

# Associated Earth Sciences, Inc.



*Celebrating Over 25 Years of Service*

June 25, 2010  
Project No. KV080118A

City of Marysville  
c/o Weed, Graafstra & Benson, P.S.  
21 Avenue A  
Snohomish, Washington 98290

Attention: Mr. Grant Weed

Subject: Phase II Environmental Site Assessment  
Geddes Marina  
1326 First Street  
Marysville, Washington

Dear Mr. Weed:

This letter-report presents the results of our Phase II Environmental Site Assessment (Phase II ESA) at the Geddes Marina site in Marysville, Washington. The site location is shown on the "Vicinity Map," Figure 1. The Phase II ESA work includes the completion of shallow exploration excavations, completion of exploration borings, marine sediment collection, and collection of ground water samples. Selected soil, marine sediment, and ground water samples from our explorations were submitted for chemical analysis.

## **SITE AND PROJECT DESCRIPTION**

The property is located south of First Street in Marysville, Washington (Figure 1). As depicted on the "Site and Exploration Plan," Figure 2, the site is roughly rectangular in shape with its long dimension oriented approximately north to south. The site encompasses an area of approximately 4.73 acres. The site consists of an existing marina facility. The marina consists of a roughly rectangular body of water (boat basin) that is connected to storm water flow from a culvert at the facility's north end and to the Snohomish River at the facility's south end. Gravel covered and partially paved drive and parking areas surround the central boat basin of the marina on all four sides. Within the boat basin there are numerous floating

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boathouses and docks. There are also numerous boats tied up within the marina, some to the docks and some within the boathouses. There are several shore-based boathouses, warehouses, and marine-related repair facilities east and northeast of the boat basin. There is a strip of tidelands and docks supporting several boathouses and boats between the marina property and the Snohomish River, to the south. An elevated Burlington Northern railroad embankment, supporting one set of tracks, is to the west of the property. A City of Marysville park, including paved parking, paved drives, a boat launch, and restroom facilities, is to the east of the site. A retail mall is located across First Street to the north of the site. Topographic gradient of the site appears to be less than approximately 5 percent, except at the water's edge and at the base of the railroad embankment. Total vertical relief across the site appears to be approximately 3 to 5 feet based on field estimates. No surveyed topographic data was available at the time this letter-report was written.

## **PURPOSE AND SCOPE**

The purpose of this study was to assess whether the soil (terrestrial), sediment (marine), or ground water may have been impacted by previous or ongoing activities on the subject site and adjacent properties. For the purposes of this study, soil is considered the unconsolidated materials above bedrock that are not below surface water; sediment is considered the unconsolidated materials above bedrock that are below surface water; and ground water is the free water below the surface of the soil. The approximate locations of the subsurface explorations and sampling locations are depicted on the "Site and Exploration Plan," Figure 2. Analytical testing was conducted on selected soil, sediment, and ground water samples by a subcontracted analytical laboratory.

## **SAMPLE COLLECTION AND ANALYTICAL RESULTS**

### **General**

Soil samples from on-shore, terrestrial borings and hand-auger explorations were collected in August and September of 2008. Off-shore marine sediment samples were collected from the boat basin in September of 2008. In addition to the soil and sediment samples, ground water samples were also collected. The ground water samples were collected in August and September 2008. The approximate locations of the sampling explorations are shown on the "Site and Exploration Plan," Figure 2. Logs of the exploration borings EB-1 through EB-7 are included in Appendix A. Logs were not compiled for the hand-auger borings, HA-1 through HA-14, or for the off-shore sediment sampling S-1 through S-8 due to their shallow nature.

All soil, sediment, and ground water samples collected for chemical analysis were placed in appropriate sample containers supplied by the laboratory. Each container was labeled with the site name, date, time, and sample number. Sample containers were placed in a chilled cooler immediately after sampling, and subsequently transported to the analytical laboratory by Associated Earth Sciences, Inc. (AESI) or laboratory personnel under chain-of-custody procedures.

## Soil Samples

### *Hand-Auger Soil Sampling*

Fourteen soil samples were collected from shallow hand-auger explorations in August and September of 2008. The hand-auger sampling was conducted by geologists from AESI. The hand-auger samples were obtained between 0.5 and 1.0 feet below the existing ground surface. The hand-auger and sampling equipment were cleaned prior to beginning the project and before beginning each hand-auger boring. Sampling equipment was cleaned and decontaminated using an Alconox<sup>®</sup> wash and distilled water prior to the beginning of the project and before collecting each soil sample. All fluids used during on-site decontamination of the sampling equipment were contained and left on-site in a sealed container. Samples were handled by disposable Nitrile gloves and a fresh pair was used for each sample. All soil samples were extracted by hand from the excavations using the disposable gloves and/or with stainless steel sampling tools that were also cleaned and decontaminated prior to each use. The soil samples were placed directly into laboratory-supplied glassware.

### *Exploration Boring (Probe) Soil Sampling*

Deep subsurface soil sampling was conducted in August and September of 2008. This deep soil sampling was conducted at seven locations across the site using truck-mounted, direct-push probe equipment provided by Environmental Services Network (ESN) of Olympia, Washington who was subcontracted to AESI. The probe rig utilized a 2-inch-diameter, steel sampler containing disposable plastic sample tubing. Throughout the drilling operation, soil samples were obtained from the sampler at continuous, approximately 4-foot intervals. The probe rig advanced the sampler to depths of approximately 12 to 15 feet below the existing surface. The sampler with its internal plastic sample tubing was extracted from the hole and split open on-site. The relative density of granular soils and the relative consistency of cohesive soils were estimated by geologists from our firm based upon the observation of the resistance to pushing the probe. Drilling equipment was cleaned and decontaminated using a high pressure washer prior to beginning the project and before beginning each soil boring. Sampling equipment was cleaned using an Alconox<sup>®</sup> wash and potable water prior to the beginning of the project and before collecting each soil sample. All fluids used during on-site decontamination of the sampling equipment were contained and left on-site in a sealed container.

Separate, disposable lengths of internal plastic tubing were used for each sample. All soil samples were extracted by hand from the plastic sample tubes using the disposable gloves and/or with stainless steel sampling tools that were also cleaned and decontaminated prior to each use. The soil samples were placed directly into laboratory-supplied glassware. One soil sample from each probe was submitted for laboratory analysis. In general, soil samples were selected for analysis because of their proximity to the top of the water table, from intervals exhibiting obvious olfactory or visual indications of contamination, or based on the geologist's professional judgment. Soil cuttings generated during the probe activities were placed in a steel drum, closed, and left on-site for subsequent characterization and disposal.

#### *Off-Shore (Marine) Sediment Sampling*

Off-shore (marine) sediment sampling in the boat basin was conducted in September of 2008. This sediment sampling was conducted at eight locations within the boat basin. A 2-inch-diameter, steel piston sampler containing a disposable plastic sample tube was used at each sediment sample location. The sediment samples were obtained from approximately 18 to 30 inches below the top of the sediment. The sampler was dropped from either a boat or from the docks within the marina by a geologist from our firm. The weight of the device drove the sampler to the above-stated depths into the sediment. The sampler, with its internal plastic sample tube, was extracted from the sediment and split open on-site. Separate, disposable lengths of plastic tubing were used for each sample. The remaining sampling equipment was cleaned and decontaminated prior to beginning the project and before beginning each sampling drop. Sampling equipment was cleaned using an Alconox<sup>®</sup> wash and distilled water prior to the beginning of the project and before collecting each soil sample.

All sediment samples were extracted by hand from the plastic sample tubes using disposable gloves and/or with stainless steel sampling tools that were also cleaned and decontaminated prior to each use. The sediment samples were placed directly into laboratory-supplied glassware and were submitted for laboratory analysis.

#### *Ground Water Sampling*

Ground water samples were obtained from the deep probes in August and September of 2008. The ground water samples were obtained from small-diameter temporary wells installed by ESN during probing. The wells were removed following ground water extraction. The water samples were collected utilizing low-flow sampling techniques and a peristaltic pump with dedicated disposable tubing for each well and a stainless steel screen section. The screen section was decontaminated prior to use at each ground water sampling location. Discharge from the peristaltic pump was directed into sample containers supplied by the laboratory.

## **Analytical Results**

The results of the analyses are discussed below by the various types of soil media and ground water. The results are also depicted on Plates 1 through 3, summarized in Tables 1 through 6 and the laboratory test certificates attached to this letter-report.

### **Analytical Results (Terrestrial Soil)**

#### Petroleum Hydrocarbons as Diesel and Motor Oil Analysis

Soil samples (terrestrial) were collected from each of the 14 shallow hand-auger explorations (HA-1 through HA-14) and the 7 deep probe borings (EB-1, 5 feet; EB-2, 3 feet; EB-3, 5 feet; EB-4, 5.5 feet; EB-5, 6 feet; EB-6, 5.5 feet; and EB-7, 5 feet). All of the soil samples were submitted to Friedman & Bruya, Inc. of Seattle, Washington (FBI) for analysis for Petroleum Hydrocarbons as Diesel and Motor Oil using Method NWTPH-Dx.

The Diesel analysis for soil samples EB-1, 5 feet; HA-2; and HA-9 had detectable concentrations of Diesel that are below the Model Toxics Control Act (MTCA) Method A Cleanup Levels. The remainder of the soil samples analyzed for Diesel had concentrations below the method detection limit.

The Motor Oil analysis for soil sample EB-6, 5.5 feet had a detectable concentration of Motor Oil that is below the MTCA Method A Cleanup Level. The remainder of the soil samples analyzed for Motor Oil had concentrations below the method detection limit.

The results of the above analyses are summarized in Table 1.

#### BTEX and Gasoline Analysis

Soil samples were also submitted to FBI for analysis for Benzene, Toluene, Ethylbenzene, and Xylene (BTEX), and Gasoline using Method 8021 B and NWTPH-Gx. All of the soil samples analyzed for BTEX and Gasoline had concentrations below the method detection limit. The results are summarized in Table 1.

#### Metals Chromium, Arsenic, Cadmium, Lead, Nickel, Copper, and Zinc Analysis

All of the soil samples analyzed except samples EB-4, 5.5 feet; EB-6, 5.5 feet; and EB-7, 5 feet were submitted to FBI for analysis for the metals Chromium, Arsenic, Cadmium, Lead, Nickel, Copper, and Zinc using EPA Method 200.8. Most of the samples analyzed for the above metals exhibited detectable concentrations of these metals. Only Chromium, Arsenic, Cadmium, and Lead have established MTCA Method A Cleanup Levels. Soil samples EB-3, 5 feet; HA-2; HA-7; HA-8; HA-10; and HA-13 exhibited Arsenic concentrations above the

MTCA Method A Cleanup Level. Soil samples HA-1, HA-4, and HA-13 exhibited Cadmium concentrations above the MTCA Method A Cleanup Level. Soil sample HA-10 exhibited a lead concentration above the MTCA Method A Cleanup Level. The remaining soil samples that were analyzed for these metals either had concentrations below the method detection limit or had concentrations of metals without an established MTCA Method A Cleanup Level. Copper and Zinc have MTCA Method B Cleanup Levels. All samples analyzed were below the MTCA Method B Cleanup Levels for copper and zinc. The results are summarized in Table 1.

#### Metals Selenium, Silver, and Barium Analysis

Soil samples EB-5, 6 feet; HA-11; HA-12; HA-13; and HA-14 were also submitted to FBI for analysis for the metals Selenium, Silver, and Barium using EPA 200.8. The soil samples analyzed for Selenium and Silver had concentrations below the method detection limit. The soil samples that were analyzed for Barium exhibited detectable concentrations of the metal below the MTCA Method B Cleanup Level. The results are summarized in Table 1.

#### Mercury Analysis

All of these soil samples except EB-4, 5.5 feet; EB-5, 6 feet; EB-6, 5.5 feet; and EB-7, 5 feet were submitted to FBI for analysis for the metal Mercury using Method 1631E. Soil samples HA-2, HA-4, and HA-10 had detectable concentrations of Mercury that were below the MTCA Method A Cleanup Level. The remainder of the soil samples analyzed for Mercury had concentrations below the method detection limit. The results are summarized in Table 1.

#### Semi-Volatile Compounds (Polynuclear Aromatic Hydrocarbons) Analysis

Soil samples EB-5, 6 feet; HA-11; HA-12; HA-13; and HA-14 were submitted to FBI for analysis for semi-volatile compounds (Polynuclear Aromatic Hydrocarbons or PAH) Naphthalene, Acenaphthylene, Acenaphthene, Florene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Ben(k)fluoranthene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene using EPA Method 8270 SIM.

Soil sample EB-5, 6 feet had a Benzo(a)pyrene concentration above the MTCA Method A Cleanup Level. This sample also exhibited a total carcinogenic PAH concentration above the MTCA Method A Cleanup Level of 0.1 parts per million (ppm). The remaining soil samples that were analyzed for these compounds either had concentrations below the detection limit or had concentrations of compounds without an established MTCA Method A Cleanup Level. The results are summarized in Table 2.

The laboratory test certificates for the above soil sample analyses are included in Appendix B.

## **Analytical Results (Marine Sediment)**

### Petroleum Hydrocarbons as Diesel and Motor Oil Analysis

Marine sediment samples were collected from each of the eight shallow sediment explorations (S-1 through S-8). All of these sediment samples were submitted to FBI for analysis for Petroleum Hydrocarbons as Diesel and Motor Oil using Method NWTPH-Dx.

The Diesel analysis for sediment samples S-1 through S7 all had detectable concentrations (250 ppm to 4,700 ppm) concentrations of petroleum hydrocarbons. The laboratory has preliminarily indicated that these results are more likely representative of creosote than Diesel though creosote was not specifically analyzed. The sediment sample S-8 had a Diesel concentration below the method detection limit.

The Motor Oil analysis for sediment samples S-1 through S7 all had detectable concentrations (1,300 ppm to 18,000 ppm) of petroleum hydrocarbons. The laboratory has preliminarily indicated that these results are more likely representative of creosote than Diesel though creosote was not specifically analyzed. The sediment sample S-8 had a Motor Oil concentration below the method detection limit.

There is no established marine sediment quality standard (“173-204 WAC Marine Sediment Quality Standards”) for Diesel or Motor Oil in marine sediment. According to the Washington State Department of Ecology, the marine sediment quality standard for hydrocarbons is site specific and, if the TPH concentrations are greater than 100 ppm, bioassays should be run to determine if the sediment meets the standard. Three bioassays are required: larval, amphipod, and polychaete. These bioassays have not been assigned or completed at the time this letter-report was prepared.

