

**ENVIRONMENTAL  
ASSOCIATES, INC.**

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NW 2701  
N. Woodinville  
Woodinville. 195LLC

RECEIVED

FEB 20 2013

DEPT OF ECOLOGY  
TCP - NWRO

April 7, 2010

JN-28260-2

North Woodinville 195, LLC  
c/o Mr. Chris Fusetti  
Sierra Construction  
19900 - 144<sup>th</sup> Avenue NE  
Woodinville, Washington 98072

Subject: **Interim Summary of Groundwater Monitoring  
Former Woodinville Auto Auction Site  
13820 NE 195<sup>th</sup> Street  
Woodinville, Washington**

Dear Mr. Fusetti:

Environmental Associates, Inc (EAI) has completed three (3) of five (5) proposed rounds of groundwater sampling and laboratory testing at the subject property. This work has been performed in accordance with our March 17, 2009 dated proposal (PR-28260-2), and with subsequent amendments requested by the client. The following report provides a brief summary of EAI's work completed to date. Additional reports and status letters will follow as agreed to by the client.

**Background**

On February 12, 2009, Environmental Associates, Inc. (EAI) presented North Woodinville 195, LLC (NWLLC) with a report summarizing the findings of a UST Removal and Independent Cleanup Action performed at the subject property. In that effort, EAI observed the removal of four (4) underground storage tanks (USTs), approximately 475-tons of "Class 3" petroleum impacted soils, and 12,000-gallons of petroleum impacted groundwater. Analysis of confirmation samples collected in conjunction with that effort indicated regulated petroleum hydrocarbon concentrations remained in soil and groundwater at, and beyond the limits of the remedial excavation. The full extent of the impacts has not been determined.



entered  
CP  
3-20-13

At the conclusion of excavation and remedial activities, six (6) separate sections of slotted and/or perforated 2"-diameter PVC piping were installed in the subsurface at locations noted on Plate 4 in conjunction with site restoration. These various sections of piping were installed to provide a means to sample groundwater, and to facilitate application of Oxygen Releasing Compound (ORC) or other products to enhance degradation of remaining subsurface contaminants (if desired).

In accordance with WDOE guidelines pertaining to UST closure "Site Assessments," a copy of our February dated report was forwarded to the WDOE. The property, under the name North Woodinville 195, LLC, is listed as a UST site and assigned a Facility ID number (#1947253). Based on information available from online WDOE resources, the property has apparently not yet been designated as a LUST site.

This current effort (groundwater sampling and ORC applications) has been undertaken in an effort to further document subsurface environmental conditions at the subject property and to attempt to assist in addressing remaining contamination.

#### **Groundwater Sampling/Oxygen Releasing Compound (ORC) Applications**

As stated above, in conjunction with site restoration six (6) separate sections of 2-inch diameter slotted PVC piping were installed on the subject property. These include the installation of two (2) approximately 35-foot horizontal runs of pipe in the remedial excavation, and four (4) vertical stand-pipes installed in the four test pits. All six (6) installations were brought to grade using at least 12" of 2"-diameter PVC pipe, and protected by traffic grade monument boxes placed in a concrete surround. For additional details regarding the construction of this piping network, the reader of this report is referred to our February 12, 2009 report. On April 7, 2009, the six (6) segments of piping were surveyed, and the first groundwater level measurements and samples were taken. Since that time, two additional rounds of sampling and testing (7/9/09 & 2/10/10) along with two applications of ORC (8/26/09 & 2/10/10) have occurred at the site.

Seasonal variations in depth to water on the order of approximately 1- to 2-feet have been encountered. With one exception (TP4 on 7/9/09), groundwater has been consistently encountered in all of the vertical stand-pipes. The first occurrence of groundwater in piping installed within the limits of the remedial excavation occurred during our February 2010 sampling event. In that February sampling, depths to groundwater ranged from 2.17- to 3.5-feet below the ground surface (see Table 1 - Water Table Survey). Based on the water table survey, local groundwater flow direction on the southwest corner of the subject property appears to be generally to the southwest. As the depths to water measured in the two horizontal pipe segments do not represent the water elevations at discreet locations, these data points were not used in generating water table contours.

A low-flow micro-purging technique relying on a peristaltic pump was used to collect groundwater samples. Water discharged from the pump was sent directly to a "flow-through" cell to allow various water quality parameters to be monitored in "real time." Once select parameters (pH, conductivity, temperature) stabilized, the parameters were documented (see Table 3 - General Water

Quality Parameters) and representative samples were pumped directly from the pump into laboratory prepared glassware.

The recovered groundwater samples were submitted to the project laboratory to be analyzed for gasoline, BTEX (benzene, toluene, ethylbenzene, xylene), diesel, and heavy oil range total petroleum hydrocarbons (TPH) by Washington State Department of Ecology test methods NWTPH-G/BTEX and NWTPH-Dx. Due to potential "interferences" noted by the project laboratory, a silica gel cleanup was used in conjunction with the NWTPH-Dx analysis.

Referring to Table 2, two (2) of the recovered groundwater samples collected during the two (2) previous rounds of sampling contained contaminants of concern (COC) above WDOE Method-A target compliance levels for unrestricted land use. These contaminants were diesel contained in the sample from TP3 on July 9, 2009, (760-parts per billion (ppb)), and benzene contained in the sample collected from TP4 on February 3, 2010 (6-ppb). All other detected COC's were present at concentrations below (i.e. compliant with) MTCA A cleanup levels.

