
depth	G	B	T	E	X
12.5'	8,600	ND	780	30	144
22.5'	ND	ND	ND	ND	ND

Location of soil borings completed by Riley on 11/20/2000, 12/29/2000 & 12/30/2000 on Jarve Property. Results shown only for selected soil samples. G=total petroleum hydrocarbons in gasoline range; B=benzene; T=toluene; E=ethylbenzene; X=xylenes; D=diesel; ND=not detectable; and, NA=not analyzed. Results given in milligrams per kilogram (mg/kg).

A A' — Location of Cross Section A-A' (Figure 3)

0 20'

Approximate scale: 1 inch = 20 feet

N

Drawing modified by Riley from Boundary & Topographic Survey, prepared by Bush, Roed & Hitchings, dated 9/99.

The Riley Group, Inc.
10728 LAKE CITY WAY NE
SEATTLE, WASHINGTON 98125

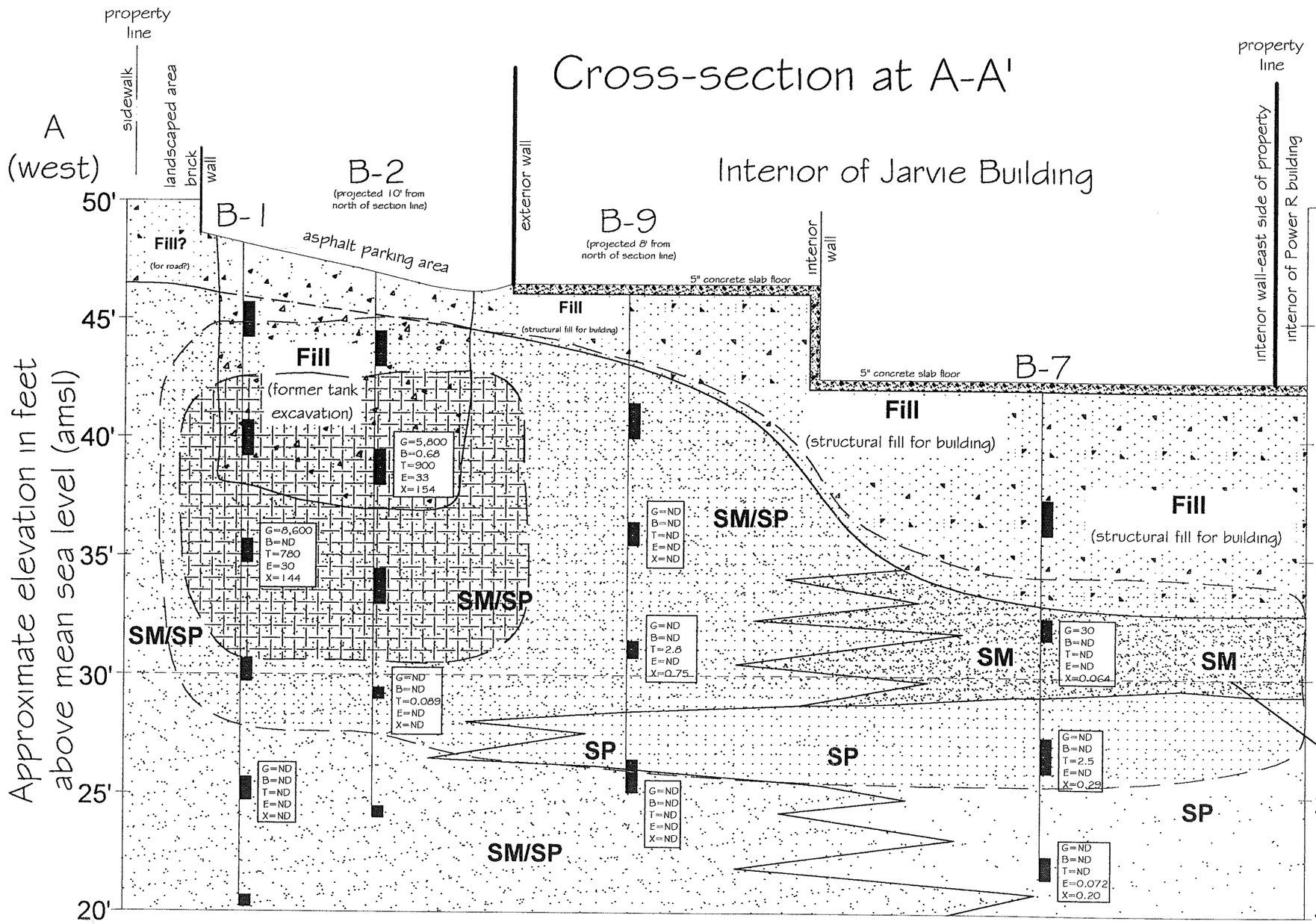
Jarvie Property - Neptune Apartments Project

Site Exploration Plan: Jarvie Property — *Figure 2*

Date: January 4, 2001 | *Riley Project #2000-178* | *Drawn by: D. Holmes*

Site Address: NEC Dexter Ave. N & N Aloha St., Seattle, Washington 98109

Cross-section at A-A'



KEY

SP	Sand, poorly sorted, typically medium-grained at the Site
SM/SP	Silty sand/sandy silt, sand typically fine-grained. Approximately 50% sand and 50% silt. Glacial till.
SM	Silty sand, sand medium to fine-grained. Glacial till.
F	Fill material. Represents "pit run" fill used as structural fill for the building. Typically sandy gravel/gravelly sand (50% each sand and gravel).
F	Fill material. Represents backfill of the former tank location, and is gravelly sand (60% sand-40% gravel) or sandy gravel (60% gravel-40% sand).

G=8,600
B=ND
T=780
E=30
X=154

Box showing soil concentrations of analyzed samples at the indicated depth. G=total petroleum hydrocarbons in the gasoline range; B=benzene; E=ethylbenzene; T=toluene; X=xylenes; ND=not detectable. Results are in milligrams per kilogram (mg/kg). Results for B-3, B-4, B-5, B-6 and B-8 are not shown.