The results of the above analyses are summarized in Table 3.

### BTEX and Gasoline Analysis

All of the sediment samples were submitted to FBI for analysis for BTEX and Gasoline using Method 8021 B and NWTPH-Gx. All of the sediment samples analyzed for BTEX and Gasoline had concentrations below the detection limit. The results are summarized in Table 3.

### Metals Chromium, Arsenic, Cadmium, Lead, Nickel, Copper, and Zinc Analysis

All of the sediment samples were submitted to FBI for analysis for the metals Chromium, Arsenic, Cadmium, Lead, Nickel, Copper, and Zinc using EPA 200.8. Most of the sediment samples analyzed for the above metals exhibited detectable concentrations of these metals. All of the sediment samples, except sample S-2, that were analyzed for these metals either

exhibited concentrations below the method detection limit or had concentrations of metals below the “173-204 WAC Marine Sediment Quality Standards.” The zinc concentration in sample S-3 was above the “173-204 WAC Sediment Quality Standards.” The results are summarized in Table 3.

### Mercury Analysis

All of these sediment samples were submitted to FBI for analysis for the metal Mercury using Method 1631E. The sediment samples S-1, S-4, S-5, S-6, and S-8 had concentrations of Mercury that were below the method detection limit. The sediment samples S-3 and S-7 had detectable concentrations of Mercury that were below the “173-204 WAC Marine Sediment Quality Standards.” The sediment sample S-2 had a Mercury concentration above the “173-204 WAC Marine Sediment Quality Standards.” The results are summarized in Table 3.

### Semi-Volatile Compounds (Polynuclear Aromatic Hydrocarbons) Analysis

Sediment samples S-1 through S-8 were submitted to FBI for analysis for semi-volatile compounds (Polynuclear Aromatic Hydrocarbons) Naphthalene, Acenaphthylene, Acenaphthene, Florene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Ben(k)fluoranthene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene using EPA Method 8270 SIM.

To allow comparison of the PAH analyses to the “173-204 WAC Marine Sediment Quality Standards,” the results for PAH must be normalized for total organic carbon (TOC) if the TOC percent is in the range of 0.5 to 2.5. Samples S-1 through S-8 were analyzed for TOC and the results are presented in Table 4. All of the samples exhibited a TOC concentration greater than 2.5 percent so the dry weight values presented can be compared directly to the “173-204 WAC Marine Sediment Quality Standards” without normalizing. All of the PAH concentrations meet the “173-204 WAC Marine Sediment Quality Standards.”

The laboratory test certificates for the above sediment sample analyses are included in Appendix B.

## **Analytical Results (Ground Water)**

### Petroleum Hydrocarbons as Diesel and Motor Oil Analysis

Ground water samples were collected from each of the seven deep probe exploration borings (EB-1 through EB-7). All of the ground water samples were submitted to FBI for analysis for Petroleum Hydrocarbons as Diesel and Motor Oil using Method NWTPH-Dx.



The Diesel analysis for ground water samples EB-4 GW; EB-6 GW; and EB-7 GW had detectable Diesel concentrations that are below the MTCA Method A Cleanup Levels. The Diesel analysis for ground water samples EB-1 W and EB-5 GW had Diesel concentrations that are above the MTCA Method A Cleanup Levels. The remainder of the ground water samples analyzed for Diesel had concentrations below the method detection limit.

The Motor Oil analysis for ground water samples EB-6 GW and EB-7 GW had detectable Motor Oil concentrations that are below the MTCA Method A Cleanup Levels. The Motor Oil analysis for ground water sample EB-5 GW had a concentration that is above the MTCA Method A Cleanup Level. The remainder of the ground water samples analyzed for Motor Oil had concentrations below the method detection limit.

The results of the above analyses are summarized in Table 5.

#### BTEX and Gasoline Analysis

All of the ground water samples were submitted to FBI for analysis for BTEX and Gasoline using Method 8021 B and NWTPH-Gx.

All of the ground water samples analyzed for BTEX and Gasoline had concentrations below the method detection limit except sample EB-6 GW. Ground water sample EB-6 GW had detectable concentrations of both Xylene and Gasoline that were below the MTCA Method A Cleanup Level. The results are summarized in Table 5.

#### Metals Analysis

All of the ground water samples were submitted to FBI for analysis for the metals Chromium, Arsenic, Cadmium, Lead, Nickel, Copper, and Zinc using EPA 200.8. Ground water samples EB-5 GW, EB-6 GW, and EB-7 GW had Chromium concentrations above the MTCA Method A Cleanup Level. All the ground water samples had Arsenic concentrations above the MTCA Method A Cleanup Level. Ground water sample EB-6 GW had a Cadmium concentration above the MTCA Method A Cleanup Level. Ground water samples EB-1 W, EB-4 GW, EB-5 GW, EB-6 GW, and EB-7 GW had Lead concentrations above the MTCA Method A Cleanup Level.

The metals Copper, Zinc, Selenium, Barium, and Silver do not have MTCA Method A Cleanup Levels, but do have MTCA Method B Cleanup Levels. Sample EB-6 GW exhibited Copper and Barium concentrations above the MTCA Method B Cleanup criteria.

The remainder of the ground water samples analyzed for the above metals exhibited concentrations of these metals that are below the method detection limit, exhibited concentrations of these metals that are below the MTCA Method A or Method B Cleanup

Level, or in the case of Nickel, had detectable concentrations without any established MTCA Method A or Method B Cleanup Levels.

The results are summarized in Table 5.

#### Mercury Analysis

Ground water samples EB-4 GW, EB-5 GW, EB-6 GW, and EB-7 GW were submitted to FBI for analysis for the metal Mercury using Method 1631E. Ground water samples EB-4 GW, EB-5 GW, and EB-7 GW had concentrations of Mercury that were below the MTCA Method A Cleanup Level. Ground water sample EB-6 GW had a Mercury concentration that is above the MTCA Method A Cleanup Level.

The results are summarized in Table 5.

#### Semi-Volatile Compounds (Polynuclear Aromatic Hydrocarbons) Analysis

Ground water samples EB-4 GW, EB-5 GW, EB-6 GW, and EB-7 GW were submitted to FBI for analysis for semi-volatile compounds (Polynuclear Aromatic Hydrocarbons) Naphthalene, Acenaphthylene, Acenaphthene, Florene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Ben(k)fluoranthene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene using EPA Method 8270 SIM. All the ground water samples that were analyzed for these compounds had concentrations below the method detection limits except for EB-5 GW and EB-6 GW. Ground water sample EB-5 GW had a detectable concentration of Benzo(b)fluoranthene. Ground water sample EB-6 GW had a detectable concentration of Naphthalene. Both detections are below the MTCA Method A Cleanup Level.

The results are summarized in Table 6.

The laboratory test certificates for the aboveground water sample analyses are included in Appendix B.

## **SUMMARY**

### **Terrestrial Soil**

#### Metals

- Soil samples EB-3, 5 feet; HA-2; HA-7; HA-8; HA-10; and HA-13 exhibited Arsenic concentrations above the MTCA Method A Cleanup Level. Soil samples HA-1, HA-4,

and HA-13 exhibited Cadmium concentrations above the MTCA Method A Cleanup Level. Soil sample HA-10 exhibited a Lead concentration above the MTCA Method A Cleanup Level.

#### Semi-Volatile Compounds (PAHs)

- Soil sample EB-5, 6 feet had a Benzo(a)pyrene concentration above the MTCA Method A Cleanup Level.

#### **Marine Sediment**

##### Metals

- Sediment sample S-3 had a Zinc concentration above the “173-204 WAC Marine Sediment Quality Standards.”
- The sediment sample S-2 had a Mercury concentration above the “173-204 WAC Marine Sediment Quality Standards.”

#### **Ground Water**

##### Hydrocarbons

- The Diesel analysis for ground water samples EB-1 W and EB-5 GW had detectable Diesel concentrations that are above the MTCA Method A Cleanup Levels.
- The Motor Oil analysis for ground water sample EB-5 GW had a concentration that is above the MTCA Method A Cleanup Level.

##### Metals

- Ground water samples EB-5 GW, EB-6 GW, and EB-7 GW had Chromium concentrations above the MTCA Method A Cleanup Level.
- All the ground water samples had Arsenic concentrations above the MTCA Method A Cleanup Level.
- Ground water sample EB-6 GW had a Cadmium concentration above the MTCA Method A Cleanup Level.
- Ground water samples EB-1 W, EB-4 GW, EB-5 GW, EB-6 GW, and EB-7 GW had Lead concentrations above the MTCA Method A Cleanup Level.

- Ground water sample EB-6 GW exhibited copper and barium concentrations above the MTCA Method B Cleanup Level.

## **PRELIMINARY COST ANALYSIS**

Based on the results of this Phase II ESA, the subject property exhibits the following contamination above the MTCA Method A Cleanup criteria and the “WAC 173-204 Marine Sediment Quality Standards”:

1. Upland soils generally contain Arsenic concentrations greater than the MTCA Method A Cleanup criterion of 20 ppm. They also contain scattered Cadmium and CPAH concentrations above their respective MTCA Method A Cleanup criterion.
2. Shallow ground water beneath the site generally exhibits total Arsenic concentrations above the MTCA Method A Cleanup criterion of 5 parts per billion (ppb). In addition, shallow ground water in the southeast corner of the property exhibits concentrations of Petroleum Hydrocarbons, total Lead, and Chromium, and scattered concentrations of Mercury, Chromium, and Cadmium above the MTCA Method A Cleanup criterion.
3. Marine sediments contained within the boat basin exhibit elevated concentrations of Petroleum Hydrocarbons and CPAH concentrations that exceed the “WAC 173-204 Marine Sediment Quality Standards.”

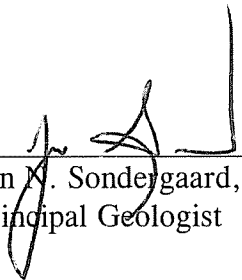
Preparation of a Cleanup Action Plan (CAP) would be required to fully evaluate potential remedial options in order to recommend the most applicable methodology. For this preliminary cost analysis, we have assumed that some form of capping and continued ground water monitoring would be the most practical and cost-effective remedial option. This methodology was chosen because Ecology has accepted capping as an effective way of isolating and mitigating elevated metal concentrations in soil and because it is likely that the shallow ground water beneath the site is not potable and would be exempt from remediation (WAC 173-340-720[2]) provided it was not a threat to marine life. Also at this time, it is not known what the ultimate end use of the property will be. This analysis assumes it would be recreational, but the ultimate determined end use could also impact the type of methodology used and the cost of the remediation.

For this preliminary cost analysis, four different remedial scenarios were evaluated:

1. Remove and replace 2 feet of upland soil and cap the basin with 2 feet of soil.
2. Asphalt pave the upland area and cap the basin with 2 feet of soil.
3. Cap the entire site with 2 feet of soil.
4. Cap only the upland area with 2 feet of soil.

The results of the preliminary cost analysis are summarized in Table 7. Estimated costs range from \$718,800 to \$2,731,200 with the least expensive being only capping the upland area and the most expensive being removing and replacing 2 feet of upland soil and capping the basin with 2 feet of soil. The difference in cost between capping the whole site (\$800,400) and just capping the upland area was \$81,200.

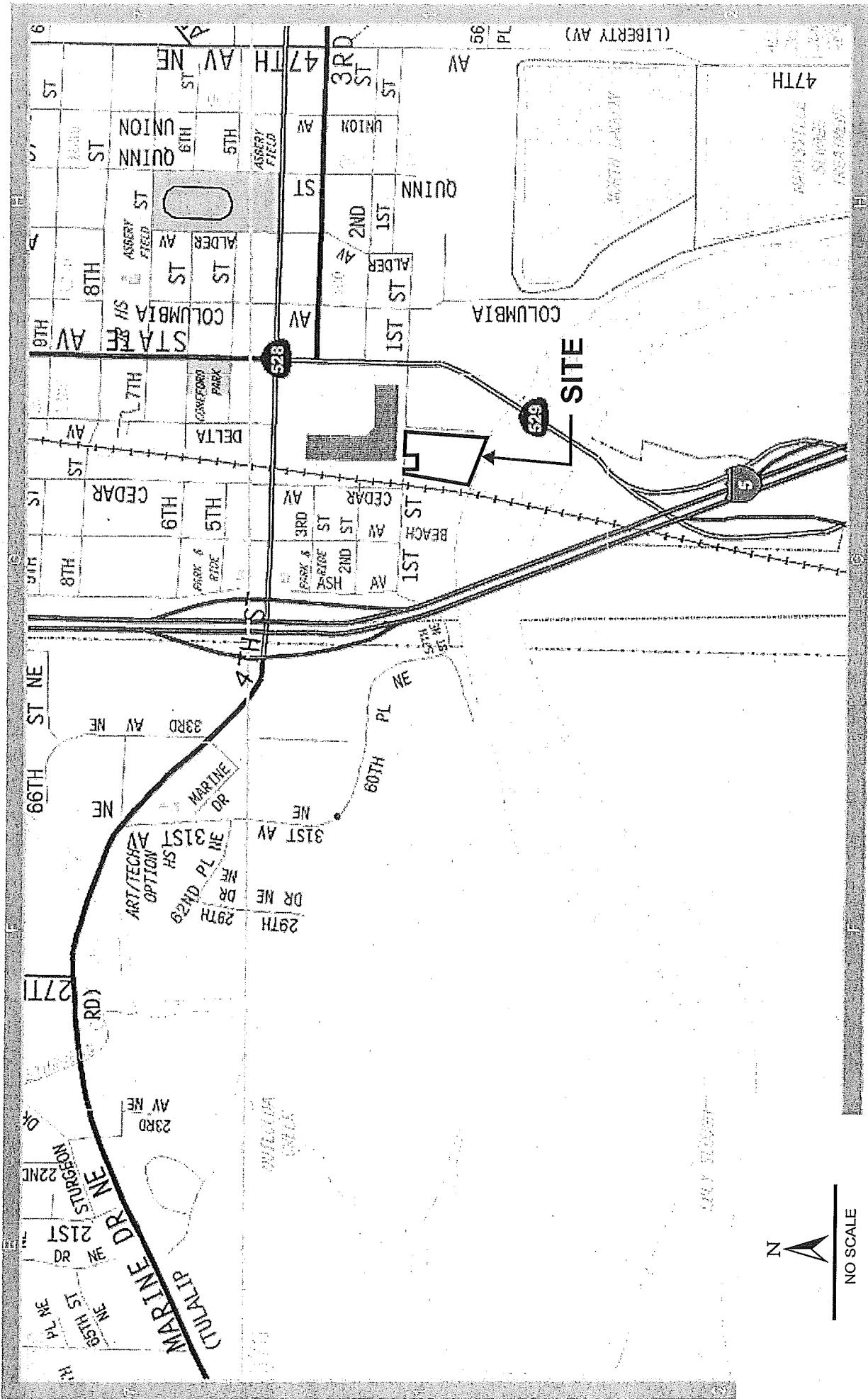
Sincerely,  
**ASSOCIATED EARTH SCIENCES, INC.**  
**Kirkland, Washington**



