



Technical Memorandum

Date: November 3, 2011

Page 1

To: Pacific Topsoils, Inc.
805 80th Street SW
Everett, Washington 98203
Attn: Mr. Januz Bajsarowicz

From: Jon N. Sondergaard, L.G., L.E.G. *JNS*
Project No: KV050654A

Subject: Mill E 2011 Ground Water Monitoring Summary

GROUND WATER MONITORING

Associated Earth Sciences, Inc. (AESI) performed annual ground water monitoring at the Mill E site on September 20, 2011, consistent with the Mill E's Performance and Compliance Monitoring Plan (PCMP) dated October 1998. During the September 2011 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	9/20/11	9.90	5.97	3.93
PZ-1B	9/20/11	7.93	2.45	5.48
PZ-2A	9/20/11	9.40	5.93	3.47
PZ-2B	9/20/11	8.38	2.93	5.45
PZ-3A	9/20/11	10.31	7.95	2.36
PZ-3B	9/20/11	7.54	4.90	2.64

(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.)	Conductance ($\mu\text{S}/\text{cm}$)	Specific Temperature ($^{\circ}\text{C}$)
PZ-3A	9/20/11	7.95	2	6.74	1032	20.5

ft-BTOC = feet below top of polyvinyl chloride (PVC) casing.
 S.U. = standard pH units.
 $\mu\text{S}/\text{cm}$ = microSiemens per centimeter.
 $^{\circ}\text{C}$ = degrees Celsius.

ASPHALT CAP AND SOIL COVER

An asphalt cap and soil cover inspection was performed on October 28, 2011 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 2011 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 (42%) was below the quality control limits (50%-150%). 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 2011 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. The September 2010 PZ-3A result of 350 micrograms per liter ($\mu\text{g/L}$) for arsenic is above the MTCa cleanup standard of 5 $\mu\text{g/L}$. Review of historic ground water quality data for the site indicates the 2011 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 2010

Sample Location	Sample Date	TPH-D ($\mu\text{g/L}$)	TPH-G ($\mu\text{g/L}$)	TPH-M ($\mu\text{g/L}$)	PCP ($\mu\text{g/L}$)	Arsenic ($\mu\text{g/L}$)
PZ-3A	9/20/11	110	30	140	0.36	350
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.
 $\mu\text{g/L}$ = 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:

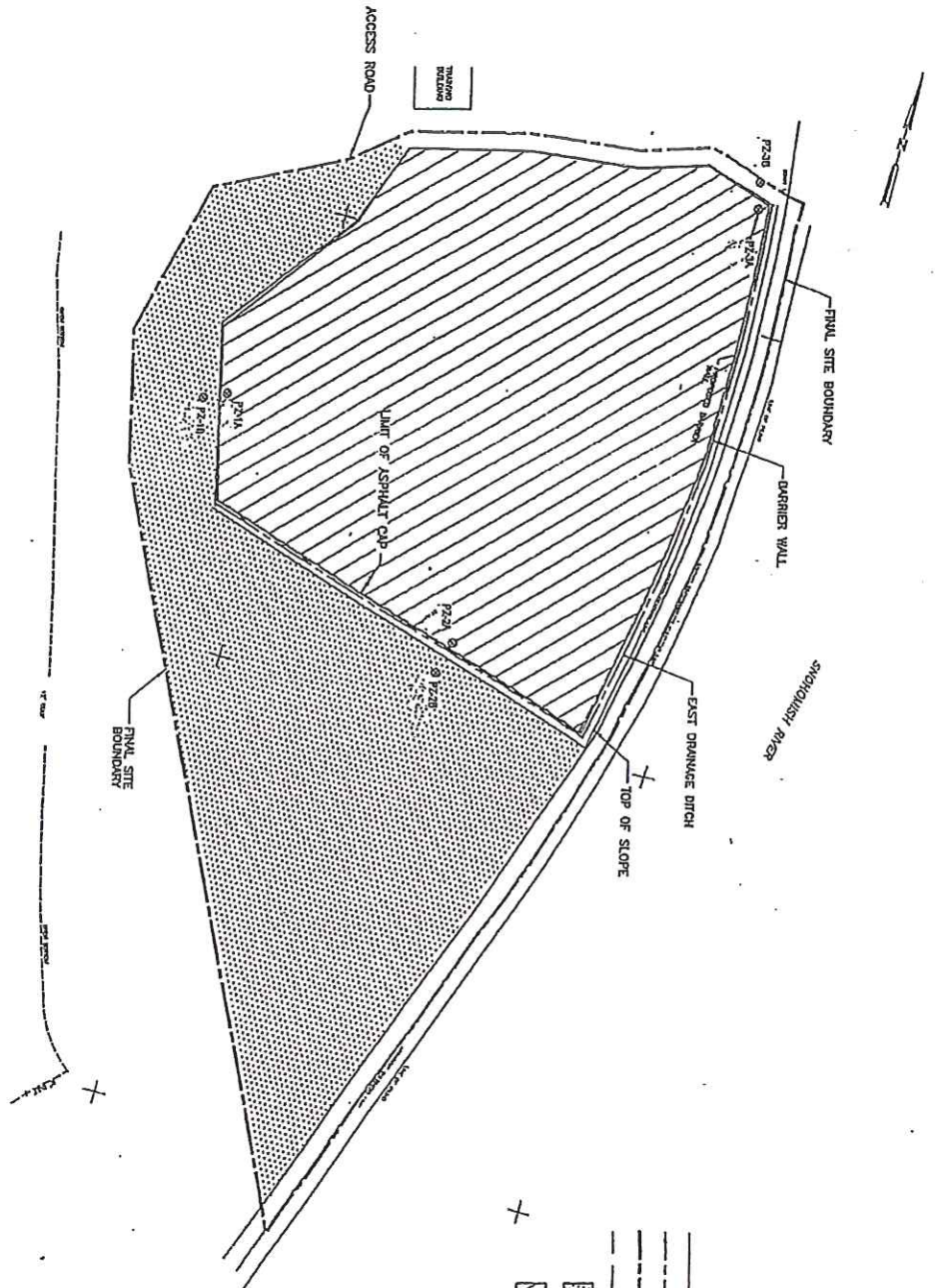
- Figure 1: Site Plan
- Figure 2: Historic Ground Water Elevations
- Figure 3: Analyte Concentrations in Well PZ-3A
- Field Report of Cap Inspection
- Site Photos
- Laboratory Test Certificates and Chain of Custody

