### **PRELIMINARY SUBSURFACE EXPLORATION**

Former Gasoline Station Site 5014 Center Street Tacoma, Washington 98409

### **C & B INVESTMENTS**

### **ENVIRONMENTAL** ASSOCIATES, INC.

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January 2, 2007

JN 26353-1

Mr. Bjorn Olson C & B Investments 9152 Gravelly Lake Drive Southwest Lakewood, Washington 98499

#### Subject: PRELIMINARY SUBSURFACE EXPLORATION Former Gasoline Station Site 5014 Center Street Tacoma, Washington 98409

Dear Mr. Olson:

Environmental Associates, Inc. (EAI), has conducted a limited ground-penetrating radar (GPR) survey and preliminary sampling and laboratory testing of subsurface soil samples obtained from eight (8) selected boring localities at the above-referenced subject property in Tacoma, Washington. This report, prepared in accordance with the terms of our proposal dated November 28, 2006 and our change order dated December 11, 2006, summarizes our approach to the project along with results and conclusions. This letter is governed by the same limitations included in the attached report of which it is a part.

The contents of this report are confidential and are intended solely for your use and the use of your representatives. Four (4) copies of this report are being distributed to you. No other distribution or discussion of this report will take place without your prior approval in writing. Additional copies are available for a small fee.

In the course of the GPR/geophysical survey, seven (7) geophysical "anomalies" characteristic of metallic underground storage tanks were identified in the surveyed portions of the subject property, as depicted on Plate 2, Site Plan, attached to this report. Six (6) of these "anomalies" were found at the locations of potential underground storage tank (UST) fill ports.



The seventh "anomaly" was found at the location of a rectangular-shaped concrete pad. Based upon geophysical data, a 1988-dated "Plan and Profile" from the City of Tacoma Public Works Department, and/or approximate measurements of tank diameters in the field, it appears that four (4) of the USTs beneath the northwestern portion of the site (which appear to extend off-site to the north into the City of Tacoma's right-of-way) may be on the order of approximately 4,000-to-8,000-gallons each in capacity. Observation of the fill port for the east-most UST in that cluster tanks suggests that this particular UST may have been partially crushed-in-place.

The northeast-most UST found on the property may be on the order of approximately 12,000-gallons in capacity. The two (2) other potential USTs ("anomaly" localities nearby to the west and north of the existing subject building) may be on the order of approximately 300-to-500 gallons in capacity and possibly historically used to store waste oil or heating oil associated with the former on-site service station.

No geophysical "anomalies" characteristic of a buried UST or USTs were found in the locations of the two (2) "proposed" 8,000-gallon capacity tanks beneath the northeastern portion of the site as shown on the 1988-dated "Plan and Profile" from the City of Tacoma Public Works Department (see Appendix C in the attached report).

Relying upon the results of laboratory testing, soil containing residual heavy oil-range total petroleum hydrocarbons at concentrations <u>below</u> the current Model Toxics Control Act (MTCA), Chapter 173-340 WAC et. seq. Method A target cleanup level exists at three (3) boring locations (B-4, B-7, and B-9). These boring localities correspond to the approximate center of the northmost fuel dispenser island (boring B-4), proximal to the east of the east-most approximately 300-to-500-gallon capacity UST (boring B-7), and proximal to the east of the west-most approximately 300-to-500-gallon capacity UST (boring B-9). In addition, trace concentrations of gasoline-range total petroleum hydrocarbons at concentrations <u>well below</u> the applicable MTCA Method A target cleanup level were reported in laboratory tested soil samples collected from two (2) boring locations (borings B-4 and B-9).

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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.

Respectfully submitted, Nas. ENVIRONMENTAL ASSOCIATES, INC Don W. Spencer, M.Sc., P.G., R.E.A. Principal 80 Waad Ge EPA-Certified Asbestos Inspector/Management Planner DON W. SPENCER I.D. # AM 48151

EPA/HUD Certified Lead Inspector (Licensed)

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

### **PRELIMINARY SUBSURFACE EXPLORATION**

**Former Gasoline Station Site** 5014 Center Street **Tacoma**, Washington 98409

**Prepared for:** 

Mr. Bjorn Olson C & B Investments 9152 Gravelly Lake Drive Southwest Lakewood, Washington 98499

Questions regarding this investigation, the conclusions reached and the recommendations given should be addressed to one of the following undersigned.

