INDEPENDENT CLEANUP ACTION REPORT

PREPARED BY:

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PREPARED FOR:

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RGI PROJECT NO. 2011-087C

INDEPENDENT CLEANUP ACTION REPORT
BARRETT HARDWARE
12230 AURORA AVENUE NORTH
SEATTLE, WASHINGTON 98133

MAY 16, 2012

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1.0 Introduction

The Barrett Hardware property (hereafter referred to as the Site) consists of approximately 5.5 acres located on the east side of Aurora Avenue North, Seattle, King County, Washington (Figure 1). The Site, King County tax identification number 3026049088, contains a two-story commercial building that originally contained Barrett Hardware (1955 to 1979); Barrett Brothers Fuel Company (1956 to 1979) and United Fuel Company (1979 to 1985). Various retail businesses occupied the Site from 1985 until January 2011.

RGI understands that BDM Investments LLC intends to enroll the Site into the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program (VCP) with the goal of obtaining a determination of No Further Action (NFA).

The Riley Group, Inc. (RGI) was retained by BDM Investments LLC (BDM) to provide environmental oversight during the independent cleanup action. These activities included, but were not necessarily limited to: petroleum-contaminated soil (PCS) excavation oversight, characterizing soil quality, directing the segregation of PCS from clean overburden soil, interim and final soil sample collection, directing laboratory testing, installation and sampling of groundwater monitoring wells, conducting data review, consulting, and draft and final report preparation.

2.0 Project Background

The following reports were completed prior to the independent cleanup action:

- *Phase I Environmental Site Assessment (ESA),* Barrett Hardware, 12230 Aurora Avenue North, Seattle, Washington, prepared by RGI, March 17, 2011.
- *Focused Phase II Subsurface Investigation* Barrett Hardware, 12230 Aurora Avenue North, Seattle, Washington, prepared by RGI, March 24, 2011.
- *UST Site Assessment*, 12230 Aurora Avenue North, Seattle, prepared by RGI, Washington, April 27, 2011.

Summaries of the report findings are provided below.

2.1 RGI PHASE I ESA, MARCH 17, 2011

RGI completed a *Phase I ESA* on March 17, 2011, which revealed the following RECs:

- The Site was developed with a home heating oil business for approximately 30 years, from 1956 to approximately 1985. The heating oil business operated three underground storage tanks (USTs), a 3,000-, a 10,000-, and a 12,000-gallon-capacity, single-wall steel tank. The 3,000-gallon heating oil UST was converted to gasoline storage in the 1960s. The three USTs were removed in February 1990. RGI did not find any documented environmental sampling that was performed during the UST removal.
- The Site contained an approximately 55-year-old, 300-gallon heating oil UST.
- Fuel delivery truck maintenance was reportedly performed on the Site.
- An auto mechanic and a motor cycle shop operated at the Site for a brief period of time.

- The north (and west) adjacent property has been developed as a gasoline service station for approximately 55 years and is listed as a LUST site.

RGI recommended that a *Focused Phase II Subsurface Investigation* be conducted to evaluate soil and groundwater quality beneath the Site, including a geophysical survey to search for abandoned USTs.

2.2 FOCUSED PHASE II SUBSURFACE INVESTIGATION, MARCH 24, 2011

Geophysical Survey

On March 3, 2011, RGI conducted a geophysical survey in an attempt to locate the former heating oil UST location and/or any abandoned USTs associated with the former heating oil business. The geophysical survey covered the eastern half of the Site using ground penetrating radar (GPR) and magnetic locator. The geophysical survey identified an existing, approximately, 300-gallon heating oil UST east of the northeast corner of the building (see Figure 2). In addition, disturbed ground, suggestive of the former UST pit was identified on the eastern portion of the Site (Figure 2).

Subsurface Investigation

On March 7 and 8, 2011, a total of 11 soil borings (BH-1 through BH-11) were advanced to depths ranging from 18 feet to approximately 32 ½ feet below ground surface (bgs). Subsurface soils encountered during drilling generally consisted of dense to very dense, gravelly fine to medium sand and/or stiff to hard silt. Figure 2 shows the March 2011 test boring locations.

A total of 12 soil and two groundwater grab samples were submitted for laboratory analysis. The samples were analyzed for gasoline- and diesel-range total petroleum hydrocarbons (TPH) and benzene, toluene, ethylebenzene, and xylenes (BTEX), and other volatile organic compounds (VOCs).

Soil

Three of the 12 soil samples submitted for testing yielded diesel-range TPH ranging from 1,000 mg/kg to 3,700 mg/kg (the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses is 2,000 mg/kg).

Three of the seven samples tested for gasoline-range TPH yielded concentrations above the method detection limit, ranging from 77 mg/kg to 140 mg/kg (the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses is 100 mg/kg).

Three of the six samples tested for BTEX yielded trace concentrations of ethylbenzene and xylene above the method detection limits but below the regulatory cleanup levels. Benzene and toluene were not detected.

Soil samples BH-2-22 ½ and BH-3-22 ½ were tested for VOCs. No VOCs were detected in BH-2-22 ½. Sample BH-3-22 ½ yielded trace concentrations of methylene chloride at 1.91 mg/kg (The MTCA cleanup level is 0.02 mg/kg); n-propylbenzene at 0.053 mg/kg (There is no MTCA cleanup level, N/A); 1,2,4-trimethylbenzene at 0.72 mg/kg (N/A); and p-Isopropyltoluene at 0.13 mg/kg (N/A).

Groundwater

Groundwater grab sample BH-1 did not yield any of the COC above the method detection limits (none detected for all parameters).

Groundwater grab sample BH-2 yielded 220,000 µg/L diesel-range TPH, 5,500 µg/L motor oil-range TPH, and 590 µg/L gasoline-range TPH. The MTCA Method A Cleanup Levels for Ground Water for gasoline-, diesel-, and oil-range TPH is 500 µg/L, 500 µg/L, and 1,000 µg/L, respectively. Trace concentrations of the following VOCs were also detected in BH-2: chloroform at 1.1 µg/L; n-propylbenzene at 1.5 µg/L; 1,3,5-trimethylbenzene at 1.0 µg/L; 1,2,4-trimethylbenzene at 24 µg/L and naphthalene at 9.3 µg/L. These VOC concentrations are below their respective MTCA cleanup levels.

Conclusions

In borings BH-2 and BH-3, the soil between approximately 17 feet and 25 feet bgs was impacted with gasoline- and diesel-range TPH at concentrations that exceeded the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses. The estimated areal extent of the impacted soil was approximately 10 feet by 30 feet. RGI recommended that a soil cleanup action be conducted to bring the Site into compliance with the MTCA Cleanup Regulation (WAC 173-340).

A groundwater grab sample from boring BH-2 exceeded the MTCA Method A Cleanup Levels for Ground Water for diesel- and oil-range TPH. RGI recommended that groundwater monitoring wells be installed to assess the groundwater quality and flow direction.

Due to the presence of underground utilities and an adjacent septic tank, it was not possible to assess soil quality in the vicinity of the existing 300-gallon heating oil UST. RGI recommended that this UST be decommissioned and removed and a *UST Site Assessment* (soil sampling) be conducted to evaluate the soil quality.

2.3 RGI UNDERGROUND STORAGE TANK (UST) SITE ASSESSMENT, APRIL 27, 2011

An approximately 300-gallon heating oil UST was located adjacent to the northeast corner of the building (Figure 2). The UST was identified by geophysical survey conducted on March 24, 2011.

On April 20, 2011, the UST was decommissioned by Filco Company, Inc. (Filco) under contract by BDM. RGI collected three soil samples from the bottom of the UST pit.

Based on field screening, RGI submitted two soil samples for chemical analyses. Soil sample HO-2 yielded 1,400 mg/kg diesel-range TPH. Sample HO-4 yielded none detectable TPH concentrations. The results of our sampling and testing indicated that the soil surrounding the former heating oil UST was compliant with MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses.

3.0 Independent Cleanup Action

Hos Brothers Construction, Inc. (Hos) under subcontract to BDM provided earth work services for the remedial excavation, including excavating, temporary shoring, loading, transport, offsite disposal of PCS and importing and placing clean backfill soil.

RGI's scope of work during the cleanup action consisted of, but was not necessarily limited to, the following tasks:

- Observing and directing soil excavation, soil segregation, and stockpiling of clean soil and PCS.
- Conducting field screening.
- Collecting interim and final confirmation soil samples for chemical analysis; and, submitting soil samples for chemical analysis to an Ecology-accredited analytical laboratory for testing the contaminants of concern (COC).
- Comparing interim and final confirmation soil sample concentrations of the COC to the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340, Table 740-1).
- Installing groundwater monitoring wells on the Site and measuring the relative top of casing elevations.
- Collecting groundwater samples for chemical analysis (for the first of four planned quarterly groundwater sampling events). Comparing the groundwater sample results to MTCA Method A Cleanup Levels for Ground Water (WAC 173-340, Table 720-1).
- Preparing this independent cleanup action report summarizing our field observations, findings, conclusions, and recommendations, if any.

This independent cleanup action was performed in general accordance with the MTCA Cleanup Regulations (WAC 173-340). The cleanup action was performed in general accordance with our April 14, 2011 Remedial Action Plan and subsequent work authorization. A "notice of intent" sign was placed on the Site on approximately April 25, 2011.

4.0 Geology and Groundwater

The geology of the Site, summarized below, is based on RGIs field observations during the independent cleanup action. During remedial excavations, PCS was encountered from approximately 15 feet bgs to approximately 27 feet bgs.

4.1 SOILS

The ground surface on the west side of the building was asphalt-paved. The ground surface on the east side of the building consisted of sand and gravel. The following description pertains primarily to the east side of the Site.

From the ground surface to approximately 15 feet bgs, the subsurface soil consisted of loose to medium dense, dry to damp, brown, slightly silty fine to medium sand, gravel, (pit run) cobbles and boulders with occasional miscellaneous debris consisting of wiring, bottles, metal conduit, iron piping, concrete sewer pipe and concrete fragments ranging from approximately 12 inches to 3-foot square-shapes. Field screening of this soil did not

yield an oily sheen and no elevated photoionization detector (PID) readings or odors were observed.

From approximately 15 feet bgs to approximately 25 feet bgs, the soil consisted of dense to very dense, gravelly fine to medium sand and/or stiff to hard silt; with a diamicton texture (matrix supported clasts) interpreted as Vashon glacial till (map unit Qvt). Field screening of this soil yielded an oily sheen and odors, though the PID did not register any elevated readings.

From approximately 25 feet to 27 feet, the soil consisted of wet to saturated, dense, silty, fine to medium sand and fine gravels, interpreted as the glacial outwash (map unit Qva). Field screening of this soil did not yield any sheen or odors.

4.2 PETROLEUM-CONTAMINATED SOILS (PCS)

PCS was encountered from approximately 15 feet bgs to approximately 24 feet bgs, and was generally confined within the glacial till.

4.3 GROUNDWATER

During the excavation activities at the Site, groundwater was encountered at an approximate depth of 27 feet bgs. Depth to groundwater in the monitoring wells ranged from 25 to 37 feet bgs (see Section 11 below).