As previously stated, two (2) applications of ORC have occurred at the subject property. The first ORC treatment occurred on August 26, 2009, and included all of the onsite test pits. After EAI completed sample collection on February 10, 2010, a second ORC treatment was performed. During this second treatment, the largest amount of ORC was added to locations with the lowest measure dissolved oxygen (DO) levels. No ORC was added to the infiltration galleries during this second application. In both cases, the ORC was mixed with tap water obtained from the Woodinville Water District, poured into the onsite test-pits and/or infiltration galleries, and further back-flushed with tap water to aid in the propagation of the ORC in the subsurface environment. To date, a total of 200-pound of ORC have added to the subsurface at the subject property.

To inform the reader, ORC (oxygen releasing compound) is used to supply oxygen so microbes present in the subsurface environment can consume petroleum hydrocarbons. Prior to application of the ORC compound in August of 2009, DO had not been detected in groundwater at the site. Measurements of groundwater quality taken during the two previous sampling events suggest the ORC applications have measurably influenced DO levels at the site, with DO detected at all of the monitoring points during our February sampling. In general, higher DO levels were found to correlate with more positive "oxidation-reduction potentials (ORP)" (i.e. more oxidative environment). An inverse relationship was also apparent between these parameters (DO & ORP) and diesel concentrations (i.e. lower DO & ORP were higher diesel concentrations are present). Together, these readings/measurements suggest the ORC is present in, and having an effect on subsurface environmental conditions.

### **Summary/Conclusions**

- Two applications of ORC have occurred at the site. Since those applications, contaminant concentrations in groundwater have been compliant with MTCA A cleanup standards with one exception. That exception was a detection of benzene in TP4 at a concentration slightly above (6-ppb) MTCA A cleanup standards (5-ppb).
- Comparing field measurements of DO, ORP to the results of laboratory testing suggests the applied ORC is present and active in the subsurface environment at the site.
- Additional ORC was added to the site upon completion of groundwater sampling on 2/10/10. This application focused on the TP1, TP2, TP3, and TP4, with higher relative quantities of ORC added to those locations where lower DO levels were measured.

Since the time of onsite tank removal, significant improvements in groundwater quality have been detected at the locations sampled. While one analyte (benzene) was present at a concentration slightly above MTCA A standards during our most recent sampling, the subsequent addition of ORC may yield a further reduction in contaminant levels. EAI recommends continued groundwater sampling and testing to document residual petroleum concentrations, along with both DO and ORP levels.

In keeping with the current work plan for the site, future monitoring would involve sampling and testing groundwater from the same locations that ORC treatments occur. Sample collection would continue to be limited by the occurrence of retrievable groundwater at any given location. Assuming six (6) samples were retrievable and analyzed during each follow-on round of testing, monitoring of groundwater quality parameters (i.e. pH, DO, ORP, etc.) continued, and a brief summary report was provided after each sampling event, costs per sampling would be approximately \$2,200. If additional groundwater monitoring wells should be required, quotes obtained by EAI provide an estimated driller cost of \$3,600 to install three wells. Costs for our (EAI) time would be in addition to that estimate, and is estimated to range from approximately \$3,200 to \$3,500 depending on the selected sampling regime.

Should pursuit of a WDOE granted "No Further Action (NFA)" determination be desired, it would be beneficial to consider consultation with WDOE representatives regarding the current sampling and testing regime, and what additional information/methodology (if any) they would need before such a determination was granted. Such conversations would most appropriately occur prior to the installation of any additional wells or other subsurface probing at the subject property.

### **Limitations**

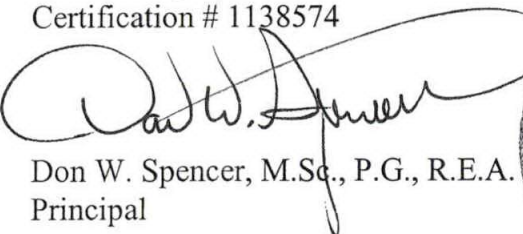
This report has been prepared for the exclusive use of the North Woodinville 195, LLC,, along with its several representatives for specific application to this site for specific application to this site. Our work for this project was conducted in a manner consistent with that level of care and skill normally

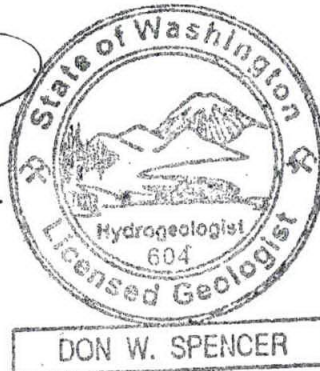
exercised by members of the environmental science profession currently practicing under similar conditions in the area, and in accordance with the terms and conditions set forth in our proposal dated March 17, 2009 and subsequently amended by the client. The opinions expressed in this report are based upon interpretations, observations and testing made at separated sampling locations and conditions may vary between those locations or other locations or depths. No other warranty, expressed or implied, is made. If new information is developed in future site work that may include excavations, borings, studies, etc., Environmental Associates, Inc., must be retained to reevaluate the conclusions of this report and to provide amendments as required.

We appreciate the opportunity to be of service on this assignment. If you have any questions or if we may be of additional service, please do not hesitate to contact us.