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Chris Cass, P.G. Environmental Geologist / Project Manager

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

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### **Reference Job Number: JN 26353-1**



CHRIS G. CASS

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### INTRODUCTION/SCOPE OF WORK

### SITE DESCRIPTION

The subject property is a single irregular-shaped parcel (Pierce County tax parcel number 6135000061) covering approximately 14,550 square feet (0.33 acres) of land. Existing improvements to the property consist principally of a single-story, wood frame convenience store building, enclosing approximately 2,475 square feet of space which was reportedly constructed in 1985. Additional improvements include a wood frame espresso stand, a small wood frame storage shed, and an asphalt-paved parking lot. Currently the property is occupied by the "Goody Goody Deli Mart" (convenience store) and "Jim's Daily Grind" (espresso stand). The approximate location of the site is shown on the Vicinity/Topographic Map, Plate 1, appended herewith.

The property is located in a mixed commercial-retail and residential area approximately 2.5 miles southwest of the downtown "core" of Tacoma, Washington.

A brief description of land use on nearby parcels is provided below. Plate 2, Site Plan, depicts the setting of the subject property and land use for adjacent sites.

- North: Center Street is situated adjacent to the north with a Unocal/Conoco Phillips- brand gasoline station farther to the north. A commercial structure occupied by American Homes Realty, Inc. and Mane Attraction is located to the northeast of the site, beyond Center Street.
- **South:** A single-story apartment building and an associated carport and parking lot are located on the adjacent area to the south.
- East:Two (2) contiguous commercial buildings are located nearby to the east. Current<br/>tenants in those buildings include Hula Hut Tanning Salon, Mattress Pro, and Family<br/>Hair Care. A small commercial structure presently occupied by Mike's Burgers<br/>(take-out restaurant) is situated adjacent to the east of the northern portion of the site.
- West: Orchard Street is situated adjacent to the west. Single-family residences and trees are located farther to the west.

### BACKGROUND

On December 3, 2006 Environmental Associates, Inc (EAI) presented the findings of a Phase I Environmental Site Assessment of the subject property to C & B Investments. Findings of EAI's December 3, 2006-dated Phase I report relevant to this current study included:

• Material risk for adverse environmental impacts to site subsurface media (i.e.

soil/groundwater ) related to the use of the property by a retail gasoline station for a period of over thirty (30) years. As no documentation of subsurface sampling and laboratory testing (if any) on the property was found in our research of the Washington Department of Ecology, and/or other readily available/reasonably ascertainable public records or provided to EAI for our review, the quantitative environmental character of site subsurface media proximal to the formerly operational on-site UST systems remains unknown and unassessed. Site observations (i.e. potential tank fill ports) suggest that at least five (5) abandoned underground storage tanks (USTs) may possibly remain beneath the northern portion of the site. Information obtained from the City of Tacoma Public Works Department suggests that two (2) additional USTs may be located beneath the northeastern portion of the site.

Following verbal communication of the findings of this Phase I effort to C & B Investments, EAI presented a proposal on November 8, 2006 to conduct a Limited Geophysical Survey and Preliminary Subsurface Exploration in an effort to evaluate whether or not the property has been adversely impacted by historic on-site gasoline station operations, and to ascertain whether or not abandoned underground storage tanks (USTs) remain in place beneath accessible portions of the site. The findings of that study are presented in this Preliminary Subsurface Exploration report.