5.0 Cleanup Regulations and PCS Designation

5.1 MTCA CLEANUP REGULATION

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 (Ch 173-340 WAC) 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 COC.

The analytical data for this project are compared to the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340-740, Table 740-1) and MTCA Method A Cleanup Levels for Ground Water (WAC 173-340-720, Table 720-1) and are summarized in Tables 1 and 2, respectively.

5.2 PCS DESIGNATION

During this project, PCS was segregated during excavation into clean and contaminated stockpiles. The two designations are described as follows:

- **Clean/Slightly Petroleum-affected soil:** soil that did or did not exhibit minimal petroleum-like odors and/or did not yield a significant sheen during field screening.

- **PCS**: soil with strong petroleum odors or that produced a moderate to strong sheen during field screening and known to contain concentrations of contaminants of concern exceeding MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses.

During soil excavation, RGI used one or all of the following criteria to classify the PCS:

- **Field Screening Data.** Field screening methods included a portable gas analyzer equipped with a photoionization detector (PID) to determine total volatile organic compounds (TVOCs), and water sheen tests. Water sheen tests were used to evaluate soil quality for the presence of diesel-range and oil-range TPH. Sheen testing proved to be the most useful because the PID did not register any elevated concentrations of airborne VOCs associated with the long chain petroleum hydrocarbons.
- **Offsite Analytical Laboratory.** An offsite analytical laboratory (Friedman & Bruya, Inc. of Seattle, Washington) provided chemical analyses of soil samples. Samples were generally submitted for expedited testing on a same day or with a 24-hour turnaround time.

6.0 Interim and Confirmation Soil Sampling

A total of 10 soil stockpile and over-excavated soil samples and nine confirmation *in-situ* soil samples were collected during this independent cleanup action (Table 1). The stockpile and over-excavated soil samples were collected to document the remedial excavation process and characterize the PCS for offsite disposal. The confirmation *in-situ* soil samples were collected to document soil conditions on the Site following the remedial excavation effort and at the final excavation limits.

Interim soil samples generally had concentrations of the COC at, or above, the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses and were subsequently excavated, transported and properly disposed of off the Site as PCS. However, due to heterogeneity of the soils and heterogeneity of the TPH concentrations within the soil mass, soils with non-detectable concentrations of the COC may have been removed during the excavation activities. Approximate interim and confirmation soil sample locations are shown on the attached Figure 3.

6.1 SAMPLE DESIGNATION NOMENCLATURE

Soil samples were identified by the sequential number and the depth (in feet bgs) as follows:

N, S, W, E = Directional Prefixes within each excavation.

SW = Excavation Sidewall.

B, BOH = Excavation Bottom.

CLN (series #) = “Clean” Stockpile Material, Composite Sample; e.g. CLN-1.

PCS (series #) = “Suspect (or Apparent) Contaminated” Stockpile Material; Composite Sample; e.g. PCS-1.

= Depth in feet bgs.

For example, sample NSW-23 is from the north sidewall at 23 feet bgs. If successive samples were required they were numbered in numeric series. For example B-2-27 would be the second bottom sample collected at a depth of 27 feet bgs.

Stockpile samples were collected as composites and in time-series as work progressed. For example PCS-1 would be the first sample taken from the "contaminated" stockpile; with subsequent samples numbered as: PCS-2, PCS-3.

7.0 Laboratory Analyses

All interim and final confirmation soil and groundwater samples were submitted to Friedman & Bruya, Inc. of Seattle, Washington for chemical testing for the COC in accordance with Ecology's MTCA Required Testing for Petroleum Releases (WAC 173-340, Table 830-1).

Soil and groundwater samples were analyzed using one or more of the following test methods:

- Gasoline-range TPH by Northwest Method NWTPH-Gx.
- Diesel- and heavy oil-range TPH by Northwest Method NWTPH-Dx with silica gel cleanup[1] .
- BTEX using EPA Method 8021B.
- VOC using EPA Test Method 8260.
- Total lead in soil using EPA Test Method 200.8.
- Total and dissolved lead in groundwater using EPA Test Method 6010/7471.

Interim and confirmation soil sample analytical results are discussed below and are summarized in Table 1.

Groundwater sample analytical results, from the initial groundwater monitoring well samples are presented in Table 2.

Analytical laboratory reports have been submitted to Ecology via RGI's ICR dated June 10, 2011 and the quarterly ground water monitoring reports dated September 12, 2011, December 16, 2011 and March 30, 2012.

8.0 Remedial Excavation

Between May 9, 2011, and May 16, 2011, Hos, under contract to BDM and as directed by RGI, excavated a total of 677.98 tons (approximately 484 cubic yards**)** of PCS from the remediation area at the Site, (Figure 2, Figure 3, and Appendix A).

PCS was encountered from approximately 15 feet bgs to approximately 24 feet bgs, generally confined within the glacial till underlying the Site. The excavation was generally centered over the March 2011 soil borings BH-2 and BH-3, which yielded the elevated concentrations of gasoline- and diesel-range TPH during the *Focused Phase II Subsurface Investigation*.

[1] Silica Gel removes biogenic organic materials that can yield false positive results.

The estimated areal extent of the impacted soil was approximately 10 feet by 30 feet. Because of the dimensions of the estimated areal extent of the PCS and the limitations imposed by the size of the trench boxes, the remedial excavation was accomplished by digging two "cells" 12 feet wide by 16 feet long. Hos started to the south (south cell) and completed that excavation before shifting north to complete the north cell. See Appendix A Photographs 1, 4, 6, and 8.

Interim soil and stockpile samples were analyzed for gasoline-, diesel-, and oil-range TPH, BTEX, and total lead. Over-excavated soil samples were collected from the trackhoe bucket and from the stockpiled soils. Clean soils were stockpiled on the southwest corner of the Site (next to the building). PCS was stockpiled at the base of the retaining wall to the northwest of the excavation.

Soils were excavated based on field screening and sample analytical results. Soil sample, ESW-2-22 yielded elevated concentrations above the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses; consequently, additional soil was removed from the east wall of the north half of the remedial excavation (Photograph 8 and 9). In the series of samples collected to characterize the PCS, concentrations of gasoline-range TPH ranged from 14 mg/kg to 260 mg/kg. Diesel-range TPH ranged from 140 mg/kg to 3,700 mg/kg, and oil-range TPH ranged was not detected. BTEX was not detected above (analytical) method detection limits.

Soil samples collected at the excavation limits confirmed that all the PCS had been removed and that the remaining *in-situ* soils contained either non-detectable concentrations of the COCs or concentrations below the MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses. Concentrations of gasoline-range TPH ranged from none-detected to 76 mg/kg, diesel-range TPH ranged from none detected to 1,500 mg/kg, oil-range TPH was not detected, and BETX was not detected. Concentrations of total lead ranged from 1.22 mg/kg to 2.41 mg/kg, below the MTCA Method A Soil Cleanup Level.

Based on the soil confirmation sampling and analytical results, remaining in-situ soils on the Site were brought into compliance with the MTCA Method A Soil Cleanup Standards.

9.0 PCS Volume

A total of 677.98 tons (approximately 484 cubic yards) of PCS-containing TPH concentrations exceeding MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses was transported to Regional Disposal Company/Allied Waste transfer station in Seattle, Washington for disposal at their Washington-licensed landfill. A summary of the truck loads and total quantity of soil disposed of is attached in Appendix D.

The offsite transportation, treatment and recycling of PCS was in accordance with applicable local, state, and federal regulations.

10.0 Infiltration Gallery Installation

On May 6, 2011, Ecology granted BDM authorization to construct an infiltration gallery. The gallery consisted of 30 feet of horizontal four-inch diameter PVC well screen centered in the base of the excavation. The PVC pipe was bedded on and covered by approximately 12 inches of pea gravel. An approximately 26-foot-high riser of four-inch PVC well casing

connects the infiltration gallery to the ground surface (see Figure 7 and Photographs 6, 7, and 8).

After confirming that soil cleanup levels had been met on the bottom of the remedial excavation, a shallow trench was excavated for placement of the infiltration gallery to facilitate communication between groundwater treatment and groundwater.

On May, 20, Marine Vacuum (Mar Vac) of Seattle, Washington pumped approximately 1,200 gallons of water from the infiltration gallery and transported it offsite for treatment and disposal at Mar Vacs' facility in Seattle (Appendix C).

If during groundwater monitoring, contaminated groundwater at concentrations above the MTCA Method A Cleanup Levels for Ground Water persist, then the remediation of the petroleum-impacted groundwater via chemical oxidation will be evaluated. However, the infiltration gallery did not need to be used.

11.0 Groundwater Monitoring Wells and Sampling

12.1 GROUNDWATER MONITORING WELLS

On May 19 and 20, 2011, three groundwater monitoring wells were constructed at the Site. Environmental Drilling, Inc. under subcontract to RGI provided the drilling services. The groundwater monitoring wells were constructed of two-inch-diameter PVC well casings with 10-foot 0.020 slot well screen, finished with flush-mounted surface monuments. The wells were completed at depths ranging from 35 feet to 45 feet bgs. The groundwater monitoring well locations are shown on Figure 2 and Figure 3. The monitoring well as-built diagrams are presented in Appendix B.

Groundwater monitoring well MW-1 was located on the west side of the building adjacent to Aurora Avenue, in the inferred up gradient position on the Site. There were no PID readings and no sheen was observed during field screening. The soil boring was backfilled with #10-20 sand to 45 feet where the ten-foot-long monitoring well screen was installed.

Groundwater monitoring well MW-2 was located on the east side of the building near the southeast corner of the Site. There were no PID readings and no sheen was observed during field screening. The monitoring well was set at 35 feet bgs.

Groundwater monitoring well MW-3 was located near the northeast corner of the Site. There were no PID readings and no sheen was observed during field screening. The monitoring well was set at 35 feet bgs.

12.2 GROUNDWATER SAMPLING

May 2011

- On May 26, 2011 RGI purged, developed and collected groundwater samples from the three newly installed groundwater monitoring wells. This sampling event was the first of four planned, consecutive quarterly groundwater monitoring events.
- Groundwater samples were submitted for chemical testing as noted in Section 7.0 above and are summarized in the attached Table 2 and discussed below.
- Sample MW-1 yielded none detected for gasoline-, diesel-, oil-range TPH, and dissolved lead. Total lead was detected at 48.50 µg/L and chloroform was detected at 15 µg/L.

- Sample MW-2 yielded none detected for gasoline-, diesel-, oil-range TPH, and dissolved lead. Total lead was detected at 59.90 µg/L and and chloroform was detected at 2.4 µg/L.
- Sample MW-3 yielded none detected for gasoline-, diesel-range TPH, and dissolved lead. Total lead was detected at 39.80 µg/L. No VOCs were detected in MW-3.
- Water from the infiltration gallery was checked for visible sheen. No sheen was observed. A sample of this water was submitted for testing for hydrocarbon identification (HCID) with the result that heavy oil was detected. The sample result was subsequently quantified via NWTPH Dx with the result that 460 µg/L (500) oil-range TPH was detected.

