Appendix B

Appendix B

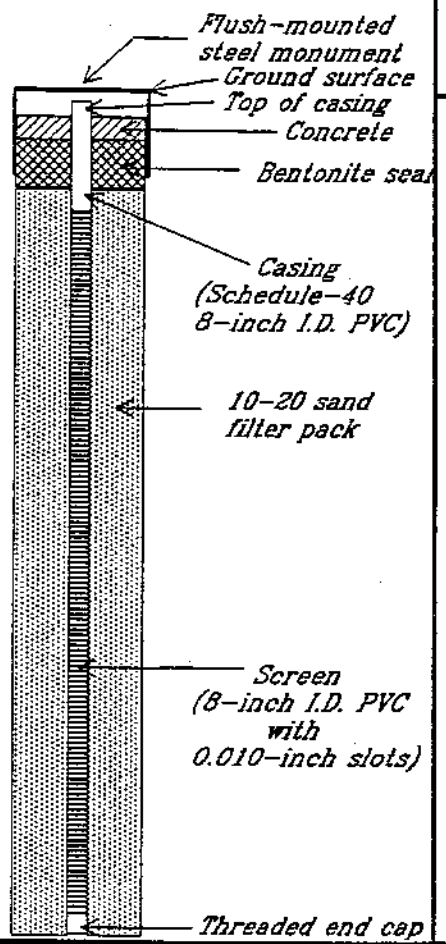
Lithologic Logs

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* WELL NO. *RW-2*

Elevation reference: Well completed:
Ground surface elevation: Casing elevation:

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*Inferred medium dense, moist, brown SILT with gravel and some sand. Slight odor noted.*					
5	*Inferred meium dense, moist, grey, SILT with some sand and gravel. Strong odor noted.*					
	Inferred, medium dense, wet, grey, SILT with sand and organics. Strong odor noted.					ATD
10	*Inferred, dense, wet, dark grey, organics (wood and peat) with some sand and silt.*					
15						
20						
25						
30	*Boring terminated at 18 feet.*					

AS-BUILT DESIGN



TESTING

LEGEND

▼ ATD — Observed groundwater level (ATD = at time of drilling)

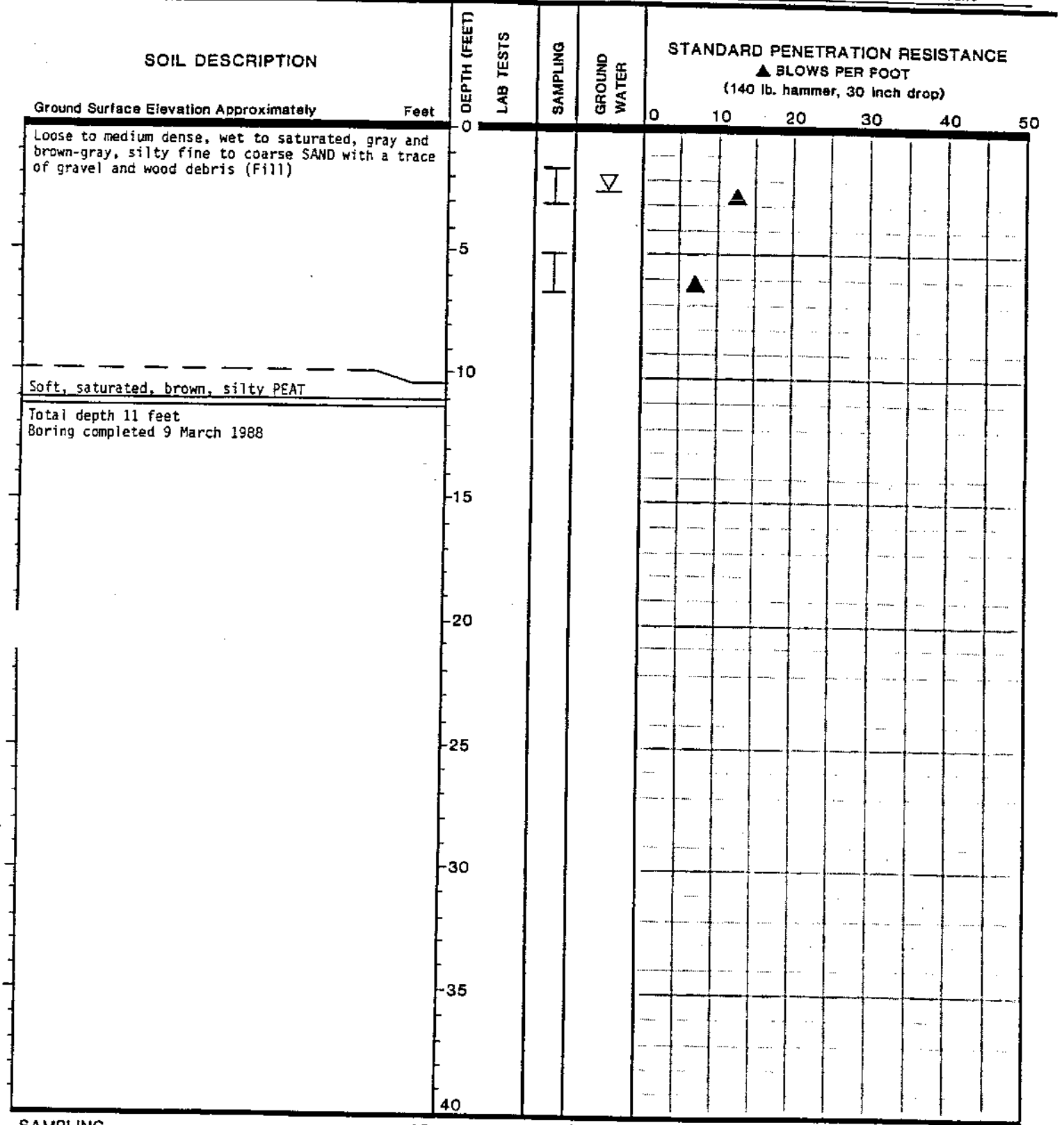
RZA RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *07 November 1991* Drilling completed: *07 November 1991* Logged by: *JK*

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-6 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

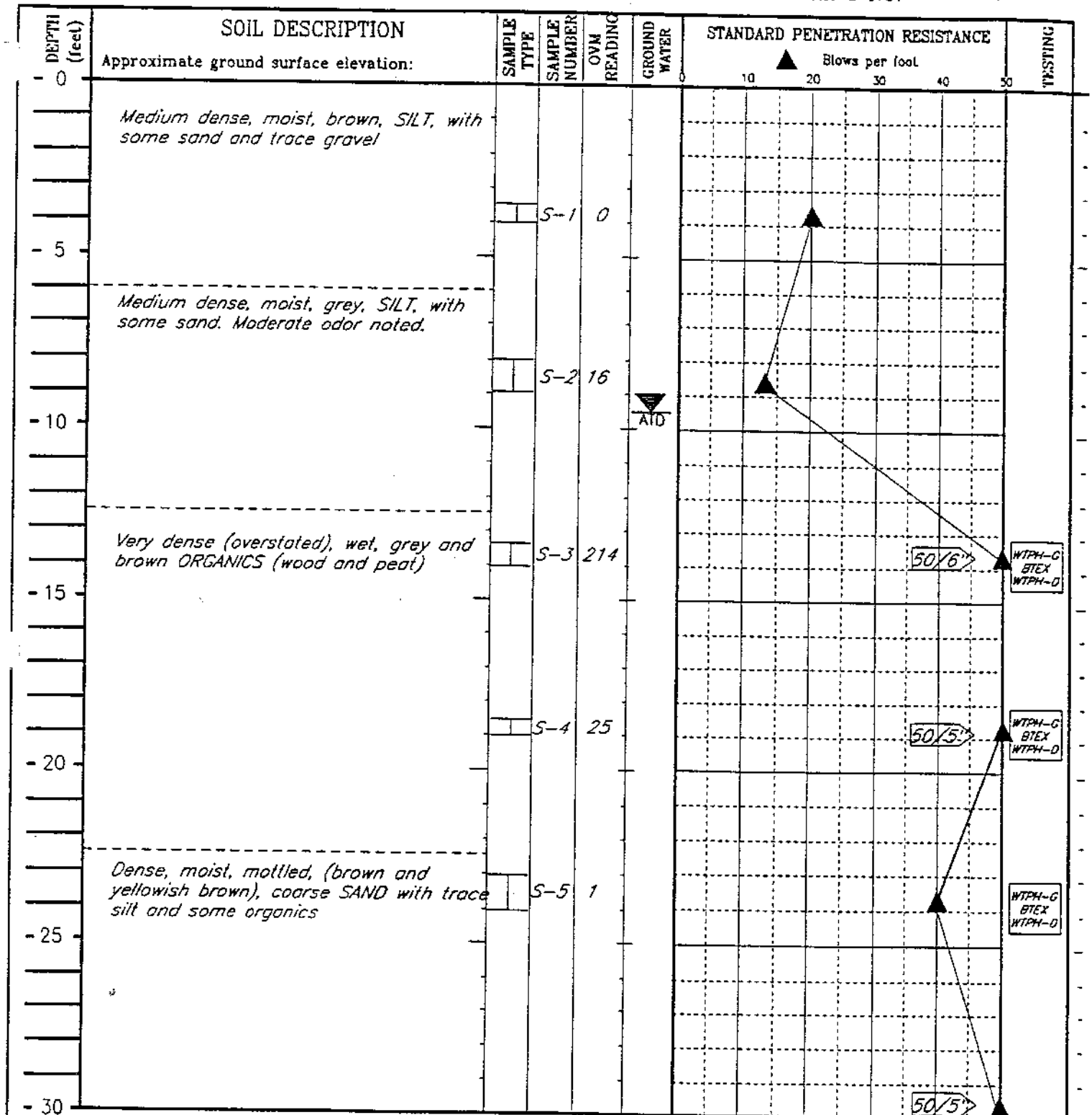


SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* BORING NO. *B-1A*



LEGEND

2-inch OD split-spoon sample

AID Groundwater level at time of drilling

WTPH-G BTEX WTPH-D Soil analyses method

RZA

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *06 November 1991* Drilling completed: *06 November 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* BORING NO. *B-1A*

DEPTH (feet)	SOIL DESCRIPTION Approximate ground surface elevation:	SAMPLE TYPE	SAMPLE NUMBER	OVM READING	GROUND WATER	STANDARD PENETRATION RESISTANCE ▲ Blows per foot 0 10 20 30 40 50	TESTING
0			S-6	0			
	Boring terminated at approximately 31 feet						
5							
10							
15							
20							
				1			
25							
30							

0 10 20 30 40 50
MOISTURE CONTENT
Plastic limit — Natural — Liquid limit

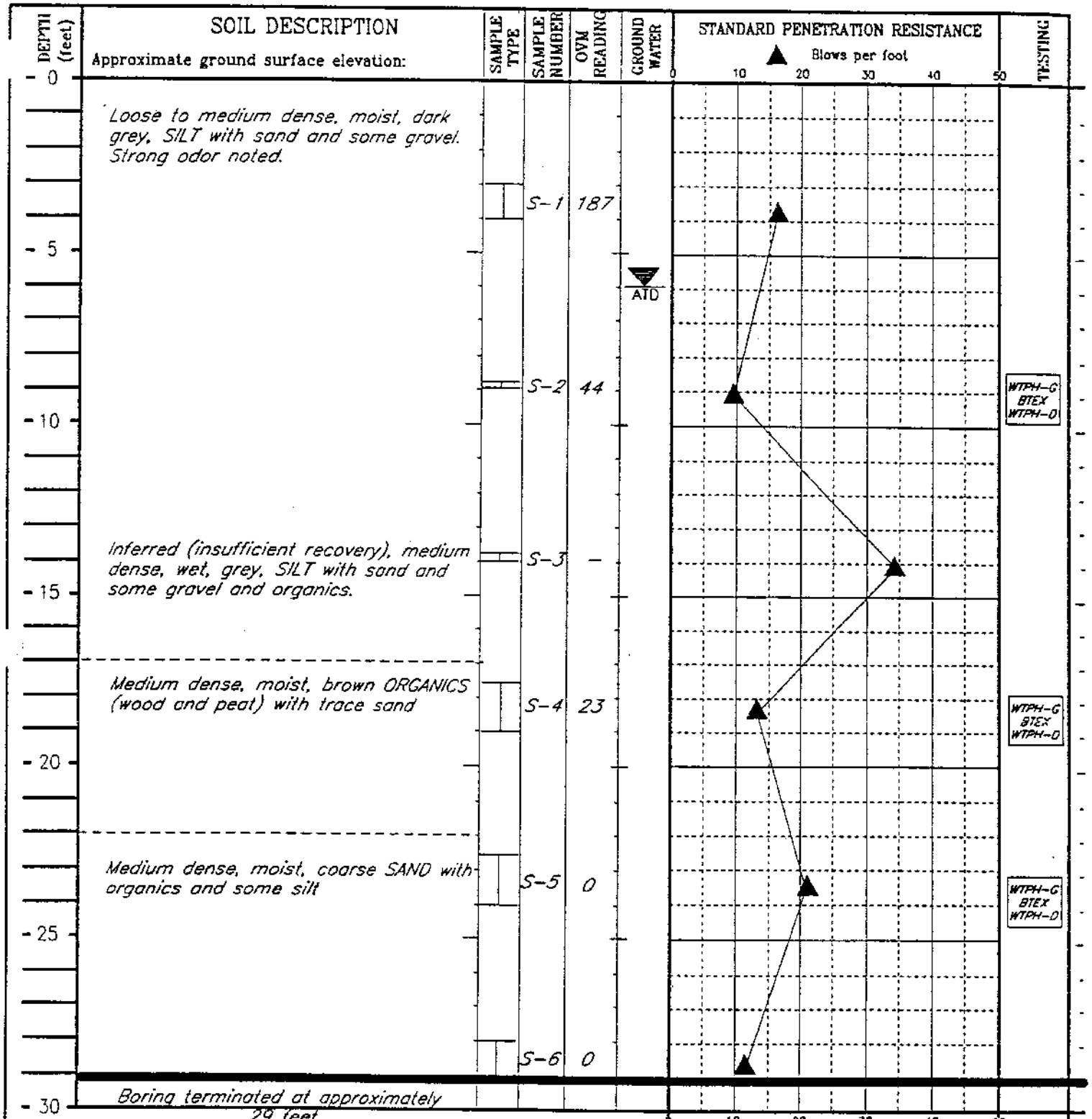
LEGEND

I 2-inch OD split-spoon sample

RZA
RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *06 November 1991* Drilling completed: *06 November 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* BORING NO. *B-8A*



LEGEND

2-inch OD split-spoon sample

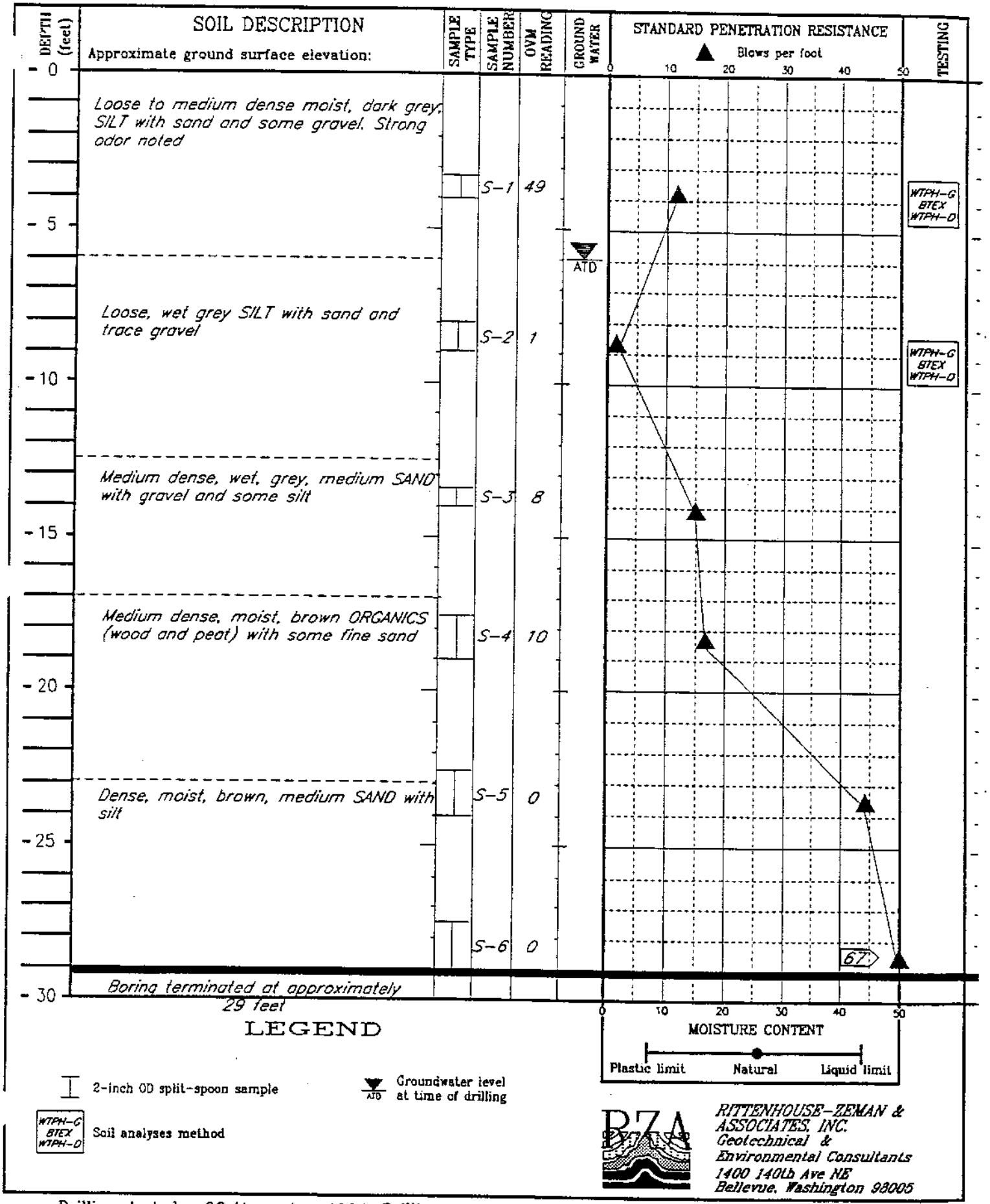
Groundwater level at time of drilling

WTPH-G BTEX WTPH-D — Soil analyses method

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *06 November 1991* Drilling completed: *06 November 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* BORING NO. *B-15A*



LEGEND

2-inch OD split-spoon sample

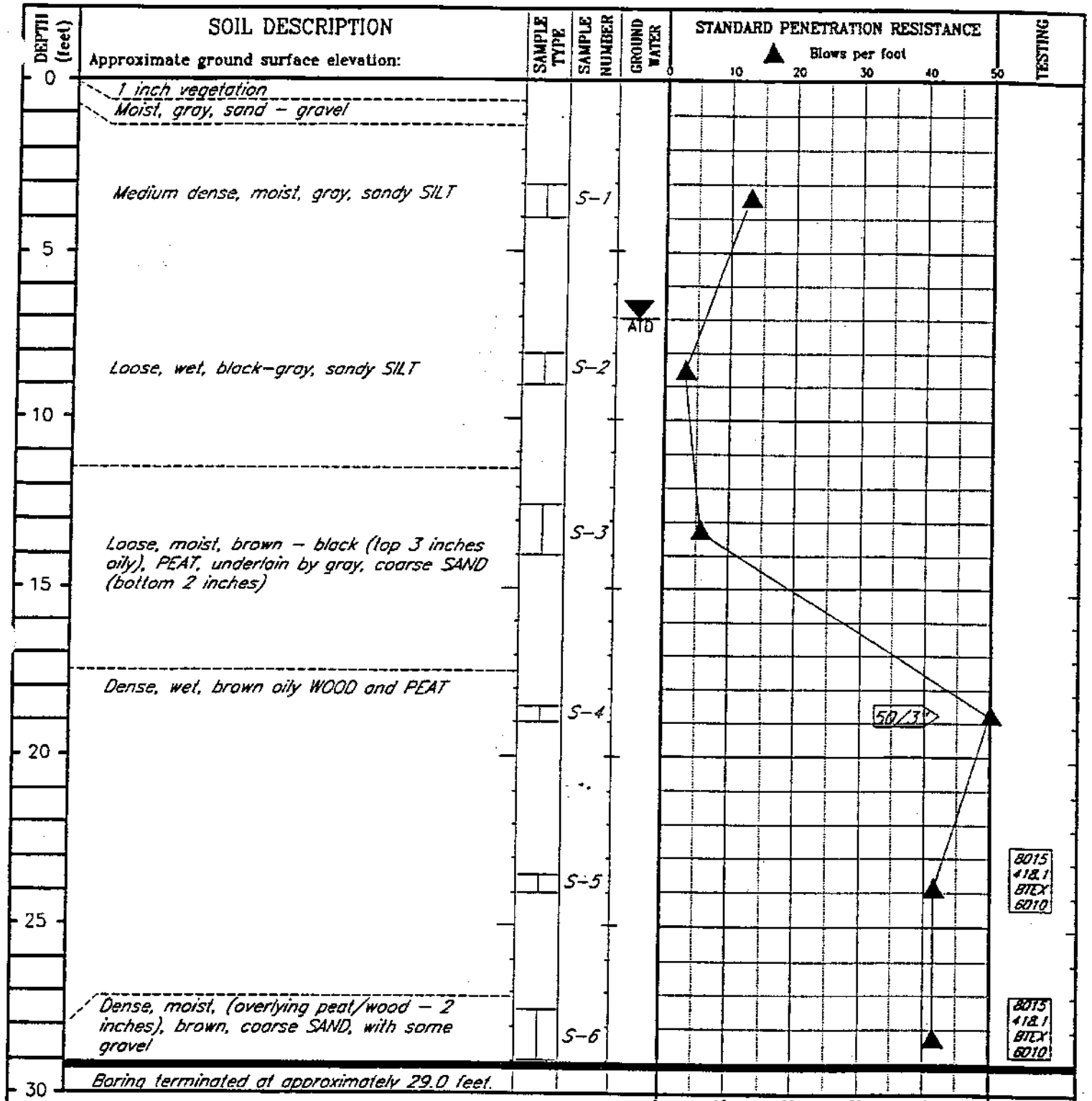
Groundwater level at time of drilling

WTPH-G BTEX WTPH-D Soil analyses method

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *06 November 1991* Drilling completed: *06 November 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* BORING NO. *B-21-91*



LEGEND

2-inch OD split-spoon sample

AtD Groundwater level at time of drilling

8015 418.1 BTEX 6010 Soil Analysis (EPA Method shown)

RZA

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *20 June 1991* Drilling completed: *20 June 1991* Logged by: *JK*

PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *B-34*

Elevation reference: *N/A* Well completed: *N/A*
Ground surface elevation: *N/A* Casing elevation: *N/A*

AS-BUILT DESIGN

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0							
	Loose, moist, brown, silty, fine to medium SAND interbedded with gray, sandy SILT with trace gravel		*S-1*	*5*	*17*		
5			*S-2*		*69*		
			S-3			ATD	
	Medium dense to dense, saturated, gray, silty, fine to medium SAND with some wood debris		*S-4*	*41*	*80*		
10	*Grades to grayish-black, silty, medium to coarse SAND*						
			S-5	*12*			
15	*Bottom of boring at 14 feet.*						
	Petroleum-like staining and odor observed in all samples.						
	Field FT-IR analysis of sample S-5 indicated >10,000 ppm TPH.						
20							
25							
30							

Boring abandoned by backfilling with bentonite.

LEGEND

- 2-inch O.D. split-spoon sample
- 3-inch OD Shelby sampler
- ATD: Observed groundwater level, ATD = at time of drilling

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *06 December 1993* Drilling completed: *06 December 1993* Logged by: *GKS*

Bobcat Boring Logs

BB-1
Gray, moist to wet, silty, gravelly SAND with some cobbles. Slow seepage at approximately 1.0 foot; no other seepage encountered; soil exhibits a petroleum hydrocarbon-like odor. No LPH observed. Met with refusal at approximately 3.0 feet.

BB-2
Gray, moist to wet, gravelly SAND. Slow seepage at approximately 1.5 feet; no other seepage encountered; soil exhibits a petroleum hydrocarbon-like odor. Seepage from 1.5 foot depth pooled at bottom of boring and exhibits an irridescent sheen. No LPH observed. Boring terminated at a depth of approximately 4.0 feet.

BB-3
Gray, moist to wet, gravelly SAND with some gravel. Slow seepage below approximately 2.5 feet; soil exhibits a petroleum hydrocarbon-like odor. Discontinuous blebs of LPH observed on water pooled at the bottom of the boring. Boring terminated at a depth of approximately 4.0 feet. Boring allowed to remain open approximately two hours; discontinuous blebs of LPH still present on the water pooled in the bottom of the boring.

BB-4
Gray, moist to wet, silty, gravelly SAND with some wood debris. Slow seepage at approximately 1.0 foot; soil exhibits a petroleum hydrocarbon-like odor. Moderate seepage observed below approximately 3.5 feet. Approximately 0.01 to 0.02 feet of LPH accumulated on groundwater in the boring. Boring terminated at a depth of approximately 4.0 feet.

BB-5
Dark gray, wet, SAND with some silt, gravel, and wood debris. Moderate seepage observed below approximately 3.0 feet; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet; caved to approximately 3.5 feet. Gauged fluid at bottom of boring using Colorcut paste; it appeared to be 100% LPH. Collected two bottles of LPH for potential future laboratory analysis; collected one bag sample of soil for possible sieve analysis.

BB-6
Gray, moist to wet, gravelly, SAND with some silt. LPH seepage observed at approximately 3.8 feet; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet. Gauged fluid at bottom of boring using Colorcut paste; it appeared to be 100% LPH.

BB-7
Gray, moist to wet, gravelly, SAND with some silt and wood debris. Slow water and LPH seepage observed at approximately 1.0 feet; rapid LPH seepage observed below approximately 3.5 feet; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet. Gauged fluid at bottom of boring using Colorcut paste; it appeared to be 100% LPH.

Logged By TJP
5/22/96

BB-8
Gray, moist to wet, gravelly SAND with some silt; scattered glass shards. LPH observed on tip of auger at approximately 2.5 feet. Slow seepage observed below approximately 3.8 feet; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet. Gauged fluid at bottom of boring using Colorcut paste approximately one hour after drilling boring; LPH thickness approximately 0.05 feet.

BB-9
Gray, moist to wet, gravelly SAND with some silt. Slow seepage observed at approximately 1.5 feet. Slow seepage observed again below approximately 3.8 feet; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet. Gauged fluid at bottom of boring using Colorcut paste; fluid appears to be a mixture of LPH and water (stains tape black like LPH but changes Colorcut from yellow to red like water).

BB-10
Gray, moist to wet, gravelly SAND with some silt and cobbles. No seepage observed; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet.

BB-11
Gray, moist to wet, gravelly SAND with some silt. No seepage observed in boring but soil and auger tip appears to be saturated with water; no LPH observed. Soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet. Boring left open overnight. Fluid level in boring in 5/23/96 was at approximately 3.0 feet. Gauged fluid with Colorcut paste; LPH thickness measured in boring using this method was approximately four inches. Collected two bottles of LPH for potential future laboratory analysis; collected one bag sample of soil for possible sieve analysis.

BB-12
Gray, wet, gravelly SAND with some silt. Rapid seepage observed below approximately 3.0 feet; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet. Seepage accumulated in the boring to a depth of approximately 2.0 feet. Gauged fluid at bottom of boring using Colorcut paste; LPH thickness approximately 0.01 feet. Collected two bottles of LPH for potential future laboratory analysis.

BB-13
Gray, moist, gravelly SAND overlying saturated ¾-inch minus round rock at approximately 2.0 feet. LPH on tip of auger when removed from the boring. However, boring caved as fast as the auger was removed; consequently, LPH thickness was indeterminate; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet.

BB-14
Gray, moist, gravelly SAND with some silt and scattered metal debris. No seepage observed; soil exhibits a petroleum hydrocarbon-like odor. Boring terminated at a depth of approximately 4.0 feet.

Logged By TJP
5/22/96

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-002
Client: American Distributing Co
Location: Bulk Terminal-Everett,
Logged by: G. Stuesse
Installation Data: (See Below)

Boring No: W-1
Date: 2-23-90
Driller: Geotech
Drilling Method: CMEC-55
Hollow Stem Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time:	Date:	Comments:
0									
2									
4		4.00		Ring @ 3.0'	Pt				0-3.0" Asphalt 3.0' Organic debris, silty, brown, loose, moist, primarily wood shavings, slight organic odo
6									
8									
10					ML				10.0' Silt, brown, soft, wet, wood shavings, slight odor.
12									
14									
16					ML				15.0' Silt, brown, soft, wet, wood shavings, slight petroleum sheen on cuttings.
18									
20									
22									
24	TD=23.0'								

Installation Data:

Screen:	23.0' - 3.0'
Blank:	3.0' - 0
Sand:	23.0' - 2.0'
Bentonite:	2.0' - 1.0'
Concrete:	1.0' - 0

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-002
Client: American Distributing Co
Location: Bulk Terminal-Everett,
Logged by: G. Stuesse
Installation Data: (See Below)

Boring No: W-2
Date: 2-22-90
Driller: Geotech
Drilling Method: CMEC-55 Hollow Stem Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time:	Date:	Comments:
0			TIP II						
2					SW				0-3" Gravel; degraded asphalt.
4		11	60	Ring @ 3.0'					3-5" Sand, fine-coarse, grey, loose, very moist, occasional fine gravel, slight-moderate oily odor, dark brown, oily film on outside of sampler.
6					SW				5.0' Sand, fine-coarse, grey, loose, wet, occasional fine gravel, slight, moderate oily, odor, dark brown oily film on outside of sampler.
8									
10									
12									
14									
16					SW				15.0' Sand, fine-coarse, grey, loose, wet, occasional coarse gravel, slight-medium oily odor, dark brown oily film on outside of sampler.
18									
20					SW				20.0' Sand, fine coarse, gray, loose, wet, occasional coarse gravel, slight-medium oily odor, dark brown oily film on outside of sampler.
22					OL				23.0' Clay, brown, soft, wet, possible organic, very slight organic odor.
24	TD=23.0'								

NOTE: The lower 3.0' of well could not be sand packed due to heaving sands.

Installation Data:

Screen:	23.0' -	3.0'
Blank:	3.0' -	0'
Sand:	23.0' -	2.0'
Bentonite:	2.0' -	1.0'
Concrete:	1.0' -	0'

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-002
Client: American Distributing Co
Location: Bulk Terminal-Everett,
Logged by: G. Stuesse
Installation Data: (See Below)

Boring No: W-3
Date: 2-22-90
Driller: Geotech
Drilling Method: CMEC-55 Hollow Stem Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time:	Date:	Comments:
0									
2									
4		11		Ring @ 3.0'	SP				3.0' Sand, slight silty, fine-medium, grey, loose, moist, occasional gravel, no odor.
6									
8					SP				7.0' Sand, slight silty, fine-medium, grey, loose, wet, occasional gravel, no odor.
10									
12									
14									
					SP				15.0' Sand, slight silty, fine-medium, grey, loose, wet, occasional gravel, no odor.
18									
20									
					SP				20.0' Sand, slight silty, fine-medium, grey, loose, wet, occasional gravel, no odor.
22									
24	TD=23.0'								

NOTE: Vapors from well have H2S odor.

Installation Data:

Screen:	23.0' - 3.0'
Blank:	3.0' - 0'
Sand:	23.0' - 2.0'
Bentonite:	2.0' - 1.0'
Concrete:	1.0' - 0'

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-4
Date: 2/22/90
Driller:
Drilling Method:
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0									0 -3" Concrete.
2					SM				
4		16	0	Ring @ 4'					@ 4' Sand, silty, fine to medium grained, gray/brown, loose, wet, moderate odor, film of brown oil on sampler.
6									
8									
10									@ 10' Sand, silty, fine to medium grained, gray/brown, loose, wet, moderate odor, pieces of glass, metal and wood.
12									
14									@ 15' Clay, organic, brown, soft, wet, pieces of wood, very slight odor.
16					OL				
18									@ 20' Clay, organic, brown, soft, wet, pieces of wood, very slight odor.
20									
22	TD=23'								

Installation Data:

Screen	23'	3'
Blank	3'	0
Sand	23'	2'
Bentonite	2'	1'
Concrete	1'	0

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-5
Date: 2/22/90
Driller:
Drilling Method:
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0									0 - 6" Gravel.
4		28	50	Ring @ 3'	SP				@ 3' Sand, fine to medium grained, slightly silty, gray, loose, moist, slight odor, pieces of wood and metal.
6									@ 6' Sand, fine to medium grained, slightly silty, gray, loose, wet, slight odor, film of brown oil on cuttings.
15					SP				@ 15' Sand, fine to medium grained, slightly silty, gray, loose, wet, slight odor, film of brown oil on cuttings.
20									@ 20' Sand, fine to medium grained, slightly silty, gray, loose, wet, slight odor, Cuttings coated with brown oil film..
23	TD=23'								

Installation Data:

Screen	23'	3'
Blank	3'	0
Sand	23'	2'
Bentonite	2'	1'
Concrete	1'	0

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-6
Date: 2/23/90
Driller:
Drilling Method:
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 - 2 - 4 - 6 - 8 - 10 - 12 - 14 -		19	30	Ring @ 3'	SM				@ 0 - 5' Sand, slightly silty, fine to medium grained, gray, loose moist, slight odor, some gravel. @ 6' Sand, slightly silty, fine to medium grained, gray, loose, wet, slight odor, some gravel, pieces of wood, brown oily film on water and cuttings. @ 10' Sand, very silty, fine to medium grained, gray, loose, wet, slight odor, some gravel, pieces of wood, brown oily film on water and cuttings.
16 - 18 - 20 - 22 - 24 -	TD=21'				OL				@ 20' Clay, organic, dark brown, soft, wet, hydrogen sulfide odor.

Installation Data:

Screen	23'	3'
Blank	3'	0
Sand	23'	2'
Bentonite	2'	1'
Concrete	1'	0

LOG OF
EXPLORATORY BORING

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By: G. Stuesse
Installation Data: Backfill with Enviroplug

Boring No: W-7
Date: 2/21/90
Driller: Geotech
Drilling Method: CME-55 Hollow-Stem Auger
Hole Diameter: 7"
Page No: 1 of 1

Plan location of boring:

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0			TIP#		
2					SM
4		5	400	Ring @ 3'	
6					
8					
10					
12					
14					
16	TD=16'				

Water Level	Time	Date	Comments:

@ 3' Sand, silty, fine to coarse grained, gray to dark gray, loose wet, gravel, slight oily odor.

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By: G. Stuesse
Installation Data: See Below

Boring No: W-8
Date: 6/28/90
Driller: ESE
Drilling Method: Hand Auger
Hole Diameter: 4"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 - 2 - 4 - 6 - 8 - 10 -	TD=10'				SM ML				0 - 3' Sand, silty, brown, loose, moist to wet, no odor. @ 3' - 10' Silt, gray, soft, wet, slight odor.

Installation Data:

Screen	10' - 2'
Blank	2' - 0
Sand	10' - 1'
Bentonite	1' - .5'
Concrete	.5' - 0

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-9
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 -					ML				0 - 3' Silt, sandy, brown, moist, no odor.
2 -									
4 -									@ 3' - 7.5' Silt, gray, wet, moderate odor.
6 -									
8 -	TD=7.5'								Installation Data: Screen 7.5' - 1.5'
									Blank 1.5' - 0
									Sand 7.5' - 1.0'
									Bentonite 1.0' - 0.5'
									Concrete 0.5' - 0

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-10
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0 -					ML
2 -					Pt
4 -					
6 -	TD=6'				

Water Level	Time	Date	Comments:

0 - 2' Silt, brown, moist, pieces of wood and metal, no odor.
@ 2' - 6' Peat, brown, wet, no odor.

Installation Data:

Screen	6.0' - 2.0'
Blank	2.0' - 0
Sand	6.0' - 1.5'
Bentonite	1.5' - 0.5'

LOG OF
EXPLORATORY BORING

ir ocation of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-11
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

epth ft)	Graphic Log	Blow/ft	Vapor Concen-tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 -									
2 -					Pt				0 - 2' Peat, silty, brown, moist, no odor.
4 -									@ 2' - 6.5' Peat, brown, wet, brown, oil sheen.
6 -									
	TD=6.5'								

Installation Data:

Screen	6.5' - 1.5'
Blank	1.5' - 0
Sand	6.5' - 1.0'
Bentonite	1.0' - 0.5'
Concrete	0.5' - 0

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-12
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0 -					SM
2 -					
4 -					Pt
6 -					
8 -	TD=7.5'				

Water Level	Time	Date	Comments:

0 - 3' Sand, silty, brown, moist, no odor.

@ 3' - 7.5' Peat, silty, brown, wet, slight odor.

Installation Data:

Screen	7.5' - 1.5'
Blank	1.5' - 0
Sand	7.5' - 1.0'
Bentonite	1.0' - 0.5'
Concrete	0.5' - 0

LOG OF
EXPLORATORY BORING

ield location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-13
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

epth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0 -					ML
2 -					
4 -					
6 -					
8 -	TD=7'				

Water Level	Time	Date	Comments:

0 - 4' Silt, some sand and gravel, brown, moist, occasional cobbles, no odor.

4' - 7' Silt, some sand and gravel, brown, moist, occasional cobbles, no odor.

Installation Data:

Screen	7' - 2'
Blank	2' - 0
Sand	7' - 1'
Bentonite	1' - .5'
Concrete	.5' - 0

LOG OF
EXPLORATORY BORING

ocation of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-14
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

pth ft)	Graphic Log	Blow/ft	Vapor Concen-tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0					ML
2					
4					
5	TD=6.5'				

Water Level	Time	Date	Comments:

0 - 6.5' Silt, sandy, moist to wet, very slight odor.

Installation Data:

Screen	6.5' - 2.0'
Blank	2.0' - 0
Sand	6.5' - 1.0'
Bentonite	1.0' - 0.5'
Concrete	0.5' - 0

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-15
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 - 2 - 4 - 6 - 8 -	TD=7'				ML				0 - 7' Silt, some sand and cobbles, moist to wet, slight odor.

Installation Data:

Screen	6.0'	- 1.5'
Blank	1.5'	- 0
Sand	6.0'	- 1.0'
Bentonite	1.0'	- 0.5'
Concrete	0.5'	- 0

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-16
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0 - 2 - 4 - 6 - 8 -	TD=6'				ML

Water Level	Time	Data	Comments:

0 - 6' Silt, some sand and gravel, moist to wet, occasional cobbles, oil on ground water surface.

Installation Data:

Screen	6' - 2'
Blank	2' - 0
Sand	6' - 1'
Bentonite	1' - .5'
Concrete	.5' - 0

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-003
Client: American Distributing Co.
Location: Bulk Terminal
Everett, WA
Logged By:
Installation Data: See Below

Boring No: W-17
Date: 6/28/90
Driller:
Drilling Method: Hand Auger
Hole Diameter: 7"
Page No: 1 of 1

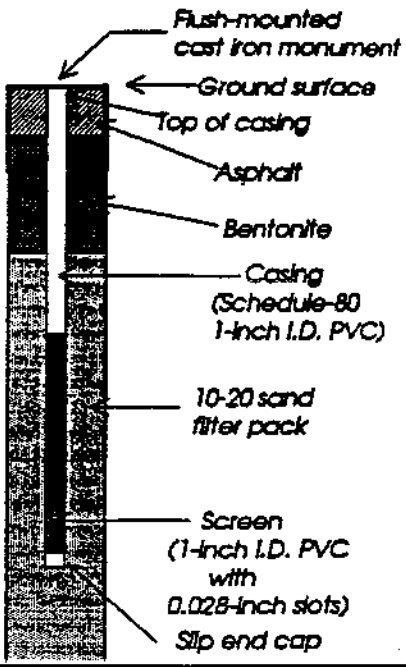
Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 -					ML				0 - 6' Silt, some sand and gravel, moist to wet, occasional cobbles, oil on ground water surface.
2 -									
4 -									
6 -									
	TD=6'								Installation Data: Screen 6' - 2'
8 -									Blank 2' - 0
									Sand 6' - 1'
									Bentonite 1' - .5'
									Concrete .5' - 0

PROJECT: Mobil Oil/ADC Bulk Plant Properties W.O. 11-04558-09 WELL NO. GP-1

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 19 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Gravel Surfacing over moist, brown, silty, gravelly SAND, non-odorous						
	Weathered, red clay brick						
	Moist, brown, silty, fine SAND with some gravel and minor brick fragments		GP-1/ 3.0'		0.0		
5							
	Moist to wet, gray, fine to medium SAND, petroleum odor at 7.0 feet		GP-1/ 8.0'		27.0	3/22/96 ATD	
	Grades to wet, gray, fine to coarse SAND (3-inch fine sandy silt layer at 10.0 feet)		GP-1/ 10.0'		7.0		WTPH-D
10							
	Bottom of boring at 12 feet.						
15							
20							
25							
30							



LEGEND

- 2-inch O.D. Geoprobe sample
- ATD: Observed groundwater level, ATD = at time of drilling
- 0/00/00: Observed groundwater level, 0/00/00 = date observed
- WTPH-G/BTEX/WTPH-D/WTPH-D Ext.: Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996 Drilling completed: 19 March 1996 Logged by: CCC

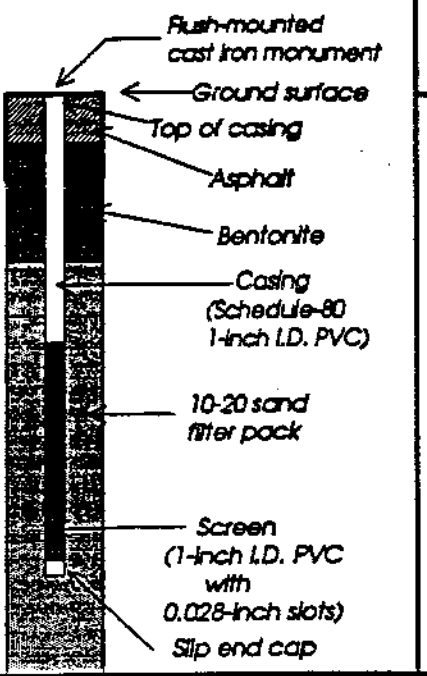
PROJECT: Mobil Oil/ADC Bulk Plant Properties

W.O. 11-04558-09 WELL NO. GP-2

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 19 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, gray/brown, silty, gravelly SAND						
	Moist, gray, fine to coarse SAND with some silt, non-odorous		GP-2/ 3.5'		0.0		
5	Grades to gray/brown, silty, fine to medium SAND, non-odorous					3/22/96	
	2-inch fine sandy SILT layer at 7.3 feet		GP-2/ 8.0'		11.0	ATD	
	Grades to saturated, stained black, fine to medium SAND, strong petroleum odor and LPH globules						
10	Fine SAND interbedded with fine wood fragments		GP-2/ 11.0'		11.0		WTPH-D
	Bottom of boring at 12 feet.						
15							
20							
25							
30							



LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996
Drilling completed: 19 March 1996
Logged by: CCC

Mobil Oil/ADC Bulk

PROJECT: Plant Properties W.O. 11-04558-09 WELL NO. GP-3

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: Not Applicable
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, gray/brown fine SAND, non-odorous						
	Grades to moist to wet, gray, fine SAND, strong petroleum odor and LPH		GP-3/ 3.0'		11.0	AID	
5			GP-3/ 6.5		17.0		WTPH-D
	Bottom of boring at 6.5 feet, due to refusal.						
10							
15							
20							
25							
30							

Bentonite abbondonment

LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level AID = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- WTPH-G/ BEX WTPH-D WTPH-D Ext. Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996 Drilling completed: 19 March 1996 Logged by: CCC

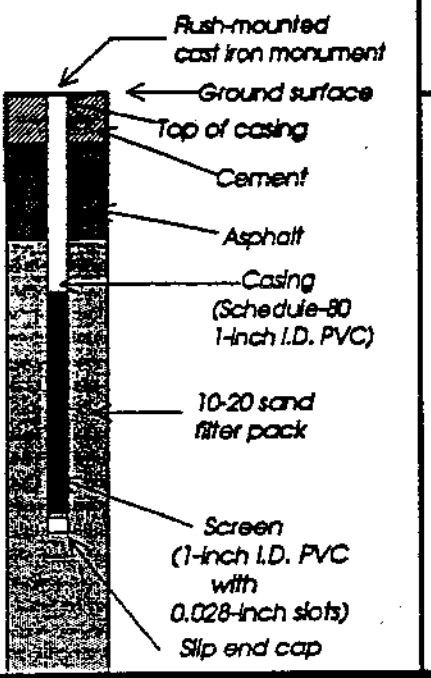
PROJECT: Mobil Oil/ADC Bulk Plant Properties

W.O. 11-04558-09 WELL NO. GP-4

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 19 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt over base course over gray/brown, gravelly, silty SAND, non-odorous						
	Moist, brown/black/gray, silty, fine to medium SAND with some gravel, wood and brick fragments, non-odorous		GP-4/ 4.0'		0.0	3/22/96	
5	Moist to wet, gray/brown, fine SAND, moderate petroleum odor		GP-4/ 6.0'		7.0	ATD	WTPH-D
	Wood debris and LPH		GP-4/ 8.0'		11.0		
10	Fine grained wood fragments, slight petroleum staining and odor						
	Bottom of boring at 12 feet.						
15							
20							
25							
30							



LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- WTPH-G/ BTEX WTPH-D Ext. — Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996
Drilling completed: 19 March 1996
Logged by: CCC

AGRA Earth and Environmental, Inc.

PROJECT: Mobil Oil/ADC Bulk Plant Properties

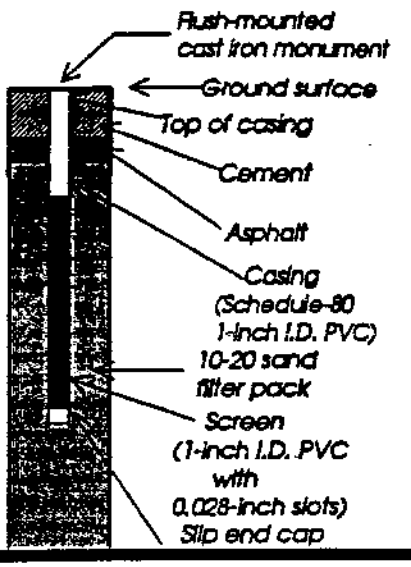
W.O. 11-04558-09 WELL NO. GP-5

Elevation reference: Unknown
Ground surface elevation: Unknown

Well completed: 19 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, gray/black, fine SAND and broken gravel						
	Moist to wet, brown, fine SAND with some silt, trace petroleum odor		GP-5/ 3.0'			ATD	WTPH-D
5	Moist to wet, gray, fine SAND, strong petroleum odor, LPH below 3.7 feet		GP-5/ 4.0'			3/22/96	
	Grades to moist, fine sandy SILT		GP-5/ 6.5'				
	Fine grained wood debris with LPH						
	Saturated, gray, fine SAND with LPH		GP-5/ 8.0				WTPH-D
10	Bottom of boring at 9.5 feet, due to refusal.						
15							
20							
25							
30							



LEGEND

- 2-inch O.D. Geoprobe sample
- ATD: Observed groundwater level, ATD = at time of drilling
- 0/00/00: Observed groundwater level, 0/00/00 = date observed
- WTPH-G/ BTEX WTPH-D Ext.: Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996

Drilling completed: 19 March 1996

Logged by: CCC

AGRA Earth & Environmental, Inc.