### METHODOLOGY/SCOPE OF WORK

Your expressed interests, which included the desire to conduct a limited geophysical survey and preliminary Phase 2 subsurface exploration at the subject property, defined the basis for the following scope of work:

- Perform a limited geophysical survey on selected portions of the accessible exterior asphaltpaved areas and on the northern and western portions of the property, proximal to the former on-site service station, as depicted on Plate 2, Site Plan. The geophysical survey included the use of ground penetrating radar (GPR) and electromagnetic (EM) instruments. The approximate areas transected by GPR are depicted on Plate 2, Site Plan.
- Advance a total of eight (8) soil borings to maximum depths ranging from approximately 12to-16 feet below the ground surface (bgs) at the approximate locations denoted as B-1 through B-9 on Plate 3, Site Plan-Detailed. As discussed later in this report, "refusal" was encountered at a depth of approximately 7 feet bgs at the location of boring B-6. To achieve the desired drilling depth, boring B-7 was advanced a short distance to the north of boring B-6 to a depth of approximately 12 feet bgs.
- Selection of nine (9) soil samples, collected in general accordance with EPA/WDOE Method 5035, to analyze/quantify for the presence of gasoline-range total petroleum hydrocarbons (TPH-G) and gasoline constituents benzene, toluene, ethylbenzene, and xylenes (BTEX) by Washington State Department of Ecology's test methods 8021B and NWTPH-Gx. Selection of nine (9) soil samples to analyze/quantify for the presence of diesel- and heavy oil-range total petroleum hydrocarbons (TPH-Dx) by Washington State Department of Ecology's test method NWTPH-Dx.

• Prepare a summary report documenting methodology, findings, conclusions, and recommendations.

### **GEOLOGIC SETTING**

During the Pleistocene epoch (2 million to 10,000 years before present), most of the Puget Sound region was affected by intrusion of continental glaciation. The last period of glaciation, the Vashon Stade of the Fraser Glaciation, ended approximately 10,000 years ago. Many of the topographic features seen today are a result of scouring and overriding by glacial ice. During the Vashon Stade, the Puget Sound region was overridden by more than 3,000 feet of ice thickness in places.

As the Vashon Stade glaciers advanced and retreated, a veil of dense glacial till was deposited over the various hills, ridges and valley sidewalls of the Puget Sound Lowlands. This unit is referred to as Vashon Till and is exposed at the surface in the vicinity of the subject site (Jones, 1998). The Vashon Till consists of dense deposits of unstratified glacial sediments ranging from clay to boulders in size.

In areas where the Vashon Till forms the surface unit as in the vicinity of the subject property, zones of "perched" groundwater are often encountered within lenses of more permeable sediment. These perched zones can often be localized, discontinuous, and are often seasonal.

Topographically, the site is situated on a level parcel approximately 290 feet above sea level.

No groundwater was encountered in the course of this current study to the maximum explored depth of approximately 16 feet below the ground surface.

Based upon inference from topography and local drainage patterns, it appears that shallow-seated groundwater (if present) in the immediate vicinity of the subject property may locally flow in an easterly direction.

From hydrologic investigations at the Tacoma Landfill approximately one-quarter of a mile to the southeast of the subject property, deeper "regional" groundwater has been found within the Colvos Sand member of the Fraser Aquifer at depths of approximately 70 feet below the ground surface. Municipal water wells for the City of Fircrest which lie approximately 2 blocks to the southwest of the subject site draw water from this regional aquifer. Groundwater flow within this regional aquifer is generally to the southwest, following the Leach Creek drainage basin.

With respect to surface water resources, Leach Creek is located approximately one-half of a mile south of the subject site. This surface water course flows in a south to southwesterly direction.

### LIMITED GEOPHYSICAL SURVEY

On December 8, 2006, the EAI technical team performed a limited geophysical survey on accessible areas on the northern and western portions of the subject property, in an effort to ascertain the orientations of several abandoned underground ground storage tanks (USTs) beneath the northern portion of the property, and to evaluate whether or not additional abandoned underground storage tanks (USTs) remain in those areas.