August 2011

- On August 23, 2011 RGI collected groundwater samples and found the depth to groundwater as measured with an electronic meter ranged from 29.5 to 39.5 feet below the top of casing (btc). Groundwater gradient was measured at 0.0496 feet/foot towards the east (Figure 4). These measurements are consistent with the previous findings.
- The groundwater samples did not yield any of the contaminants of concern except total lead.
- Total unfiltered lead concentrations ranged from 8.55 mg/L to 56.6 mg/L. Dissolved (filtered) lead concentrations were not detected above the method detection limits.
- The elevated concentration of total lead detected in the unfiltered water samples was due to the presence of sediment in the samples.

November 2011

- On November 30, 2011, the depth to groundwater as measured with an electronic meter ranged from 28.82 to 41.25 feet below the top of casing. Groundwater gradient was measured at 0.0397 foot towards the east (Figure 5). These measurements are consistent with the previous findings.
- The groundwater samples did not yield any of the contaminants of concern, except total lead.
- Total unfiltered lead concentrations ranged from 12.5 mg/L to 37.7 mg/L. Dissolved (filtered) lead concentrations were not detected above the method detection limits.
- The elevated concentration of total lead detected in the unfiltered water samples was due to the presence of sediment in the samples.

March 2012

- On March 21, 2012, depth to groundwater was measured to the nearest hundredth of a foot using an electronic water level meter ranged from 26.90 to 41.18 feet below the top of casing. Groundwater gradient was measured at 0.0377 feet/foot towards the east (Figure 6). These measurements are consistent with the previous findings. These measurements are presented in Table 2.

- Diesel-range and gasoline-range TPH were not detected in any of the three groundwater samples analyzed for this quarter.
- Total unfiltered lead concentrations ranged from 14.1 µg/L to 48.2 µg/L. Dissolved (filtered) lead concentrations were not detected above the method detection limits. The elevated concentration of total lead detected in the unfiltered water samples was due to the presence of suspended sediment in the samples.
- VOCs were not detected in any of the three groundwater samples except for chloroform.
- Chloroform was detected at concentrations ranging from 1.9 µg/L to 6.8 µg/L; the highest concentration was detected in MW-1 and the lowest in MW-2. (MTCA Method B Non-Carcinogenic Cleanup Level is 80 µg/L). The presence of chloroform is generally consistent with leaking municipal water supply lines and/or sewers.

12.0 Conclusions and Recommendations

12.1 SOIL

A total of 677.98 tons (approximately 484 cubic yards) of PCS was excavated and exported from the Site for this independent cleanup action.

Based on the confirmation soil sampling analytical results, the independent cleanup action was successful in bringing all soils on the Site into compliance with the MTCA Method A Cleanup Regulations.

No further soil cleanup is recommended or warranted at this time.

12.2 GROUNDWATER

A total of approximately 1,200 gallons of petroleum-impacted groundwater was removed from the Site on May 20, 2011. The first round of groundwater monitoring (from the infiltration well installed within the remedial excavation and from the other three groundwater monitoring wells) suggest that shallow groundwater has not been impacted by the petroleum release.

The groundwater monitoring results from four consecutive quarters of groundwater sampling did not yield any of the contaminants of concern, except total lead. The elevated concentration of total lead detected in the unfiltered water samples was due to the presence of suspended sediment in the samples. The occurrence of total lead has been consistent throughout the groundwater monitoring and appears to represent naturally occurring background levels in unfiltered turbid water samples.

Four quarters of groundwater monitoring data demonstrate that the quality of groundwater entering the Site from the west is the same as the quality of the groundwater exiting the Site to the east. There has been no adverse impact to groundwater quality as a result of the past releases of petroleum hydrocarbons on the Site.

RGI recommends Ecology grant the Site a No Further Action (NFA) Determination as the results of four consecutive quarters of groundwater monitoring have shown that the groundwater quality is compliant with MTCA.

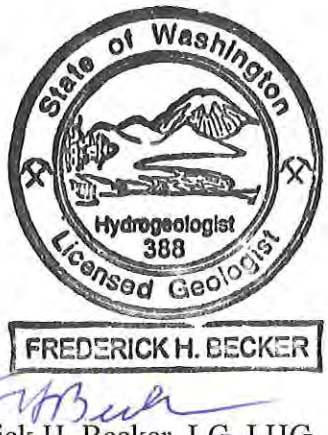
13.0 LIMITATIONS

This report is the property of RGI, BDM Investments LLC., and their authorized representatives 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 intends for specific application to the Barrett Hardware property, 12230 Aurora Avenue North, King County, Seattle, Washington. No other warranty, expressed or implied, is made.

The analyses and recommendations presented in this report are based upon data obtained from our review of available information at the time of preparing this report, our test pits excavated on the Site, or other noted data sources. Conditional changes may occur through time by natural or human-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 RGI's control, may render this report invalid, partially or wholly. If variations appear evident, RGI should be requested to reevaluate the recommendations in this report prior to proceeding with construction.

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

Sincerely,
THE RILEY GROUP, INC.



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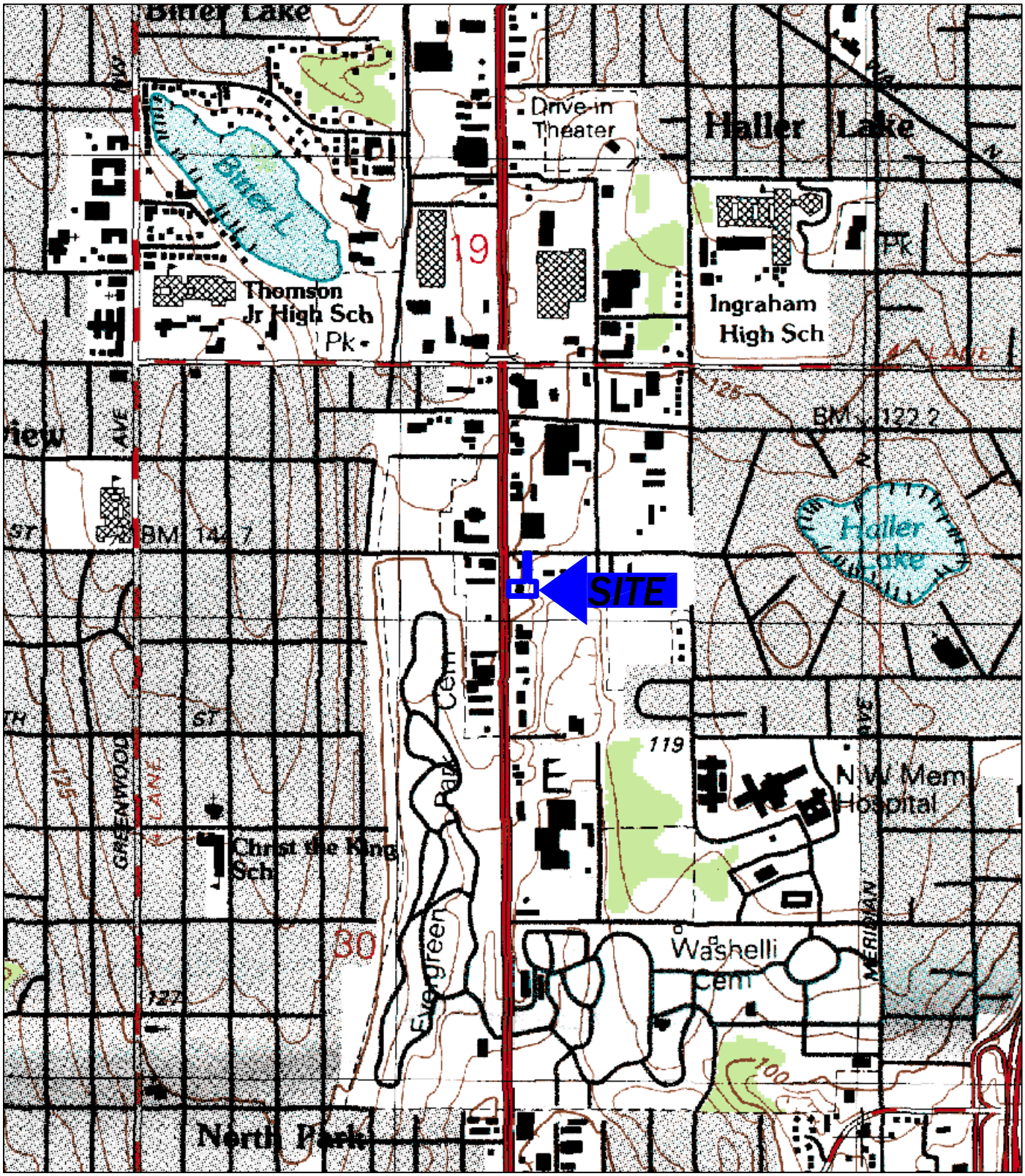
Principal

Report Distribution *Mr. Bob Barrett, (PDF and one bound copy)*
Mr. Dale Myers, one bound copy



USGS, 1979, Seattle North, Washington
7.5-Minute Quadrangle

Approximate Scale: 1"=1000'