PROJECT: Mobil Oil/ADC Bulk Plant Properties

W.O. 11-04558-09 WELL NO. GP-6

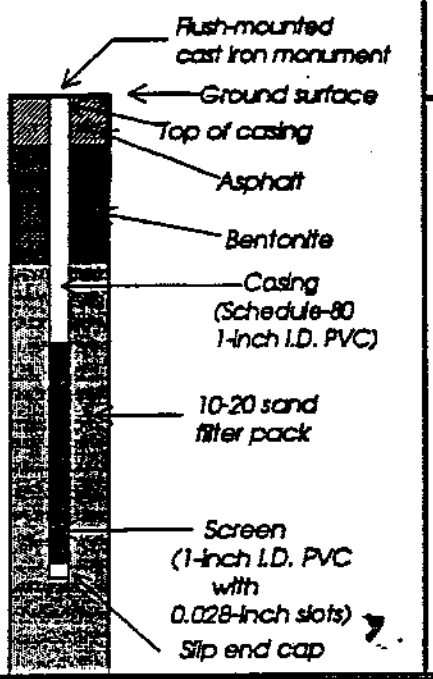
Elevation reference: Unknown | Well completed: 19 March 1996

Ground surface elevation: Unknown | Casing elevation: Unknown

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	Asphalt and base course over moist, gray, fine SAND with silt rich zones (2 to 3 feet - silty, gravelly SAND with wood debris, non-odorous)					
	Black, fine to medium sandy SILT and wood fragments, saturated with very viscous LPH		GP-6/ 3.5'		15	AID 3/22/96
5			GP-6/ 6.0'			
	Fine to medium grained wood debris, petroleum odor, no LPH					
	Wood fragments saturated with very viscous LPH					
10						
	Bottom of boring at 12 feet.					
15						
20						
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level AID = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- Analytical testing

AGRA Earth & Environmental

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996 | Drilling completed: 19 March 1996 | Logged by: CCC

AGRA Earth & Environmental, Inc.

PROJECT: Mobil Oil/ADC Bulk Plant Properties

W.O. 11-04558-09 WELL NO. GP-7

Elevation reference: Unknown
Ground surface elevation: Unknown

Well completed: Not Applicable
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, brown, fine SAND with some silt (5-inch sandy SILT layer at 3.0 feet), non-odorous		GP-7/ 4.0'				
	Moist, brown, silty, gravelly SAND with wood debris and very viscous LPH grading to fine grained wood debris		GP-7/ 5.5			ATD	WTPH-G/ BTEX WTPH-D Ext.
5	Bottom of boring at 7.0 feet, due to refusal.						
10							
15							
20							
25							
30							

Bentonite abandonment

LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- WTPH-G/ BTEX WTPH-D Ext. — Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 20 March 1996

Drilling completed: 20 March 1996

Logged by: CCC

PROJECT: Mobil Oil/ADC Bulk Plant Properties

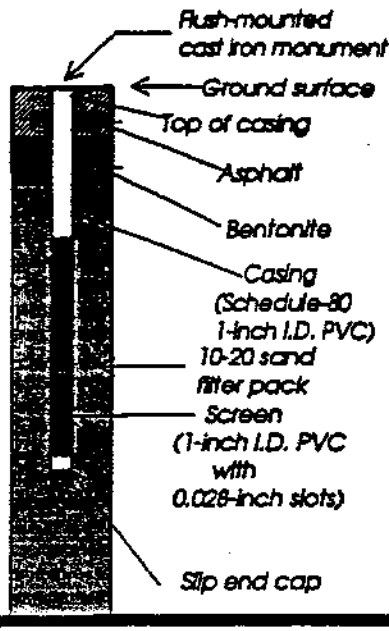
W.O. 11-04558-09 WELL NO. GP-8

Elevation reference: Unknown | Well completed: 20 March 1996

Ground surface elevation: Unknown | Casing elevation: Unknown

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course						
			GP-8/ 3.0'				
	Minor recovery, moist, dark gray SAND, slight petroleum odor					3/22/96	
5	Moist, black to gray/green, fine sandy SILT with wood debris, 1" thick zone of LPH						
	Fine grained wood debris saturated with LPH over gray/green SILT		GP-8/ 9.0'		11		WTPH-G/ BTEX WTPH-D Ext.
10	Mionr recovery - silty, fine SAND over fine grained wood debris, petroleum odor						
	Bottom of boring at 11 feet.						
15							
20							
25							
30							

AS-BUILT DESIGN



LEGEND

- 1-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- WTPH-G/ BTEX WTPH-D Ext. Analytical testing

AGRA Earth & Environmental

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 20 March 1996 | Drilling completed: 20 March 1996 | Logged by: CCC

AGRA Earth & Environmental, Inc.

PROJECT: Mobil Oil/ADC Bulk Plant Properties

W.O. 11-04558-09 WELL NO. GP-9

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 20 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course						
	Trace recovery; minor gravel and wood fragments						
5						3/22/96	
	Minor recovery; moist, gray, fine SAND over minor wood debris and sandy SILT with gravel, strong petroleum odor		GP-9/ 8.0'		3.0		WTPH-G/ BTEX WTPH-D Ext. / WTPH-D
10	No recovery						
	Bottom of boring at 12 feet.						
15							
20							
25							
30							

AS-BUILT DESIGN:
- Flush-mounted cast iron monument
- Ground surface
- Top of casing
- Asphalt
- Bentonite
- Casing (Schedule-80 1-inch I.D. PVC)
- 10-20 sand filter pack
- Screen (1-inch I.D. PVC with 0.028-inch slots)
- Slip end cap

LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level 0/00/00 = date observed
- Observed groundwater level ATD = at time of drilling
- WTPH-G/ BTEX WTPH-D WTPH-D Ext. — Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

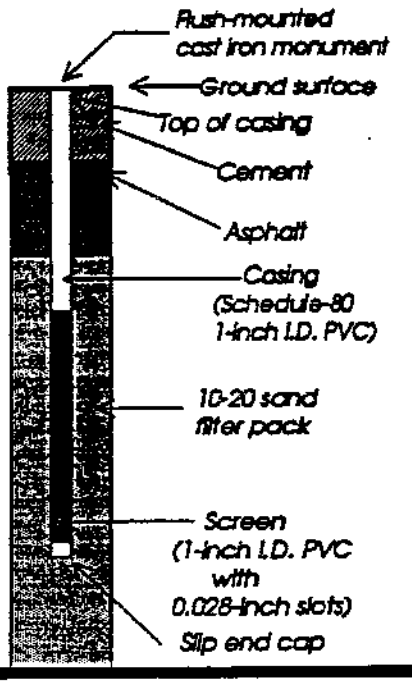
Drilling started: 20 March 1996
Drilling completed: 20 March 1996
Logged by: CCC

PROJECT: Mobil Oil/ADC Bulk Plant Properties W.O. 11-04558-09 WELL NO. GP-10

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 20 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, brown/gray, silty, fine SAND, non-odorous		GP-10/ 3.0'		1.0		
	Moist, gray, fine sandy SILT with some gravel, slight petroleum odor						
	Woody debris saturated with LPH						
5	Moist to wet, gray/orange/brown, gravelly, medium to coarse SAND, petroleum odor		GP-10/ 7.0'			3/22/96	
	Wet, brown stained gray, fine sandy SILT, strong petroleum odor, minor LPH						WTPH-D
	Wet, brown, fine grained wood debris with LPH, minor saturated sand						
10	Saturated, gray, fine SAND with wood debris, strong sulfur odor, slight petroleum odor		GP-10/ 11.0'		0.0		
	Wood fragments						
	Bottom of boring at 12 feet.						
15							
20							
25							
30							



LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 20 March 1996 Drilling completed: 20 March 1996 Logged by: CCC

AGRA Earth & Environmental, Inc.

PROJECT: Mobil Oil/ADC Bulk Plant Properties

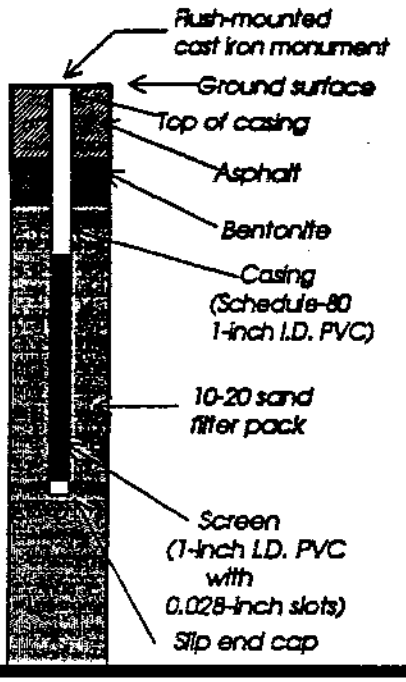
W.O. 11-04558-09 WELL NO. GP-11

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 20 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, brown, silty, fine SAND, non-odorous		GP-11/ 3.0'		4.0		
	Moist, gray, silty, fine SAND with mottling and some shells and wood debris						
5	Moist, tan grading to gray, fine sandy SILT with interbedded wood debris, slight petroleum odor at 4.0 feet		GP-11/ 6.5'			3/22/96	
	Wet to saturated, brown, silty, gravelly SAND, strong petroleum odor, minor LPH						WTPH-D
	Saturated, black, fine SAND, trace petroleum odor		GP-11/ 8.0'		0.0		WTPH-G/ BTEX WTPH-D WTPH-D Ext.
10			GP-11/ 12.0'				
	Bottom of boring at 12 feet.						
15							
20							
25							
30							

AS-BUILT DESIGN



LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- WTPH-G/ BTEX WTPH-D WTPH-D Ext. — Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 20 March 1996 Drilling completed: 20 March 1996 Logged by: CCC

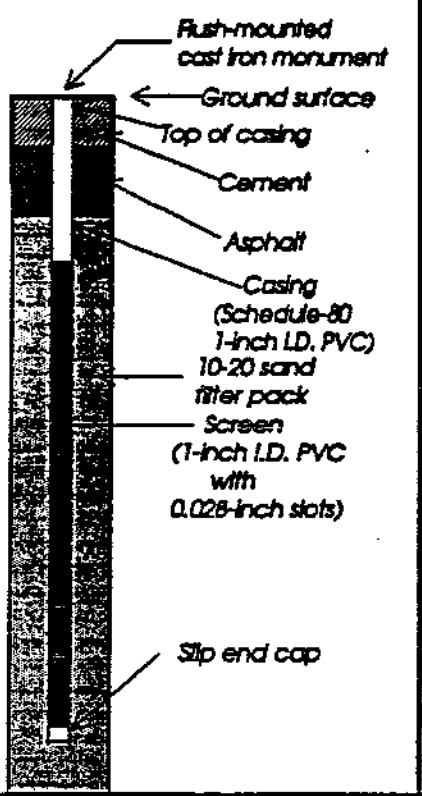
PROJECT: Mobil Oil/ADC Bulk Plant Properties W.O. 11-04558-09 WELL NO. GP-12

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 20 March 1996
Casing elevation: Unknown

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt and base course over moist, black, gravelly SAND, slight petroleum odor						
	Moist, gray/brown, fine to coarse SAND grading to brown, fine SAND with some gravel, non-odorous		GP-12/ 8.0'			3/22/96	
10	Wet, gray stained globules black, fine SAND with gravel, strong petroleum odor and minor LPH globules		GP-12/ 10.0'			ATD	
			GP-12/ 11.0'				WTPH-D
	Saturated, gray, fine SAND with some gravel, strong petroleum odor, minor globules of LPH		GP-12/ 12.5'		3.2		WTPH-D
15	Bottom of boring at 14 feet.						
20							
25							
30							

AS-BUILT DESIGN



LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level ATD = at time of drilling
- Observed groundwater level 0/00/00 = date observed
- Analytical testing

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 19 March 1996 Drilling completed: 19 March 1996 Logged by: CCC

AGRA Earth & Environmental, Inc.

PROJECT: Mobil Oil/ADC Bulk Plant Properties W.O. 11-04558-09 WELL NO. GP-13

Elevation reference: Unknown
Ground surface elevation: Unknown
Well completed: 20 March 1996
Casing elevation: Unknown

AS-BUILT DESIGN

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER	TESTING
0	Asphalt over dense, moist, gray, gravelly, fine to coarse SAND, non-odorous		GP-13/ 3.5'				
5	Grades to moist, gray/black, gravelly, fine to medium SAND, non-odorous		GP-13/ 7.0'				WTPH-D
10	Wet/saturated, gray/black, silty, fine SAND with some gravel and some wood debris, organic odor		GP-13/ 10.0'			ATD	WTPH-G/ BTEX WTPH-D Ext. WTPH-D
	Bottom of boring at 12 feet.						
15							
20							
25							
30							

Bentonite abandonment

LEGEND

- 2-inch O.D. Geoprobe sample
- Observed groundwater level 0/00/00 = date observed
- Observed groundwater level ATD = at time of drilling
- WTPH-G/ BTEX WTPH-D WTPH-D Ext. Analytical testing

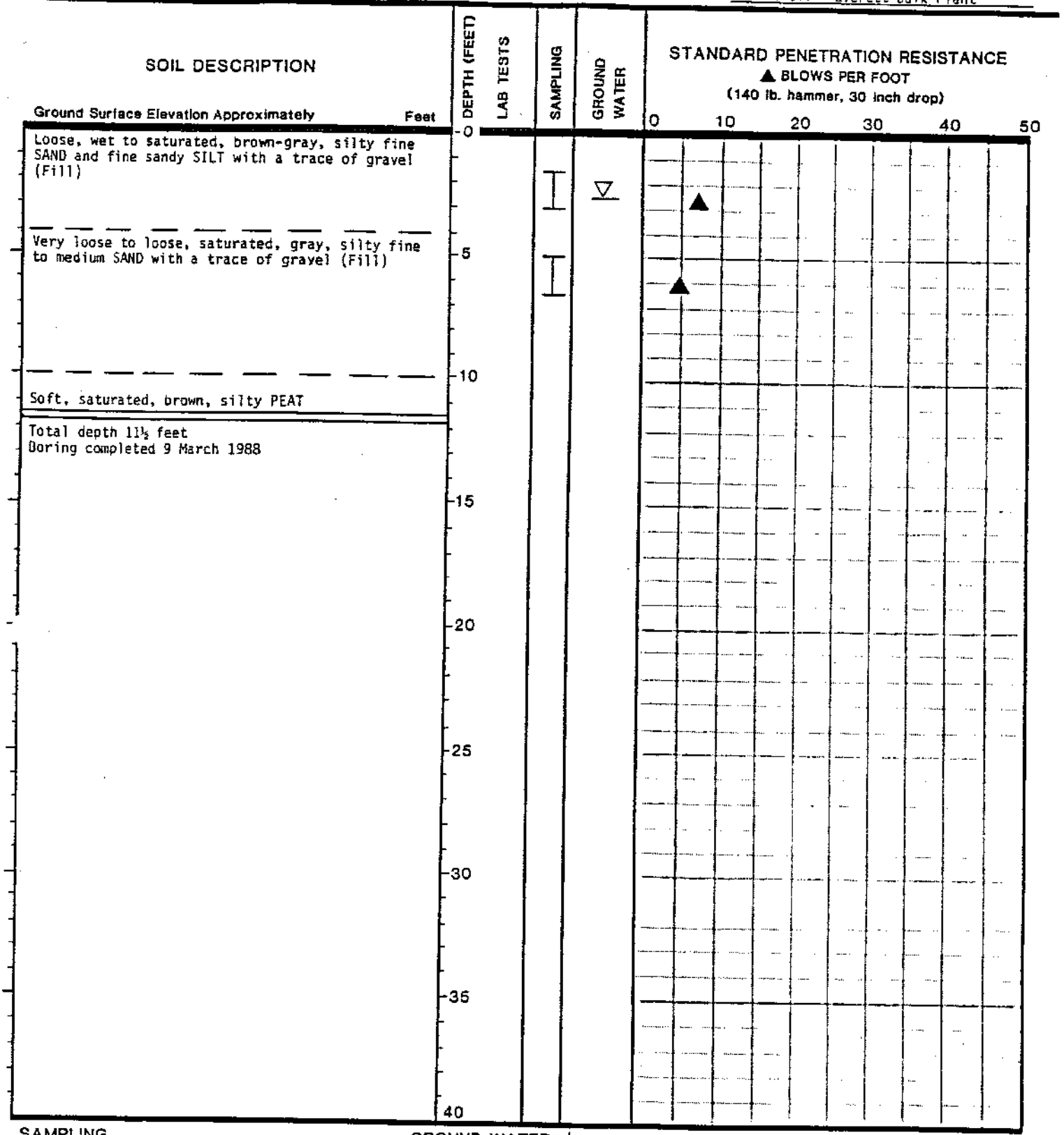
AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 20 March 1996 Drilling completed: 20 March 1996 Logged by: CCC

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-7 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant



SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-8 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	STANDARD PENETRATION RESISTANCE ▲ BLOWS PER FOOT (140 lb. hammer, 30 inch drop)
Ground Surface Elevation Approximately Feet					0 10 20 30 40 50
Loose to medium dense, wet to saturated, gray and brown-gray, silty fine SAND and fine sandy SILT with a trace of gravel (Fill)	0				
Very loose to loose, saturated, gray, silty fine SAND with a trace of gravel (Fill)	5				
Soft, saturated, brown, silty PEAT	10				
Total depth 11½ feet Boring completed 9 March 1988	15				
	20				
	25				
	30				
	35				
	40				

SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

KZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-9 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	STANDARD PENETRATION RESISTANCE ▲ BLOWS PER FOOT (140 lb. hammer, 30 inch drop)
Ground Surface Elevation Approximately Feet					0 10 20 30 40 50
Loose, wet to saturated, dark brown, gravelly, silty, fine SAND with a trace to some wood debris (Fill)	0				
Very loose, saturated, wood debris	5				
Very loose to loose, saturated, dark brown-gray and gray, silty, fine SAND (Fill)	10				
Soft, saturated, brown, silty PEAT					
Total depth 11½ feet Boring completed 9 March 1988	15				
	20				
	25				
	30				
	35				
	40				

SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.

Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-10 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	STANDARD PENETRATION RESISTANCE ▲ BLOWS PER FOOT (140 lb. hammer, 30 inch drop)
Ground Surface Elevation Approximately Feet					0 10 20 30 40 50
Loose to medium dense, wet to saturated, dark brown, gravelly, silty, fine to coarse SAND with a trace to some wood debris (Fill)	0				
Very loose, saturated, dark brown and gray, silty fine SAND (Fill)	5				
Soft, saturated, brown, silty PEAT	10				
Total depth 11½ feet Boring completed 9 March 1988	15				
	20				
	25				
	30				
	35				
	40				

SAMPLING

- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- * SAMPLE NOT RECOVERED

GROUND WATER

- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS

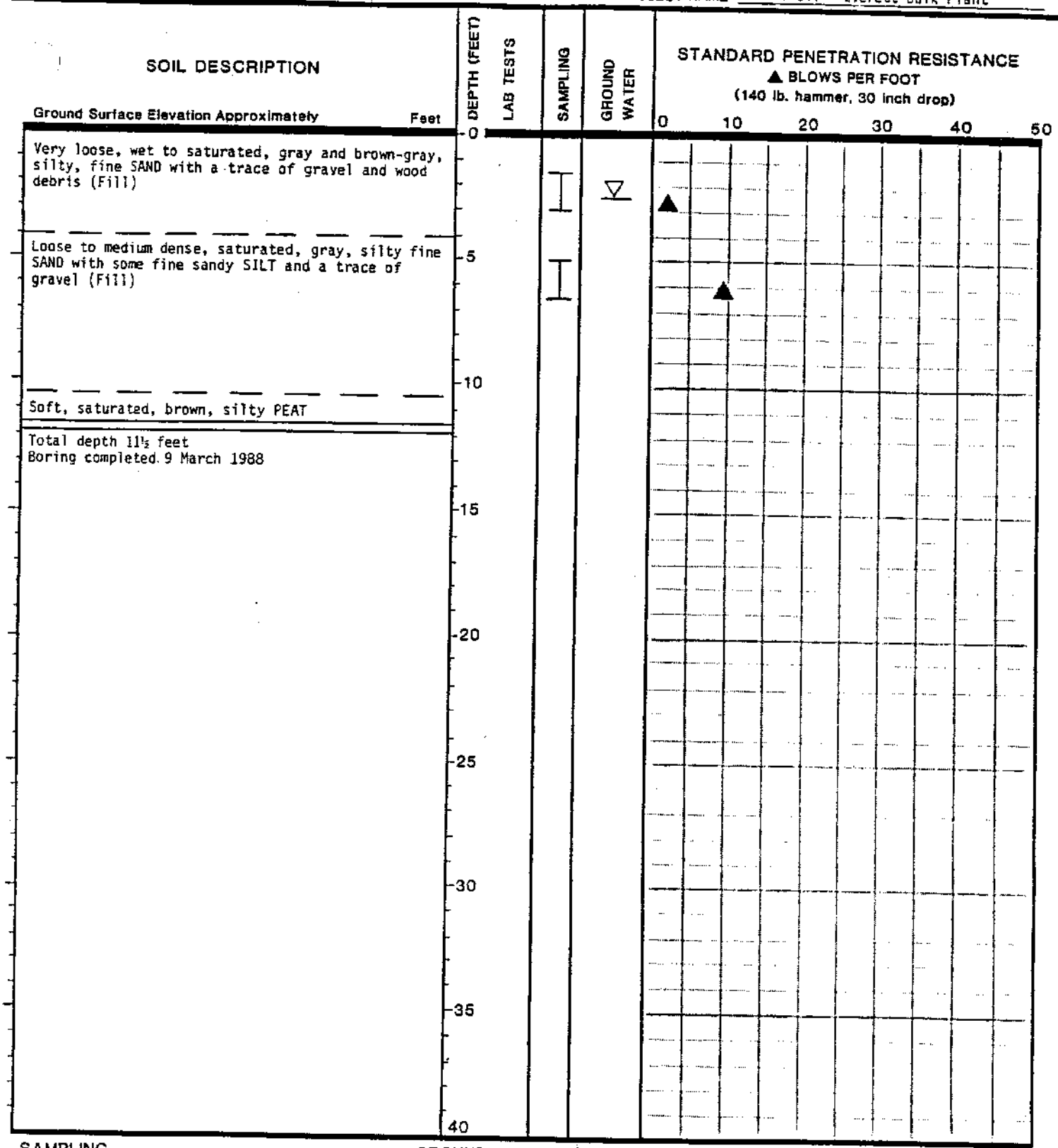
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-11 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant



SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 5" ID RING SAMPLE
- LK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-12 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION Ground Surface Elevation Approximately Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	STANDARD PENETRATION RESISTANCE ▲ BLOWS PER FOOT (140 lb. hammer, 30 inch drop) 0 10 20 30 40 50
Loose, wet to saturated, gray and brown-gray, silty, fine SAND with a trace of gravel and wood debris (Fill)	0				
Very loose to loose, saturated, gray, silty, fine to medium SAND with a trace of gravel (Fill)	5				
Soft, saturated, brown, silty PEAT	10				
Total depth 11½ feet Boring completed 9 March 1988	15				
	20				
	25				
	30				
	35				
	40				

SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

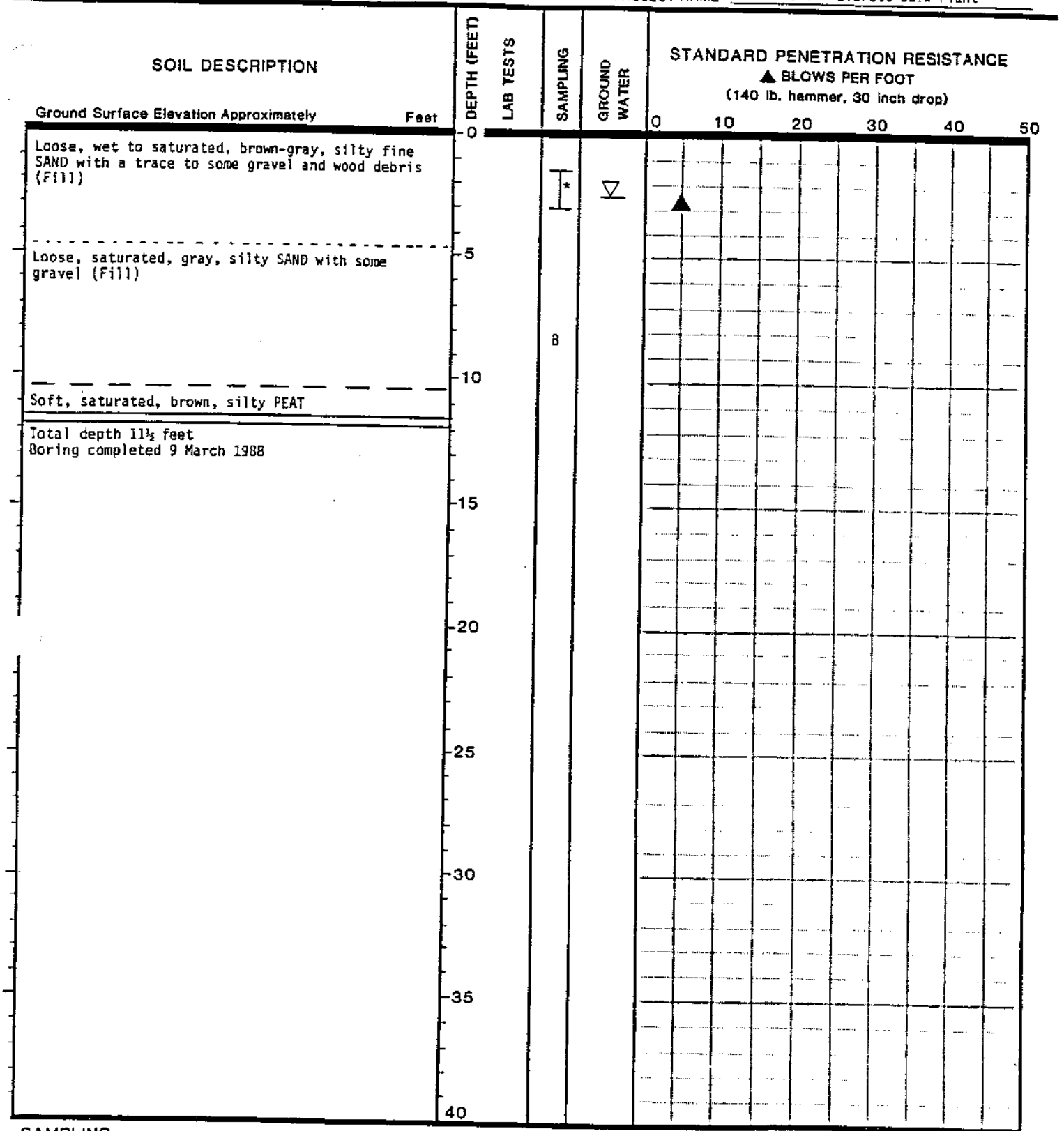
LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-13 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant



SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- * SAMPLE NOT RECOVERED

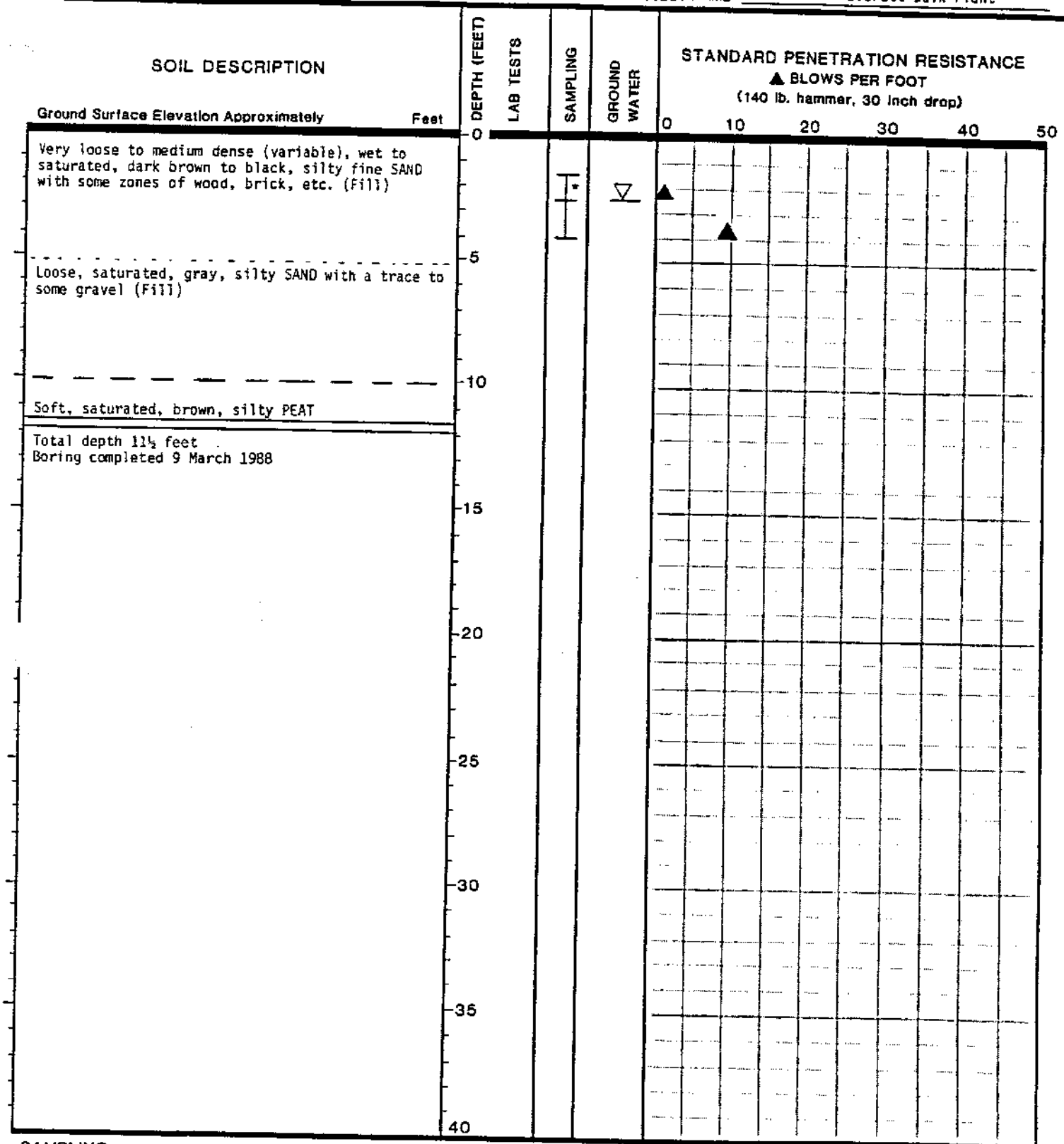
GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-14 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant



SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

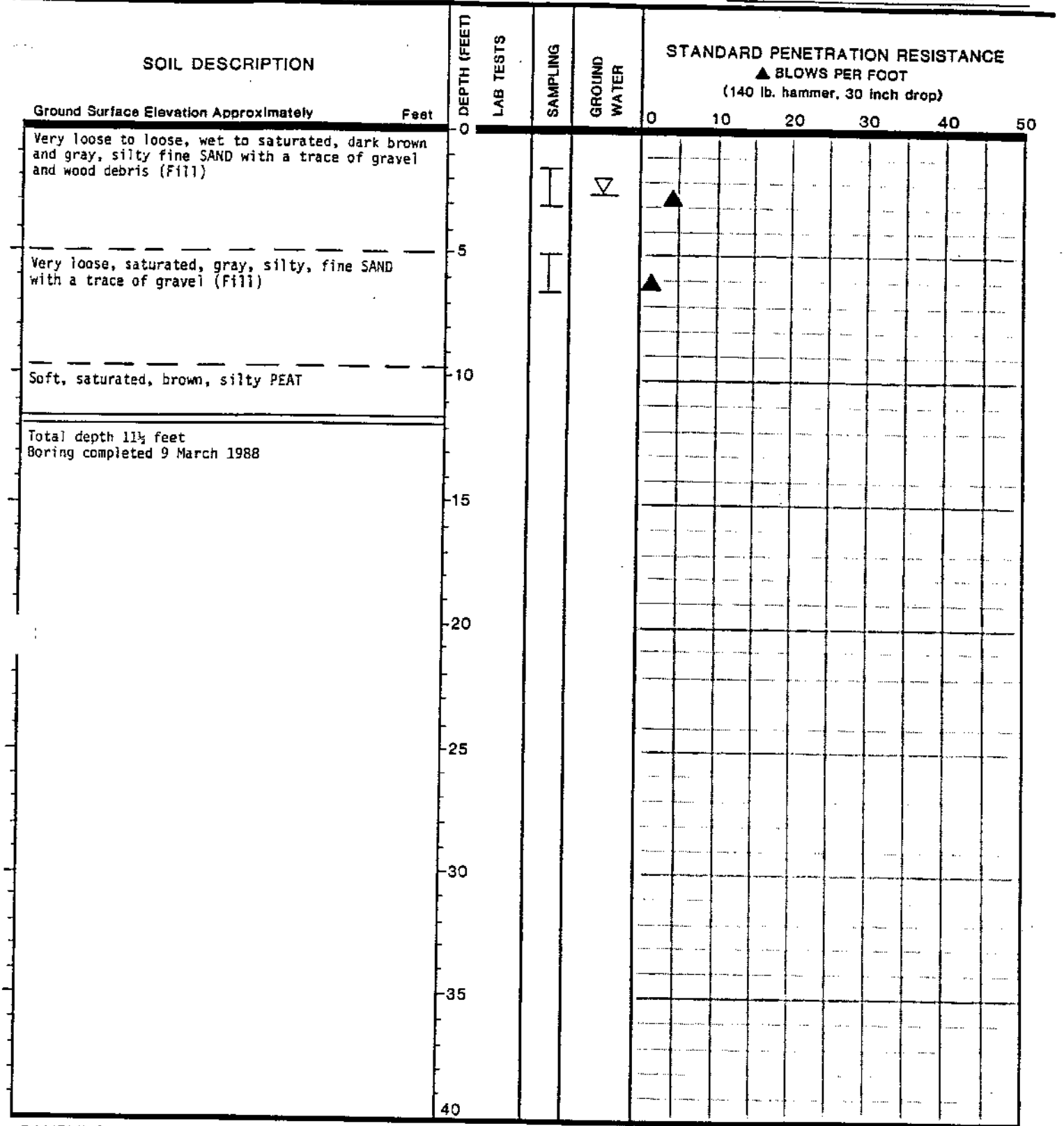
GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-15 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant



SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- ★ SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-16 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	STANDARD PENETRATION RESISTANCE ▲ BLOWS PER FOOT (140 lb. hammer, 30 inch drop)
Ground Surface Elevation Approximately Feet					0 10 20 30 40 50
Loose to medium dense, wet to saturated, brown-gray, gravelly, silty SAND with a trace to some wood debris (Fill)	0				
	5				
Soft, saturated, brown, silty PEAT	10				
Total depth 11½ feet Boring completed 9 March 1988	15				
	20				
	25				
	30				
	35				
	40				

SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- * SAMPLE NOT RECOVERED

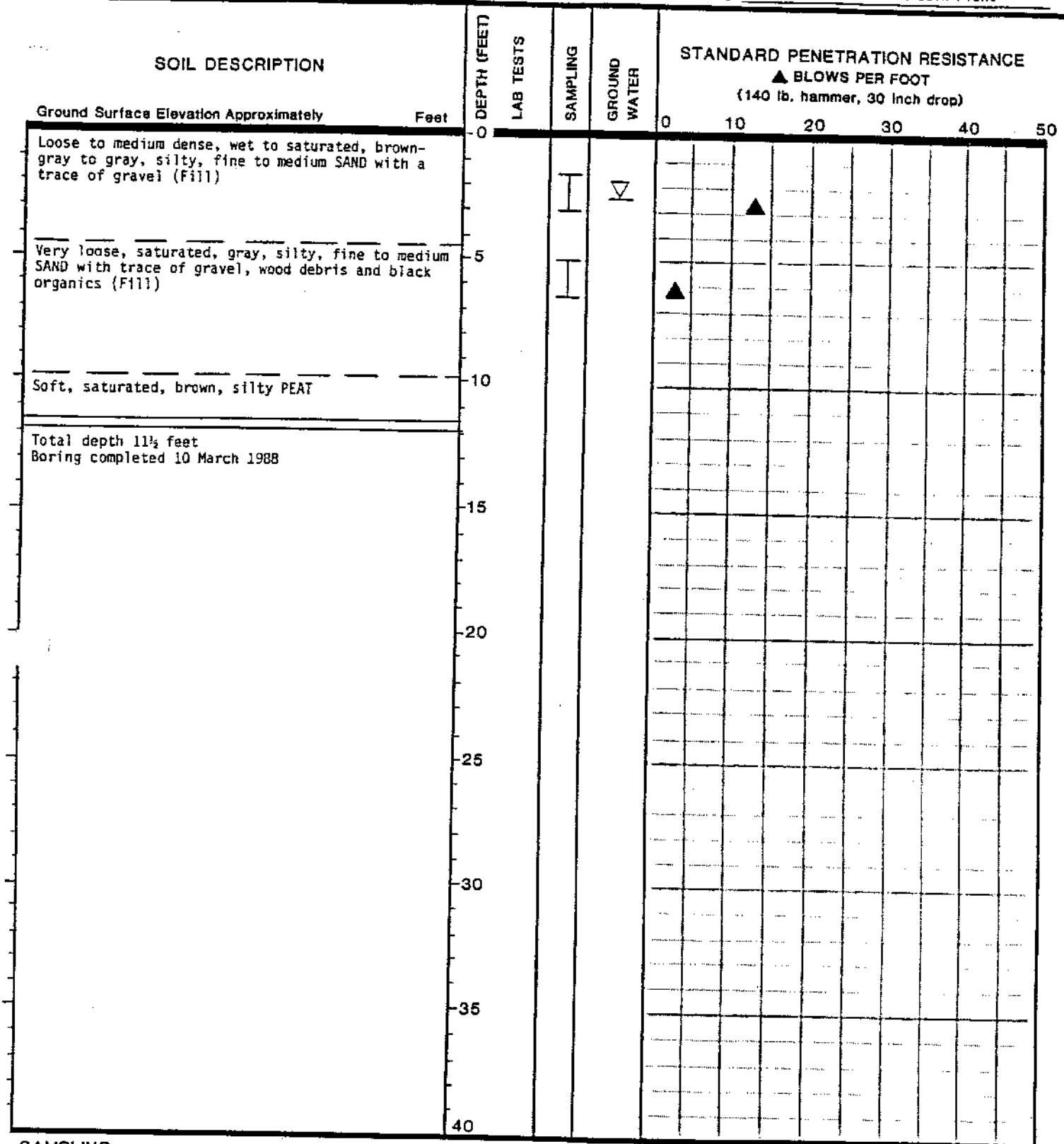
GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-17 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant



SAMPLING
- 2" OD SPLIT SPOON SAMPLE
- 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- SAMPLE NOT RECOVERED

GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

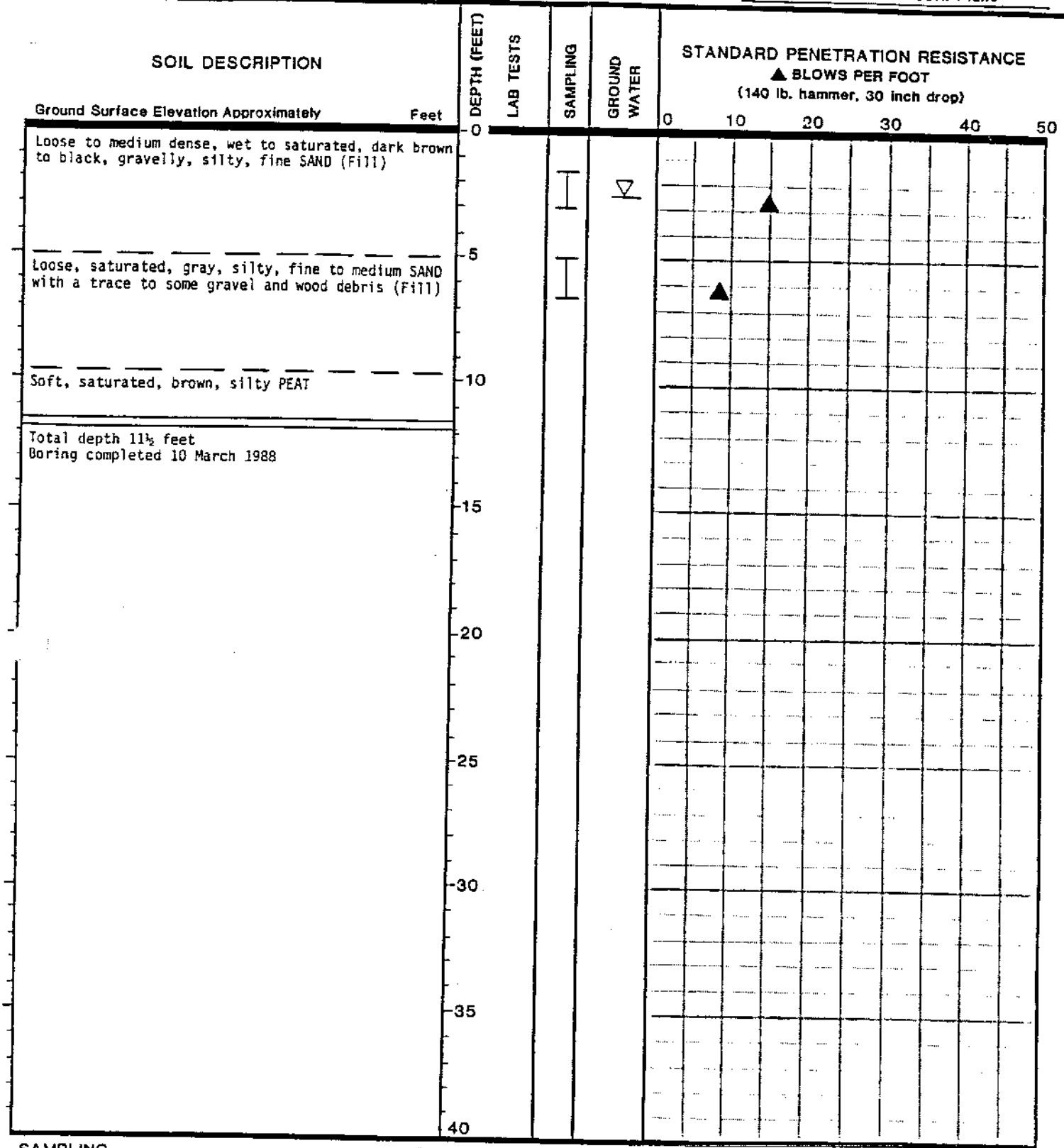
LABORATORY TESTS
- % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

RZA

RITTENHOUSE-ZEMAN & ASSOC., INC.
Geotechnical / Hydrogeological Consultants

BORING NUMBER MW-18 W.O. W-4558-1

PROJECT NAME Mobil Oil - Everett Bulk Plant

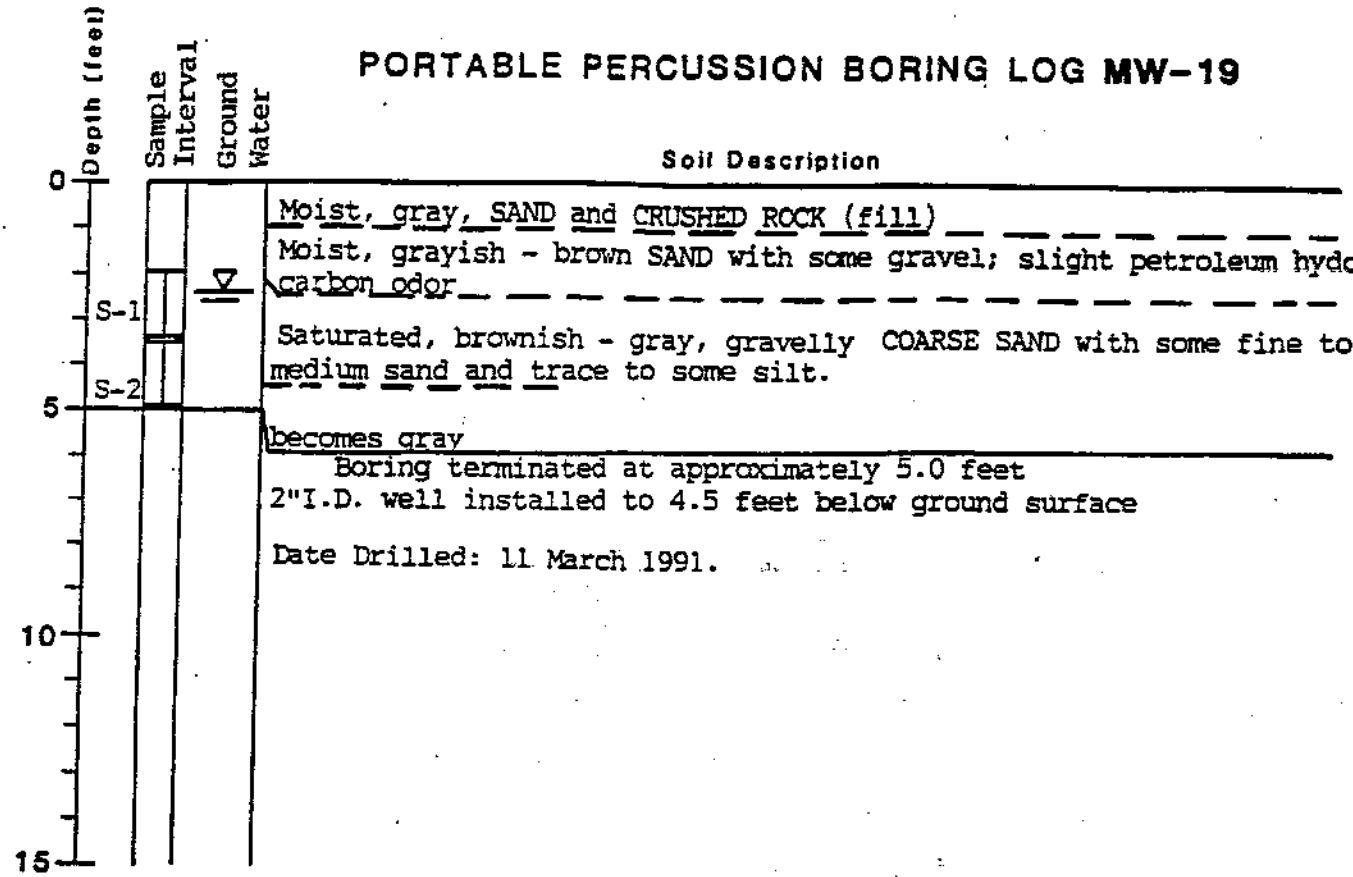


SAMPLING
- I 2" OD SPLIT SPOON SAMPLE
- II 3" OD SHELBY SAMPLE
- 2.5" ID RING SAMPLE
- BULK SAMPLE
- * SAMPLE NOT RECOVERED

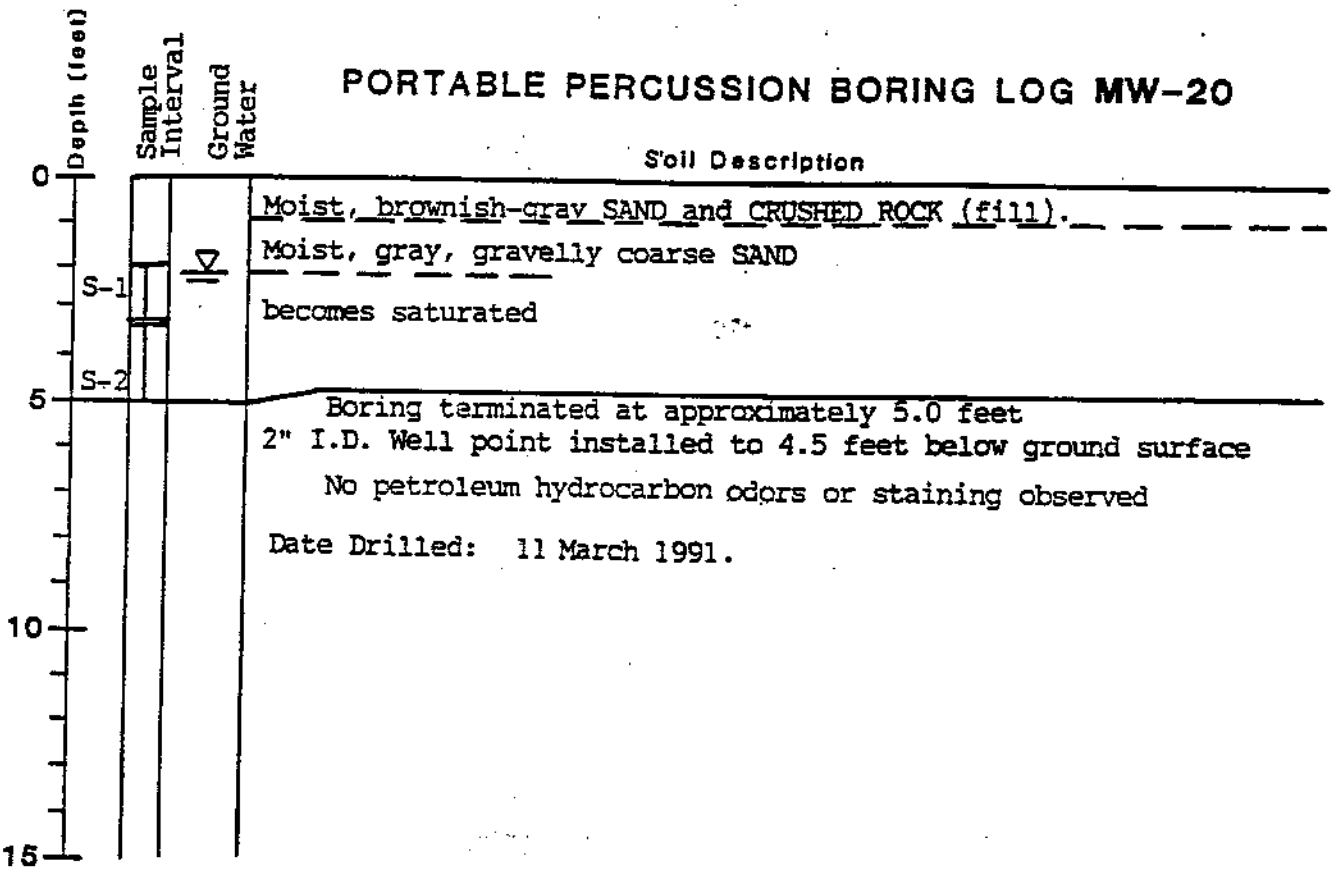
GROUND WATER
- SEAL
- DATE
- WATER LEVEL AT TIME OF DRILLING ATD
- OBSERVATION WELL TIP

LABORATORY TESTS
- ● % WATER CONTENT
- NP NON PLASTIC
- LIQUID LIMIT
- NATURAL WATER CONTENT
- PLASTIC LIMIT

PORTABLE PERCUSSION BORING LOG MW-19



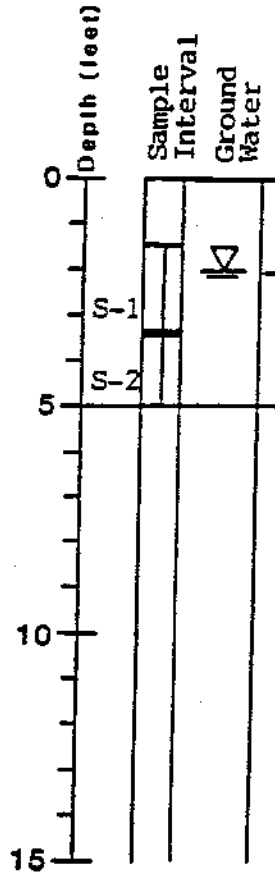
PORTABLE PERCUSSION BORING LOG MW-20



ATD groundwater level at time of drilling

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical Consultants
1400 140th N.E.
Bellevue, Washington 98007
(206) 746-4020

PORTABLE PERCUSSION BORING LOG MW-21



Soil Description

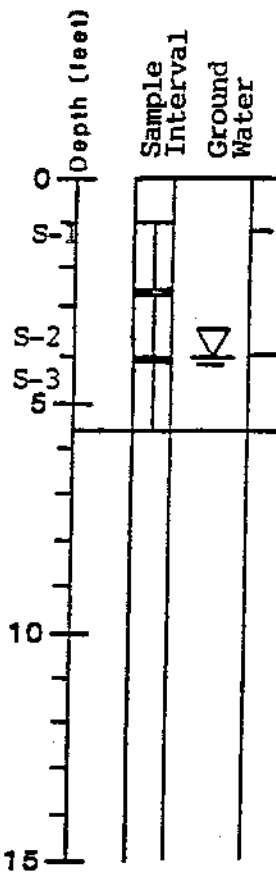
Moist, dark brown, silty SAND with gravel (fill).