In the course of the geophysical survey, seven (7) geophysical "anomalies" characteristic of metallic underground storage tanks were identified in the surveyed portions of the subject property, as depicted on Plate 2, Site Plan, attached to this report. Six (6) of these "anomalies" were found at the locations of potential underground storage tank (UST) fill ports. The seventh "anomaly" was found at the location of a rectangular-shaped concrete pad. Based upon geophysical data, a 1988-dated "Plan and Profile" from the City of Tacoma Public Works Department (see Appendix C), and/or approximate measurements of tank diameters in the field, it appears that four (4) of the USTs beneath the northwestern portion of the site (which appear to extend off-site to the north into the City of Tacoma's right-of-way/sidewalk) may be on the order of approximately 4,000-to-8,000-gallons each in capacity.

Observation of the fill port for the east-most UST in that cluster tanks suggests that this particular UST may have been partially crushed-in-place.

The three (3) west-most tanks in this cluster were each estimated to have diameters of approximately 60-to-65 inches based upon measurements taken from the fill ports. Geophysical data suggests that the tops of these three (3) west-most USTs in that cluster may be approximately 3 feet below the ground surface.

The northeast-most UST may be on the order of approximately 12,000-gallons in capacity. This UST was estimated to have a diameter of approximately 106 inches based upon measurements taken from the fill port.

The two (2) other potential USTs ("anomaly" localities nearby to the west and north of the existing subject building) may be on the order of approximately 300-to-500 gallons in capacity and possibly historically used to store waste oil or heating oil associated with the former on-site service station. Neither of these two (2) USTs had accessible fill ports at the time of our field work.

No geophysical "anomalies" characteristic of a buried UST or USTs were found in the locations of the two (2) "proposed" 8,000-gallon capacity tanks beneath the northeastern portion of the site as shown on the 1988-dated "Plan and Profile" from the City of Tacoma Public Works Department (see Appendix C).

A copy of the GPR survey data from the transect line which shows the "anomaly" for the southwestmost potential UST is included with this report in Appendix B.

### **SUBSURFACE EXPLORATION**

### STRATAPROBE BORINGS

#### Soil Borings / Subsurface Conditions / Soil Sampling

On December 19, 2006, a total of nine (9) Strataprobe borings (B-1 through B-9) were made at the approximate locations depicted on Plate 3, Site Plan - Detailed, using a truck-mounted Strataprobe hydraulic punch soil boring rig. Borings B-1 and B-2 were situated proximal to the approximately 12,000-gallon capacity abandoned UST on the northern portion of the site. Borings B-3 and B-5 were positioned proximal to the southeast of the cluster of the four (4) approximately 4,000-to-8,000-gallon capacity USTs. Boring B-4 was situated in the approximate center of the north-most former fuel dispenser island location. Borings B-6 and B-7 were situated immediately proximal to the southeast of the west-most former fuel dispenser island location (a utility pole and the espresso stand structure prevented closer drill rig access to that former fuel dispenser island location). Boring B-9 was situated immediately proximal to the east of the west-most approximately 300-to-500 gallon capacity UST.

Under the observation of our staff environmental geologist, the Strataprobe unit was brought into position over each selected boring location, blocked up, and leveled before probing. Following set-up preparations, the boring technique consisted of advancing a 1-inch diameter soil sampling tube in 4 foot intervals beginning at the ground surface. This sampling method allowed for the collection of a continuous soil sample core beginning at the ground surface and extending to the maximum depth explored in each soil boring. After each sampling interval the sampling assembly was removed and the core extracted for examination. Discrete soil samples were collected from each sampling interval of the core. Logs of borings B-1 thorough B-9 are provided as Plates 5 through 13, attached to this report. Three (3) photographs taken during drilling activities on December 19, 2006 are provided on Plate 4, Site Photographs.

In an effort to preserve sample integrity, the collected soil samples were stored on-site in an insulated chest maintained at or below 4 degrees centigrade, and was transported to the project laboratory in this condition. Each sample was clearly identified with respect to project, boring number, date, time, etc. EPA-recommended sample management protocol, including maintenance of chain-of- custody documentation, was observed at each stage of the project.

Borings B-1 through B-5 were each completed to a depth of approximately 16 feet below the ground surface (bgs). Refusal was encountered at a depth of approximately 7 feet bgs at the location of boring B-6.