Estimated vertical and lateral (east-west) extent of soil containing petroleum hydrocarbons at concentrations exceeding MTCA Method A cleanup guidelines

Estimated vertical and lateral (east-west) extent of soils exhibiting odors of hydrocarbons; however, concentrations are below MTCA Method A soil cleanup guidelines

0 10'
Approximate horizontal scale:
1 inch = 10 feet

0 5'
Approximate vertical scale:
1 inch = 5 feet
(vertical exaggeration = 2x)

The Riley Group, Inc.
10728 LAKE CITY WAY NE
SEATTLE, WASHINGTON 98125

Jarvie Property

Cross-section at A-A' — *Figure 3*

Date: January 5, 2000 | *Riley Project #2000-178* | *Drawn by: D. Holmes*

Site Address: NEC Dexter Ave. N & N Aloha St., Seattle, Washington 98109

Table 1: Summary of Subsurface Soil Analyses: Parking Lot Area.

Proposed Neptune Apartments: Jarvie Property
760 Aloha Avenue North
Seattle, Washington 98109
Riley Project #2000-178

Sample Identification	Sample Depth	PID (ppmv)	Gasoline TPH	BTEX				Diesel/Oil TPH	Moisture Content
				B	T	E	X		
Jarve Parking Lot (B-1, B-2 and B-3) & Vacant Parcel to North (B-4)									
Boring B-1									
B-1-2.5'	2.5	77	----	----	----	----	----	----	----
B-1-7.5'	7.5	550	----	----	----	----	----	----	----
B-1-12.5'	12.5	>2,000	8,600	ND < 1.1	780	30	144	----	10
B-1-17.5'	17.5	495	----	----	----	----	----	----	----
B-1-22.5'	22.5	483	ND<5.6	ND<0.056	ND<0.056	ND<0.056	ND<0.056	----	11
B-1-27.5'	27.5	225	----	----	----	----	----	----	----
Boring B-2									
B-2-2.5'	2.5	170	----	----	----	----	----	----	----
B-2-7.5'	7.5	> 2,000	5,800	0.68	900	33	154	----	12
B-2-12.5'	12.5	> 2,000	----	----	----	----	----	----	----
B-2-17.5'	17.5	45	ND<5.6	ND<0.056	0.089	ND<0.056	ND<0.056	----	11
B-2-22.5'	22.5	18	----	----	----	----	----	----	----
Boring B-3									
B-3-2.5'	2.5	----	----	----	----	----	----	----	----
B-3-7.5'	7.5	> 2,000	95	ND<0.054	ND<0.054	ND<0.054	0.11	ND<100	8
B-3-12.5'	12.5	154	----	----	----	----	----	----	----
B-3-17.5'	17.5	16	ND<5.7	ND<0.057	ND<0.057	ND<0.057	ND<0.057	----	13
B-3-22.5'	22.5	17	----	----	----	----	----	----	----
Boring B-4									
B-4-2.5'	2.5	8	----	----	----	----	----	----	----
B-4-7.5'	7.5	14	----	----	----	----	----	----	----
B-4-12.5'	12.5	1732	95	ND<0.27	ND<0.27	ND<0.27	ND<0.27	ND<100	9
B-4-17.5'	17.5	22	ND<5.8	ND<0.058	ND<0.058	ND<0.058	ND<0.058	----	14
MTCA Method A Cleanup Level			**100**	**0.5**	**40**	**20**	**20**	**200**	---

Samples collected by The Riley Group, Inc. on November 20, 2000.

Sample Depth given in feet below ground surface.
PID, field screening results for VOCs using a photo-ionization detector (PID).
TPH, total petroleum hydrocarbons.
Gasoline TPH/BTEX determined using Ecology Test Method NWTPH-G with BTEX.
Diesel TPH determined by Ecology Test Method NWTPH-Diesel - Extended.
ND, non-detect, contaminant not detected at noted analytical detection limit.
All results and detection limits given in ppm, parts per million (milligrams per kilogram [mg/kg]).
---, not analyzed or not applicable.

MTCA, Washington Department of Ecology Model Toxics Control Act Method A Soil Cleanup Levels (WAC 173-340-740) for reference.

Table 2: Summary of Subsurface Soil Analyses: Inside Building Area.

Proposed Neptune Apartments: Jarvie Property
760 Aloha Avenue North
Seattle, Washington 98109
Riley Project #2000-178

Sample Identification	Sample Depth	Field Test	Gas TPH	BTEX				Diesel TPH	Moisture Content
				B	T	E	X		
Inside Jarve Building									
Boring B-6									
B-6-5'	5.0	none	----	----	----	----	----	----	----
B-6-10'	10.0	none	ND<5.6	ND<0.056	ND<0.056	ND<0.056	ND<0.056	----	11
B-6-15'	15.0	none	----	----	----	----	----	----	----
B-6-16'	16.0	none	ND<5.3	ND<0.053	ND<0.053	ND<0.053	ND<0.053	----	6
Boring B-7									
B-7-5'	5.0	none	----	----	----	----	----	----	----
B-7-10'	10.0	strong	30	ND<0.056	ND<0.056	ND<0.056	0.064	----	11
B-7-15'	15.0	moderate	ND<27	ND<0.27	2.5	ND<0.27	0.29	----	13
B-7-20'	20.0	faint	ND<5.9	ND<0.059	ND<0.059	0.072	0.2	----	15
Boring B-8									
B-8-5'	5.0	none	----	----	----	----	----	----	----
B-8-10'	10.0	moderate	ND<5.4	ND<0.054	0.39	0.13	0.352	----	7
B-8-15'	15.0	moderate	27	ND<0.054	4.9	0.55	2.88	----	8
B-8-20'	20.0	none	ND<5.7	ND<0.057	ND<0.057	ND<0.057	ND<0.057	----	13
Boring B-9									
B-9-5'	5.0	faint	----	----	----	----	----	----	----
B-9-10'	10.0	faint	ND<27	ND<0.27	ND<0.27	ND<0.27	ND<0.27	----	9
B-9-15'	15.0	faint	ND<27	ND<0.27	2.8	ND<0.27	0.75	----	7
B-9-20'	20.0	none	ND<5.6	ND<0.056	ND<0.056	ND<0.056	ND<0.056	----	11
MTCA Method-A Cleanup Level			**100**	**0.5**	**40**	**20**	**20**	**200**	**---**

Samples collected by The Riley Group, Inc. on December 29, 2000.
Sample Depth given in feet below ground surface.
Field Test, based upon olfactory observations, PID results and water sheen field tests. Relative to each other.
TPH, total petroleum hydrocarbons.
Gasoline TPH/BTEX determined using Ecology Test Method NWTPH-G with BTEX.
Diesel TPH determined by Ecology Test Method NWTPH-Diesel - Extended.
ND, non-detect, contaminant not detected at noted analytical detection limit.
All results and detection limits given in ppm, parts per million (milligrams per kilogram [mg/kg]).
---, not analyzed or not applicable.
MTCA, Washington Department of Ecology Model Toxics Control Act Method A Soil Cleanup Levels (WAC 173-340-740) for reference.