Saturated, gray, gravelly, coarse SAND
Petroleum hydrocarbon ordor observed from approximately 3 to 4 feet

Boring terminated at approximately 5.0 feet
2" i.d. Well point installed to 4.5 feet below ground surface

Date Drilled: 11 March 1991.

PORTABLE PERCUSSION BORING LOG MW-22



Soil Description

Moist, brown, silty, fine SAND with trace of gravel
become black with strong petroleum hydrocarbon odor.

becomes saturated; product seepage from sample

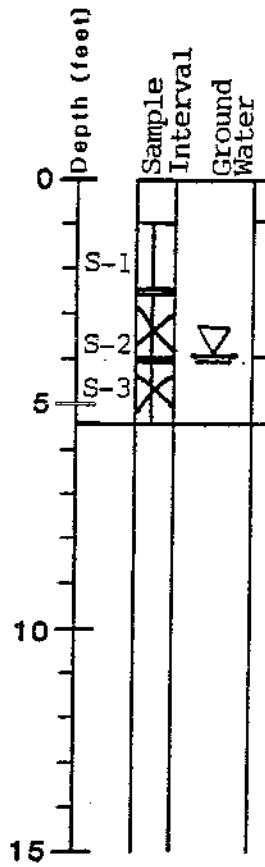
Boring terminated at approximately 5.5 feet
1.25 "i.d well point installed to 5.5 feet below ground surface

Date Drilled: 12 March 1991.

ATD groundwater at time of drilling

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical Consultants
1400 140th N.E.
Bellevue, Washington 98007
(206) 746-8020

PORTABLE PERCUSSION BORING LOG MW-23



Soil Description

Moist, brown, silty, fine to medium SAND with gravel

Moist, brown, fine to medium SAND with some silt and some gravel

No samples recovered below 2.5 feet

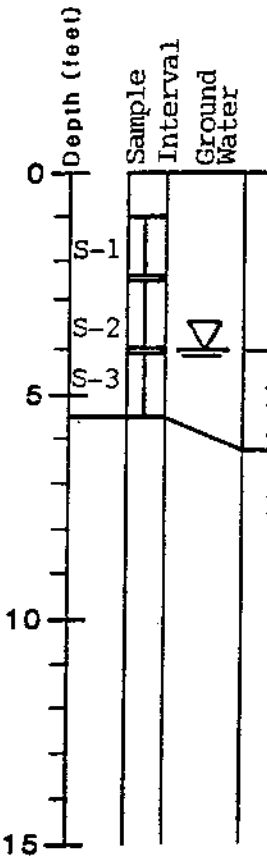
becomes saturated

Boring terminated at approximately 5.5 feet

1.25" i.d Well point installed to 5.5 feet below ground surface

No petroleum hydrocarbon odors or staining observed

PORTABLE PERCUSSION BORING LOG MW-24



Soil Description

Moist, brown, fine to medium SAND with some gravel and some silt

becomes saturated

slight petroleum hydrocarbon odor and staining observed

Boring terminated at approximately 5.5 feet

1.25" i.d. Well point installed to 5.5 feet below ground surface

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.

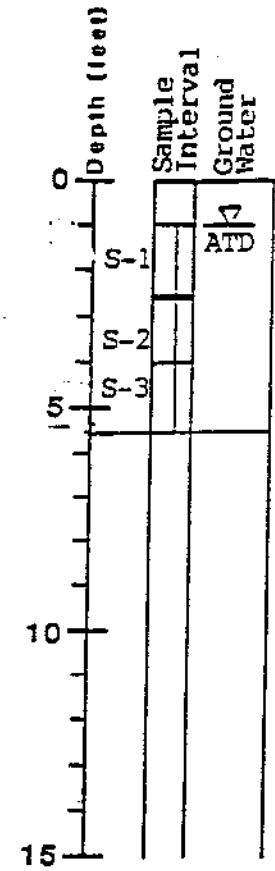
Geotechnical Consultants

1400 140th N.E.

Bellevue, Washington 98007

(206) 746-8020

PORTABLE PERCUSSION BORING LOG MW-25



Soil Description

Asphalt pavement

Moist to wet, gray, medium SAND (fill)

Moist, gray with rust mottling, silty SAND with gravel and some wood debris (fill)

becomes gray saturated

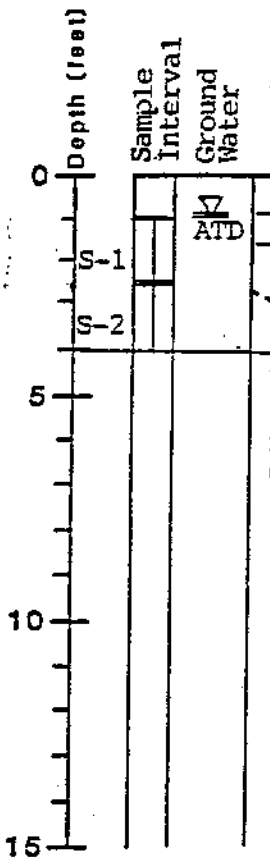
Saturated, dark brown, silty, fine to medium SAND with some gravel, wood debris & brick fragments (fill)

Saturated, gray, fine to medium SAND (fill)

boring terminated at approximately 5.5 feet
2" I.D. well point installed to 5.0 feet below ground surface
no petroleum hydrocarbon odor or unusual staining observed
OVM headspace readings all nondetectable

Date Drilled: 14 June 1991.

PORTABLE PERCUSSION BORING LOG MW-26



Soil Description

Asphalt pavement

Wet, dark brown, silty SAND with gravel (fill)

Moist, gray with grayish-brown laminae, fine to medium SAnd with some gravel (fill)

Wet, brownish-gray, silty fine to medium SAND with some gravel & some wood debris

boring terminated at approximately 4.0 feet
2" I.D. well point installed to 5.0 feet below ground surface
no petroleum hydrocarbon odor or unusual staining observed
OVM readings all nondetectable

Date Drilled: 14 June 1991.

ATD groundwater level at time of drilling

RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical Consultants
1400 140th N.E.
Bellevue, Washington 98007
(206) 746-8020

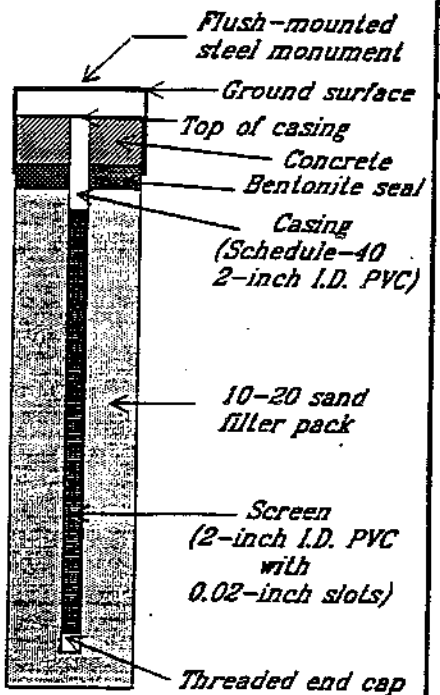
RZA

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* WELL NO. *MW-27*

Elevation reference: Well completed: *20 June 1991*
Ground surface elevation: Casing elevation:

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*2" Asphalt.*					
	Medium dense, moist, gray, silty fine SAND with hydrocarbon odor		S-1	15		ATD
5						
	Loose, wet, brown, PEAT with oily sheen and hydrocarbon odor		S-2	2		
10						
	Loose, moist, gray, medium SAND hydrocarbon odor and sheen		S-3	4		
	Boring terminated at 13.5 feet.					
15						
20						
25						
30						

AS-BUILT DESIGN



TESTING

8015 418.1 BTEX 8010

8015 418.1 BTEX 8010

LEGEND

- 2-inch O.D. split-spoon sample
- ATD — Observed groundwater level (ATD = at time of drilling)
- 8015 418.1 BTEX 8010 — Soil Analysis (EPA Method shown)

RZA RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

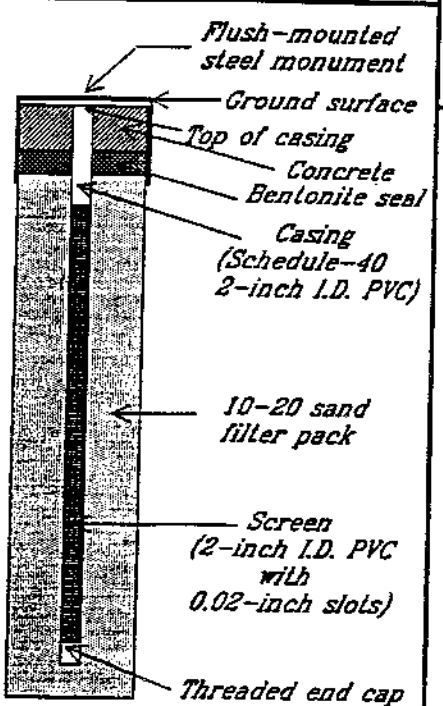
Drilling started: *20 June 1991* Drilling completed: *20 June 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* WELL NO. *MW-28*

Elevation reference: Well completed: *20 June 1991*
Ground surface elevation: Casing elevation:

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*2" Asphalt.*					
	3 inches brown/gray sandy GRAVEL					
	Loose, moist, gray silty fine SAND		S-1	2		ATD
5						
	Loose, moist, brown, PEAT layer, strong hydrocarbon odor		S-2	2		
10						
	Loose, moist to wet, brown, silty medium SAND with organics (peat); moderate hydrocarbon odor		S-3	2		
	Boring terminated at 13.5 feet.					
15						
20						
25						
30						

AS-BUILT DESIGN



TESTING

8015 418.1 BTEX 6010

8015 418.1 BTEX 6010

LEGEND

- 2-inch O.D. split-spoon sample
- ATD — Observed groundwater level (ATD = at time of drilling)
- 8015 418.1 BTEX 6010 — Soil Analysis (EPA Method shown)

RZA *RITTENHOUSE-ZEMAN & ASSOCIATES, INC.*
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

Drilling started: *20 June 1991* Drilling completed: *20 June 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* WELL NO. *MW-29*

Elevation reference: Well completed: *20 June 1991*
Ground surface elevation: Casing elevation:

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*2" to 3" Asphalt.*					
	Loose, moist, gray, sandy, gravel					
			S-1	3		ATD
5	*Loose, moist, gray fine sandy SILT grading into silty fine sand*					
			S-2	5		
10	*Loose, wet, black oil-saturated PEAT with wood*					
			S-3	50/3"		
	Boring terminated at 13.5 feet.					
20						
25						
30						

AS-BUILT DESIGN

Flush-mounted steel monument
Ground surface
Top of casing
Concrete
Bentonite seal
Casing (Schedule-40 2-inch I.D. PVC)
10-20 sand filter pack
Screen (2-inch I.D. PVC with 0.02-inch slots)
Threaded end cap

TESTING

8015 418.1 BTEX 6010

8015 418.1 BTEX 6010

LEGEND

- 2-inch O.D. split-spoon sample
- ATD — Observed groundwater level (ATD = at time of drilling)
- 8015 418.1 BTEX 6010 — Soil Analysis (EPA Method shown)
- X — Sample not recovered

RZA RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

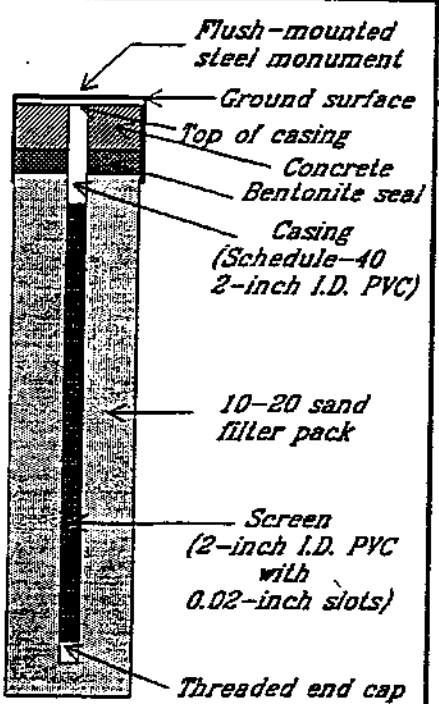
Drilling started: *20 June 1991* Drilling completed: *20 June 1991* Logged by: *JK*

PROJECT *Mobil Bulk Plant* W.O. *W-4558-3* WELL NO. *MW-30*

Elevation reference: Well completed: *20 June 1991*
Ground surface elevation: Casing elevation:

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*2" Asphalt.*					
	Loose, moist, gray, silty SAND					
	Loose, moist, gray, silty fine SAND	⊠	S-1	5		ATD
5	*Loose, black, oily wood and PEAT*					
	Very loose, wet, oily, gray medium SAND with organics (wood and peat)	⊠	S-2	2		
10	*Loose, wet (oily), black/brown PEAT and wood*	⊠	S-3	8		
	Boring terminated at 13.5 feet.					
15						
20						
25						
30						

AS-BUILT DESIGN



TESTING

8015 418.1 BTEX 6010

8015 418.1 BTEX 6010

LEGEND

- 2-inch O.D. split-spoon sample
- 8015 418.1 BTEX 6010 — Soil Analysis (EPA Method shown)
- ATD — Observed groundwater level (ATD = at time of drilling)
- X — Sample not recovered

RZA RITTENHOUSE-ZEMAN & ASSOCIATES, INC.
Geotechnical & Environmental Consultants
1400 140th Ave NE
Bellevue, Washington 98005

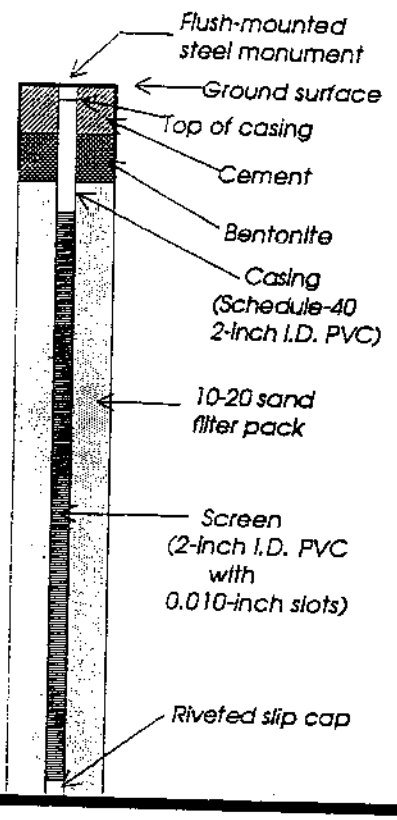
Drilling started: *20 June 1991* Drilling completed: *20 June 1991* Logged by: *JK*

PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *MW-3*

Elevation reference: *100.00 feet* Well completed: *07 December 1993*
Ground surface elevation: *Unknown* Casing elevation: *98.58 feet*

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*Asphaltic Concrete*					
	Medium dense, wet, brownish-gray, fine SAND with gravel (Fill). Slight petroleum-like odor observed		S-1	25	5	
5						
	Loose, wet to saturated, dark greenish-gray, SAND with some gravel and wood debris (Fill)		S-2	6	5	12/8/93
10						
	Medium dense, saturated, dark gray, medium SAND with wood debris		S-3	22	5	
15	*Bottom of boring at 15 feet.*					
20						
25						
30						

AS-BUILT DESIGN



Page 1 of 1

TESTIN

LEGEND

2-inch O.D. split-spoon sample

Observed groundwater level
0/00/00 = date observed

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *07 December 1993* Drilling completed: *07 December 1993* Logged by: *TJP*

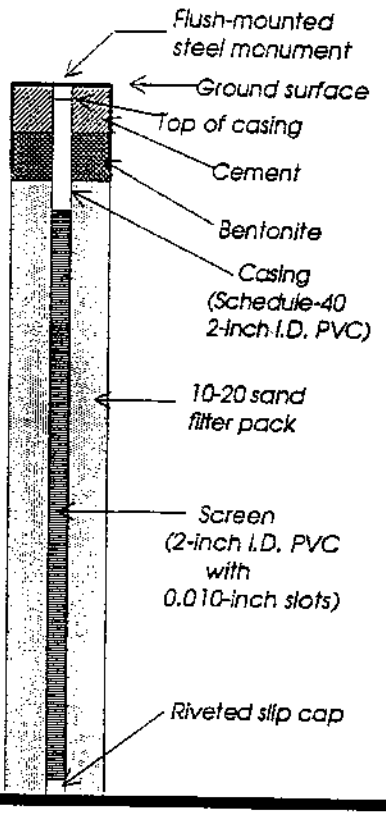
PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *MW-32*

Elevation reference: *100.00 feet* | Well completed: *07 December 1993*
Ground surface elevation: *Unknown* | Casing elevation: *99.17 feet*

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*Gravel surface*					
	Medium dense, wet to saturated, greenish-gray, gravelly, medium SAND (Fill)		S-1	13	5	12/8/93
5						
	Medium dense, saturated, grayish-dark brown, medium SAND with gravel, some silt and wood fragments		S-2	17	5	
10						
	Medium dense, saturated, grayish-dark brown, silty, fine to medium SAND with some gravel and wood fragments		S-3	17	5	
15	*Bottom of boring at 15 feet. No unusual staining or petroleum-like odors observed.*					
20						
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

2-inch O.D. split-spoon sample

Observed groundwater level
0/00/00 = date observed

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *07 December 1993* Drilling completed: *07 December 1993* Logged by: *TJP*

PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *MW-3*

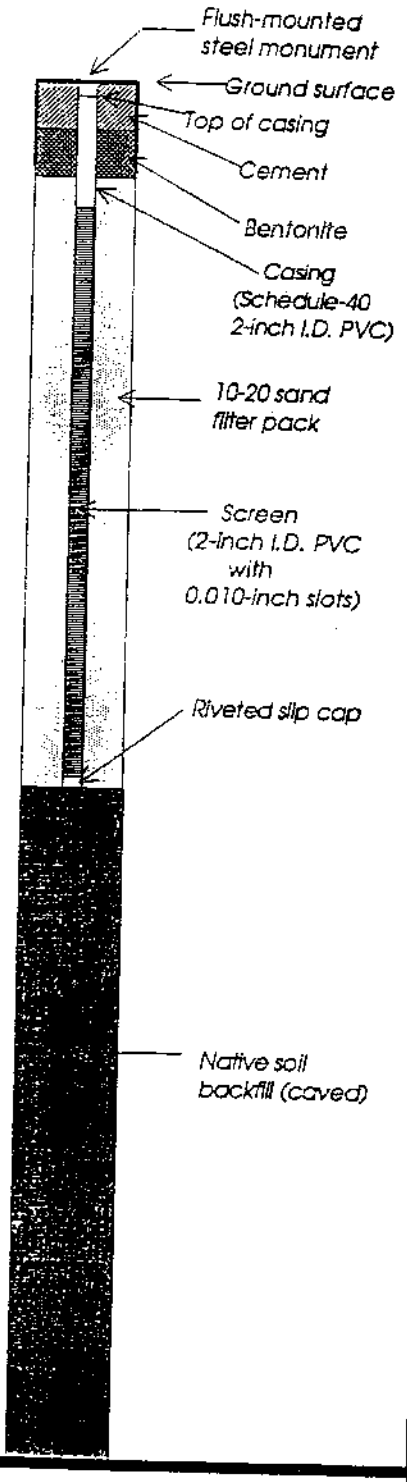
Elevation reference: *100.00 feet* Well completed: *07 December 1993*
Ground surface elevation: *Unknown* Casing elevation: *97.64 feet*

AS-BUILT DESIGN

TESTING

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*Asphaltic Concrete*					
	Medium dense, wet to saturated, gray, medium to coarse SAND with some gravel (Fill)		S-1	21	5	12/8/93
5	*Medium dense, saturated, greenish-gray, silty, fine to medium SAND (Fill)*		S-2	11	5	
	Loose, saturated, brown, silty PEAT		S-3	5	5	
10	*Loose to medium dense, saturated, gray to brownish-gray, SAND with trace to some silt, gravel and wood fragments*		S-4	8	5	
	(Chunk of wood stuck in sample tube; S-5 blow count probably not representative)		S-5	50/5"	5	
15			S-6	11	5	
			S-7	6	5	
20			S-8	10	5	
			S-9	17	5	
25	*Very stiff, saturated, brown, clayey SILT with organics (PEAT-Like)*		S-10	14	5	
			S-11	17	5	
30	*Bottom of boring at 29 feet.*					

No unusual staining or petroleum-like odors observed.



LEGEND

— 2-inch O.D. split-spoon sample

0/00/00 Observed groundwater level 0/00/00 = date observed

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *07 December 1993* Drilling completed: *07 December 1993* Logged by: *TJP*

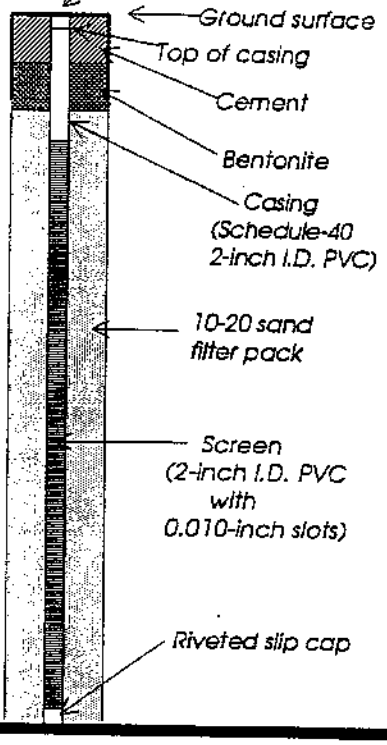
PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *MW-35*

Elevation reference: *100.00 feet* Well completed: *06 December 1993*
Ground surface elevation: *Unknown* Casing elevation: *103.96 feet*

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0						
	Dense, moist, gray, silty, fine to medium SAND with some gravel		S-1	38	0	
5						12/8/93
	Loose, moist to saturated, gray, fine sandy SILT with some gravel		S-2	6	0	
10						
			S-3	4	0	
15	*Bottom of boring at 15 feet.* *Field FT-IR analysis of samples S-1 and S-2 indicated TPH concentrations of <50 ppm.*					
20						
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

2-inch O.D. split-spoon sample

Observed groundwater level
0/00/00 = date observed

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *06 December 1993* Drilling completed: *06 December 1993* Logged by: *GKS*

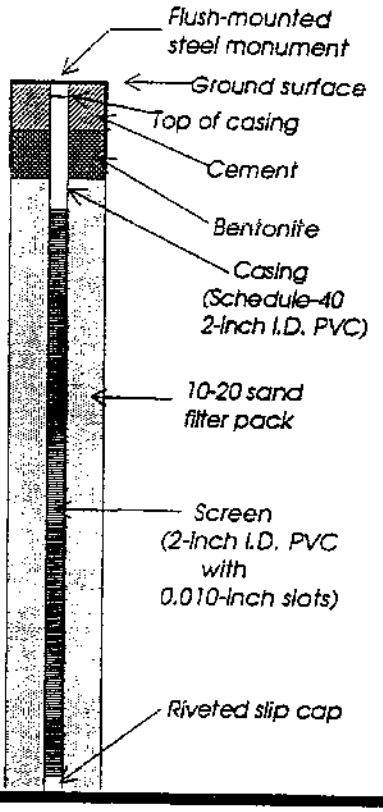
PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *MW-3*

Elevation reference: *100.00 feet* Well completed: *06 December 1993*
Ground surface elevation: *Unknown* Casing elevation: *99.91 feet*

AS-BUILT DESIGN

TESTING

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	*Medium dense, moist, blackish-gray, silty, fine to medium SAND with some gravel*		S-1	19	0	12/8/93
5	*Becomes very loose, with increasing silt content*		S-2	2	0	
10	*Wood debris*		S-3	4	0	
15	*Bottom of boring at 15 feet.*					
20						
25						
30						



LEGEND

2-inch O.D. split-spoon sample

Observed groundwater level
0/00/00 = date observed

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *06 December 1993* Drilling completed: *06 December 1993* Logged by: *GKS*

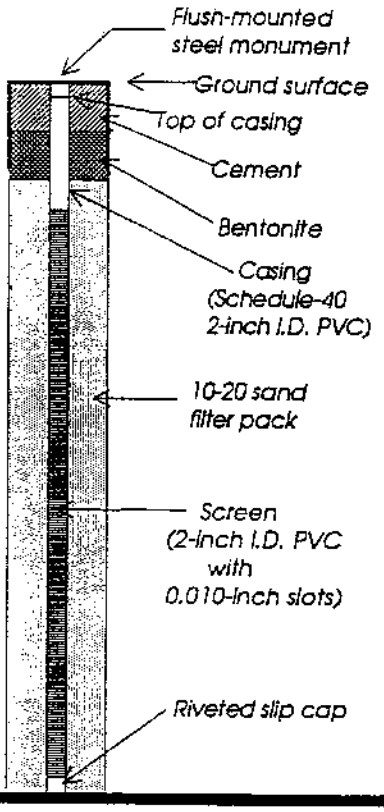
PROJECT: *Everett Mobil Bulk Plant* W.O. *11-04558-04* WELL NO. *MW-3*

Elevation reference: *100.00 feet* Well completed: *06 December 1993*
Ground surface elevation: *Unknown* Casing elevation: *103.87 feet*

AS-BUILT DESIGN

TESTING

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0						
	Medium dense, moist, gray, silty, fine to medium SAND with trace gravel		S-1	17	51	
5						12/8/93
	Becomes very loose, saturated; strong petroleum-like odor		S-2	3	57	
10						
	Very loose, saturated, reddish-brown, medium to coarse SAND with some silt, trace gravel and organics; petroleum seepage observed		S-3	3	34	
15	*Bottom of boring at 15 feet.*					
20						
25						
30						



LEGEND

2-inch O.D. split-spoon sample

Observed groundwater level
0/00/00 = date observed

RZA AGRA, Inc.
Geotechnical & Environmental Group

11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: *06 December 1993* Drilling completed: *06 December 1993* Logged by: *GKS*

PROJECT: Mobil/ADC W.O. 11-04558-09 WELL NO. MW-38

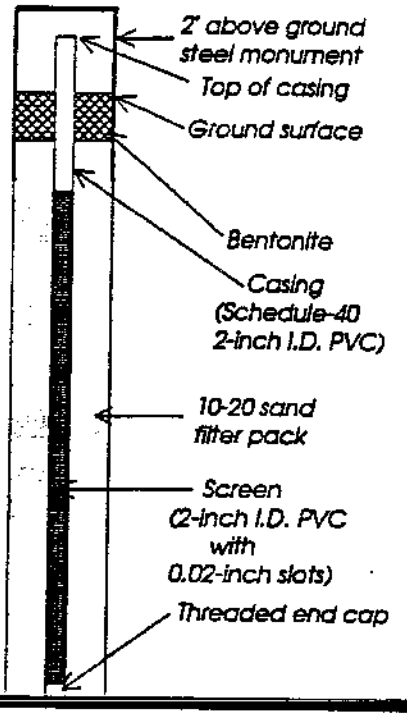
Location reference: Unknown Well completed: 05 June 1996

Ground surface elevation: Unknown Casing elevation: Unknown

Page 1 of 1

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING	GROUND WATER
0	Grass and Roots Loose, moist, dark brown, silty SAND with gravel (strong petroleum hydrocarbon-like odor)		MW-38/ 2.5			
5			MW-38/ 5.0	10	0.0	ATD
			MW-38/ 7.5	50/ 1"	0.0	
10	Medium dense, saturated, brown WOOD CHIPS with trace silt (Fill) (strong petroleum hydrocarbon-like odor)		MW-38/ 10.0	11	0.0	
	Bottom of boring at 12.5 feet.					
15						
20						
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

2-inch O.D. split-spoon sample

Grab sample

ATD Observed groundwater level ATD = at time of drilling

AGRA Earth & Environmental
11335 NE 122nd Way, Suite 100
Kirkland, Washington 98034-6918

Drilling started: 05 June 1996 Drilling completed: 05 June 1996 Logged by: RAL

AGRA Earth & Environmental, Inc.

LOCATION 20' WALL
VRW-1

AGRA Earth & Environmental

TEST BORING LOG

HOLE NO. VRW-1
SHEET 1 OF 1
TOTAL DEPTH 15.0
DATE BEGUN 6/5/96
DATE COMPLETED 6/5/96

WEATHER partly cloudy, 50's

SAMPLING

GROUNDWATER TABLE
DEPTH IN FEET 6.7
TIME 0930
DATE 6/5/96

PROJECT NAME MOBIL/ADC
JOB NUMBER 11-04558-09 T17
PROJECT ENGINEER RAC
DRILLING CONTRACTOR CREW CASCADE
METHOD USED HSA
SAMPLING METHOD SPT STANDARD PENETRATION TEST T-TUBE BARING DEM

SOIL DESCRIPTION

GRASS AND ROOTS OVER
BACKFILL BENTONITE TO APPROX. 5.0 feet

Sample	Blows	Symbol	Description
VRW-1 5.0	15 / 7 / 6	SM	m dense, saturated, dark brown silty SAND with GRAVEL (SM) - wood debris, free product (oil), strong oil. NO SAMPLE FOR HEADSPACE
VRW-1 7.5	8 / 6 / 6	Pt	stiff, ~~moist~~ saturated, brown PEAT - trace silt, strong odor. HNU = 14 ppm
VRW-1 10.0	12 / 11 / 8	SP	m. dense, saturated, grey brown SAND with silt (SP) - trace peat, wood debris from 10-10.5 feet, strong odor. HNU = 40 ppm
VRW-1 12.5	6 / 6 / 5	Pt	stiff, saturated, brown PEAT - trace silt, strong odor HNU = 5 ppm

DRILL OUT TO 15' HEAVING SAND
0.5 THREADED CAP

140 lb - 30" Drop

BORING LOG SUMMARY

AGRA Earth & Environmental, Inc. (Rev. 7/94)

AGRA
Earth & Environmental

MONITORING WELL AS-BUILT REPORT

PROJECT No. 11-04558-09
PROJECT NAME MOBIL/ADL
BORING/WELL I.D. MW-1
DATE 6/5/96

LOCATION
OBSERVED BY PMC
DRILLER/INSTALLER CASCADE

SOIL TYPE DEPTH

+2.0

0 SURFACE

1

2

14.0
14.5
14.5

ABOVE GROUND RISER HEIGHT (IF APPLICABLE)
MONUMENT TYPE (IF APPLICABLE)
WELL CAP TYPE locking

GROUT TYPE/#SACKS

BENTONITE SEAL #SACKS

WELL CASING I.D. 4"
TYPE OF CASING Schedule 40 PVC
TYPE OF CONNECTION Threaded

FILTER PACK/SIZE/#SACKS 6x12

WELL SCREEN I.D. 4"
TYPE OF SCREEN "V" screen
SLOT SIZE 0.030

DIAMETER OF BOREHOLE 12"

ENDCAP TYPE threaded (0.5' point)

REMARKS

LOCATION: ← 20' → WALL
VRW-1

WEATHER: partly cloudy, 50's

AGRA Earth & Environmental

TEST BORING LOG

HOLE NO. VRW-1
SHEET 1 OF 1
TOTAL DEPTH 15.0
DATE BEGUN 6/5/96
DATE COMPLETED 6/5/96

SAMPLING

GROUNDWATER TABLE
ATD=AT TIME OF DRILLING AB=AFTER BORING
DEPTH IN FEET 6.7
TIME 0930
DATE 6/5/96

PROJECT NAME MOBIL/ADC
PROJECT NUMBER 11-04558-09 T17
GEOLOGIST ENGINEER RAC
DRILLING CONTRACTOR CREW CASCADE
METHOD USED HSA
SAMPLING METHOD SPT=STANDARD PENETRATION TEST T=TUBE RARING D&M

SOIL DESCRIPTION

GRASS AND ROOTS OVER
BACKFILL BENTONITE TO APPROX. 5.0 feet

Sample	Blows	Description
D&M VRW-1 5.0	15 / 7 / 6	SM m. dense, saturated, dark brown silty SAND with GRAVEL (SM) - wood debris, free product (oil), strong oil. NO SAMPLE FOR HEADSPACE
VRW-1 7.5	8 / 6 / 6	Pt stiff, ~~moist~~ saturated, brown PEAT - trace silt, strong odor HNU=14ppm
VRW-1 10.0	12 / 11 / 8	SP m. dense, saturated, grey brown SAND with silt (SP) - trace peat, wood debris from 10-10.5 feet, strong odor. HNU = 40ppm
VRW-1 12.5	6 / 6 / 5	Pt stiff, saturated, brown PEAT - trace silt, strong odor HNU = 5 ppm

DRILL OUT TO 15'. HEAVING SAND
0.5 THREADED CAP

140 lb - 30" Drop

BORING LOG SUMMARY

AGRA
Earth & Environmental

MONITORING WELL AS-BUILT REPORT

PROJECT No. 11-04558-09
LOCATION
PROJECT NAME MOBIL/ADC
OBSERVED BY BTL
BORING/WELL I.D. VBLW-1
DRILLER/INSTALLER CASCADE
DATE 6/5/96

SOIL TYPE DEPTH

+2.0

0 SURFACE

1

2

14.0
14.5
14.5

ABOVE GROUND RISER HEIGHT (IF APPLICABLE)
MONUMENT TYPE (IF APPLICABLE)
WELL CAP TYPE locking

GROUT TYPE/ =SACKS

BENTONITE SEAL =SACKS

WELL CASING I.D. 4"
TYPE OF CASING Schedule 40 PVC
TYPE OF CONNECTION Threaded

FILTER PACK/SIZE =SACKS 6x12

WELL SCREEN I.D. 4"
TYPE OF SCREEN "V" screen
SLOT SIZE 0.030

DIAMETER OF BOREHOLE 12"

ENDCAP TYPE threaded (0.5' points)

REMARKS

OK

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with enviroplug

Boring No: AD-01
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						3.0'			
0				Sample @ 0.5-1.0'	sp				Grass 0.5-1.0 Sand, coarse grained, occasional gravel, very slight clay loose, moist, no odor.
1									
2					sc				2.0' Sand, clayey, fine grained, grey brown, loose, very moist, moderate petroleum odor.
3				Sample @ 3.0'					2.5-3' Sand, clayey, occasional gravel, light grey brown, very moist, loose, strong petroleum odor. 3' Sand, coarse grained, slightly clayey, some gravel, light grey wet, moderate petroleum odor.
4	TD = 3.0'								
5									Groundwater at approximately 3'.

LOG OF
EXPLORATORY BORING

F. location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with enviroplug

Boring No: AD-02
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						approx. 2.0'			
0									Grass
1				Sample @ 0.5-1.0'	sp				0.5-1.0' Sand, coarse grained with occasional gravel, saturated, slight petroleum odor.
2									
3				Sample @ 2.5-3.0'	sm				2.5-3.0' Sand, coarse grained with grey/green clayey silt, organic debris, strong petroleum odor, irridescent sheen on water.
	TD = 3.0'								
4									
5									Groundwater at approximately 2'

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with enviroplug

Boring No: AD-03
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0						Approx. 2.0'			
1				Sample @ 0.5-1.0'	SC				0.5-1.0 Sand, coarse grained, with clay and occasional pebbles/gravel, light brown, moist, no odor.
2	TD = 2.0'			Sample @ 1.5-2.0'	SC				1.5-2.0 Sand, coarse, grained, increased clay content with gravel, light grey-brown, wet, no odor.
3									
4									Groundwater at approximately 2.0'
5									

LOG OF
EXPLORATORY BORING

ie.. ocation of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with enviroplug

Boring No.: AD-04
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

epth ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0				Sample @ 0.5-1.0	ap	Approx. 9 inches			0.5-1.0 Sand, gravelly, coarse grained sand, light brown to grey, moist to wet, no odor.
1	TD = 1.0'								
2									Groundwater at approximately 9 inches.
3									
4									
5									

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with enviroplug

Boring No: AD-05
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 3.0'			
0				Sample @ 1.5-2.0	SC				0.5-1.0' Sand, clayey, coarse grained sand, light grey, loose, moist, some gravel, slight petroleum odor.
1				Sample @ 1.5-2.0'	SC				1.5-2.0' Sand, clayey, coarse grained, light grey, loose, moist, slight petroleum odor.
2				Sample @ 2.5-3.0	SC				2.5-3.0' Sand, clayey, coarse grained, light grey, loose, moist, some gravel, slight petroleum odor.
3	TD = 3.0'								
4									
5									Groundwater at approximately 3.0'

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-06
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0 -						Approx. 1.5'			
1 -	TD = 1.0'			Sample @ 0.5-1.0	sp				0.5-1.0 Sand, coarse grained, gravelly, loose, moist, moderate odor.
2 -									
3 -									Groundwater at approximately 5.0'
4 -									
5 -									

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everatt, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-07
Date: 1-15-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0				Sample @ 0.5-1.0"	sp	Approx. 6"			0.5-1.0 Sand, coarse grained, gravelly, loose, moist to wet, modarate odor, groundwater has irridescent film.
1	TD = 1.0'								
2									Groundwater at approximately 6 inches.
3									
4									
5									

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Boring No: AD-08
Date: 1-16-90
Client: American Distributing Co.
Driller: D. Alford
Location: Bulk Terminal-Everett, WA
Drilling Method: Hand Auger
Hole Diameter: 2"
Logged by: D. Alford
Page No: 1 of 1
Installation Data: Backfill with enviroplug

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 5.0'			
0						Grass			
				Sample @ 0.5-1.0'	sm	0.5-1.0'			Sand, silty with occasional gravel, medium grained, light brown, dry, no odor.
1					sm	1.5-2.0'			Sand. coarse grained, gravelly, some silt/clay, light to to dark brown, loose, moist, no odor.
2									
				Sample @ 2.5-3.0'	sc	2.5-3.0'			Sand, clayey, with occasional gravel, light grey, moist strong petroleum odor.
3									
4									
				Sample @ 4.5-5.0'	sc	4.5-5.0'			Sand, clayey, with occasional gravel, light grey, moist strong petroleum odor. Saturated at 5.0'
5	TD = 5.0'								

Groundwater at approximately 5.0'

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-09
Date: 1-16-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0				Sample @ 0.5-1.0'	sp	Approx. 1.5'			0.5-1.0' Sand, coarse grained, with occasional gravel, loose, moist, no odor.
1				Sample @ 1.5-2.0'	sp				1.5-2.0 Sand, with gravel, slightly loose, wet, petroleum odor.
2	TD = 2.0'								
3									
4									Groundwater at approximately 1.5'
5									

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-10
Date: 1-16-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
0				Sample @ 0.5-1.0'	sp	Approx. 1.25'			0.5-1.0' Sand with gravel, loose, wet, visible oil stains, moderate petroleum odor.
1									
2	TD = 1.5'								Groundwater at approximately 1.25'
3									
4									
5									

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-11
Date: 1-16-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 1.5'			
0				Sample @ 0.5-1.0'	sp	0.5-1.0'	Sand, gravelly, loose, moist, visible oil stains, moderate petroleum odor.		
1				Sample @ 1.5-2.0'	gp	1.5-2.0'	Sandy gravel, loose, wet, visible oil staining as above, moderate odor.		
2	TD = 2.0'								
3						Groundwater at approximately 1.5'			
4									
5									

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Blaes
Installation Data: Backfill with Enviroplug

Boring No: AD-12
Date: 1-16-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 3.5'			
0				Sample @ 0.5-1.0'	sp	0.5-1.0'	Sand, with gravel, medium grained, brown, loose, moist, no petroleum odor.		
1									
2									
3				Sample @ 2.5-3.0'	sp	2.5-3.0'	Sand, medium grained, gravelly, grey brown, loose, visible oil staining, strong diesel odor.		
4	TD = 3.5'			Sample @ 3.0-3.5'		3.0-3.5'	Sand, medium grained, gravelly, grey, wet, strong petroleum odor.		
5									

Groundwater at approximately 3.5'

LOG OF
EXPLORATORY BORING

ield location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-13
Date: 1-16-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

epth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0				Sample @ 0.5-1.0'	sm
1					
2				Sample @ 2.0-2.5'	sp
3	TD = 2.5'				
4					
5					

Water Level	Time	Data	Comments:
Approx. 2.5'			

0.5-1.0' Sand, silty with occasional gravel, light brown-brown, moist, moderate petroleum odor.

2.0-2.5' Sand, gravelly, dark brown, loose, very moist, visible petroleum staining, strong petroleum odor.

Groundwater approximately 2.5'

Note: Possible free product on ground water. Ground water has irridescent film and oil streaming from soil in capillary zone.

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Alford
Installation Data: Backfill with Enviroplug

Boring No: AD-14
Date: 1-16-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 2.5'			
0 -									
1 -				Sample @ 0.5-1.0'	sp				0.5-1.0' Sand, gravelly, coarse grained, brown-dark brown, loose, moist, moderate petroleum odor.
2 -				Sample @ 2.0-2.5'	sp				2.0-2.5' Sand, gravelly, coarse grained, brown-dark brown, loose, very moist, strong petroleum odor, visible staining.
3 -	TD = 2.5'								
4 -									Groundwater approximately 2.5'
5 -									

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Blaes
Installation Data: Backfill with Enviroplug

Boring No: AD-15
Date: 1-17-90
Driller: D. Blaes
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 3.0'			
0				Sample @ 0.5-1.0'	sp				0.5-1.0' Sand, fine to medium grained, brown, dry, loose, no odor.
1									
2				Sample @ 2.5-3.0'	sp				2.5-3.0' Sand, medium grained, grey to black, loose, moist to wet, very strong gasoline odor.
3	TD = 3.0'								3.0'- Gravel-could not retain sample.
4									Groundwater approximately 3.0'
5									

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Blaes
Installation Data: Backfill with Enviroplug

Boring No: AD-16
Date: 1-17-90
Driller: D. Blaes
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 1.5'			
0 -									Grass
-				Sample @	sp				0.5-1.0 Sand, fine to medium grained, grey, loose, wet, visible
1 -				0.5-1.0'					petroleum staining, very strong gasoline odor.
-									
2 -	TD = 1.5'								
-									
3 -									Groundwater at approximately 1.5'
-									
4 -									
-									
5 -									
-									
-									
-									
-									

LOG OF
EXPLORATORY BORING

location of boring:

Project No: 05-487-001
Boring No: AD-17
Date: 1-17-90
Client: American Distributing Co.
Driller: D. Blaes
Location: Bulk Terminal-Everett, WA
Drilling Method: Hand Auger
Hole Diameter: 2"
Logged by: D. Blaes
Page No: 1 of 1
Installation Data: Backfill with Enviroplug

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)
0					
1	TD = 1.0'			Sample @ 0.5-1.0'	sp
2					
3					
4					
5					

Water Level	Time	Date	Comments:
Approx. 1.0'			

Grass
0.5-1.0' Sand, medium grained, gravel, dark grey loose, wet, moderate gasoline odor.