Associated Earth Sciences, Inc.



FORMER MILL E/KOPPERS SITE PLAN

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



- LEGEND:
- PZ1A (7.91) Piezometer Location
 - Groundwater Elevation Referenced to Mean Sea Level
 - Limit of Asphalt Cap
 - Ditch Line and Drainage Direction
 - Final Site Boundary
 - Barrier Wall
 - Limit of Soil Cap Area
 - Asphalt Cap Area



FIGURE 1

DATE 9/2007

PROJ. NO. KE050654A

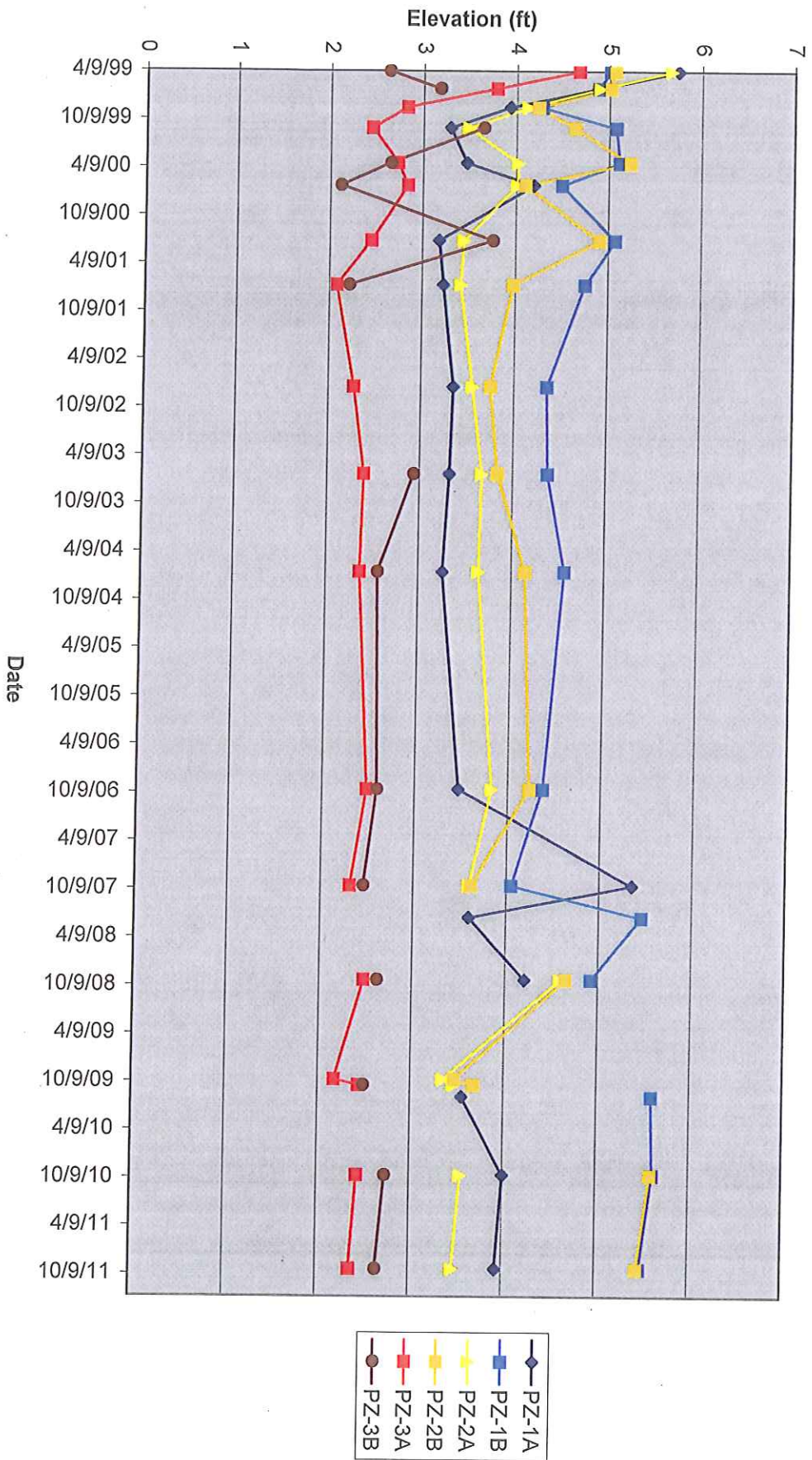
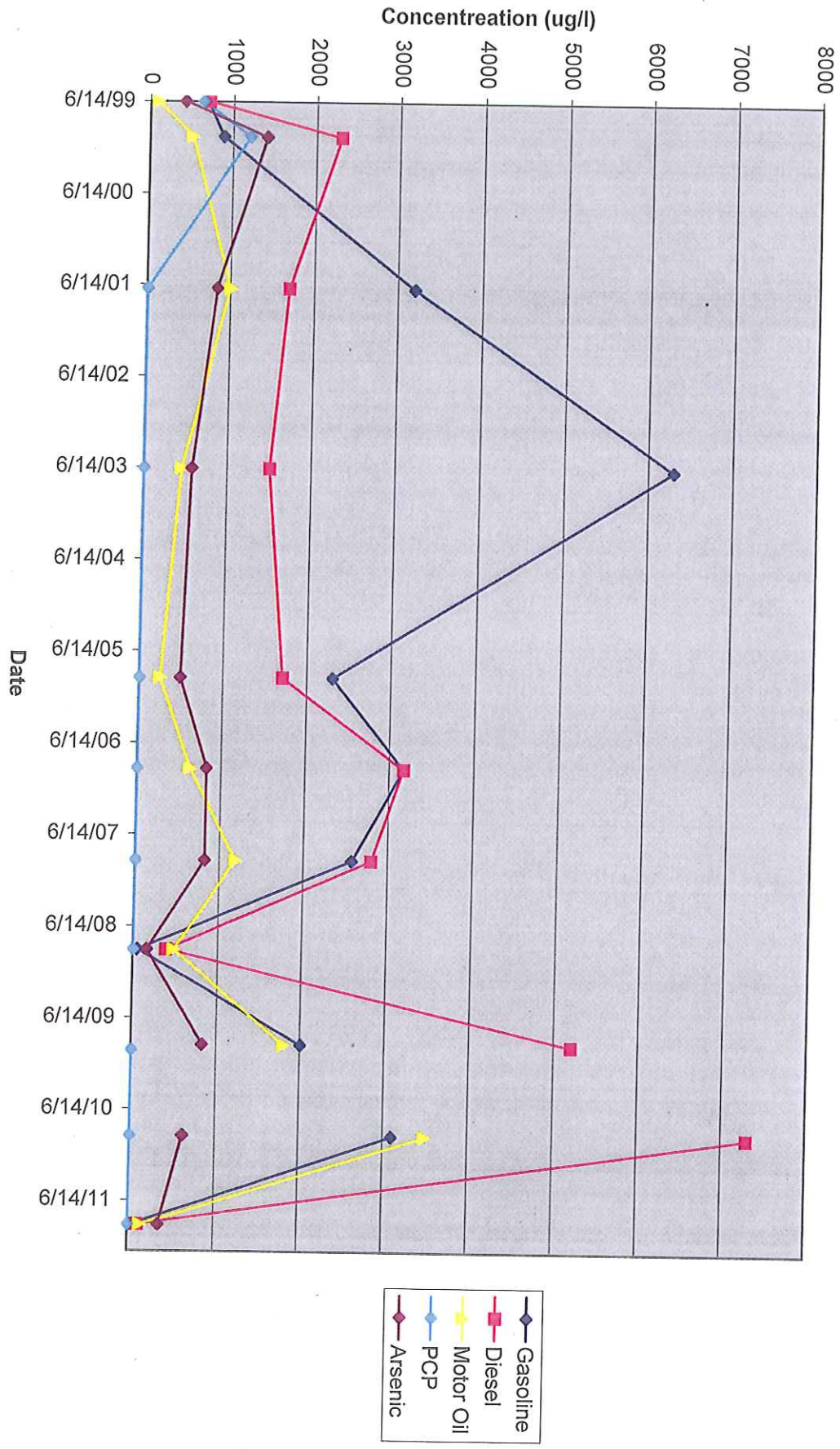