Table 3: Petroleum Contaminated Soil Classification & Estimated Volumes

Jarvie Property: Proposed Neptune Apartments Project
760 Aloha Avenue North
Seattle, Washington 98109
Riley Project #2000-178

Area of the Jarvie Property	Class III & IV Soils[1] Soils with concentrations over MTCA Method A Cleanup Levels		Class I & II Soils[2] Soils with concentrations below MTCA Method A Cleanup Levels	
	In-place volume (yards)	Excavated weight in tons (includes fluff factor of 1.5)	In-place volume (yards)	Excavated weight in tons (includes fluff factor of 1.5)
Parking Lot Area	400 to 755	600 to 1,150	not applicable	not applicable
Beneath Jarvie Building	not applicable	not applicable	1,745 to 2,100	2,618 to 3,150

Class I to IV Soils, Petroleum contaminated soil classification per Ecology's Guidance for Remediation of Petroleum Contaminated Soils (91-30, 1995).

Disposal Options:

1. - Disposal options include off-site treatment/disposal of petroleum contaminated soil. Licensed treatment/disposal facilities include TPS, Rabanco, and others)

2. - Disposal options may include:

   A. Off-site Disposal or Treatment at licensed facility (particularly Associated Sand & Gravel)

   B. On-site treatment or landfarming

   C. Find soil recycler or other appropriate end use for Class I soils

Boring B-1

Logged by D. Holmes on November 20, 2000
Driller: Environmental Drilling, Inc.

Drilled using Mobile B-61, 4.5" ID HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
						1" Asphalt over brownish-gray sandy pebble gravel
	2.5'	8		77.5	F (GW/ SW)	2.5' - sandy GRAVEL (fill), brownish-gray, gravel to 3/4", sand - fine to medium grained, minor clay, loose, no odors (8:55)
5				484		@6' - Cuttings become fine-grained sand, dark gray (stained),odor of hydrocarbons
	7.5'	26		550		7.5' - gravelly SAND w/silt (fill), dark gray (stained), sand - medium grained, gravel to 3/4", damp, medium dense, strong odor of hydrocarbons (9:05)
10			▼			
	12.5'	>50		>2000	SW/ SP	2.5' - silty SAND, dark gray (stained), medium to fine-grained, minor gravel to 3/4", wet, very dense, strong odor of hydrocarbons (9:35)
15						
	17.5'	>50		494		17.5' - silty SAND, dark gray (stained), sand - medium grained, minor gravel to 3/4", wet, very dense, moderate odor of hydrocarbons (9:45)
20						
	22.5'	>50		483	SW/ SP	22.5' - SAND, dark gray (stained), medium-coarse grained, wet, very dense, faint odor of hydrocarbons (10:00)
25						@25' - Difficult drilling - probable top of glacial till (lodgement)
	27.5'	>50		225		27.5' - silty SAND, dark gray (stained), sand - very fine grained, sparse pea gravel (glacial till), damp, very dense, no odors (10:10)

Boring terminated at 28.0 feet. Groundwater encountered at 10.5 feet bgs.

The Riley Group, Inc.
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Jarvie Property

Riley Project # 2000-178	*Log of Boring B-1*	*Figure A-1*
Logged by: D. Holmes	*Date Logged: 11/20/2000*	
Site Address: Dexter and Aloha, Seattle, Washington		

Boring B-2

Logged by D. Holmes on November 20, 2000
Driller: Environmental Drilling, Inc.

Drilled using Mobile B-61, 4.5" ID HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
						1" Asphalt over brown sandy GRAVEL fill
	2.5'	25		170	F (GW/ SW)	2.5' - sandy GRAVEL (fill), grayish-brown, gravel to 1", sand - medium with fine and coarse fragments, damp, medium dense, no odors (10:55)
5						@5' - Cuttings become gravelly SAND, dark gray (stained), odor of hydrocarbons
	7.5'	6		>2000		7.5' - silty SAND w/ gravel to 3/4" (fill), dark gray, sand - fine grained, damp, loose, strong odor of hydrocarbons (11:00)
10			▼			
	12.5'	>50		>2000		12.5' - silty SAND, dark gray (stained), sand - fine grained, sparse pea gravel, damp, very dense, moderate odor of hydrocarbons (11:15)
15						
	17.5'	>50		44.8	SP	17.5' - silty SAND, dark gray (stained), sand - fine grained, sparse pea gravel, wet, very dense, faint odor of hydrocarbons (11:20)
20						
	22.5'	59		18.3		22.5' - silty SAND, brown, sand - very fine grained, coarsening upward to coarse sand w/ no silt, wet, very dense, no odors (12:20)
25						

Boring terminated at 23.0 feet. Groundwater encountered at 10.5 feet bgs.

The Riley Group, Inc.
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SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-2*	*Figure A-2*
Logged by: D. Holmes	*Date Logged: 11/20/2000*	
Site Address: Dexter and Aloha, Seattle, Washington		

Boring B-3

Logged by D. Holmes on November 20, 2000
Driller: Environmental Drilling, Inc.

Drilled using Mobile B-61, 4.5" ID HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
						1" Degraded asphalt over brown silty SAND w/gravel to 3/4", moist
	2.5'	2		NA	F (SW)	2.5' - SAND (fill), brown, cream colored bentonite, very moist, very loose, no odors, not enough sample recovery to check headspace (13:00)
5						@5' - Gravel interval with PVC chips present
	7.5'	38		>2000		7.5' - Silty SAND with gravel to 1/2" (fill), Lt gray top; dark gray bottom, sand - medium fine to very fine grained, damp, dense, odor of hydrocarbons increasing with depth (13:05)
10			▼			
	12.5'	>50		154	SP	12.5' - Interbedded very silty SAND and medium-grained SAND, damp, very dense, lower sample - abundant organics and oxidization staining and faint odor of hydrocarbons, upper sample - strong odor of hydrocarbons, beds 2" thick (13:10)
15						
	17.5'	79		15.6	SW	17.5' - SAND, gray, medium to coarse grained, sparse pea gravel, wet, very dense, no distinct odors (13:20)
20						@19'-24' - Easy drilling
	22.5'	>50		17.4	ML/ SP	22.5' - interbedded fine sandy SILT and medium SAND, gray, wet, very dense, no odors (13:25)
25						

Boring terminated at 23.5 feet. Groundwater encountered at 10.5 feet bgs.