Groundwater at approximately 1.0'

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Blaes
Installation Data: Backfill with Enviroplug

Boring No: AD-18
Date: 1-17-90
Driller: D. Alford
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 4.5'			
0				Sample @ 0.5-1.0'	sc				0.5-1.0' Sand, clayey, brown, slightly cohesive, moist, no odor
1					sc				1.0-4.0' Sand, medium grained, clayey, brown to grey, organic debris, medium dense, moist, moderate diesel odor at 2.0-3.0'
2									
3									
4				Sample @ 4.0-5.0'	sc				4.0-4.5' Sand, medium grained, clayey, grey to black, moderate to slight diesel odor.
5	TD = 4.5'								

Groundwater at approximately 4.5'

LOG OF
EXPLORATORY BORING

Location of boring:

Project No: 05-487-001
Client: American Distributing Co.
Location: Bulk Terminal-Everett, WA
Logged by: D. Blaes
Installation Data: Backfill with Enviroplug

Boring No: AD-19
Date: 1-17-90
Driller: D. Blaes
Drilling Method: Hand Auger
Hole Diameter: 2"
Page No: 1 of 1

Depth (ft)	Graphic Log	Blow/ft	Vapor Concentration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comments:
						Approx. 1.5'			
0									Grass
				Sample @ 0.5-1.0'	sp				0.5-1.0' Sand, fine to medium grained, grey to black, loose, moist, moderate diesel odor.
1				Sample @ 1.0-1.5'					1.0-1.5' Sand, fine to medium grained, grey to black, loose, moist, soil saturated with diesel fuel oil. (probable free product on groundwater surface)
2	TD = 1.5'								
3									
4									Groundwater at approximately 1.5'
5									

TEST PIT LOGS

Depth (feet)	Soil Classification	11-04558-04
	Test Pit TP-1	
0.0 - 0.5	Gravel surface	
0.5 - 1.5	Loose, wet, dark grayish-brown, silty SAND with gravel (Fill)	
1.5 - 3.5	Loose, wet to saturated, gray, coarse SAND with gravel	
	Strong petroleum-like odor and black oily staining observed;	
	Test pit terminated at approximately 3.5 feet	
	Moderate groundwater and liquid petroleum hydrocarbon seepage below 3 feet	
	Field FT-IR analysis indicated > 4,600 ppm TPH at 3 foot depth	
	Test Pit TP-2	
0.0 - 0.5	Gravel surface; old A/C at 0.5 feet	
0.5 - 4.0	Loose, wet to saturated, gray, coarse SAND with gravel	
	No unusual odors or staining observed;	
	Test pit terminated at approximately 4.0 feet	
	Moderate groundwater seepage observed below 3.5 feet	
	A large block of concrete encountered at a depth of approximately 1 foot	
	Field FT-IR analysis indicated 30 ppm TPH at 3.5 foot depth	
	Test Pit TP-3	
0.0 - 0.5	Gravel surface old A/C at 0.5 feet	
0.5 - 4.0	Loose, wet to saturated, gray, coarse SAND with gravel	
	Test pit terminated at approximately 4.0 feet	
	Moderate groundwater seepage observed below 3.5 feet	
	Slight surface sheen observed on groundwater emanating from the east side of the test pit	
	Field FT-IR analysis indicated 80 ppm TPH at 3.5 foot depth	

Depth (feet)	Soil Classification
	Test Pit TP-4
0.0 - 0.5	Gravel surface
0.5 - 4.0	Loose, wet to saturated, gray, coarse SAND with gravel
	Test pit terminated at approximately 4.0 feet
	Moderate groundwater seepage observed below 3.5 feet
	No unusual odors or staining observed
	Field FT-IR analysis indicated 30 ppm TPH at 3.5 feet
	Test Pit TP-5
0.0 - 0.5	Gravel surface
0.5 - 4.0	Loose, wet to saturated, gray, coarse SAND with gravel
	Test pit terminated at approximately 4.0 feet
	Moderate groundwater seepage observed below 3.5 feet
	No unusual odors or staining observed
	Field FT-IR analysis indicated 50 ppm TPH at 3.5 feet

Date excavated: 8 December 1993 Logged by: TJP

Backhoe Test Pit Logs

TP-1-96
Gray, moist to wet, silty SAND with gravel and some cobbles. Met with refusal at a depth of approximately 3.0 feet due to buried concrete. Slow seepage observed at approximately 1.5 feet. Soil exhibits a petroleum hydrocarbon-like odor. After approximately 1.5 hours, discontinuous blebs of LPH were observed on the water accumulated in the test pit.

TP-2-96
Brown, moist to wet, silty SAND with gravel and some wood and metal debris; becomes gray below approximately 1.0 feet. Slow seepage observed at approximately 1.0 feet and again below approximately 4.0 feet. Soil exhibits a petroleum hydrocarbon-like odor. After approximately 1.5 hours, discontinuous blebs of LPH were observed on the water accumulated in the test pit. Test pit terminated at approximately 4.5 feet.

TP-3-96
Gray, moist, gravelly SAND with some silt with scattered wood and brick debris. Underlain at approximately 4.0 feet by gray, wet to saturated, cohesive, silty, fine to medium SAND. Slow seepage observed at approximately 1.5 feet. Moderate seepage observed below a depth of approximately 6.0 feet. Soil exhibits a petroleum hydrocarbon-like odor. No LPH observed; sheen present of water accumulated in the test pit. Test pit terminated at approximately 6.5 feet.

Logged by TJP
5/23/96

Backhoe Test Pit Logs

TP-4-96
Brown, moist to wet, silty SAND with some gravel; becomes gray with a petroleum hydrocarbon-like odor below 2.5 feet. Slow seepage observed below approximately 5.0 feet. Discontinuous blebs of LPH observed on the groundwater accumulated in the bottom of the test pit. Test pit terminated at approximately 6.0 feet.

TP-5-96
Brown, moist to wet, silty SAND with some gravel with some brick and glass debris; becomes gray with a petroleum hydrocarbon-like odor below 2.5 feet. Slow seepage observed below approximately 5.0 feet. Encountered a 4-inch diameter clay pipe at approximately 4.5 feet. LPH and water drained from the pipe for approximately 10 to 15 minutes after digging through the pipe. Discontinuous blebs of LPH observed on the groundwater accumulated in the bottom of the test pit. The LPH appeared to originate from both seepage from the soil and infiltration from the broken clay pipe. Test pit terminated at approximately 6.0 feet.

TP-6-96
Brownish-gray, moist to wet, silty SAND with gravel and wood debris; becomes gray with a petroleum hydrocarbon-like odor below approximately 2.0 feet. Moderate to rapid LPH and groundwater seepage observed below approximately 4.0 feet. Approximately 0.02 feet of LPH accumulated as a continuous layer on top of groundwater pooled inside of the test pit. Test Pit terminated at approximately 6.0 feet.

TP-7-96
Moist to wet, dark brown to black, SAND with some silt and gravel; strong petroleum hydrocarbon-like odor observed. Moderate LPH and groundwater seepage observed below 3.0 feet. LPH accumulated as a continuous layer on top of the groundwater pooled in the test pit. LPH thickness was approximately 0.10 feet. Test pit terminated at approximately 4.0 feet.

Logged by TJP
06/06/96

APPENDIX D

SELECTED GEOTECHNICAL BORING LOGS

LOG OF BORING NO. DM-7-99

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **December 8, 1999**
DATE COMPLETED: **December 8, 1999**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER: **Scott Kruger**
DRILLING METHOD: **Hollow Stem Auger to Mud Rotary**
SAMPLING METHOD: **D&M U, 300lb hammer, 30" drop**

WATER LEVEL: ▼ **7.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **45.00 ft**
WEATHER: **Light rain**
FIELD ENGINEER: **BBS**
CHECKED BY:

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- [B] Bag Sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0			brown woody debris mixed in with brown silty SAND (FILL)	
18				7		13	5	SM		Dark to reddish brown medium to fine SAND with trace silt and fine gravel (loose to medium dense with depth)(wet)	
							▼			Petroleum Odor Detected in samples 1, 2, 3 (0 - 15 feet below ground surface) PID = 0	
18	6.3	108	12.7	11		8	10				
18				6		3	15				
18	5.4	79.7	20.4	17		2	20				
18				22		7	25	ML		Gray SILT with some medium sand and trace gravel (hard)(low plasticity)	
						12	30				

NOTES: **PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons**

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

LOG OF BORING DM-7-99

FIGURE A-9.1

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**

FIELD ENGINEER: **BBS**
CHECKED BY:

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Bag sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION(ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
18		119.2	25.8	81		12	30				
								SM		Brown medium SAND with some silt and trace of fine gravel (very dense)(wet)	
12		107.2	15	50/6"		17	35				
18		109.8	11.4	68		22	40				
10				100/10"		27	45			End of Boring at 46 feet below ground surface Ground water encountered at 7 feet below ground surface	

NOTES: **PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons**

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

LOG OF BORING DM-7-99

FIGURE A-9.2

LOG OF BORING NO. DM-8-99

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **December 1, 1999**
DATE COMPLETED: **December 1, 1999**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER: **Scott Kruger**
DRILLING METHOD: **Hollow Stem Auger to Mud Rotary**
SAMPLING METHOD: **D&M U, 300lb hammer, 30" drop**

WATER LEVEL: ▼ **5.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH: **50.00 ft**
WEATHER: **Overcast, light rain**
FIELD ENGINEER: **BBS**
CHECKED BY:

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0			Asphalt	
								SM/ ML		Black SAND with some silt and trace fine gravel (fill)(very loose)(wet)	
										Petroleum Odor Detected in samples 1, 2 (0 - 10 feet below ground surface) PID = 0	
18	19.6			2		13	5				
								SM		Reddish brown medium SAND with some gravel and trace silt (very dense)(wet)	
18	5.1			5		8	10				
18		78	13.9	52		3	15				
18		119.3	18.9	87		-2	20				
18		111.3	15.5	95		-7	25				
						-12	30				

NOTES: **PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons**

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

LOG OF BORING DM-8-99

FIGURE A-10.1

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**

FIELD ENGINEER: **BBS**
CHECKED BY:

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION(ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
9		113.1	14.3	50/3"	■	~12	30				
6				50/6"	⊠	~17	35				
								ML		Gray SILT with trace fine to medium sand and fine gravel (very stiff)	
18				29	⊠	~22	40				
18	90.2			36	⊠	~27	45				
								SM		Gray fine to medium SAND with some silt (very dense)(wet)	
18				50/6"	■	~32	50				
										End of Boring at 51.5 feet below ground surface Ground water encountered at 5 feet below ground surface	

NOTES: **PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons**

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

LOG OF BORING DM-8-99

FIGURE A-10.2

MONITORING WELL NO. DM-6-99

PROJECT: California Street Overcrossing
PROJECT NO: 04333-041-189
PROJECT LOCATION: Everett, WA
CLIENT NAME: Port of Everett
DATE STARTED: December 6, 1999
DATE COMPLETED: December 6, 1999
DRILLING CONTRACTOR: Cascade Drilling
DRILLER: Scott Kruger
DRILLING METHOD: Hollow Stem Auger to Mud Rotary
SAMPLING METHOD: D&M U, 300lb hammer, 30" drop

WATER LEVEL: ▼0.00 ft
ELEVATION: +20.00
TOTAL DEPTH: 55.00 ft
WEATHER: Overcast, light rain
FIELD ENGINEER: BBS
CHECKED BY:

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	DESCRIPTION
						20.0	0	SM/ML	Blackish Brown fine sandy SILT with trace gravel (possible fill)(soft)(moist)
18	15	99.6	25.3	1	Relatively undisturbed	15.0	5	SM	Gray brown medium to fine SAND with trace to some silt and fine gravel (medium dense)(wet) Petroleum Odor Detected in samples 1, 2 (0 - 10 feet below ground surface) PID = 0
18		103.1	16.5	14	Relatively undisturbed	10.0	10		
18	3.1	126.6	13.6	56	Relatively undisturbed	5.0	15		
18				55	Relatively undisturbed	0.0	20		
18	14.3	90.8	14.3	14	Relatively undisturbed	-5.0	25		
								ML	Dark gray SILT with some fine sand (very stiff)(low plasticity)
						-10.0	30		

WELL CONSTRUCTION DETAIL & REMARKS: ELEVATION AT +20.00

NOTES: PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

WELL SYMBOL KEY:
- Bentonite grout
- Bentonite plug
- Filter Pack
- Well screen
- Concrete plug

MONITORING WELL DM-6-99

FIGURE A-8.1

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**

FIELD ENGINEER: **BBS**
CHECKED BY:

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag sample

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION(ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	WELL CONSTRUCTION DETAIL & REMARKS
						10.0	30				ELEVATION
18		103.6	18.9	26							
								SM		Brown medium SAND with some silt and trace gravel (very dense)(wet)	
18		93.1	20.2	88 for 11		15.0	35				
								SP		Gray brown medium SAND with trace silt and fine gravel (very dense)(wet)	
18				88 for 11		20.0	40				
18		109.4	20.1	96 for 11		25.0	45				-25.00
12				50 for 5'		30.0	50				
12				50 for 5'		35.0	55				-35.00
										End of boring at 56 feet below ground surface Ground water encountered 6 feet below ground surface	

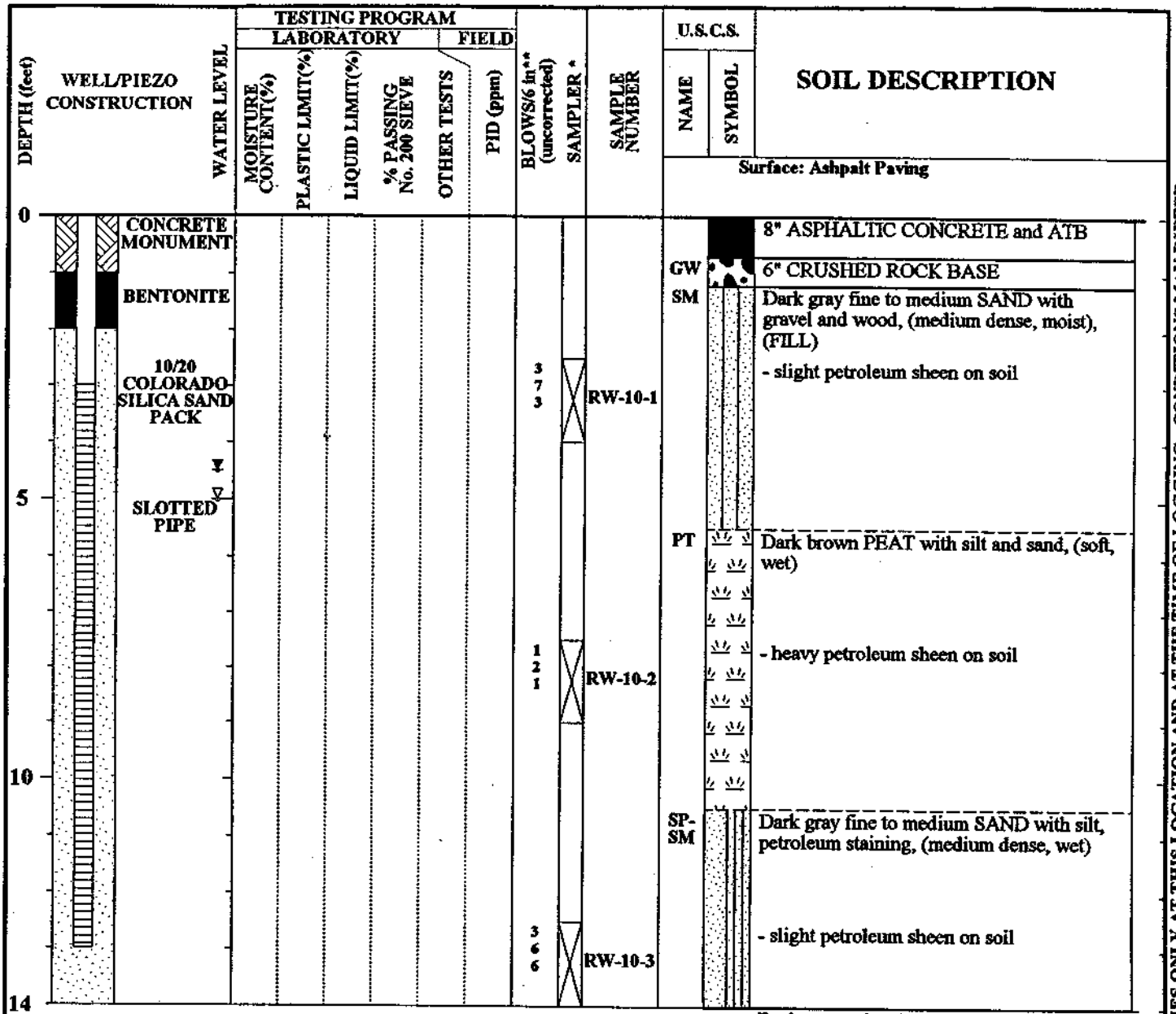
NOTES: **PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons**

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

WELL SYMBOL KEY:
- Bentonite grout
- Bentonite plug
- Filter Pack
- Well screen
- Concrete plug

MONITORING WELL DM-6-99

FIGURE A-8.2



Boring completed at 14' on 10/01/99.
Groundwater encountered at 5' bgs during drilling and at 4.5' before developing well.
Developed / purged 10 gallons until water turned clear.

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

BY: _____ APPROV: _____

DATE DRILLED: 10-1-99
LOGGED BY: S. Lewis
REVIEWED BY: Jim Schmidt

SURFACE ELEVATION (feet):
TOTAL DEPTH (feet): 14.0
DIAMETER OF BORING (in): 8 OD

DRILLING METHOD: Mobile B-59
DRILLER: Holt Drilling
CASING SIZE: 2" DIAMETER WELL

KLEINFELDER
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
SOILS AND MATERIALS TESTING

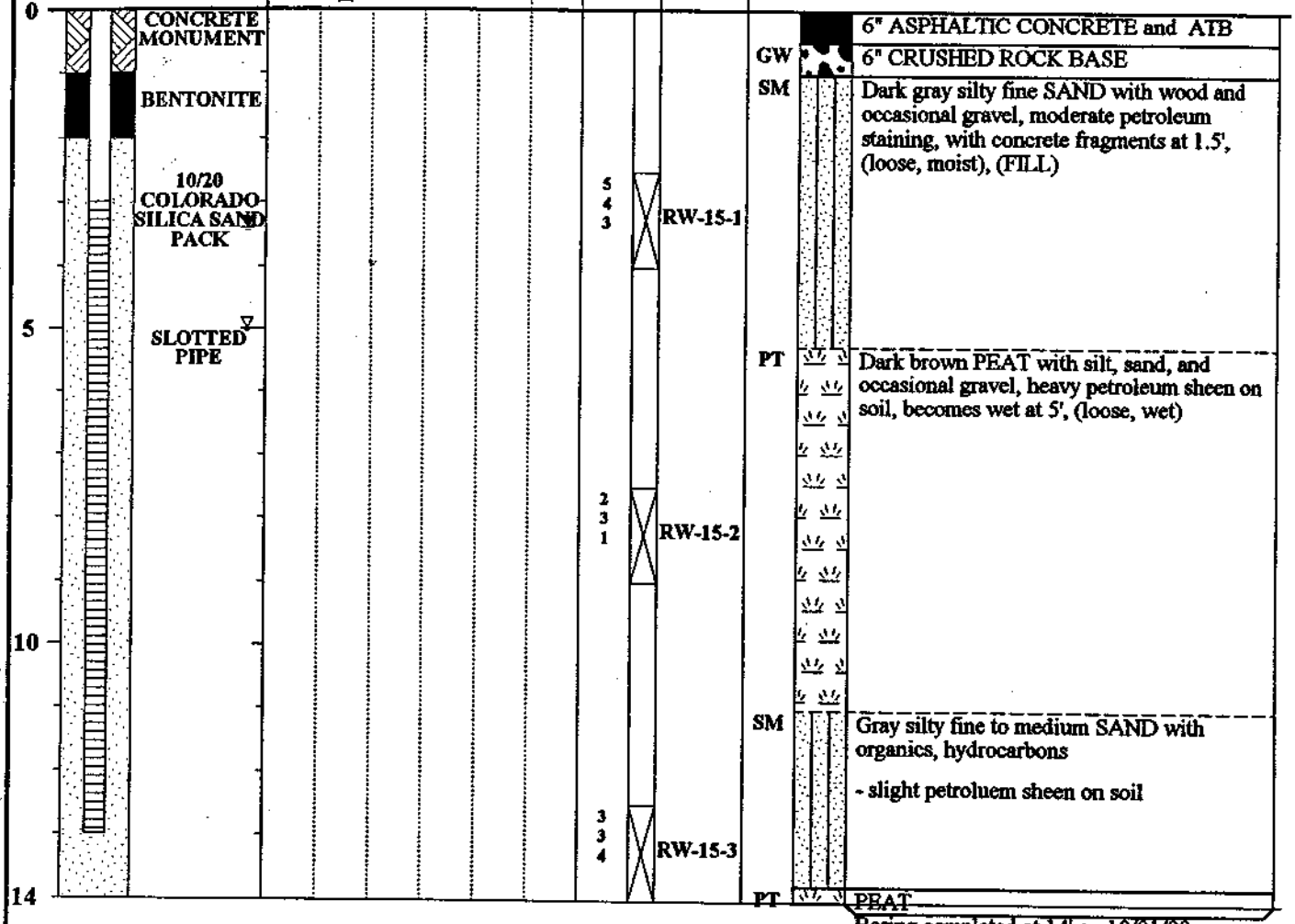
PROJECT NUMBER: 60-1914-01

Mobile
Everett, Washington

BORING LOG
RW-10

FIGURE
A - 2

PAGE 1 of 1



Boring completed at 14' on 10/01/99. Groundwater encountered at 5' bgs during drilling and at 3.4' before developing well. Developed / purged 10 gallons from well until water turned clear.

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

APPROV: _____

BY: _____

DATE DRILLED: 10-1-99
LOGGED BY: S. Lewis
REVIEWED BY: Jim Schmidt

SURFACE ELEVATION (feet):
TOTAL DEPTH (feet): 14.0
DIAMETER OF BORING (in): 8 OD

DRILLING METHOD: Mobile B-59
DRILLER: Holt Drilling
CASING SIZE: 2" DIAMETER WELL

KLEINFELDER
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
SOILS AND MATERIALS TESTING

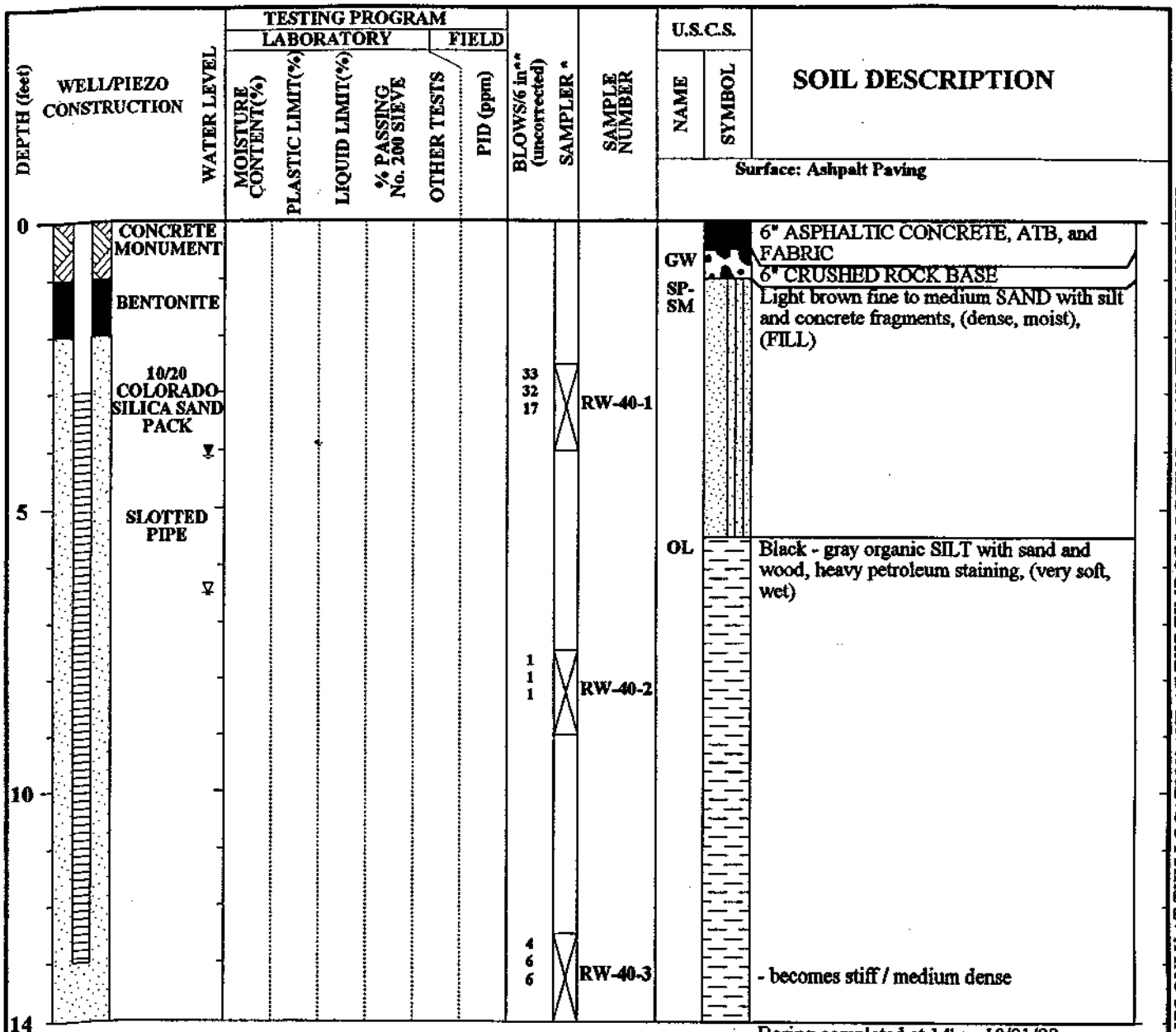
PROJECT NUMBER: 60-1914-01

Mobile
Everett, Washington

BORING LOG
RW-15

FIGURE
A - 3

PAGE 1 of 1



DATE DRILLED: 10-1-99
LOGGED BY: S. Lewis
REVIEWED BY: Jim Schmidt

SURFACE ELEVATION (feet):
TOTAL DEPTH (feet): 14.0
DIAMETER OF BORING (in): 8 OD

DRILLING METHOD: Mobile B-59
DRILLER: Holt Drilling
CASING SIZE: 2" DIAMETER WELL

KLEINFELDER
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS
SOILS AND MATERIALS TESTING

PROJECT NUMBER: 60-1914-01

Mobile
Everett, Washington

BORING LOG
RMW-40

FIGURE
A - 4

PAGE 1 of 1

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

APPROV: _____

BY: _____

APPENDIX B
BORING LOGS

LOG OF BORING NO. UG-1

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 25, 2000**
DATE COMPLETED: **September 25, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **4.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **12.00 ft**
WEATHER:
FIELD ENGINEER: **T. Parkington**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0			Asphaltic Concrete.	
								GP		Gravel subgrade	
								PT		Dark brown silty peat	PID = 3 ppm
							▼ 5				PID = 24 ppm
						13		SM		Black silty sand with some woody peat	
								SM		Brown sand with some silt. h.c. odor	PID = 2 ppm
						8	10			Brown gray sand, wet.	PID = 0 ppm No odor
										Boring completed at 12 feet. Backfilled with Bentonite. Ground water at 4 feet bgs.	

NOTES:

URS

LOG OF BORING UG-1

FIGURE G 1

LOG OF BORING NO. UG-2

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 25, 2000**
DATE COMPLETED: **September 25, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **3.00 ft**
ELEVATION: **16 ft**
TOTAL DEPTH: **17.00 ft**
WEATHER:
FIELD ENGINEER: **T. Parkington**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						16	0			Asphaltic Concrete.	
								OL		Black organic silt	
								SM		Black silty sand. Strong odor.	PID = 200 ppm
						11	5	PT		Black woody peat	Very oily. PID = 200 ppm GW sample taken PID = 300 ppm
						6	10				PID = 12 ppm
						1	15	SM		Brown silty sand.	PID = 0 ppm
										Boring completed at 17 feet. Backfilled with bentonite. Ground water at 3 feet	

NOTES:

URS

LOG OF BORING UG-2

FIGURE G 2

LOG OF BORING NO. UG-3

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 25, 2000**
DATE COMPLETED: **September 25, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **5.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **14.50 ft**
WEATHER:
FIELD ENGINEER: **T. Parkington**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B — Bag Sample
- P — Pocket Penetrometer
- V — Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0				
								GP		Asphaltic Concrete.	
										Gravel subgrade	
								SM		Gray brown silty sand	PID = 0 ppm
						13	5 ▼	SM		Red-tan silty sand	PID = 0 ppm
								SM/ ML		Brown silty sand / sandy silt with lenses of woody peat.	PID = 1 ppm
						8	10				
											No evidence of hydrocarbons in water on rods
										Boring completed at 14.5 feet. Backfilled with bentonite. Groundwater at 5 feet bgs.	

NOTES:

URS

LOG OF BORING UG-3

FIGURE G 3

LOG OF BORING NO. UG-4

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 25, 2000**
DATE COMPLETED: **September 25, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **4.00 ft**
ELEVATION: **20 ft**
TOTAL DEPTH: **14.50 ft**
WEATHER:
FIELD ENGINEER: **T. Parkington**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B — Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						20	0	GP		Gravel	
					X			SM		Brown sand with some silt and gravel. No odor	PID = 0 ppm
					X	15	5 ▼	ML		Gray silt	PID = 0 ppm
					X			SM		Brown sand with some silt	PID = 0 ppm
					X	10	10				
					X					Boring completed at 14.5 feet. Backfilled with bentonite. Groundwater at 4 feet.	

NOTES:

LOB3 K:\163\04333--1\GEOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/3/00 Seattle, WA 98121

URS

LOG OF BORING UG-4

FIGURE G 4

LOG OF BORING NO. UG-5

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 25, 2000**
DATE COMPLETED: **September 25, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **6.00 ft**
ELEVATION: **19 ft**
TOTAL DEPTH : **12.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						19	0	GP		Gravel	
								SM		Brown silty sand with trace gravel. No odor.	PID = 0 ppm
						14	5 ▼				PID = 0 ppm
								SM		Gray silty sand	PID = 0 ppm
								SM		Dark brown silty sand with trace gravel and wood fragments.	
						9	10				PID = 0 ppm
										End of boring at 12 feet. Backfilled with bentonite. Ground water at 6 feet bgs.	

NOTES:

LOB3 K:\1163\04333--1\GEOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/3/00 Seattle, WA 98121

URS

LOG OF BORING UG-5

FIGURE G 5

LOG OF BORING NO. UG-6

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **5.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **12.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0	SM/ GM		Brown silty gravel and sand	
								SM		Gray silty sand, some gravel. No odor.	PID = 0 ppm
						13	▼			Traces of brown color	PID = 0 ppm
										Some wood fragments.	PID = 0 ppm
						8	10	SP		Brown sand, silt and gravel.	PID = 0 ppm
										End of boring at 12 feet. Backfilled with bentonite. Ground water at 5 feet bgs.	

NOTES:

URS

LOG OF BORING UG-6

FIGURE G 6

LOG OF BORING NO. UG-7

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **2.00 ft**
ELEVATION: **16 ft**
TOTAL DEPTH : **12.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						16	0			Asphaltic Concrete.	
								SM		Dark brown to gray silty sand with some gravel	PID = 0 ppm
						11	5				PID = 0 ppm
										Some wood fragments	PID = 0 ppm
						6	10			Dark brown sand with some silt and gravel.	PID = 0 ppm
										End of boring at 12 feet. Backfilled with bentonite. Groundwater at 2 feet bgs.	

NOTES:

LOB3 K:\1\03\04333--1\GEOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/3/00 Seattle, WA 98121

URS

LOG OF BORING UG-7

FIGURE G 7

LOG OF BORING NO. UG-8

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **4.00 ft**
ELEVATION: **17 ft**
TOTAL DEPTH: **19.50 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						17	0	GP		Gravel	
								SM		Gray silty sand with some gravel	
								SM		Dark brown to black silty sand with some gravel and wood fragmenst.	PID = 186 ppm
						12	5 ▼			Strong odor.	
										Strong odor	PID = 180 ppm
								SM		Gray silty sand with some gravel	
										Black silty sand with some wood fragments. Strong odor	PID = 105 ppm
						7	10	PT		Black woody peat, strong odor.	
			364.4							Color grades to red with no odor.	PID = 5 ppm
											PID = 0 ppm
						2	15			Brown sand with some silt and gravel. Faint odor	
										No odor.	PID = 0 ppm
										End of boring at 19.5 feet. Backfilled with bentonite. Gound water at 4 feet bgs.	

NOTES:

LOB3 K:\1163\04333--1\GEOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/3/00 Seattle, WA 98121

URS

LOG OF BORING UG-8

FIGURE G 8

LOG OF BORING NO. UG-9

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **4.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **17.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- B Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0	GP		Gravel	
								SM		Gray silty sand with some gravel. Strong odor.	PID = 430 ppm
						13	5			Strong odor.	PID = 175 ppm
								PT		Woody peat. Strong odor.	PID = 200 ppm
						8	10			Strong odor.	PID = 375 ppm
			827.4								PID = 0 ppm
						3	15	SP		Brown sand with trace silt and some gravel. Some odor.	
										No odor	PID = 0 ppm
										End of boring at 17 feet. Backfill with bentonite. Groundwater at 4 feet bgs.	

NOTES:

LOB3 K:\1633\04333--1\GEOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/3/00 Seattle, WA 98121

URS

LOG OF BORING UG-9

FIGURE G 9

LOG OF BORING NO. UG-10

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **3.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **12.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0	GP		Gravel	
								SP		Brown to dark brown sand with some to trace silt and gravel. No odor.	PID = 0 ppm
						13	5				PID = 0 ppm
											PID = 0 ppm
						8	10				PID = 0 ppm
										End of boring at 12 feet. Backfilled with Bentonite. Groundwater at 3 feet bgs.	

NOTES:

URS

LOG OF BORING UG-10

FIGURE G 10

LOG OF BORING NO. UG-11

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **4.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH: **12.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0	GP		Gravel.	
								SP		Brown to gray sand with some to trace silt and gravel. Faint odor.	PID = 0 ppm
							▼ 5			No odor	PID = 0 ppm
						13					PID = 0 ppm
						8	10				PID = 0 ppm
										End of boring at 12 feet. Backfilled with bentonite. Groundwater at 4 feet bgs.	

NOTES:

URS

LOG OF BORING UG-11

FIGURE G 11

LOG OF BORING NO. UG-12

PROJECT: **California Street Overcrossing**
PROJECT NO: **04333-041-189**
PROJECT LOCATION: **Everett, WA**
CLIENT NAME: **Port of Everett**
DATE STARTED: **September 26, 2000**
DATE COMPLETED: **September 26, 2000**
DRILLING CONTRACTOR: **Cascade Drilling**
DRILLER:
DRILLING METHOD: **Geoprobe**
SAMPLING METHOD: **Geoprobe**

WATER LEVEL: ▼ **4.00 ft**
ELEVATION: **18 ft**
TOTAL DEPTH : **12.00 ft**
WEATHER:
FIELD ENGINEER: **B. Strickler**
CHECKED BY: **M. McCabe**

SAMPLE TYPE KEY:
- Relatively undisturbed sample
- Disturbed sample
- Sample attempt with no recovery
- SPT split spoon sample
- Bag Sample
- Pocket Penetrometer
- Vane Shear (psf)

SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
						18	0				
					X			SP		Brown sand with trace silt and gravel. No odor.	PID = 0 ppm
					X	13	5			Some wood fragments.	PID = 0 ppm
					X						PID = 0 ppm
					X	8	10				PID = 0 ppm
								PT		Woody peat	
								SP		Brown sand with trace silt and gravel.	
										End of boring at 12 feet. Groundwater at 4 feet bgs. Backfilled with bentonite.	

NOTES:

URS

LOG OF BORING UG-12

FIGURE G 12

LOB3 K:\1163\04333--1\GEOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/3/00 Seattle, WA 98121

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-1/JP-1a

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3' stainless steel split spoon
Logged By:	Kate Pineo	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	4 below ground surface
Drilling Method:	Direct Push			Total Depth:	13 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips, asphalt patch

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickenss of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0						Asphalt, gravel road base.				
1										
2		36/24		SM		Gray to brown Silt and fine Sand, some very angular fine Gravel, dry.		16.1	JP1/1.5-4.5	Began sampling at 1.5'.
				SP		Gray medium to coarse sand, mottled, moist.				
3										
4				ML		Gray Silt and Clay, wood debris, moist. Grading brown.				
5		36/27	8:15	SM		Brown fine Sand and Silt, wet.		45	JP1/4.5-7.5	
6				ML		Brown Silt and Clay, wet.				
7										
8		36/36	8:30	SM		Brown Sand and Silt with silty clay interbeds, grading black.		15	JP1/7.5-10	
9										
10		36/12	8:45	SP		Brown medium to coarse Sand, medium soft, mottled, wet.		5		Refusal at 10' bgs. Moved 6.5' west and sampled 10 - 13'.
11										
12										
13						BORING COMPLETED AT 13'				
14										
15										
16										
17										
18										
19										
20										

NOTES:

Groundwater level measured down-hole with water level indicator.

PID screening on black soil at 10' bgs = 14 ppm.

Sampled groundwater JP1/GW at 8:30. Slow recharge, very clear water.

Slight organic odor in 10 - 13' sample. Not collected for analysis.

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-2

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3' stainless steel split spoon
Logged By:	Kate Pineo	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	2.3 below ground surface
Drilling Method:	Direct Push			Total Depth:	6 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickenss of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0		36/24	9:15	ML		Brown Silt and Clay, some fine Gravel, dry.		0	JP2/0-3	
1				SM		Fine Sand and Silt, some fine Gravel, wet.				
2								0	JP2/3-6	
3		36/24	9:15			Grading brown fine to coarse Sand and fine Gravel, some Silt.				
4						Grading brown-gray fine Sand and Silt, some fine to coarse Gravel.				
5						Black fine Sand, saturated.				
6						BORING COMPLETED AT 6'				
7										
8										
9										

NOTES:

Groundwater level measured down-hole with water level indicator.

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-3

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3' stainless steel split spoon
Logged By:	Kate Pinto	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	2.5 below ground surface
Drilling Method:	Direct Push			Total Depth:	6 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickenss of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0		36/30	10:00	GP		Brown fine to medium Sand and fine Gravel, dry.		8.5	JP3/0-3	
				ML		Brown-gray Silt and Clay, some fine Gravel, damp.				
1										
2										
3		36/36	10:00	SM		Brown fine Sand and Silt, wet.		6	JP3/3-6	
4										
5										
6						BORING COMPLETED AT 6'.				
7										
8										
9										

NOTES:

Groundwater level measured down-hole with water level indicator.

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-4

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3' stainless steel split spoon
Logged By:	Kate Pineo	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	2 below ground surface
Drilling Method:	Direct Push			Total Depth:	10 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickness of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0		36/24	10:30	GP		Brown-gray fine Sand and Gravel, dry		280 - 300	JP4/0-3	Odor.
				SM		Gray fine Sand and Silt, some fine Gravel, dark gray ash/sinder layer, dry.				
1										
2						Grading brown fine Sand and Silt, little coarse Gravel.				
3		36/12	10:45	SP		Brown fine to coarse SAND, little coarse Gravel, wet.		270	JP4/3-6	Odor.
4										
5										
6						No sample collected.				
7										
8		24/7	10:50	SM		Gray medium Sand and Silt, wet. Red-brown wood debris noted.		5.3	JP4/8-10	
9										
						BORING COMPLETED AT 10'.				

NOTES:

Groundwater level measured down-hole with water level indicator.
Groundwater sample JP4/GW collected at 10:50.

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-5

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3" stainless steel split spoon
Logged By:	Kate Pineo	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	2 below ground surface
Drilling Method:	Direct Push			Total Depth:	6 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickness of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0		36/36	11:05	SM		Light gray fine Sand and Silt, some coarse Gravel, dry.		4.3	JP5/0-3	
1				ML		Dark gray SILT and coarse Gravel				
		36/22	11:10	SM		Brown dense fine Sand and Silt, wet, grading gray.		1.5		
2										
3						Grading brown.		5.3	JP5/3-6	
4										
5										
				SP		Black fine to medium Sand and Gravel.				
6						BORING COMPLETED AT 6'.				
7										
8										
9										

NOTES:

Groundwater level measured down-hole with water level indicator.

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-6

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3' stainless steel split spoon
Logged By:	Kate Pineo	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	2 below ground surface
Drilling Method:	Direct Push			Total Depth:	9 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickness of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0		36/24	11:50	SM		Gray-brown fine Sand and Silt, some coarse Gravel, mottled, dry.		4.3	JP5/0-3	
1										
2										
3		36/6	11:50			Grading wet.		14		Poor recovery.
4										
5										
6		36/18	11:50			Grading peat noted.		1.5	JP5/6-9	
7										
8										
9						BORING COMPLETED AT 9'.				

NOTES:

Groundwater level measured down-hole with water level indicator.

URS

SOIL BORING AND WELL INSTALLATION DATA SHEET

Boring ID: JP-7

Project Information

Project Name:	California Street Overcrossing	Location:	California St and Federal Ave
Project/Task No.:	53-04333041.00 00056	Weather:	sunny, 60F

Drilling Information

Date Started:	Thursday, June 21, 2001			Annulus Diameter:	2 inches
Date Completed:	Thursday, June 21, 2001			Hammer Weight and Drop:	NA lbs and NA inches
Drilled By:	Kasey Goble	of	Cascade Drilling	Sampler Type:	3' stainless steel split spoon
Logged By:	Kate Pineo	of	URS	Approximate Surface Elevation:	NA feet
Checked By:	Dave Raubvogel	of	URS	Groundwater Level:	2 below ground surface
Drilling Method:	Direct Push			Total Depth:	9 below ground surface
Drill Rig Type:	Truck-mounted GeoProbe			Backfill Material:	bentonite chips

Well Installation Data

Type of Well Casing:	NA	Top of PVC Elevation:	NA
Screen Perforation:	NA	Type/Thickenss of Seals:	NA
Diameter of Well:	NA	Type of Sand Pack:	NA
Screened Interval:	NA		

Depth (feet)	Blows per 6 inches	Penetration/ Recovery (inches)	Time	USCS Classification	USCS Graphic	Material Description	Well Completion Diagram	PID Readings (ppm)	Samples	Remarks
0		36/30		SM		Light brown fine Sand and Silt, some fine Gravel, dry.				Odor.
								75	JP7/1-2	
1						Grading dark gray.		20	JP7/2-3	
2				SP		Brown fine to medium Sand, little coarse Gravel, wet.				
3		36/0								No recovery.
4										
5										
6		36/24	12:20			Grading brown fine to medium Sand.		9	JP7/6-9	
7										
8										
9						BORING COMPLETED AT 9'.				

NOTES:

Groundwater level measured down-hole with water level indicator.
Groundwater sample JP7/GW collected at 12:20.

ENVIRONMENTAL RESOLUTIONS, INC.

Project No.: 31174 Boring: MW20 Plate: 1 OF 1
Site: Former Mobil Oil Terminal 46-108 Date: 07/03/02
Drill Contractor: Cascade Drilling, Inc. of Woodinville, WA
Sample Method: None Geologist: Antonio Luna
Drill Rig: CME-55 Bore Hole Diameter: 8" Signature:
Location: Southwest corner of property Registration:
in gravel next to Federal Avenue. Logged by: Antonio Luna

DEPTH (ft)	BLOW COUNTS	PID/OVM (ppm)	SAMPLE	COLUMN	USCS	GEOLOGIC DESCRIPTION	WELL DESIGN
						Removed steel well and point, backfilled with bentonite, capped with 1 foot of cement	
5						Total depth, 5 feet below ground surface	

Casing Diameter: N/A, Slot Size: N/A, Sand Size: N/A, Grout: N/A

FN: 31174B0020

ENVIRONMENTAL RESOLUTIONS, INC.

Project No.: 31174 Boring: MW21 Plate: 1 OF 1
Site: Former Mobil Oil Terminal 46-108 Date: 07/03/02
Drill Contractor: Cascade Drilling, Inc. of Woodinville, WA
Sample Method: None Geologist: Antonio Luna
Drill Rig: CME-55 Bore Hole Diameter: 10" Signature:
Location: Southwest corner of property Registration:
in gravel next to Federal Avenue. Logged by: Antonio Luna

DEPTH (ft)	BLOW COUNTS	PID/OVM (ppm)	SAMPLE	COLUMN	USCS	GEOLOGIC DESCRIPTION	WELL DESIGN
						Removed schedule 40 PVC well casing, overdrilled to remove seal and sand pack, backfilled with bentonite, capped with 1 foot of cement	
5						Total depth, 6 feet below ground surface	

Casing Diameter: N/A, Slot Size: N/A, Sand Size: N/A, Grout: N/A

FN: 31174B002I

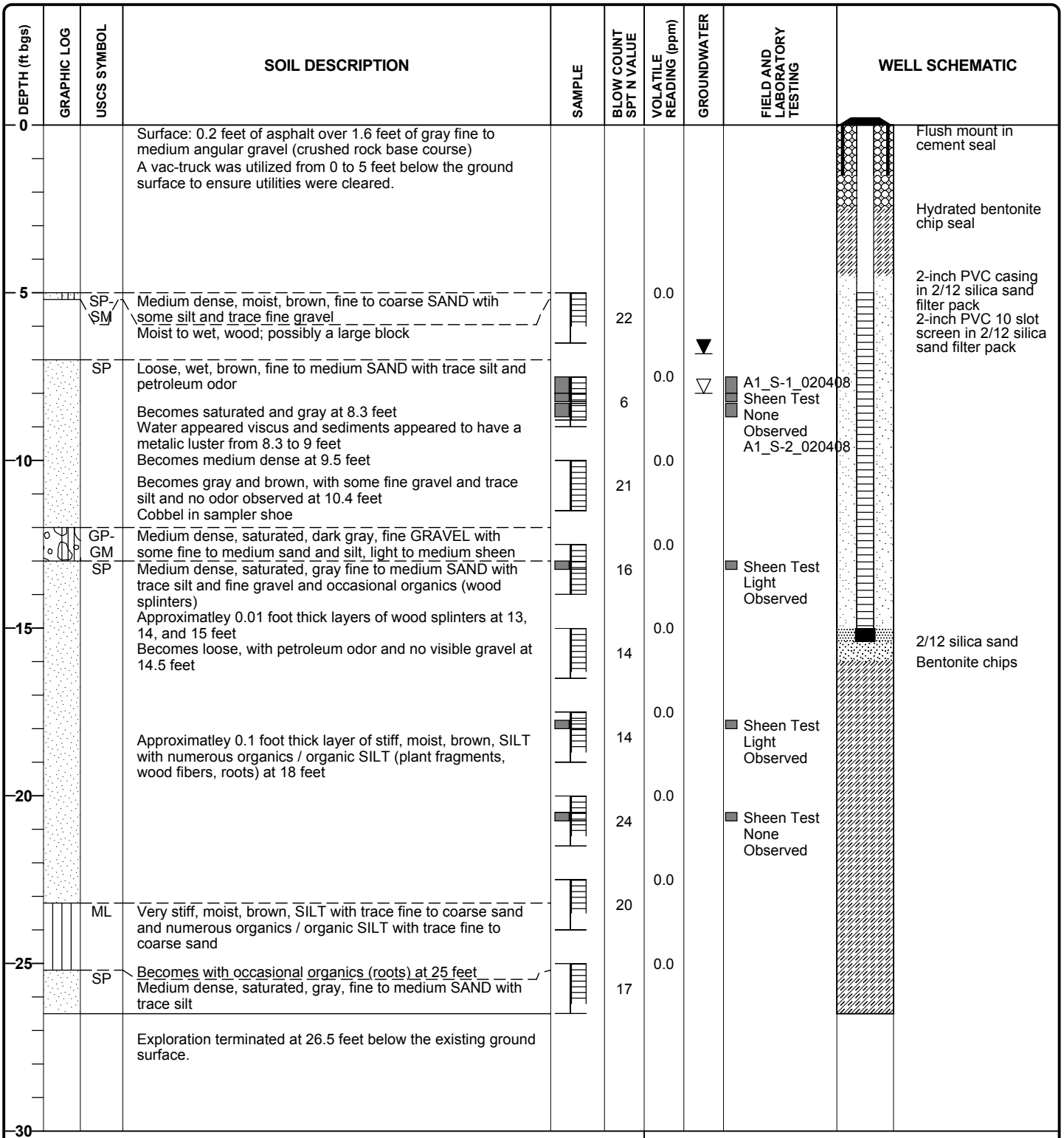
ENVIRONMENTAL RESOLUTIONS, INC.