Figure 2 Mill E Ground Water Elevations (ft)
 "A" Wells inside containment
 "B" Wells outside containment

Mill E Analyte Concentrations
Well PZ-3A



FIELD REPORT

Associated Earth Sciences, Inc.



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

TO:

Pacific Topsoils, 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 existing asphalt sections and fill soils covering previously identified contaminated soils on site. Eduardo Garcia, a professional engineer with our firm, was on site and performed site observations. The property is currently being utilized to recycle wood debris into wood chips and similar shredded wood products. The site contains several stockpiles of wood debris and wood chips in the central portion of the asphalt cap. Since our last site visit, AESI observed the placement of a new asphalt berm and drainage swales in the southeast portion of the paved areas. The improvements were placed to help manage stormwater on the site. While on site, AESI observed that the asphalt cap was observed to be in suitable condition with no obvious signs of cracking, fissures, pumping, excessive settlements, or similar indicators of pavement distress. AESI should be contacted if indications of pavement distress are observed before our next scheduled site visit. AESI noted that portions of the silt fence, particularly in the northwest portion of the paved areas, were in need of maintenance. AESI recommends that silt fencing be maintained in general accordance with the Monitoring Plan.

AESI also observed fill soils within the southern edge of the property. Approximately 1 foot of fill soil was placed on top of the site. Vegetation on the site was sparse to moderate and largely consisted of short brush, grass, and similar low-growth vegetation. AESI did not observe pumping, rutting, or similar indications of near surface disturbance. AESI should be contacted if the soil cap is disturbed before our next scheduled site visit. AESI noted that equipment was being stored to the south of the paved areas. It should be noted that vehicle traffic over the soil cap, especially during wet weather, can increase the risk of pumping, rutting, or otherwise disturbing near surface soils in the vicinity of the soil cap and is not recommended.

COPIES TO:

DATE

MAILED:

FIELD REP.:

Eduardo Garcia, P.E.

PRINCIPAL / PM:

Don Sothmann L.E.S.

Project No.	KV050654	
Date	10-28-11	Mill E Site
Location	Riverside Business Park	
Weather	Cloudy, 50's	
Municipality	Everett	Report Number
Engineer	AESI	
Client/Owner	Pacific Topsoils, Inc.	