The Riley Group, Inc.
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SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-3*	*Figure A-3*
Logged by: D. Holmes		*Date Logged: 11/20/2000*
Site Address: Dexter and Aloha, Seattle, Washington		

Boring B-4

Logged by D. Holmes on November 20, 2000
Driller: Environmental Drilling, Inc.

Drilled using Mobile B-61, 4.5" ID HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
					F (SW)	Bare Ground - medium SAND w/gravel to 1.25", brown, damp, no odor
	2.5'	>50		8.4		2.5' - sandy SILT w/ sparse to moderate gravel to 3/4" (fill), brown, damp, very dense, no odors (14:05)
5						@4' - Cuttings become dark gray (stained), no odors, difficult drilling below 4'
	7.5'	>50		14.0		7.5' - silty SAND, gray, sand - fine grained, sparse pea gravel, glacial till (lodgement), damp, very dense, faint to moderate odor of hydrocarbons (14:25)
10					SP	@11' - Cuttings are sand, wet, faint odor of hydrocarbons
	12.5'	>50	▼	1732		12.5' - Upper sample - SAND, dark gray, medium-coarse grained, very moist, very dense, strong odor of hydrocarbons; Lower sample - silty SAND, brown, fine grained, sparse gravel, damp, very dense, faint odor of hydrocarbons (14:40)
15						
	17.5'	43		22.2		17.5' - SAND, gray, medium grained, wet, dense, no odor of hydrocarbons (14:50)
20						
25						

Boring terminated at 18.5 feet. Groundwater encountered at 12.5 feet bgs. .

The Riley Group, Inc.
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SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-4*	*Figure A-4*
Logged by: D. Holmes		*Date Logged: 11/20/2000*

Site Address: Dexter and Aloha, Seattle, Washington

Boring B-5

Logged by D. Holmes on November 20, 2000
Driller: Environmental Drilling, Inc.

Drilled using Mobile B-61, 4.5" ID HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
						Bare ground - silty sandy GRAVEL to 2"-3", brown, small to medium fines
5	1	8		7.5	F SP	1 - silty SAND (fill), brown, sand - fine grained, sparse gravel, moist, loose, faint odor of hydrocarbons (15:45)
10	2	6	▼	20.5		2 - silty SAND (fill), gray and brown mottled, sand - fine grained, wet, loose, moderate odor of hydrocarbons (15:50)
15	3	>50		8.0	SP	3 - silty SAND, gray and brown mottled, sand - fine grained, wet, very dense, faint odor of hydrocarbons (16:00)
20	4	>50		7.5		4 - silty SAND, gray and brown mottled, sand - fine grained, wet, very dense, no odors (16:10)
25						

Boring terminated at 20.5 feet. Groundwater encountered at 12 feet bgs.

The Riley Group, Inc.
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SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-5*	*Figure A-5*
Logged by: D. Holmes	*Date Logged: 11/20/2000*	
Site Address: Dexter and Aloha, Seattle, Washington		

Boring B-6

Logged by D. Holmes on December 29, 2000
Driller: Davies Drilling

Drilled using track-mounted limited access Mobile B-53, 6.5" OD HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
			Groundwater not encountered		F (GW)	5" concrete over brown sandy GRAVEL fill (pit run)
5	5'	31		n.o.		5' - No recovery. Likely pit run fill. (18:50)
10	10'	53		284	SM	10' - Very silty SAND, brown upper shading to gray lower, upper portion organic with rootlets present, medium-fine-grained with a few pea gravel clasts, moist upper, damp lower, very dense (native soil - till). (18:55)
15	15'	82/7"		n.o.		15' - Gray silty SAND as above, very little recovery. (19:15)
	16'	57/10"		1412		16' - Gray silty SAND as above. (19:35)
20						
25						

Boring terminated at 16.8 feet. Groundwater not encountered. No inidcations of petroleum contamination noted. n.o. = not obtained.

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SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-6*	*Figure A-6*
Logged by: D. Holmes	*Date Logged: 12/29/2000*	
Site Address: NEC Dexter Ave. N and N Aloha St., Seattle, Washington 98109		

Boring B-7

Logged by D. Holmes on December 29, 2000
Driller: Davies Drilling

Drilled using track-mounted limited access Mobile B-53, 6.5" OD HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
						5" concrete over brown sandy GRAVEL fill (pit run)
5	5'	4	▼	>2000	F (SW)	5' - Gravelly sand FILL (pit run fill), brown, medium- to coarse-grained, gravel to 3", damp, very loose . (20:25)
						perched groundwater present in fill on top of till (20" of water)
10	10'	72/11"	▼	>2000	SM	10' - Silty SAND, gray, minor pea gravel, medium-fine-grained, noticeable odor of hydrocarbons, upper 4" wet, lower 7" damp, very dense (native soil - till). (20:35)
						groundwater present at 13' bgs
15	15'	72		>2000	SP	15' - SAND, gray, medium-grained, minor silt and gravel, moderate ofor of hydrocarbons, wet. (21:00)
20	20'	77/12"		953		16' - SAND as above, wet, moderate to faint odor of hydrocarbons, very dense. (21:30)
25						

Boring terminated at 21.0 feet. Groundwater encountered in fill at 8.7 feet bgs perched on top of native soil. Deeper groundwater encountered at 13 feet bgs. Odors of hydrocarbons present below 10 feet, moderating with increasing depth.

The Riley Group, Inc.
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SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-7*	*Figure A-7*
Logged by: D. Holmes		*Date Logged: 12/29/2000*

Site Address: NEC Dexter Ave. N and N Aloha St., Seattle, Washington 98109

Boring B-8

Logged by D. Holmes on December 29 and 30, 2000
Driller: Davies Drilling

Drilled using track-mounted limited access Mobile B-53, 6.5" OD HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
					F (GW)	5" concrete over brown sandy GRAVEL fill (pit run)
5	5'	32		>2000	ML	5' - Sandy SILT, brown, fine-grained, damp, dense. Likely weathered glacial till. (23:15)
						cutting have odor of hydrocarbons at 8' bgs
10	10'	92/10"	▼	>2000	SM	10' - Silty SAND with minor gravel, fine-grained, gravel to over 1.5", moderate to faint odor of hydrocarbons, damp, very dense. (23:25)
					SP	
15	15'	76/11"		>2000		15' - Upper 6": SAND, gray, medium-grained, wet, odor of hydrocarbons. Lower 5": Silty SAND, gray, fine grained, minor pea gravel, damp, slight odor of hydrocarbons, very dense. (23:55)
					SM	
20	20'	71/12"		n.o.		20' - Silty SAND, brown with oxidation rind around 1.5" gravel clast in sample, medium-fine grained, no odors of hydrocarbons, very little recovery, damp, very dense. (00:15)
25						

Boring terminated at 21.0 feet. Groundwater encountered at 12 feet bgs. Odors of hydrocarbons noted from 8 feet to 18 feet bgs. n.o. = not obtained.