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Jon N. Sondergaard, L.G., L.E.G.  
Principal Geologist

- Attachments:
- Figure 1: Vicinity Map
  - Figure 2: Site and Exploration Plan
  - Plate 1: Analytical Test Results – Terrestrial Soil
  - Plate 2: Analytical Test Results – Marine Sediment
  - Plate 3: Analytical Test Results – Ground Water
  - Appendix A: Exploration Logs
  - Appendix B: Laboratory Analytical Data
  - Table 1: Geddes Marina Analytical Test Results for Diesel, Motor Oil, BTEX, and Metals in Terrestrial Soil (ppm)
  - Table 2: Geddes Marina Analytical Test Results for Semi-Volatile Compounds in Terrestrial Soil Samples (ppm)
  - Table 3: Geddes Marina Analytical Test Results for Diesel, Motor Oil, BTEX, and Metals in Marine Sediments (Soil) (ppm)
  - Table 4: Analytical Test Results for Semi-Volatile Compounds in Marine Sediment (Soil) Samples (ppm)
  - Table 5: Analytical Test Results for Diesel, Motor Oil, BTEX, and Metals in Ground Water (ppb)
  - Table 6: Analytical Test Results for Semi-Volatile Compounds in Ground Water Samples (ppb)
  - Table 7: Preliminary Cost Estimate for Remediation



NO SCALE

Associated Earth Sciences, Inc.



VICINITY MAP  
 GEDDES MARINA PHASE II  
 MARYSVILLE, WASHINGTON

FIGURE 1

DATE: 10/08

PROJ. NO. KV080118A



**Legend**

- ⊕ Exploration Boring
- Hand Auger Exploration
- ◆ Sediment\_Samples
- Approximate Subject Property Boundary



Reference: parcel outlines, waterbodies, Snohomish County GIS Center, acquired 2-08; Aerial photograph acquired from USGS Seamless Dataserver, 8-08

Associated Earth Sciences, Inc.



**SITE AND EXPLORATION PLAN**

GEDDES MARINA  
MARYSVILLE, WASHINGTON

FIGURE 2

DATE 10/08

PROJ. NO. KV080118A



PROJECT NO.: K0080118A	CHECKED BY: MSA	DATE: 11/08	DRAWN BY: MSA
SHEET			
1 of 3			

**PLATE 1**  
**ANALYTICAL TEST RESULTS - TERRESTRIAL SOIL**  
**GEDDES MARINA**  
**MARYSVILLE, WASHINGTON**

**Associated Earth Sciences, Inc.**  
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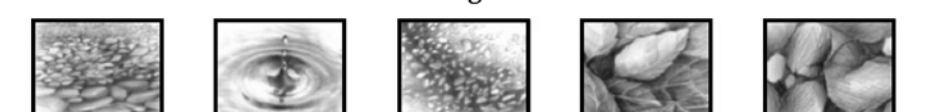


Reference: parcel outlines, waterbodies; Snohomish County GIS Center, acquired 2-08; Aerial photograph acquired from USGS Seamless Datacenter, 8-08

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DATE:	11/08
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	2 of 3

**PLATE 2**  
**ANALYTICAL TEST RESULTS - GROUNDWATER**  
**GEDDES MARINA**  
**MARYSVILLE, WASHINGTON**

**Associated Earth Sciences, Inc.**  
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Reference: parcel outlines, waterbodies; Snohomish County GIS Center, acquired 2-08; Aerial photograph acquired from USGS Seamless Datacenter, 8-08

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DATE: 11/08	PROJECT NO.: K0080118A
SHEET: 3 of 3	

**PLATE 3  
ANALYTICAL TEST RESULTS - MARINE SEDIMENT  
GEDDES MARINA  
MARYSVILLE, WASHINGTON**

**Associated Earth Sciences, Inc.**  
www.aesgeo.com

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Table 1 Geddes Marina Analytical Test Results for Diesel, Motor Oil, BTEX, and Metals in Terrestrial Soil (ppm)

Sample ID	Media	Depth (feet)	Date Sampled	Diesel	Motor Oil	Chromium	Arsenic	Selenium	Silver	Cadmium	Barium	Lead	Mercury	Nickel	Copper	Zinc	BTEX	Gasoline
EB-1, 5ft	Soil	5	8/19/2008	590	<250	11.4	5.04	NA	NA	<1	NA	5.72	ND	14.1	11.9	19.5	ND	ND
EB-2, 3ft	Soil	3	8/19/2008	<50	<250	9.56	3.5	NA	NA	<1	NA	4.89	ND	13.9	10.1	17.8	ND	ND
EB-3, 5ft	Soil	5	8/19/2008	<50	<250	27.5	<b>22.3</b>	NA	NA	<1	NA	27.2	ND	29.9	41.1	49.8	ND	ND
EB-4 5.5'	Soil	5.5	9/12/2008	<50	<250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND
EB-5 6'	Soil	6	9/12/2008	<50	<250	28.4	15	<1	<1	<1	24	43.5	NA	27.8	45	42.1	ND	ND
EB-6 5.5'	Soil	5.5	9/12/2008	<50	750	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND
EB-7 5'	Soil	5	9/12/2008	<50	<250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND
HA-1	Soil	1	8/19/2008	<50	<250	63	9.28	NA	NA	<b>60.5</b>	NA	95	ND	149	204	848	ND	ND
HA-2	Soil	1	8/19/2008	84	<250	28.5	<b>22</b>	NA	NA	<1	NA	63.2	0.21	16.7	98.9	179	ND	ND
HA-3	Soil	1	8/19/2008	<50	<250	35	19.5	NA	NA	<1	NA	10.7	ND	19.6	41.3	39.4	ND	ND
HA-4	Soil	1	8/19/2008	<50	<250	29.2	13.5	NA	NA	<b>3.42</b>	NA	117	0.29	32.9	124	897	ND	ND
HA-5	Soil	1	8/19/2008	<50	<250	22.4	6.29	NA	NA	<1	NA	105	ND	8.85	47	29.5	ND	ND
HA-6	Soil	1	8/19/2008	<50	<250	11.2	2.42	NA	NA	<1	NA	14.8	ND	10.1	14.5	26.6	ND	ND
HA-7	Soil	1	8/19/2008	<50	<250	42.5	<b>56.9</b>	NA	NA	<1	NA	101	ND	19.9	111	73.6	ND	ND
HA-8	Soil	1	8/19/2008	<50	<250	30.4	21.1	NA	NA	<1	NA	16.9	ND	14.8	47.2	40.5	ND	ND
HA-9	Soil	1	8/19/2008	57	<250	30.1	16.3	NA	NA	<1	NA	30.9	ND	20.4	42.9	46.9	ND	ND
HA-10	Soil	1	8/19/2008	<50	<250	60.8	<b>23.5</b>	NA	NA	<1	NA	<b>544</b>	0.22	27.5	132	243	ND	ND
HA-11	Soil	0.5	9/12/2008	<50	<250	20.4	14.8	<1	<1	<1	87.4	26.4	ND	20.8	27.1	271	ND	ND
HA-12	Soil	0.5	9/12/2008	<50	<250	12.5	3.45	<1	<1	1.97	26.8	17.4	ND	20.8	35.9	135	ND	ND
HA-13	Soil	0.5	9/12/2008	<50	<150	11.7	<b>25.8</b>	<1	<1	<b>4.09</b>	35.9	41.7	ND	14.7	37.5	61.7	ND	ND
HA-14	Soil	0.5	9/12/2008	<50	<150	10.2	7.48	<1	<1	1.09	18.9	66.8	ND	9.95	75.7	133	ND	ND
MTCA Method A Cleanup Levels				2,000	2,000	2,000*	20	400**	400**	2	16000**	250	2		3000**	24000**		100

NOTES

ppm=parts per million

x=The pattern of peaks is not indicative of diesel

ND=below the detection level

\*Based on Chromium III Clean Up Standard

**Bold** = Exceeds MTCA Method A Clean Up Standard

\*\*=MTCA Method B Clean Up Criteria

Table 3 Geddes Marina Analytical Test Results for Diesel, Motor Oil, BTEX, and Metals in Marine Sediments (Soil) (ppm)															
Sample ID	Media	Depth (feet)	Date Sampled	Diesel	Motor Oil	Chromium	Arsenic	Cadmium	Lead	Zinc	Copper	Nickel	Mercury	BTEX	Gasoline
S-1	Soil	5	9/10/2008	650x	3,100	26	6.21	1.3	120	251	49.4	27	<0.2	ND	ND
S-2	Soil	3	9/10/2008	1,600x	5,700	36.5	15.5	1.94	376	276	55.8	29.5	<b>0.44</b>	ND	ND
S-3	Soil	5	9/10/2008	4,700x	18,000	65.9	17.2	3.73	302	<b>471</b>	129	50.5	0.31	ND	ND
S-4	Soil	5.5	9/10/2008	300x	1,500	35.9	20.7	<1	31.3	81.6	54.1	35.4	<0.2	ND	ND
S-5	Soil	6	9/10/2008	250x	1,300	54.1	19	<1	99.3	106	65.5	42.4	<0.2	ND	ND
S-6	Soil	5.5	9/10/2008	690x	3,400	42.2	17.9	<1	64.7	105	61.5	36.4	<0.2	ND	ND
S-7	Soil	5	9/10/2008	420x	2,000	45.2	16.2	<1	110	153	91.3	36.8	0.22	ND	ND
S-8	Soil	1	9/10/2008	<50	<250	41	17.4	<1	16.5	57.4	49.2	50	<0.2	ND	ND
173-204 WAC Sediment Quality Standards				see below*	see below*	260	57	5.1	450	410	390		0.41		

**NOTES**

ppm=parts per million

ND=Below the detection level

x=The pattern of peaks present is not indicative of diesel

**Bold** = Exceeds 173-204 Sediment Quality Standard

\*The Marine Sediment Quality Standard for Total Petroleum Hydrocarbons is determined on a site specific basis based on bioassay testing.

Table 5 Analytical Test Results for Diesel, Motor Oil, BTEX, and Metals in Ground Water (ppb)

Sample ID	Media	Depth (feet)	Date Sampled	Diesel	Motor Oil	Chromium	Arsenic	Copper	Cadmium	Zinc	Lead	Selenium	Mercury	Barium	Nickel	Silver	BTEX	Gasoline
EB-1, W	Ground Water	5	8/19/2008	920x	<270	16.2	10.7	16.5	<1	35	26.2	NA	NA	NA	15.5	NA	ND	ND
EB-2, W	Ground Water	5	8/19/2008	<50	<250	17.1	23.5	16.7	<1	17.6	8.52	NA	NA	NA	17.8	NA	ND	ND
EB-3, W	Ground Water	5	8/19/2008	<50	<250	37.8	62	49.5	<1	47.6	9.27	NA	NA	NA	27.5	NA	ND	ND
EB-4 GW	Ground Water	2-3	9/12/2008	78x	<290	48	33.8	65.7	<5	79.3	79.9	35.1	0.2	331	49.6	<5	ND	ND
EB-5 GW	Ground Water	2-3	9/12/2008	7,000x	25,000	125	77.9	258	<5	271	188	20.3	0.29	372	117	<5	ND	ND
EB-6 GW	Ground Water	2-3	9/12/2008	87x	320	938	178	1,050	19	1,940	2,050	22.3	3	4,770	957	5.49	3*	160
EB-7 GW	Ground Water	2-3	9/12/2008	300x	490	89.5	44.2	118	<10	253	3,040	2.9	0.26	414	89	<10	ND	ND
MTCA Method A Clean-up level				500	500	50***	5	590**	5	4800**	15	80**	2	3200**		80**	1000	1000

NOTES:

ppb=parts per billion

ND=Below the detection level

x=The pattern of peaks is not indicative of diesel

NA=not analyzed

\* = Xylene component was 3 parts per billion, no other analytes detected

\*\*= MTCA Method B Clean Up Level

**Bold**=Above MTCA Method A Clean Up Level

\*\*\*=MTCA Method A clean up level for Chromiim III

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Table 7 Preliminary Cost Estimate for Remediation  
Geddes Marina, Marysville, WA

Alternative	Remove and Replace 2 Ft Upland Soil Cap Basin with 2 ft of Soil	Asphalt Pave Upland Cap Basin with 2 ft of Soil	Cap Entire Site With 2 ft of Soil	Only Cap Upland With 2 ft of Soil
<b>Task</b>				
Clean Up Action Plan	\$30,000.00	\$30,000.00	\$30,000.00	\$30,000.00
Ground Water Monitoring Wells	\$10,000.00	\$10,000.00	\$10,000.00	\$10,000.00
Topo/Boundary Survey	\$20,000.00	\$20,000.00	\$20,000.00	\$20,000.00
Civil Engineering	\$30,000.00	\$30,000.00	\$30,000.00	\$30,000.00
Ground Water Monitoring (5 yr. Period)	\$200,000.00	\$200,000.00	\$200,000.00	\$200,000.00
Excavation	\$15,000.00	\$0.00	\$0.00	\$0.00
Contaminated Soil Disposal	\$1,185,000.00	\$0.00	\$0.00	\$0.00
Delivered Fill	\$245,000.00	\$173,000.00	\$245,000.00	\$208,000.00
Fill Placement	\$31,000.00	\$22,000.00	\$31,000.00	\$26,000.00
Compaction	\$23,000.00	\$16,000.00	\$23,000.00	\$19,500.00
Finish Grading	\$12,000.00	\$19,000.00	\$18,000.00	\$15,500.00
Base Course	\$0.00	\$128,000.00	\$0.00	\$0.00
Asphalt 3-inches Thick	\$0.00	\$252,000.00	\$0.00	\$0.00
Construction Monitoring	\$60,000.00	\$50,000.00	\$60,000.00	\$40,000.00
<b>Subtotal</b>	\$1,861,000.00	\$950,000.00	\$667,000.00	\$599,000.00
Contingency 20%	\$372,200.00	\$190,000.00	\$133,400.00	\$119,800.00
<b>Estimated Total Cost (2008 Dollars)</b>	<b>\$2,233,200.00</b>	<b>\$1,140,000.00</b>	<b>\$800,400.00</b>	<b>\$718,800.00</b>

NOTES:

- 1) Assumes site demolition and clearing and drainage of basin has been completed
- 2) Assumes ground water is not potable and does not require clean up (WAC 173-340-720(2))
- 3) The costs presented above are only estimates based on currently available data and are not intended for construction purposes.
- 4) Final site preparation would not be suitable for shallow spread footing foundations. Deep foundations would be required to support structures.