0 500 1000 2000

N

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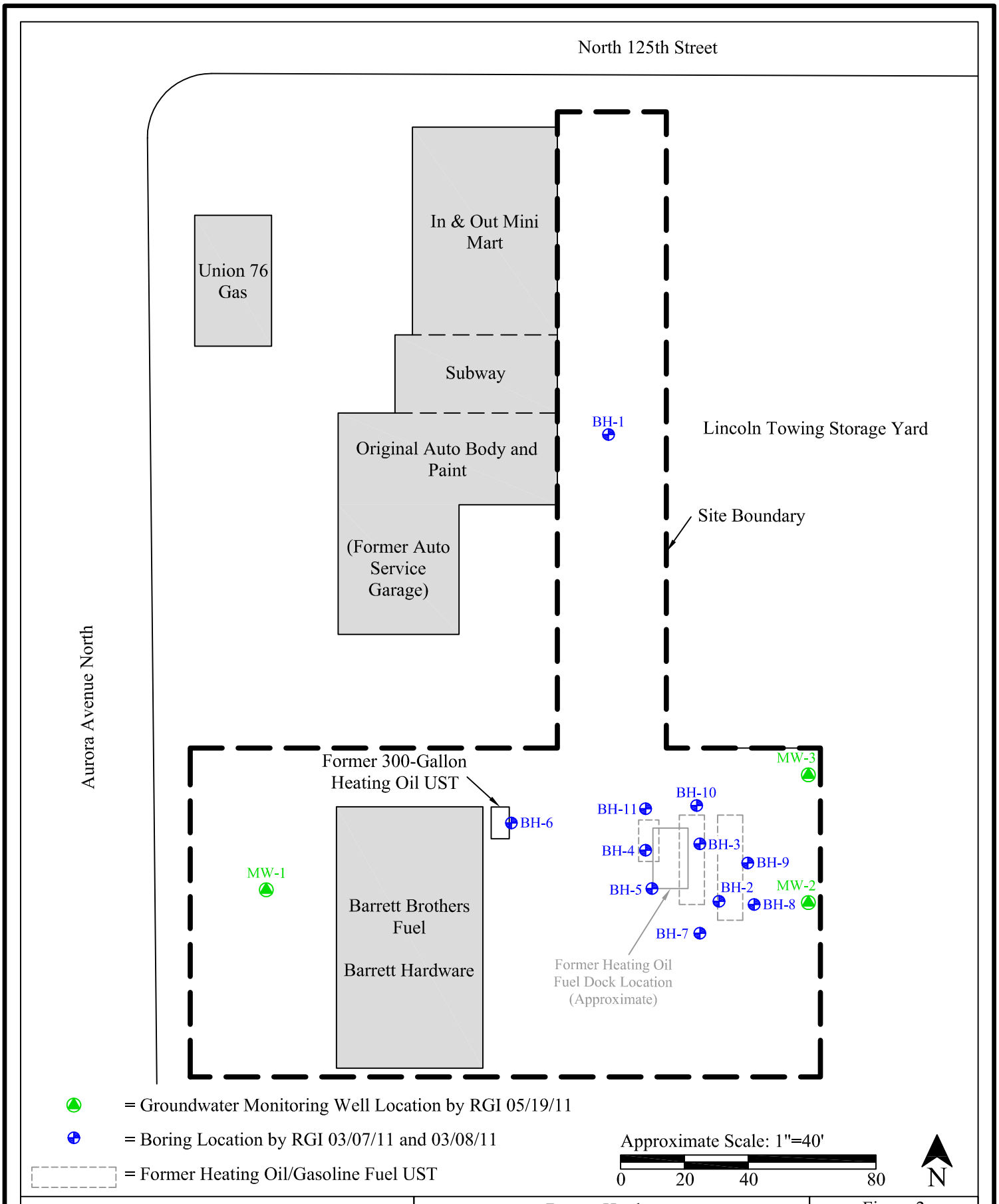
Barrett Hardware		Figure 1
RGI Project Number 2011-087C	Site Vicinity Map	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		



The Riley Group, Inc.
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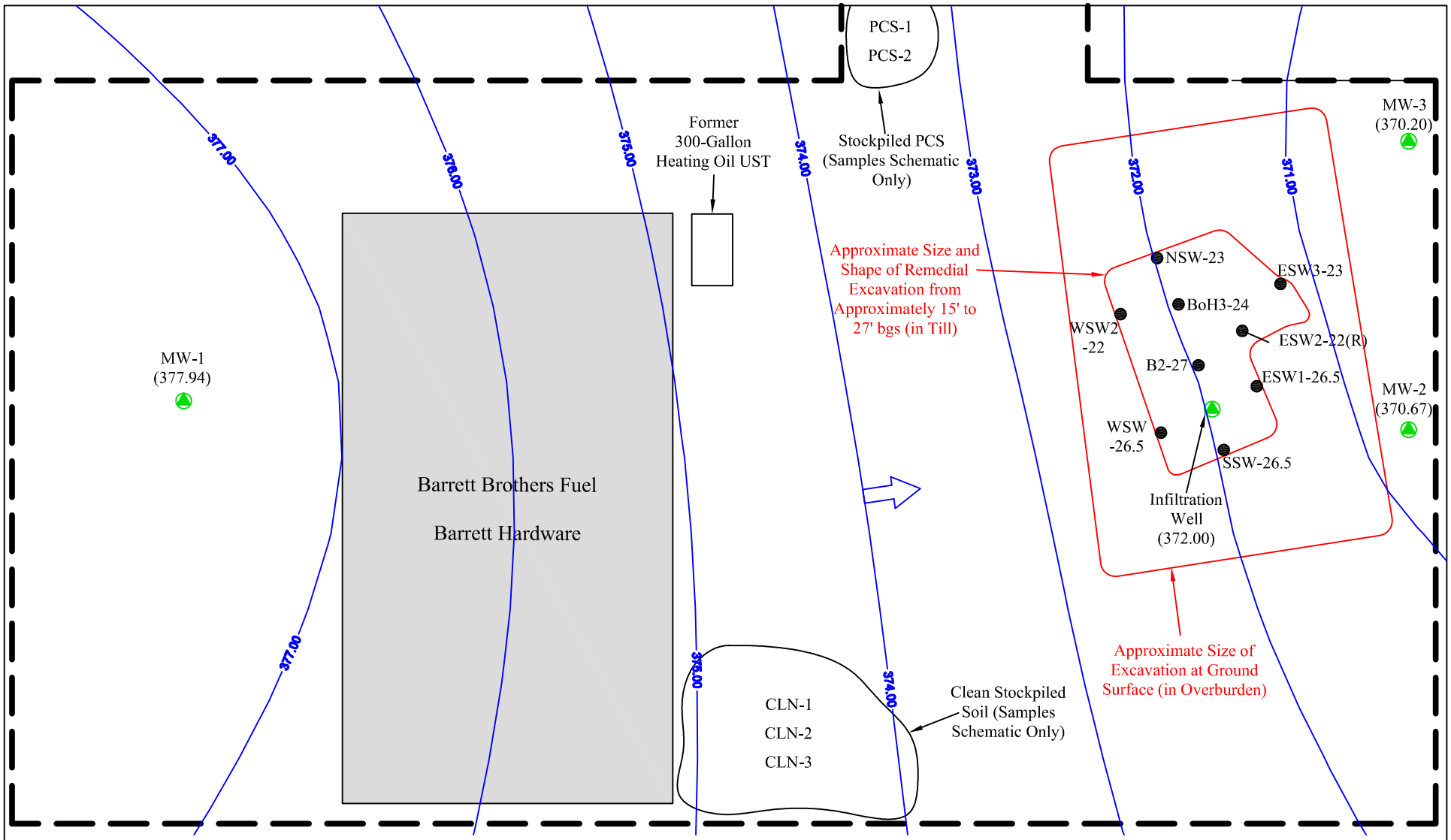
Barrett Hardware		Figure 2
RGI Project Number 2011-087C	Site Plan	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		



–(377.00)– = Groundwater contours generated using Surfer Software (based on Kriging method). Contours based on May 26, 2011 water level measurements.

= Groundwater Flow Direction

= Groundwater Monitoring Well Location by RGI 05/19/11

= Confirmation Soil Sample Location

(R) = Removed

Approximate Scale: 1"=20'

0 10 20 40

N

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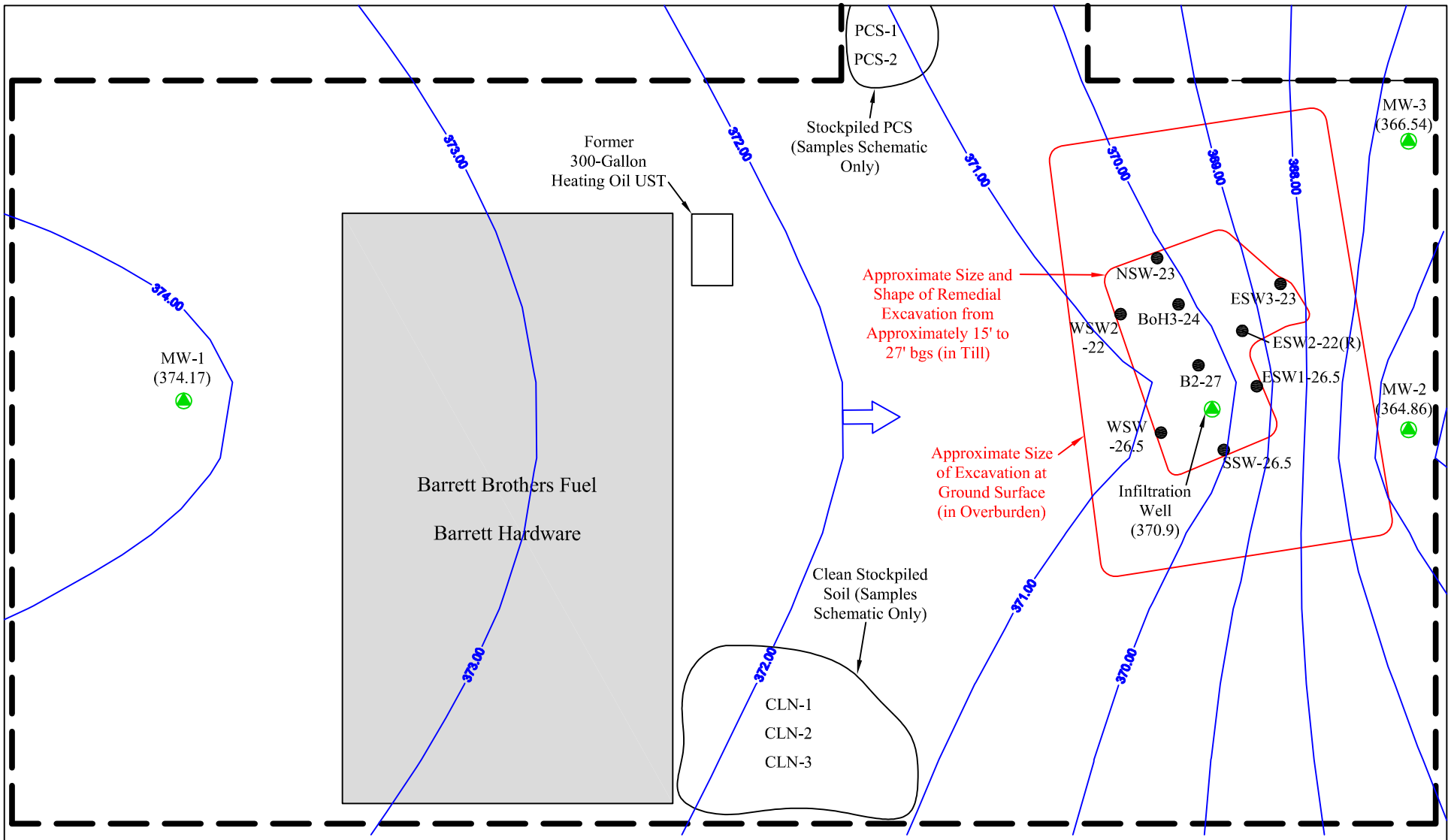
Barrett Hardware		Figure 3
RGI Project Number 2011-087C	Remedial Excavation	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		



–(377.00)– = Groundwater contours generated using Surfer Software (based on Kriging method). Contours based on November 30, 2011 water level measurements.

