Associated Earth Sciences, Inc.

Technical Memorandum

Date: November 29, 2012

To: Pacific Topsoils, Inc.
805 80th Street SW
Everett, Washington 98203

Attn: Mr. Januz Bajsarowicz

Project Name: Mill E Site

From: Jon N. Sondergaard, L.G., L.E.G.

Project No: KV050654A

Subject: Mill E 2012 Ground Water Monitoring Summary

GROUND WATER MONITORING

Associated Earth Sciences, Inc. (AESI) performed annual ground water monitoring at the Mill E site on September 25, 2012, consistent with the Mill E's Performance and Compliance Monitoring Plan (PCMP) dated October 1998. During the September 2012 monitoring event, depth to water measurements were made in all of the site's six piezometers (PZ-1A, PZ-1B, PZ-2A, PZ-2B, PZ-3A, and PZ-3B). The depth to water measurements are summarized in Table 1. A site plan showing the approximate well locations is presented on Figure 1.

Table 1
Depth to Ground Water[1]

Piezometer	Date	Reference Elevation (feet) Top of PVC[1]	Depth to Water (feet)[2]	Ground Water Elevation (feet)[3]
PZ-1A	9/25/2012	9.90	6.06	4.00
PZ-1B	9/25/2012	7.93	2.52	5.55
PZ-2A	9/25/2012	9.40	6.01	3.54
PZ-2B	9/25/2012	8.38	3.03	5.52
PZ-3A	9/25/2012	10.31	8.02	2.29
PZ-3B	9/25/2012	7.54	4.99	2.71

[1] Top of casing elevations referenced to mean sea level (Shaw, 2003).
[2] Measurements collected at outgoing tide.
[3] "A" wells are located inside the containment; "B" wells are located outside the containment.

Ground water samples were collected from piezometer PZ-3A only. Piezometer PZ-3A was purged and sampled using a disposable bailer, consistent with the facility's PCMP. Field measurements (depth to water, pH, conductivity, and temperature) were recorded at the time of sampling. The field measurements are summarized in Table 2. After purging and recording of field measurements, ground water samples were obtained for off-site analytical testing. The ground water samples were collected in laboratory prepared bottles. The samples were placed in a cooler packed with ice and delivered under chain of custody (COC) procedures to Aquatic Research Incorporated in Seattle Washington. The COC form outlining the requested analyses is attached.

Table 2
Field Monitoring Parameters
September 2010

Sample Location	Sample Date	Depth to Water (ft-BTOC)	Gallons Removed	pH (S.U.)	Specific Conductance (μS/cm)	Temperature (°C)
PZ-3A	9/25/12	8.02	2	6.47	816	17.11

ft-BTOC = feet below top of polyvinyl chloride (PVC) casing.
S.U. = standard pH units.
μS/cm = microSiemens per centimeter.
°C = degrees Celsius.

ASPHALT CAP AND SOIL COVER

An asphalt cap and soil cover inspection was performed on November 27, 2012 by a professional engineer from AESI. A copy of the field report from that visit is attached. The majority of the cap was visible. The central interior portion of the cap was covered with wood chips and shipping containers and the asphalt was not visible in these areas. Where observed, the asphalt cap exhibited little evidence of deterioration and no signs of excessive settlement.

The areas to the south of the asphalt cap are covered with a 1-foot-thick soil cover with grass and some scattered brush. AESI did not observe pumping, rutting, or similar indications of surface disturbance. The soil cap appeared intact and was performing as intended, in our opinion. Photos taken at the time of our visit are attached to this report.

QUALITY ASSURANCE/QUALITY CONTROL

Laboratory quality assurance/quality control (QA/QC) analyses were performed in conjunction with the September 2012 ground water quality monitoring event. Routine laboratory QA procedures included analyzing surrogate spikes, matrix spikes, matrix duplicates, laboratory control samples, and method blanks. The Lab Control Spike percent recovery for both the neutral blank and the samples analyzed are within the quality control limits (65%-135%). All other QA/QC results were judged to be acceptable for their intended use. The test results are presented in Table 3 below and the Aquatic Research Incorporated laboratory certificates are attached to this memorandum.