Photo 2. View looking east

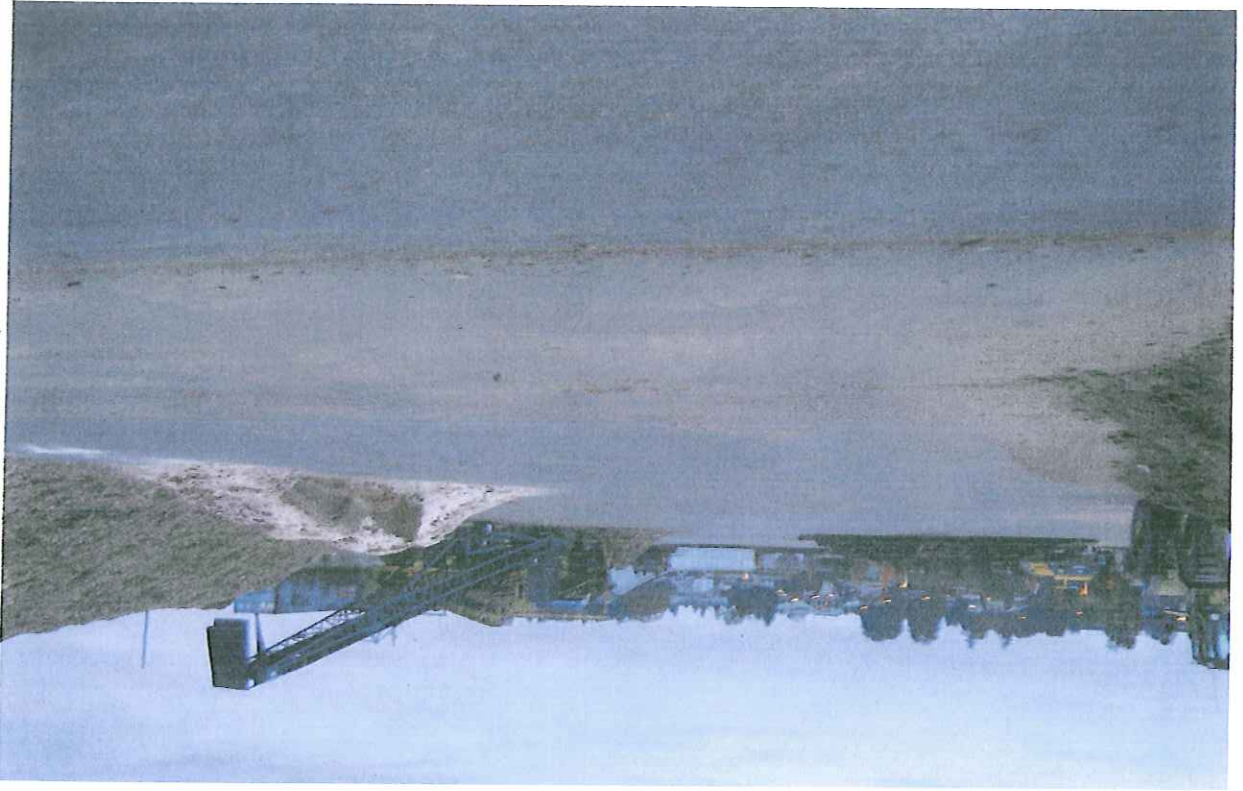


Photo 1. View looking north.





Photo 3. Drainage improvements along south side.



Photo 4. View looking south at soil cover.



CASE FILE NUMBER: ASE001-04
REPORT DATE: 10/27/11
DATE SAMPLED: 09/20/11
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				
GAS	DIESEL	MOTOR OIL	TOTAL ARSENIC		
SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(ug/L)	
PZ-3A	0.03	0.11	0.14	350	

BTEX COMPOUNDS					
SAMPLE ID	Benzene	Toluene	Ethylbenzene	tot-Xylene	
	(ug/L)	(ug/L)	(ug/L)	(ug/L)	
PZ-3A	7.5	1.2	2.8	8.6	

AQUATIC RESEARCH INCORPORATED

LABORATORY & CONSULTING SERVICES
 3927 AURORA AVENUE NORTH, SEATTLE, WA 98103
 PHONE: (206) 632-2715 FAX: (206) 632-2417



CASE FILE NUMBER: ASE001-04
 REPORT DATE: 10/27/11
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 FINAL REPORT, LABORATORY ANALYSIS OF SELECTED PARAMETERS ON WATER
 SAMPLES FROM ASSOCIATED EARTH SCIENCES, INC

QA/QC DATA

QC PARAMETER	GAS	DIESEL	MOTOR OIL	TOTAL ARSENIC
METHOD	NWTPH-GX	NWTPH-DX	NWTPH-DX	EPA 6020
DATE ANALYZED	09/21/11	10/03/11	10/03/11	10/18/11
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				57.3
SPIKE ADDED				50.0
% RECOVERY	NA	NA	NA	114.68%
QC CHECK				
FOUND	0.05	0.25	0.53	52.6
TRUE	0.05	0.25	0.50	50.0
% RECOVERY	100.00%	100.40%	105.50%	105.20%
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