  
Derek B. Pulvino  
Project Manager - Environmental Scientist

WDOE Registered Site Assessor  
Certification # 1138574

  
Don W. Spencer, M.Sc., P.G., R.E.A.  
Principal



License: 604 (Washington)  
License: 11464 (Oregon)  
License: 876 (California)  
License: 5195 (Illinois)  
License: 0327 (Mississippi)

#### **Attachments**

Table 1 - Water Table Survey  
Table 2 - Petroleum Hydrocarbons - Groundwater Sampling Results  
Table 3 - General Water Quality Parameters

Plate 1 - Vicinity Map  
Plate 2 - Topographic Map  
Plate 3 - Site Plan  
Plate 4 - Detailed Site Plan

Appendix-A Laboratory Reports

<b>TABLE 1</b> <b>Water Table Survey</b> <b>(feet)</b>				
Monitoring Point	TOC Elevation	Depth to Water Below TOC	Net Change	Elevation of Water Table
<b>East Infiltration</b> 4/9/09 7/9/09 2/10/10	90.00	No Water (>4.12) No Water (>4.12) 3.5	-- -- --	-- -- 86.50
<b>West Infiltration</b> 4/9/09 7/9/09 2/10/10	89.32	No Water (>3.76) No Water (>3.76) 2.80	-- -- --	-- -- 86.52
<b>TP-1</b> 4/9/09 7/9/09 2/10/10	87.26	1.98 3.50 2.40	-- -1.52 1.10	85.28 83.76 84.86
<b>TP-2</b> 4/9/09 7/9/09 2/10/10	87.88	2.23 3.44 2.17	-- -1.21 1.27	85.65 84.44 85.71
<b>TP-3</b> 4/9/09 7/9/09 2/10/10	86.54	1.85 3.80 2.73	-- -1.95 1.07	84.69 82.74 83.81
<b>TP-4</b> 4/9/09 7/9/09 2/10/10	87.16	2.32 No Water 2.6	-- -- --	84.84 -- 84.56
<b>Notes:</b> (1) TOC. Top of casing elevation. (2) Elevations based upon assigning the ground surface in the vicinity of the East Infiltration point an approximate elevation of 90.00 feet above sea-level.				

**TABLE 2 - Petroleum Hydrocarbons - Groundwater Sampling Results**  
**All results and limits in parts per billion (ppb)**

Monitoring Point	Gasoline (TPH)	Diesel (TPH)	Heavy Oil (TPH)	Benzene	Toluene	Ethylbenzene	Total Xylenes
<b>East Infiltration</b> Apr-09 (Not Sampled, Dry) 7/9/2009 (Not Sampled, Dry) February 3, 2010	NA NA <100	NA NA <50*	NA NA <250	NA NA <1	NA NA <1	NA NA <1	NA NA <3
<b>West Infiltration</b> Apr-09 (Not Sampled, Dry) 7/9/2009 (Not Sampled, Dry) February 10, 2010	NA NA <100	NA NA <50	NA NA <250	NA NA <1	NA NA <1	NA NA <1	NA NA <3
<b>TP-1</b> April 9, 2009 July 9, 2009 February 3, 2010	<100 120 100	93* 230* 240*	<250 <250 <250	1 <1 <1	<1 <1 <1	<1 <1 <1	<3 <3 <3
<b>TP-2</b> April 9, 2009 July 9, 2009 February 3, 2010	<100 160 <100	<50* 190* <50*	<250 <250 <250	<1 <1 <1	<1 <1 <1	<1 <1 <1	<3 <3 <3
<b>TP-3</b> April 9, 2009 July 9, 2009 February 3, 2010	<100 120 <100	83* <b>760*</b> 52*	<250 470 <250	<1 <1 <1	<1 <1 <1	<1 <1 <1	<3 <3 <3
<b>TP-4</b> April 9, 2009 7/9/2009 (Not Sampled, Dry) February 3, 2010	<100 NA 220	<50* NA 290*	<250 NA <250	<1 NA <b>6</b>	<1 NA <1	2 NA 6	<3 NA <3
Reporting Limit <sup>3</sup>	100	50	250	1	1	1	3
<b>MTCA-Method-A Cleanup Levels<sup>4</sup></b>	<b>800 or 1000<sup>5</sup></b>	<b>500</b>	<b>500</b>	<b>5</b>	<b>1000</b>	<b>700</b>	<b>1000</b>

## Notes:

- 1 - "ND" denotes analyte not detected at or above listed Reporting Limit.
- 2 - "NA" denotes sample not analyzed for specific analyte.
- 3 - "Reporting Limit" represents the laboratory lower quantitation limit.
- 4 - Method A groundwater cleanup levels as published in the Model Toxics Control Act (MTCA) 173-340-WAC.
- 5 - The MTCA gasoline TPH cleanup level is 800 ppb for groundwater with benzene. Otherwise, the cleanup level is 1000 ppb.
- 6 - The project laboratory reports that "the pattern of peaks present is not indicative of diesel." The detected concentration is likely "carry over" from the gasoline range.
- \* - Sample analyzed for diesel and heavy oil range petroleum compounds using "silica gel cleanup" methodology.