WATER BALANCE

Elevations for the top of the well casings and historic ground water elevations were obtained by reviewing the "2003 Annual Ground Water Compliance Monitoring and Five Year Data Review Report," prepared by Shaw Environmental, Inc. (Shaw) and obtained from the Washington State Department of Ecology (Ecology). Ground water elevations for the year 2005 could not be found. All "A" series wells (PZ-1A, PZ-2A, and PZ-3A) are located inside of the barrier wall and all "B" series wells (PZ-1B, PZ-2B, and PZ-3B) are located outside of the barrier wall. Figure 2 shows a comparison of historical ground water elevation data obtained for the site. Review of the data indicates that generally after 2001, ground water elevations outside of the barrier wall are higher than inside the barrier, with the exception of the 2007 measurement for well PZ-1A. The higher than expected water level in PZ-1A in 2007 was examined, and was determined to be a result of surface water collecting in the well monument. This problem has been corrected by raising the elevation of the top of the well monument to prevent surface water from seeping into the monument (Technical Memorandum dated December 17, 2009).

The data for wells PZ-1A/1B, PZ-2A/2B and PZ-3A/3B suggests the barrier wall is generally performing as intended and isolating ground water inside the barrier from that outside the barrier.

RESULTS AND CONCLUSIONS

The September 2012 ground water analytical results for the Mill E site were compared to the Model Toxics Control Act (MTCA) cleanup levels established in the 1998 Consent Decree. The results are presented in Table 3. Concentrations of all analytical parameters detected in the PZ-3A ground water sample were below the established MTCA cleanup standards, except for arsenic and PCP. The September 2012 PZ-3A result of 616 micrograms per liter (μg/L) for arsenic is above the MTCA cleanup standard of 5 μg/L. and the result of 9.93 μg/L for PCP is above the MTCA cleanup standard of 7.29 μg/L. Review of historic ground water quality data for the site indicates the 2012 results are within the range of past measurements (Figure 3), but are lower than the 2010 concentrations.

Table 3
Comparison of Ground Water Analytical Results
and MTCA Cleanup Standard for Ground Water
September 2012