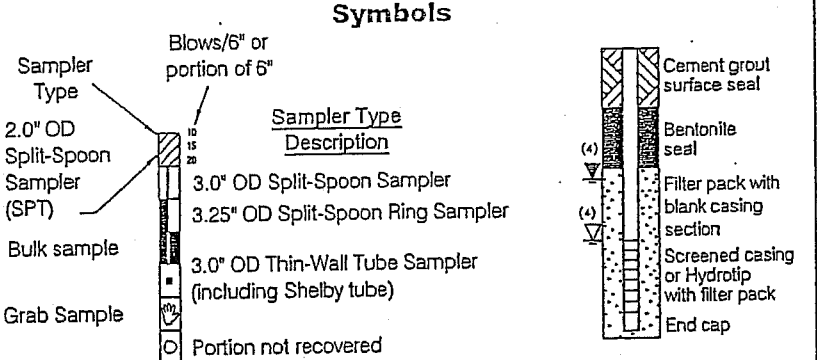
# **APPENDIX A**

## **Exploration Logs**

Soil Classification		Terms Describing Relative Density and Consistency		
		Density	SPT <sup>(2)</sup> blows/foot	
Coarse-Grained Soils - More than 50% (1) Retained on No. 200 Sieve	Gravels - More than 50% (1) of Coarse Fraction Retained on No. 4 Sieve	GW	Well-graded gravel and gravel with sand, little to no fines	Coarse-Grained Soils Density Very Loose 0 to 4 Loose 4 to 10 Medium Dense 10 to 30 Dense 30 to 50 Very Dense >50 Consistency Very Soft 0 to 2 Soft 2 to 4 Medium Stiff 4 to 8 Stiff 8 to 15 Very Stiff 15 to 30 Hard >30 Test Symbols G = Grain Size M = Moisture Content A = Atterberg Limits C = Chemical DD = Dry Density K = Permeability
		GP	Poorly-graded gravel and gravel with sand, little to no fines	
		GM	Silty gravel and silty gravel with sand	
	Sands - 50% (1) or More of Coarse Fraction Passes No. 4 Sieve	GC	Clayey gravel and clayey gravel with sand	
		SW	Well-graded sand and sand with gravel, little to no fines	
		SP	Poorly-graded sand and sand with gravel, little to no fines	
Fine-Grained Soils - 50% (1) or More Passes No. 200 Sieve	Sands - 50% (1) or More of Coarse Fraction Passes No. 4 Sieve	SM	Silty sand and silty sand with gravel	
		SC	Clayey sand and clayey sand with gravel	
		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel	
	Sils and Clays Liquid Limit Less than 50	CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay	
		OL	Organic clay or silt of low plasticity	
		Sils and Clays Liquid Limit 50 or More	MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel			
OH	Organic clay or silt of medium to high plasticity			
Highly Organic Soils	PT	Peat, muck and other highly organic soils		

Component Definitions	
Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

(3) Estimated Percentage		Moisture Content
Component	Percentage by Weight	
Trace	<5	Dry - Absence of moisture, dusty, dry to the touch
Few	5 to 10	Slightly Moist - Perceptible moisture
Little	15 to 25	Moist - Damp but no visible water
With	- Non-primary coarse constituents: ≥ 15% - Fines content between 5% and 15%	Very Moist - Water visible but not free draining
		Wet - Visible free water, usually from below water table



- (1) Percentage by dry weight
- (2) (SPT) Standard Penetration Test (ASTM D-1586)
- (3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
- (4) Depth of groundwater  
 ▼ ATD = At time of drilling  
 ▽ Static water level (date)
- (5) Combined USCS symbols used for fines between 5% and 15%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.





# LOG OF EXPLORATION BORING NO. EB-1

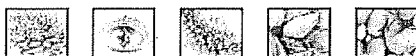
Depth (ft)	<p style="font-size: small;">This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p style="text-align: center;"><b>DESCRIPTION</b></p>
1	Asphalt <b>Fill</b> Medium dense, moist, light gray, non-stratified, sandy fine to coarse, subrounded and subangular gravel, few silt (SM).
2	<b>Fill</b> Loose, moist to wet, light gray to dark gray, non-stratified fine to coarse SAND, little silt, trace fine subrounded gravel (SW).
3	<b>Woody Debris/Log</b>
4	<b>Fill</b> Loose, saturated, brown, silty fine to medium SAND and crushed SHELLS, trace disseminated organics (SM).
5	<b>Fill/Lacustrine Deposit?</b> Very soft to soft, saturated, light olive-gray and light brown, interlayered organic rich silty CLAY, trace fine sand, PEAT, and WOODY MATERIAL (OL/CL/PT).
6	
7	
8	
9	Loose, saturated, non-stratified, fine to coarse SAND, trace silt, trace organics (SW).
10	PEAT (PT).
11	
12	<b>Estuarine/Alluvial Deposit</b>
13	Loose, saturated, light gray, non-stratified, fine to medium SAND, few grading down to trace silt (SM/SW).
14	
15	
16	
17	Bottom of exploration boring at depth 16 feet Ground water at approximately 5' below the surface. Soil sample (EB-1, 5') taken at approximately 5' below the surface. Water sample (EB-1, W) taken from approximately 5' below the surface.
18	
19	
20	

KCTP3 080118A.GPJ October 17, 2008

## Geddes Marina Phase II ESA Marysville, WA

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8/19/08

# LOG OF EXPLORATION BORING NO. EB-2

Depth (ft)	DESCRIPTION
1	<b>Fill</b> Medium dense, moist, light gray, non-stratified, gravelly fine to coarse SAND, few silt (SM).
2	
3	<b>Fill</b>
4	Very soft to soft, wet to saturated, brown, PEATY ORGANIC MATERIAL.
5	<b>Fill</b> Loose, saturated, brown, non-stratified, silty fine to medium SAND and crushed SHELLS, trace disseminated organics (SM).
6	<b>Fill/Lacustrine Deposit?</b>
7	Soft, saturated, light olive-gray and light brown, interbedded/interlayered organics, silty CLAY and PEATY MATERIAL, scattered small logs (CL/OL/PT).
8	
9	
10	
11	
12	<b>Estuarine Deposit</b>
13	Soft, saturated, light olive-gray, weakly stratified, silty CLAY, few disseminated organics (CL).
14	
15	
16	Bottom of exploration boring at depth 15 feet Ground water at approximately 4' below the surface. Soil sample (EB-2, 3') taken from approximately 3' below the surface. Water sample (EB-2, W) taken from approximately 5' below the surface.
17	
18	
19	
20	

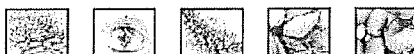
## Geddes Marina Phase II ESA Marysville, WA

Associated Earth Sciences, Inc.

Project No. KV080118A

Logged by: JDC

Approved by:



8/19/08

# LOG OF EXPLORATION BORING NO. EB-3

Depth (ft)	
	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p><b>DESCRIPTION</b></p>
1	<p><b>Fill</b></p> <p>Medium dense, moist, light gray, non-stratified, sandy fine to coarse subrounded GRAVEL, few silt (GM).</p>
2	<p><b>Fill/Lacustrine Deposit?</b></p> <p>Soft, saturated, light olive-gray and light brown, interbedded/interlayered organics, silty CLAY and PEATY MATERIAL, scattered small logs (CL/OL/PT).</p>
3	
4	
5	
6	
7	
8	
9	
10	<p><b>Estuarine Deposit</b></p> <p>Soft, saturated, light olive-gray, weakly stratified, silty CLAY, few disseminated organics (CL).</p>
11	
12	
13	
14	
15	
16	<p>Bottom of exploration boring at depth 15 feet            Ground water at approximately 5' below the surface. Soil sample (EB-3, 5') taken at approximately 5' below the surface.            Water sample (EB-3, W) taken at approximately 5' below the surface.</p>
17	
18	
19	
20	

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Project No. KV080118A

8/19/08

# LOG OF EXPLORATION BORING NO. EB-4

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.
	<b>DESCRIPTION</b>
1	<b>Fill</b> Loose, damp, gray/black, sandy GRAVEL, some silt (SM).
2	
3	
4	<b>Fill</b> Loose, damp, dark brown, silty SAND, trace gravel and wood debris (slight black staining) (SW).
5	<b>Fill</b> Very soft to soft, saturated, light brown, silty CLAY, PEAT and wood debris (OL/CL/PT).
6	
7	
8	
9	<b>Fill</b> Loose, dark brown, medium to coarse SAND, trace wood debris (SW).
10	
11	
12	
13	Bottom of exploration boring at depth 12 feet Screened from 4' to 7' temp steel well, sampler with peristaltic.
14	
15	
16	
17	
18	
19	
20	

## Geddes Marina Phase II ESA Marysville, WA

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Project No. KV080118A

October 2008

# LOG OF EXPLORATION BORING NO. EB-5

Depth (ft)	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p><b>DESCRIPTION</b></p>
1	<p><b>Fill</b></p> <p>Loose, damp, gray/dark brown, sandy GRAVEL, some silt (SM). Note: Some burnt/charred material in shoe.</p>
2	
3	
4	
5	<p><b>Fill</b></p> <p>Loose, damp, gray/dark brown, sandy GRAVEL, some silt, grades to very soft, gray/brown, PEAT/SILT, with wood debris (PT).</p>
6	
7	
8	Same as above.
9	
10	
11	
12	
13	Bottom of exploration boring at depth 12 feet Screened from 7' to 10' (Raked screen to 4' to 6' after 45 minutes of little water).
14	
15	
16	
17	
18	
19	
20	

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Project No. KV080118A

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# LOG OF EXPLORATION BORING NO. EB-6

Depth (ft)	
	<p>This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p><b>DESCRIPTION</b></p>
1	<p><b>Fill</b></p> <p>Loose, damp, gray, sandy GRAVEL, some silt, grades to loose, dark brown, silty CLAY, trace wood debris (SM/OL/CL).</p>
2	
3	
4	
5	<p><b>Fill</b></p> <p>Same as above with 3" gray sand interbed, grades to very loose, damp, brown, PEAT, with silt (OL/CL/PT).</p>
6	
7	
8	<p>-----</p> <p><b>Estuarine/Alluvial Deposit</b></p>
9	Loose to medium dense, saturated, light gray, fine to medium SAND, trace silt, grades to brown PEAT (SM/SW/PT).
10	
11	
12	
13	Bottom of exploration boring at depth 12 feet
14	
15	
16	
17	
18	
19	
20	

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## Geddes Marina Phase II ESA Marysville, WA

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October 2008

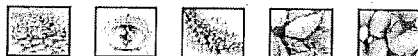
# LOG OF EXPLORATION BORING NO. EB-7

Depth (ft)	<p style="font-size: small;">This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.</p> <p style="margin-top: 10px;"><b>DESCRIPTION</b></p>
1	<p><b>Fill</b></p> <p>Very loose, damp to wet, gray/brown, sandy GRAVEL, with silt, trace wood debris (SM).</p>
2	
3	
4	
5	<p><b>Fill</b></p> <p>Same as above, grades to very loose, moist to wet, brown, PEAT, with silt (SM/PT).</p>
6	
7	
8	<p><b>Fill</b></p> <p>Very soft, saturated, brown, silty PEAT (PT).</p>
9	
10	
11	
12	
13	Bottom of exploration boring at depth 12 feet
14	
15	
16	
17	
18	
19	
20	

## Geddes Marina Phase II ESA Marysville, WA

Logged by: MSA  
Approved by:

Associated Earth Sciences, Inc.