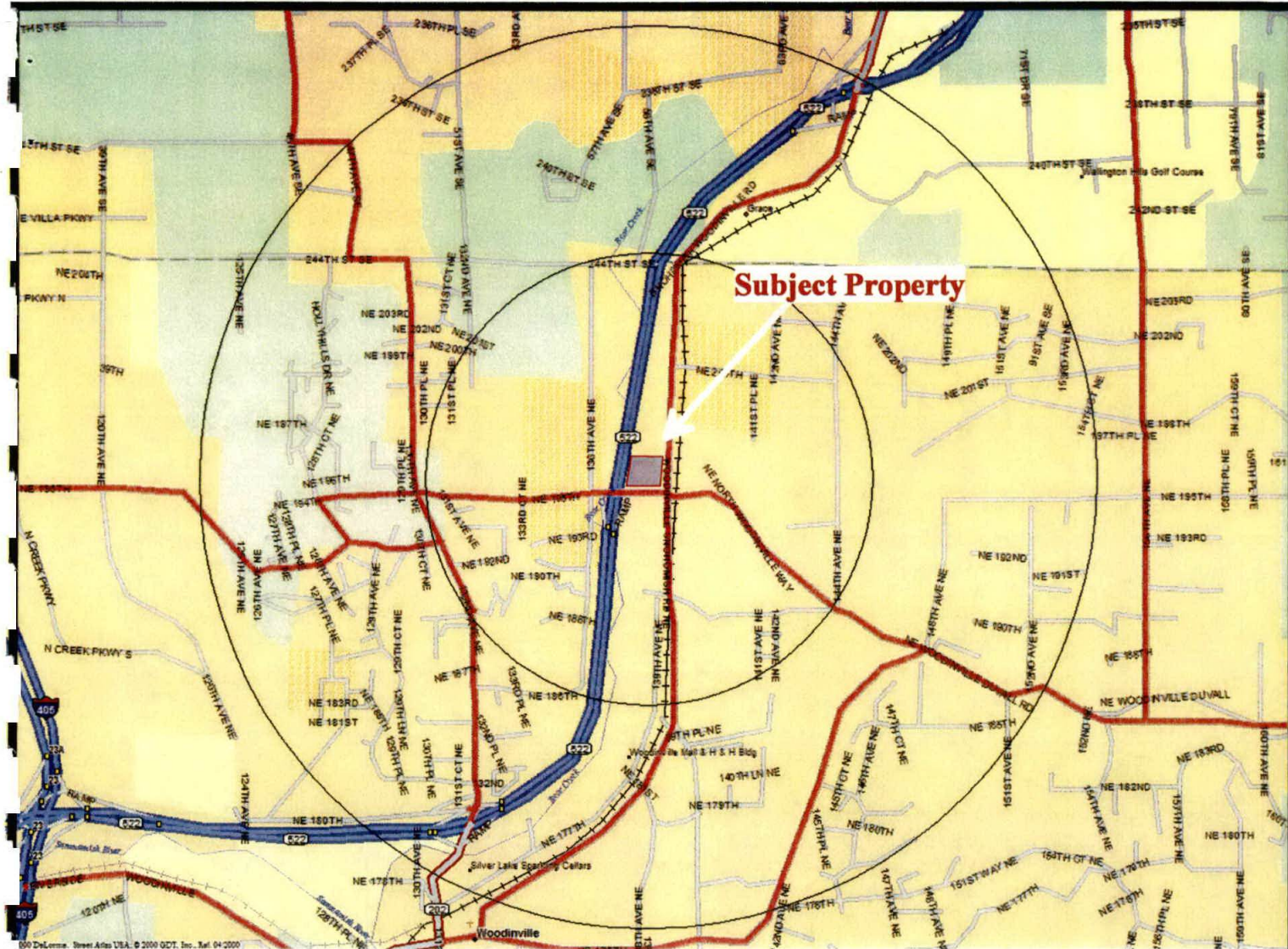
Bold and Italics denotes concentrations above existing or proposed MTCA Method A groundwater cleanup levels.



**TABLE 3 - General Water Quality Parameters  
Readings Taken at Time of Sampling**

Monitoring Point	pH	Conductivity mS/m	Temperature (Celsius)	Oxidation- Reduction Potential mV	Turbidity NTU	Dissolved Oxygen mg/L	Total Dissolved Solids g/L
<b>East Infiltration</b> April 7, 2009 (Not Sampled, Dry) July 9, 09 (Not Sampled, Dry) February 3, 2010	NA NA 6.19	NA NA 22.8	NA NA 9.7	NA NA +199	NA NA Not Measured	NA NA 2.98	NA NA 0.15
<b>West Infiltration</b> April 7, 2009 (Not Sampled, Dry) July 9, 2009 (Not Sampled, Dry) February 3, 2010	NA NA 10.35	NA NA 35.9	NA NA 9.2	NA NA +124	NA NA Not Measured	NA NA 16.59	NA NA 0.23
<b>TP-1</b> April 7, 2009 July 9, 2009 February 3, 2010	6.57 5.71 6.75	35.4 35.11 38.0	10.8 23.4 9.0	+28 +47 +21	34.8 Not Measured Not Measured	0.00 0.00 0.91	0.24 0.23 0.25
<b>TP-2</b> April 7, 2009 July 9, 2009 February 3, 2010	6.74 5.94 6.72	22.1 40.7 27.8	10.5 23.4 8.6	+96 +5 +241	30.7 Not Measured Not Measured	0.00 0.00 4.21	0.15 0.26 0.18
<b>TP-3</b> April 7, 2009 July 9, 2009 February 3, 2010	6.71 5.76 6.69	32.2 48.4 48.5	9.6 22.6 9.0	+99 +14 +42	16.3 Not Measured Not Measured	0.00 0.00 1.71	0.21 0.31 0.32
<b>TP-4</b> April 7, 2009 July 9, 2009 (Not Sampled, Dry) February 3, 2010	7.34 NA 6.58	40.8 NA 38.7	10.5 NA 9.3	+87 NA +4	35.2 NA Not Measured	0.00 NA 0.79	0.27 NA 0.25