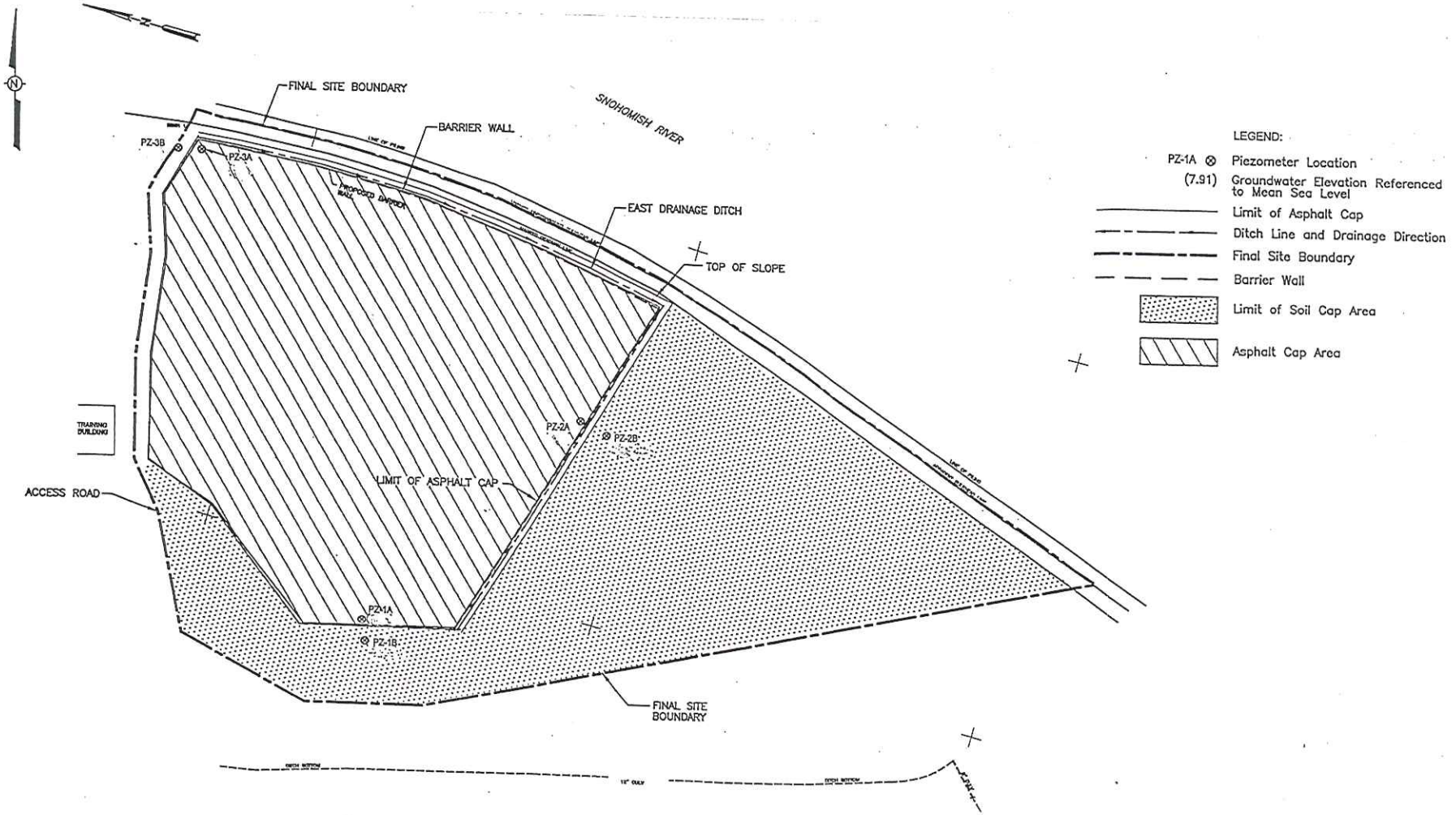
Sample Location	Sample Date	TPH-D (μg/L)	TPH-G (μg/L)	TPH-M (μg/L)	PCP (μg/L)	Arsenic (μg/L)
PZ-3A	9/25/12	280	20	100	**9.93**	**616**
MTCA[(1)]		*10,000*	*10,000*	*10,000*	*7.29*	*5*

TPH-D = total petroleum hydrocarbons-diesel.
TPH-G = total petroleum hydrocarbons-gasoline.
TPH-M = total petroleum hydrocarbons-motor oil.
PCP = pentachlorophenol.
μg/L = micrograms per liter.
Bold denotes an exceedance of the MTCA cleanup standard for ground water.
(1) MTCA = Model Toxics Control Act cleanup standards for ground water per the 1998 Consent Decree.

We trust the information presented meets your current needs. Please do not hesitate to contact us if you have any questions or require additional information.

Attachments:
Figure 1: Site Plan
Figure 2: Historic Ground Water Elevations
Figure 3: Analyte Concentrations in Well PZ-3A
Field Report of Cap Inspection
Site Photos
Laboratory Test Certificates and Chain of Custody

JNS/pc
KV050654A12
Projects\20050654\KV\WP



BASE MAP TOPOGRAPHY BASED ON AERIAL PHOTOGRAMMETRIC MAPPING BY RICHARD B. DAVIS CO., WITH CONTROL SURVEY BY CLARK M. LEEMAN SURVEYING, IN DECEMBER, 1997. **(SHAW, 2003)**

Associated Earth Sciences, Inc.

projects\

FORMER MILL E/KOPPERS SITE PLAN

FIGURE 1

DATE 9/2007

PROJ. NO. KE050654A

Figure 2 Mill E Ground Water Elevations (ft)
"A" Wells inside containment
"B" Wells outside containment