The Riley Group, Inc.
10728 LAKE CITY WAY NE
SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-8*	*Figure A-8*
Logged by: D. Holmes	*Date Logged: 12/29/2000 & 12/30/2000*	
Site Address: NEC Dexter Ave. N and N Aloha St., Seattle, Washington 98109		

Boring B-9

Logged by D. Holmes on December 30, 2000
Driller: Davies Drilling

Drilled using track-mounted limited access Mobile B-53, 6.5" OD HSA with 140 lb. hammer.
Boring backfilled with bentonite.

Depth (feet)	Sample ID/ Interval	(N) Blows/ft	Moisture Content (%)/ Water Table	PID (ppm)	USCS	Soil Description
					F (GW)	5" concrete over brown sandy GRAVEL fill (pit run)
5	5'	56		>2000		5' - Silty SAND (glacial till), minor pea gravel, brown and gray mottled, fine-grained, odors of hydrocarbons,damp, very dense . (01:25)
10	10'	65/12"		1325	SM	10' - Silty SAND as above, gray, odor of hydrocarbons, damp (moist at top), very dense . (01:45)
15	15'	80/9"		1085		15' - Silty SAND as above, with gravel to over 1.5", faint odor of hydrocarbons, damp, very dense. (02:00)
20	16'	89/11"	▼	386	SP SM	16' - Upper 9": SAND, brown, medium-grained, odor of hydrocarbons, wet. Lower 8": Silty SAND, brown, fine-grained, no odors of hydrocarbons, damp, very dense. (02:25)
25						

Boring terminated at 20.9 feet. Groundwater encountered at 19 feet bgs. odors of hydrocarbons between 4 feet and 20.75 feet bgs.

The Riley Group, Inc.
10728 LAKE CITY WAY NE
SEATTLE, WASHINGTON 98125

Jarvie Property

Riley Project # 2000-178	*Log of Boring B-9*	*Figure A-9*
Logged by: D. Holmes	*Date Logged: 12/30/2000*	
Site Address: NEC Dexter Ave. N and N Aloha St., Seattle, Washington 98109		

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

December 1, 2000

Paul Riley
The Riley Group, Inc.
10728 Lake City Way NE
Seattle, WA 98125

Re: Analytical Data for Project 2000-178
Laboratory Reference No. 0011-168

Dear Paul:

Enclosed are the analytical results and associated quality control data for samples submitted on November 21, 2000.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 11-28-00
Date Analyzed: 11-28&29-00

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-1-12.5'**			**B-1-22.5'**		
Lab ID:	11-168-03			11-168-05		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		1.1	**ND**		0.056
Toluene	**780**	**E**	1.1	**ND**		0.056
Ethyl Benzene	**30**		1.1	**ND**		0.056
m,p-Xylene	**110**	**E**	1.1	**ND**		0.056
o-Xylene	**34**		1.1	**ND**		0.056
TPH-Gas	**8600**		110	**ND**		5.6
Surrogate Recovery: Fluorobenzene	136%			88%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 11-28-00
Date Analyzed: 11-28&29-00

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-2-7.5'**			**B-2-17.5'**		
Lab ID:	11-168-08			11-168-10		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**0.68**		0.28	**ND**		0.056
Toluene	**900**	**E**	1.1	**0.089**		0.056
Ethyl Benzene	**33**		1.1	**ND**		0.056
m,p-Xylene	**120**	**E**	1.1	**ND**		0.056
o-Xylene	**34**		1.1	**ND**		0.056
TPH-Gas	**5800**		110	**ND**		5.6
Surrogate Recovery: Fluorobenzene	146%			88%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 11-28-00
Date Analyzed: 11-28-00

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-3-7.5'**			**B-3-17.5'**		
Lab ID:	11-168-13			11-168-15		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.054	**ND**		0.057
Toluene	**ND**		0.054	**ND**		0.057
Ethyl Benzene	**ND**		0.054	**ND**		0.057
m,p-Xylene	**0.11**		0.054	**ND**		0.057
o-Xylene	**ND**		0.054	**ND**		0.057
TPH-Gas	**95**		5.4	**ND**		5.7
Surrogate Recovery: Fluorobenzene	83%			86%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 11-28-00
Date Analyzed: 11-28-00

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-4-12.5'**			**B-4-17.5'**		
Lab ID:	11-168-19			11-168-20		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.27	**ND**		0.058
Toluene	**ND**		0.27	**ND**		0.058
Ethyl Benzene	**ND**		0.27	**ND**		0.058
m,p-Xylene	**ND**		0.27	**ND**		0.058
o-Xylene	**ND**		0.27	**ND**		0.058
TPH-Gas	**95**		27	**ND**		5.8
Surrogate Recovery: Fluorobenzene	98%			86%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 11-28-00
Date Analyzed: 11-28-00

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-5-10'**			**B-5-20'**		
Lab ID:	11-168-22			11-168-24		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.057	**ND**		0.056
Toluene	**ND**		0.057	**ND**		0.056
Ethyl Benzene	**ND**		0.057	**ND**		0.056
m,p-Xylene	**ND**		0.057	**ND**		0.056
o-Xylene	**ND**		0.057	**ND**		0.056
TPH-Gas	**67**	**O**	5.7	**ND**		5.6
Surrogate Recovery: Fluorobenzene	88%			92%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 11-28-00
Date Analyzed: 11-28-00

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB1128S1

	Result	Flags	PQL
Benzene	**ND**		0.050
Toluene	**ND**		0.050
Ethyl Benzene	**ND**		0.050
m,p-Xylene	**ND**		0.050
o-Xylene	**ND**		0.050
TPH-Gas	**ND**		5.0
Surrogate Recovery: Fluorobenzene	105%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 11-28-00
Date Analyzed: 11-28-00

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID:	11-168-05 **Original**	11-168-05 **Duplicate**	**RPD**	**Flags**
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**ND**	**ND**	NA	
o-Xylene	**ND**	**ND**	NA	
TPH-Gas	**ND**	**7.80**	NA	
Surrogate Recovery:				
Fluorobenzene	88%	84%		