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 SAMPLES FROM ASSOCIATED EARTH SCIENCES, INC

PAGE 3

QA/QC DATA

QC PARAMETER	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Benzene	EPA 8260	09/21/11	0.4	0.4
Toluene	EPA 8260	09/21/11	0.4	0.4
Ethylbenzene	EPA 8260	09/21/11	0.4	0.4
tot-Xylene	EPA 8260	09/21/11	1.2	1.2
DETECTION LIMIT				
DUPLICATE				
SAMPLE ID	ORIGINAL	DUPLICATE	RPD	
SAMPLE ID	MS/MSD			
SAMPLE ID	MS %REC			
SAMPLE ID	MSD %REC			
RPD %	NA	NA	NA	NA
QC CHECK	ug/l	FOUND	TRUE	% RECOVERY
		2.2	2.0	110.00%
		2.1	2.0	105.00%
		2.0	2.0	100.00%
		6.2	6.0	103.33%
				<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



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

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

Case File Number: ASE00104A1
 Sample ID No.: PZ-3A
 Date Collected: 9/20/2011
 Date Received: 9/20/2011
 Date Analyzed: 10/13/11
 Date of Report: 10/14/11
 Data File Path: O:\5973\8270\111013\0601006.D
 Matrix: Water
 Sample Vol. (ml): 1050
 Final Volume (ml): 1.0
 Dilution Factor: 1
 Analyst: T. Meadows
 Supervisor's Initials: 0601006.D

CAS#	Name of Compound	Amount (ppb)	Flag
87-86-5	Pentachlorophenol	0.36	J

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.	Water	Soil	QC limits
2,4,6-Tribromophenol	97%	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
10/14/10-phy/Mass Spectrometry

Case File Number: ASE00104A1 MS
Sample ID No.: PZ-3A Matrix Spike
Date Collected: 9/20/2011
Date Received: 9/20/2011
Date Analyzed: 10/13/11
Date of Report: 10/14/11
Data File Path: O:\5973\8270\111013\

Matrix: Water
Sample Vol. (ml): 1040
Final Volume (ml): 1.0
Dilution Factor: 1

Analyst: T. Meadows
Supervisor's Initials: 0701007.D

Surrogate Recoveries	%Rec.	104%	QC limits
	Water	0-183%	
	Soil	65-135%	

Matrix Spike Recoveries	%Rec.	78%	QC limits
	Water	50-150%	
	Soil	50-150%	



SEMI-VOLATILE ORGANIC CHEMICAL REPORT

Results of Analysis by EPA Method 8270
 Measurement of Extractable Organic Compounds in Water by Capillary Column
 10/14/10-phy/Mass Spectrometry

Case File Number: ASE00104A1 MSD
 Sample ID No.: PZ-3A Matrix Spike Duplicate
 Date Collected: 9/20/2011
 Date Received: 9/20/2011
 Date Analyzed: 10/13/11
 Date of Report: 10/14/11
 Data File Path: O:\5973\8270\111013\

Matrix: Water
 Sample Vol. (ml): 1050
 Final Volume (ml): 1.0
 Dilution Factor: 1

Analyst: T. Meadows
 Supervisor's Initials: 0801008.D

Surrogate Recoveries	%Rec.	104%	QC limits
2,4,6-Tribromophenol	Water	0-183%	65-135%
	Soil		

Matrix Spike Recoveries	%Rec.	75%	QC limits
Pentachlorophenol	Water	50-150%	50-150%
	Soil		



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

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

Case File Number:	9/26/11-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:	09/26/11	Analyst:	T. Meadows
Date Analyzed:	10/13/11	Supervisor's Initials:	0401004.D
Date of Report:	10/14/11		
Data File Path:	O:\5973\8270\111013\		

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

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

Surrogate Recoveries	%Rec.	Water	Soil	QC limits
2,4,6-Tribromophenol	32%	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
10/14/10-phy/Mass Spectrometry

Case File Number: 9/26/11-LCS
Sample ID No.: Lab Control Spike
Date Collected: n/a
Date Received: n/a
Date Analyzed: 10/13/11
Date of Report: 10/14/11
Analyst: T. Meadows
Supervisor's Initials: 0501005.D
Data File Path: O:\5973\8270\1110131

Matrix: Water
Sample Vol. (ml): 1000
Final Volume (ml): 2.0
Dilution Factor: 1

QC limits	Surrogate Recoveries		%Rec. 45%	Water	Soil
	0-183%	65-135%			

QC limits	Matrix Spike Recoveries		%Rec. 42%	Water	Soil
	50-150%	50-150%			