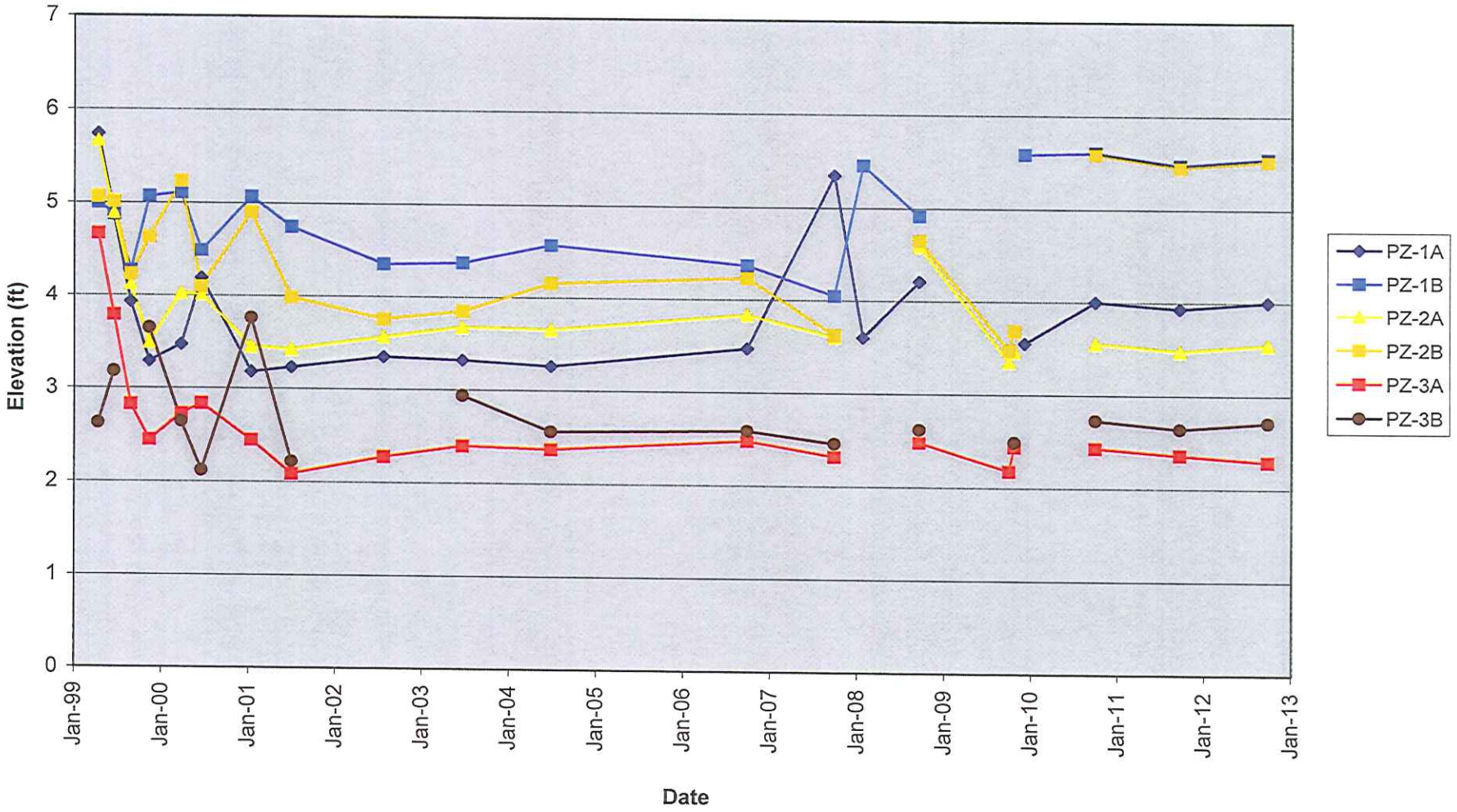