## ENVIRONMENTAL ASSOCIATES, INC.

1380 112th Avenue N.E., Ste. 300  
Bellevue, Washington 98004

## VICINITY MAP

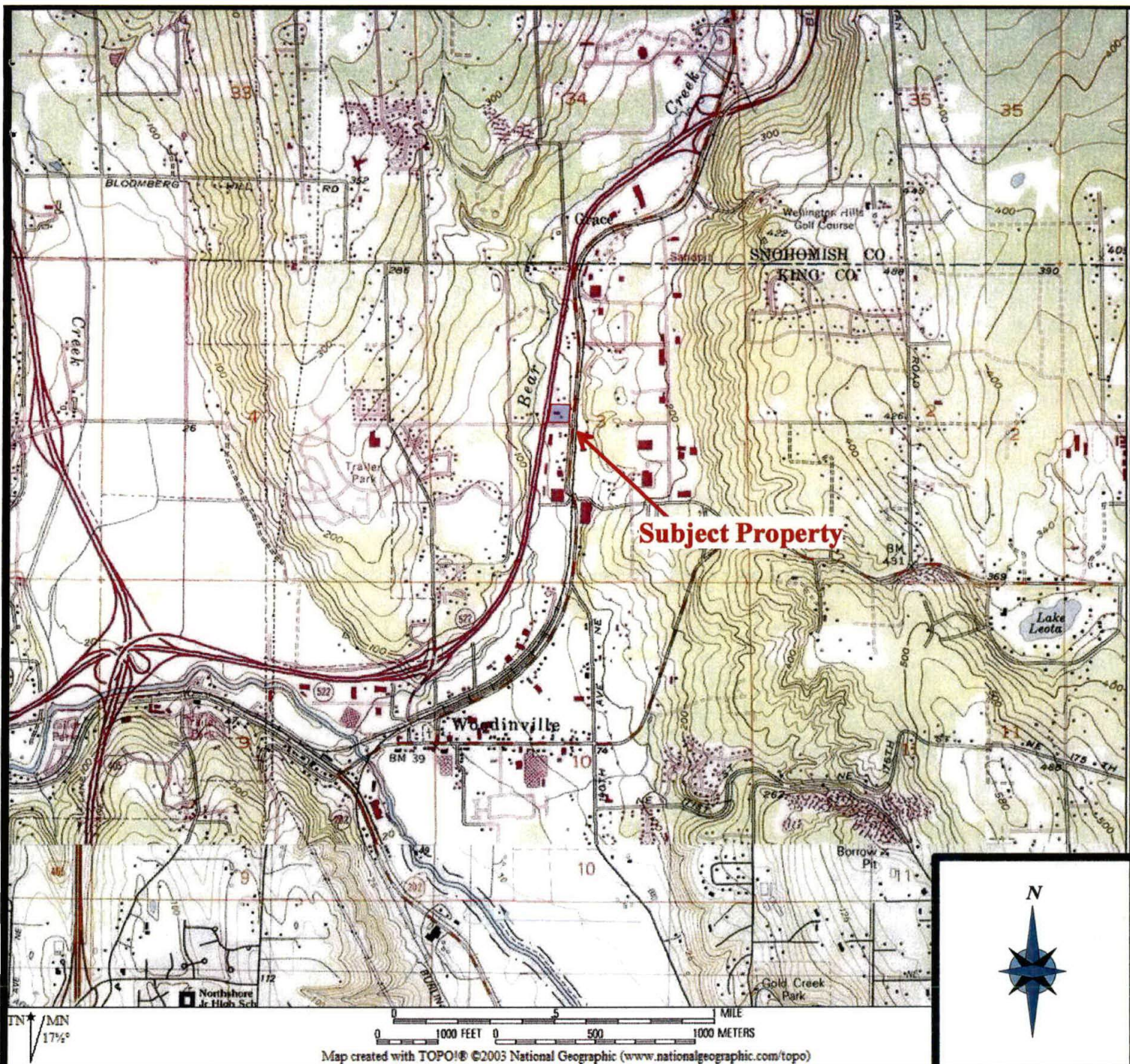
Former Auto Auction Site  
13820 NE 195th Street  
Woodinville, Washington