= Groundwater Flow Direction

= Groundwater Monitoring Well Location by RGI 05/19/11

= Confirmation Soil Sample Location

(R) = Removed

Approximate Scale: 1"=20'

0 10 20 40

N

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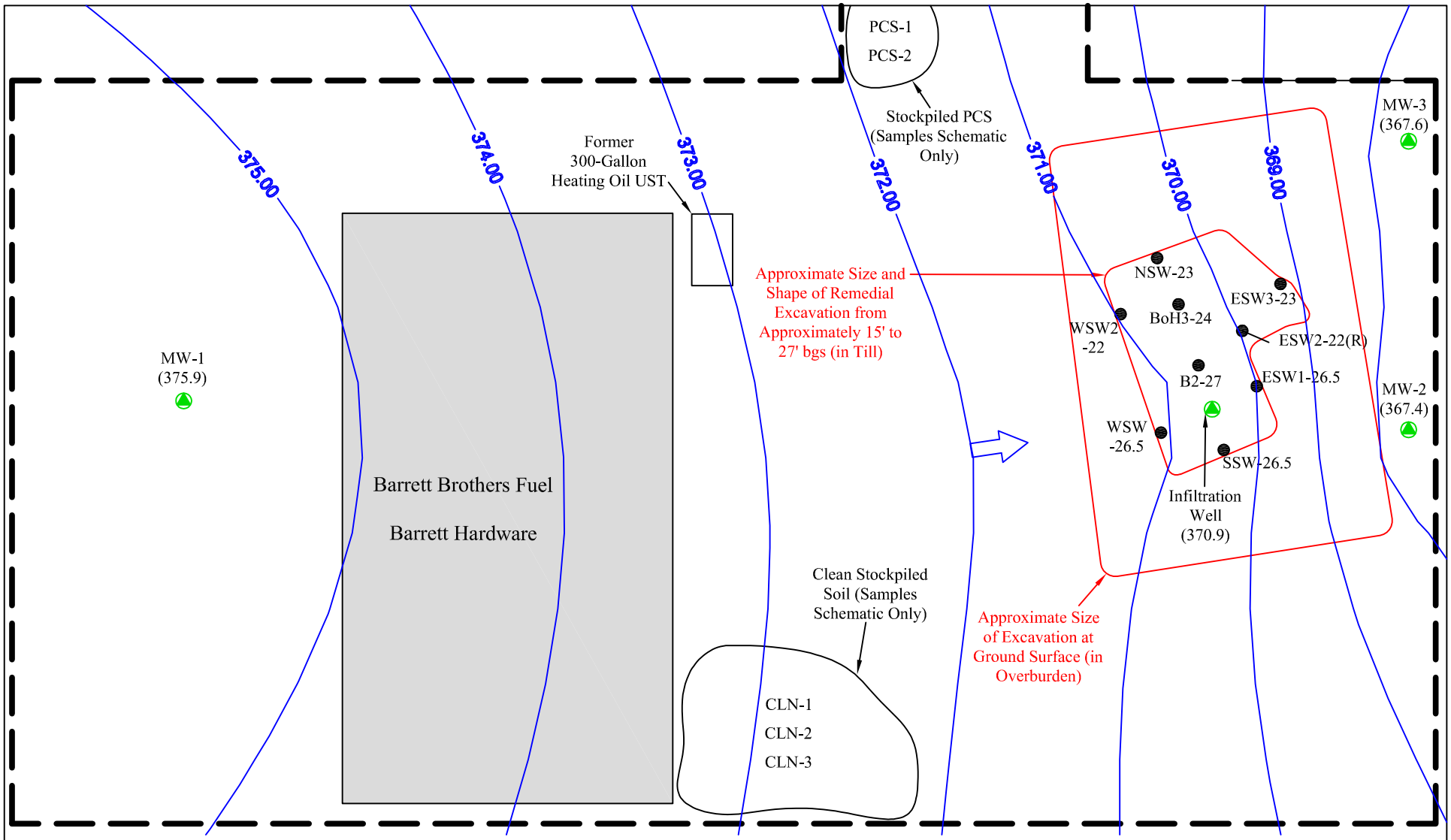
United Fuel Company		Figure 4
RGI Project Number 2011-087C	Site Plan with Groundwater Contours August 2011	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		



–(377.00)– = Groundwater contours generated using Surfer Software (based on Kriging method). Contours based on August 23, 2011 water level measurements.

= Groundwater Flow Direction

= Groundwater Monitoring Well Location by RGI 05/19/11

= Confirmation Soil Sample Location

(R) = Removed

Approximate Scale: 1"=20'

0 10 20 40

N

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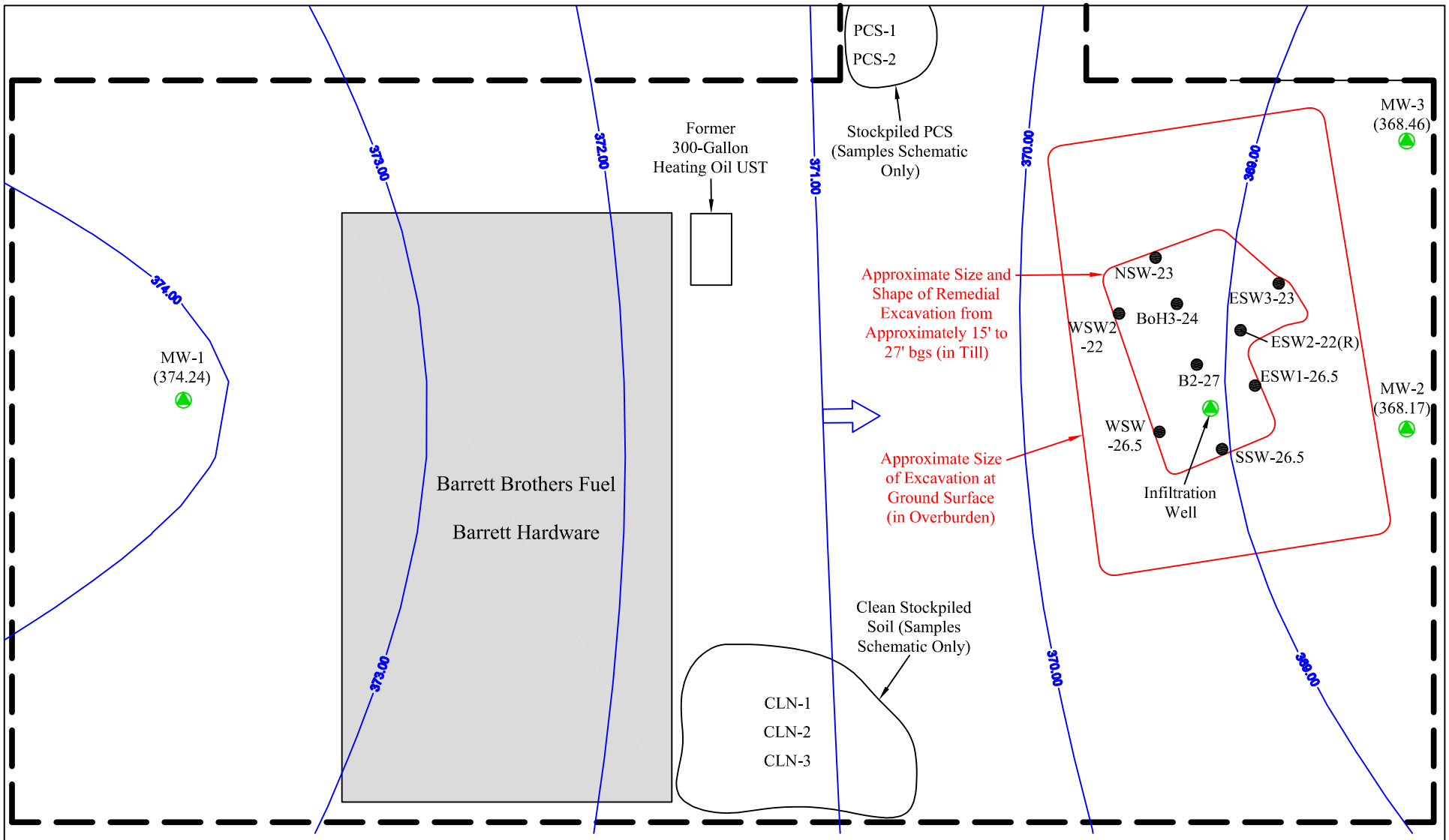
United Fuel Company		Figure 5
RGI Project Number 2011-087C	Site Plan with Groundwater Contours November 2011	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		



–(374.00)– = Groundwater contours generated using Surfer Software (based on Kriging method). Contours based on March 21, 2012 water level measurements.

= Groundwater Flow Direction

= Groundwater Monitoring Well Location by RGI 05/19/11

= Confirmation Soil Sample Location

(R) = Removed

Approximate Scale: 1"=20'

0 10 20 40

N

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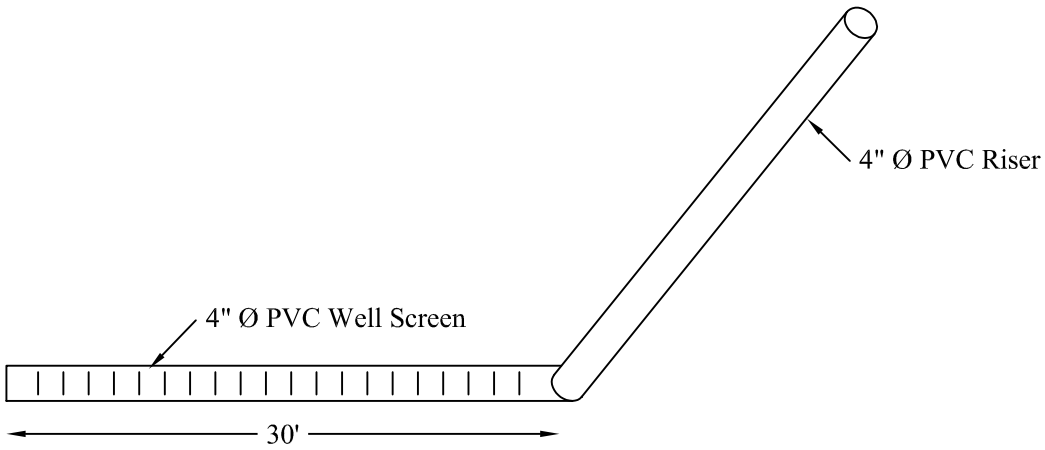
United Fuel Company		Figure 6
RGI Project Number 2011-087C	Site Plan with Groundwater Contours March 2012	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		



Specifications:

- 3' bentonite seal from 12" to 4' bgs
- Flush mounted surface monument cemented in place
- 4" Ø riser of schedule 40 PVC
- Horizontal component - schedule 40 PVC well screen 30' long with end cap

Not to Scale

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Barrett Hardware		Figure 7
RGI Project Number 2011-087C	Infiltration Gallery Schematic	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Table 1. Summary of Soil Sample Analytical Laboratory Results
Barrett Hardware
12230 Aurora Avenue North, Seattle, Washington 98133
The Riley Group, Inc. Project No. 2011-087C