Project No. KV080118A

October 2008

# **APPENDIX B**

## **Laboratory Analytical Data**



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
Bradley T. Benson, B.S.  
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September 17, 2008

Jon Sondergaard, Project Manager  
Associated Earth Sciences, Inc.  
911 5th Avenue, Suite 100  
Kirkland, WA 98033

Dear Mr. Sondergaard:

Included are the additional results from the testing of material submitted on August 20, 2008 from the Geddes Marina KV080118A, F&BI 808206 project. There are 25 pages included in this report.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
AE10917R.DOC

# FRIEDMAN & BRUYA, INC.

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## ENVIRONMENTAL CHEMISTS

### CASE NARRATIVE

This case narrative encompasses samples received on August 20, 2008 by Friedman & Bruya, Inc. from the Associated Earth Sciences, Inc. Geddes Marina KV080118A, F&BI 808206 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Associated Earth Sciences, Inc.</u>
808206-01	EB-1, 5 ft
808206-02	EB-1, W
808206-03	EB-2, 3 ft
808206-04	EB-2, W
808206-05	EB-3, 5 ft
808206-06	EB-3, W
808206-07	HA-1
808206-08	HA-2
808206-09	HA-3
808206-10	HA-4
808206-11	HA-5
808206-12	HA-6
808206-13	HA-7
808206-14	HA-8
808206-15	HA-9
808206-16	HA-10

There was insufficient sample volume to analyze for mercury in water. All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-1, W	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	808206-02
Date Analyzed:	08/26/08	Data File:	808206-02.015
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	81	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	16.2
Nickel	15.5
Copper	16.5
Zinc	35.0
Arsenic	10.7
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-2, W	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	808206-04
Date Analyzed:	08/26/08	Data File:	808206-04.016
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	114	60	125
Indium	78	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	17.1
Nickel	17.8
Copper	16.7
Zinc	17.6
Arsenic	23.5
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-3, W	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	808206-06
Date Analyzed:	08/26/08	Data File:	808206-06.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	70	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	37.8
Nickel	27.5
Copper	49.5
Zinc	47.6
Arsenic	62.0
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	Not Applicable	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	I8-328 mb
Date Analyzed:	08/26/08	Data File:	I8-328 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125
Indium	98	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<2
Arsenic	<1
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-1, 5 ft	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-01
Date Analyzed:	08/26/08	Data File:	808206-01.021
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	11.4
Nickel	14.1
Copper	11.9
Zinc	19.5
Arsenic	5.04
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-2, 3 ft	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-03
Date Analyzed:	08/26/08	Data File:	808206-03.022
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	9.56
Nickel	13.9
Copper	10.1
Zinc	17.8
Arsenic	3.50
Cadmium	<1



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-3, 5 ft	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-05
Date Analyzed:	08/26/08	Data File:	808206-05.023
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	27.5
Nickel	29.9
Copper	41.1
Zinc	49.8
Arsenic	22.3
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-1	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-07
Date Analyzed:	08/26/08	Data File:	808206-07.026
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	77	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	63.0
Nickel	149
Copper	204
Zinc	848
Arsenic	9.28
Cadmium	60.5

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-2	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-08
Date Analyzed:	08/26/08	Data File:	808206-08.027
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	95	60	125
Indium	81	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	28.5
Nickel	16.7
Copper	98.9
Zinc	179
Arsenic	22.0
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-3	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-09
Date Analyzed:	08/26/08	Data File:	808206-09.028
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	94	60	125
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	35.0
Nickel	19.6
Copper	41.3
Zinc	39.4
Arsenic	19.5
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-4	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-10
Date Analyzed:	08/26/08	Data File:	808206-10.030
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	89	60	125
Indium	81	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	29.2
Nickel	32.9
Copper	124
Zinc	897
Arsenic	13.5
Cadmium	3.42

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-5	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-11
Date Analyzed:	08/26/08	Data File:	808206-11.031
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	89	60	125
Indium	82	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	22.4
Nickel	8.85
Copper	47.0
Zinc	29.5
Arsenic	6.29
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-6	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-12
Date Analyzed:	08/26/08	Data File:	808206-12.032
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	11.2
Nickel	10.1
Copper	14.5
Zinc	26.6
Arsenic	2.42
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-7	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-13
Date Analyzed:	08/26/08	Data File:	808206-13.033
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	42.5
Nickel	19.9
Copper	111
Zinc	73.6
Arsenic	56.9
Cadmium	<1



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-8	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-14
Date Analyzed:	08/26/08	Data File:	808206-14.034
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	30.4
Nickel	14.8
Copper	47.2
Zinc	40.5
Arsenic	21.1
Cadmium	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-9	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-15
Date Analyzed:	08/26/08	Data File:	808206-15.035
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	89	60	125
Indium	78	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	30.1
Nickel	20.4
Copper	42.9
Zinc	46.9
Arsenic	16.3
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-10	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-16
Date Analyzed:	08/26/08	Data File:	808206-16.036
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	88	60	125
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	60.8
Nickel	27.5
Copper	132
Zinc	243
Arsenic	23.5
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	Not Applicable	Project:	Geddes Marina KV080118A, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	I8-330 mb
Date Analyzed:	08/26/08	Data File:	I8-330 mb.019
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	85	60	125
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/17/08  
Date Received: 08/20/08  
Project: Geddes Marina KV080118A, F&BI 808206  
Date Extracted: 08/26/08  
Date Analyzed: 09/12/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
EB-1, 5 ft 808206-01	<0.2
EB-2, 3 ft 808206-03	<0.2
EB-3, 5 ft 808206-05	<0.2
HA-1 808206-07	<0.2
HA-2 808206-08	0.21
HA-3 808206-09	<0.2
HA-4 808206-10	0.29
HA-5 808206-11	<0.2
HA-6 808206-12	<0.2
HA-7 808206-13	<0.2
HA-8 808206-14	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/17/08  
Date Received: 08/20/08  
Project: Geddes Marina KV080118A, F&BI 808206  
Date Extracted: 08/26/08  
Date Analyzed: 09/12/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
HA-9 808206-15	<0.2
HA-10 808206-16	0.22
Method Blank	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/17/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 808235-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	ug/L (ppb)	10.1	10.2	1	0-20
Nickel	ug/L (ppb)	8.90	8.96	1	0-20
Copper	ug/L (ppb)	8.63	8.96	4	0-20
Zinc	ug/L (ppb)	13.3	11.1	18	0-20
Arsenic	ug/L (ppb)	1.06	1.13	6	0-20
Cadmium	ug/L (ppb)	<1	<1	nm	0-20

Laboratory Code: 808235-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	ug/L (ppb)	20	10.1	97 b	50-150
Nickel	ug/L (ppb)	20	8.90	105 b	50-150
Copper	ug/L (ppb)	20	8.63	102 b	50-150
Zinc	ug/L (ppb)	50	13.3	95 b	50-150
Arsenic	ug/L (ppb)	10	1.06	116	50-150
Cadmium	ug/L (ppb)	5	<1	105	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	105	70-130
Nickel	ug/L (ppb)	20	106	70-130
Copper	ug/L (ppb)	20	108	70-130
Zinc	ug/L (ppb)	50	98	70-130
Arsenic	ug/L (ppb)	10	90	70-130
Cadmium	ug/L (ppb)	5	103	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/17/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 808206-05 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	mg/kg (ppm)	27.5	33.1	18	0-20
Nickel	mg/kg (ppm)	29.9	38.2	24 hr	0-20
Copper	mg/kg (ppm)	41.1	50.7	21 hr	0-20
Zinc	mg/kg (ppm)	49.8	56.6	13	0-20
Arsenic	mg/kg (ppm)	22.3	22.8	2	0-20
Cadmium	mg/kg (ppm)	<1	<1	nm	0-20

Laboratory Code: 808206-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	27.5	94 b	50-150
Nickel	mg/kg (ppm)	25	29.9	93 b	50-150
Copper	mg/kg (ppm)	50	41.1	93 b	50-150
Zinc	mg/kg (ppm)	50	49.8	93 b	50-150
Arsenic	mg/kg (ppm)	10	22.3	108 b	50-150
Cadmium	mg/kg (ppm)	10	<1	105	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	101	70-130
Nickel	mg/kg (ppm)	25	103	70-130
Copper	mg/kg (ppm)	50	104	70-130
Zinc	mg/kg (ppm)	50	105	70-130
Arsenic	mg/kg (ppm)	10	108	70-130
Cadmium	mg/kg (ppm)	10	103	70-130



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/17/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES FOR  
TOTAL MERCURY  
USING EPA METHOD 1631E**

Laboratory Code: 808206-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.2	95	104	50-150	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	99	70-130

# 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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
Charlene Morrow, M.S.  
Yelena Aravkina, M.S.  
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September 2, 2008

Jon Sondergaard, Project Manager  
Associated Earth Sciences, Inc.  
911 5th Avenue, Suite 100  
Kirkland, WA 98033

SEP - 8 2008

Dear Mr. Sondergaard:

Included are the results from the testing of material submitted on August 20, 2008 from the Geddes Marina KV080118A, F&BI 808206 project. There are 32 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
AE10902R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on August 20, 2008 by Friedman & Bruya, Inc. from the Associated Earth Sciences, Inc. Geddes Marina KV080118A, F&BI 808206 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Associated Earth Sciences, Inc.</u>
808206-01	EB-1, 5ft
808206-02	EB-1, W
808206-03	EB-2, 3ft
808206-04	EB-2, W
808206-05	EB-3, 5ft
808206-06	EB-3, W
808206-07	HA-1
808206-08	HA-2
808206-09	HA-3
808206-10	HA-4
808206-11	HA-5
808206-12	HA-6
808206-13	HA-7
808206-14	HA-8
808206-15	HA-9
808206-16	HA-10

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

Date Extracted: 08/22/08

Date Analyzed: 08/22/08 and 08/25/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx  
Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)**

<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 50-150)
EB-1, 5ft 808206-01	<0.02	<0.02	<0.02	<0.06	<2	88
EB-2, 3ft 808206-03	<0.02	<0.02	<0.02	<0.06	<2	88
EB-3, 5ft 808206-05	<0.02	<0.02	<0.02	<0.06	<2	101
HA-1 808206-07	<0.02	<0.02	<0.02	<0.06	<2	127
HA-2 808206-08	<0.02	<0.02	<0.02	<0.06	<2	83
HA-3 808206-09	<0.02	<0.02	<0.02	<0.06	<2	97
HA-4 808206-10	<0.02	<0.02	<0.02	<0.06	<2	67
HA-5 808206-11	<0.02	<0.02	<0.02	<0.06	<2	88
HA-6 808206-12	<0.02	<0.02	<0.02	<0.06	<2	90
HA-7 808206-13	<0.02	<0.02	<0.02	<0.06	<2	79

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

Date Extracted: 08/22/08

Date Analyzed: 08/22/08 and 08/25/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR BENZENE, TOLUENE, ETHYLBENZENE,  
XYLENES AND TPH AS GASOLINE  
USING EPA METHOD 8021B AND NWTPH-Gx**  
Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<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 50-150)
HA-8 808206-14	<0.02	0.05	<0.02	<0.06	<2	128
HA-9 808206-15	<0.02	<0.02	<0.02	<0.06	<2	90
HA-10 808206-16	<0.02	<0.02	<0.02	<0.06	<2	84
Method Blank	<0.02	<0.02	<0.02	<0.06	<2	108

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

Date Extracted: 08/22/08

Date Analyzed: 08/23/08

**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)
EB-1, W 808206-02	<1	<1	<1	<3	<100	92
EB-2, W 808206-04	<1	<1	<1	<3	<100	80
EB-3, W 808206-06	<1	<1	<1	<3	<100	91
Method Blank	<1	<1	<1	<3	<100	98

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

Date Extracted: 08/22/08

Date Analyzed: 08/22/08 and 08/23/08

**RESULTS FROM THE ANALYSIS OF THE SOIL 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 on a Dry Weight Basis  
Results Reported as mg/kg (ppm)**

<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> (% Recovery) (Limit 53-144)
EB-1, 5ft 808206-01	590	<250	89
EB-2, 3ft 808206-03	<50	<250	89
EB-3, 5ft 808206-05	<50	<250	89
HA-1 808206-07	<50	<250	91
HA-2 808206-08	84	<250	91
HA-3 808206-09	<50	<250	88
HA-4 808206-10	<50	<250	88
HA-5 808206-11	<50	<250	89
HA-6 808206-12	<50	<250	91
HA-7 808206-13	<50	<250	88



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08  
Date Received: 08/20/08  
Project: Geddes Marina KV080118A, F&BI 808206  
Date Extracted: 08/22/08  
Date Analyzed: 08/22/08 and 08/23/08

**RESULTS FROM THE ANALYSIS OF THE SOIL 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 on a Dry Weight Basis  
Results Reported as mg/kg (ppm)**

<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 53-144)
HA-8 808206-14	<50	<250	92
HA-9 808206-15	57	<250	90
HA-10 808206-16	<50	<250	92
Method Blank	<50	<250	89

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

Date Extracted: 08/22/08

Date Analyzed: 08/25/08

**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 52-134)
EB-1, W dv 808206-02	920 x	<270	81
EB-2, W 808206-04	<50	<250	80
EB-3, W 808206-06	<50	<250	84
Method Blank	<50	<250	65

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-1, 5ft	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-01
Date Analyzed:	08/26/08	Data File:	808206-01.021
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	87	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	5.72

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-2, 3ft	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-03
Date Analyzed:	08/26/08	Data File:	808206-03.022
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	88	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	4.89

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-3, 5ft	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-05
Date Analyzed:	08/26/08	Data File:	808206-05.023
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	85	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	27.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-1	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-07
Date Analyzed:	08/26/08	Data File:	808206-07.026
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	81	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	95.0

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-2	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-08
Date Analyzed:	08/26/08	Data File:	808206-08.027
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	63.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-3	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-09
Date Analyzed:	08/26/08	Data File:	808206-09.028
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	84	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	10.7



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-4	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-10
Date Analyzed:	08/26/08	Data File:	808206-10.030
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	82	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	117

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-5	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-11
Date Analyzed:	08/26/08	Data File:	808206-11.031
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	83	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	105

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-6	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-12
Date Analyzed:	08/26/08	Data File:	808206-12.032
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	87	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	14.8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-7	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-13
Date Analyzed:	08/26/08	Data File:	808206-13.033
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	84	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	101

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-8	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-14
Date Analyzed:	08/26/08	Data File:	808206-14.034
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	83	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	16.9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-9	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-15
Date Analyzed:	08/26/08	Data File:	808206-15.035
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Lead	30.9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-10	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	808206-16
Date Analyzed:	08/26/08	Data File:	808206-16.036
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	83	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)
Lead	544

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	Not Applicable	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/26/08	Lab ID:	I8-330 mb
Date Analyzed:	08/26/08	Data File:	I8-330 mb.019
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	86	Limit:	Limit:
		60	125

Analyte:	Concentration
	mg/kg (ppm)

Lead	<1
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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-1, W	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	808206-02
Date Analyzed:	08/26/08	Data File:	808206-02.015
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	85	60	125

Analyte:	Concentration ug/L (ppb)
Lead	26.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-2, W	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	808206-04
Date Analyzed:	08/26/08	Data File:	808206-04.016
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Holmium	89	60	125

Analyte:	Concentration ug/L (ppb)
Lead	8.52

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-3, W	Client:	Associated Earth Sciences, Inc.
Date Received:	08/20/08	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	808206-06
Date Analyzed:	08/26/08	Data File:	808206-06.017
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	81	Limit:	Limit:
		60	125

Analyte:	Concentration
	ug/L (ppb)
Lead	9.27

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	Not Applicable	Project:	Geddes Marina, F&BI 808206
Date Extracted:	08/25/08	Lab ID:	I8-328 mb
Date Analyzed:	08/26/08	Data File:	I8-328 mb.008
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower	Upper
Holmium	99	Limit:	Limit:
		60	125

Analyte:	Concentration
	ug/L (ppb)
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

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

Laboratory Code: 808206-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Analyte	Reporting Units	Percent		
		Spike Level	Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	104	70-130
Toluene	mg/kg (ppm)	0.5	98	70-130
Ethylbenzene	mg/kg (ppm)	0.5	102	70-130
Xylenes	mg/kg (ppm)	1.5	100	70-130
Gasoline	mg/kg (ppm)	20	84	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**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: 808247-01 (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	100	65-118
Toluene	ug/L (ppb)	50	101	72-122
Ethylbenzene	ug/L (ppb)	50	104	73-126
Xylenes	ug/L (ppb)	150	102	74-118
Gasoline	ug/L (ppb)	1,000	91	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