Job Number:  
JN 28260-2

Date:  
April 2010

Plate:  
1





## TOPOGRAPHIC MAP

Former Auto Auction Site  
13820 NE 195th Street  
Woodinville, Washington

## ENVIRONMENTAL ASSOCIATES, INC.

1380 - 112th Avenue N.E., Ste. 300  
Bellevue, Washington 98004

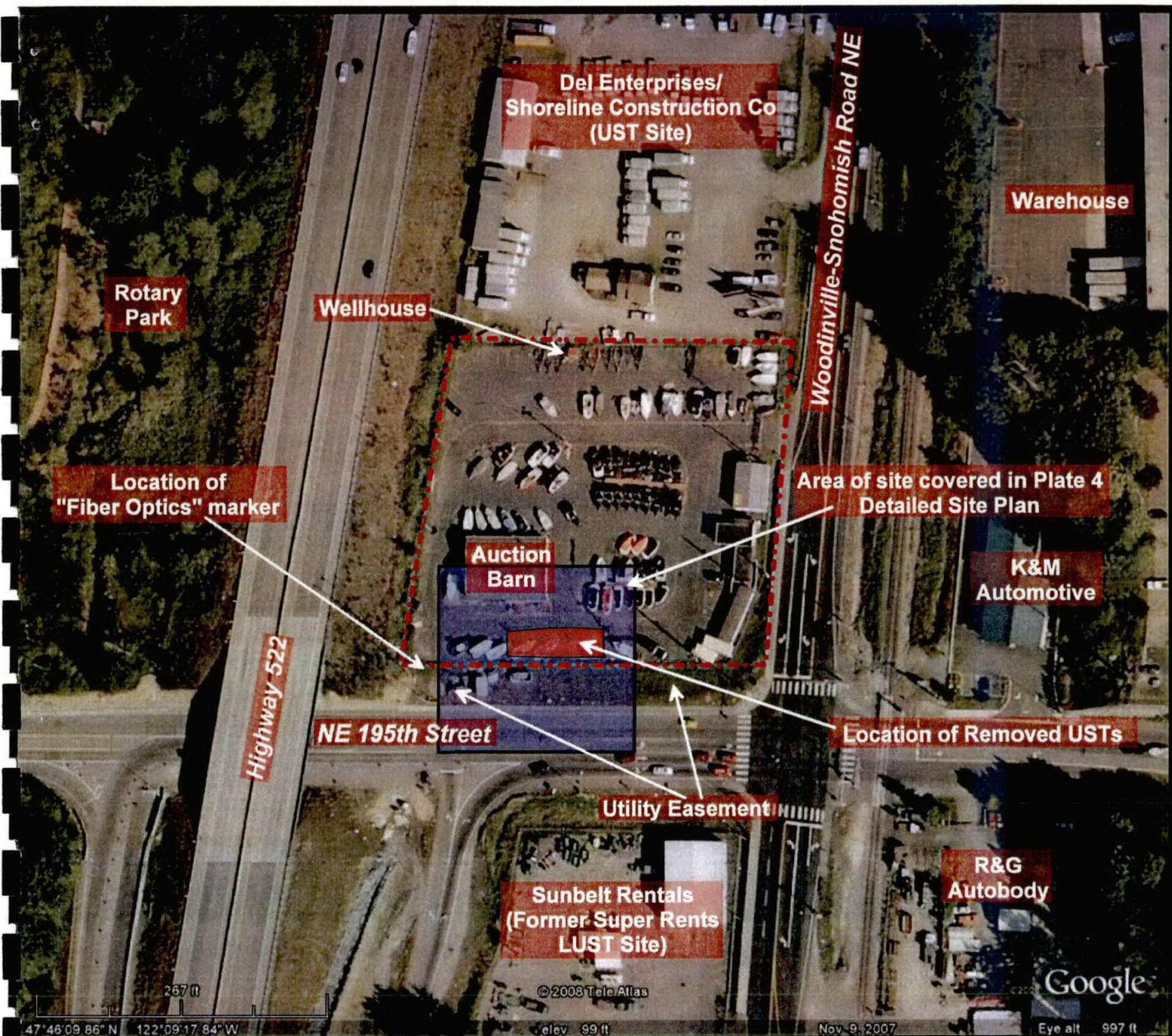
Job Number:  
JN 28260-2

Date:  
April 2010

Plate:  
2







Approximate area of subject property.



## ENVIRONMENTAL ASSOCIATES, INC.

1380 112th Avenue N.E., Ste. 300  
Bellevue, Washington 98004

## SITE PLAN

Former Auto Auction Site  
13820 NE 195th Street  
Woodinville, Washington

Job Number:  
JN 28260-2

Date:  
April 2010

Plate:  
3



Former Auction Barn  
(Currently Storage)

Approximate location of  
standpipes interpreted to  
have been for fuel dispensing

Natural Gas  
Line

TP2

West  
Infiltration

East  
Infiltration

Tank 4

Tank 3

Tank 1

Tank 2

Light Pole

Approximate limits  
of remedial excavation

Sewer  
Manhole  
Cover

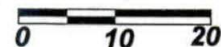
Utility Easement

Utility Easement

NE 195th Street



Approximate Scale:  
1"=20'



Approximate subject property border

Approximate location and area of test pit

TP3 Approximate location and name of vertical  
standpipe and flush grade monument  
(i.e. monitoring/infiltration point).

Approximate location and alignment of horizontal  
slotted 2"-PVC pipe.

Tank 4

Approximate location and number of removed  
UST

Approximate groundwater elevation contour  
lines (as measured 2/2/10)

Inferred direction of groundwater flow

## ENVIRONMENTAL ASSOCIATES, INC.

1380 112th Avenue N.E., Ste. 300  
Bellevue, Washington 98004

## DETAILED SITE PLAN

Former Auto Auction Site  
13820 NE 195th Street  
Woodinville, Washington

Job Number:  
JN 28260-1

Date:  
April 2010

Plate:  
4

## **APPENDIX-A**

### **Laboratory Reports**

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
Bradley T. Benson, B.S.  
Kurt Johnson, B.S.