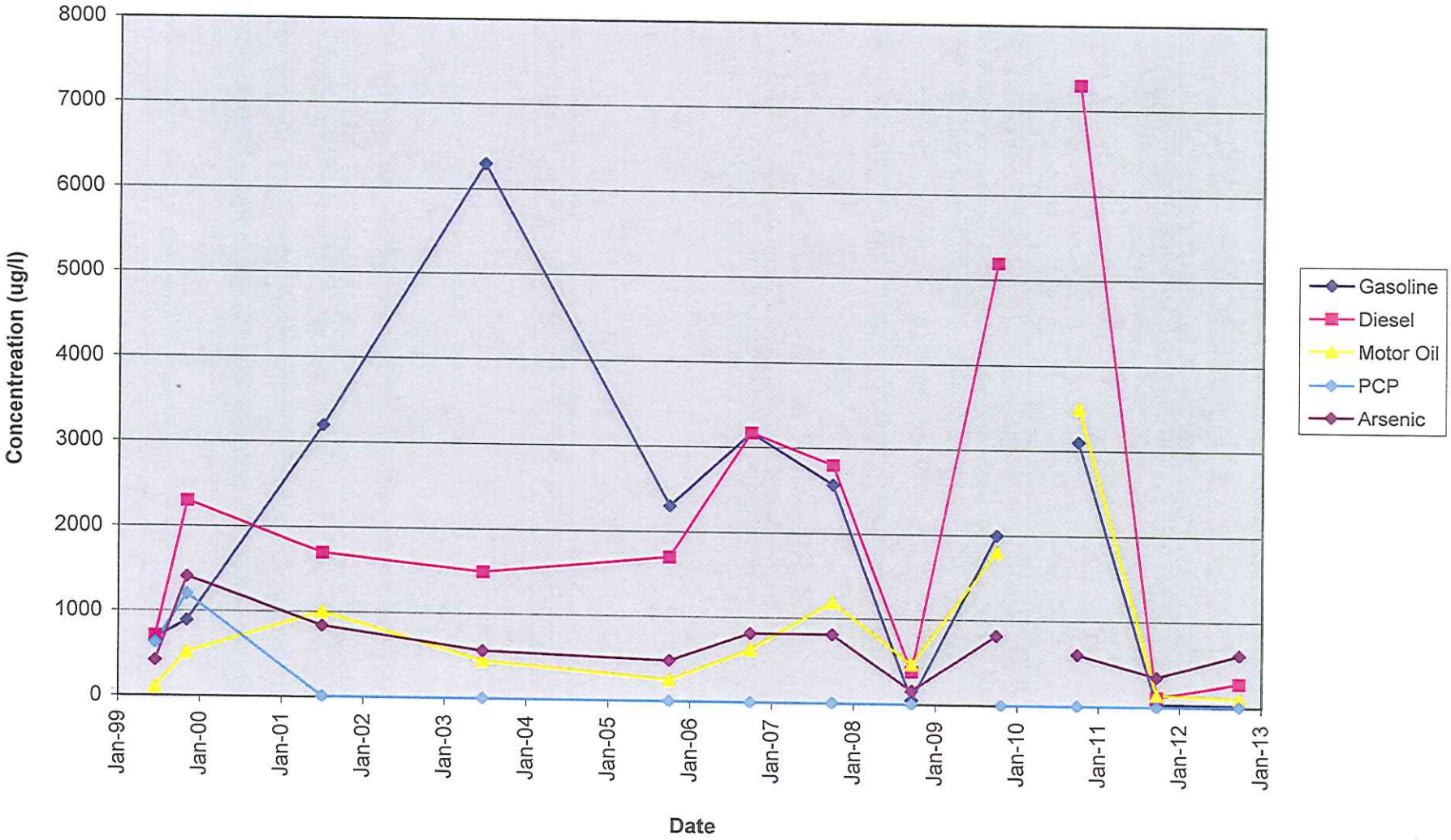