Sample Number	Sample Depth	Sample Date	Gas TPH	BTEX				Diesel TPH	Oil TPH	HCID			Total Lead
				B	T	E	X			Gasoline	Diesel	Heavy Oil	
Stockpile and Over-excavated Samples													
PCS-1	na	05/10/11	14	ND<0.02	ND<0.02	ND<0.02	ND<0.06	140	ND<250	----	----	----	1.48
PCS-2	na	05/10/11	----	----	----	----	----	----	----	----	----	----	----
PCS-3	na	05/10/11	**140**	ND<0.1	ND<0.1	ND<0.1	ND<0.3	1,600	ND<250	----	----	----	2.41
PCS-4	na	05/11/11	**260**	ND<0.2	ND<0.2	ND<0.2	ND<0.6	**3,400**	ND<250	----	----	----	----
PCS-5	na	05/12/11	49	ND<0.02	ND<0.02	ND<0.02	ND<0.06	770	ND<250	----	----	----	----
PCS-7	na	05/13/11	**160**	ND<0.1	ND<0.1	ND<0.1	ND<0.3	**2,900**	ND<250	----	----	----	----
CLN-1	na	05/12/11	----	----	----	----	----	----	----	ND<20	ND<50	ND<250	----
CLN-2	na	05/12/11	----	----	----	----	----	170	ND<250	ND<20	D>50	ND<250	----
CLN-3	na	05/12/11	----	----	----	----	----	ND<50	ND<250	ND<20	D>50	ND<250	----
ESW-2-22	22	05/12/11	**210**	ND<0.2	ND<0.2	ND<0.2	ND<0.6	**3,700**	ND<250	----	----	----	1.62
Confirmation Samples													
WSW1-26.5	26.5	05/11/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	----
SSW-26.5	26.5	05/11/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	----
ESW1-26.5	26.5	05/11/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	----
B1-27	27	05/11/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	----
B2-27	27	05/11/11	16	ND<0.02	ND<0.02	ND<0.02	ND<0.06	1,500	ND<250	----	----	----	----
WSW-2-22	22	05/12/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	1.54
Bot-3-24	24	05/12/11	76	ND<0.02	ND<0.02	ND<0.02	ND<0.06	260	ND<250	----	----	----	1.22
NSW-23	23	05/12/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	1.55
ESW-3	23	05/16/11	ND<2	ND<0.02	ND<0.02	ND<0.02	ND<0.06	ND<50	ND<250	----	----	----	----
MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses			**100/30[1]**	**0.03**	**7**	**6**	**9**	**2,000**	**2,000**	**100/30[1]**	**2,000**	**2,000**	**250**

All results and detection limits are given in mg/kg; equivalent to parts per million (ppm).

Sample Depth = Soil sample depth interval in feet below ground surface (bgs).

TPH = total petroleum hydrocarbons.

Gasoline-range TPH determined using Ecology Test Method NWTPH Gx.

BTEX (benzene, toluene, ethylbenzene, and xylenes) determined using EPA Test Method 8021B.

Diesel- and Oil-range TPH determined using Ecology Test Method NWTPH Dx with silica gel cleanup.

HCID = hydrocarbon identification determined using Ecology Test Method NWTPH-HCID.

Total lead determined using EPA Method 200.8.

ND = Not Detected at noted analytical detection limit.

---- = Not analyzed or not applicable.

[1] The higher cleanup level is allowed if no benzene is detected in the sample and the total of toluene, ethylbenzene and xylenes is less than MTCA Cleanup Level, Ecology's Model Toxics Control Act Method A Soil Cleanup Levels for Unrestricted Land Uses (WAC 173-340-

Bold and yellow highlighted results indicate concentrations (if any) that exceed MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses.

Table 2. Summary of Groundwater Sample Results
United Fuel Company (Barrett Hardware)
12230 Aurora Avenue North, Seattle, Washington 98133
The Riley Group, Inc. Project No. 2011-087C

Sample Number	Sample Date	TOC Elevation	Depth to Water (below TOC)	Groundwater Elevation	Gas TPH	Diesel TPH	Oil TPH	HCID			Total Lead[3]	Dissolved Lead	VOCs
								Gasoline	Diesel	Heavy Oil			
MW-1													
MW-1	03/21/12	415.42	41.18	374.24	ND<100	ND<50	ND<250	----	----	----	**47.4**	ND<1	Chloroform = 6.8
MW-1	11/30/11	415.42	41.25	374.17	ND<100	ND<50	ND<250	----	----	----	14	ND<1	Chloroform = 7.4
MW-1	08/23/11	415.42	39.5	375.9	ND<100	ND<50	ND<250	----	----	----	8.55	ND<1	Chloroform = 11
MW-1	05/26/11	415.42	37.48	377.94	ND<100	ND<50	ND<250	----	----	----	**48.5**	ND<1	Chloroform = 15
MW-2													
MW-2	03/21/12	395.37	27.20	368.17	ND<100	ND<50	ND<250	----	----	----	14.1	ND<1	Chloroform = 1.9
MW-2	11/30/11	395.37	30.51	364.86	ND<100	ND<50	ND<250	----	----	----	**37.7**	ND<1	Chloroform = 4.2
MW-2	08/23/11	395.37	28.0	367.4	ND<100	ND<50	ND<250	----	----	----	**34.0**	ND<1	Chloroform = 4.3
MW-2	05/26/11	395.37	24.70	370.67	ND<100	ND<50	ND<250	----	----	----	**59.9**	ND<1	Chloroform = 2.4
MW-3													
MW-3	03/21/12	394.96	26.50	368.46	ND<100	ND<50	ND<250	----	----	----	**48.2**	ND<1	Chloroform = 4.1
MW-3	11/30/11	394.96	28.42	366.54	ND<100	ND<50	ND<250	----	----	----	12.5	ND<1	Chloroform = 5.1
MW-3	08/23/11	394.96	27.4	367.6	ND<100	ND<50	ND<250	----	----	----	**56.6**	ND<1	Chloroform = 4.5
MW-3	05/26/11	394.96	24.76	370.20	ND<100	ND<50	ND<250	----	----	----	**39.8**	ND<1	Chloroform = 2.2
Infiltration Well													
Infiltration	08/23/11	396.92	dry	----	----	----	----	----	----	----	----	----	----
Infiltration Well	05/26/11	396.92	24.92	372.00	----	150 x	460	ND<200	ND<500	D>500	----	----	----
MTCA Method A Cleanup Levels for Ground Water					**800/1,000[1]**	**500**	**500**	**800/1,000[1]**	**500**	**500**	**15**	**15**	**Chloroform = 80[2]**

Unless otherwise noted, all analytical results are given in micrograms per liter (ug/L), equivalent to parts per billion (ppb).

Samples collected by RGI field staff using a peristaltic pump under low-flow conditions.

TOC = top of casing.

Gasoline-range TPH determined using Ecology Test Method NWTPH Gx.

Diesel-and oil-range TPH determined using Ecology Test Method NWTPH Dx with silica gel cleanup.

HCID =(hydrocarbon identification) gasoline, diesel, and oil determined using Ecology Test Method NWTPH-HCID.

Total and dissolved lead determined using EPA Test Method 200.8.

VOCs = volatile organic compounds determined using EPA Test Method 8260C.

ND = Not detected at noted analytical detection limit.

---- = Not analyzed or not applicable.

[1] The higher cleanup level is applicable if no benzene is detected in groundwater.

[2] Method A Cleanup Level was not available. Therefore, the MTCA Method B Non-Carcinogenic Cleanup Level is referenced.

[3] Total Lead appears to be naturally occurring background levels.

x = The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

Model Toxics Control Act Method A Cleanup Levels for Ground Water (WAC 173-340-900, Table 720-1).

Bold and yellow highlighted results indicate concentrations (if any) that exceed MTCA Method A Cleanup Levels for Ground Water.

Photograph 1: May 10, 2011 - Looking southwest at the southern half of the excavation. Note the pipe in the sidewall that was related to the UST system.

Photograph 2: May 11, 2011 - Loading PCS.

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Barrett Hardware		Figure A-1
RGI Project Number 2011-087C	Site Photographs	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Photograph 3: May 12, 2011 - Looking south across the remedial excavation. The north cell excavation has been started.

Photograph 4: May 12, 2011 - Looking southwest as the excavation of the north cell is reaching approximately 25 feet bgs.

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Barrett Hardware		Figure A-2
RGI Project Number 2011-087C	Site Photographs	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Photograph 5: May 12, 2011 - View north-northeast as the north cell is started.

Photograph 6: May 13, 2011 - Looking south across the remedial excavation with shoring and stand pipe in place.

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Barrett Hardware		Figure A-3
RGI Project Number 2011-087C	Site Photographs	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Photograph 7: May 13, 2011 - Vertical riser has been placed on the groundwater remediation system.

Photograph 8: May 16, 2011 - Looking southeast, photograph showing the final shape of the remedial excavation.

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Barrett Hardware		Figure A-4
RGI Project Number 2011-087C	Site Photographs	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Photograph 9: May 16, 2011 - Looking south, photograph showing the final shape of the remedial excavation.

Photograph 10: May 16, 2011 - Looking northeast during the backfilling with in-situ overburden.

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Barrett Hardware		Figure A-5
RGI Project Number 2011-087C	Site Photographs	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Photograph 11: May 17, 2011 - Looking southwest across the excavation as it is being backfilled.

Photograph 12: May 17, 2011 - View northeast across the excavation as backfill proceeds.

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Barrett Hardware		Figure A-6
RGI Project Number 2011-087C	Site Photographs	Date Drawn: 05/2012
Address: 12230 Aurora Avenue North, Seattle, Washington 98133		

Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring/Well No.: MW-1
Sheet 1 of 2

Date(s) Drilled: **May 19, 2011**	Logged By: **FB**	Surface Conditions: **Asphalt**
Drilling Method(s): **Hollow Stem Auger**	Drill Bit Size/Type: **n/a**	Total Depth of Borehole: **53 feet bgs**
Drill Rig Type: **Truck Mounted**	Drilling Contractor: **EDI**	Approximate Surface Elevation: **415.42 feet AMSL**
Groundwater Level and Date Measured: **47.5 feet bgs**	Sampling Method(s): **SPT**	Hammer Data : **140 lb, 30 in drop, auto trip**
Borehole Backfill: **Monitoring Well**	Location: **12230 Aurora Avenue North, Seattle, Washington 98133**	

Elevation (feet)	Depth (feet)	Sample Type	Sample ID	Sampling Resistance, blows/ft	PID Reading, ppm	Recovery (%)	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
415.42	0						Asphalt		Asphalt		Concrete
							SP		Brown to tan, fine to medium SAND with fine to coarse, rounded gravel, dry		Bentonite
410.42	5										Blank 2" PVC
			1	2	0.0		SP		Tan, fine SAND, very loose, no odor		
405.42	10								Cobbly		
			2	38	0.0		SP		Tan, medium SAND with gravel, coarse sand and fine gravel lenses, dense, damp (glacial till)		
400.42	15										
			3	92	0.0		SP		Tan, slightly gravelly, fine SAND, very dense, dry		
395.42	20										
			4	30/6"	0.0		SP		Tan, fine SAND with fine gravel, very dense, dry		
390.42	25										
			5	91	0.0						
385.42	30										