3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
FAX: (206) 283-5044  
e-mail: fbi@isomedia.com

March 4, 2010

Derek Pulvino, Project Manager  
Environmental Associates, Inc.  
1380 112th Ave. NE, 300  
Bellevue, WA 98004

Dear Mr. Pulvino:

Included are the additional results from the testing of material submitted on February 4, 2010 from the 28260-2, F&BI 002046 project. There are 4 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
EAI0304R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 4, 2010 by Friedman & Bruya, Inc. from the Environmental Associates, Inc. 28260-2, F&BI 002046 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Environmental Associates, Inc.</u>
002046-01	WIN
002046-02	TP1
002046-03	TP2
002046-04	TP3
002046-05	TP4
002046-06	EIN

All quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/04/10  
Date Received: 02/04/10  
Project: 28260-2, F&BI 002046  
Date Extracted: 02/04/10  
Date Analyzed: 02/24/10

RESULTS FROM THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx  
Sample Extracts Passed Through a  
Silica Gel Column Prior to Analysis  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150)
TP1 002046-02	240 x	<250	103
TP2 002046-03	<50	<250	95
TP3 002046-04	52 x	<250	101
TP4 002046-05	290 x	<250	92
EIN 002046-06	<50	<250	85
Method Blank 00-0162 MB	<50	<250	89

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 03/04/10

Date Received: 02/04/10

Project: 28260-2, F&BI 002046

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	106	100	69-135	6

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 - More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - Analyte present in the blank and the sample.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - Analysis performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

vo - The value reported fell outside the control limits established for this analyte.

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

002046

## SAMPLE CHAIN OF CUSTODY

ME 02/04/10

v2/c05

Send Report To Derek PulvinoCompany EAI AssociatesAddress 1350 112th Ave NE #200City, State, ZIP Bellevue, WA 98004Phone # 425-455-9025 Fax #SAMPLERS (signature) [Signature]

PROJECT NAME/NO.

28260-2

PO #

REMARKS

Page # 1 of 1

## TURNAROUND TIME

☒ Standard (2 Weeks)☐ RUSH

Rush charges authorized by:

## SAMPLE DISPOSAL

☒ Dispose after 30 days☐ Return samples☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED										Notes
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Silica Gel	TPH-Diesel			
WIN	01A-C	2/3	13:12	H <sub>2</sub> O	2 VOCs 1 TPH-Diesel	X	X	X								✓-per DP MS
TP1	02A-C		11:23													
TP2	03A-C		11:01													
TP3	04A-C		12:30													
TP4	05A-C		11:52													
ETN	06A-C		10:35													

Friedman & Bruya, Inc.  
3012 16th Avenue WestSeattle, WA 98119  
Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COC.DOC

## SIGNATURE

Relinquished by:

Derek Pulvino

Received by:

[Signature]

Relinquished by:

Received by:

## PRINT NAME

HONZ NEILY

## COMPANY

EAI

EAI

## DATE

2/4/10

✓

## TIME

11:50

✓

Samples received at 3 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
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3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
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February 10, 2010

Derek Pulvino, Project Manager  
Environmental Associates, Inc.  
1380 112th Ave. NE, 300  
Bellevue, WA 98004

Dear Mr. Pulvino:

Included are the results from the testing of material submitted on February 4, 2010 from the 28260-2, F&BI 002046 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
EAI0210R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on February 4, 2010 by Friedman & Bruya, Inc. from the Environmental Associates, Inc. 28260-2, F&BI 002046 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Environmental Associates, Inc.</u>
002046-01	WIN
002046-02	TP1
002046-03	TP2
002046-04	TP3
002046-05	TP4
002046-06	EIN

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/10/10  
Date Received: 02/04/10  
Project: 28260-2, F&BI 002046  
Date Extracted: 02/05/10  
Date Analyzed: 02/06/10

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx  
Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl</u> <u>Benzene</u>	<u>Total</u> <u>Xylenes</u>	<u>Gasoline</u> <u>Range</u>	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 52-124)
WIN 002046-01	<1	<1	<1	<3	<100	85
TP1 002046-02	<1	<1	<1	<3	110	88
TP2 002046-03	<1	<1	<1	<3	<100	89
TP3 002046-04	<1	<1	<1	<3	<100	79
TP4 002046-05	6	<1	6	<3	220	67
EIN 002046-06	<1	<1	<1	<3	<100	87
Method Blank	<1	<1	<1	<3	<100	90



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/10/10  
Date Received: 02/04/10  
Project: 28260-2, F&BI 002046  
Date Extracted: 02/04/10  
Date Analyzed: 02/05/10

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 50-150)
WIN 002046-01	<50	<250	92
TP1 002046-02	690 x	<250	110
TP2 002046-03	280 x	270 y	102
TP3 002046-04	2,600 x	900 y	107
TP4 002046-05	4,700 x	990 y	100
EIN 002046-06	61 x	<250	105
Method Blank	<50	<250	94

**FRIEDMAN & BRUYA, INC.****ENVIRONMENTAL CHEMISTS**

Date of Report: 02/10/10

Date Received: 02/04/10

Project: 28260-2, F&amp;BI 002046

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND  
TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 001216-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	99	65-118
Toluene	ug/L (ppb)	50	100	72-122
Ethylbenzene	ug/L (ppb)	50	100	73-126
Xylenes	ug/L (ppb)	150	101	74-118
Gasoline	ug/L (ppb)	1,000	105	69-134

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 02/10/10

Date Received: 02/04/10

Project: 28260-2, F&BI 002046

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	118	122	69-135	3

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 - More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

002076

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17E ua/04/10

2/05.