Figure 3 Mill E Analyte Concentreations
Well PZ-3A



FIELD REPORT

Associated Earth Sciences, Inc.

911 Fifth Avenue, Suite 100
Kirkland, Washington 98033
425-827-7701 FAX 827-5424

Date	Project Name	Project No.
11-27-12	Mill E Site	KV050654
Location: Riverside Business Park		Weather: Clear 50's
Municipality: Everett		Report Number: 4
Engineer/Architect: AESI		
Client/Owner: Pacific Topsoil		
General Contractor/Superintendent		
Grading Contractor/Superintendent		

TO: Pacific Topsoil Inc.
805 80th Street SW
Everett, WA 98203

ATTN: Mr. Januz Bajsarowicz

AS REQUESTED BY: Performance and Compliance Monitoring Plan

THE FOLLOWING WAS NOTED:

As part of the Mill E Performance and Compliance Monitoring Plan, Associated Earth Sciences, Inc. (AESI) arrived on site to observe the existing asphalt section and fill soil covering previously identified contaminated soils on site.

Matthew A. Miller, PE a professional engineer with our firm was on site and performed site observations. The property is currently being used to recycle wood debris into wood chips and similar shredded wood products. The site contains several stock piles of wood debris and wood chips in the central portion of the asphalt cap. During our site visit, the asphalt cap was observed to be in serviceable condition with no obvious signs of cracking, fissures, or pumping. However there was an area near the entrance that has developed a low point for standing water to collect. This is located near the entrance where two "birdbaths" have developed since our last visit. We recommend that these areas be saw cut and replaced or leveled to allow drainage in the area. See Photo below:

MATTHEW A. MILLER
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

11-27-12

AESI should be contacted if additional indications of pavement distress are observed before our next scheduled site visit.

While on site, AESI also observed fill soils along the southwestern edge of the property. Approximately 1 foot of soil was placed on top of the site. AESI did not observe pumping, however there was minimal indications of rutting from wheeled vehicles less than 4 inches deep. No visible indications of settling were observed.

COPIES TO:

DATE MAILED:

FIELD REP.: Matthew A. Miller, PE

PRINCIPAL / PM:

Looking northwest towards entry road. Areas of ponded water on pavement.

Looking north at operations

Looking southeast toward Snohomish River

Looking west towards Everett

Aquatic Research Inc.
3927 Aurora Ave. N. , Seattle, WA 98103 | (206) 632-2715

SEMI-VOLATILE ORGANIC CHEMICAL REPORT

Results of Analysis by EPA Method 8270
Measurement of Extractable Organic Compounds in Water by Capillary Column
Gas Chromatography/Mass Spectrometry

Case File Number:	**9/28/12-MB**	Matrix:	Water
Sample ID No.:	**Method Blank**	Sample Vol. (ml)	**1000**
Date Collected:	**n/a**	Final Volume (ml)	**1.0**
Date Received:	**n/a**	Dilution Factor:	**1**
Date Extracted:	**09/28/12**		
Date Analyzed	**10/05/12**	Analyst:	**T. Meadows**
Date of Report:	**10/08/12**	Supervisor's Initials:	
Data File Path:	**D:\5975 Data\PAM\2012\100512**	**02901001.D**	

CAS#	Name of Compound	Amount (ppb)	Flag
87-86-5	Pentachlorophenol	0.40	U

FLAGS:

U	Indicates compound was analyzed for, but not detected at the specified detection limit.
B	Blank contaminated with this analyte.
J	Estimated value - compound positively identified, but below specified detection limit.
E	Estimated value - compound exceeded calibration range.
D	Compound analyzed at a secondary dilution factor of _____ from data file: _____
PP	Compound Purges Poorly, requiring elevated detection limit.

NOTE: ppm Amounts are in mg/L or mg/KG dry weight.