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Gx/BTEX
MS/MSD QUALITY CONTROL

Date Extracted: 11-28-00
Date Analyzed: 11-28-00

Matrix: Soil
Units: mg/Kg (ppm)

Spike Level: 1.00 ppm

Lab ID:	11-168-05 **MS**	Percent Recovery	11-168-05 **MSD**	Percent Recovery	**RPD**	**Flags**
Benzene	**0.908**	**91**	**0.897**	**90**	1.2	
Toluene	**0.935**	**94**	**0.919**	**92**	1.8	
Ethyl Benzene	**0.922**	**92**	**0.913**	**91**	0.96	
m,p-Xylene	**0.933**	**93**	**0.924**	**92**	0.99	
o-Xylene	**0.910**	**91**	**0.903**	**90**	0.78	

Surrogate Recovery:

Fluorobenzene	86%	84%

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Dx

Date Extracted:	11-22-00
Date Analyzed:	11-22-00
Matrix:	Soil
Units:	mg/Kg (ppm)

Client ID:	B-3-7.5'	B-4-12.5'
Lab ID:	11-168-13	11-168-19
Diesel Fuel:	ND	ND
PQL:	27	28
Heavy Oil:	ND	ND
PQL:	54	55
Surrogate Recovery:		
o-Terphenyl	87%	93%

Flags:

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Dx
METHOD BLANK QUALITY CONTROL

Date Extracted:	11-22-00
Date Analyzed:	11-22-00
Matrix:	Soil
Units:	mg/Kg (ppm)
Lab ID:	MB1122S1
Diesel Fuel:	ND
PQL:	25
Heavy Oil:	ND
PQL:	50
Surrogate Recovery:	
o-Terphenyl	65%

Flags:

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

NWTPH-Dx
DUPLICATE QUALITY CONTROL

Date Extracted:	11-22-00
Date Analyzed:	11-22-00
Matrix:	Soil
Units:	mg/Kg (ppm)

Lab ID:	11-174-01	11-174-01 DUP
Diesel Fuel:	ND	ND
PQL:	130	130
RPD:	N/A	
Surrogate Recovery:		
o-Terphenyl	---	---
Flags:	S	S

Date of Report: December 1, 2000
Samples Submitted: November 21, 2000
Lab Traveler: 11-168
Project: 2000-178

% MOISTURE

Date Analyzed: 11-22-00

Client ID	Lab ID	% Moisture
B-1-12.5'	11-168-03	10
B-1-22.5'	11-168-05	11
B-2-7.5'	11-168-08	12
B-2-17.5'	11-168-10	11
B-3-7.5'	11-168-13	8.0
B-3-17.5'	11-168-15	13
B-4-12.5'	11-168-19	9.0
B-4-17.5'	11-168-20	14
B-5-10'	11-168-22	13
B-5-20'	11-168-24	11

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

D - Data from 1:____ dilution.

E - The value reported exceeds the quantitation range, and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeniety. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

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

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid cleanup procedure.

Z -

ND - Not Detected at PQL
MRL - Method Reporting Limit
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Fax: (425) 885-4603 • Phone: (425) 883-3881

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☐ Standard (Hydrocarbon analyses: 5 days, All other analyses: 7 days)
☐ 11/30 (other)

Project Chemist: DB

Laboratory No. 11-168

Company: The Riley Group
Project No.: 2000-178
Project Name: Nature Apts.
Project Manager: Sampler: Dave Holmes / Paul Riley

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	Archive					% Moisture
1	B-1-2.5'	11/20	8:55	S	1														✓					
2	B-1-7.5'		9:05		1														✓					
3	B-1-12.5'		9:35				⊗																	X
4	B-1-17.5'		9:45																✓					
5	B-1-22.5'		10:00				⊗																	X
6	B-1-27.5'		10:10																✓					
7	B-2-2.5'		10:55																✓					
8	B-2-7.5'		11:00				⊗																	X
9	B-2-12.5'		11:15																✓					
10	B-2-17.5'		11:20				⊗																	X
11	B-2-22.5'		12:20																✓					
12	B-3-2.5'	↓	13:00	↓	↓														✓					

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Dave Holmes	11/21		11-21-00
FIRM Riley	TIME 9:30	FIRM Stroud	TIME 930
RELINQUISHED BY	DATE	RECEIVED BY	DATE 11/21/00
FIRM	TIME	FIRM OSE	TIME 10:30 AM
REVIEWED BY		DATE REVIEWED	

COMMENTS: Analyses to follow
⊗ Added per client request

Chromatographs with final report ☒

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

OnSite Environmental Inc.

14648 NE 95th Street • Redmond, WA 98052
Fax: (425) 885-4603 • Phone: (425) 883-3881

Chain of Custody

Turnaround Request (in working days) (Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☐ Standard (Hydrocarbon analyses: 5 days, All other analyses: 7 days)
- ☐ 11/30 (other)

Project Chemist: DB

Laboratory No. 11-168

Company: The Riley Group

Project No.: 2000-178

Project Name: Neptune Apts

Project Manager: Dave Holmes (Sampler) / Paul Riley

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	Archive						% Moisture
13	B-3-7.5'	11/20	13:05	S	1		(X)	(X)																	X
~~14~~	~~B-3-12.5'~~		~~13:10~~										Not	Received.	DB										
15	B-3-17.5'		13:20				(X)																		X
16	B-3-22.5'		13:25																✓						
17	B-4-2.5'		14:05																✓						
18	B-4-7.5'		14:25																✓						
19	B-4-12.5'		14:40				(X)	(X)																	X
20	B-4-17.5'		14:50				(X)																		X
21	B-5-5'		15:45																✓						
22	B-5-10'		15:50				(X)																		X
23	B-5-15'		16:00																✓						
24	B-5-20'	↓	16:10	↓	↓		(X)																		X

RELINQUISHED BY: Dave Holmes [signature]	DATE: 11/21	RECEIVED BY: [signature]	DATE: 11-21-00
FIRM: Riley	TIME: 9:30	FIRM: Speedy	TIME: 9:30
RELINQUISHED BY	DATE	RECEIVED BY: [signature]	DATE: 11/21/00
FIRM	TIME	FIRM: OSE	TIME: 10:30 AM
REVIEWED BY		DATE REVIEWED	

COMMENTS: Analyses to Follow

(X) Added per client request

Chromatographs with final report ☒

DISTRIBUTION LEGEND: White - OnSite Copy Yellow - Report Copy Pink - Client Copy

OnSite Environmental Inc.
Analytical Testing and Mobile Laboratory Services

January 4, 2001

Dave Holmes
The Riley Group, Inc.
10728 Lake City Way NE
Seattle, WA 98125

Re: Analytical Data for Project 2000-178
Laboratory Reference No. 0012-204

Dear Dave:

Enclosed are the analytical results and associated quality control data for samples submitted on December 30, 2000.