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

Laboratory Code: 808206-12 (Matrix Spike) Silica Gel

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	105	105	71-137	0

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	103	70-129

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**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	94	91	73-142	3



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 808206-05 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Lead	mg/kg (ppm)	27.2	20.4	29 hr	0-20

Laboratory Code: 808206-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Lead	mg/kg (ppm)	50	27.2	97 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	mg/kg (ppm)	50	104	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/02/08

Date Received: 08/20/08

Project: Geddes Marina KV080118A, F&BI 808206

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 808235-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Lead	ug/L (ppb)	1.49	1.53	3	0-20

Laboratory Code: 808235-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Lead	ug/L (ppb)	10	1.49	109	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Lead	ug/L (ppb)	10	106	70-130

# 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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.  
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September 25, 2008

SEP 29 2008

Jon Sondergaard, Project Manager  
Associated Earth Sciences, Inc.  
911 5th Avenue, Suite 100  
Kirkland, WA 98033

Dear Mr. Sondergaard:

Included are the results from the testing of material submitted on September 10, 2008 from the Geddes Marina/KV080118A, F&BI 809094 project. There are 29 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
AE10925R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 10, 2008 by Friedman & Bruya, Inc. from the Associated Earth Sciences, Inc. Geddes Marina/KV080118A, F&BI 809094 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Associated Earth Sciences, Inc.</u>
809094-01	S-1
809094-02	S-2
809094-03	S-3
809094-04	S-4
809094-05	S-5
809094-06	S-6
809094-07	S-7
809094-08	S-8

The 8270C calibration standard for Indeno(1,2,3-cd)pyrene failed for the analysis of sample S-1. The result is flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
 Date Received: 09/10/08  
 Project: Geddes Marina/KV080118A, F&BI 809094  
 Date Extracted: 09/11/08  
 Date Analyzed: 09/11/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING EPA METHOD 8021B AND NWTPH-Gx**  
 Results Reported on a Dry Weight Basis  
 Results Reported as mg/kg (ppm)

<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 50-150)
S-1 809094-01	<0.02	<0.02	<0.02	<0.06	<2	54
S-2 809094-02	<0.02	<0.02	<0.02	<0.06	<2	67
S-3 809094-03	<0.02	<0.02	<0.02	<0.06	<2	55
S-4 809094-04	<0.02	<0.02	<0.02	<0.06	<2	103
S-5 809094-05	<0.02	<0.02	<0.02	<0.06	<2	90
S-6 809094-06	<0.02	<0.02	<0.02	<0.06	<2	110
S-7 809094-07	<0.02	<0.02	<0.02	<0.06	<2	95
S-8 809094-08	<0.02	<0.02	<0.02	<0.06	<2	122
Method Blank	<0.02	<0.02	<0.02	<0.06	<2	82

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/10/08  
Project: Geddes Marina/KV080118A, F&BI 809094  
Date Extracted: 09/11/08  
Date Analyzed: 09/11/08 and 09/12/08

**RESULTS FROM THE ANALYSIS OF THE SOIL 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 on a Dry Weight Basis  
Results Reported as mg/kg (ppm)**

<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 67-127)
S-1 809094-01	650 x	3,100	88
S-2 809094-02	1,600 x	5,700	86
S-3 809094-03	4,700 x	18,000	88
S-4 809094-04	300 x	1,500	85
S-5 809094-05	250 x	1,300	85
S-6 809094-06	690 x	3,400	87
S-7 809094-07	420 x	2,000	86
S-8 809094-08	<50	<250	95
Method Blank	<50	<250	92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-1	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-01
Date Analyzed:	09/11/08	Data File:	809094-01.033
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	111	60	125
Indium	102	60	125
Holmium	101	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	26.0
Nickel	27.0
Copper	49.4
Zinc	251
Arsenic	6.21
Cadmium	1.30
Lead	120



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-2	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-02
Date Analyzed:	09/11/08	Data File:	809094-02.034
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	110	60	125
Indium	101	60	125
Holmium	100	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	36.5
Nickel	29.9
Copper	55.8
Zinc	276
Arsenic	15.5
Cadmium	1.94
Lead	376

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	S-3	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-03
Date Analyzed:	09/11/08	Data File:	809094-03.035
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	115	60	125
Indium	102	60	125
Holmium	103	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	65.9
Nickel	50.5
Copper	129
Zinc	471
Arsenic	17.2
Cadmium	3.73
Lead	302

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-4	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-04
Date Analyzed:	09/11/08	Data File:	809094-04.036
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	96	60	125
Holmium	99	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	35.9
Nickel	35.4
Copper	54.1
Zinc	81.6
Arsenic	20.7
Cadmium	<1
Lead	31.3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-5	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-05
Date Analyzed:	09/11/08	Data File:	809094-05.037
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	114	60	125
Indium	99	60	125
Holmium	99	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	54.1
Nickel	42.4
Copper	65.5
Zinc	106
Arsenic	19.0
Cadmium	<1
Lead	99.3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-6	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-06
Date Analyzed:	09/11/08	Data File:	809094-06.038
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	108	60	125
Indium	99	60	125
Holmium	99	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	42.2
Nickel	36.4
Copper	61.5
Zinc	105
Arsenic	17.9
Cadmium	<1
Lead	64.7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-7	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-07
Date Analyzed:	09/11/08	Data File:	809094-07.039
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	109	60	125
Indium	95	60	125
Holmium	97	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	45.2
Nickel	36.8
Copper	91.3
Zinc	153
Arsenic	16.2
Cadmium	<1
Lead	110

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	S-8	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	809094-08
Date Analyzed:	09/11/08	Data File:	809094-08.040
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	113	60	125
Indium	100	60	125
Holmium	100	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	41.0
Nickel	50.0
Copper	49.2
Zinc	57.4
Arsenic	17.4
Cadmium	<1
Lead	16.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	NA	Project:	KV080118A, F&BI 809094
Date Extracted:	09/11/08	Lab ID:	I8-347 mb
Date Analyzed:	09/11/08	Data File:	I8-347 mb.023
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	102	60	125
Indium	102	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1
Lead	<1



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/10/08  
Project: Geddes Marina/KV080118A, F&BI 809094  
Date Extracted: 09/11/08  
Date Analyzed: 09/12/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
S-1 809094-01	<0.2
S-2 809094-02	0.44
S-3 809094-03	0.31
S-4 809094-04	<0.2
S-5 809094-05	<0.2
S-6 809094-06	<0.2
S-7 809094-07	0.22
S-8 809094-08	<0.2
Method Blank	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-1	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-01 1/500
Date Analyzed:	09/17/08	Data File:	091631.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	0 ds	50	150
Benzo(a)anthracene-d12	464 ds	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<1
Acenaphthylene	<1
Acenaphthene	<1
Fluorene	<1
Phenanthrene	3.3
Anthracene	<1
Fluoranthene	9.2
Pyrene	7.2
Benz(a)anthracene	2.5
Chrysene	4.5
Benzo(a)pyrene	3.0
Benzo(b)fluoranthene	4.3
Benzo(k)fluoranthene	2.3
Indeno(1,2,3-cd)pyrene	2.3 ca
Dibenz(a,h)anthracene	<1
Benzo(g,h,i)perylene	2.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-2	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-02 1/250
Date Analyzed:	09/15/08	Data File:	091514.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	146	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.5
Acenaphthylene	<0.5
Acenaphthene	<0.5
Fluorene	<0.5
Phenanthrene	2.1
Anthracene	0.61
Fluoranthene	5.9
Pyrene	4.7
Benz(a)anthracene	2.0
Chrysene	2.7
Benzo(a)pyrene	2.2
Benzo(b)fluoranthene	3.3
Benzo(k)fluoranthene	1.3
Indeno(1,2,3-cd)pyrene	1.7
Dibenz(a,h)anthracene	<0.5
Benzo(g,h,i)perylene	1.6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-3	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-03 1/250
Date Analyzed:	09/15/08	Data File:	091516.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	50	150
Benzo(a)anthracene-d12	145	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.5
Acenaphthylene	<0.5
Acenaphthene	<0.5
Fluorene	0.52
Phenanthrene	6.5
Anthracene	1.3
Fluoranthene	18
Pyrene	14
Benz(a)anthracene	5.6
Chrysene	8.9
Benzo(a)pyrene	6.9
Benzo(b)fluoranthene	11
Benzo(k)fluoranthene	4.0
Indeno(1,2,3-cd)pyrene	5.8
Dibenz(a,h)anthracene	1.1
Benzo(g,h,i)perylene	5.6

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-4	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-04 1/50
Date Analyzed:	09/15/08	Data File:	091510.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	117	50	150
Benzo(a)anthracene-d12	128	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.15
Anthracene	<0.1
Fluoranthene	1.5
Pyrene	1.2
Benz(a)anthracene	0.44
Chrysene	0.68
Benzo(a)pyrene	0.59
Benzo(b)fluoranthene	1.1
Benzo(k)fluoranthene	0.39
Indeno(1,2,3-cd)pyrene	0.59
Dibenz(a,h)anthracene	0.11
Benzo(g,h,i)perylene	0.56

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-5	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-05 1/50
Date Analyzed:	09/15/08	Data File:	091511.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	50	150
Benzo(a)anthracene-d12	117	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.16
Anthracene	<0.1
Fluoranthene	1.5
Pyrene	1.2
Benz(a)anthracene	0.44
Chrysene	0.71
Benzo(a)pyrene	0.53
Benzo(b)fluoranthene	0.88
Benzo(k)fluoranthene	0.36
Indeno(1,2,3-cd)pyrene	0.44
Dibenz(a,h)anthracene	0.10
Benzo(g,h,i)perylene	0.45

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-6	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-06 1/50
Date Analyzed:	09/15/08	Data File:	091512.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	112	50	150
Benzo(a)anthracene-d12	118	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	0.62
Pyrene	0.53
Benz(a)anthracene	0.25
Chrysene	0.32
Benzo(a)pyrene	0.29
Benzo(b)fluoranthene	0.52
Benzo(k)fluoranthene	0.21
Indeno(1,2,3-cd)pyrene	0.29
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	0.28

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-7	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-07 1/50
Date Analyzed:	09/15/08	Data File:	091513.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	50	150
Benzo(a)anthracene-d12	116	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.17
Anthracene	<0.1
Fluoranthene	1.4
Pyrene	1.2
Benz(a)anthracene	0.43
Chrysene	0.63
Benzo(a)pyrene	0.56
Benzo(b)fluoranthene	1.1
Benzo(k)fluoranthene	0.39
Indeno(1,2,3-cd)pyrene	0.60
Dibenz(a,h)anthracene	0.11
Benzo(g,h,i)perylene	0.59



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	S-8	Client:	Associated Earth Sciences, Inc.
Date Received:	09/10/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	809094-08 1/5
Date Analyzed:	09/15/08	Data File:	091507.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	50	150
Benzo(a)anthracene-d12	111	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.016
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	0.011
Phenanthrene	0.033
Anthracene	<0.01
Fluoranthene	0.17
Pyrene	0.15
Benz(a)anthracene	0.045
Chrysene	0.058
Benzo(a)pyrene	0.055
Benzo(b)fluoranthene	0.098
Benzo(k)fluoranthene	0.033
Indeno(1,2,3-cd)pyrene	0.052
Dibenz(a,h)anthracene	0.010
Benzo(g,h,i)perylene	0.049

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	NA	Project:	KV080118A, F&BI 809094
Date Extracted:	09/12/08	Lab ID:	081472mb 1/5
Date Analyzed:	09/15/08	Data File:	091506.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	106	50	150
Benzo(a)anthracene-d12	108	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/10/08

Project: Geddes Marina/KV080118A, F&BI 809094

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

Laboratory Code: 809097-07 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent	
			Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	94	70-130
Toluene	mg/kg (ppm)	0.5	92	70-130
Ethylbenzene	mg/kg (ppm)	0.5	92	70-130
Xylenes	mg/kg (ppm)	1.5	93	70-130
Gasoline	mg/kg (ppm)	20	99	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/10/08

Project: Geddes Marina/KV080118A, F&BI 809094

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

Laboratory Code: 809092-01 (Matrix Spike) Silica Gel

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	150	102	100	69-125	2

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	103	70-127

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/10/08

Project: Geddes Marina/KV080118A, F&BI 809094

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 809079-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	mg/kg (ppm)	9.52	9.57	1	0-20
Nickel	mg/kg (ppm)	17.4	18.8	8	0-20
Copper	mg/kg (ppm)	6.32	7.13	12	0-20
Zinc	mg/kg (ppm)	12.2	19.2	45 hr	0-20
Arsenic	mg/kg (ppm)	<1	<1	nm	0-20
Cadmium	mg/kg (ppm)	<1	<1	nm	0-20
Lead	mg/kg (ppm)	1.55	1.49	4	0-20

Laboratory Code: 809079-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	9.52	91	50-150
Nickel	mg/kg (ppm)	25	17.4	99 b	50-150
Copper	mg/kg (ppm)	50	6.32	98	50-150
Zinc	mg/kg (ppm)	50	12.2	102 b	50-150
Arsenic	mg/kg (ppm)	10	<1	108	50-150
Cadmium	mg/kg (ppm)	10	<1	109	50-150
Lead	mg/kg (ppm)	20	1.55	109	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	108	70-130
Nickel	mg/kg (ppm)	25	109	70-130
Copper	mg/kg (ppm)	50	105	70-130
Zinc	mg/kg (ppm)	50	107	70-130
Arsenic	mg/kg (ppm)	10	105	70-130
Cadmium	mg/kg (ppm)	10	106	70-130
Lead	mg/kg (ppm)	20	108	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/10/08

Project: Geddes Marina/KV080118A, F&BI 809094

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES FOR  
TOTAL MERCURY  
USING EPA METHOD 1631E**

Laboratory Code: 809079-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.2	70	105	50-150	40 vo

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	100	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/10/08