Surrogate Recoveries	%Rec.	QC limits Water	QC limits Soil
2,4,6-Tribromophenol	66%	0-183%	65-135%

Aquatic Research Inc.
3927 Aurora Ave. N. , Seattle, WA 98103 | (206) 632-2715

SEMI-VOLATILE ORGANIC CHEMICAL REPORT

Results of Analysis by EPA Method 8270
Measurement of Extractable Organic Compounds in Water by Capillary Column
Gas Chromatography/Mass Spectrometry

Case File Number:	**ASE00116A1**	Matrix:	Water
Sample ID No.:	**PZ-3A**	Sample Vol. (ml)	**1060**
Date Collected:	**09/25/12**	Final Volume (ml)	**1.0**
Date Received:	**09/25/12**	Dilution Factor:	**1**
Date Extracted:	**09/28/12**		
Date Analyzed	**10/05/12**	Analyst:	**T. Meadows**
Date of Report:	**10/08/12**	Supervisor's Initials:	
Data File Path:	**D:\5975 Data\PAM\2012\100512\ 03101003.D**		

CAS#	Name of Compound	Amount (ppb)	Flag
87-86-5	Pentachlorophenol	9.93	

FLAGS:

U	Indicates compound was analyzed for, but not detected at the specified detection limit.
B	Blank contaminated with this analyte.
J	Estimated value - compound positively identified, but below specified detection limit.
E	Estimated value - compound exceeded calibration range.
D	Compound analyzed at a secondary dilution factor of _____ from data file: _____
PP	Compound Purges Poorly, requiring elevated detection limit.

NOTE: ppm Amounts are in mg/L or mg/KG dry weight.

Surrogate Recoveries	%Rec.	QC limits Water	QC limits Soil
2,4,6-Tribromophenol	131%	0-183%	65-135%

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: ASE001-16 PAGE 1

REPORT DATE: 10/29/12

DATE SAMPLED: 09/25/12 DATE RECEIVED: 09/25/12

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM ASSOCIATED EARTH SCIENCES, INC

CASE NARRATIVE

One water sample was received by the laboratory in good condition and analyzed according to the chain of custody. No difficulties were encountered in the preparation or analysis of this sample. Sample data follows while QA/QC data is contained on subsequent pages.

SAMPLE DATA

	NWTPH-G	NWTPH-DX		
SAMPLE ID	GAS (mg/L)	DIESEL (mg/L)	MOTOR OIL (mg/L)	TOTAL ARSENIC (ug/L)
PZ-3A	0.02	0.28	<0.10	616

	BTEX COMPOUNDS			
SAMPLE ID	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	tot-Xylene (ug/L)
PZ-3A	6.0	1.1	3.2	6.0

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: ASE001-16 PAGE 2

REPORT DATE: 10/29/12

DATE SAMPLED: 09/25/12 DATE RECEIVED: 09/25/12

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM ASSOCIATED EARTH SCIENCES, INC

QA/QC DATA

QC PARAMETER	GAS (mg/L)	DIESEL (mg/L)	MOTOR OIL (mg/L)	TOTAL ARSENIC (ug/L)
METHOD	NWTPH-GX	NWTPH-DX	NWTPH-DX	EPA 6020
DATE ANALYZED	10/01/12	10/04/12	10/04/12	09/26/12
DETECTION LIMIT	0.01	0.05	0.10	2.0
DUPLICATE				
SAMPLE ID				BATCH
ORIGINAL				<2.0
DUPLICATE				<2.0
RPD	NA	NA	NA	NC
SPIKE SAMPLE				
SAMPLE ID				BATCH
ORIGINAL				<2.0
SPIKED SAMPLE				51.5
SPIKE ADDED				50.0
% RECOVERY	NA	NA	NA	103.00%
QC CHECK				
FOUND	0.05	0.46	0.86	49.5
TRUE	0.05	0.50	1.00	50.0
% RECOVERY	100.00%	92.00%	86.00%	98.97%
PREP BLANK	<0.01	<0.05	<0.10	<2.0