The standard policy of OnSite Environmental Inc. is to store your samples for 30 days from the date of receipt. If you require longer storage, please contact the laboratory.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning the data, or need additional information, please feel free to call me.

Sincerely,

David Baumeister
Project Manager

Enclosures

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 1-2-01
Date Analyzed: 1-3-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-6-10'**			**B-6-16'**		
Lab ID:	12-204-01			12-204-03		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.056	**ND**		0.053
Toluene	**ND**		0.056	**ND**		0.053
Ethyl Benzene	**ND**		0.056	**ND**		0.053
m,p-Xylene	**ND**		0.056	**ND**		0.053
o-Xylene	**ND**		0.056	**ND**		0.053
TPH-Gas	**ND**		5.6	**ND**		5.3
Surrogate Recovery: Fluorobenzene	98%			99%		

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 1-2-01
Date Analyzed: 1-3-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-7-10'**			**B-7-15'**		
Lab ID:	12-204-05			12-204-06		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.056	**ND**		0.29
Toluene	**ND**		0.056	**2.5**		0.29
Ethyl Benzene	**ND**		0.056	**ND**		0.29
m,p-Xylene	**0.064**		0.056	**0.29**		0.29
o-Xylene	**ND**		0.056	**ND**		0.29
TPH-Gas	**30**		5.6	**ND**		29
Surrogate Recovery: Fluorobenzene	98%			96%		

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 1-2-01
Date Analyzed: 1-3-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-7-20'**			**B-8-10'**		
Lab ID:	12-204-07			12-204-09		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.059	**ND**		0.054
Toluene	**ND**		0.059	**0.39**		0.054
Ethyl Benzene	**0.072**		0.059	**0.13**		0.054
m,p-Xylene	**0.20**		0.059	**0.29**		0.054
o-Xylene	**ND**		0.059	**0.062**		0.054
TPH-Gas	**ND**		5.9	**ND**		5.4
Surrogate Recovery: Fluorobenzene	91%			105%		

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 1-2-01
Date Analyzed: 1-3-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-8-15'**			**B-8-20'**		
Lab ID:	12-204-10			12-204-11		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.054	**ND**		0.057
Toluene	**4.9**		0.054	**ND**		0.057
Ethyl Benzene	**0.55**		0.054	**ND**		0.057
m,p-Xylene	**2.2**		0.054	**ND**		0.057
o-Xylene	**0.68**		0.054	**ND**		0.057
TPH-Gas	**27**		5.4	**ND**		5.7
Surrogate Recovery:						
Fluorobenzene	105%			100%		

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 1-2-01
Date Analyzed: 1-3-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID:	**B-9-10'**			**B-9-15'**		
Lab ID:	12-204-13			12-204-14		
	Result	Flags	PQL	**Result**	Flags	PQL
Benzene	**ND**		0.27	**ND**		0.27
Toluene	**ND**		0.27	**2.8**		0.27
Ethyl Benzene	**ND**		0.27	**ND**		0.27
m,p-Xylene	**ND**		0.27	**0.75**		0.27
o-Xylene	**ND**		0.27	**ND**		0.27
TPH-Gas	**ND**		27	**ND**		27
Surrogate Recovery:						
Fluorobenzene	96%			93%		

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX

Date Extracted: 1-2-01
Date Analyzed: 1-3-01

Matrix: Soil
Units: mg/Kg (ppm)

Client ID: **B-9-20'**
Lab ID: 12-204-15

	Result	Flags	PQL
Benzene	**ND**		0.056
Toluene	**ND**		0.056
Ethyl Benzene	**ND**		0.056
m,p-Xylene	**ND**		0.056
o-Xylene	**ND**		0.056
TPH-Gas	**ND**		5.6

Surrogate Recovery:
Fluorobenzene 98%

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-2-01
Date Analyzed: 1-2-01

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB0102S1

	Result	Flags	PQL
Benzene	**ND**		0.050
Toluene	**ND**		0.050
Ethyl Benzene	**ND**		0.050
m,p-Xylene	**ND**		0.050
o-Xylene	**ND**		0.050
TPH-Gas	**ND**		5.0

Surrogate Recovery:
Fluorobenzene 102%

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX
METHOD BLANK QUALITY CONTROL

Date Extracted: 1-2-01
Date Analyzed: 1-2-01

Matrix: Soil
Units: mg/Kg (ppm)

Lab ID: MB0102S2

	Result	Flags	PQL
Benzene	**ND**		0.050
Toluene	**ND**		0.050
Ethyl Benzene	**ND**		0.050
m,p-Xylene	**ND**		0.050
o-Xylene	**ND**		0.050
TPH-Gas	**ND**		5.0

Surrogate Recovery:
Fluorobenzene 98%

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX
DUPLICATE QUALITY CONTROL

Date Extracted: 1-2-01
Date Analyzed: 1-2-01

Matrix; Soil
Units: mg/Kg (ppm)

Lab ID:	12-159-08 **Original**	12-159-08 **Duplicate**	**RPD**	**Flags**
Benzene	**ND**	**ND**	NA	
Toluene	**ND**	**ND**	NA	
Ethyl Benzene	**ND**	**ND**	NA	
m,p-Xylene	**1.47**	**1.71**	15	
o-Xylene	**0.787**	**0.892**	13	
TPH-Gas	**1750**	**2130**	20	
Surrogate Recovery:				
Fluorobenzene	99%	99%		

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

NWTPH-Gx/BTEX
SB\SBD QUALITY CONTROL

Date Extracted: 1-2-01
Date Analyzed: 1-2-01

Matrix: Soil
Units: mg/Kg (ppm)

Spike Level: 1.00 ppm

Lab ID:	SB0102S1 **SB**	Percent Recovery	SB0102S1 DUP **SBD**	Percent Recovery	**RPD**	**Flags**
Benzene	**0.991**	**99**	**1.03**	**103**	3.7	
Toluene	**1.04**	**104**	**1.07**	**107**	2.6	
Ethyl Benzene	**1.01**	**101**	**1.04**	**104**	2.9	
m,p-Xylene	**1.01**	**101**	**1.04**	**104**	2.9	
o-Xylene	**1.02**	**102**	**1.06**	**106**	3.6	

Surrogate Recovery:

Fluorobenzene	102%	103%

Date of Report: January 4, 2001
Samples Submitted: December 30, 2000
Lab Traveler: 12-204
Project: 2000-178

% MOISTURE

Date Analyzed: 01-02-01

Client ID	Lab ID	% Moisture
B-6-10'	12-204-01	11
B-6-16'	12-204-03	6.0
B-7-10'	12-204-05	11
B-7-15'	12-204-06	13
B-7-20'	12-204-07	15
B-8-10'	12-204-09	7.0
B-8-15'	12-204-10	8.0
B-8-20'	12-204-11	13
B-9-10'	12-204-13	9.0
B-9-15'	12-204-14	7.0
B-9-20'	12-204-15	11

OnSite Environmental Inc.