Send Report To Derek PulvineCompany ENV. AssociatesAddress 1380 112th Ave NE #200City, State, ZIP Bellevue, WA 98004Phone # 425-455-9025 Fax #SAMPLERS (signature) [Signature]

PROJECT NAME/NO.

28260-2

PO #

REMARKS

Page # 1 of 1

TURNAROUND TIME

☒ Standard (2 Weeks)☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Dispose after 30 days☐ Return samples☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED										Notes
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS					
WIN	01A-C	2/3	13:12	A <sub>20</sub>	2 vials 1000mL	X	X	X								
TP1	02A-C		11:25													
TP2	03A-C		11:01													
TP3	04A-C		12:30													
TP4	05A-C		11:52													
ENV	06A-C		10:35													

Friedman & Bruya, Inc.  
3012 16th Avenue West

Seattle, WA 98119-0000

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COC\COC.DOC

SIGNATURE

Relinquished by:

Derek Pulvine

PRINT NAME

Received by:

HONG NGUYEN

COMPANY

EAI

DATE

2/4/10

TIME

11:50

Relinquished by:

Received by:

Samples received at 3 °C

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
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3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
FAX: (206) 283-5044  
e-mail: fbi@isomedia.com

July 17, 2009

Derek Pulvino, Project Manager  
Environmental Associates, Inc.  
1380 112th Ave. NE, 300  
Bellevue, WA 98004

Dear Mr. Pulvino:

Included are the results from the testing of material submitted on July 10, 2009 from the N.Woodinville LLC 28260-2, F&BI 907092 project. There are 8 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
EAI0717R.DOC

# **FRIEDMAN & BRUYA, INC.**

## **ENVIRONMENTAL CHEMISTS**

### **CASE NARRATIVE**

This case narrative encompasses samples received on July 10, 2009 by Friedman & Bruya, Inc. from the Environmental Associates, Inc. N.Woodinville LLC 28260-2, F&BI 907092 project. Samples were logged in under the laboratory ID's listed below.

<b><u>Laboratory ID</u></b>	<b><u>Environmental Associates, Inc.</u></b>
907092-01	TP1
907092-02	TP2
907092-03	TP3

All quality control requirements were acceptable.



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/17/09

Date Received: 07/10/09

Project: N.Woodinville LLC 28260-2, F&BI 907092

Date Extracted: 07/14/09

Date Analyzed: 07/14/09

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Results Reported as ug/L (ppb)

<u>Sample ID</u> Laboratory ID	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl Benzene</u>	<u>Total Xylenes</u>	<u>Gasoline Range</u>	<u>Surrogate (% Recovery)</u> (Limit 52-124)
TP1 907092-01	<1	<1	<1	<3	120	89
TP2 907092-02	<1	<1	<1	<3	160	80
TP3 907092-03	<1	<1	<1	<3	120	87
Method Blank	<1	<1	<1	<3	<100	85

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 07/17/09

Date Received: 07/10/09

Project: N.Woodinville LLC 28260-2, F&BI 907092

Date Extracted: 07/10/09

Date Analyzed: 07/13/09

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx  
Sample Extracts Passed Through a  
Silica Gel Column Prior to Analysis  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-137)
TP1 907092-01	230	<250	87
TP2 907092-02	190	<250	69
TP3 907092-03	760	470	95
Method Blank	<50	<250	85

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 07/17/09

Date Received: 07/10/09

Project: N.Woodinville LLC 28260-2, F&BI 907092

Date Extracted: 07/10/09

Date Analyzed: 07/11/09

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Diesel Range</u> (C <sub>10</sub> -C <sub>25</sub> )	<u>Motor Oil Range</u> (C <sub>25</sub> -C <sub>36</sub> )	<u>Surrogate</u> <u>(% Recovery)</u> (Limit 51-137)
TP1 907092-01	820	<250	118
TP2 907092-02	1,000	350 y	102
TP3 907092-03	2,700	1,200 y	113
Method Blank	<50	<250	98

**FRIEDMAN & BRUYA, INC.****ENVIRONMENTAL CHEMISTS**

Date of Report: 07/17/09

Date Received: 07/10/09

Project: N.Woodinville LLC 28260-2, F&amp;BI 907092

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES, AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**

Laboratory Code: 907097-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
Xylenes	ug/L (ppb)	<3	<3	nm
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	ug/L (ppb)	50	98	65-118
Toluene	ug/L (ppb)	50	96	72-122
Ethylbenzene	ug/L (ppb)	50	95	73-126
Xylenes	ug/L (ppb)	150	97	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

**FRIEDMAN & BRUYA, INC.**

**ENVIRONMENTAL CHEMISTS**

Date of Report: 07/17/09

Date Received: 07/10/09

Project: N.Woodinville LLC 28260-2, F&BI 907092

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	99	93	71-131	6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/17/09

Date Received: 07/10/09

Project: N.Woodinville LLC 28260-2, F&BI 907092

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL EXTENDED USING METHOD NWTPH-Dx**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	101	109	71-131	8

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 - More than one compound of similar molecule structure was identified with equal probability.

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js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr - The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.



V1 / .H.C.4

Phone # \_\_\_\_\_

125-455-9025 Fax # 425-445-231

V1 / .H.C.4

Ask about Silica gel columns

Rush charges authorized by:

☐ Will call with instructions

Samples received at 6 °C

FORMS\COC\COC.DOC

TIME

Received by:

Derek Pulino  
Aghan Pham

EAI  
Feb

7/10	8:40
7/10/09	10:00