To achieve the desired drilling depth, boring B-7 was advanced a short distance to the north of boring B-6 to a depth of approximately 12 feet bgs. Boring B-8 (southeast of the former west-most fuel dispenser island) was advanced to a depth of approximately 8 feet below the ground surface. Boring B-9 was completed to a depth of approximately 12 feet bgs.

Subsurface soils encountered in the borings generally consisted of tan or dark brown gravelly sand with some layers of silty or clayey sand. Native "woody" material was encountered at depths of approximately 8-to-9 feet bgs and from approximately 10.5 to 12 feet bgs in boring B-4.

No groundwater was encountered in the course of this current study to the maximum explored depth of approximately 16 feet below the ground surface.

A slight petroleum-like odor was noted in the soil sample collected from the depth interval of approximately 3-to-4 feet bgs in boring B-4 (north-most former fuel dispenser island location). Field screening results using a photoionization detector (PID) indicated an "elevated" level of volatile vapors in that soil sample. Soil samples collected from depth ranges of approximately 2-to-4 feet bgs and from approximately 4-to-6 feet bgs in boring B-4 were submitted for laboratory analysis.

Considering that field observations did not suggest the presence of petroleum contamination in the remaining soil borings, the deeper soil samples (at approximately 14-to-16 feet bgs or 10-to-12 feet bgs) were selected for laboratory analysis from borings B-1 through B-3 and borings B-7 and B-9. The soil sample collected from a depth range of approximately 2-to-4 feet bgs in boring B-8 (proximal to the southeast of the west-most former fuel dispenser island location) was submitted for laboratory analysis.

All soil samples obtained for analysis for the presence of gasoline-range total petroleum hydrocarbons (TPH-G) and gasoline constituents benzene, toluene, ethylbenzene, and xylenes (BTEX) were collected in general accordance with EPA/WDOE Method 5035.

### LABORATORY ANALYSIS / RESULTS

Results of completed laboratory analysis performed on selected soil samples collected from borings B-1 thorough B-5 and B-7 through B-9 are provided in Appendix A.

### Soil Sample Analysis/Results

As summarized in Table 1, soil containing residual heavy oil-range total petroleum hydrocarbons at concentrations <u>below</u> the current Model Toxics Control Act (MTCA), Chapter 173-340 WAC et. seq. Method A target cleanup level exists at three (3) boring locations (B-4, B-7, and B-9). These boring localities correspond to the approximate center of the north-most fuel dispenser island (boring B-4 at a depth range of approximately 4-to-6 feet bgs), proximal to the east of the east-most approximately 300-to-500-gallon capacity UST (boring B-7), and proximal to the east of the west-most approximately 300-to-500-gallon capacity UST (boring B-9).

Reported detectable heavy oil-range total petroleum hydrocarbon concentrations ranged from 490 parts-per-million (ppm) to 680 ppm (i.e. compliant with the current MTCA Method A cleanup level of 2,000 ppm for heavy oil in soil).

<u>No detectable</u> concentrations of diesel- range total petroleum hydrocarbons were reported in the nine (9) laboratory tested soil samples above the laboratory's lower quantitation limit of 50 ppm.

A residual concentration of 11 ppm for gasoline-range total petroleum hydrocarbons (TPH-G), which is <u>well below</u> (i.e. compliant with) the applicable MTCA Method A cleanup level of 100 ppm (with no benzene present) was reported in the laboratory tested soil sample collected from boring B-4 at a depth range of approximately 2-to-4 feet bgs (former north-most fuel dispenser island location). <u>No detectable</u> concentrations of benzene, toluene, or ethylbenzene were reported in that laboratory tested soil sample collected from boring B-4. A total xylenes concentration of 0.07 ppm, which is compliant with the MTCA Method A cleanup level of 9 ppm, was reported in that same soil sample collected from boring B-4 (approximate depth range of 2-to-4 feet bgs). <u>No detectable</u> concentrations of TPH-G or benzene, toluene, ethylbenzene, or total xylenes (BTEX) gasoline constituents were reported in the laboratory tested soil sample collected from boring B-4 at a depth range of approximately 4-to-6 feet bgs.