DATA QUALIFIERS AND ABBREVIATIONS

A - Due to a high sample concentration, the amount spiked is insufficient for meaningful MS/MSD recovery data.

B - The analyte indicated was also found in the blank sample.

C - The duplicate RPD is outside control limits due to high result variability when analyte concentrations are within five times the quantitation limit.

D - Data from 1:____ dilution.

E - The value reported exceeds the quantitation range, and is an estimate.

F - Surrogate recovery data is not available due to the high concentration of coeluting target compounds.

G - Insufficient sample quantity for duplicate analysis.

H - The analyte indicated is a common laboratory solvent and may have been introduced during sample preparation, and be impacting the sample result.

I - Compound recovery is outside of the control limits.

J - The value reported was below the practical quantitation limit. The value is an estimate.

K - Sample duplicate RPD is outside control limits due to sample inhomogeniety. The sample was re-extracted and re-analyzed with similar results.

L - The RPD is outside of the control limits.

M - Hydrocarbons in the gasoline range (toluene-napthalene) are present in the sample.

O - Hydrocarbons outside the defined gasoline range are present in the sample; NWTPH-Dx recommended.

P - The RPD of the detected concentrations between the two columns is greater than 40.

Q - Surrogate recovery is outside of the control limits.

S - Surrogate recovery data is not available due to the necessary dilution of the sample.

T - The sample chromatogram is not similar to a typical _____.

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

V - Matrix Spike/Matrix Spike Duplicate recoveries are outside control limits due to matrix effects.

W - Matrix Spike/Matrix Spike Duplicate RPD are outside control limits due to matrix effects.

X - Sample extract treated with a silica gel cleanup procedure.

Y - Sample extract treated with an acid cleanup procedure.

Z -

ND - Not Detected at PQL
MRL - Method Reporting Limit
PQL - Practical Quantitation Limit
RPD - Relative Percent Difference

Chain of Custody

OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Fax: (425) 885-4603 • Phone: (425) 883-3881

Turnaround Request (in working days)

(Check One)

☐ Same Day ☐ 1 Day
☐ 2 Day ☐ 3 Day
☐ Standard
(Hydrocarbon analyses: 5 days, All other analyses: 7 days)
☐ By Wed 1-2-01 P.M. or Thurs. 1-3-01 A.M. (other)
* the latest

Project Chemist: DR

Laboratory No. 12-204

Company: The Riley Group, Inc.
Project No.: 2000-0178
Project Name: Neptune Apts. / Dexter/Aloha Tanic Prop.
Project Manager: Dave Holmes / P. Riley

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	% Moisture
	B-6-5' (No sample!)	12/29	~~8:30~~ 8:30	S	1											←	No Sample Obtained!		
1	B-6-10'	12/29	18:55	S	1		X	X											X
2	B-6-15' (Do not Analyze!)	12/29	19:15	S	1											←	Abundant Headspace - little recovery		
3	B-6-16'	12/29	19:35	S	1		X	X		No Dx									X
4	B-7-5'	12/29	20:25	S	1														
5	B-7-10'	12/29	20:35	S	1		X	X											X
6	B-7-15'	12/29	21:00	S	1		X												X
7	B-7-20'	12/29	21:30	S	1		X												X
8	B-8-5'	12/29	23:15	S	1														
9	B-8-10'	12/29	23:25	S	1		X												X
10	B-8-15'	12/29	23:55	S	1		X												X
11	B-8-20'	12/30	00:15	S	1		X												X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Dave Holmes	12/30		12/30/00
FIRM Riley	TIME 3:15	FIRM	TIME 7:00
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME
REVIEWED BY		DATE REVIEWED	

COMMENTS:

Chromatographs with final report ☒ YES!!

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OnSite Environmental Inc.
14648 NE 95th Street • Redmond, WA 98052
Fax: (425) 885-4603 • Phone: (425) 883-3881

Chain of Custody

Laboratory No. 12-204

Project Chemist: DR

Company: The Riley Group

Project No.: 2000-178

Project Name: Nesture Apts/ Dexter/Aloha/ Tarrie prop

Project Manager: Dave Holmes / Paul Riley

Turnaround Request (in working days)

(Check One)

- ☐ Same Day
- ☐ 1 Day
- ☐ 2 Day
- ☐ 3 Day
- ☐ Standard (Hydrocarbon analyses: 5 days, All other analyses: 7 days)
- ☐ See Page 1 (other)

Requested Analysis

Lab ID	Sample Identification	Date Sampled	Time Sampled	Matrix	# of Cont.	NWTPH-HCID	NWTPH-Gx/BTEX	NWTPH-Dx	Volatiles by 8260B	Halogenated Volatiles by 8260B	Semivolatiles by 8270C	PAHs by 8270C	PCB's by 8082	Pesticides by 8081	Total RCRA Metals (8)	TCLP Metals	VPH	EPH	% Moisture
12	B-9-5'	12/30	1:25	S	1														
13	B-9-10'	12/30	1:45	S	1		X												X
14	B-9-15'	12/30	2:00	S	1		X												X
15	B-9-20'	12/30	2:25	S	1		X												X

RELINQUISHED BY	DATE	RECEIVED BY	DATE
Dave Holmes	12/30	[illegible signature]	12/30/00
FIRM: The Riley Grp	TIME: 3:15	FIRM: OnSite Env	TIME: 7:00
RELINQUISHED BY	DATE	RECEIVED BY	DATE
FIRM	TIME	FIRM	TIME

REVIEWED BY

DATE REVIEWED

COMMENTS:

Chromatographs with final report ☒ YES!

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