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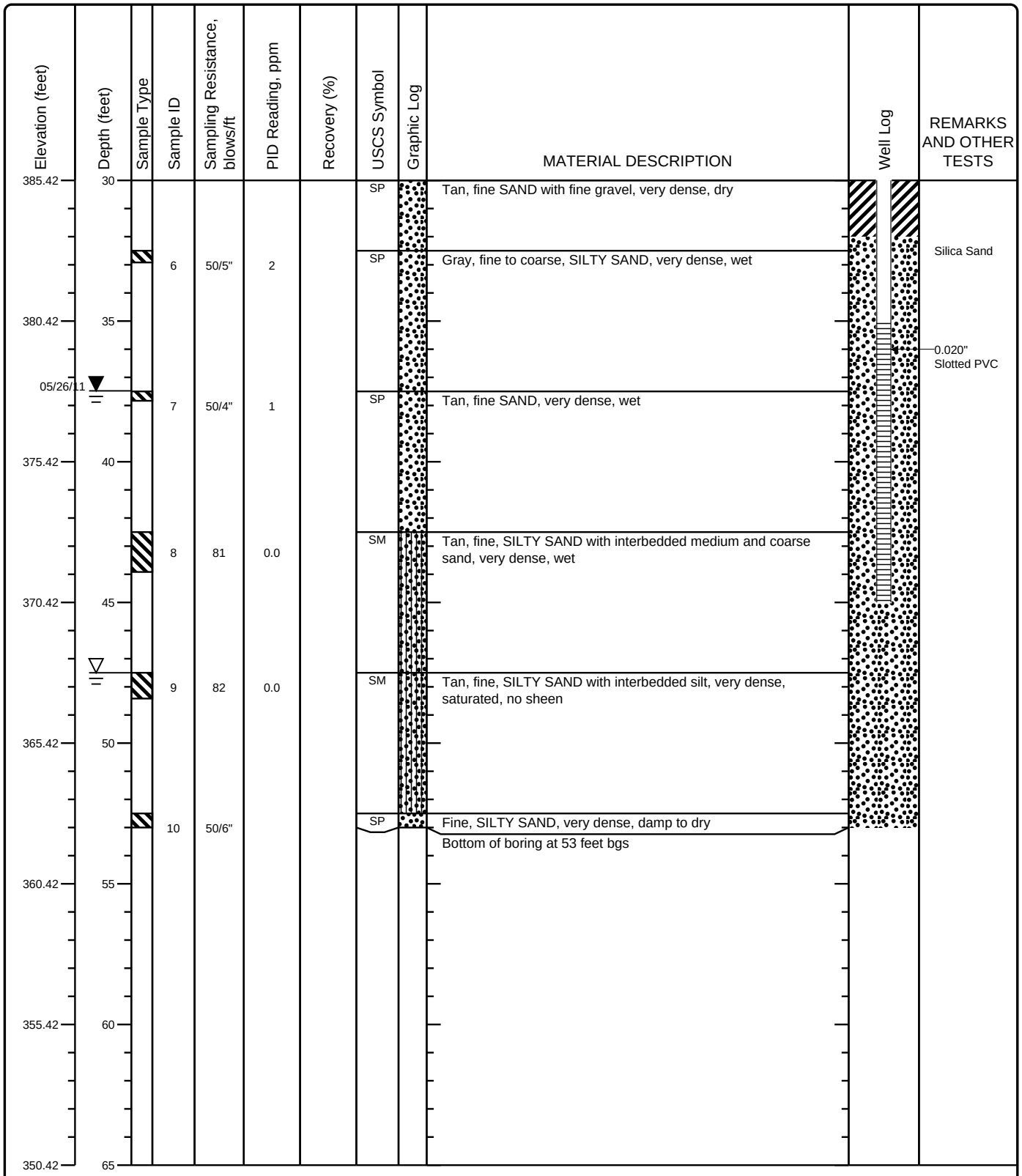
Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring/Well No.: MW-1
Sheet 2 of 2



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Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring/Well No.: MW-2
Sheet 1 of 2

Date(s) Drilled: **May 19, 2011**	Logged By: **FB**	Surface Conditions: **Soil**
Drilling Method(s): **Hollow Stem Auger**	Drill Bit Size/Type: **n/a**	Total Depth of Borehole: **35 feet bgs**
Drill Rig Type: **Truck Mounted**	Drilling Contractor: **EDI**	Approximate Surface Elevation: **395.37 feet AMSL**
Groundwater Level and Date Measured: **27.5 feet bgs**	Sampling Method(s): **SPT**	Hammer Data : **140 lb, 30 in drop, auto trip**
Borehole Backfill: **Monitoring Well**	Location: **12230 Aurora Avenue North, Seattle, Washington 98133**	

Elevation (feet)	Depth (feet)	Sample Type	Sample ID	Sampling Resistance, blows/ft	PID Reading, ppm	Recovery (%)	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
395.37	0						SP		Brown, fine to medium SAND, damp		Concrete
											Bentonite
390.37	5										Blank 2" PVC
			1	93	0.0		SM		Tan, fine to medium, slightly SILTY SAND with coarse sand and fine gravel, very dense, damp (diamicton texture 8.5 - 9 feet bgs) (glacial till)		
385.37	10										
			2	83	0.0						
380.37	15										
			3	50/5"	0.0				Cobbly		
375.37	20										
			4	50/6"	0.0						Silica Sand
370.37	25										0.020" Slotted PVC
			5	50/3"	0.0		SP		Gray, medium to coarse SAND with fine gravel (coarse sand and fine gravel first 6"), saturated, no sheen (advance sand)		
365.37	30										

05/26/11

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Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring/Well No.: MW-2

Sheet 2 of 2

Elevation (feet)	Depth (feet)	Sample Type	Sample ID	Sampling Resistance, blows/ft	PID Reading, ppm	Recovery (%)	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
365.37	30						SP		Gray, medium to coarse SAND with fine gravel (coarse sand and fine gravel first 6"), saturated, no sheen (advance sand)		
			6	36	0.0		SP		Gray and tan, fine SAND with lenses of coarse sand, dense, saturated		
360.37	35								Bottom of boring at 35 feet bgs		
355.37	40										
350.37	45										
345.37	50										
340.37	55										
335.37	60										
330.37	65										

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Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring/Well No.: MW-3
Sheet 1 of 2

Date(s) Drilled: **May 19, 2011**	Logged By: **FB**	Surface Conditions: **Soil**
Drilling Method(s): **Hollow Stem Auger**	Drill Bit Size/Type: **n/a**	Total Depth of Borehole: **35 feet bgs**
Drill Rig Type: **Truck Mounted**	Drilling Contractor: **EDI**	Approximate Surface Elevation: **394.96 feet AMSL**
Groundwater Level and Date Measured: **27.5 feet bgs**	Sampling Method(s): **SPT**	Hammer Data : **140 lb, 30 in drop, auto trip**
Borehole Backfill: **Monitoring Well**	Location: **12230 Aurora Avenue North, Seattle, Washington 98133**	

Elevation (feet)	Depth (feet)	Sample Type	Sample ID	Sampling Resistance, blows/ft	PID Reading, ppm	Recovery (%)	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
394.96	0						SP		Brown, gravelly SAND with chunks of concrete, wire and miscellaneous metal debris		Concrete
											Bentonite
389.96	5										Blank 2" PVC
			1	50/5"	0.0		SP		Tan, fine SAND with fine gravel, very dense, dry (glacial till)		
384.96	10										
			2	56	0.0		SP		Tan, fine SAND with fine gravel, very dense, wet		
379.96	15										
			3	50/6"	0.0						
374.96	20										Silica Sand
			4	50/5"	0.0		SP		Interbedded fine SAND and medium to coarse SAND with gravel, very dense, damp to wet (advance sand)		
369.96	25										0.020" Slotted PVC
			5	50/5"	0.0		SP		Brown, medium SAND with fine gravel, very dense, saturated, no sheen, no odor		
364.96	30										

05/26/11

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1838 South Washington Street, Kennewick, WA 99337

Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring/Well No.: MW-3
Sheet 2 of 2

Elevation (feet)	Depth (feet)	Sample Type	Sample ID	Sampling Resistance, blows/ft	PID Reading, ppm	Recovery (%)	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	Well Log	REMARKS AND OTHER TESTS
364.96	30						SP		Brown, medium SAND with fine gravel, very dense, saturated, no sheen, no odor		
			6	50/2"	0.0		SP		Gray, gravelly, fine to coarse SAND, very dense, saturated, no sheen		
359.96	35								Bottom of boring at 35 feet bgs		
354.96	40										
349.96	45										
344.96	50										
339.96	55										
334.96	60										
329.96	65										

The Riley Group, Inc.
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711 St. Helens Avenue, Tacoma, WA 98402
1838 South Washington Street, Kennewick, WA 99337

Project Name: Barrett Hardware
Project Number: 2011-087C
Client: BDM Investments LLC

Boring Log Key
Sheet 1 of 1

1 Elevation (feet)	2 Depth (feet)	3 Sample Type	4 Sample ID	5 Sampling Resistance, blows/ft	6 PID Reading, ppm	7 Recovery (%)	8 USCS Symbol	9 Graphic Log	10 MATERIAL DESCRIPTION	11 Well Log	12 REMARKS AND OTHER TESTS

COLUMN DESCRIPTIONS

1. Elevation (feet): Elevation (MSL, feet).
2. Depth (feet): Depth in feet below the ground surface.
3. Sample Type: Type of soil sample collected at the depth interval shown.
4. Sample ID: Sample identification number.
5. Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
6. PID Reading, ppm: The reading from a photo-ionization detector, in parts per million.
7. Recovery (%): Core Recovery Percentage is determined based on a ratio of the length of core sample recovered compared to the cored interval length.
8. USCS Symbol: USCS symbol of the subsurface material.
9. Graphic Log: Graphic depiction of the subsurface material encountered.
10. MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
11. Well Log: Graphical representation of well installed upon completion of drilling and sampling.
12. REMARKS AND OTHER TESTS: Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

MATERIAL GRAPHIC SYMBOLS


Asphaltic Concrete (AC)


Bentonite


Portland Cement Concrete


Silty SAND (SM)


Poorly graded SAND (SP)

TYPICAL SAMPLER GRAPHIC SYMBOLS


Shelby Tube (Thin-walled, fixed head)


Auger sampler


Bulk Sample


3-inch-OD California w/ brass rings


CME Sampler


Continuous Core Sampler


Grab Sample


2.5-inch-OD Modified California w/ brass liners


Pitcher Sample


2-inch-OD unlined split spoon (SPT)


Shelby Tube (Thin-walled, fixed head)

OTHER GRAPHIC SYMBOLS


Water level (at time of drilling, ATD)


Water level (after waiting)


Minor change in material properties within a stratum


Inferred/gradational contact between strata

Queried contact between strata

GENERAL NOTES

1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

The Riley Group, Inc.
17522 Bothell Way NE, Bothell, WA 98011
711 St. Helens Avenue, Tacoma, WA 98402
1838 South Washington Street, Kennewick, WA 99337