A trace concentration TPH-G at the laboratory's lower quantitation limit of 2 ppm (i.e. compliant with the applicable MTCA Method A cleanup level of 100 ppm) was reported in the analyzed soil sample collected from boring B-9 at a depth range of approximately 10-to-12 feet bgs (proximal to the west-most approximately 300-to-500-gallon capacity UST). No detectable concentrations of BTEX were reported in that same laboratory tested soil sample collected from boring B-9.

<u>No detectable</u> concentrations of TPH-G or BTEX above the laboratory's lower quantitation limits were reported in the laboratory tested soil samples collected from borings B-1, B-2, B-3, B-5, B-7, and B-8.

Concentrations of total lead reported in laboratory tested soil samples collected from borings B-1 thorough B-5 and B-7 through B-9 ranged from 1.06 ppm to 105 ppm (i.e. compliant with the MTCA Method A cleanup level of 250 ppm for lead in soil).

## **CONCLUSIONS/ RECOMMENDATIONS**

### Limited Geophysical Survey:

In the course of the GPR/geophysical survey, seven (7) geophysical "anomalies" characteristic of metallic underground storage tanks were found in the surveyed portions of the subject property, as depicted on Plate 2, Site Plan.

### Preliminary Subsurface Soil Sampling and Testing:

Relying upon the results of laboratory testing, it would appear that soils sampled and laboratory tested from borings B-1 through B-5 and B-7 through B-9 (see Plate 3, Site Plan - Detailed) on the subject property during the course of this study do <u>not</u> contain concentrations of total gasoline-, diesel-, and heavy oil-range petroleum hydrocarbons or total lead <u>above</u> their current applicable Model Toxics Control Act (MTCA), Chapter 173-340 WAC et. seq. Method A target cleanup levels at the locations and depths sampled and laboratory tested.

The detections of residual heavy oil-range total petroleum hydrocarbons (compliant with the current MTCA Method A cleanup level) in the laboratory analyzed soil samples collected from borings B-7 and B-9 may possibly be attributable to past releases of heating fuel and/or waste oil from the two (2) approximately 300-to-500 gallon capacity USTs.

Positive identification of the source areas for these residual heavy oil detections, along with the residual detection of heavy oil in the soil sample collected from boring B-4 at a depth range of approximately 4-to-6 feet bgs (former north-most fuel dispenser island location), has not been achieved at this time.

EAI would recommend that all seven (7) of the abandoned USTs beneath the subject property be removed and disposed of in a safe and lawful manner consistent with methods set forth in API Recommended Practice 1604, the Uniform Fire Code, and other local codes which may apply. UST decommissioning activities should be performed by personnel/contractors which are appropriately licensed by the Washington Department of Ecology to perform such services.

A UST Site Assessment in accordance with the WDOE's "Guidance For Site Checks and Site Assessments for Underground Storage Tanks" document dated February 1991 and revised in October 1992 should be performed by appropriately certified personnel at the time of UST decommissioning activities. Washington-licensed professional staff of Environmental Associates, Inc., have all experience and capability to provide such additional services as may be required.

Acknowledging that the City of Tacoma's infrastructure (i.e. street light pole, electrical/street light utilities, sidewalk, etc.) is located above four (4) abandoned USTs which appear to extend off-site from the property beneath the City of Tacoma's right-of-way, it may be prudent to inquire with the Tacoma-Pierce County Health Department (TPCHD), WDOE, and/or the City of Tacoma Public

Works Department regarding the permitting process for removing these USTs. The purpose of this brief discussion is merely to inform the client of this issue of the USTs extending <u>off-site</u> as an unquantified potential exposure to third party liability.

# LIMITATIONS

This report has been prepared for the exclusive use of C & B Investments and their several representatives 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 November 28, 2006 and our change order dated December 11, 2006. The opinions expressed in this report are based upon the results of and sampling and testing conducted at separated localities and environmental conditions may vary between those localities and at 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.

The scope of work presented in this report was intended to provide a preliminary spatially broad evaluation of the subject property and was not intended to characterize the existence of, or the extent of all possible impacted areas that may or may not exist.