Project: Geddes Marina/KV080118A, F&BI 809094

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: 809094-08 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	0.016	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	0.011	<0.01	nm
Phenanthrene	mg/kg (ppm)	0.033	0.015	75 h
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	0.17	0.092	61 h
Pyrene	mg/kg (ppm)	0.15	0.080	61 h
Benz(a)anthracene	mg/kg (ppm)	0.045	0.029	43 h
Chrysene	mg/kg (ppm)	0.058	0.039	39 h
Benzo(b)fluoranthene	mg/kg (ppm)	0.098	0.065	40 h
Benzo(k)fluoranthene	mg/kg (ppm)	0.033	0.022	40 h
Benzo(a)pyrene	mg/kg (ppm)	0.055	0.035	44 h
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.052	0.031	51 h
Dibenz(a,h)anthracene	mg/kg (ppm)	0.010	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	0.049	0.031	45 h

Laboratory Code: 809094-08 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	0.016	87	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	86	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	89	58-108
Fluorene	mg/kg (ppm)	0.17	0.011	92	57-113
Phenanthrene	mg/kg (ppm)	0.17	0.033	91	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	83	42-132
Fluoranthene	mg/kg (ppm)	0.17	0.17	88 b	45-145
Pyrene	mg/kg (ppm)	0.17	0.15	85 b	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	0.045	91 b	17-134
Chrysene	mg/kg (ppm)	0.17	0.058	94 b	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.098	98 b	28-134
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.033	92	55-115
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.055	94 b	37-123
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.052	85 b	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.010	89	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	0.049	87 b	60-105

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/10/08

Project: Geddes Marina/KV080118A, F&BI 809094

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	85	94	72-112	10
Acenaphthylene	mg/kg (ppm)	0.17	74	85	68-112	14
Acenaphthene	mg/kg (ppm)	0.17	82	92	70-111	11
Fluorene	mg/kg (ppm)	0.17	82	93	69-110	13
Phenanthrene	mg/kg (ppm)	0.17	82	92	68-111	11
Anthracene	mg/kg (ppm)	0.17	74	83	67-110	11
Fluoranthene	mg/kg (ppm)	0.17	79	92	68-114	15
Pyrene	mg/kg (ppm)	0.17	78	92	68-114	16
Benz(a)anthracene	mg/kg (ppm)	0.17	76	84	58-108	10
Chrysene	mg/kg (ppm)	0.17	82	93	64-115	13
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	80	94	54-119	16
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	83	90	61-123	8
Benzo(a)pyrene	mg/kg (ppm)	0.17	73	82	54-111	12
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	77	84	46-126	9
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	82	91	57-119	10
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	80	89	60-116	11



**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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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SEP 29 2008

September 25, 2008

Jon Sondergaard, Project Manager  
Associated Earth Sciences, Inc.  
911 5th Avenue, Suite 100  
Kirkland, WA 98033

Dear Mr. Sondergaard:

Included are the results from the testing of material submitted on September 15, 2008 from the KV080118A, F&BI 809129 project. There are 43 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 should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
c: Michael August  
AE10925R.DOC

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on September 15, 2008 by Friedman & Bruya, Inc. from the Associated Earth Sciences, Inc. KV080118A, F&BI 809129 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Associated Earth Sciences, Inc.</u>
809129-01	HA-11
809129-02	HA-12
809129-03	HA-13
809129-04	HA-14
809129-05	EB-5 6'
809129-06	EB-4 5.5'
809129-07	EB-6 5.5'
809129-08	EB-7 5'
809129-09	EB-4 GW
809129-10	EB-5 GW
809129-11	EB-6 GW
809129-12	EB-7 GW

All quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
 Date Received: 09/15/08  
 Project: KV080118A, F&BI 809129  
 Date Extracted: 09/16/08  
 Date Analyzed: 09/16/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
 FOR BENZENE, TOLUENE, ETHYLBENZENE,  
 XYLENES AND TPH AS GASOLINE  
 USING EPA METHOD 8021B AND NWTPH-Gx**  
 Results Reported on a Dry Weight Basis  
 Results Reported as mg/kg (ppm)

<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 50-150)
HA-11 809129-01	<0.02	<0.02	<0.02	<0.06	<2	87
HA-12 809129-02	<0.02	<0.02	<0.02	<0.06	<2	88
HA-13 809129-03	<0.02	<0.02	<0.02	<0.06	<2	86
HA-14 809129-04	<0.02	<0.02	<0.02	<0.06	<2	85
EB-5 6' 809129-05	<0.02	<0.02	<0.02	<0.06	<2	75
Method Blank	<0.02	<0.02	<0.02	<0.06	<2	100

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/15/08  
Project: KV080118A, F&BI 809129  
Date Extracted: 09/16/08  
Date Analyzed: 09/16/08

**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)
EB-4 GW 809129-09	<1	<1	<1	<3	<100	77
EB-5 GW 809129-10	<1	<1	<1	<3	<100	71
EB-6 GW 809129-11	<1	<1	<1	3	160	59
EB-7 GW 809129-12	<1	<1	<1	<3	<100	61
Method Blank	<1	<1	<1	<3	<100	72

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/15/08  
Project: KV080118A, F&BI 809129  
Date Extracted: 09/16/08  
Date Analyzed: 09/18/08

**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 51-132)
EB-4 GW dv 809129-09	78 x	<290	86
EB-5 GW d 809129-10 1/5	7,000 x	25,000	101
EB-6 GW 809129-11	87 x	320	92
EB-7 GW 809129-12	300 x	490	86
Method Blank	<50	<250	92

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/15/08  
Project: KV080118A, F&BI 809129  
Date Extracted: 09/17/08  
Date Analyzed: 09/18/08

**RESULTS FROM THE ANALYSIS OF THE SOIL 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 on a Dry Weight Basis  
Results Reported as mg/kg (ppm)**

<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> (% Recovery) (Limit 53-144)
EB-5 6' 809129-05	<50	<250	81
EB-4 5.5' 809129-06	<50	<250	81
EB-6 5.5' 809129-07	<50	750	77
EB-7 5' 809129-08	<50	<250	83
Method Blank	<50	<250	80

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/15/08  
Project: KV080118A, F&BI 809129  
Date Extracted: 09/17/08  
Date Analyzed: 09/17/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR TOTAL PETROLEUM HYDROCARBONS AS  
DIESEL AND MOTOR OIL  
USING METHOD NWTPH-Dx**  
Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<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 53-144)
HA-11 809129-01	<50	<250	75
HA-12 809129-02	<50	<250	78
HA-13 809129-03	<50	290	78
HA-14 809129-04	<50	<250	73
Method Blank	<50	<250	80



# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-11	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/19/08	Lab ID:	809129-01
Date Analyzed:	09/19/08	Data File:	809129-01.015
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	101	60	125
Indium	89	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	20.4
Arsenic	14.8
Selenium	<1
Silver	<1
Cadmium	<1
Barium	87.4
Lead	26.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-12	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/19/08	Lab ID:	809129-02
Date Analyzed:	09/19/08	Data File:	809129-02.016
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	90	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	12.5
Arsenic	3.45
Selenium	<1
Silver	<1
Cadmium	1.97
Barium	26.8
Lead	17.4

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-13	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/19/08	Lab ID:	809129-03
Date Analyzed:	09/19/08	Data File:	809129-03.017
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	86	60	125
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	11.7
Arsenic	25.8
Selenium	<1
Silver	<1
Cadmium	4.09
Barium	35.9
Lead	41.7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-14	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/19/08	Lab ID:	809129-04
Date Analyzed:	09/19/08	Data File:	809129-04.019
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	87	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	10.2
Arsenic	7.48
Selenium	<1
Silver	<1
Cadmium	1.09
Barium	18.9
Lead	66.8

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-5 6'	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/19/08	Lab ID:	809129-05
Date Analyzed:	09/19/08	Data File:	809129-05.020
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125
Indium	88	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	28.4
Arsenic	15.0
Selenium	<1
Silver	<1
Cadmium	<1
Barium	24.0
Lead	43.5

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	NA	Project:	KV080118A, F&BI 809129
Date Extracted:	09/19/08	Lab ID:	I8-359 mb
Date Analyzed:	09/19/08	Data File:	I8-359 mb.008
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	92	60	125
Holmium	99	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Arsenic	<1
Selenium	<1
Silver	<1
Cadmium	<1
Barium	<1
Lead	<1

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-4 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/17/08	Lab ID:	809129-09 x5
Date Analyzed:	09/17/08	Data File:	809129-09 x5.080
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	90	60	125
Indium	74	60	125
Holmium	79	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	48.0
Arsenic	33.8
Selenium	35.1
Silver	<5
Cadmium	<5
Barium	331
Lead	79.9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-5 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/17/08	Lab ID:	809129-10 x5
Date Analyzed:	09/17/08	Data File:	809129-10 x5.081
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125
Indium	75	60	125
Holmium	82	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	125
Arsenic	77.9
Selenium	20.3
Silver	<5
Cadmium	<5
Barium	372
Lead	188



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-6 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/17/08	Lab ID:	809129-11 x10
Date Analyzed:	09/17/08	Data File:	809129-11 x10.054
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	121	60	125
Indium	74	60	125
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	938
Arsenic	178
Selenium	22.3
Silver	5.49
Cadmium	19.0
Barium	4,770
Lead	2,030

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-7 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/17/08	Lab ID:	809129-12 x10
Date Analyzed:	09/17/08	Data File:	809129-12 x10.055
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	80	60	125
Indium	73	60	125
Holmium	78	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	89.5
Arsenic	44.2
Selenium	2.90
Silver	<10
Cadmium	<10
Barium	414
Lead	3,040

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	NA	Project:	KV080118A, F&BI 809129
Date Extracted:	09/17/08	Lab ID:	i8-352 mb
Date Analyzed:	09/17/08	Data File:	i8-352 mb.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	64	60	125
Indium	65	60	125
Holmium	72	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Arsenic	<1
Selenium	<1
Silver	<1
Cadmium	<1
Barium	<1
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/15/08  
Project: KV080118A, F&BI 809129  
Date Extracted: 09/18/08  
Date Analyzed: 09/19/08

**RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E  
Results Reported as ug/L (ppb)**

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
EB-4 GW 809129-09	<0.2
EB-5 GW 809129-10	0.29
EB-6 GW 809129-11	3.0
EB-7 GW 809129-12	0.26
Method Blank	<0.2

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08  
Date Received: 09/15/08  
Project: KV080118A, F&BI 809129  
Date Extracted: 09/19/08  
Date Analyzed: 09/19/08

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES  
FOR TOTAL MERCURY  
USING EPA METHOD 1631E**

Results Reported on a Dry Weight Basis  
Results Reported as mg/kg (ppm)

<u>Sample ID</u> Laboratory ID	<u>Total Mercury</u>
HA-11 809129-01	<0.2
HA-12 809129-02	<0.2
HA-13 809129-03	<0.2
HA-14 809129-04	<0.2
EB-5 6' 809129-05	<0.2
Method Blank	<0.2

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID: HA-11	Client: Associated Earth Sciences, Inc.
Date Received: 09/15/08	Project: KV080118A, F&BI 809129
Date Extracted: 09/18/08	Lab ID: 809129-01 1/5
Date Analyzed: 09/19/08	Data File: 091914.D
Matrix: Soil	Instrument: GCMS6
Units: mg/kg (ppm)	Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	50	150
Benzo(a)anthracene-d12	96	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	0.016
Fluorene	<0.01
Phenanthrene	0.032
Anthracene	0.014
Fluoranthene	0.075
Pyrene	0.065
Benz(a)anthracene	0.029
Chrysene	0.060
Benzo(a)pyrene	0.048
Benzo(b)fluoranthene	0.067
Benzo(k)fluoranthene	0.020
Indeno(1,2,3-cd)pyrene	0.034
Dibenz(a,h)anthracene	0.012
Benzo(g,h,i)perylene	0.052

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	HA-12	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/18/08	Lab ID:	809129-02 1/5
Date Analyzed:	09/18/08	Data File:	091817.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	87	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.023
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	HA-13	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/18/08	Lab ID:	809129-03 1/5
Date Analyzed:	09/18/08	Data File:	091814.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	50	150
Benzo(a)anthracene-d12	96	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.023
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	0.024
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	0.012
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.021



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	HA-14	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/18/08	Lab ID:	809129-04 1/5
Date Analyzed:	09/18/08	Data File:	091818.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	84	50	150
Benzo(a)anthracene-d12	88	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.012
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.032
Anthracene	<0.01
Fluoranthene	0.074
Pyrene	0.067
Benz(a)anthracene	0.034
Chrysene	0.067
Benzo(a)pyrene	0.050
Benzo(b)fluoranthene	0.11
Benzo(k)fluoranthene	0.034
Indeno(1,2,3-cd)pyrene	0.070
Dibenz(a,h)anthracene	0.014
Benzo(g,h,i)perylene	0.087

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	EB-5 6'	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/18/08	Lab ID:	809129-05 1/5
Date Analyzed:	09/18/08	Data File:	091819.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	84	50	150
Benzo(a)anthracene-d12	88	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.033
Acenaphthylene	0.029
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.032
Anthracene	0.013
Fluoranthene	0.30
Pyrene	0.43
Benz(a)anthracene	0.52
Chrysene	0.62
Benzo(a)pyrene	0.77
Benzo(b)fluoranthene	0.91
Benzo(k)fluoranthene	0.27
Indeno(1,2,3-cd)pyrene	0.57
Dibenz(a,h)anthracene	0.11
Benzo(g,h,i)perylene	0.53

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	NA	Project:	KV080118A, F&BI 809129
Date Extracted:	09/18/08	Lab ID:	081501mb 1/5
Date Analyzed:	09/18/08	Data File:	091805.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	76	50	150
Benzo(a)anthracene-d12	69	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	EB-4 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/16/08	Lab ID:	809129-09
Date Analyzed:	09/17/08	Data File:	091720.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	81	50	150
Benzo(a)anthracene-d12	77	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	EB-5 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/16/08	Lab ID:	809129-10
Date Analyzed:	09/17/08	Data File:	091725.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	73	50	150
Benzo(a)anthracene-d12	71	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	0.11
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	EB-6 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/16/08	Lab ID:	809129-11 rr
Date Analyzed:	09/18/08	Data File:	091813.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85	50	150
Benzo(a)anthracene-d12	82	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	1.6
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	EB-7 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809129
Date Extracted:	09/16/08	Lab ID:	809129-12
Date Analyzed:	09/17/08	Data File:	091726.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	80	50	150
Benzo(a)anthracene-d12	75	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.13
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	0.10
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	NA	Project:	KV080118A, F&BI 809129
Date Extracted:	09/16/08	Lab ID:	081478mb
Date Analyzed:	09/17/08	Data File:	091711.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	50	150
Benzo(a)anthracene-d12	75	50	129