Project No.: 31174 Boring: Unknown Plate: 1 OF 1
Site: Former Mobil Oil Terminal 46-108 Date: 07/03/02
Drill Contractor: Cascade Drilling, Inc. of Woodinville, WA
Sample Method: None Geologist: Antonio Luna
Drill Rig: CME-55 Bore Hole Diameter: 10" Signature:
Location: Southwest corner of property Registration:
in gravel next to Federal Avenue. Logged by: Antonio Luna

DEPTH (ft)	BLOW COUNTS	PID/OVM (ppm)	SAMPLE	COLUMN	USCS	GEOLOGIC DESCRIPTION	WELL DESIGN
						Well overdrilled to remove well casing, seal, and sand pack, backfilled with bentonite, capped with 1 foot of cement	
5						Total depth, 6 feet below ground surface	

Casing Diameter: N/A, Slot Size: N/A, Sand Size: N/A, Grout: N/A

FN: 31174Bunk



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: CME
CONTRACTOR: Cascade Drilling, Inc./Scott
LOGGED BY: LME

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BAB238
DRILLING DATES: 02/04/2008 - 02/04/2008

REMARKS:

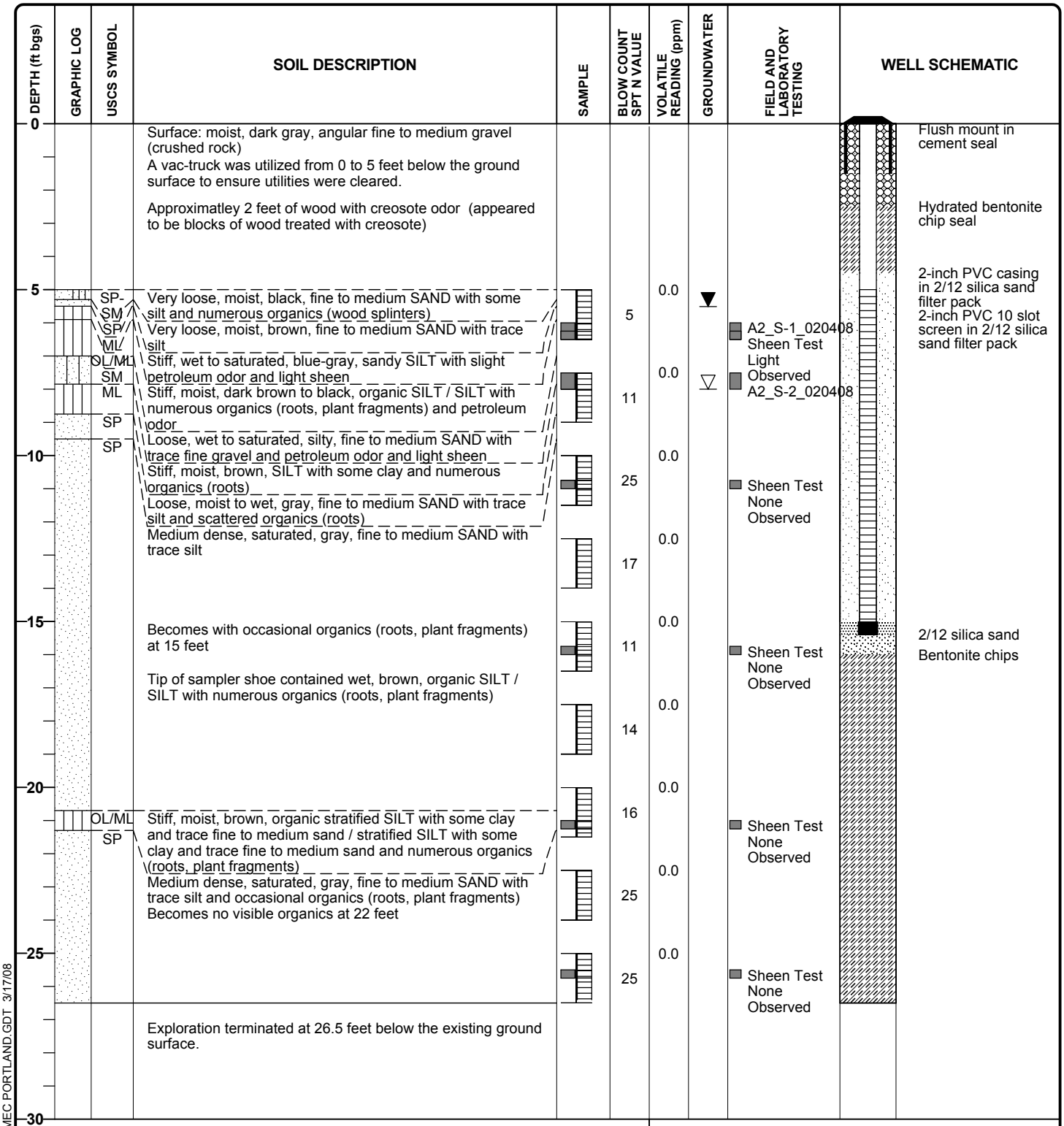
ENVR+WELL BORING FEDERALAVENUE.GPJ AMEC_PORTLAND.GDT 3/17/08

ExxonMobil / American Distributing Company

7-915-15716-B

AMEC Earth and Environmental, Inc.
11335 NE 122nd Way, Suite 100
Kirkland, Washington
USA 98034
Tel (425) 820-4669
Fax (425) 821-3914

LOG OF BORING MWA1



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: CME
CONTRACTOR: Cascade Drilling, Inc./Scott
LOGGED BY: LME

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BAB237
DRILLING DATES: 02/04/2008 - 02/04/2008

REMARKS:

ENVR+WELL BORING FEDERALAVENUE.GPJ AMEC_PORTLAND.GDT 3/17/08

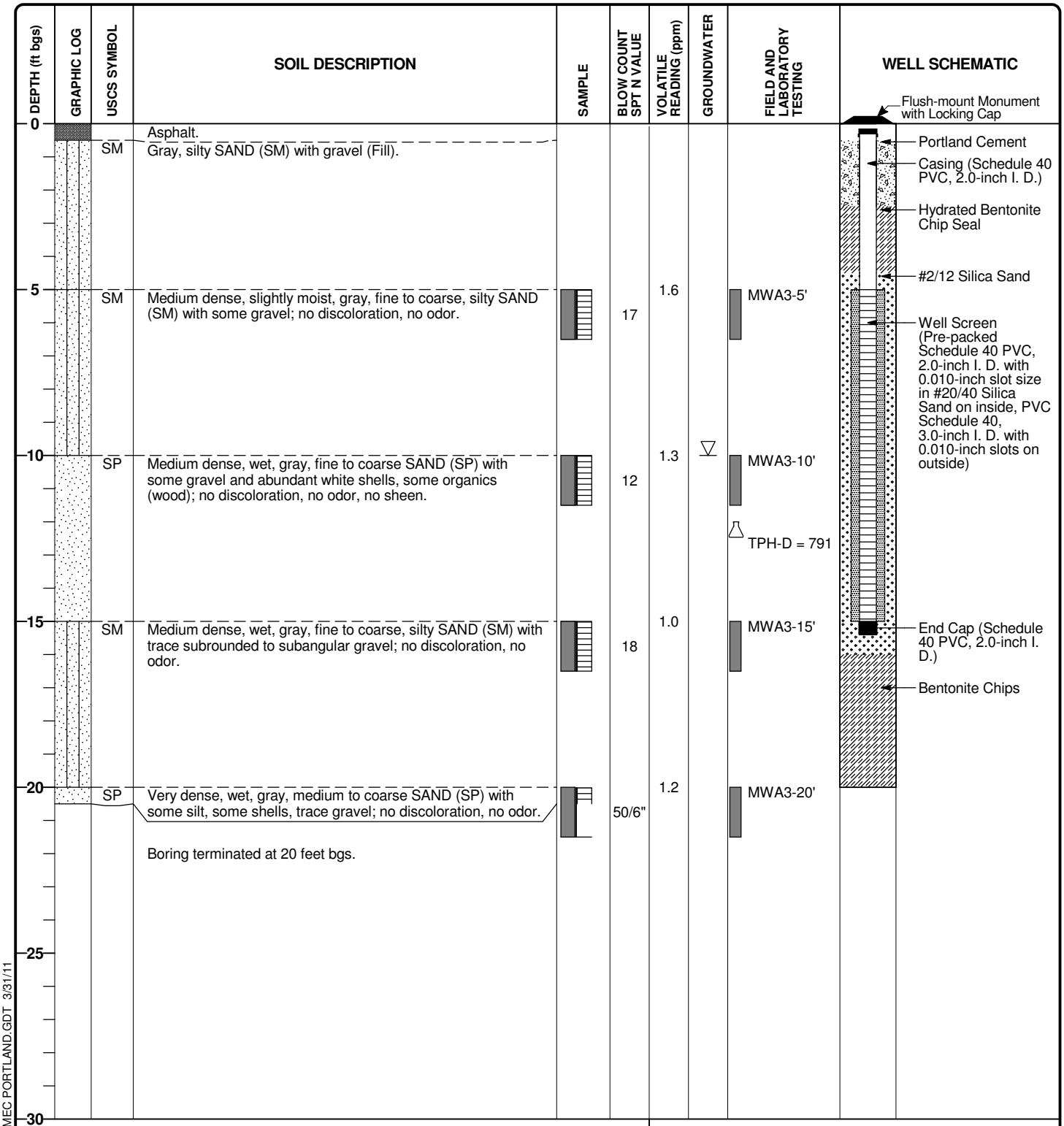
ExxonMobil / American Distributing Company

7-915-15716-B

AMEC Earth and Environmental, Inc.
11335 NE 122nd Way, Suite 100
Kirkland, Washington
USA 98034
Tel (425) 820-4669
Fax (425) 821-3914

LOG OF BORING MWA2

AGENCY DRAFT



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 305
DRILLING DATES: 6/23/2010 - 6/24/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

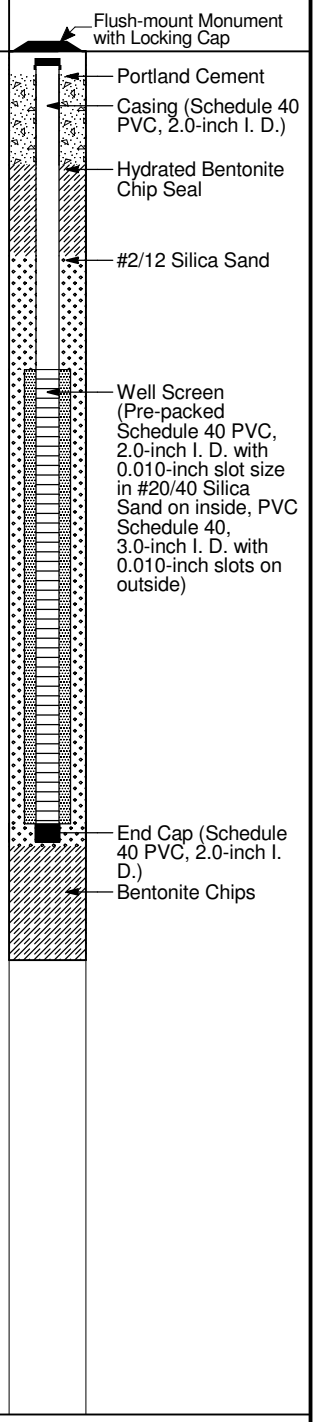
amec

LOG OF BORING MW-A3

AGENCY DRAFT

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
0	SM	Asphalt (0.3 feet). Silty SAND (SM) with gravel (Fill).			
5	SM	Medium dense, slightly moist, gray, fine to coarse, silty SAND (SM) with some gravel; no discoloration, no odor.	16	4.3	MW-A4-5'
10		Moist to wet; no discoloration, no odor, no sheen.	21	4.5	MW-A4-10'
15		Same as above. wood (< 1 inch); petroleum hydrocarbon-like odor.	26	6.7	MW-A4-15' TPH-D = 667; TPH-O = 515
20	SP	Medium dense, wet, gray, medium to coarse SAND (SP) with some silt and gravel, some organics (wood), abundant shells; no discoloration, no odor.	26	4.6	MW-A4-20'
25		Boring terminated at 20 feet bgs.			
30					

GROUNDWATER



WELL SCHEMATIC

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 306
DRILLING DATES: 6/22/2010 - 6/24/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

ExxonMobil / American Distributing Company

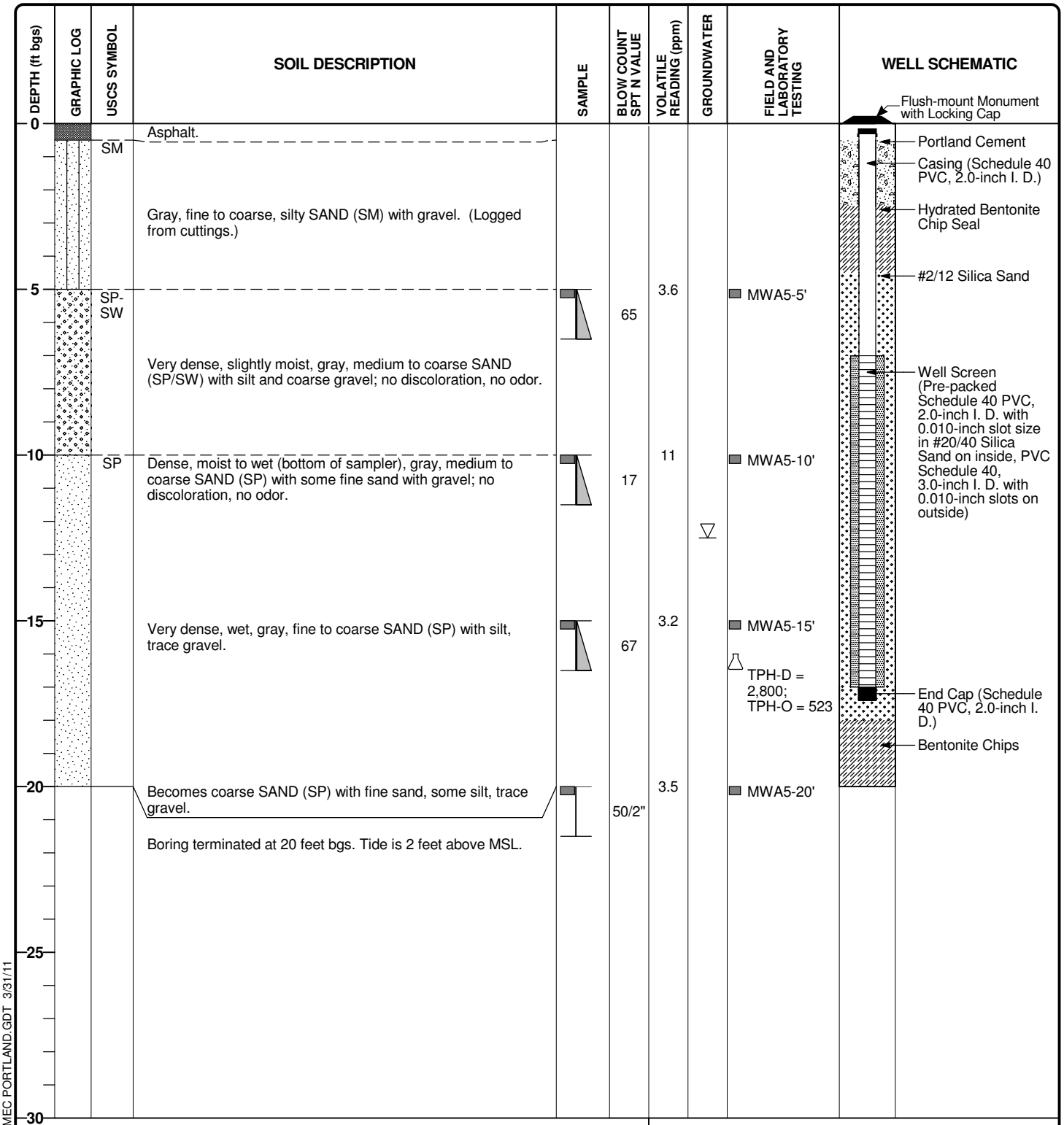
1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

amec

LOG OF BORING MW-A4

AGENCY DRAFT



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 301
DRILLING DATES: 6/23/2010 - 6/24/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

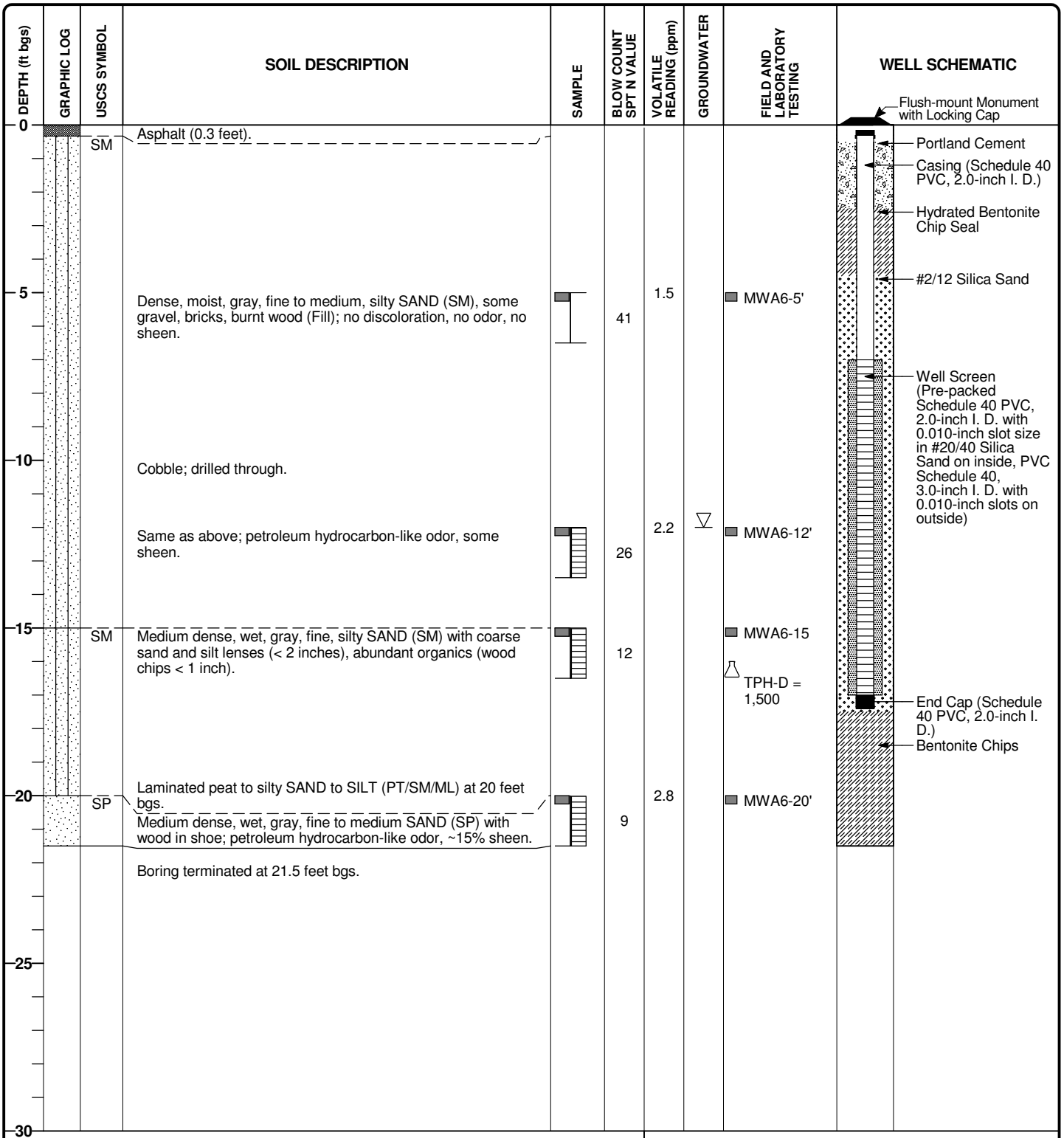
ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

LOG OF BORING MW-A5

AGENCY DRAFT



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 304
DRILLING DATES: 6/25/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

LOG OF BORING MW-A6

AGENCY DRAFT

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
0			No samples collected, for lithology descriptions refer to MW-7AB boring log.						Flush-mount Monument with Locking Cap; Portland Cement; Casing (Schedule 40 PVC, 2.0-inch I. D.); Medium Bentonite Chips; #2/12 Silica Sand; Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with 0.010-inch slot size in #20/40 Silica Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside); End Cap (Schedule 40 PVC, 2.0-inch I. D.)
5									
10									
15			Boring terminated at 15 feet bgs.						
20									
25									
30									

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BLT 570
DRILLING DATES: 12/2/2010

REMARKS:

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

amec

LOG OF BORING MW-A7

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	TESTING AND LABORATORY DATA
0	SP	Surface: 0.3 feet of asphalt over 0.5 feet asphalt base. Wet, olive-brown, medium to coarse SAND (SP) with some fine sand and silt; no discoloration, no odor.		61	▽	MW-7A-1 11/30/10
		Very loose.	2	3.2 - 6.1		S-1
		Becomes fine to coarse SAND (SP).	2			S-2
5			2	12		S-3
		No recovery. Driller reports very loose SAND.	0			
		No recovery.	0			
10	SM	Very loose, wet, olive to brown, fine to coarse, silty SAND (SM), organics.	10			S-5
	SM-SP	Medium dense, wet, yellow to yellow-brown, fine to coarse, silty SAND (SM/SP), trace gravel.	19	23 - 30		MW-7AB-12 12/1/10 S-6
		Sand increases.	25	80		S-7
				7.0		S-8
15	SM	Dense, wet, brown to olive-brown, fine to coarse, silty SAND (SM); no discoloration, no odor.	42	1.3		S-9
		Becomes, moist, iron oxidation discoloration, approximately 1 foot heave.	26	2.5		S-10
	SM	Medium dense, wet, orange-brown, fine, silty SAND (SM), trace gravel.	17			
20	SM-ML	Medium dense, moist, gray to olive-gray, fine, silty SAND to SILT (SM/ML) with iron oxidation discoloration.	18			S-11
				4.4		S-12 (Shelby)
	ML	Soft, gray SILT (ML).				
	ML	Stiff, moist, olive-gray SILT (ML) with brown, fine organics.	63	0.0		S-13
25	SP	Very dense, wet, olive, fine to coarse SAND (SP) with some silt, trace gravel, micaceous; no discoloration, no odor.	94			S-14
		Gravel increases in last 6 inches of sampler shoe.	56	1.5 - 2.5		S-15
		Becomes with gravel.		7.0		S-16
		Becomes with trace gravel.	50/6"			
30		Lenses of moist, brown, silty SAND (SM) with brown, very fine organics (approximately 4 inches thick).	50/5"			S-17

BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG: Hollow Stem Auger

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/30/2010 - 12/1/2010

REMARKS:
Cleared to 5 feet bgs with hand auger and vacuum truck.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

amec

LOG OF BORING MW-7AB

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SP-SM	Very dense, wet, olive, fine to coarse SAND (SP/SM) with silt and silty sand; no discoloration, no odor. No samples collected due to reported heave.		0 0 50/5"	NA			S-18
35			Boring terminated at 35.5 feet bgs; backfilled with bentonite slurry via tremmie pipe.						
40									
45									
50									
55									
60									

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 11/30/2010 - 12/1/2010

REMARKS:
Cleared to 5 feet bgs with hand auger and vacuum truck.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 3/31/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
600 University Street, Suite 1020
Seattle, Washington
USA 98101
Tel (206) 342-1760
Fax (206) 342-1761

amec

LOG OF BORING MW-7AB

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	TESTING AND LABORATORY DATA
0		Asphalt (5 inches), base gravel, CAP fabric at 1 foot bgs.				
	SM	Silty SAND (SM), wood waste; petroleum hydrocarbon-like odor from 1 to 4 feet bgs.		60		
				61		
	SM	Medium dense, moist, fine to coarse, silty SAND (SM) with gravel; gray discoloration, strong petroleum hydrocarbon-like odor.	23	50	▽	S-1
5				80		S-2
		Becomes loose; gray discoloration, strong petroleum hydrocarbon-like odor.	4			
		Becomes olive-gray; some odor.		19		S-3
			16			
				7.0		S-4
			8			
10	SM	Medium dense, wet, dark brown, fine to coarse, silty SAND with organics (decayed wood); some discoloration, slight petroleum hydrocarbon-like odor.		18		S-5
			11			
				1.5		S-6
	SP	Loose, wet, gray, fine to medium SAND (SP) with silt, some gravel and coarse sand, some fine organics.	6			
						S-7
			9	0.4		AB1-14' @1015 12/03/10
		Driller reports soft material at 14 feet bgs.				S-8 (Shelby)
15						
	SP-SM	Loose, wet, dark gray, fine to coarse SAND (SP/SM) with some silt to silty sand with fine organics; no discoloration, no odor.		0.1		S-9
			7			
				0.0		S-10
			7			
20	SP	Very loose, wet, gray, fine to coarse SAND (SP) with silt, fine organics and some decayed wood; no discoloration, no odor.				S-11
			2			
		Wood waste in sampler shoe.		0.0		S-12
		Becomes loose.	7			
		Becomes medium dense, with organics (fine wood).		0.0		S-13
			13			
				0.0		S-14
25			13			
						S-15
			19			
						AB1-27' @ 1115 12/03/10
						S-16
		Decayed wood (4 inches).	14			
		Becomes very dense, gray.				S-17
30			50/6"			

BORING METHOD: HSA
BOREHOLE DIAMETER:
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 6/22/2010 - 12/3/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-1

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SP	Very loose, wet, gray, fine to coarse SAND (SP) with silt, fine organics and some decayed wood; no discoloration, no odor. Wood (last 6 inches of sampler).		19				S-18
			Wood (last 6 inches).						S-19
		SM	Loose, wet, olive-brown, fine to medium, silty SAND (SM) with brown, fine gravel, some dark brown, decayed organics.		8				
		SP-SM	Medium dense, wet, gray, fine to medium SAND (SP/SM) with silt to silty sand, some fine gravel.		19				
35			Boring terminated at 35 feet bgs; backfilled with bentonite slurry via tremmie pipe then patched with concrete on top.						
40									
45									
50									
55									
60									

BORING METHOD: HSA
BOREHOLE DIAMETER:
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 6/22/2010 - 12/3/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-1

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
0		GW	Gravel surface.			30			
		SM	Gray, moist, fine to coarse, silty SAND (SM) with gravel (Fill); some petroleum hydrocarbon-like odor.		NA	21			
					NA	29			
					NA	61			AB1A 3.5-4.5 6/22/10
		SM	Brownish, oily discolored, silty SAND (SM), silt content increased; strong hydrocarbon-like odor.		NA	49	▽		
5		SM	Dark brown, silty SAND (SM); free product; strong petroleum hydrocarbon-like odor.		NA				
			Boring terminated at 5.5 feet bgs; backfilled with medium bentonite chips.						
10									
15									
20									
25									
30									

BORING METHOD: Hand Auger
BOREHOLE DIAMETER: 3 (in)
DRILL RIG:
CONTRACTOR: Cascade Drilling, Inc./AS
LOGGED BY: A.Speranksy

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 6/22/2010

REMARKS:
Air knife to 5 feet bgs, sampled using hand auger.

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-1A

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
0			Asphalt (0.5 feet).						
		GW	Drain gravel.						
			CAP fabric at 1.5 feet bgs.						
		SM	Silty SAND and GRAVEL (SM).						
		PT	Brown, gravel, sand, silt, wood waste, bricks (PT); strong organic odor.			2.5	▽		AB-2-4.5-5' 6/21/10
5		SM	Very loose, wet, brown, silty SAND (SM) with gravel, decayed organics; some organic odor, 50% sheen.		3	3.1			S-1
					1	27			S-2
		PT	Dark brown wood waste, organics, some silt and sand, very light material (PT); no sheen.		2	5.9			S-3
10					2	3.6			S-4
			Increasing sand content.			4.5			S-5 (Shelby)
		SP	Medium dense, wet, gray, fine to coarse SAND (SP) with silt, trace subrounded to subangular gravel; no discoloration, no odor.		12	0.0			S-6
15					10	0.0			S-7 AB-2-14 6/23/10, Dup 1
					10				S-8
			Some decayed organics.						
			Silt increases.		17				S-9
					24				S-10
20			Wood at 20.5 feet. Some organics (wood chips < 1 inch), trace gravel; no odor or sheen.		15	2.3			S-11
					28				S-12
			Becomes dense, trace organics.		40	2.7			S-13
25			No samples collected from 25 to 27 feet bgs.						
		SP	Very dense, wet, gray, fine to coarse SAND (SP) with silt, some dark brown organics (wood chips).		27	1.9			S-14
		PT	Peat (PT).			1.5			S-15
		SP	Very dense, wet, gray, fine to coarse SAND (SP) with silt, some organics (wood chips); no odor.		62				
30									

BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG:

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 6/21/2010 - 6/23/2010

REMARKS:
Air knife to 5 feet bgs for utilities clearance.

From 30 feet bgs changed to D&M sampler; field density is approximate.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-2

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SM	Dense, wet, brown, fine to coarse, silty SAND (SM) with organics (wood > 2 inches thick), 50% wood in sampler with some gravel. Changed to D & M sampler at 30 feet bgs. Heaving sand.	S-16	37	1.1			S-17
		SM	Dense, wet, yellow-brown, fine to medium, silty SAND (SM) with coarse sand, some gravel; no odor.	S-18	34	0.6			S-19
35		SP	Very dense, wet, olive-grey, medium to coarse SAND (SP), little to no fines, some gravel.	S-20	51				
		SM	Very dense, wet, yellow-brown, fine to medium, silty SAND (SM) with coarse sand, some gravel; no odor.	S-21	65	0.7			
					72				
					50/6"				
40			Boring terminated at 40 feet bgs; backfilled with medium bentonite chips and capped with concrete patch.						
45									
50									
55									
60									

BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG:

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 6/21/2010 - 6/23/2010

REMARKS:
Air knife to 5 feet bgs for utilities clearance.

From 30 feet bgs changed to D&M sampler; field density is approximate.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-2

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	TESTING AND LABORATORY DATA
0		Asphalt (5 inches); CAP fabric @ 0.5 bgs.				
	SM	Moist to wet, gray, fine to coarse, silty SAND (SM) with gravel (Fill); gray discoloration, some petroleum hydrocarbon-like odor. (Logged using a hand auger.)				
5		Medium dense, wet, olive-gray, fine to coarse, silty SAND (SM) with gravel (Fill); no discoloration, weak petroleum hydrocarbon-like odor.	18	1.1	▽	AB3-4.5-5' 6/21/10 S-1
			21	3.7		S-2
		Becomes loose with increased silt content.	9	3.7		
10			5	3.3		S-3
	SP	Very dense, wet, olive-brown SAND (SP) with silt, occasional gravel; no discoloration, no odor.	50/1"	1.4		S-4
	SP	Loose, wet, gray, fine to coarse SAND (SP); no discoloration, no odor.				
	PT	Wood waste (PT), some very loose, gray, silty sand and trace gravel; organic odor.	3	5.9		S-5
15		No recovery. Soft material.				S-6 (Shelby)
20	SP	Dense, wet, olive-brown SAND (SP) with silt, gravel and some wood; no odor.	21	0.0		AB3-20' 6/22/10 S-7
			24			S-8
		Becomes olive-gray, some gravel; no discoloration, no odor.	31	0.0		S-9
25			42	0.0		S-10
		Heave; added water to hole.	30	0.0		S-11
		Becomes gray with occasional wood (non-decayed) and little no fines.	64	0.0		S-12
30			83	0.0		S-13

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG:
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A. Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 6/21/2010 - 6/22/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

At 34 feet bgs changed to D&M sampler; field density is approximate.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-3

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SP	Dense, wet, olive-brown SAND (SP) with silt, gravel and some wood; no odor.			0.0			S-14
			Becomes olive-gray, no organics, trace gravel and some silt.		77				
						0.0			S-15
					50/2"				
									S-16
			D&M sampler.		50/5"				
35									S-17
					50/5"				
			No recovery.						
		SP	Very dense, wet, yellow-brown, fine to coarse SAND (SP) with fine sand lenses stained with iron-oxide.						
40					50/2"				S-18
			Boring terminated at 40 feet bgs; backfilled with medium bentonite chips.						
45									
50									
55									
60									

BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG:

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A. Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 6/21/2010 - 6/22/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

At 34 feet bgs changed to D&M sampler; field density is approximate.

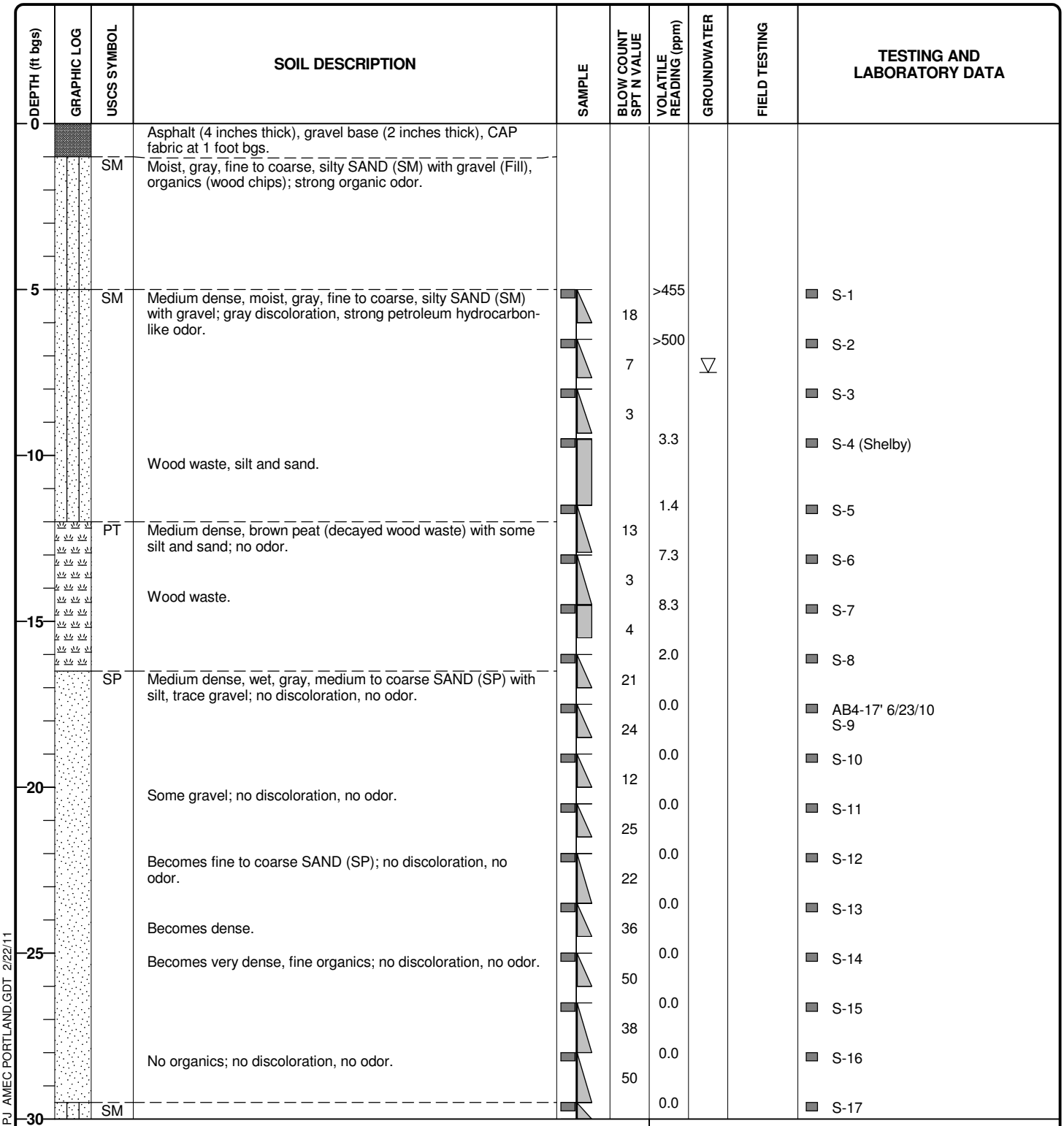
ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-3



BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG:

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 6/21/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-4

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SM	Dense to very dense, wet, yellow-brown, fine to medium coarse, silty SAND (SM) with trace subrounded gravel, micaceous.		61	0.0			S-18
			Becomes dense, olive-gray, fine, silty SAND (SM) with some medium sand.		31	0.0			S-19
		ML	Stiff, moist, gray SILT (ML), some fine sand with clay, trace gravel, slightly plastic, iron-oxide staining.		31				S-19A S-20
35		SP	Very dense, gray, fine to coarse SAND (SP), little fines; no discoloration, no odor.		61				
			Boring terminated at 35.5 feet bgs. Backfilled with medium bentonite chips, concrete patch at top.						
40									
45									
50									
55									
60									

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG:
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 6/21/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-4

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	TESTING AND LABORATORY DATA
0		Asphalt (6 inches thick), rock drain beneath, CAP fabric at 1 foot bgs.				
	SM	Moist, gray, silty SAND (SM) with fine to coarse gravel (Fill); strong petroleum hydrocarbon-like odor, sheen.		4.4		
		Becomes moist; very strong petroleum hydrocarbon-like odor; 50% sheen; oily.		30		
5	SM	Wet wood waste, bricks, silty SAND (SM) mixture (Fill); oily; 100% sheen.	10	>100	▽	AB5-5' 6/25/10 S-1
	SM-PT	Very loose, wet, brown, fine to coarse, silty SAND (SM), with organics (peat); 100% sheen. Trace gravel.	3	125		S-2
				400		S-3
		Very loose, wet, gray, silty SAND (SM), wood waste; strong petroleum hydrocarbon-like odor, 75% sheen.	2			
10			2	>200		S-4
		Wood waste, some gray sand.				S-5 (Shelby)
	PT	Becomes loose, wood waste (PT); strong petroleum hydrocarbon-like odor, sheen.	9	75.7		S-6
				>200		S-7
15			13			
				>200		S-8
			11			
		Very strong petroleum hydrocarbon-like odor, 100% sheen.		>200		S-9
			8			
	SM	Medium dense, wet, gray, fine to coarse, silty SAND (SM).		321		S-10
20			11			
	SP	Medium dense, wet, yellow-brown, fine to coarse SAND (SP) with silt and some organics (wood); slight petroleum hydrocarbon-like odor, 25% sheen.	12	9		S-11
	SM	Dense, wet, olive-brown, fine to coarse, silty SAND (SM); no discoloration, no odor.		3.8		AB5-22' 6/25/10 S-12
			26			
		Becomes loose.		3.5		S-13
			9			
25				4.2		S-14
		Becomes medium dense, trace gravel, trace organics (< 1 inch). Trace to some gravel; no discoloration, no odor.	30	3.2		S-15
			26			
				5.2		S-16
			34			
		Becomes dense, fine organics.				S-17
30						

BORING METHOD: HSA

BOREHOLE DIAMETER:

DRILL RIG:

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 6/25/2010

REMARKS:
Air knife to 5 feet bgs, samples collected using hand auger to 5 feet bgs. At 31 feet bgs changed to D&M sampler; field density is approximate.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-5

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SM	Dense, wet, olive-brown, fine to coarse, silty SAND (SM); no discoloration, no odor. Heave. D&M sampler at 31 feet bgs.		37				S-18
		SM	Wet. olive-brown, medium to coarse, silty SAND (SM) with some medium to coarse sand, trace subangular to subrounded gravel. No recovery.		44 50/4" 59				AB5-35' 6/25/10 S-19
35			Boring terminated at 35.5 feet bgs. Boring backfilled with medium bentonite chips and cement patch at surface.						
40									
45									
50									
55									
60									

BORING METHOD: HSA
BOREHOLE DIAMETER:
DRILL RIG:
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 6/25/2010

REMARKS:
Air knife to 5 feet bgs, samples collected using hand auger to 5 feet bgs. At 31 feet bgs changed to D&M sampler; field density is approximate.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

amec

LOG OF BORING AB-5

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
0		GW	Gravel surface.						
		SM	Gray, moist, silty SAND (SM) with gravel; gray discoloration, strong petroleum hydrocarbon-like odor.		NA	90		AB5A 0.5-1.1'	
					NA	99 >110		AB5A 1.5-2.5'	
			Very strong petroleum hydrocarbon-like odor.						
			Moist, dark brown, wood waste; oily free product, oily discoloration, strong petroleum hydrocarbon-like odor.		NA	>300		AB5A 3-3.5'	
					NA	>1,000 >1,500		AB5A 4-4.5'	
5			Becomes wet; free product.		NA	700	▽	AB5A 5-5.5'	
			Boring terminated at 5.5 feet bgs.						
10									
15									
20									
25									
30									

BORING METHOD: Hand Auger
BOREHOLE DIAMETER: 3 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speranksy

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 6/22/2010

REMARKS:
Air knife to 5 feet bgs, sampled using hand auger.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-5A

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
0			Asphalt (6 inches), gravel base, cap fabric at 1 foot bgs.						
			Brown, free product on water approximately 25%.						
			Water seeps into drain rock, impossible to vacuum. Brown, free product on water table approximately 25%.						
			Boring terminated at 3.5 feet bgs; backfilled with medium bentonite chips and capped with concrete patch.						
5									
10									
15									
20									
25									
30									

BORING METHOD: Air Knife
BOREHOLE DIAMETER:
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speranksy

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 6/21/2010

REMARKS:
Air knife to 3 feet bgs, no samples collected.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AB-6

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	TESTING AND LABORATORY DATA
0		Asphalt (5 inches).					
	SM	Gray, moist, silty, fine to coarse SAND (SM) with gravel, wood, glass (Fill); grayish discoloration, petroleum hydrocarbon-like odor, staining.					
5	SM	Medium dense, moist to wet (at bottom), gray, fine to medium, silty SAND (SM) with gravel; grayish discoloration, strong petroleum hydrocarbon-like odor, sheen ~50%.		9	12		AP1-5'
10	SM	Dense, wet, gray, fine to coarse, silty SAND (SM) with some subrounded gravel; no discoloration, some petroleum hydrocarbon-like odor, no sheen.		25	3.1		AP1-10'
15		Organics.			5.1		AP1-15'
	ML	Brown wood waste with silt (ML), laminated; no discoloration, some organic odor.		26			
		Boring terminated at 17 feet bgs; sand installed to 15 feet bgs; installed and sampled temporary well with screened interval from 5 to 15 feet bgs.					
20		Backfilled with medium bentonite chips; cement patch at surface.					
25							
30							

BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG:

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 6/23/2010 - 6/24/2010

REMARKS:
Air knife and vactor truck to 4 feet bgs for utilities clearance.

Sampled with hand auger to 5 feet bgs, D&M sampler to 17 feet bgs; field density is approximate.