Activity By Job ID

Report period May 2011

REGIONAL DISPOSAL INTERMODAL

Job ID: **LW-11196** 11,255 **Hos Brothers**

Date	Ticket #	truck	Container		Material Code/Desc	Gross	Tare	Net	Tons	Origin
5/11/11	9:01 am 411,723	SOIL		74	SW-CONT SOIL W/F	54,700	29,580	25,120	12.56	SEATTLE/KING
5/11/11	9:11 am 411,728	SOIL		74	SW-CONT SOIL W/F	55,900	27,640	28,260	14.13	SEATTLE/KING
5/11/11	9:15 am 411,729	SOIL		74	SW-CONT SOIL W/F	56,600	27,940	28,660	14.33	SEATTLE/KING
5/11/11	10:15 an 411,763	SOIL		74	SW-CONT SOIL W/F	57,540	29,920	27,620	13.81	SEATTLE/KING
5/11/11	10:34 an 411,783	SOIL		74	SW-CONT SOIL W/F	54,360	27,600	26,760	13.38	SEATTLE/KING
5/11/11	10:35 an 411,782	SOIL		74	SW-CONT SOIL W/F	55,480	27,360	28,120	14.06	SEATTLE/KING
5/11/11	11:19 an 411,815	SOIL		74	SW-CONT SOIL W/F	59,380	29,720	29,660	14.83	SEATTLE/KING
5/11/11	11:41 an 411,844	SOIL		74	SW-CONT SOIL W/F	55,660	27,440	28,220	14.11	SEATTLE/KING
5/11/11	12:11 pn 411,846	SOIL		74	SW-CONT SOIL W/F	54,940	27,580	27,360	13.68	SEATTLE/KING
5/11/11	12:27 pn 411,915	SOIL		74	SW-CONT SOIL W/F	56,220	30,560	25,660	12.83	SEATTLE/KING
5/11/11	1:22 pm 411,901	SOIL		74	SW-CONT SOIL W/F	56,280	27,660	28,620	14.31	SEATTLE/KING
5/11/11	1:22 pm 411,904	SOIL		74	SW-CONT SOIL W/F	54,560	27,600	26,960	13.48	SEATTLE/KING
5/11/11	1:44 pm 411,916	SOIL		74	SW-CONT SOIL W/F	57,780	30,560	27,220	13.61	SEATTLE/KING
5/11/11	2:31 pm 411,950	SOIL		74	SW-CONT SOIL W/F	55,980	27,620	28,360	14.18	SEATTLE/KING
5/11/11	2:42 pm 411,962	SOIL		74	SW-CONT SOIL W/F	56,060	30,620	25,440	12.72	SEATTLE/KING
5/12/11	7:52 am 412,085	SOIL		74	SW-CONT SOIL W/F	55,280	29,220	26,060	13.03	SEATTLE/KING
5/12/11	8:01 am 412,089	SOIL		74	SW-CONT SOIL W/F	54,660	28,160	26,500	13.25	SEATTLE/KING
5/12/11	8:15 am 412,090	SOIL		74	SW-CONT SOIL W/F	57,280	30,400	26,880	13.44	SEATTLE/KING
5/12/11	8:52 am 412,103	SOIL		74	SW-CONT SOIL W/F	53,780	28,800	24,980	12.49	SEATTLE/KING
5/12/11	9:11 am 412,111	SOIL		74	SW-CONT SOIL W/F	55,940	27,500	28,440	14.22	SEATTLE/KING
5/12/11	9:18 am 412,116	SOIL		74	SW-CONT SOIL W/F	53,180	30,660	22,520	11.26	SEATTLE/KING
5/12/11	9:55 am 412,130	SOIL		74	SW-CONT SOIL W/F	54,840	28,900	25,940	12.97	SEATTLE/KING
5/12/11	10:17 an 412,143	SOIL		74	SW-CONT SOIL W/F	53,500	27,540	25,960	12.98	SEATTLE/KING
5/12/11	10:58 an 412,170	SOIL		74	SW-CONT SOIL W/F	53,940	29,060	24,880	12.44	SEATTLE/KING
5/12/11	12:25 pn 412,230	SOIL		74	SW-CONT SOIL W/F	56,920	28,940	27,980	13.99	SEATTLE/KING
5/12/11	1:21 pm 412,256	SOIL		74	SW-CONT SOIL W/F	57,720	29,020	28,700	14.35	SEATTLE/KING
5/12/11	2:11 pm 412,282	SOIL		74	SW-CONT SOIL W/F	53,400	29,100	24,300	12.15	SEATTLE/KING

Activity By Job ID

Report period May 2011

REGIONAL DISPOSAL INTERMODAL

5/13/11	8:00 am	412,440	SOIL	74	SW-CONT SOIL W/F	51,980	29,160	22,820	11.41	SEATTLE/KING
5/13/11	8:05 am	412,439	SOIL	74	SW-CONT SOIL W/F	48,940	27,040	21,900	10.95	SEATTLE/KING
5/13/11	8:47 am	412,446	SOIL	74	SW-CONT SOIL W/F	52,360	29,320	23,040	11.52	SEATTLE/KING
5/13/11	8:53 am	412,448	SOIL	74	SW-CONT SOIL W/F	51,280	27,700	23,580	11.79	SEATTLE/KING
5/13/11	9:14 am	412,458	SOIL	74	SW-CONT SOIL W/F	49,900	29,200	20,700	10.35	SEATTLE/KING
5/13/11	9:20 am	412,462	SOIL	74	SW-CONT SOIL W/F	50,380	26,960	23,420	11.71	SEATTLE/KING
5/13/11	9:56 am	412,480	SOIL	74	SW-CONT SOIL W/F	52,160	27,620	24,540	12.27	SEATTLE/KING
5/13/11	10:24 an	412,499	SOIL	74	SW-CONT SOIL W/F	50,280	27,020	23,260	11.63	SEATTLE/KING
5/13/11	10:24 an	412,498	SOIL	74	SW-CONT SOIL W/F	51,840	29,780	22,060	11.03	SEATTLE/KING
5/13/11	10:53 an	412,514	SOIL	74	SW-CONT SOIL W/F	49,340	27,560	21,780	10.89	SEATTLE/KING
5/13/11	11:17 an	412,530	SOIL	74	SW-CONT SOIL W/F	53,080	29,280	23,800	11.90	SEATTLE/KING
5/13/11	11:24 an	412,540	SOIL	74	SW-CONT SOIL W/F	50,600	26,940	23,660	11.83	SEATTLE/KING
5/13/11	12:42 pn	412,584	SOIL	74	SW-CONT SOIL W/F	54,860	29,220	25,640	12.82	SEATTLE/KING
5/13/11	12:57 pn	412,594	SOIL	74	SW-CONT SOIL W/F	51,760	27,540	24,220	12.11	SEATTLE/KING
5/13/11	1:42 pm	412,632	SOIL	74	SW-CONT SOIL W/F	54,600	29,260	25,340	12.67	SEATTLE/KING
5/13/11	1:42 pm	412,634	SOIL	74	SW-CONT SOIL W/F	50,860	26,940	23,920	11.96	SEATTLE/KING
5/16/11	7:40 am	412,893	SOIL	74	SW-CONT SOIL W/F	56,080	29,740	26,340	13.17	SEATTLE/KING
5/16/11	8:35 am	412,906	SOIL	74	SW-CONT SOIL W/F	54,420	29,940	24,480	12.24	SEATTLE/KING
5/16/11	9:28 am	412,920	SOIL	74	SW-CONT SOIL W/F	55,400	30,040	25,360	12.68	SEATTLE/KING
5/16/11	9:31 am	412,924	SOIL	74	SW-CONT SOIL W/F	55,860	28,080	27,780	13.89	SEATTLE/KING
5/16/11	10:21 an	412,944	SOIL	74	SW-CONT SOIL W/F	57,060	30,180	26,880	13.44	SEATTLE/KING
5/16/11	10:24 an	412,946	SOIL	74	SW-CONT SOIL W/F	56,960	27,700	29,260	14.63	SEATTLE/KING
5/16/11	11:20 an	412,988	SOIL	74	SW-CONT SOIL W/F	56,120	27,560	28,560	14.28	SEATTLE/KING
5/16/11	12:10 pn	413,024	SOIL	74	SW-CONT SOIL W/F	57,740	30,040	27,700	13.85	SEATTLE/KING
5/16/11	12:29 pn	413,040	SOIL	74	SW-CONT SOIL W/F	56,620	27,520	29,100	14.55	SEATTLE/KING
5/16/11	1:02 pm	413,060	SOIL	74	SW-CONT SOIL W/F	41,760	30,120	11,640	5.82	SEATTLE/KING

Total For Job **LW-11196** **53** Loads **677.98** TN

Activity By Job ID

Report period May 2011

REGIONAL DISPOSAL INTERMODAL

Grand Total	53 Loads	**677.98** TN

This Memorandum is an acknowledgment that a Bill of Lading has been issued and is not Original Bill of Lading, nor a copy or duplicate, covering the property named herein, and is intended solely for filing or record.

Shipper No. 08084

Carrier No. _____

Page _____ of _____

MARINE VACUUM SERVICE INC.
(Name of carrier) (SCAC)

Date 5-20-11

On Collect on Delivery shipments, the letters "COD" must appear before consignee's name or as otherwise provided in Item 430, Sec.1.

TO:
Consignee MARINE VACUUM SERVICE INC.
Street 1516 S. GRAHAM ST.
City SEATTLE State, WA Zip Code 98108

FROM:
Shipper RILEY GROUP
Street 12230 AURORA N.
City Seattle State Wa. Zip Code 98133
24 hr. Emergency Contact Tel. No. 800-540-7491

Route

Vehicle Number 25

No. of Units & Container Type	HM	BASIC DESCRIPTION Proper Shipping Name, Hazard Class UN or NA Number, Packing Group or UN or NA Number, Proper Shipping Name, Hazard Class, Packing Group	TOTAL QUANTITY (Weight, Volume, Gallons, etc.)	WEIGHT (Subject to Correction)	RATE	CHARGES (For Carrier Use Only)
LTT		NON REGULATED				
		Waste Water	1200	gals.		

PLACARDS TENDERED: YES ☐ NO ☐

Note — (1) Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property, as follows: "The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____."
(2) Where the applicable tariff provisions specify a limitation of the carrier's liability absent a release or a value declaration by the shipper and the shipper does not release the carrier's liability or declare a value, the carrier's liability shall be limited to the extent provided by such provisions. See NMFC Item 172.
(3) Commodities requiring special or additional care or attention in handling or stowing must be so marked and packaged as to ensure safe transportation. See Section 2(e) of item 360, Bills of Lading, Freight Bills and Statements of Charges and Section 1(a) of the Contract Terms and Conditions for a list of such articles.

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

_____ Signature

REMIT C.O.D. TO:
ADDRESS

COD Amt: $

C.O.D. FEE: PREPAID ☐ COLLECT ☐ $

Subject to Section 7 of the conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement:
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

_____ (Signature of Consignor)

TOTAL CHARGES $

FREIGHT CHARGES
FREIGHT PREPAID except when box at right is checked ☐ Check box if charges are to be collect

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated above which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of, said property over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the bill of lading terms and conditions in the governing classification on the date of shipment.
Shipper hereby certifies that he is familiar with all the lading terms and conditions in the governing classification and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

SHIPPER RILEY GROUP
PER X

CARRIER MARINE VACUUM SERVICE INC.
PER Rick Woolsey
DATE 5-20-11

4

Permanent post-office address of shipper.