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES

3927 AURORA AVENUE NORTH, SEATTLE, WA 98103

PHONE: (206) 632-2715 FAX: (206) 632-2417

CASE FILE NUMBER: ASE001-16 PAGE 3

REPORT DATE: 10/29/12

DATE SAMPLED: 09/25/12 DATE RECEIVED: 09/25/12

FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER SAMPLES FROM ASSOCIATED EARTH SCIENCES, INC

QA/QC DATA

QC PARAMETER	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	tot-Xylene (ug/L)
METHOD	EPA 8260	EPA 8260	EPA 8260	EPA 8260
DATE ANALYZED	10/01/12	10/01/12	10/01/12	10/01/12
DETECTION LIMIT	0.4	0.4	0.4	1.2
DUPLICATE				
SAMPLE ID				
ORIGINAL				
DUPLICATE				
RPD	NA	NA	NA	NA
SPIKE SAMPLE MS/MSD				
SAMPLE ID				
MS %REC				
MSD %REC				
RPD %	NA	NA	NA	NA
QC CHECK ug/l				
FOUND	2.1	2.1	2.0	6.5
TRUE	2.0	2.0	2.0	6.0
% RECOVERY	104.00%	104.50%	99.00%	108.33%
BLANK	<0.4	<0.4	<0.4	<1.2

RPD = RELATIVE PERCENT DIFFERENCE.
NA = NOT APPLICABLE OR NOT AVAILABLE.
NC = NOT CALCULABLE DUE TO ONE OR MORE VALUES BEING BELOW THE DETECTION LIMIT.
OR = RECOVERY NOT CALCULABLE DUE TO SPIKE SAMPLE OUT OF RANGE OR SPIKE TOO LOW RELATIVE TO SAMPLE CONCENTRATION.

SUBMITTED BY:

Damien Gadomski

Damien Gadomski
Project Manager

ASE001-16

Aquatic Research Incorporated

3927 Aurora Ave. N / Seattle, WA 98103 / (206) 632-2715

CHAIN-OF-CUSTODY RECORD

CLIENT: Associated Earth Sciences, Inc.
SAMPLING DATE: 9/25/2012
SAMPLERS: Lara Koger

SHEET 1 OF 1
PROJECT ID: Mill E/KV050654A
CASE FILE NO.:
DATA RECORDED BY:

SAMPLE INFORMATION

SAMPLE ID	DATE/TIME COLLECTED	PARAMETERS: TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	PCP	Arsenic	BOTT #	NOTES
PZ-3A	9/25/12 1315	X	X	X	X	X		

	Relinquished By	Date/Time	Received By	Date/Time
Printed Name	Lara Koger	9/25/2012 1415	S. Wilson	9/25/12
Signature				1415
Affiliation	AESI		AMI	

	Relinquished By	Date/Time	Received By	Date/Time
Printed Name				
Signature				
Affiliation				

Miscellaneous Notes (Hazardous Materials, Quick turn-around time, etc.):

ASE001-16

Aquatic Research Incorporated

3927 Aurora Ave. N / Seattle, WA 98103 / (206) 632-2715

CHAIN-OF-CUSTODY RECORD

CLIENT: Associated Earth Sciences, Inc.
SAMPLING DATE: 9/25/2012
SAMPLERS: Lara Koger

SHEET 1 OF 1
PROJECT ID: Mill E/KJ050654A
CASE FILE NO.:
DATA RECORDED BY:

SAMPLE INFORMATION

SAMPLE ID	DATE/TIME COLLECTED	PARAMETERS: TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	PCB	Arsenic	BOTT #	NOTES
PZ-3A	9/25/12 1315	X	X	X	X	X		

	Relinquished By	Date/Time	Received By	Date/Time
Printed Name	Lara Koger	9/25/2012 1415	S. Hillwood	9/25/12
Signature				1415
Affiliation	AESI		ARI	

	Relinquished By	Date/Time	Received By	Date/Time
Printed Name				
Signature				
Affiliation				

Miscellaneous Notes (Hazardous Materials, Quick turn-around time, etc.):