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AP-1

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/16/11

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	TESTING AND LABORATORY DATA
0	SP	Asphalt (0.3 feet). Olive-brown, fine to coarse SAND (SP) with silt.		
	SM	Moist to wet, fine, silty SAND (SM), with some dark brown organics, micaceous; gray discoloration, strong petroleum hydrocarbon-like odor.	>100	AP2-1' 11/30/10
			25	
5	SM-PT	Wet, dark brown, fine to coarse, silty SAND (SM) with wood waste; strong petroleum hydrocarbon-like odor. Oily wood waste.		
		Dark brown, silty SAND; strong petroleum hydrocarbon-like odor, sheen. Orange to dark brown, wood waste (PT); no discoloration, no odor.		
10			3.5 - 6.0	
	SM	Wet, brown, fine to coarse, silty SAND (SM) with organics; some petroleum hydrocarbon-like odor, 30% sheen.		
	SP	Wet, yellow-brown, medium to coarse SAND (SP) with fine sand and some silt, trace gravel; no discoloration, no odor.	0.0	AP2-14' 12/07/10
15		Boring terminated at 15 feet bgs; backfilled with fine bentonite chips.		
20				
25				
30				

BORING METHOD: Push-probe
BOREHOLE DIAMETER: 4 (in)
DRILL RIG: Push-probe
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 11/30/2010 - 12/7/2010

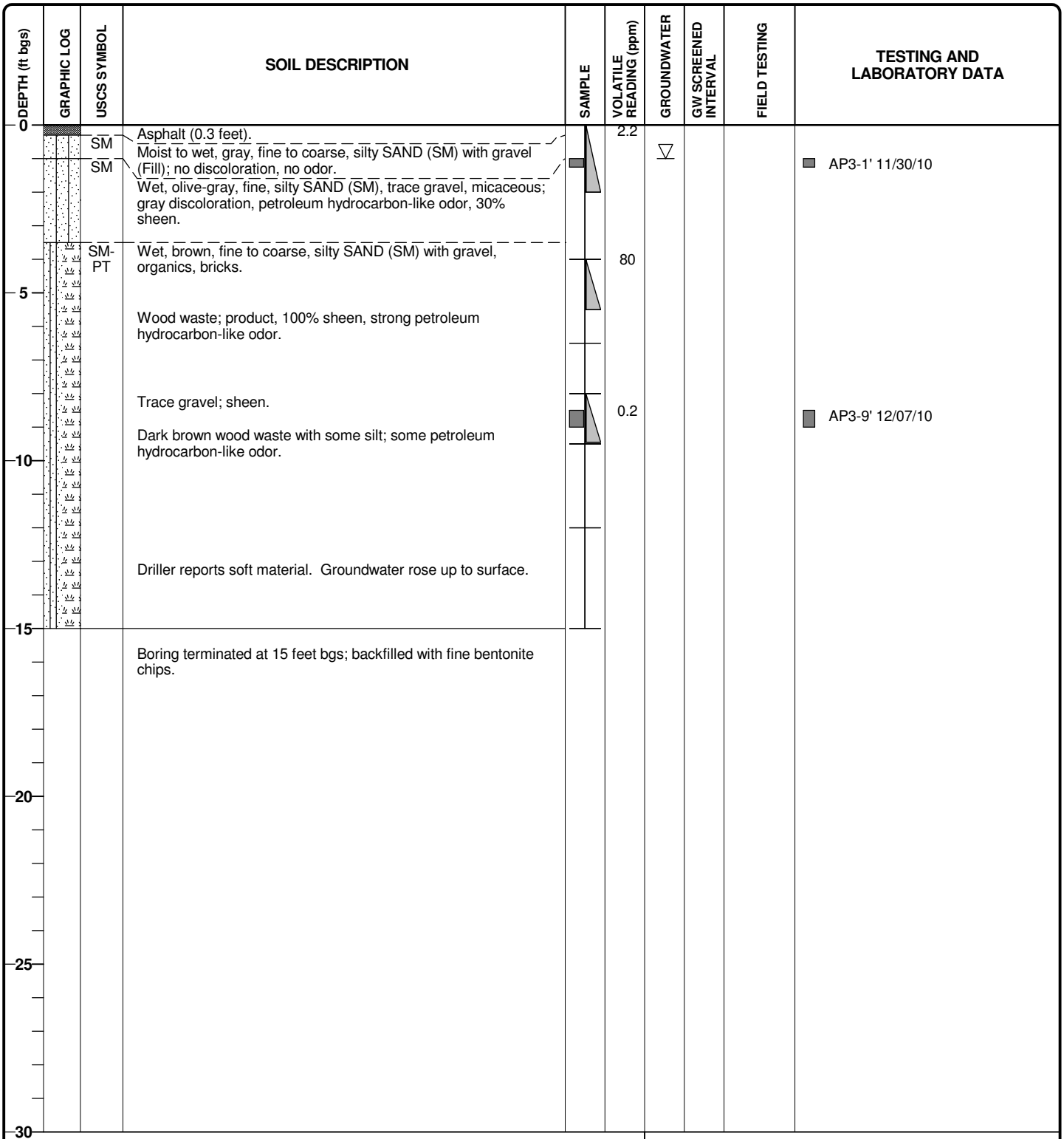
REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AP-2



BORING METHOD: Push-probe
BOREHOLE DIAMETER: 4 (in)
DRILL RIG: Push-probe
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 11/30/2010 - 12/7/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

DIRECT PUSH BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AP-3

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING	TESTING AND LABORATORY DATA
0		SM	Asphalt (0.3 feet).		1.7	▽			
		SM	Moist to wet, olive-gray, fine to medium, silty SAND (SM), trace gravel; iron-oxide discoloration.						AP4-1' 11/30/10
			Wet, gray, fine to coarse, silty SAND (SM) with gravel; no discoloration, no odor.		0.0				
		SP	Wet, olive-gray, fine to coarse SAND (SP) with some silt.						
5		SM	Wet, olive, fine to medium, silty SAND (SM); no discoloration, no odor.						
		SM-PT	Wet, red-brown, fine to medium, silty SAND (SM) with trace fine gravel. brown organics. Dark brown wood waste.		0.0				AP4-6' 12/07/10
		SP	Wet, olive-gray, fine to coarse SAND (SP) with silt, trace fine gravel; no discoloration, no odor.						
10			Dark brown, wood waste (decayed) with some silt; no odor.						
		SM	Brown, silty SAND (SM).						
		SP	Wet, yellow-brown, coarse SAND (SP) with some fine and medium sand, little to no fines, trace fine gravel; no discoloration, no odor.						AP4-15' 12/07/10
15			Boring terminated at 15 feet bgs; backfilled with fine bentonite chips.						
20									
25									
30									

BORING METHOD: Push-probe
BOREHOLE DIAMETER: 4 (in)
DRILL RIG: Push-probe
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 11/30/2010 - 12/7/2010

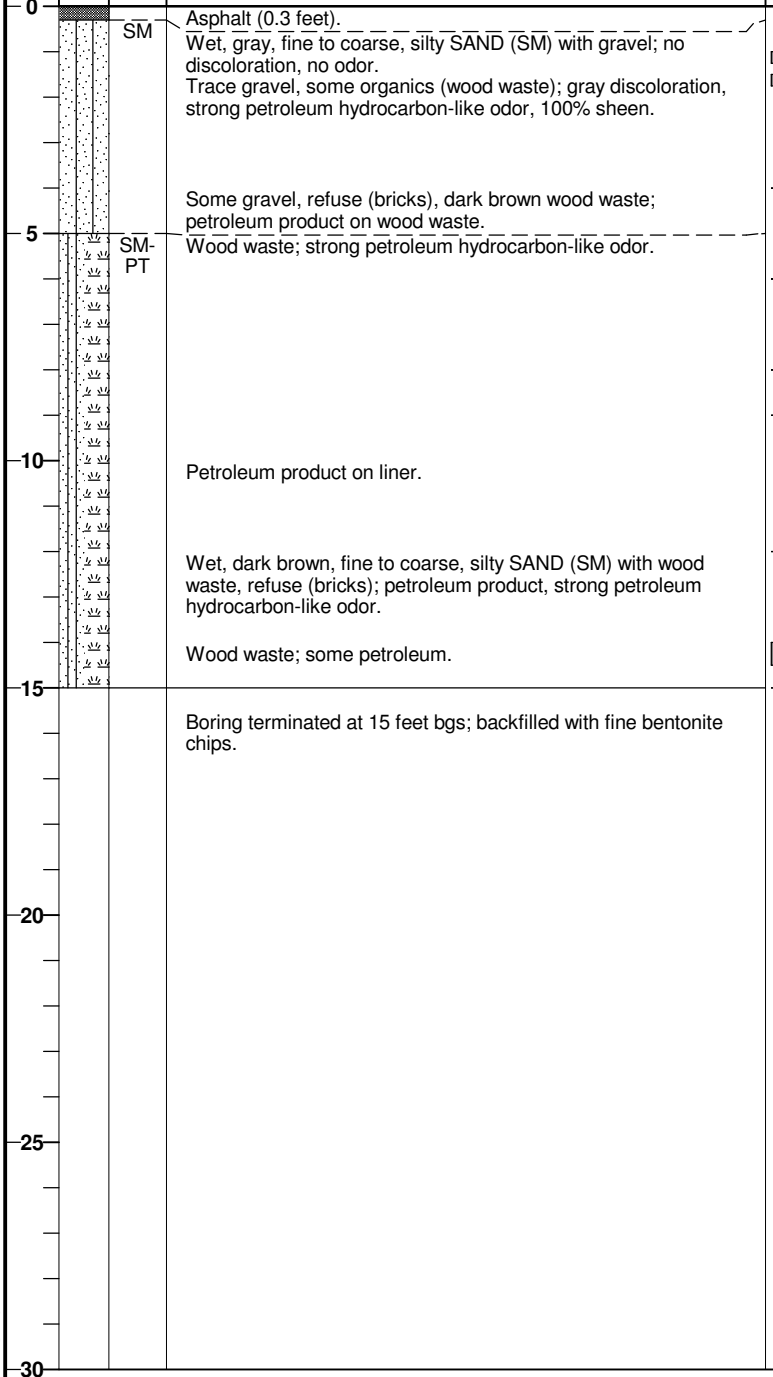
REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AP-4



DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	VOLATILE READING (ppm)	TESTING AND LABORATORY DATA
0	SM	Asphalt (0.3 feet).		
		Wet, gray, fine to coarse, silty SAND (SM) with gravel; no discoloration, no odor.	>200	AP5-1' 11/30/10
		Trace gravel, some organics (wood waste); gray discoloration, strong petroleum hydrocarbon-like odor, 100% sheen.		AP5-1.5' 12/07/10
		Some gravel, refuse (bricks), dark brown wood waste; petroleum product on wood waste.	>300	
5	SM-PT	Wood waste; strong petroleum hydrocarbon-like odor.		
			>300	
10		Petroleum product on liner.		
		Wet, dark brown, fine to coarse, silty SAND (SM) with wood waste, refuse (bricks); petroleum product, strong petroleum hydrocarbon-like odor.		
		Wood waste; some petroleum.	36	AP5-14.5' 12/07/10
15		Boring terminated at 15 feet bgs; backfilled with fine bentonite chips.		
20				
25				
30				

BORING METHOD: Push-probe
BOREHOLE DIAMETER: 4 (in)
DRILL RIG: Push-probe
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 11/30/2010 - 12/7/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AP-5

DIRECT PUSH BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
0		Asphalt (0.3 feet), 0.5 feet asphalt base.						
	SP	Gray, fine to coarse SAND (SP) with silt and gravel; gray discoloration, petroleum hydrocarbon-like odor.				▽		AP6-1 11/30/10
		Petroleum product was rising to the surface.						
5		Rod dropped to 7 feet bgs unexpectedly. Oil is dripping from the rod.						
	SM-PT	Dark brown, wet, silty SAND (SM) and wood waste; petroleum product, strong petroleum hydrocarbon-like odor.		5				S-1
				2				S-2
10	PT			0				
		No recovery (wood waste). (Logged from drill cuttings.)		1				
		No recovery (wood waste).		24				S-3
		Dark brown, wood waste (decayed, fine and large, 6 inch thick wood) (PT); petroleum product, petroleum hydrocarbon-like odor.		4				S-4
15		No recovery (wood waste); petroleum product. (Logged from drill cuttings.)		1				
				0				
	ML-PT	Soft, wet, dark brown, SILT (ML) and wood waste (PT); petroleum product; petroleum hydrocarbon-like odor.		4				S-5
20	SM	No recovery. Silty SAND (SM) on ring lines.		18				
		Medium dense, wet, yellow-brown, fine to coarse, silty SAND (SM) with trace fine organics; no discoloration, no odor.		29				S-6
								AP6-23' 12/02/10
					0.4 - 16			S-7
				50/6"				
25		Abundant fine organics, trace fine gravel.			1.5			S-8
				20				
	SP	Fine to coarse SAND (SP) with some gravel.			3.1 - 4.5			S-9
				23				
	ML	Stiff, olive to gray SILT (ML) with sand, trace gravel, slightly plastic.			1.4			S-10
				8				
30					0.0			S-11

BORING METHOD: HSA
BOREHOLE DIAMETER:
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 11/30/2010 - 12/2/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/18/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING AP-6

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		ML	Stiff to very stiff, moist, gray to olive-gray SILT (ML) with fine sand, iron oxidation; no discoloration, no odor.		16	0.0			AP6-30' 12/02/10
									S-12
					31				
			Becomes very stiff, gray, trace organics; no discoloration, no odor.						S-13
		SM	Brown, wet, fine to medium, silty SAND (SM).		38				
		SP	Dense, wet, olive-gray, fine to coarse SAND (SP) with gravel						S-14
35					31				
		SM	Becomes silty SAND (SM) with gravel.						
			Boring terminated at 35.5 feet bgs; backfilled with bentonite slurry via tremmie pipe.						
40									
45									
50									
55									
60									

BORING METHOD: HSA
BOREHOLE DIAMETER:
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 11/30/2010 - 12/2/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/18/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING AP-6

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING	TESTING AND LABORATORY DATA
0		SP	Asphalt (0.3 feet). Moist, gray, fine to coarse SAND (SP), some gravel, shells; sheen.		11	▽			AP7-1' 10/28/10
		SM	Wet, gray, fine to medium, silty SAND (SM), some gravel, shells; gray discoloration, strong petroleum hydrocarbon-like odor, 100% sheen.						
		SM-PT	Wet, gray to dark brown (organics), fine to medium, silty SAND (SM) with wood waste; some product, 100% sheen.		90				
5									
		SP	Wet, olive-gray, coarse SAND (SP) with gravel, some fine to medium sand, some silt; slight petroleum hydrocarbon-like odor.		16				
10					13				AP7-10' 12/02/10 DUP6
		PT	Decayed wood waste.						
		SP-PT	Wet, olive-gray, coarse SAND (SP) with gravel and fine to coarse sand. Dark brown wood waste.						
		SP	Wet, olive, fine to medium SAND (SP) with silt and trace gravel; no discoloration, no odor, no sheen.		2.8				AP7-15' 12/02/10
15			Boring terminated at 15 feet bgs; backfilled with fine bentonite chips.						
20									
25									
30									

BORING METHOD: Push-probe
BOREHOLE DIAMETER: 4 (in)
DRILL RIG: Push-probe
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
START CARD/TAG ID: NA
DRILLING DATES: 10/28/2010 - 12/2/2010

REMARKS:
Air knife and vactor truck to 5 feet bgs for utilities clearance.

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING AP-7

DIRECT PUSH BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	TESTING AND LABORATORY DATA
0	SP	Surface: 0.3 feet of asphalt over 0.5 feet asphalt base. Wet, olive-brown, medium to coarse SAND (SP) with some fine sand and silt; no discoloration, no odor.		61	▽	MW-7A-1 11/30/10
				3.2 - 6.1		S-1
		Very loose.	2			
		Becomes fine to coarse SAND (SP).	2			S-2
5				12		S-3
			2			
		No recovery. Driller reports very loose SAND.	0			
		No recovery.	0			
10	SM	Very loose, wet, olive to brown, fine to coarse, silty SAND (SM), organics.	10			S-5
	SM-SP	Medium dense, wet, yellow to yellow-brown, fine to coarse, silty SAND (SM/SP), trace gravel.	19	23 - 30		MW-7A-12 12/1/10 S-6
		Sand increases.	25	80		S-7
				7.0		S-8
15	SM	Dense, wet, brown to olive-brown, fine to coarse, silty SAND (SM); no discoloration, no odor.	42			
				1.3		S-9
		Becomes, moist, iron oxidation discoloration, approximately 1 foot heave.	26			
				2.5		S-10
	SM	Medium dense, wet, orange-brown, fine, silty SAND (SM), trace gravel.	17			
20	SM-ML	Medium dense, moist, gray to olive-gray, fine, silty SAND to SILT (SM/ML) with iron oxidation discoloration.	18			S-11
				4.4		S-12 (Shelby)
	ML	Soft, gray SILT (ML).				
	ML	Stiff, moist, olive-gray SILT (ML) with brown, fine organics.	63	0.0		S-13
						S-14
25	SP	Very dense, wet, olive, fine to coarse SAND (SP) with some silt, trace gravel, micaceous; no discoloration, no odor.	94			
		Gravel increases in last 6 inches of sampler shoe.		1.5 - 2.5		S-15
		Becomes with gravel.	56			
				7.0		S-16
			50/6"			
		Becomes with trace gravel. Lenses of moist, brown, silty SAND (SM) with brown, very fine organics (approximately 4 inches thick).				S-17
30			50/5"			

BORING METHOD: HSA

BOREHOLE DIAMETER: 8 (in)

DRILL RIG: Hollow Stem Auger

CONTRACTOR: Cascade Drilling, Inc.

LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA

GROUND SURFACE ELEVATION: NA

CASING ELEVATION: NA

DRILLING DATES: 11/30/2010 - 12/1/2010

REMARKS:
Cleared to 5 feet bgs with hand auger and vacuum truck.

ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/18/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING MW-7AB

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING	TESTING AND LABORATORY DATA
30		SP-SM	Very dense, wet, olive, fine to coarse SAND (SP/SM) with silt and silty sand; no discoloration, no odor. No samples collected due to reported heave.		0 0 50/5"	NA			S-18
35			Boring terminated at 35.5 feet bgs; backfilled with bentonite slurry via tremmie pipe.						
40									
45									
50									
55									
60									

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
DRILLING DATES: 11/30/2010 - 12/1/2010

REMARKS:
Cleared to 5 feet bgs with hand auger and vacuum truck.

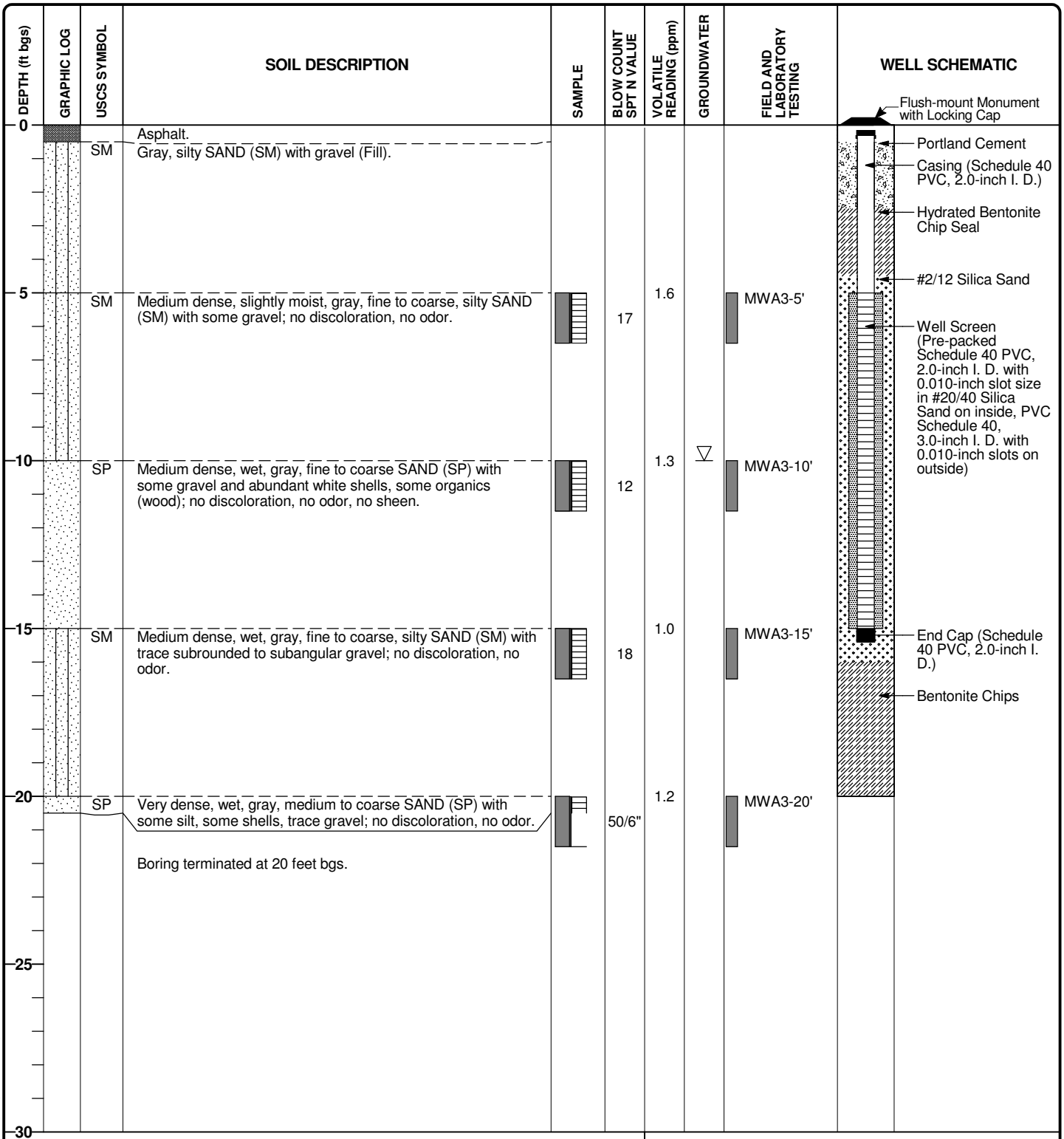
ENVIRONMENTAL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/18/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC
7376 SW Durham Road
Portland, Oregon
USA 97224
Tel (503) 639-3400
Fax (503) 620-7892

LOG OF BORING MW-7AB



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 305
DRILLING DATES: 6/23/2010 - 6/24/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/16/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING MW-A3

DEPTH (ft bgs)	USCS SYMBOL	SOIL DESCRIPTION	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	FIELD AND LABORATORY TESTING
0	SM	Asphalt (0.3 feet). Silty SAND (SM) with gravel (Fill).			
5	SM	Medium dense, slightly moist, gray, fine to coarse, silty SAND (SM) with some gravel; no discoloration, no odor.	16	4.3	MW-A4-5'
10		Moist to wet; no discoloration, no odor, no sheen.	21	4.5	MW-A4-10'
15		Same as above. wood (< 1 inch); some petroleum hydrocarbon-like odor.	26	6.7	MW-A4-15'
20	SP	Medium dense, wet, gray, medium to coarse SAND (SP) with some silt and gravel, some organics (wood), abundant shells; no discoloration, no odor.	26	4.6	MW-A4-20'
25		Boring terminated at 20 feet bgs.			
30					

WELL SCHEMATIC

- Flush-mount Monument with Locking Cap
- Portland Cement
- Casing (Schedule 40 PVC, 2.0-inch I. D.)
- Hydrated Bentonite Chip Seal
- #2/12 Silica Sand
- Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with 0.010-inch slot size in #20/40 Silica Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
- End Cap (Schedule 40 PVC, 2.0-inch I. D.)
- Bentonite Chips

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 306
DRILLING DATES: 6/22/2010 - 6/24/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

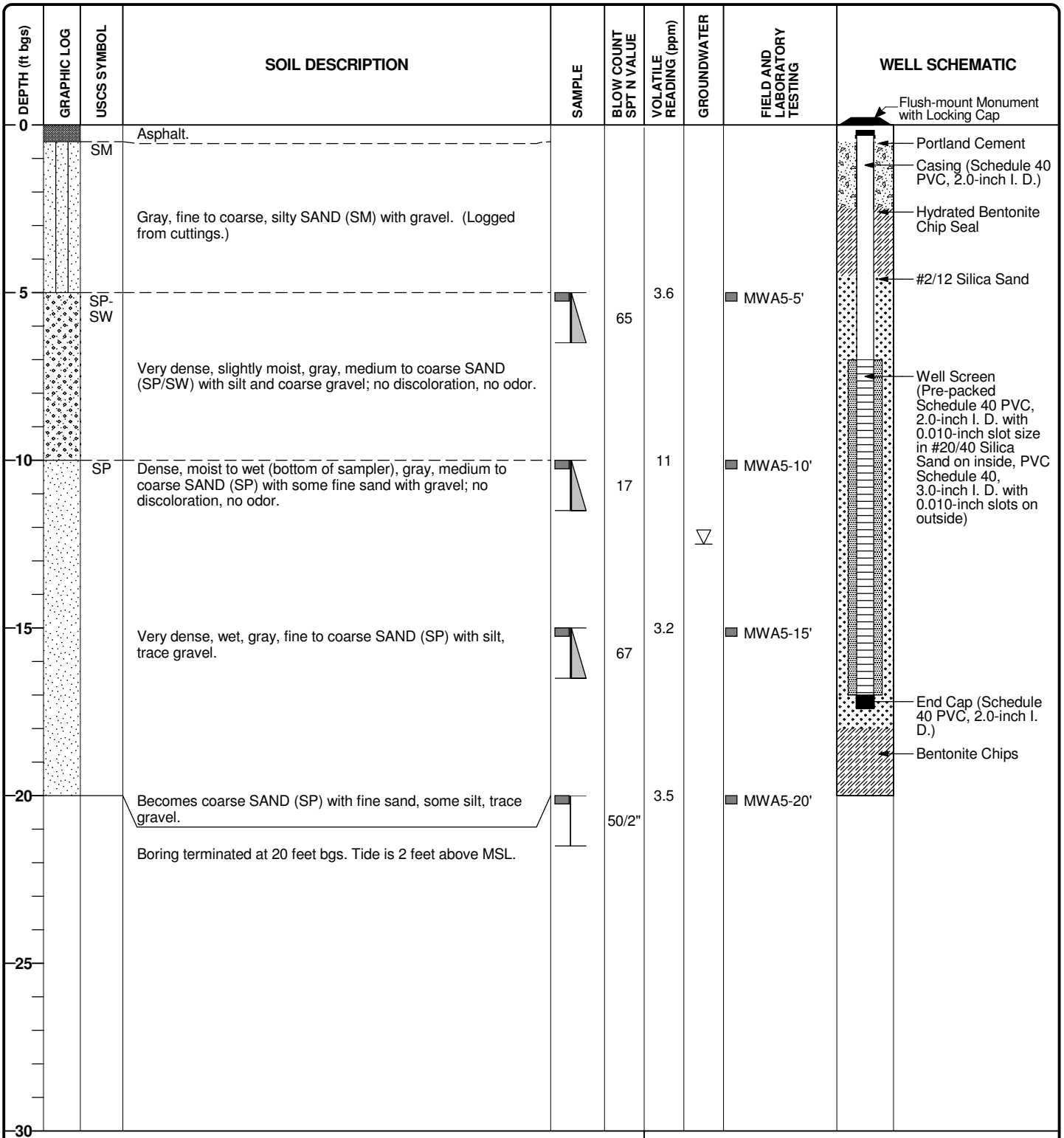
ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/16/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING MW-A4



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 301
DRILLING DATES: 6/23/2010 - 6/24/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

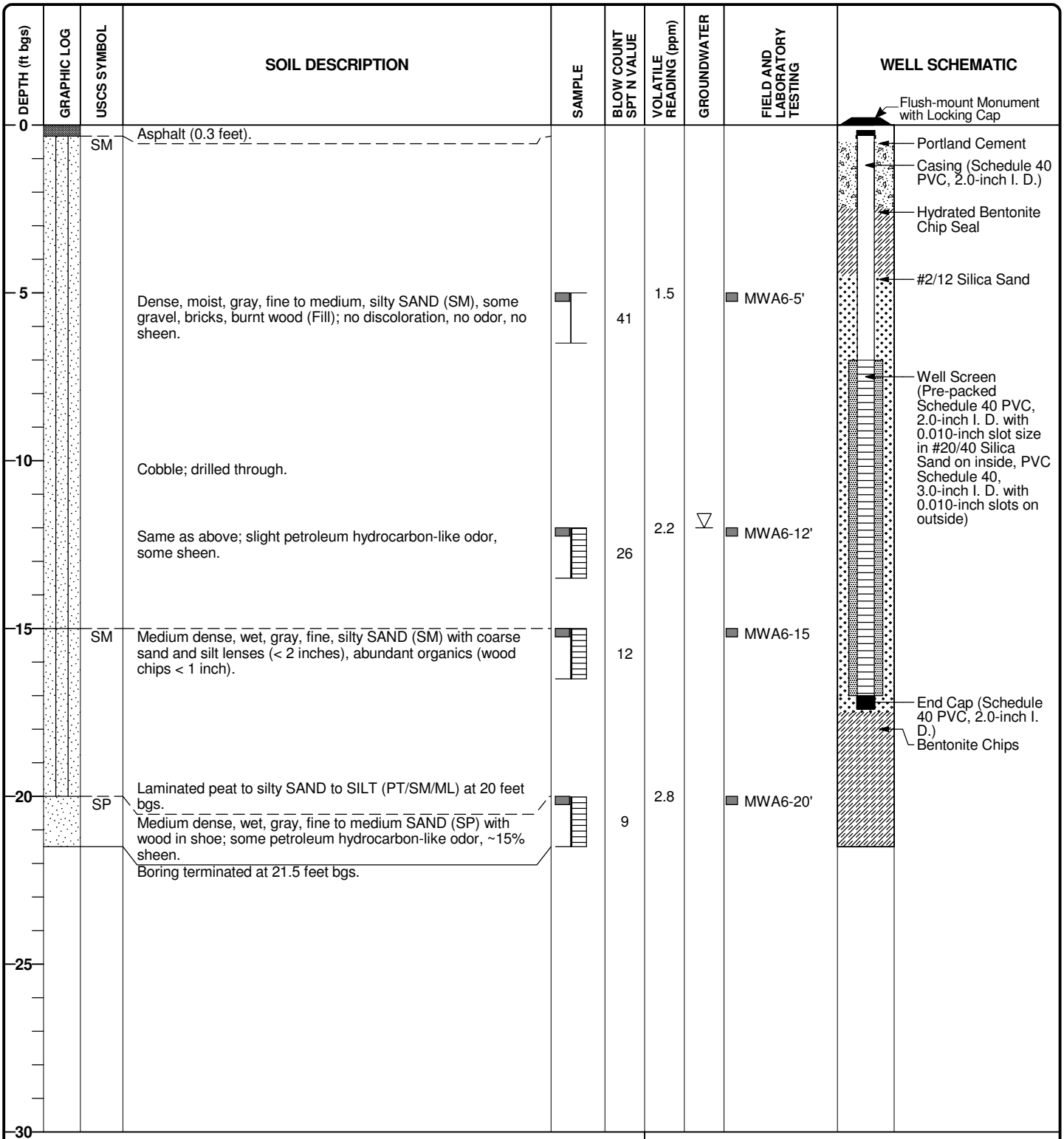
ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/16/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING MW-A5



BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: NA
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BCM 304
DRILLING DATES: 6/25/2010

REMARKS:
Air knife to 4 feet bgs for utilities clearance.

D&M sampler; field density is approximate.

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/16/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING MW-A6

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
0			No samples collected, for lithology descriptions refer to MW-7AB boring log.						Flush-mount Monument with Locking Cap; Portland Cement; Casing (Schedule 40 PVC, 2.0-inch I. D.); Medium Bentonite Chips; #2/12 Silica Sand; Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with 0.010-inch slot size in #20/40 Silica Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside); End Cap (Schedule 40 PVC, 2.0-inch I. D.)
5									
10									
15			Boring terminated at 15 feet bgs.						
20									
25									
30									

BORING METHOD: HSA
BOREHOLE DIAMETER: 8 (in)
DRILL RIG: Hollow Stem Auger
CONTRACTOR: Cascade Drilling, Inc.
LOGGED BY: A.Speransky

ELEVATION REFERENCE: NA
GROUND SURFACE ELEVATION: NA
CASING ELEVATION: NA
START CARD/TAG ID: /BLT 570
DRILLING DATES: 12/2/2010

REMARKS:

ENVR+WELL BORING 1-915-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/16/11

ExxonMobil / American Distributing Company

1-915-15716E

AMEC Earth and Environmental, Inc.
11810 North Creek Parkway N
Bothell, Washington
USA 98011
Tel (425) 368-1000
Fax (425) 368-1001

LOG OF BORING MW-A7

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. BN-SB04**	
BORING LOCATION: BNSF Property	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/21/13	DATE FINISHED: 10/21/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 25.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), moist, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size).	Cleared to 10 feet bgs with vacuum truck.
2						BN-SB04-102113 is collected from interval 0 to 10 FT.
3						
4	BN-SB04-4-102113			0.1		
5						No sheen.
6					wet at 5.3 FT.	
7						
8						
9						
10				0.2		No sheen.
11			10 10 9	0.3		No sheen.
12			14 11			No sheen.
13			13	0.3	WELL-GRADED SAND with SILT (SW-SM): yellowish brown (10YR 5/6), moist, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size), mottling.	No sheen.
14			12 15 16		SILTY SAND (SM): dark yellowish brown (10YR 3/4), wet, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75" in size).	No sheen.
15				0.3 0.4		

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. BN-SB04 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	BN-SB04-24.5-102113		17 21 20	0.4	very dark grayish brown (10YR 3/2),	No sheen. No sheen.
17			20 21 20	0.4 0.4	WELL-GRADED SAND with SILT (SW-SM): very dark grayish brown (10YR 3/2), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size). Heaving Sand.	No sheen.
18			17 26			No sheen.
19			27	0.3		No sheen.
20			17 22			No sheen.
21			21 18	0.3 0.3		No sheen.
22			27 25	0.3	SILTY SAND (SM): dark yellowish brown (10YR 4/4), wet, medium dense, 75% fine to coarse sand, 20% fines, 5% fine subrounded gravel (up to 0.75" in size).	No sheen.
23			10 12 20	0.4	SILTY SAND (SM): dark yellowish brown (10YR 4/4), wet, medium dense, 60% fine to coarse sand, 35% fines, 5% fine subrounded gravel (up to 0.75" in size), mottled.	No sheen.
24			13 14		SILT (ML): very dark gray (10YR 3/1), wet, no plasticity, stiff, 85% fines, 10% fine sand, 5% fine subrounded gravel (up to 0.75" in size), trace shells.	No sheen.
25			17		Bottom of Boring @ 25.0 FT. Abandoned with bentonite to surface.	
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. BN-SB05**	
BORING LOCATION: BNSF Property	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/21/13	DATE FINISHED: 10/21/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 24.5	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0				0.6	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), moist, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size), trace rounded cobbles, trace brick and wood debris. FILL.	
1						Cleared to 5 feet bgs with vacuum truck.
2						BN-SB05-102113 is collected from interval 0 to 5 FT.
3						
4	BN-SB05-4-102113					
5				0.0	Wet @ 5 FT.	No sheen.
6			7 8 10			No sheen.
				0.0	WELL-GRADED SAND with SILT (SW-SM): dark grayish brown (10YR 3/2), wet, medium dense, 90% fine to coarse sand, 5% fines, 5% fine subrounded gravel (up to 0.75" in size).	
7			10 11			No sheen.
8			10	0.0 0.1		No sheen.
9			11 26 15			No sheen.
				0.1 0.1		
10			11			No sheen.
			14			
11			16	0.1		No sheen.
			14			
12			14 19			No sheen.
				0.1 0.2	WELL-GRADED SAND with SILT (SW-SM): very dark grayish brown (10YR 3/2), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size).	
13			15 15			No sheen.
14			15	0.2		No sheen.
15			12			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. BN-SB05 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
			16		Heaving Sand.	No sheen.
			12	0.2		
16				0.2		No sheen.
			16			
			21			
17			19	0.1		No sheen.
			17			
18			21		SANDY SILT (ML): yellowish brown (10YR 5/4), wet, low plasticity, very stiff, 60% fines, 40% fine to medium sand.	No sheen.
			21			
19						
			21		SILT (ML): very dark gray (10YR 3/1), wet, low plasticity, stiff, 93% fines, 5% fine sand, trace fine subrounded gravel (up to 0.75" in size).	
			10			
20			10			
			10			
21			10			
			10			
22			10			
			8			
23			9			
	BN-SB04-24.5-102113		8			
24			8			
			8		Bottom of Boring @ 24.5 FT. Abandoned with bentonite to surface.	
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. BN-SB06**	
BORING LOCATION: BNSF Property	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/21/13	DATE FINISHED: 10/21/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 24.5	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), moist, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size).	Cleared to 5 feet bgs with vacuum truck. BN-SB06-102113 is collected from interval 0 to 5 FT.
2						
3						
4	BN-SB06-4-10213			0.2	Wet @ 4 FT.	No sheen.
5				0.0		
6			4 6 7			
7				0.0	SILTY SAND (SM): dark yellowish brown (10YR 3/4), wet, medium dense, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75" in size), mottled.	No sheen. No sheen.
8			10 21 28	0.0		No sheen.
9			12 14 16	0.0		No sheen.
10			13 15		WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), wet, medium dense, 90% fine to coarse sand, 10% fines.	No sheen.
11			18	0.0		No sheen.
12			16 20 20	0.0		No sheen.
13			19 21			No sheen.
14			21	0.0	SILTY SAND (SM): dark yellowish brown (10YR 3/4), wet, medium dense, 80% fine to medium sand, 20% fines.	No sheen.
15			14			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. BN-SB06 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16			24 21	0.0	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size).	No sheen.
			28 31			No sheen.
17			30	0.0		No sheen.
			26 27		Heaving Sand.	
18			29	0.0		No sheen.
19			21 25			No sheen.
20			31	0.0	brown (10YR 5/3),	
21			10 10 20	0.0		
22			10 20			
23			20		SILTY SAND (SM): dark yellowish brown (10YR 4/4), moist, medium dense, 80% fine to coarse sand, 20% fines.	
24	BN-SB06-24-102113		31 33 36	0.0	WELL-GRADED SAND with SILT (SW-SM): brown (10YR 5/3), wet, dense sand, 90% fine to coarse sand, 10% fines.	
25					Bottom of Boring @ 24.5 FT. Abandoned with bentonite to surface.	
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. BN-SB07**	
BORING LOCATION: BNSF Property	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/18/13	DATE FINISHED: 10/18/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 25.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0				0.5	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), moist, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel, trace cobbles.	
1						Cleared to 10 feet bgs with vacuum truck.
2						BN-SB07-102113 is a composite sample from 0 to 10 FT.
3					Wet @ 3 FT.	No Sheen.
4	BN-SB07-4-101813					
5						
6						
7						
8						
9						
10				0.0 0.0	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), wet, medium dense, 90% fine to coarse sand, 10% fines.	No Sheen.
11			12 13 15	0.0		No Sheen.
12			9 12 15	0.0 0.0		No Sheen.
13			8 8 6	0.0		No Sheen.
14				0.0		No Sheen.
15				0.0		

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. BN-SB07 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	BN-SB07-24-101813		6 12 13	0.0	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), wet, medium dense, 90% fine to coarse sand, 10% fines.	No Sheen. No Sheen.
17			13 16 15	0.0 0.0	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), wet, medium dense, 90% fine to coarse sand, 10% fines.	No Sheen.
18			8 9 9	0.0	Heaving Sand.	No Sheen. No Sheen.
19			14 19 25	0.1 0.0		No Sheen.
20			20 22 25	0.0	very dark gray (10YR 3/1),	No Sheen. No Sheen.
21			22 27 26	0.2 0.1		No Sheen.
22			23 18 19			No Sheen.
23					Bottom of Boring @ 25 FT. Abandoned with bentonite to surface.	
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. CE-SB01**
BORING LOCATION: City of Everett Right of Way	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/23/13 / DATE FINISHED: 10/23/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					SILTY SAND (SM): very dark gray (10YR 3/1), moist, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75"). FILL.	
1						Cleared to 5 feet bgs with vacuum truck.
2						CE-SB01-4-102313 is collected from interval 0 to 5 FT.
3						
4	CE-SB01-4-102313			11.6		
5				26	Wet @ 5 FT.	No sheen.
6			4 3 3	142		Sheen
7			5 15 20	134	Pieces of wood, brick fragments, glass, ceramic tile fragments, rock pieces (up to 1"). FILL.	Sheen, visible product, petroleum hydrocarbon-like odor.
8				96.8		Sheen, visible product, petroleum hydrocarbon-like odor.
9			4 3 2			Sheen, visible product, petroleum hydrocarbon-like odor.
10	CE-SB01-9.5-102313		3 4 4	64.6 76.1	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, mixed with SANDY SILT (ML). FILL.	Sheen, visible product, petroleum hydrocarbon-like odor.
11				35		Sheen, visible product, petroleum hydrocarbon-like odor.
12			4 4 4			Sheen, petroleum hydrocarbon-like odor.
13			2 3 3	64.9 71.5	SILTY SAND (SM): very dark gray (10YR 3/1), moist, loose, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75").	Sheen, petroleum hydrocarbon-like odor.
14				44.9	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, mixed with SANDY SILT (ML).	Sheen, visible product, petroleum hydrocarbon-like odor.
15			4			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. CE-SB01 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	CE-SB01-24-102313		2 2	29		Sheen, visible product, petroleum hydrocarbon-like odor.
			1 2 1		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, mixed with SANDY SILT (ML).	Sheen, visible product, petroleum hydrocarbon-like odor.
17						
			3 2 4			
18						
			4 4 3	7.5 3.4		
19					PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter.	Sheen.
			4 3 2	5.9 2.6	SANDY SILT (ML): very dark gray (10YR 3/1), wet, no plasticity, soft, 60% fines, 40% fine to medium sand.	No sheen.
20					ORGANIC SOIL (PT): reddish brown (2.5YR 2.5/3), wet, stiff, 100% organic matter. Piece of rock from 22 FT to 22.5 FT.	Sheen.
			12 20 20		SILTY SAND (SM): very dark gray (10YR 3/1), moist, medium dense, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75"), wood debris.	Sheen.
21						
			20 21 22	1.2		No sheen.
22					Bottom of Boring @ 24.5 FT. Abandoned with bentonite to surface.	
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. CE-SB02**	
BORING LOCATION: City of Everett Right of Way	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/23/13	DATE FINISHED: 10/23/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					SILTY SAND (SP-SM): dark brown (10YR 3/3), moist, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75"), wood debris, ceramic tile debris. FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4	CE-SB02-4-101413			1096		
5			3	162	Wet @ 5 FT.	Sheen, visible product, petroleum hydrocarbon-like odor.
6			4 4			Sheen, petroleum hydrocarbon-like odor.
7			2	232 76.9		Sheen, petroleum hydrocarbon-like odor.
8			2 2	108	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, mixed with SILTY SAND (SM), nails, glass fragments, copper wire (< 1cm in size). FILL.	Sheen, petroleum hydrocarbon-like odor.
9			3 2 2			Sheen, petroleum hydrocarbon-like odor.
10				79.4 87.5		Sheen, petroleum hydrocarbon-like odor.
11			4 4 5	20.9		Sheen, petroleum hydrocarbon-like odor.
12			2 2 2	34 23		Sheen, petroleum hydrocarbon-like odor.
13			7 8 7			Sheen, petroleum hydrocarbon-like odor.
14			5 5 6			Sheen, petroleum hydrocarbon-like odor.
15						

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. CE-SB02 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
				6.5		Sheen, petroleum hydrocarbon-like odor.
				4.6	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter, nails, glass fragments, hydrogen sulfide-like odor. FILL.	
16			3			Sheen.
			3			
17			3			No sheen.
			4			
			4			
18			6			
					SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 70% fine to medium sand, 25% fines, 5% fine subrounded gravel.	No sheen.
				3.2		
				0.8	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter, nails, hydrogen sulfide-like odor.	
19	CE-SB02-20-102313		7			Sheen.
			10		SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 70% fine to medium sand, 25% fines, 5% fine subrounded gravel.	
20			10			No sheen.
					Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. EA-SB01**
BORING LOCATION: ExxonMobil/ADC	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/28/13 / DATE FINISHED: 10/28/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (0.5 inches), road base (13 inches), CAP fabric at 18 inches.	
1						Cleared to 5 feet bgs with vacuum truck.
2					SILTY SAND (SM): very dark gray (10YR 3/1), moist, 55% fine to medium sand, 40% fines, 5% fine subrounded gravel (up to 0.75"), wood debris, cobbles, ceramic pieces. FILL.	
3						
4	EA-SB01-101413			161		
5				139		Sheen, visible product, petroleum hydrocarbon-like odor.
6			1 1 1		Wet @ 5.5 FT.	Sheen, visible product, petroleum hydrocarbon-like odor.
7				134 135		
8			1 1 2	53.6	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, very soft, mixed with SILTY SAND (SM), rootlets. FILL.	Sheen, visible product, petroleum hydrocarbon-like odor.
9			1 2 3		SILTY SAND (SM): very dark gray (10YR 3/1), moist, very loose, 55% fine to medium sand, 40% fines, 5% fine subrounded gravel (up to 0.75"), wood debris, nails, glass fragments. FILL.	Sheen, petroleum hydrocarbon-like odor.
10				75.8 120	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, very soft, mixed with SILTY SAND (SM), rootlets. FILL.	Sheen, visible product, petroleuym hydrocarbon-like odor.
11			10 14 15		SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 55% fine to medium sand, 40% fines, 5% fine subrounded gravel (up to 0.75"), wood debris, nails, glass fragments. FILL.	Sheen, petroleum hydrocarbon-like odor.
12			5 6 9		Wood pieces. SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 55% fine to medium sand, 40% fines, 5% fine subrounded gravel (up to 0.75"), wood debris, nails, glass fragments. FILL.	Sheen, visible product, petroleum hydrocarbon-like odor.
13			12 13 15	34.7 5.6	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75"), wood debris.	No sheen, petroleum hydrocarbon-like odor.
14				20.3		No sheen, petroleum hydrocarbon-like odor.
15			10			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. EA-SB01 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16			7 5	60 20.3		Sheen, petroleum hydrocarbon-like odor.
			8 5		WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to coarse sand, 10% fines, wood debris.	Sheen, petroleum hydrocarbon-like odor.
17			6	26.3	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to coarse sand, 10% fines, wood debris, mixed with PEAT, reddish brown (2.5YR 2.5/3), hydrogen sulfide-like odor.	Sheen, petroleum hydrocarbon-like odor.
18			8 6 9	43.5		No sheen.
19	EA-SB01-102813		5	10 10		Sheen.
20			5 6			No sheen.
					Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. EA-SB02**
BORING LOCATION: ExxonMobil/ADC	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/28/13 / DATE FINISHED: 10/28/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (5 inches), road base (10 inches), CAP fabric at 15 inches.	
1					SILTY SAND (SM): very dark gray (10YR 3/1), moist, 65% fine to mediums and, 30% fines, 5% fine subrounded gravel (up to 0.75"), cobbles. FILL	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4	EA-SB02-4-101413			421		
5				33.3		Sheen, visible product, petroleum hydrocarbon-like odor.
6			4 3 2		Wet @ 5.5 ft with wire and wood debris.	Sheen, visible product, petroleum hydrocarbon-like odor.
7			3 2 3	18.3 30.4		Sheen, visible product, petroleum hydrocarbon-like odor.
8			3 9 4	64		Sheen, visible product, petroleum hydrocarbon-like odor.
9				61.6	Mixed with PEAT, reddish brown (2.5YR 2.5/3)	Sheen, visible product, petroleum hydrocarbon-like odor.
10			5 6 6	8.6	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 65% fine to mediums and, 30% fines, 5% fine subrounded gravel (up to 0.75"), glass pieces. FILL.	Sheen, visible product, petroleum hydrocarbon-like odor.
11				42.8	Mixed with PEAT, reddish brown (2.5YR 2.5/3)	Sheen.
12			3 3 4	16.1		Sheen, petroleum hydrocarbon-like odor.
13			2 3 6	9.8	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, mixed with wood pieces and SILTY SAND (SM).	
14			4		WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to medium sand, 10% fines.	No sheen.
15						

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. EA-SB02 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	EA-SB02-21-102813		5 4	21.6 19.6	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, mixed with POORLY-GRADED SAND with SILT (SP-SM), hydrogen sulfide-like odor.	Sheen. Sheen.
17			5 5 5 6	8.6		Sheen.
18			5 4			Sheen.
19				12 3.2		No sheen.
20			6 5 4		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, 100% organic, trace fine subrounded gravel (up to 0.75"), wood pieces, hydrogen sulfide-like odor.	No sheen.
21			4 4 4	7.1		
22					Bottom of Boring @ 21.5 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. EA-SB03**
BORING LOCATION: ExxonMobil/ADC	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/30/13 / DATE FINISHED: 10/30/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (7 inches), road base (8 inches).	
1						
					WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), moist, 70% fine to coarse sand, 20% fine subrounded gravel (up to 0.75"), 10% fines, cobbles, wood debris. FILL.	Cleared to 5 feet bgs with vacuum truck. EA-SB03-5-103013 is collected from interval 0 to 5 FT.
2						
3						
4	EA-SB03-5-103013			155		
5				29.6	Wet @ 5 FT.	Petroelum hydrocarbon-like odor.
					Wood pieces	
6			7 3 3	3.2	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), moist, 70% fine to coarse sand, 20% fine subrounded gravel (up to 0.75"), 10% fines, cobbles, wood debris. FILL.	Sheen, petroleum hydrocarbon-like odor.
7			2 3 3	10.5	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel, wood debris, rootlets.	Sheen.
8				0.7	SILTY SAND (SM): dark gray (10YR 4/1), wet, loose, 80% fine to medium sand, 15% fines, 5% fine subrounded gravel, wood debris, rootlets.	Sheen.
9			1 2 2	10.7		No sheen.
10				5.7		Sheen.
			2 2 3	1.7	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter, hydrogen sulfide-like odor.	Sheen.
11						
12	EA-SB03-12-103013		3 3 4	0.7		No sheen.
13			4 5	0.5		No sheen.
14			16	0.2	WELL-GRADED SAND with SILT (SW-SM): dark gray (10YR 4/1), wet, loose, 90% fine to medium sand, 10% fines.	No sheen.
15			5			

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. EA-SB03 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
			6			No sheen.
			7	0.8		
				0.5	WELL-GRADED SAND with SILT (SW-SM): dark gray (10YR 4/1), wet, loose, 90% fine to medium sand, 10% fines, hydrogen sulfide-like odor.	
16			3			No sheen.
			4			
17			6	4.9		No sheen.
			8			
18			7			No sheen.
			5	0.6	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter, with pieces of wood, hydrogen sulfide-like odor.	
19	EA-SB03-20-103013		3		POORLY-GRADED SAND with SILT (SP-SM): dark gray (10YR 4/1), wet, loose, 90% fine to medium sand, 10% fines, hydrogen sulfide-like odor, mixed with PEAT.	No sheen.
			4	0.3		
20			4		Bottom of Boring @ 20 Ft. Abandoned with bentonite to 1 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. EA-SB04**
BORING LOCATION: ExxonMobil/ADC	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/23/13 / DATE FINISHED: 10/23/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (7 inches), road base (6 inches), CAP fabric at 15.6 inches.	
1						Cleared to 5 feet bgs with vacuum truck.
2					WELL-GRADED SAND with SILT and GRAVEL (SW-SM): very dark gray (10YR 3/1), moist, 70% fine to coarse sand, 20% fine subrounded gravel (up to 0.75"), 10% fines, wood debris. FILL.	
3						
4	EA-SB04-5-101713			541		
5				327	Wet @ 5 FT.	Sheen, visible product, petroleum hydrocarbon-like odor.
6			4 5 3	333		Sheen, petroleum hydrocarbon-like odor.
7			10 10			Sheen, petroleum hydrocarbon-like odor.
8			12 7	99.9	Wood pieces.	
9			15 15		WELL-GRADED SAND with SILT and GRAVEL (SW-SM): very dark gray (10YR 3/1), moist, 70% fine to coarse sand, 20% fine subrounded gravel (up to 0.75"), 10% fines, wood debris. FILL.	Sheen, petroleum hydrocarbon-like odor.
10			8 10 10	6.1	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, stiff, 100% organic matter, pieces of wood.	Sheen, petroleum hydrocarbon-like odor.
11			4 4	14.8 7.5		Sheen, petroleum hydrocarbon-like odor.
12			6	14.7	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75") mixed with PEAT, reddish brown (2.5YR 2/5/3), wood.	No sheen.
13			2 23			Sheen, petroleum hydrocarbon-like odor.
14				4.6		Sheen, petroleum hydrocarbon-like odor.
15			6			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. EA-SB04 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	EA-SB04-20102313		7 10 12 11 18 13 16 22	2.2 1.2 2.8		No sheen, petroleum hydrocarbon-like odor.
					SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75").	No sheen.
17						No sheen.
18					Poor recovery, pieces of rock wedged in sampler shoe.	No sheen.
19			16 20 20	1.6	POORLY-GRADED SAND with SILT (SP-SM): very dark gray (10YR 3/1), wet, medium dense, 80% fine to coarse sand, 10% fine sand, 10% fine subrounded gravel (up to 0.75"), wood debris.	No sheen.
20					Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. EA-SB05**	
BORING LOCATION: ExxonMobil/ADC	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/29/13	DATE FINISHED: 10/29/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (7 inches), No CAP fabric.	
1					SILTY SAND with GRAVEL (SM): very dark brown (10YR 2/2), moist, 60% fine to medium sand, 25% fines, 15% fine subrounded gravel (up to 0.75"), wood debris, cobbles, nails, pieces of glass. FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4	EA-SB05-5-101913			122		
5				4.0	Wet @ 5 FT.	No sheen.
6			3 3 4	3.6		No sheen.
7			1 1 1	0.9		Sheen.
8				1.4		No sheen.
9			2 2 1	0.8		No sheen.
10			1 1 2			No sheen.
11			8 9 8	0.7	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter, hydrogen sulfide-like odor. Poor recover, due to wood pieces in shoe of split-spoon sampler.	No sheen.
12						No sheen.
13			20 21 20	0.8	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, organic matter mixed with wood pieces and SILTY SAND (SM), hydrogen sulfide-like odor.	No sheen.
14				4.9		No sheen.
15			4			