### REFERENCES

- Environmental Associates, Inc. (EAI), December 3, 2006, Phase I Environmental Site Assessment, Former Gasoline Station Site, 5014 Center Street, Tacoma, Washington 98409. Reference Job Number 26353. 22 pps., 3 plates, 3 appendices. Prepared for C & B Investments.
- Environmental Associates, Inc. (EAI), June 8, 2005, Subsurface Sampling and Testing, 4 Parcels of Commercial Property, 5002 South Center Street, Tacoma, Washington. EAI reference job number 25115. 13 pps., 5 plates, 2 appendices. Prepared for C & B Investments.
- Jones, M.A., 1998, Geologic Framework for the Puget Sound Aquifer System, Washington & British Columbia. U.S. Geological Survey Professional Paper 1424-C, 18 plates, 9 figures, 2 tables.

Thomas Brothers Map Co., 2000, The Thomas Guide: King/Pierce/Snohomish Counties.

U.S. Geological Survey, 1959, Steilacoom, Washington, 1:24,000 Quadrangle. Photorevised 1994, 1 sheet.

TABLE	-E1 - Petroleum Hydrocarbons - Soil Sampling Results	Im Hydroca	arbons - So	il Samplir	ng Result	S	
Former Gaso	soline Station Site - 5014 Center Street, Tacoma, Washington	Site - 5014	Center Sti	reet, Taco	ma, Wasl	hington	
	All results and limits in parts per million (ppm) Soil samples collected on December 19, 2006	nd limits in	results and limits in parts per million (p) Soil samples collected on December 19, 2006	million (pl	pm)		
Stratanrohe Boring / Denth Range	Gasoline	Diesel	Heavy Oil	Renzene	Toluene	Ethylhenzene   Total Xylenes	Total Xylanec
	(TPH-G)	(TPH-D)	(TPH-O)				
B-1 at ~14-to-16 feet bgs	ND <sup>1</sup>	ND	QN	QN	ND	ND	ND
B-2 at $\sim$ 14-to-16 feet bgs	ND	ND	ND	QN	Ð	ND	ND
B-3 at $\sim$ 13-to-14 feet bgs	ND	ND	ND	ND	ND	ND	ND
B-4 at ~2-to-4 feet bgs	11	DN	ND	DN	QN	DN	0.07
B-4 at ~4-to-6 feet bgs	ND	ND	680	ND	ND	ND	ND
B-5 at ~13-to-16 feet bgs	DN	ND	ND	QN	R	ND	ND
B-7 at 10-to-12 feet bgs	ND	ND	500	ND	ΔN	ND	ND
B-8 at ~2-to-4 feet bgs	ND	ND	ND	ND	<b>UN</b>	ΠN	ΠŊ
B-9 at ~10-to-12 feet bgs	2	ND	490	ND	ND	ND	ND
Detection Limit <sup>2</sup>	2	50	250	0.02	0.02	0.02	0.06
Current MTCA Method A Cleanup Level <sup>4</sup>	30.5	2000	2000	0.03	7	9	6
	$100 (no benzene)^5$						
<ul> <li>Notes:</li> <li>"ND" denotes analyte not detected above listed Detection Limit.</li> <li>"Detection Limit" represents the laboratory lower quantitation limit.</li> <li>"Detection Limit" represents the laboratory lower quantitation limit.</li> <li>Method A soil cleanup levels as published in the Model Toxics Control Act (MTCA) 173-340-WAC.</li> <li>The MTCA gasoline TPH cleanup level is 100 ppm for soils with no benzene present and less than 20% aromatic hydrocarbons between C8 and C16. Otherwise, the cleanup level is 30 ppm.</li> </ul>	etection Limit. quantitation limit. Model Toxics Control Act (MTCA) 173-340-WAC. m for soils with no benzene present and less than 6. Otherwise, the cleanup level is 30 ppm.	(MTCA) 173-340-W/ # present and less th level is 30 ppm.	ac. an				
bgs - Below ground surface.							880-5