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

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

Laboratory Code: 809122-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	0.03	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<2	<2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	88	70-130
Toluene	mg/kg (ppm)	0.5	84	70-130
Ethylbenzene	mg/kg (ppm)	0.5	86	70-130
Xylenes	mg/kg (ppm)	1.5	87	70-130
Gasoline	mg/kg (ppm)	20	102	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**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: 809114-23 (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	87	65-118
Toluene	ug/L (ppb)	50	87	72-122
Ethylbenzene	ug/L (ppb)	50	86	73-126
Xylenes	ug/L (ppb)	150	84	74-118
Gasoline	ug/L (ppb)	1,000	98	69-134

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**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	94	103	67-141	9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

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

Laboratory Code: 809140-04 (Matrix Spike) Silica Gel

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	101	102	71-137	1

Laboratory Code: Laboratory Control Sample Silica Gel

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	102	70-129

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

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

Laboratory Code: 809140-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	98	99	71-137	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	99	70-129

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 809132-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	mg/kg (ppm)	12.4	11.8	5	0-20
Arsenic	mg/kg (ppm)	3.27	3.18	3	0-20
Selenium	mg/kg (ppm)	<1	<1	nm	0-20
Silver	mg/kg (ppm)	<1	<1	nm	0-20
Cadmium	mg/kg (ppm)	<1	<1	nm	0-20
Barium	mg/kg (ppm)	59.9	51.8	15	0-20
Lead	mg/kg (ppm)	75.4	109	36 hr	0-20

Laboratory Code: 809132-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	12.4	101 b	50-150
Arsenic	mg/kg (ppm)	10	3.27	112 b	50-150
Selenium	mg/kg (ppm)	5	<1	88	50-150
Silver	mg/kg (ppm)	10	<1	110	50-150
Cadmium	mg/kg (ppm)	10	<1	108	50-150
Barium	mg/kg (ppm)	50	59.9	88 b	50-150
Lead	mg/kg (ppm)	20	75.4	166 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	115	70-130
Arsenic	mg/kg (ppm)	10	112	70-130
Selenium	mg/kg (ppm)	5	106	70-130
Silver	mg/kg (ppm)	10	114	70-130
Cadmium	mg/kg (ppm)	10	111	70-130
Barium	mg/kg (ppm)	50	110	70-130
Lead	mg/kg (ppm)	20	113	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 809114-21 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	ug/L (ppb)	4.95	<1	nm	0-20
Arsenic	ug/L (ppb)	1.27	<1	nm	0-20
Selenium	ug/L (ppb)	<1	<1	nm	0-20
Silver	ug/L (ppb)	<1	<1	nm	0-20
Cadmium	ug/L (ppb)	<1	<1	nm	0-20
Barium	ug/L (ppb)	103	103	0	0-20
Lead	ug/L (ppb)	<1	<1	nm	0-20

Laboratory Code: 809114-21 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	ug/L (ppb)	20	4.95	88 b	50-150
Arsenic	ug/L (ppb)	10	1.27	111	50-150
Selenium	ug/L (ppb)	5	<1	108	50-150
Silver	ug/L (ppb)	5	<1	105	50-150
Cadmium	ug/L (ppb)	5	<1	108	50-150
Barium	ug/L (ppb)	50	103	107 b	50-150
Lead	ug/L (ppb)	10	<1	105	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	112	70-130
Arsenic	ug/L (ppb)	10	86	70-130
Selenium	ug/L (ppb)	5	94	70-130
Silver	ug/L (ppb)	5	104	70-130
Cadmium	ug/L (ppb)	5	97	70-130
Barium	ug/L (ppb)	50	105	70-130
Lead	ug/L (ppb)	10	103	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES FOR  
TOTAL MERCURY  
USING EPA METHOD 1631E**

Laboratory Code: 809148-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MS	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.2	99	102	50-150	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	101	70-130



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES FOR  
TOTAL MERCURY  
USING EPA METHOD 1631E**

Laboratory Code: 809132-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.2	111	133	50-150	18

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	99	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: 809129-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	0.023	0.027	16
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	0.024	0.022	9
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	0.012	0.012	0
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	0.021	0.019	10

Laboratory Code: 809129-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	89	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	92	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	88	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	91	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	86	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	76	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	88	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	88	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	84	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	88	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	86	28-134
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	88	55-115
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	84	37-123
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	84	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	83	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	81	60-105

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL  
SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	90	90	72-112	0
Acenaphthylene	mg/kg (ppm)	0.17	75	76	68-112	1
Acenaphthene	mg/kg (ppm)	0.17	88	87	70-111	1
Fluorene	mg/kg (ppm)	0.17	84	85	69-110	1
Phenanthrene	mg/kg (ppm)	0.17	88	85	68-111	3
Anthracene	mg/kg (ppm)	0.17	75	73	67-110	3
Fluoranthene	mg/kg (ppm)	0.17	80	79	68-114	1
Pyrene	mg/kg (ppm)	0.17	80	80	68-114	0
Benz(a)anthracene	mg/kg (ppm)	0.17	72	73	58-108	1
Chrysene	mg/kg (ppm)	0.17	87	86	64-115	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	77	78	54-119	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	83	82	61-123	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	68	66	54-111	3
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	72	72	46-126	0
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	82	80	57-119	2
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	84	81	60-116	4

Note: The calibration verification result for benzo(a)anthracene-d12 and indeno(1,2,3-cd)pyrene exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid. This applies to samples 809129-02, 809129-03, 809129-04, and 809129-05.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER  
SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM**

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	77	78	68-101	1
Acenaphthylene	ug/L (ppb)	5	76	77	70-109	1
Acenaphthene	ug/L (ppb)	5	77	79	69-104	3
Fluorene	ug/L (ppb)	5	79	80	68-111	1
Phenanthrene	ug/L (ppb)	5	76	80	66-106	5
Anthracene	ug/L (ppb)	5	74	77	67-112	4
Fluoranthene	ug/L (ppb)	5	77	81	69-116	5
Pyrene	ug/L (ppb)	5	78	81	68-115	4
Benz(a)anthracene	ug/L (ppb)	5	73	72	65-102	1
Chrysene	ug/L (ppb)	5	75	76	66-103	1
Benzo(b)fluoranthene	ug/L (ppb)	5	79	82	70-117	4
Benzo(k)fluoranthene	ug/L (ppb)	5	81	81	64-116	0
Benzo(a)pyrene	ug/L (ppb)	5	78	79	68-116	1
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	74	73	63-122	1
Dibenz(a,h)anthracene	ug/L (ppb)	5	80	79	66-116	1
Benzo(g,h,i)perylene	ug/L (ppb)	5	78	77	66-114	1

Note: The calibration verification result for benzo(a)anthracene-d12 and indeno(1,2,3-cd)pyrene exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid. This applies to sample 809129-11.

Note: The calibration verification result for indeno(1,2,3-cd)pyrene exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid. This applies to samples 809129-09, 809129-10, and 809129-12.

# 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.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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October 14, 2008

Jon Sondergaard, Project Manager  
Associated Earth Sciences, Inc.  
911 5th Avenue, Suite 100  
Kirkland, WA 98033

OCT 20 2008

Dear Mr. Sondergaard:

Included are the amended results from the testing of material submitted on September 10, 2008 from the Geddes Marina/KV080118A, F&BI 809094 project. The metals have been corrected to the list requested on the chain of custody.

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

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl  
Project Manager

Enclosures  
AE10925R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-11	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/19/08	Lab ID:	809129-01
Date Analyzed:	09/19/08	Data File:	809129-01.015
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	101	60	125
Indium	89	60	125
Holmium	93	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	20.4
Nickel	20.8
Copper	27.1
Zinc	271
Arsenic	14.8
Cadmium	<1
Lead	26.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-12	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/19/08	Lab ID:	809129-02
Date Analyzed:	09/19/08	Data File:	809129-02.016
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	90	60	125
Holmium	98	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	12.5
Nickel	20.8
Copper	35.9
Zinc	135
Arsenic	3.45
Cadmium	1.97
Lead	17.4



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-13	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/19/08	Lab ID:	809129-03
Date Analyzed:	09/19/08	Data File:	809129-03.017
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	86	60	125
Holmium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	11.7
Nickel	14.7
Copper	37.5
Zinc	61.7
Arsenic	25.8
Cadmium	4.09
Lead	41.7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	HA-14	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/19/08	Lab ID:	809129-04
Date Analyzed:	09/19/08	Data File:	809129-04.019
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125
Indium	87	60	125
Holmium	95	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	10.2
Nickel	9.95
Copper	75.7
Zinc	133
Arsenic	7.48
Cadmium	1.09
Lead	66.8

# FRIEDMAN & BRUYA, INC.

## ENVIRONMENTAL CHEMISTS

### Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-5 6'	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/19/08	Lab ID:	809129-05
Date Analyzed:	09/19/08	Data File:	809129-05.020
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	97	60	125
Indium	88	60	125
Holmium	96	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	28.4
Nickel	27.8
Copper	45.0
Zinc	42.1
Arsenic	15.0
Cadmium	<1
Lead	43.5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	Not Applicable	Project:	KV080118A, F&BI 809094
Date Extracted:	09/19/08	Lab ID:	I8-359 mb
Date Analyzed:	09/19/08	Data File:	I8-359 mb.008
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	93	60	125
Indium	92	60	125
Holmium	99	60	125

Analyte:	Concentration mg/kg (ppm)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-4 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/17/08	Lab ID:	809129-09 x5
Date Analyzed:	09/17/08	Data File:	809129-09 x5.080
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	90	60	125
Indium	74	60	125
Holmium	79	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	48.0
Nickel	49.6
Copper	65.7
Zinc	79.3
Arsenic	33.8
Cadmium	<5
Lead	79.9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-5 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/17/08	Lab ID:	809129-10 x5
Date Analyzed:	09/17/08	Data File:	809129-10 x5.081
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	104	60	125
Indium	75	60	125
Holmium	82	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	125
Nickel	117
Copper	258
Zinc	271
Arsenic	77.9
Cadmium	<5
Lead	188

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-6 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/17/08	Lab ID:	809129-11 x10
Date Analyzed:	09/17/08	Data File:	809129-11 x10.054
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	121	60	125
Indium	74	60	125
Holmium	86	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	938
Nickel	957
Copper	1,050
Zinc	1,940
Arsenic	178
Cadmium	19.0
Lead	2,030

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	EB-7 GW	Client:	Associated Earth Sciences, Inc.
Date Received:	09/15/08	Project:	KV080118A, F&BI 809094
Date Extracted:	09/17/08	Lab ID:	809129-12 x10
Date Analyzed:	09/17/08	Data File:	809129-12 x10.055
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	80	60	125
Indium	73	60	125
Holmium	78	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	89.5
Nickel	89.0
Copper	118
Zinc	253
Arsenic	44.2
Cadmium	<10
Lead	3,040



FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Associated Earth Sciences, Inc.
Date Received:	Not Applicable	Project:	KV080118A, F&BI 809094
Date Extracted:	09/17/08	Lab ID:	i8-352 mb
Date Analyzed:	09/17/08	Data File:	i8-352 mb.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	64	60	125
Indium	65	60	125
Holmium	72	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Arsenic	<1
Cadmium	<1
Lead	<1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF SOIL SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 809132-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	mg/kg (ppm)	12.4	11.8	5	0-20
Nickel	mg/kg (ppm)	16.9	14.6	15	0-20
Copper	mg/kg (ppm)	35.7	38.3	7	0-20
Zinc	mg/kg (ppm)	72.1	86.7	18	0-20
Arsenic	mg/kg (ppm)	3.27	3.18	3	0-20
Cadmium	mg/kg (ppm)	<1	<1	nm	0-20
Lead	mg/kg (ppm)	75.4	109	36 hr	0-20

Laboratory Code: 809132-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	12.4	101 b	50-150
Nickel	mg/kg (ppm)	25	16.9	93 b	50-150
Copper	mg/kg (ppm)	50	35.7	116 b	50-150
Zinc	mg/kg (ppm)	50	72.1	128 b	50-150
Arsenic	mg/kg (ppm)	10	3.27	112 b	50-150
Cadmium	mg/kg (ppm)	10	<1	108	50-150
Lead	mg/kg (ppm)	20	75.4	166 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	mg/kg (ppm)	50	115	70-130
Nickel	mg/kg (ppm)	25	113	70-130
Copper	mg/kg (ppm)	50	113	70-130
Zinc	mg/kg (ppm)	50	101	70-130
Arsenic	mg/kg (ppm)	10	112	70-130
Cadmium	mg/kg (ppm)	10	111	70-130
Lead	mg/kg (ppm)	20	113	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 09/25/08

Date Received: 09/15/08

Project: KV080118A, F&BI 809129

**QUALITY ASSURANCE RESULTS  
FOR THE ANALYSIS OF WATER SAMPLES  
FOR TOTAL METALS USING EPA METHOD 200.8**

Laboratory Code: 809114-21 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	ug/L (ppb)	4.95	<1	nm	0-20
Nickel	ug/L (ppb)	5.67	4.95	14	0-20
Copper	ug/L (ppb)	3.16	2.72	15	0-20
Zinc	ug/L (ppb)	3.13	2.16	37 a	0-20
Arsenic	ug/L (ppb)	1.27	<1	nm	0-20
Cadmium	ug/L (ppb)	<1	<1	nm	0-20
Lead	ug/L (ppb)	<1	<1	nm	0-20

Laboratory Code: 809114-21 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	ug/L (ppb)	20	4.95	88 b	50-150
Nickel	ug/L (ppb)	20	5.67	104 b	50-150
Copper	ug/L (ppb)	20	3.16	101	50-150
Zinc	ug/L (ppb)	50	3.13	91	50-150
Arsenic	ug/L (ppb)	10	1.27	111	50-150
Cadmium	ug/L (ppb)	5	<1	108	50-150
Lead	ug/L (ppb)	10	<1	105	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	112	70-130
Nickel	ug/L (ppb)	20	111	70-130
Copper	ug/L (ppb)	20	107	70-130
Zinc	ug/L (ppb)	50	85	70-130
Arsenic	ug/L (ppb)	10	86	70-130
Cadmium	ug/L (ppb)	5	97	70-130
Lead	ug/L (ppb)	10	103	70-130