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. EA-SB05 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16			4 5 8 10	1.63 20.3	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, organic matter mixed with wood pieces, hydrogen sulfide-like odor. WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/2), wet, medium dense, 90% fine to coarse sand, 10% fines mixed with 10% PEAT, hydrogen sulfide-like odor.	No sheen. No sheen.
17			14 8	3.0 17		No sheen.
18			8 5	17	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, organic matter mixed with wood pieces, hydrogen sulfide-like odor.	No sheen.
19	EA-SB05-20-102913		6 6	27.3	WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/2), wet, medium dense, 90% fine to coarse sand, 10% fines mixed with 10% PEAT and pieces of wood, hydrogen sulfide-like odor.	No sheen.
20			8		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, organic matter mixed with wood pieces, hydrogen sulfide-like odor.	
21					Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. EA-SB06**
BORING LOCATION: ExxonMobil/ADC	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/28/13 / DATE FINISHED: 10/28/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
					Asphalt (6 inches).	
1					SILTY SAND (SM): gray (10YR 5/1), moist, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75").	Cleared to 5 feet bgs with vacuum truck.
2						EA-SB06-5-101413 is collected from interval 0 to 5 FT.
3	EA-SB06-5-101413			417		
4						
5						Sheen, petroleum hydrocarbon-like odor.
6	EA-SB06-6-102813		3 3 4	868 671	Wet @ 6 FT.	No sheen, petroleum hydrocarbon-like odor.
7			1 1 1	7.6		No sheen, petroleum hydrocarbon-like odor.
8				4.2	SILTY SAND (SM): gray (10YR 5/1), wet, loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75"), mixed with PEAT, reddish brown (2.5YR 2.5/3) and wood pieces.	No sheen, petroleum hydrocarbon-like odor.
9			2 2 1	78.2		No sheen, petroleum hydrocarbon-like odor.
10			1 1 2		SILTY SAND (SM): very dark gray (10YR 3/1), wet, very loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75").	Sheen, petroleum hydrocarbon-like odor.
11				8	SILTY SAND (SM): very dark gray (10YR 3/1), wet, very loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75"), mixed with PEAT, reddish brown (2.5YR 2.5/3) and wood pieces.	No sheen.
12	EA-SB06-12-102813		8 8 9	9.3 3.2	ORGANIC SOIL (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, organic matter, pieces of wood, hydrogen sulfide-like odor.	No sheen.
13			20 21	2.6	ORGANIC SOIL (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, organic matter, pieces of wood, metal debris, mixed with brown, SANDY SILT (ML), hydrogen sulfide-like odor.	No sheen.
14			20	2.4		No sheen.
15			4			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. EA-SB06 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	EA-SB06-20-102813		4 5 8	1.5 1.3		No sheen. No sheen.
17			10 14	1.2	SILTY SAND (SM): brown (10YR 5/3), wet, medium dense, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75")	No sheen.
18			8 8 5	1.3	WELL-GRADED SAND with SILT (SW-SM): dark gray (10YR 4/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel, wood pieces.	No sheen.
19			6			No sheen.
20			6 8	1.2	2 inch piece of gravel. Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB01**
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/25/13 / DATE FINISHED: 10/25/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					SILTY SAND (SM): dark yellowish brown (10YR 3/4), moist, 60% fine to medium sand, 30% fines, 10% fine subrounded gravel (up to 0.75"), wood debris, bricks, and cobbles present. FILL.	
1						Cleared to 5 feet bgs with vacuum truck.
2						
3						
4						
5	FA-SB01-5.5-101513	■		76		Sheen, visible product, petroleum hydrocarbon-like odor.
6					Wet @ 5.5 FT.	Sheen, petroleum hydrocarbon-like odor.
7			5 5 3	60 34.7		Sheen, visible product, petroleum hydrocarbon-like odor.
8				19.2	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Sheen, visible product, petroleum hydrocarbon-like odor.
9			3 1 5	10.7		Sheen, petroleum hydrocarbon-like odor.
10			8 8 8	14.7 20.7	Pieces of wood. WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Sheen, petroleum hydrocarbon-like odor.
11					SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 75% fine to coarse sand, 20% fines, 5% fine subrounded gravel (up to 0.75").	Sheen, petroleum hydrocarbon-like odor.
12			5 4 5	6.1 11.8		Sheen, petroleum hydrocarbon-like odor.
13			5 5 7		WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	No sheen, petroleum hydrocarbon-like odor.
14				7.5	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, mixed with SILTY SAND with GRAVEL and wood debris.	Sheen, petroleum hydrocarbon-like odor.
15			9			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB01 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
	FA-SB01-20-102513		8 10	2.2 7.6		Sheen, petroleum hydrocarbon-like odor.
16			3 4		WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Sheen.
17			4	2.2	mixed with PEAT, reddish brown (2.5YR 2.5/3), hydrogen sulfide-like odor.	Sheen.
18			15 17 23	2.2		No sheen.
19			10 13	1	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75") mixed with dark brown, SILT (ML).	No sheen.
20			13		Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	No sheen.
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB02**
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/24/13 / DATE FINISHED: 10/24/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					WELL-GRADED SAND (SW): very dark gray (10YR 3/1), moist, 100% fine to medium sand.	
1						Cleared to 8 feet bgs with vacuum truck.
2						
3						
4						
5	FA-SB02-5-101513	■		150		Sheen, trace free product, petroluem hydrocarbon odor.
6					Wet @ 6 FT.	Sheen, petroluem hydrocarbon odor.
7						Sheen, petroluem hydrocarbon odor.
8				44.8 5.6	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to medium sand, 10% fines.	Sheen, petroluem hydrocarbon odor.
9			10 6 3			Sheen, petroluem hydrocarbon odor.
10			5 5 5	38.9 1.6 20.5		Sheen, petroluem hydrocarbon odor.
11					WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 80% fine to medium sand, 10% fines, 10% fine subrounded gravel, wood debris (roots).	No sheen.
12			6 7 9	7.4 5.6		Sheen.
13			4 4 3			Sheen.
14				3.2		No sheen.
15			3			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB02 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	FA-SB02-20-102413		5 5	2.2 3.2	SANDY SILT (ML): very dark brown (10YR 2/2), wet, no plasticity, medium stiff, 65% fines, 35% fine to medium sand, wood debris, hydrogen sulfide-like odor.	No sheen.
17			4 5 9	1.2	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose to medium dense, 65% fine to coarse sand, 30% fines, 5% fine subrounded gravel (up to 0.75" in size), hydrogen sulfide odor.	No sheen.
18			13 14 14	0.8	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose to medium dense, 80% fine to coarse sand, 15% fines, 5% fine subrounded gravel (up to 0.75" in size), wood debris, hydrogen sulfide odor.	No sheen. No sheen.
19			7 8 11	0.6	Mixed with reddish brown (2.5 YR 3.5/3) PEAT.	No sheen.
20					Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB03**
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/24/13 / DATE FINISHED: 10/24/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
					Surface Elevation: NA	
1					POORLY-GRADED SAND with SILT (SP-SM): very dark grayish brown (10YR 3/2), moist, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel (up to 0.75"), wood debris (roots).	Cleared to 5 feet bgs with vacuum truck.
2						FA-SB03-4-102413 is collected from interval 0 to 5 FT.
3						
4	FA-SB03-4-102413			9.4		
5				9.5	Wet @ 5 FT.	No sheen.
6	FA-SB03-6.5-102413		4 4 4	23.4		Sheen, petroleum hydrocarbon-like odor.
7			5 7 9	7.4	SILTY SAND (SM): dark brown (10YR 3/3), wet, loose, 60% fine to medium sand, 30% fines, 10% fine subrounded gravel (up to 0.75") mixed with SANDY SILT (ML) dark greenish gray (10GY 4/1).	Sheen, petroleum hydrocarbon-like odor.
8				2.6	SILTY SAND (SM): very dark gray (10YR 3/1), wet, 65% fine to coarse sand, 30% fines 5% fine subrounded gravel (up to 0.75").	No sheen.
9			6 7 8	0.5	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Sheen.
10			8 9 9	0.5		No sheen.
11				0.8		No sheen.
12			5 7 7	0.6	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 80% fine to medium sand, 20% fines.	No sheen.
13			7 8 8	0.6		No sheen.
14				2.1	mixed with PEAT, reddish brown (2.5YR 2.5/3).	No sheen.
15			13			

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB03 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
			15			No sheen.
			19	0.4		
				0.2	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 75% fine to coarse sand, 10% fines, 5% fine subrounded gravel, rootlets.	
16			15			No sheen.
			17			
			22	0.2		
17						No sheen.
			10			
			11			
18			14			No sheen.
				0.2		
				0.2		
19						No sheen.
	FA-SB03-20-102413		16			
			17		mixed with PEAT, reddish brown (2.5YR 2.5/3).	
20			22		Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB04**	
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/24/13	DATE FINISHED: 10/24/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					POORLY-GRADED SAND with SILT (SP-SM): very dark grayish brown (10YR 3/2), moist, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Cleared to 5 feet bgs with vacuum truck. FA-SB04-4-102413 is collected from interval 0 to 5 FT.
2						
3						
4	FA-SB04-4-102413			2.3		
5				0.1	Wet @ 5 FT.	No sheen, petroleum hydrocarbon-like odor.
6			2 2 3	0.8	SANDY SILT (ML): dark greenish gray (5GY 4/1), wet, soft, non plasticity, 70% fines, 30% fine sand.	No sheen.
7			1 1	0.1	SILTY SAND (SM): dark greenish gray (5GY 4/1), wet, loose, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75").	No sheen.
8			2	0.1	Mixed with PEAT, reddish brown (2.5yr 2.5/3), burnt wood debris.	No sheen.
9			1 5 11	0.1		No sheen.
10			10	0.2		No sheen.
11			11 9	0.1	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	No sheen.
12			11 12 14	0.1		No sheen.
13			10 10	0.2		No sheen.
14			7	0.2	hydrogen sulfide-like odor.	No sheen.
15			5			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB04 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	FA-SB04-20-102413		5 5	2.8 21.6	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75"), mixed with PEAT, reddish brown (2.5yr 2.5/3).	No sheen.
			5 6 7	9.9	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75"), hydrogen sulfide-like odor.	No sheen.
17			6 8 10	1.9	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75"), mixed with PEAT, reddish brown (2.5yr 2.5/3).	No sheen.
18			6 5 8	0.3	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75"), hydrogen sulfide-like odor.	No sheen.
19						
20					Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB05**
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/24/13 / DATE FINISHED: 10/24/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					SILTY SAND (SM): dark gray (10YR 4/1), moist, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75").	Cleared to 8 feet bgs with vacuum truck. FA-SB05-4-102413 is collected from interval 0 to 8 FT.
2						
3						
4	FA-SB05-4-102413					
5				0.0		
6					Wet @ 5.5 FT.	
7						
8				1.0	SILTY SAND (SM): dark gray (10YR 4/1), moist, loose, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75"), mixed with PEAT reddish brown (2.5YR 2.5/3).	No sheen.
9			5 8 12			No sheen.
				0.3 0.3	WELL-GRADED SAND with SILT (SW-SM): dark gray (10YR 4/1), wet, loose, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel.	
10			8 9 9			No sheen.
11				0.5		No sheen.
12			8 7 9			No sheen.
				0.3 0.3		
13			6 7 9			No sheen.
14				27.9	wet, loose, 75% fine to medium sand, 10% fines, 15% fine subrounded gravel.	No sheen.
15			5			

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB05 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
	FA-SB05-20-102413		7 9	0.3		No sheen.
16			6	8.9	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel, hydrogen sulfide-like odor.	No sheen.
17			6 9	10.1		No sheen.
18			7 5 6	1.6	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, 100% organics, with pieces of wood.	No sheen.
19			11 14	5.9	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 90% fine to medium sand, 10% fines, plant debris, hydrogen sulfide-like odor.	No sheen.
20			16		Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB06**
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/25/13 / DATE FINISHED: 10/25/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (0.5 inches).	
1					SILTY SAND (SM): dark yellowish brown (10YR 3/4), moist, 55% fine to medium sand, 30% fines, 10% fine subrounded gravel (up to 0.75"), cobbles present.	Cleared to 5 feet bgs with vacuum truck.
2						FA-SB06-4-102513 is collected from interval 0 to 5 FT.
3						
4	FA-SB06-4-102513			0.4		
5				0.8	Wet @ 5 FT.	No sheen.
6			3 2 4	31.2		Sheen, petroleum hydrocarbon-like odor.
7	FA-SB06-7.5-102513		4 6	55	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Sheen, petroleum hydrocarbon-like odor.
8			5	42		Sheen, petroleum hydrocarbon-like odor.
9			7 6 6	35		Sheen, petroleum hydrocarbon-like odor.
10			9 10 10	33.9 2.6		No sheen, petroleum hydrocarbon-like odor.
11			5 6 6	20.9 20.7		Sheen, petroleum hydrocarbon-like odor.
12			10 11 12	2.6		No sheen, petroleum hydrocarbon-like odor.
13						Sheen, petroleum hydrocarbon-like odor.
14			9			Sheen, petroleum hydrocarbon-like odor.
15						

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB06 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15	FA-SB06-20-102513		12 15	8.5 11.6		No sheen, petroleum hydrocarbon-like odor.
16			9 10		WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75"). Heaving sand.	Sheen, petroleum hydrocarbon-like odor.
17			13	3.2		Sheen, petroleum hydrocarbon-like odor.
18			4 4 4	7.9	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 60% fine to coarse sand, 30% fine subrounded gravel (up to 0.75"), 10% fines, with wood debris.	No sheen, petroleum hydrocarbon-like odor.
19			8		WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel (up to 0.75").	Sheen.
20			6 5	5.1	Bottom of Boring @ 20 Ft. Abandoned with bentonite to 1 FT bgs and cement to surface.	No sheen.
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. FA-SB07**
BORING LOCATION: Federal Ave (West Right-of-Way)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/25/13 / DATE FINISHED: 10/25/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					SILTY SAND (SM): dark yellowish brown (10YR 3/4), moist, 60% fine to medium sand, 30% fines, 10% fine subrounded gravel (up to 0.75").	Cleared to 5 feet bgs with vacuum truck.
2						FA-SB07-4-102513 is collected from interval 0 to 5 FT.
3						
4	PE-SB01-4-102513			0.1		
5				0.0	gray (10YR 5/1), Wet @ 5 FT.	No sheen.
6			4 4 5	2.1	mixed with pieces of wood.	No sheen.
7			5 7 6	15	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel, rootlets.	No sheen, petroleum hydrocarbon-like odor.
8				0.5		No sheen.
9			6 9 15	0.4		No sheen.
10				0.2		No sheen.
11			8 16 16	0.3		No sheen.
12			7 8 9	0.1		No sheen.
13				0.2		No sheen.
14			8 9 9	0.3		No sheen.
15			9			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. FA-SB07 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	PE-SB01-20-102513		9 11	0.1 1.8	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded gravel, rootlets, mixed with PEAT reddish brown (2.5YR 2.5/3).	No sheen.
			10 10		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, stiff, mixed with POORLY-GRADED SAND with SILT, hydrogen sulfide odor.	No sheen.
17			11	0.1	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, medium dense, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel, rootlets.	No sheen.
18			10 14 16	0.3	Pieces of wood.	No sheen.
19					WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel, rootlets.	No sheen.
20			15 15 18	0.1	Bottom of Boring @ 20 FT. Abandoned with bentonite to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. KC-SB01**	
BORING LOCATION: Kimberly Clark	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/30/13	DATE FINISHED: 10/30/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 25.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					WELL-GRADED SAND with SILT and GRAVEL (SW-SM): dark brown (10YR 3/3), wet, 70% fine to coarse sand, 20% fine subrounded to rounded gravel (up to 0.75"), 10% fines, cobbles.	Cleared to 5 feet bgs with vacuum truck. KC-SB01-103013 is collected from interval 0 to 5 FT.
1						
2						
3						
4	KC-SB01-5-103013			0.1		
5				0.2	WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/3), wet, loose, 85% fine to coarse sand, 10% fines, 5% fine subrounded to rounded gravel (up to 0.75").	No sheen.
6			8 5 5	0.3		No sheen.
7			3 2	0.3		No sheen.
8			2	0.1		No sheen.
9			4 5 5	0.1	WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/3), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded to rounded gravel (up to 0.75"), wood pieces.	No sheen.
10			12 13	0.2	dark gray (10Y 4/1), no wood pieces.	No sheen.
11			16	0.1		No sheen.
12			5 15 21	0.1		No sheen.
13			15 17	0.1		No sheen.
14			21	0.1		No sheen.
15			11			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. KC-SB01 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
			16			No sheen.
			21	0.1		
				0.2	WELL-GRADED SAND with SILT (SW-SM): very dark grayish brown (10YR 3/2), wet, medium dense, 90% fine to coarse sand, 10% fines.	
16			19		Heaving sand.	No sheen.
			20			
			21	0.2		
17						No sheen.
			18			
			22			
18						No sheen.
			21	0.1		
				0.2		
19						No sheen.
			15			
			17			
			19	0.1		
20					WELL-GRADED SAND with SILT (SW-SM): very dark grayish brown (10YR 3/2), wet, medium dense, 85% fine to coarse sand, 10% fines, 5% fine subrounded to rounded gravel (up to 0.75").	No sheen.
			18			
			22			
21						No sheen.
			24	0.2		
				0.2		
22						No sheen.
			14			
			18		4 inch cobble stuck in shoe of split-spoon sampler.	
			19			
23						No sheen.
				0.3		
24	KC-SB01-25-103013					
			20		SILTY SAND (SM): dark gray (10YR 5/3), wet, medium dense, 75% fine to medium sand, 25% fines.	No sheen.
			20	0.2		
25			24			
					Bottom of Boring @ 25 FT. Abandoned with bentonite to surface.	
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB02**
BORING LOCATION: Vigor Marine (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/22/13 / DATE FINISHED: 10/22/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (8 inches), base gravel (10 inches).	
1						Cleared to 5 feet bgs with vacuum truck.
2					WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), moist, 85% fine to medium sand, 10% fines, 5% fine subrounded gravel (up to 0.75" in size), brick debris. FILL.	
3						
4						
5				40 90.8		No sheen.
6	PE-SB02-7-102213		8 6 7		Wet @ 6 FT.	Sheen, free product, petroleum hydrocarbon-like odor
7			10 10	88 4.1		Sheen, free product, petroleum hydrocarbon-like odor
8			12	2.2		Sheen.
9			5 5 5	4.7		No sheen.
10			10 9	2.2		Sheen.
11			10	0.8		No sheen.
12			7 9 15	3.2		No sheen.
13			10 9	4.1	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 0.75" in size).	Sheen.
14			10	1.3		No sheen.
15			15			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB02 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
15			14 15	1.3 1.1		No sheen.
16			9 10		SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 65% fine to medium sand, 30% fines, 5% fine subrounded gravel (up to 0.75" in size), no sheen, hydrogen sulfide-like odor.	No sheen.
17			12	4		No sheen.
18			12 13 14	0.5		No sheen.
19	PE-SB02-20-102213		11 10	0.6		No sheen.
20			14		Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB03**
BORING LOCATION: Vigor Marine (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/22/13 / DATE FINISHED: 10/22/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (5 inches), base gravel (18 inches).	
1						Cleared to 5 feet bgs with vacuum truck.
2					WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), moist, 95% fine to medium sand, 5% fines.	
3						
4	PE-SB03-5-101613			46		
5				44		Sheen, free product, petroleum hydrocarbon-like odor
6			8 20 12	13.1	Wet @ 5.25 FT.	Sheen, free product, petroleum hydrocarbon-like odor
7			8 7 6	18		Sheen, petroleum hydrocarbon-like odor
8			6 10 10	3.8		Sheen, petroleum hydrocarbon-like odor
9			3 4 6	22 2.4		Sheen, petroleum hydrocarbon-like odor
10						Sheen, petroleum hydrocarbon-like odor
11			8 9 12	1.6	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% fines, trace wood debris.	No sheen
12			6 8 8	1.1 1.0		No sheen
13			10	5.6		No sheen
14						No sheen
15						

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB03 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	PE-SB03-20-102213		10 10 7 9 9	3.1 1.0 2.4	SANDY SILT (ML): very dark brown (10YR 2/2), wet, no plasticity, medium stiff, 65% fines, 35% fine sand, trace wood debris, hydrogen sulfide-like odor.	No sheen No sheen
17					SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 80% fine to medium sand, 20% fines, hydrogen sulfide-like odor.	No sheen
18			8 7 8	0.6 1.5	SANDY SILT (ML): dark brown (10YR 3/3), wet, no plasticity, loose, 70% fines, 30% fine to medium sand, hydrogen sulfide-like odor.	No sheen No sheen
19			9 10 10	1.5		
20					Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB04**	
BORING LOCATION: Port of Everett	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/22/13	DATE FINISHED: 10/22/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (6 inches), base gravel (12 inches).	
1						Cleared to 5 feet bgs with vacuum truck.
2					SILTY SAND (SM): very dark gray (10YR 3/1), moist, loose, 65% fine to coarse sand, 25% fines, 10% fine subrounded gravel (up to 0.75" in size), wood debris.	PE-SB04-102213 is collected from interval 0 to 5 FT.
3						
4	PE-SB04-102213			0.0		
5				4.6		No sheen.
6			4 4 5	0.2		No sheen.
7			2	3.4	Wet @ 7.0 FT.	No sheen.
8			2 3	0.3	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to medium sand, 10% fines.	Sheen.
9			6 8		SANDY SILT (ML): dark brown (10YR 3/3), wet, no plasticity, medium stiff, 60% fines, 40% fine to medium sand, wood debris (possible railroad tie).	No sheen.
10			10	0.0 0.0	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to medium sand, 10% fines. Pieces of wood.	No sheen.
11			4 4 5	0.0	WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR 3/1), wet, loose, 90% fine to medium sand, 10% fines.	No sheen.
12			6 6 6	1.9		No sheen.
13			4	0.4		No sheen.
14			4 3	0.9	SANDY SILT (ML): very dark brown (10YR 2/2), wet, no plasticity, medium stiff, 70% fines, 30% fine sand, wood debris, hydrogen sulfide odor.	No sheen.
15			6			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB04 (cont'd)

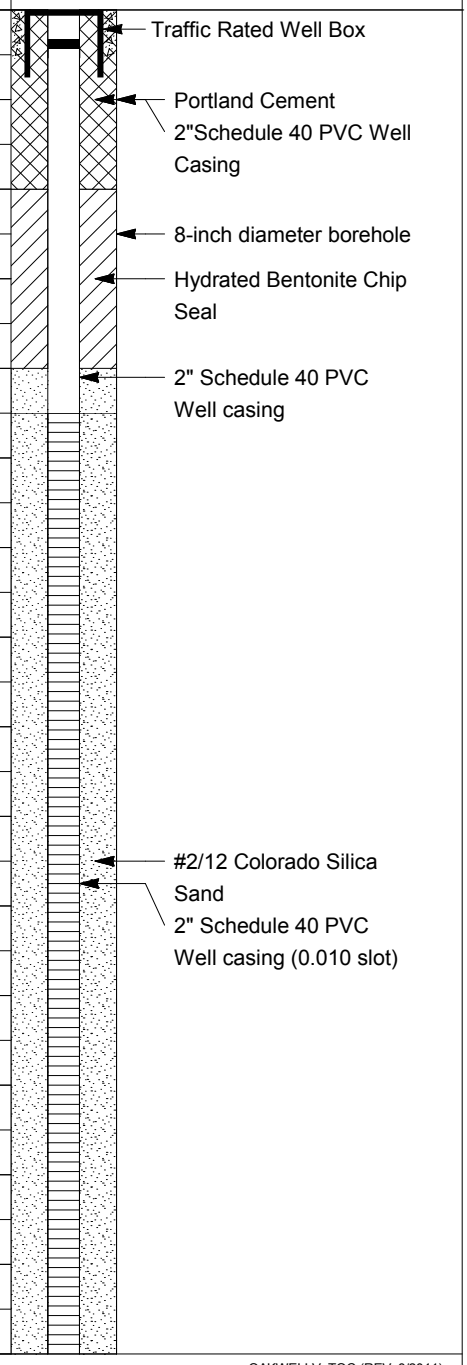
DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	PE-SB04-102213		7 7 7 9 9	1.0 9.0 0.1	SANDY SILT (ML): very dark brown (10YR 2/2), wet, no plasticity, medium stiff, 70% fines, 30% fine sand, wood debris, hydrogen sulfide odor.	No sheen. No sheen.
17					SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 60% fine to coarse sand, 40% fines, hydrogen sulfide odor.	No sheen.
18			17 18 14	0.1	SANDY SILT (ML): dark yellowish brown (10YR 4/4), wet, no plasticity, stiff, 70% fines, 30% fine sand, wood debris, hydrogen sulfide odor.	No sheen.
19			14 17		SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 60% fine to coarse sand, 40% fines, hydrogen sulfide odor.	No sheen.
20			21		SANDY SILT (ML): very dark gray (10YR 3/1), wet, no plasticity, stiff, 70% fines, 30% fine sand, wood debris, hydrogen sulfide odor.	
21					Bottom of Boring @ 20 FT. Abandoned with bentonite to 1 FT bgs and cement to surface.	
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Well No. MW-A8**
BORING LOCATION: Dunlap Towing (Port of Everett Leasehold Property)	TOP OF CASING ELEVATION AND DATUM: Ground Surface
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 10/29/13 / DATE FINISHED: 10/28/13
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 15.5 / SCREEN INTERVAL (ft.): 5-15
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.): FIRST 13, COMPL. 11.75 / CASING:
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 lb / DROP: 30 in	RESPONSIBLE PROFESSIONAL: John Long / REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA
0					Asphalt (6 inches).
1	MW-A8-6-102913		8 6 6	0.1	WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/3), moist, 80% fine to coarse sand, 10% fines, 10% fine subrounded gravel (up to 0.75"), cobbles, brick, metal pieces. FILL.
2					
3					
4					
5					
6			22 30 30	0.2 0.3 0.1	
7					
8			9 8 6	0.1	SILTY SAND (SM): dark brown (10YR 3/3), moist, loose, 75% fine to coarse sand, 25% fines, 5% fine subround gravel. FILL.
9					WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/3), moist, medium dense, 80% fine to coarse sand, 10% fines, 10% fine subrounded gravel (up to 0.75").
10			9 20 21	0.0 0.0	
11			18 21 22	0.0	
12			22 28 31	0.0 0.1	Cobble at 12.5 FT to 13 Ft.
13					brown (10YR 4/3), WET @ 13.5 FT.
14			20 21 24	0.1	
15					

WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS



PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Well No. MW-A8 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
16	MW-A8-15-102913	■			WELL-GRADED SAND with SILT (SW-SM): dark brown (10YR 3/3), moist, medium dense, 80% fine to coarse sand, 10% fines, 10% fine subrounded gravel (up to 0.75").	2" Schedule 40 PVC endcap
17					Bottom of Boring @ 15.5 FT.	
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKWELLV_TOC (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. BN-SB08**
BORING LOCATION: BNSF Property	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/10/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), moist, 75% fine to coarse sand, 15% fines, 10% fine subrounded gravel (up to 0.75" in size). FILL.	Cleared to 5.5 feet bgs with vacuum truck.
2						
3						
4						
5	BN-SB08-5.5-020414	■		0.0		Sheen
					Wet at 5.5'.	
6				0.2 0.1	Trace wood debris.	No Sheen
7			6 7 8	0.2		No Sheen
8			5 6 6			No Sheen
9				0.3 0.2	POORLY-GRADED SAND (SP): very dark grayish brown (10YR 3/2), wet, medium dense, 95% fine to medium sand, 5% fines.	No Sheen
10			10 13 12	0.3	Similar to above but with trace fine subangular gravel (up to 0.75" in size).	No Sheen
11			15 11 10			No Sheen
12				0.7 0.2	WELL-GRADED SAND with GRAVEL (SW): very dark grayish brown (10YR 3/2), wet, medium dense, 80% fine to coarse sand, 15% fine subrounded gravel (up to 1" in size), 5% fines.	No Sheen
13			5 11 10	0.1		No Sheen
14			13 9 10		WELL-GRADED SAND (SW): very dark grayish brown (10YR 3/2), wet, medium dense, 90% fine to coarse sand, 5% fine subrounded gravel (up to 1" in size), 5% fines.	No Sheen
15						

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. BN-SB08 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16			14 12 15	0.3 0.4 0.4		No Sheen No Sheen
17			12 11		POORLY-GRADED SAND (SP): dark yellowish brown (10YR 4/4), wet, medium dense, 95% fine to coarse sand, 5% fines, trace subrounded gravel (up to 1" in size).	No Sheen
18			12	0.4		No Sheen
19			15 16 16	0.3	SILTY SAND (SM): dark yellowish brown (10YR 4/4), wet, medium dense, 75% fine to medium sand, 25% fines.	No Sheen
20			10 12			No Sheen
21			13	0.3 0.5		
22			8 13 14	0.5	SANDY SILT (ML): very dark gray (10YR 3/1), wet, no plasticity, medium stiff, 70% fines, 30% fine sand, trace fine subrounded gravel (up to 1" in size).	
23	BN-SB08-24-021014		11 18	0.5	SILT (ML): very dark gray (10YR 3/1), wet, no plasticity, stiff, 95% fines, 5% fine sand, trace fine subrounded gravel (up to 0.75" in size), trace shells.	
24			11		Bottom of Boring @ 24.0 FT. Abandoned with bentonite to surface.	
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. BN-SB09**	
BORING LOCATION: BNSF Property	ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14	DATE FINISHED: 2/10/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
1					WELL-GRADED GRAVEL with SAND (GW): gray moist, 80% fine to coarse subrounded gravel (up to 3" in size), 15% fine to coarse sand, 5% fines. FILL.	Cleared to 9 feet bgs with vacuum truck.
2					Wet @ 2 FT.	
3					Filter fabric observed at 3 FT.	
4						
5						
6						
7						
8	BN-SB09-9-020414			0.1	WELL-GRADED SAND with SILT (SW-SM): dark yellowish brown (10YR 3/4), wet, medium dense, 70% fine to coarse sand, 15% fine subrounded gravel (up to 0.75" in size), 15% fines.	
9						No Sheen
10				0.3 0.4	Heaving Sand.	No Sheen
11			1 15 21	0.3		No Sheen
12			13 25 20			No Sheen
13				0.2 0.2		No Sheen
14			19 20 15			No Sheen
15				0.2		

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. BN-SB09 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	BN-SB09-24-021014		6 12 12	0.3 0.4	POORLY-GRADED SAND (SP): dark yellowish brown (10YR 3/4), wet, medium dense, 95% fine to medium sand, 5% fines, trace subrounded gravel (up to 0.75" in size). POORLY-GRADED SAND (SP): dark yellowish brown (10YR 3/4), wet, medium dense, 95% fine to medium sand, 5% fines, trace subrounded gravel (up to 0.75" in size).	No Sheen No Sheen
17			9 14 10	0.3		No Sheen
18			14 17			No Sheen
19			21	0.5 0.5		No Sheen
20			10 12 12	0.2		No Sheen
21			15 15			
22			15	0.3 0.3		
23			17 22 20	0.3		
24			20 20			
25			20		Bottom of Boring @ 25.0 FT. Abandoned with bentonite to surface.	
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. KC-SB02**
BORING LOCATION: Kimberly Clark	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/10/14
DRILLING METHOD: Limited Access Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 55 modified	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 150 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (4 Inches)	
1					POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), moist, 95% fine to medium sand, 5% fines, trace coarse sand and trace fine subrounded gravel (up to 0.75" in size). FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4	KC-SB02-5-020414			6.3		
5				0.2	Wet @ 5 FT.	Trace Sheen
6	KC-SB02-7-021014		8 6 8			
7				0.0	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 75% fine to medium sand, 20% fines, 5% fine subrounded gravel (up to 1" in size).	No Sheen
8			6 6 9	0.7	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, mixed with SANDY SILT (SM).	No Sheen
9			8 10 10	0.0 0.1	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% fines, mottled.	No Sheen No Sheen
10			14 28 30			No Sheen
11				0.4 0.2		No Sheen
12			20 20 20			No Sheen
13			15 19 21	0.4	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, medium dense, 95% fine to coarse sand, 5% fines, trace subrounded gravel (up to 0.75" in size).	No Sheen
14				0.2 0.3		No Sheen
15			16			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. KC-SB02 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	KC-SB02-20-021014		15 15 16 17 17	0.2		No Sheen No Sheen
17				0.0 0.5	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, medium dense, 95% fine to coarse sand, 5% fines, trace subrounded gravel (up to 0.75" in size) mixed with PEAT (PT), hydrogen sulfide odor.	No Sheen
18			15 18 23	0.0		No Sheen
19			7 9	11.0	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff.	No Sheen
20			12		Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	No Sheen
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB05**
BORING LOCATION: Dunlap Towing (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/7/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (5 inches)	
1					SILTY SAND with GRAVEL (SM): dark yellowish brown (10YR 3/4), moist, 65% fine to coarse sand, 20% fine subrounded gravel (up to 0.75" in size), 15% fines. FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4						
5				4 0.6	WELL-GRADED SAND (SW): dark yellowish brown (10YR 3/4), moist, loose, 95% fine to coarse sand, 5% fines. FILL.	No Sheen
6			5 5 5			No Sheen
7			50/6		WELL-GRADED SAND (SW): dark yellowish brown (10YR 3/4), moist, loose, 90% fine to coarse sand, 5% fines, 5% fine subrounded gravel (up to 0.75" in size), wood debris. FILL.	No Sheen
8	PE-SB05-9-021014			0.4 0.4		No Sheen
9			5 5 7	0.3	SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 80% fine to medium sand, 20% fines.	No Sheen
10			4 5 11	0.5	SANDY SILT (ML): very dark gray (10YR 3/1), wet, medium stiff, 80% nonplastic fines, 20% fine to medium sand, trace subrounded gravel (up to 2" in size), wood debris (twigs), hydrogen sulifde odor.	No Sheen
11				0.3	SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 80% fine to medium sand, 20% fines, trace fine gravel, trace peat, cemented.	No Sheen
12			12 14 19	0.3		No Sheen
13			21			No Sheen
14			20 20	0.3 0.2	POORLY-GRADED SAND (SP): black (10YR 2/1), wet, medium dense, 95% fine to medium sand, 5% fines, trace fine subrounded gravel, trace peat, yellow specks.	No Sheen
15			16			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB05 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16			13 14	0.4	POORLY-GRADED SAND (SP): black (10YR 2/1), wet, medium dense, 90% fine to medium sand, 5% nonplastic fines, 5% fine subrounded gravel (up to 0.75" in size).	No Sheen
			5 5		SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 70% fine to medium sand, 30% nonplastic fines, trace subrounded gravel (up to 0.75" in size).	No Sheen
17			8	0.4 0.3	SANDY SILT (ML): very dark gray (10YR 3/1), wet, medium stiff, 70% nonplastic fines, 30% fine to medium sand.	No Sheen
18			6 7 9	0.3	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, trace fine subrounded gravel. Trace wood debris mixed in POORLY-GRADED SAND (SP).	No Sheen
19	PE-SB05-20-020714		6			No Sheen
20			9 12	0.4	Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	No Sheen
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB06**
BORING LOCATION: Vigor Marine (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/7/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (5""	
1					WELL-GRADED SAND with GRAVEL (SW): dark yellowish brown (10YR 3/4), moist, 75% fine to coarse sand, 15% fine subrounded gravel (up to 1" in size), FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3					Concrete rubble, filter fabric at 5'.	
4						
5				2.4 3.6	WELL-GRADED SAND (SW): dark yellowish brown (10YR 3/4), moist, loose, 90% fine to coarse sand, 10% nonplastic fines, FILL.	No Sheen
6			5 7 7			No Sheen
7	PE-SB06-7.5-020714			1.6	SILTY SAND (SM): dark yellowish brown (10YR 3/4), moist, loose, 75% fine to coarse sand, 20% nonplastic fines, 5% fine subrounded gravel (up to 2" in size), wood debris, FILL. Wet @ 7 FT.	Sheen, trace product, petroleum hydrocarbon-like
8			8 8 11	2.0 13.3		Sheen
9			8 10 15	11.6	WELL-GRADED SAND with GRAVEL (SW): very dark gray (10YR 3/1), wet, medium dense, 80% fine to coarse sand, 15% fine subrounded gravel (up to 1" in size), 5% nonplastic fines.	Sheen
10			10 12 15			Sheen, trace product, petroleum hydrocarbon-like
11	PE-SB06-11.5-020714			12	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, medium dense, 95% fine to medium sand, 5% nonplastic fines.	No Sheen
12			10 10 11			No Sheen
13					No recovery.	No Sheen
14				10 13.8	WELL-GRADED SAND with GRAVEL (SW): very dark gray (10YR 3/1), wet, medium dense, 85% fine to coarse sand, 15% nonplastic fines, trace subrounded gravel (up to 0.75" in size).	No Sheen
15			12			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB06 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	PE-SB06-20-020714		11 14	1.8	WELL-GRADED SAND with GRAVEL (SW): very dark gray (10YR 3/1), wet, medium dense, 85% fine to coarse sand, 15% nonplastic fines, trace subrounded gravel (up to 0.75" in size).	No Sheen
17			11 11 9	3.9 8.3		No Sheen No Sheen
18			7 7 9	5	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, with trace PEAT (PT), hydrogen sulfide-like odor.	No Sheen
19			13 15			No Sheen
20			20		Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	No Sheen
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB07**
BORING LOCATION: Vigor Marine (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/7/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt.	
1					POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), moist, 90% fine to coarse sand, 5% nonplastic fines, 5% fine subrounded gravel (up to 1" in size). FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3					Wood debris mixed in the POORLY-GRADED SAND.	
4						
5	PE-SB07-5-020314			100 71.6	WELL-GRADED SAND (SW): very dark gray (10YR 3/1), moist, 95% fine to coarse sand, 5% nonplastic fines. FILL. Wet @ 4.5 FT.	Sheen, visible product, petroleum hydrocarbon-like odor.
6	PE-SB07-7-020714		4 5 9		WELL-GRADED SAND (SW): very dark gray (10YR 3/1), wet, loose, 95% fine to coarse sand, 5% nonplastic fines, trace subrounded gravel (up to 0.75" in size).	Sheen, visible product, petroleum hydrocarbon-like odor.
7			16 19	60		Sheen, visible product, petroleum hydrocarbon-like odor.
8	PE-SB07-9-020714		18	33 71		Sheen, visible product, petroleum hydrocarbon-like odor.
9			8 5		Similar as above but with trace wood debris.	
10	PE-SB07-11-020714		8 18	43		Sheen, visible product, petroleum hydrocarbon-like odor.
11			18 18	4.0		Sheen, visible product, petroleum hydrocarbon-like odor. No Sheen
12	PE-SB07-13-020714		16 15 18	4.0 11.4		No Sheen
13	PE-SB07-15-020714		15 18			Trace Sheen
14			21	12.2 4.5		No Sheen
15			14			

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB07 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	PE-SB07-17-020714		15 19	9.9	SILTY SAND (SM): very dark gray (10YR 3/1), wet, medium dense, 80% fine to medium sand, 20% nonplastic fines, trace fine subrounded gravel (up to 0.75" in size), trace PEAT.	No Sheen
17			13 20	14.5		No Sheen
18			15 10 10	12.2		No Sheen Sheen
19	PE-SB07-20-020714		12 6 8	8.4 4.8		No Sheen
20			8		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, 100% organic, hydrogen sulfide-like odor.	No Sheen
21					Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB08**
BORING LOCATION: Vigor Marine (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/6/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) — FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt.	
1					WELL-GRADED SAND (SW): very dark gray (10YR 3/1), moist, 85% fine to coarse sand, 10% fines, 5% nonplastic fines. FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4						
5				0.8 0		No Sheen
6	PE-SB08-7.5-020614		6 6 7		SILTY SAND (SM): very dark gray (10YR 3/1), moist, loose, 65% fine to coarse sand, 35% nonplastic fines, trace fine subrounded gravel (up to 0.75" in size), wood debris.	No Sheen
7			3 5 8	0.0	SANDY SILT (ML): very dark gray (10YR 3/1), wet, soft, 65% nonplastic fines, 35% fine to medium sand.	No Sheen
8				0 0.0	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, trace fine subrounded gravel (up to 0.75" in size).	No Sheen
9			3 5 8			No Sheen
10				2.0		No Sheen
11	PE-SB08-11.5-020614		4 4 5	2.2	WELL-GRADED SAND (SW): very dark gray (10YR 3/1), wet, loose, 85% fine to coarse sand, 10% nonplastic fines, 5% fine subrounded gravel (up to 2" in size).	Sheen, petroleum hydrocarbon-like odor
12			5 5 8			Sheen, petroleum hydrocarbon-like odor
13			4 5 7	2.1 3.2		Sheen, petroleum hydrocarbon-like odor
14				2.9 6.6		Sheen, petroleum hydrocarbon-like odor
15			6			

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB08 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
	PE-SB08-23-020614 PE-SB08-21-020614		7 9	21.2		Sheen, petroleum hydrocarbon-like odor
16			14 15 18	30.8 11.3	WELL-GRADED SAND with GRAVEL (SW): very dark gray (10YR 3/1), wet, medium dense, 65% fine to coarse sand, 30% fine rounded to subrounded gravel (up to 3" in size), 5% nonplastic fines, glass fragments.	Sheen, petroleum hydrocarbon-like odor Sheen, petroleum hydrocarbon-like odor
18			16 18 18	16.6	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, medium dense, 90% fine to coarse sand, 5% nonplastic fines, 5% fine subrounded gravel.	Sheen, petroleum hydrocarbon-like odor Sheen, petroleum hydrocarbon-like odor
20			5 5 4	7.9	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, trace subrounded gravel (up to 0.75" in size).	
21			6 7 7	0	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, medium dense, 95% fine to medium sand, 5% nonplastic fines, trace subrounded gravel (up to 0.75" in size) mixed with trace PEAT (PT), hydrogen sulfide odor.	Sheen, petroleum hydrocarbon-like odor
22			21 24 27	0		No Sheen
23					Bottom of Boring @ 23.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	No Sheen
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA		**Log of Boring No. PE-SB09**	
BORING LOCATION: Port of Everett		ELEVATION AND DATUM: NA	
DRILLING CONTRACTOR: Cascade Drilling, Inc.		DATE STARTED: 2/4/14	DATE FINISHED: 2/10/14
DRILLING METHOD: Hollow-stem auger		TOTAL DEPTH (ft.): 20.0	MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75		DEPTH TO WATER (ft.)	FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]		LOGGED BY: J. Bellamy, LG	
HAMMER WEIGHT: 300	DROP: 30	RESPONSIBLE PROFESSIONAL: John Long	REG. NO. L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt.	
1					WELL-GRADED SAND (SW): dark yellowish brown (10YR 3/4), moist, loose, 85% fine to coarse sand, 10% nonplastic fines, 5% fine subrounded gravel (up to 0.75" in size). FILL.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4						
5	PE-SB09-5.5-021014		6	1.0	Wet @ 5 FT.	Sheen
6			7 18	0.2 0.0		Sheen
7			5		POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, trace subrounded gravel (up to 0.75" in size).	No Sheen
8			10 9	0.5 0.3		Trace Sheen
9			2 3		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, 100% organic matter, hydrogen sulfide-like odor.	No Sheen
10			3	0.0	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, soft, mixed with POORLY GRADED SAND (SP).	No Sheen
11			6 5 6	0.0 0.1		No Sheen
12			6 6 8	0.2	POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, trace PEAT (PT)	No Sheen
13			9 8			No Sheen
14			6	0.2 0.9		No Sheen
15			10			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB09 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
			10			No Sheen
			10	2.0		
16			5		POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet, loose, 95% fine to medium sand, 5% nonplastic fines, mixed with PEAT (PT), hydrogen sulfide-like odor.	No Sheen
			5			
17			4	8.6		No Sheen
				0.6		
18			9			No Sheen
			14			
			15	2.6		
19						No Sheen
	PE-SB09-5.5-021014		8			
			8	7.0		
20			9		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, medium stiff, 100% organic, hydrogen sulfide-like odor.	No Sheen
					Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA	**Log of Boring No. PE-SB10**
BORING LOCATION: Vigor Marine (Port of Everett Leasehold Property)	ELEVATION AND DATUM: NA
DRILLING CONTRACTOR: Cascade Drilling, Inc.	DATE STARTED: 2/4/14 / DATE FINISHED: 2/6/14
DRILLING METHOD: Hollow-stem auger	TOTAL DEPTH (ft.): 20.0 / MEASURING POINT: Ground Surface
DRILLING EQUIPMENT: CME 75	DEPTH TO WATER (ft.) FIRST: NA / COMPL.: NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG
HAMMER WEIGHT: 300 / DROP: 30	RESPONSIBLE PROFESSIONAL: John Long / REG. NO.: L.Hg. 1354

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: NA	REMARKS
0					Asphalt (6")	
1					WELL-GRADED SAND (SW): very dark gray (10YR 3/1), moist, 80% fine to coarse sand, 15% nonplastic fines, 5% fine subrounded gravel, Fill.	Cleared to 5 feet bgs with vacuum truck.
2						
3						
4						
5				1.5 0.2	WELL-GRADED SAND (SW): very dark gray (10YR 3/1), moist, medium dense, 80% fine to coarse sand, 15% nonplastic fines, 5% fine subrounded gravel, Fill.	No Sheen
6	PE-SB10-8.5-021014		10 22 16	0.2		No Sheen
7			21 21			No Sheen
8			20	0.0 0.0	Wet @ 8.5 FT.	No Sheen
9			16 15 16	0.0		No Sheen
10			9 7			No Sheen
11			7	0.0 0.0		No Sheen
12			8 7 5	5.8		No Sheen
13			5 5			No Sheen
14			4	0.4 0.1	SANDY SILT (ML): very dark gray (10YR 3/1), wet, medium stiff, 83% nonplastic fines, 17% fine to coarse sand, trace fine subrounded gravel (up to 0.75" in size), trace PEAT (PT), hydrogen sulfide-like odor.	No Sheen
15			7			

PROJECT: ExxonMobil/ADC Final Data Investigation
2717/2731 Federal Ave. Everett, WA

Log of Boring No. PE-SB10 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	REMARKS
16	PE-SB10-20-021014		6 7	0.2	WELL-GRADED SAND (SW): very dark gray (10YR 3/1), wet, loose, 90% fine to coarse sand, 5% nonplastic fines, 5% fine subrounded gravel (up to 0.75" in size), mixed with trace PEAT (PT).	No Sheen
			5 4		SANDY SILT (ML): very dark gray (10YR 3/1), wet, medium stiff, 83% nonplastic fines, 17% fine to coarse sand, trace fine subrounded gravel (up to 0.75" in size), trace PEAT (PT), wood debris, hydrogen sulfide-like odor.	No Sheen
17			5	0.0 0.0		No Sheen
18			8 10			
			10	0.0	WELL-GRADED SAND (SW): very dark gray (10YR 3/1), wet, loose, 90% fine to coarse sand, 5% nonplastic fines, 5% fine subrounded gravel (up to 1" in size).	No Sheen
19			12		SILT (ML): very dark gray (10YR 3/1), wet, stiff, 90% nonplastic fines, 10% fine to medium sand, wood debris.	No Sheen
			15	0.0		
20			20		WELL-GRADED SAND (SW): very dark gray (10YR 3/1), wet, medium dense, 90% fine to coarse sand, 5% nonplastic fines, 5% fine subrounded gravel (up to 1" in size).	No Sheen
21					Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bgs and cement to surface.	
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						

OAKBOREV (REV. 8/2011)

Appendix C

NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE PLANE, NORTH ZONE, NAD 83/91. THE FOLLOWING CONTROL POINTS WERE PROVIDED TO US BY OUR CLIENT AND WERE LOCATED USING GPS RTK: CONTROL POINT 733-21-01, N: 360317.040, E:1301542.320 AND CONTROL POINT 733-21-02, N: 360305.020, E:1301886.200

2. VERTICAL DATUM: NAVD 88

3. BENCHMARK: USC&GS BENCHMARK DESIGNATED AS "J-7" DESCRIBED AS A 3 1/2" BRASS CAP LOCATED ON HEWITT AVENUE AT THE SOUTHWEST END OF THE RAILROAD BRIDGE #1783.8. ELEV.=26.770

4. DATE OF SURVEY: AUGUST 20TH THROUGH 25TH, 2010. SUPPLEMENTAL SURVEYING ON DECEMBER 13, 2010.

5. EQUIPMENT USED: LEICA TCRA 1103+, LEICA DNA10 DIGITAL LEVEL, AND LEICA GPS RTK..

6. ONLY THE UTILITY SURFACE FEATURES WERE LOCATED DURING THIS SURVEY. THE UTILITY LINES SHOWN HEREON WHERE FROM A DRAWING PREPARED BY OTHERS AND PROVIDED TO US BY OUR CLIENT.

LEGEND

- CHAIN LINK FENCE
- WATER LINE
- SANITARY SEWER LINE
- STORM DRAIN LINE
- UNDERGROUND TELEPHONE
- POWER POLE W/LUMINAIRE
- POWER POLE
- GUY ANCHOR
- PARKING LOT LIGHT
- WATER METER
- WATER VALVE
- FIRE HYDRANT
- HOSE BIB
- TELEPHONE MANHOLE
- TELEPHONE RISER BOX
- SEWER MANHOLE
- CLEANOUT
- CATCH BASIN/INLET
- STORM DRAIN MANHOLE
- MONITORING WELL
- SOIL BORING
- SIGN
- JUNCTION BOX
- BOLLARDS

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)

SURVEYED: JM/CP
DRAWN: EF
CHECKED: FM

REV	REVISION	DATE	BY	APP'D

True NORTH LAND SURVEYING, INC.
815 S. Weller Street
Suite 200
Seattle, WA 98104-3023
206.332.0800

EILEEN M. FORRESTER STATE OF WASHINGTON 31453 REGISTERED PROFESSIONAL LAND SURVEYOR

Date: 12-17-10
Scale: 1" = 40'
Book: J1055.02.dwg

Exxon Mobil / American Distribution Co.

Topographic Survey

For AMEC

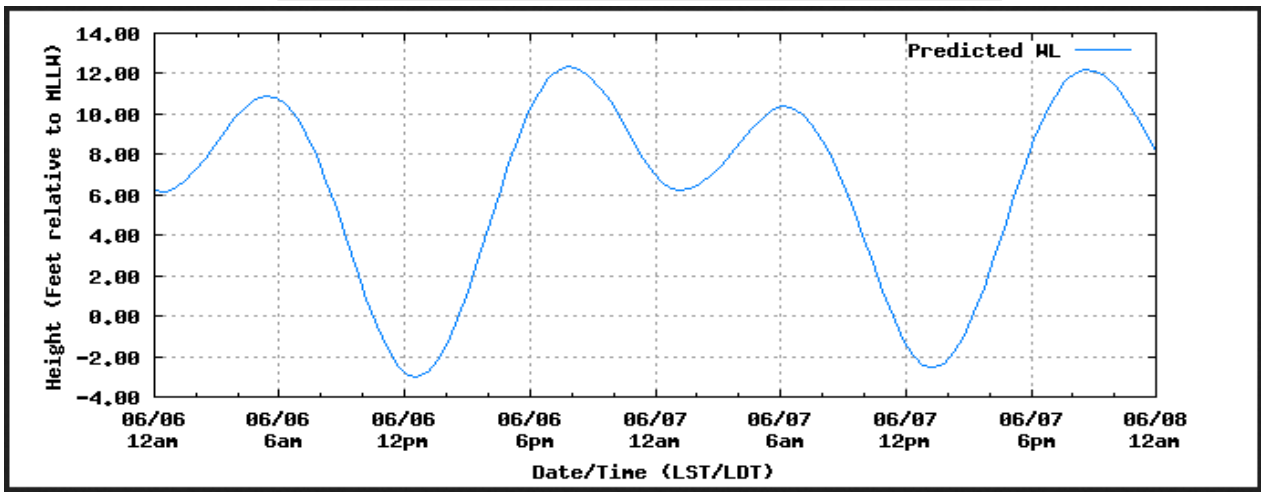
Job Number: J10-55.02

Sheet: 1 of 1

Appendix D

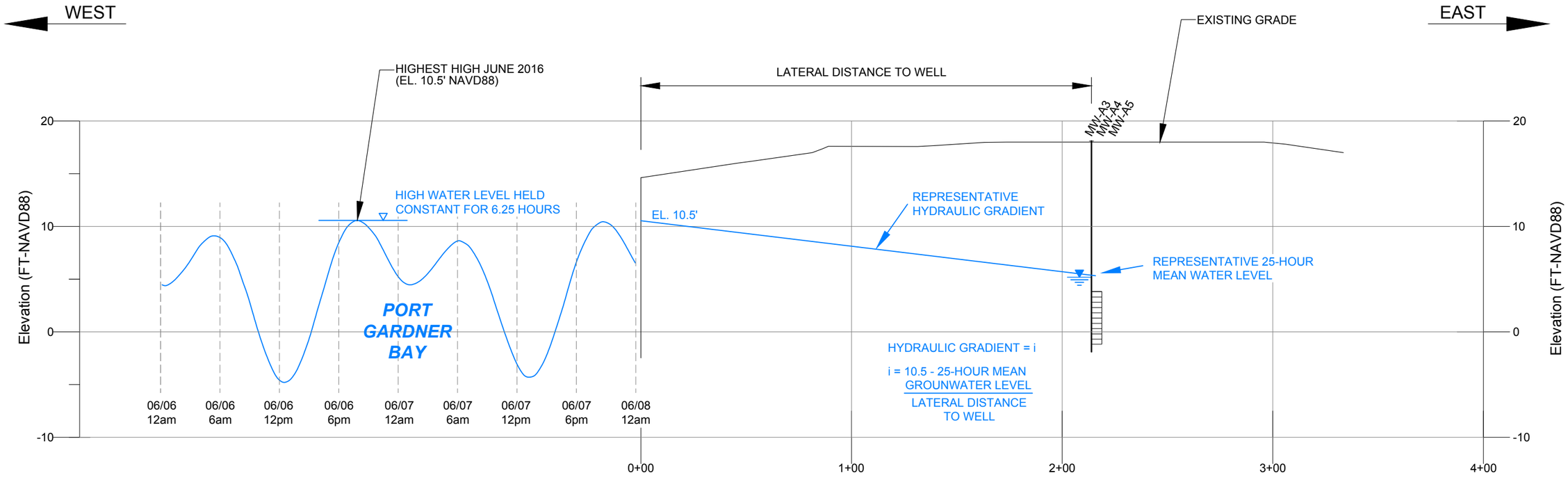
Calculated Maximum Tide Flux Travel Distance
ExxonMobil/ADC Property Ecology Site ID 2728
Everett, Washington

June 6, 2016 Tide Predictions at Everett, Washington



MW-A5 hydraulic conductivity							
Well	**Mean Water Level 25 hour (NGVD88)**	**units**	**Datum**	**Distance from Port Gardner Bay (feet)**	**K (cm/sec)**	**K based on**	**K (inch/hour)**
MW-A3	6.413	feet	NGVD88	368	6.35E-03	MW-A5	9.0
MW-A4	4.747	feet	NGVD88	234	6.35E-03		9.0
MW-A5	5.605	feet	NGVD88	230	6.35E-03		9.0
Everett Tide	12.3	feet	MLLW	Effective Porosity	0.3	% of voids for sand	
(June 6,2016)	10.5	feet	NGVD88				
	Seepage veolocity	S_v =	Ki/n_e				
	K	i	n_e	S_v (inch/hour)	6.25 hour travel distance (feet)		
	9.0	0.011	0.3	0.33	0.17		
	9.0	0.025	0.3	0.74	0.38		
	9.0	0.021	0.3	0.64	0.33		

MW-A6 hydraulic conductivity							
Well	**Mean Water Level 25 hour (NGVD88)**	**units**	**Datum**	**Distance from Port Gardner Bay (feet)**	**K (cm/sec)**	**K based on**	**K (inch/hour)**
MW-A3	6.413	feet	NGVD88	368	9.28E-03	MW-A6	13.2
MW-A4	4.747	feet	NGVD88	234	9.28E-03		13.2
MW-A5	5.605	feet	NGVD88	230	9.28E-03		13.2
Everett Tide	12.3	feet	MLLW	Effective Porosity	0.3	% of voids for sand	
(June 6,2016)	10.5	feet	NGVD88				
	Seepage veolocity	S_v =	Ki/n_e				
	K	i	n_e	S_v (inch/hour)	6.25 hour travel distance (feet)		
	13.2	0.011	0.3	0.49	0.25		
	13.2	0.025	0.3	1.08	0.56		
	13.2	0.021	0.3	0.93	0.49		



wood.	CLIENT: EXXONMOBIL AMERICAN DISTRIBUTING CO.	DWN BY: APS	PROJECT: EXXONMOBIL/ADC PROPERTY ECOLOGY SITE ID 2728	DATE: SEPTEMBER 2018
	Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101	CHK'D BY: LV		PROJECT NO: 6103180009
		DATUM: NAVD88 FT	TITLE: TIDAL MIXING CALCULATION SCHEMATIC CROSS SECTION	REV. NO.:
		PROJECTION: WASP		FIGURE No. D-1
		SCALE: AS SHOWN		

S:\6103-0009\001_DataInvestigationReport\Everett_EXM-Figures_091118.dwg – Figure D-1_Tidal – Sep. 12, 2018 1:39pm – adam.stenberg

Appendix E

Memo

To: Leah Vigoren
From: Crystal Neirby
Danille Jorgenson
Tel: (206) 342-1760
Fax: (206) 342-1761

Date: April 15, 2015

Project: 6103140009
cc: Project File

Subject: ExxonMobil/ADC Site – January 2015 Semiannual Groundwater Sampling Data Quality Review – Work Order Numbers: 15-01-0127, 15-01-0234, 15-01-0235, 15-01-0330, and 15-01-0445

This memorandum presents a summary data quality review for analyses of 31 primary groundwater samples, three groundwater field duplicate samples, and four trip blanks collected between January 5 and 8, 2015. The samples were submitted to Eurofins Calscience, located in Garden Grove, California, a laboratory certified by the Washington State Department of Ecology (Ecology).

The samples were analyzed for the following analytes:

- Selected volatile organic compounds (VOCs) (benzene, toluene, ethylbenzene, total xylenes, and methyl tert-butyl ether) by U.S. Environmental Protection Agency (EPA) Method 8260B;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C with select ion monitoring (SIM);
- Total petroleum hydrocarbons (TPH) as gasoline (TPH-G) by Ecology Method NWTPH-Gx; and
- TPH as diesel (TPH-D) and motor oil (TPH-MO) by Ecology Method NWTPH-Dx with silica gel cleanup.

The sample IDs, sample collection dates, laboratory sample IDs, and analyses conducted on the samples are listed in the table below.

Sample Location	Sample ID	Sample Collection Date	Laboratory Sample ID	Requested Analyses
MW-A8	XOM010515-03	1/5/2015	15-01-0127-1	all
MW-A5	XOM010515-01	1/5/2015	15-01-0127-2	all
MW-A6	XOM010515-02	1/5/2015	15-01-0127-3	all
MW-A7	XOM010515-04	1/5/2015	15-01-0127-4	all
MW-A2	XOM010515-06	1/5/2015	15-01-0127-5	all
MW-A2 Field Duplicate	XOM010515-100	1/5/2015	15-01-0127-6	all
MW-19	XOM010515-07	1/5/2015	15-01-0127-7	all
Trip Blank	--	1/5/2015	15-01-0127-8	VOCs
MW-A3	XOM010615-05	1/6/2015	15-01-0234-1	all

Sample Location	Sample ID	Sample Collection Date	Laboratory Sample ID	Requested Analyses
MW-A4	XOM010615-09	1/6/2015	15-01-0234-2	all
MW-A1	XOM010615-10	1/6/2015	15-01-0234-3	all
MW-40R	XOM010615-08	1/6/2015	15-01-0234-4	all
MW-11	XOM010615-11	1/6/2015	15-01-0234-5	all
Trip Blank	--	1/6/2015	15-01-0234-6	VOCs
LPH-1	XOM010615-12	1/6/2015	15-01-0235-1	all
LPH-2	XOM010615-13	1/6/2015	15-01-0235-2	all
RW-2	XOM010615-14	1/6/2015	15-01-0235-3	all
MW-10	XOM010615-15	1/6/2015	15-01-0235-4	all
LPH-3	XOM010715-16	1/7/2015	15-01-0330-1	all
W-1	XOM010715-17	1/7/2015	15-01-0330-2	all
W-2	XOM010715-18	1/7/2015	15-01-0330-3	all
LPH-4	XOM010715-19	1/7/2015	15-01-0330-4	all
LPH-5	XOM010715-20	1/7/2015	15-01-0330-5	all
LPH-6	XOM010715-21	1/7/2015	15-01-0330-6	all
W-10R	XOM010715-22	1/7/2015	15-01-0330-7	all
W-3	XOM010715-23	1/7/2015	15-01-0330-8	all
W-2 Field Duplicate	XOM010715-101	1/7/2015	15-01-0330-9	all
Trip Blank	--	1/7/2015	15-01-0330-10	VOCs
LPH-7	XOM010815-24	1/8/2015	15-01-0445-1	all
Sump 1	XOM010815-25	1/8/2015	15-01-0445-2	all
Sump 2	XOM010815-26	1/8/2015	15-01-0445-3	all
LPH-8	XOM010815-27	1/8/2015	15-01-0445-4	all
LPH-9	XOM010815-28	1/8/2015	15-01-0445-5	all
W-17	XOM010815-29	1/8/2015	15-01-0445-6	all
W-6	XOM010815-30	1/8/2015	15-01-0445-7	all
W-15R	XOM010815-31	1/8/2015	15-01-0445-8	all
W-15R Field Duplicate	XOM010815-102	1/8/2015	15-01-0445-9	all
Trip Blank	--	1/8/2015	15-01-0445-10	VOCs

The analytical results for these samples were reviewed in accordance with the requirements specified in EPA National Functional Guidelines (EPA, 2008), the analytical methods referenced by the laboratory, Amec Foster Wheeler data review procedures, and the laboratory quality control limits. The EPA guidelines referenced above were written specifically for the Contract Laboratory Program, and have

been modified for the purposes of this data quality review where they differ from EPA SW-846 method requirements.

All of the certified laboratory reports were reviewed to assess the following: chain-of-custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS) and LCS duplicates (LCSD); matrix spike (MS) samples; analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and MS duplicates (MSD); instrument tunes; instrument blanks; interference check samples; and initial and continuing calibrations. This level of data review is equivalent to an EPA Level 2B data review. The work orders subject to the Level 2B data review are 15-01-0127, 15-01-0235, 15-01-0330, and 15-01-0445.

In addition, 10 percent of the results were subjected to an EPA Level 3 data review. The Level 3 data review involves review of all of the criteria noted above for the Level 2B data review and also includes recalculation of instrument and sample results from the laboratory responses, and comparison of the recalculated results to the results reported by the laboratory. The work order subject to the Level 3 data review is 15-01-0234.

Upon receipt by the laboratory, information from the sample jars was compared to the chain-of-custody forms. The temperatures of the coolers were recorded as part of the check-in procedure, and were less than the maximum acceptable temperature of 6 degrees Celsius (°C).

Samples were analyzed using the methods identified in the introduction to this report, and the results were evaluated for the following criteria.

1. **GC/MS Instrument Performance Check (VOCs and PAHs)** – Acceptable
2. **Holding Times** – Acceptable.
3. **Blanks** – Acceptable.

   A trip blank was not submitted with samples included in work order 15-01-0235. These samples were collected on the same day as samples submitted with work order 15-01-0127 and all of the samples analyzed for VOCs were submitted in the same cooler; therefore, the trip blank submitted with work order 15-01-0127 can be used to evaluate samples in work order 15-01-0235. Sample results are not affected and are not qualified.
4. **LCS/LCSD** – Acceptable.
5. **MS/MSD** – Acceptable.
6. **Laboratory Duplicates** – Acceptable.
7. **Field Duplicates** – Acceptable.

   Three field duplicates were collected and the primary and duplicate sample IDs are identified in the table below. The primary and duplicate results, as well as the calculated relative percent differences (RPDs), are summarized in the table below. An RPD is not calculated if both the primary and duplicate results are not greater than five times the value of the reporting limit, as indicated in the table below by “NC.” In these cases, the difference between the primary and duplicate results should not exceed the value of the reporting limit. The field duplicate RPDs are acceptable (i.e., the RPD is less than 30 or the primary and duplicate results do not differ by more than the value of the RL) except for the TPH-G results for

XOM010715-18 and XOM010715-101. The TPH-G results in these two samples are qualified as estimated and flagged with a "J."

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
XOM010515-06/ XOM010515-100	TPH-D	320	320	100	0
	TPH-G	110	110	100	0
	1-methylnaphthalene	0.22	0.18	0.096	NC
	acenaphthene	0.68	0.71	0.096	4
	fluorene	1.1	1.0	0.096	10
XOM010715-18/ XOM010715-101	TPH-D	1,300	970	100	29
	TPH-G	490	1,000	100	68
	acenaphthene	2.6	2.3	0.096	12
	fluorene	2.8	2.2	0.096	24
	phenanthrene	2.6	2.5	0.096	4
	anthracene	0.14	0.14	0.096	NC
	pyrene	0.10	ND	0.096	NC
	2-methylnaphthalene	12	11	0.096	9
	1-methylnaphthalene	25	23	0.096	8
XOM010815-31/ XOM010815-102	TPH-D	3,000	3,000	100	0
	TPH-G	2,500	2,900	100	15
	acenaphthylene	0.36	0.53	0.095	NC
	acenaphthene	3.3	4.1	0.095	22
	fluorene	4.1	4.0	0.095	2
	phenanthrene	3.2	3.6	0.095	12
	anthracene	0.28	0.26	0.095	NC
	fluoranthene	0.26	0.19	0.095	NC
	pyrene	0.20	0.13	0.095	NC
	2-methylnaphthalene	120	120	0.095	0
	1-methylnaphthalene	92	93	0.095	1

Notes
µg/L = micrograms per liter
RPD= relative percent difference

8. **Surrogates** – Acceptable except as noted:

NWTPH-Gx
The surrogate was recovered at 139 percent, greater than the control limits of 38 to 134 percent, in sample XOM010815-102. The high recovery equates to a possible high bias in the samples; therefore, the TPH-G result for sample XOM010815-102 is qualified as estimated and flagged with a "J."

PAHs by EPA 8270C SIM
One of three surrogates, nitrobenzene-d5, was not recovered in the 50X dilutions performed on samples XOM010815-31 and XOM010815-102. The dilutions were performed to overcome high analyte concentrations. The samples are not qualified because the surrogates were not recovered due to the necessary dilutions.

9. **Internal Standards** – Acceptable.

10. **Reporting Limits and Laboratory Flags** – Acceptable.

Work Order 15-01-0127
NWTPH-Dx: The laboratory flagged the TPH-D results in samples XOM010515-01, XOM010515-06, XOM010515-100, and XOM010515-07 with an "HD" to indicate the chromatographic profiles of these samples were inconsistent with the pattern of the reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; therefore the results are reported and are not qualified.

Work Order 15-01-0234
NWTPH-Dx
The laboratory flagged the TPH-D results from samples XOM010615-05, XOM010615-08, and XOM010615-10 with HD because the chromatogram did not resemble that of the reference standard. These results were subjected to a level 3 data review, and results were calculated using the reference standard. Amec Foster Wheeler agrees that the results should be considered estimated and the identification is tentative. Results for these samples are qualified as estimated and tentatively identified because of the poor spectral match, and the results are flagged NJ.

NWTPH-Gx
The laboratory flagged the TPH-G result from sample XOM010615-08 with HD because the chromatogram did not resemble that of the reference standard. These results were subjected to a level 3 data review, and results were calculated using the reference standard. Amec Foster Wheeler agrees that the results are estimated and the identification is tentative. This result is qualified as estimated and tentatively identified because of the poor spectral match, and the result is flagged NJ.

Work Order 15-01-0235
NWTPH-Dx: The laboratory flagged the TPH-D results in samples XOM010615-13, XOM010615-14, and XOM010615-15 with "HD" to indicate the chromatographic profiles of these samples were inconsistent with the pattern of the reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; the results are reported and are not qualified.

Work Order 15-01-0330
NWTPH-Dx: The laboratory flagged the TPH-D results in samples XOM010715-16, XOM010715-17, XOM010715-18, XOM010715-19, XOM010715-20, XOM010715-21, XOM010715-22, XOM010715-23, and XOM010715-101 and the TPH-MO results in samples XOM010715-17, XOM010715-19, XOM010715-20, and XOM010715-22 with "HD" to indicate the chromatographic profiles of these samples were inconsistent with the pattern of the

reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; the results are reported and are not qualified.

NWTPH-Gx: The laboratory flagged the TPH-G results in samples XOM010715-17, XOM010715-18, XOM010715-22, and XOM010715-101 with "HD" to indicate the chromatographic profiles of these samples was inconsistent with the pattern of the reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; the results are reported and are not qualified.

Work Order 15-01-0445
NWTPH-Dx: The laboratory flagged the TPH-D results in samples XOM010815-24, XOM010815-26, XOM010815-27, XOM010815-28, XOM010815-29, XOM010815-30, XOM010815-31, and XOM010815-102, and the motor oil results in samples XOM010815-26, XOM010815-27, XOM010815-28, and XOM010815-29 with "HD" to indicate the chromatographic profiles of these samples was inconsistent with the pattern of the reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; the results are reported and are not qualified.

NWTPH-Gx: The laboratory flagged the TPH-G results in samples XOM010815-26, XOM010815-27, XOM010815-28, XOM010815-29, XOM010815-30, XOM010815-31, and XOM010815-102 with "HD" to indicate the chromatographic profiles of these samples was inconsistent with the pattern of the reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; the results are reported and are not qualified.

11. **Initial Calibrations** – Acceptable.

12. **Continuing Calibrations** – Acceptable.

13. **Calculation Check** – Acceptable.

OVERALL ASSESSMENT OF DATA

The Eurofins Calscience work orders 15-01-0127, 15-01-0234, 15-01-0235, 15-01-0330, and 15-01-0445 are complete and usable. Evaluation of the data usability is based on EPA's guidance documents. Few problems were identified, and analytical performance was generally within specified limits. There were no rejected results, and all data are acceptable and meet the project's data quality objectives.

A summary of qualified results is presented in the table below.

Sample Identifications and Qualified Results

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM010515-03	none		
XOM010515-01	none		
XOM010515-02	none		
XOM010515-04	none		
XOM010515-06	none		
XOM010515-100	none		

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM010515-07	none		
XOM010615-05	TPH as Diesel	110 NJ	Poor Spectral Match
XOM010615-09	none		
XOM010615-10	TPH as Diesel	730 NJ	Poor Spectral match
XOM010615-08	TPH as Diesel TPH as Gasoline	790 NJ 610 NJ	Poor Spectral Match
XOM010615-11	none		
XOM010615-12	none		
XOM010615-13	none		
XOM010615-14	none		
XOM010615-15	none		
XOM010715-16	none		
XOM010715-17	none		
XOM010715-18	TPH-G	490 J	field duplicate RPD
XOM010715-19	none		
XOM010715-20	none		
XOM010715-21	none		
XOM010715-22	none		
XOM010715-23	none		
XOM010715-101	TPH-G	1,000 J	field duplicate RPD
XOM010815-24	none		
XOM010815-25	none		
XOM010815-26	none		
XOM010815-27	none		
XOM010815-28	none		
XOM010815-29	none		
XOM010815-30	none		
XOM010815-31	none		
XOM010815-102	TPH-G	2,900 J	surrogate recovery

REFERENCES

U.S. Environmental Protection Agency (EPA), 2008, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-08-001, June.

TABLE E-1: GROUNDWATER SAMPLE ANALYTICAL RESULTS [1,2]

ExxonMobil/ADC Property, Ecology Site ID 2728

Everett, Washington

Well ID	LPH-1	LPH-2	LPH-3	LPH-4	LPH-5	LPH-6	LPH-7	LPH-8	LPH-9	MW-10	MW-11	MW-19	MW-40R	MW-A1	MW-A2		MW-A3	MW-A4
Date Sampled	01/06/2015	01/06/2015	01/07/2015	01/07/2015	01/07/2015	01/07/2015	01/08/2015	01/08/2015	01/08/2015	01/06/2015	01/06/2015	01/05/2015	01/06/2015	01/06/2015	01/05/2015	01/05/2015 FD	01/06/2015	01/06/2015
TPH (µg/L)																		
TPH as Gasoline	100 U	100 U	100	100 U	100 U	100 U	100 U	140	390	290	100 U	130 NJ	610	100 U	110	110	100 U	100 U
TPH as Diesel	100 U	130	200	8,600	450	240	140	140	970	690	100 U	180 NJ	790	730 NJ	320	320	110 NJ	100 U
TPH as Motor Oil Range	100 U	100 U	100 U	4100	230	100 U	100 U	130	180	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
PAHs (µg/L)																		
1-Methylnaphthalene	0.28	0.095 U	0.45	0.10	1.3	0.32	0.097 U	0.095 U	4.3	3.2	0.095 U	0.096 U	11	1.2	0.22	0.18	0.096 U	1.1
2-Methylnaphthalene	0.096 U	0.095 U	0.095 U	0.095 U	0.15	0.095 U	0.097 U	0.095 U	0.095 U	0.15	0.095 U	0.096 U	0.53	0.68	0.096 U	0.096 U	0.096 U	1.6
Acenaphthene	0.096 U	1.2	0.94	0.65	0.64	0.56	0.15	0.24	0.85	0.83	0.095 U	0.096 U	0.91	0.66	0.68	0.71	0.62	4.4
Acenaphthylene	0.096 U	0.095 U	0.095 U	0.027	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Anthracene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.13
Benzo (a) anthracene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Benzo (a) pyrene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Benzo (b) fluoranthene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Benzo (g,h,i) perylene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Benzo (k) fluoranthene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Chrysene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Dibenz (a,h) anthracene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Fluoranthene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.15
Fluorene	0.096 U	0.19	0.41	0.36	0.43	0.52	0.12	0.21	0.84	0.28	0.095 U	0.096 U	0.77	0.63	1.1	1.0	0.23	1.9
Indeno (1,2,3-c,d) pyrene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Naphthalene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	7.9
Phenanthrene	0.096 U	0.095 U	0.13	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.15	0.39	0.095 U	0.096 U	0.42	0.096 U	0.096 U	0.096 U	0.89	1.3
Pyrene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 U	0.097 U	0.095 U	0.14	0.096 U	0.095 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U	0.096 U
Total cPAHs	0.0725 U	0.0717 U	0.0717 U	0.0717 U	0.0725 U	0.0717 U	0.0732 U	0.0717 U	0.0717 U	0.0725 U	0.0717 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U
VOCs (µg/L)																		
Benzene	4.3	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl-t-Butyl Ether (MTBE)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
p/m-Xylene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes (total)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

TABLE E-1: GROUNDWATER SAMPLE ANALYTICAL RESULTS [1,2]

ExxonMobil/ADC Property, Ecology Site ID 2728

Everett, Washington

Well ID	MW-A5	MW-A6	MW-A7	MW-A8	RW-2	Sump 1	Sump 2	W-1	W-2		W-3	W-6	W-10R	W-15R	W-15R	W-17
Date Sampled	01/05/2015	01/05/2015	01/05/2015	01/05/2015	01/06/2015	01/08/2015	01/08/2015	01/07/2015	01/07/2015	01/07/2015 FD	01/07/2015	01/08/2015	1/7/2015	01/08/2015	1/8/2015 FD	01/08/2015
TPH (µg/L)																
TPH as Gasoline	100 U	100 U	100 U	100 U	340	100 U	1,900	300	490 J	1,000 J	100 U	450	350	2,500	2,900 J	1,000
TPH as Diesel	240	100 U	100 U	100 U	270	100 U	11,000	1,900	1,300	970	250	390	870	3,000	3,000	990
TPH as Motor Oil Range	100 U	100 U	100 U	100 U	100 U	100 U	2,900	230	100 U	100 U	100 U	100 U	150	100 U	100 U	290
PAHs (µg/L)																
1-Methylnaphthalene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	38	14	25	23	0.75	7.9	17	92	93	0.45
2-Methylnaphthalene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	4.5	9.1	12	11	0.095 U	0.097 U	4.2	120	120	0.096 U
Acenaphthene	2.8	0.28	0.095 U	0.096 U	0.096 U	0.099 U	8.8	1.9	2.6	2.3	0.46	0.82	3.8	3.3	4.1	0.32
Acenaphthylene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	2.6	0.096 U	0.096 U	0.095 U	0.095 U	0.16	0.096 U	0.36	0.53	0.096 U
Anthracene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	3.8	0.35	0.14	0.14	0.095 U	0.097 U	0.19	0.28	0.26	0.096 U
Benzo (a) anthracene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	8.3	0.24	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Benzo (a) pyrene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	8.1	0.11	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Benzo (b) fluoranthene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	4.4	0.14	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Benzo (g,h,i) perylene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	4.3	0.096 U	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Benzo (k) fluoranthene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	5.0	0.10	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Chrysene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	6.3	0.36	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Dibenz (a,h) anthracene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	1.7	0.096 U	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Fluoranthene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	24	2.2	0.096 U	0.095 U	0.095 U	0.097 U	0.21	0.26	0.19	0.13
Fluorene	0.13	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	8.3	1.9	2.8	2.2	0.37	1.0	2.3	4.1	4.0	0.36
Indeno (1,2,3-c,d) pyrene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	3.5	0.096 U	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Naphthalene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	0.97 U	0.096 U	0.096 U	0.095 U	0.095 U	0.097 U	0.096 U	0.095 U	0.095 U	0.096 U
Phenanthrene	0.19	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	12	3.5	2.6	2.5	0.095 U	0.64	2.1	3.2	3.6	0.15
Pyrene	0.095 U	0.096 U	0.095 U	0.096 U	0.096 U	0.099 U	32	1.5	0.10	0.095 U	0.095 U	0.097 U	0.14	0.20	0.13	0.33
Total cPAHs	0.0717 U	0.0725 U	0.0717 U	0.0725 U	0.0725 U	0.0747 U	10.45	0.1712	0.0725 U	0.0717 U	0.0717 U	0.0732 U	0.0725 U	0.0717 U	0.0717 U	0.0725 U
VOCs (µg/L)																
Benzene	0.50 U	0.50 U	0.50 U	0.50 U	0.53	0.50 U	0.72	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	1.9	2.1	0.50 U
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl-t-Butyl Ether (MTBE)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
o-Xylene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4	1.4	1.0 U
p/m-Xylene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.6	2.3	1.0 U
Toluene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2	1.2	1.0 U
Xylenes (total)	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.0	3.6	1.0 U

Notes:

1. Data qualifiers are as follows:
   J = The result is an approximation.
   NJ = The result is estimated and the identification is tentative due to a poor match with the reference standard.
   U = not detected at or above the laboratory reporting limit shown.
   UJ = not detected at or above value shown, which is the estimated reporting limit.

Abbreviations:

-- = not analyzed
µg/L = micrograms per liter
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
FD = field duplicate
TPH = total petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
VOCs = volatile organic compounds

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	AD-1	AD-1	AD-2	AD-2	AD-3	AD-3	AD-4	AD-5	AD-5	AD-5	AD-6	AD-7	AD-8	AD-8	AD-8	AD-9	AD-9	AD-10
		1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990
	Depth[3]	0.5 to 1	3 to 3	0.5 to 1	2.5 to 3	0.5 to 1	1.5 to 2	0.5 to 1	0.5 to 1	1.5 to 2	2.5 to 3	0.5 to 1	0.5 to 1	0.5 to 1	2.5 to 3	4.5 to 5	0.5 to 1	1.5 to 2	0.5 to 1
TPH																			
Total Petroleum Hydrocarbons		780	3,900	250	280	31	9	720	8,800	1,900	2,300	2,700	5,800	1,600	2,700	6,200	630	4,400	33,000
Gasoline Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCs																			
Benzene		--	0.4 U	--	--	--	--	--	--	--	0.4 U	--	--	--	0.4 U	0.4 U	--	--	--
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	AD-11	AD-11	AD-12	AD-12	AD-12	AD-13	AD-13	AD-14	AD-14	AD-15	AD-15	AD-16	AD-17	AD-18	AD-18	AD-19	AD-19	B-1
		1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	1/15/1990	10/9/1990
	Depth[3]	0.5 to 1	1.5 to 2	0.5 to 1	2.5 to 3	3 to 3.5	0.5 to 1	2 to 2.5	0.5 to 1	2 to 2.5	0.5 to 1	2.5 to 3	0.5 to 1	0.5 to 1	0.5 to 1	4 to 5	0.5 to 1	1 to 1.5	NA
TPH																			
Total Petroleum Hydrocarbons		8,000	12,000	230	14,000	16,000	4,400	27,000	13,000	17,000	61	2,400	2,200	8,500	24	520	23,000	100,000	2,117
Gasoline Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCs																			
Benzene		--	--	--	0.4 U	0.4 U	--	0.4 U	--	5.1	0.4 U	0.4 U	0.4 U	0.4 U	--	--	--	--	--
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	B-1	B-2	B-3	B-3	B-4	B-5	B-6	B-7	B-8	B-8	B-9	B-9	B-10	B-10	B-11	B-11	B-12	B-12
		10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990
	Depth[3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH																			
Total Petroleum Hydrocarbons		446	90.6	213	831	65.2	701	428	434	126	174	469	643	206	231	323	406	191	11,775
Gasoline Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCs																			
Benzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	B-13	B-13	B-14	B-14	B-15	B-15	B-16	B-16	B-17	B-17	B-18	B-18	B-19	B-19	B-20	B-20	B-21	B-21
		10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990	10/9/1990
	Depth[3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPH																			
Total Petroleum Hydrocarbons		277	15.9	212	128	132	17	1,898	9,718	1,513	2,139	46	738	626	10,577	117	46.9	2,116	1,974
Gasoline Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCs																			
Benzene		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	B-21	B-21	B-22	B-22	B-23	B-23	B-24	B-24	B-24	B-25	B-25	MW-10	MW-11	MW-12	MW-15	MW-16	MW-17	MW-18
		6/24/1991	6/24/1991	10/9/1990	10/9/1990	10/9/1990	10/9/1990	03/11/91	03/11/91	10/9/1990	10/9/1990	10/9/1990	3/9/1988	3/9/1988	3/9/1988	3/9/1988	3/9/1988	3/9/1988	3/9/1988
	Depth[3]	23.5 to 24	27.5 to 29	NA	NA	NA	NA	2 to 4	3 to 5.5	NA	NA	NA	1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3
TPH																			
Total Petroleum Hydrocarbons		12000	27	360	1,800	1,691	6,421	260	1,300	560	76	29.8	1,260	9,480	5 U	3,030	5 U	124	777
Gasoline Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diesel Range Organics		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Motor Oil		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCs																			
Benzene		0.035	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	0.015 U	0.362	0.015 U	0.158 U	0.015 U	0.015 U	0.048
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	MW-19	MW-19	MW-20	MW-20	MW-21	MW-21	MW-22	MW-22	MW-23	MW-24	MW-24	MW-27	MW-27	MW-28	MW-28	MW-29	MW-29
		3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	3/11/1991	06/24/91	06/24/91	06/24/91	06/24/91	06/24/91	06/24/91
	Depth[3]	3.5 to 3.5	5 to 5	3.5 to 3.5	5 to 5	3.5 to 3.5	5 to 5	4 to 4	5 to 5	2.5 to 2.5	NA	NA	8.5 to 9	12.5 to 13.5	7.5 to 9	12.5 to 13.5	3 to 4	7.5 to 9
TPH																		
Total Petroleum Hydrocarbons		53	14	18	20	110	12,000	41,000	24,000	300	260	1,300	4,700	61	93	51	590	730,000
Gasoline Range Organics		--	--	--	--	--	--	--	--	--	--	--						
Diesel Range Organics		--	--	--	--	--	--	--	--	--	--	--						
Motor Oil		--	--	--	--	--	--	--	--	--	--	--						
VOCs																		
Benzene		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.18
SVOCs																		
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	--	--	--	--	--	--						

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	MW-30	MW-30	MW-6	MW-7	MW-8	MW-9	RW-1	W-1	W-2	W-3	W-4	W-5	W-6	W-7	B-34	B-34	DM-6	DM-7
		06/24/91	06/24/91	3/9/1988	3/9/1988	3/9/1988	3/9/1988	3/9/1988	2/23/1990	2/23/1990	2/23/1990	2/23/1990	2/23/1990	2/23/1990	2/23/1990	12/6/1993	12/6/1993	12/6/1999	12/8/1999
	Depth[3]	8 to 9	13 to 13.5	1.5 to 3	1.5 to 3.5	1.5 to 3	1.5 to 3	to	3 to 3	to	3 to 3	4 to 4	3 to 3	3 to 3	3 to 3	4 to 5.5	12.5 to 14	5 to 6.5	NA
TPH																			
Total Petroleum Hydrocarbons		4,900	7,700	80	605	1,580	33,500	1,730	13,000	17,000	28	4,600	2,300	1,200	910	--	--	--	--
Gasoline Range Organics				--	--	--	--	--	--	--	--	--	--	--	--	670	2,600	10.5	20.1
Diesel Range Organics				--	--	--	--	--	--	--	--	--	--	--	--	500	4,800	44.3	482
Motor Oil				--	--	--	--	--	--	--	--	--	--	--	--	--	--	25 U	225
VOCs																			
Benzene		0.05 U	0.5	0.015 U	0.015 U	0.015 U	0.015 U	0.575	--	--	--	--	--	--	--	0.63	6.6	--	--
SVOCs																			
Carcinogenic PAHs as B(a)P[4]				--	--	--	--	--	--	--	--	--	--	--	--	0.0755 U	1.51 U	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	DM-8	GP-1	GP-2	GP-3	GP-4	GP-7	GP-8	GP-8	GP-9	GP-10	GP-11	GP-12	GP-12	GP-13	GP-13	JP-1	JP-2	JP-2
		12/1/1999	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	3/20/1996	6/21/2001	6/21/2001	6/21/2001
	Depth[3]	NA	10 to 10	11.5 to 11.5	6.5 to 6.5	6 to 6	5.5 to 5.5	7 to 7	8 to 8	8 to 8	7 to 7	6.5 to 6.5	11 to 11	12.5 to 12.5	7 to 7	10 to 10	4.5 to 7.5	0 to 3	3 to 6
TPH																			
Total Petroleum Hydrocarbons		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range Organics		5 U	--	--	--	--	150	3.9	--	880	--	160	--	--	--	1 U	5 U	5 U	5 U
Diesel Range Organics		44.4	276	322	1370	297	3,800	77	6.55	12,000	383	40.2	382	414	2 U	15	73.8	134	379
Motor Oil		102	--	--	--	--	4,300	160	--	2,900	--	60	--	--	--	41	100	341	942
VOCs																			
Benzene		--	--	--	--	--	0.05 U	0.05 U	--	0.05 U	--	0.05 U	--	--	--	0.05 U	0.05 U	0.05 U	0.05 U
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	0.69	0.52	--	0.31	--	0.038	--	--	--	0.052	--	--	--

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	JP-3	JP-4	JP-5	JP-6	JP-7	MW-31	MW-31	MW-32	MW-32	MW-33	MW-33	MW-35	MW-35	MW-36	MW-36	MW-37	MW-37	TP-2
		6/21/2001	6/21/2001	6/21/2001	6/21/2001	6/21/2001	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993	12/6/1993
	Depth[3]	4 to 6	3 to 6	3 to 6	6 to 9	1 to 2	2.5 to 4	12.5 to 14	NA	7.5 to 9	5 to 6.5	12.5 to 14	2.5 to 4	12.5 to 14	2.5 to 4	12.5 to 14	NA	NA	NA
TPH																			
Total Petroleum Hydrocarbons		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range Organics		5 U	6.04	5 U	5 U	26.5	1 U	31	1 U	1 U	49	1 U	1 U	1.3	30	1 U	180	170	1 U
Diesel Range Organics		10 U	180	210	26.6	264	13	49	17	10 U	1100	11	10 U	16	700	22	3,500	380	10 U
Motor Oil		25 U	58.2	375	69.3	923	--	--	--	--	--	--	--	--	--	--	--	--	--
VOCs																			
Benzene		0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.77	0.18	0.05 U
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	--	--	--	--	0.0755 U	0.0755 U	0.367	0.0755 U	0.0755 U	0.0755 U	0.0755 U	0.0755 U	1.51 U	0.0755 U	0.3775 U	0.0755 U	0.076 U

TABLE E-2: SOIL TPH AND BTEX RESULTS, 1993 TO 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	TP-3	TP-5	UG-1	UG-2	UG-3	UG-4	UG-5	UG-6	UG-7	UG-8	UG-9	UG-9	UG-10	UG-11	UG-12
		12/6/1993	12/6/1993	9/25/2000	9/25/2000	9/25/2000	9/25/2000	9/25/2000	9/26/2000	9/26/2000	9/26/2000	9/26/2000	9/26/2000	9/26/2000	9/26/2000	9/26/2000
	Depth[3]	NA	NA	5 to 7	10 to 12	7.5 to 9.5	5 to 7	5 to 7	5 to 7	5 to 7	5 to 7	2.5 to 4.5	10 to 12	5 to 7	5 to 7	5 to 7
TPH																
Total Petroleum Hydrocarbons		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gasoline Range Organics		3.4	1 U	173	55.3	108	5 U	5 U	5 U	5 U	3,410	6,050	630	5 U	5 U	5 U
Diesel Range Organics		16	10 U	27,100	364	190	10 U	10 U	10 U	402	5,180	8,560	2,170	10 U	153	10 U
Motor Oil		--	--	52,300	353	79.5	25 U	25 U	25 U	1,860	730	327	320	25 U	176	25 U
VOCs																
Benzene		0.05 U	0.05 U	--	--	--	--	--	--	--	--	2.5 U	--	--	--	--
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.076 U	0.076 U	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

1. Data qualifiers are as follows:
   U = not detected.
2. Results reported in milligrams per kilogram.
3. Depth measured in feet below ground surface.
4. The total toxic equivalent concentration was calculated following WAC 173-340-708(8)(e)

Abbreviations:

-- = no data available
B(a)P = benzo(a)pyrene
NA = not available
PAHs = polycyclic aromatic hydrocarbons
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	AB-1	AB-1	AB-1A	AB-2	AB-2	AB-2 *	AB-3	AB-3	AB-4	AB-5	AB-5	AB-5A	AP-1	AP-1	AP-2
		12/3/2010	12/3/2010	12/3/2010	6/21/2010	6/23/2010	6/23/2010	6/21/2010	6/22/2010	6/23/2010	6/25/2010	6/25/2010	6/22/2010	6/24/2010	6/24/2010	11/30/2010
	Depth[3]	14	27	14	4.5 to 5	14 to 14	14 to 14	4.5 to 5	20 to 20	17.2 to 17.4	22 to 22.25	5 to 5.5	3 to 3.5	5 to 6.5	15 to 16.5	1 to 1.25
TPH																
Gasoline Range Organics		5.29 U	6.09 U	5.29 U	354	6.39 U	5.27 U	3.85 U	7.64 U	5.3 U	5.41 U	131	804	44.1	18.6 U	4.12 U
Diesel Range Organics		44.7	5.2	44.7	752	4.49 U	4.65 U	4.35 U	5.61 U	4.95 U	4.01 U	8840	7580	989	14.2	4.39 U
Motor Oil		21.9	9.37	21.9	803	6.54	4.65 U	4.35 U	9.4	8.36	5.45	11,000	464 U	1360	35.5	32.5
VOCs																
Benzene		0.00187 U	0.00219 U	0.00187 U	0.0048 U	0.00209 U	0.00192 U	0.00149 U	0.00277 U	0.0293	0.0969 U	0.0949	0.195	0.00222 U	0.00631 U	0.0009 U
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.00652405	0.006 U	0.00652405	0.027882	0.003 U	0.003 U	0.003 U	0.004 U	0.003 U	0.003 U	0.0200215	0.15679	0.18503	0.007 U	0.018131
New PAH calculations from DB																
Carcinogenic PAHs (3 sig figs)		0.00652	0.00319 U	0.00652	0.0279	0.00286 U	0.00286 U	0.00282 U	0.00362 U	0.00319 U	0.00297 U	0.0200	0.157	0.185	0.00684 U	0.00291 U
Carcinogenic PAHs (2 sig figs)		0.0065	0.0032 U	0.0065	0.028	0.0029 U	0.0029 U	0.0028 U	0.0036 U	0.0032 U	0.0030 U	0.020	0.16	0.19	0.0068 U	0.0029 U
Carcinogenic PAHs (all digits)		0.00652405	0.0031861 U	0.00652405	0.027882	0.00286145 U	0.00286145 U	0.00281615 U	0.003624 U	0.0031861 U	0.0029747 U	0.0200215	0.15679	0.18503	0.0068403 U	0.00290675 U

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	AP-2	AP-3	AP-3	AP-4	AP-4	AP-4	AP-5	AP-5	AP-5	AP-6	AP-6	AP-6	AP-7	AP-7	AP-7	AP-7
		12/7/2010	11/30/2010	12/7/2010	11/30/2010	12/7/2010	12/7/2010	11/30/2010	12/07/2010	12/07/2010	11/30/2010	12/02/2010	12/02/2010	10/28/2010	12/07/2010	12/07/2010	12/07/2010
	Depth[3]	13.5 to 14	1 to 1.25	8.5 to 9	1 to 1.25	6 to 6.5	14.5 to 15	1 to 1.25	1.5 to 1.75	14 to 14.5	NA	23 to 23	23 to 23.25	NA	10 to 10.5	10 to 10.5	14.5 to 15
TPH																	
Gasoline Range Organics		5.44 U	4.81 U	9.43 U	6.04 U	8.25 U	4.91 U	44.8	652	45.1 U	184	5.12 U	5.65 U	4.63 U	1.39 U	44.3	51.8
Diesel Range Organics		4.56 U	8.37	4.62 U	6.95	6.64 U	4.73 U	44.4	440	8,660	1,990	45.3	13.2	3.43	3.04	553	717
Motor Oil		8.98	106	15.7	111	16.6	4.73 U	369	176	8,980	129	37.1	10.5	2.39	119	836	861
VOCs																	
Benzene		0.0022 U	0.00117 U	0.0032 U	0.00119 U	0.00316 U	0.00202 U	0.00094 U	0.0353	0.0168 U	0.00156	0.00115 U	0.00123 U	0.00108 U	0.00101 U	0.00962 U	0.00441 U
SVOCs																	
Carcinogenic PAHs as B(a)P[4]		0.003 U	0.0091646	0.0090492	0.0119794	0.00866615	--	0.009754	0.045062	0.39632	0.0464755	0.0044549	0.0044718	0.0060143	0.042179	0.072838	0.00280105 U
New PAH calculations from DB																	
Carcinogenic PAHs (3 sig figs)		0.0181	0.00916	0.00905	0.0120	0.00783	--	0.00975	0.0451	0.396	0.0465	0.00445	0.00447	0.00601	0.0422	0.0728	0.00280 U
Carcinogenic PAHs (2 sig figs)		0.018	0.0092	0.0090	0.012	0.0078	--	0.0098	0.045	0.40	0.046	0.0045	0.0045	0.0060	0.042	0.073	0.0028 U
Carcinogenic PAHs (all digits)		0.018131	0.0091646	0.0090492	0.0119794	0.00783265	--	0.009754	0.045062	0.39632	0.0464755	0.0044549	0.0044718	0.0060143	0.042179	0.072838	0.00280105 U

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	BN-SB04	BN-SB04	BN-SB05	BN-SB05	BN-SB06	BN-SB06	BN-SB06 *	BN-SB07	BN-SB07	BN-SB08	BN-SB08	BN-SB09	BN-SB09	B-POE	B-WROW
		10/21/2013	10/21/2013	10/21/2013	10/21/2013	10/21/2013	10/21/2013	10/21/2013	10/18/2013	10/18/2013	2/4/2014	2/10/2014	2/4/2014	2/10/2014	11/3/2010	7/1/2010
	Depth[3]	4 to 5	24 to 24.5	4 to 5	24 to 24.5	4 to 5	24 to 24.5	24 to 24.5	4 to 5	24.5 to 25	5 to 5.5	23.5 to 24	8.5 to 9	23.5 to 24	NA	NA
TPH																
Gasoline Range Organics		8.15 U	5.86 U	4.76 U	7.89 U	5.96 U	6.46 U	6.37 U	5.74 U *	6.03 U *	5.28 U	6.12 U	5.71 U	4.82 U	579	365
Diesel Range Organics		4.46 U	4.84 U	27.1	4.94 U	4.82 U	4.87 U	4.93 U	12.8	5.85 U	13.2	5.89 U	5.6 U	5.46 U	5,540	3,400
Motor Oil		4.46 U	4.84 U	236	4.94 U	30	4.87 U	4.93 U	23.4	16	19.1	5.89 U	19.1	5.46 U	4,560	406
VOCs																
Benzene		0.00215 U	0.0018 U	0.00186 U	0.00237 U	0.00194 U	0.00198 U	0.00202 U	0.00206 U	0.00198 U	0.00194 U	0.0019 U	0.00166 U	0.00184 U	0.0116	0.118 U
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.00827585	0.003 U	0.225606	0.004 U	0.0114253	0.003 U	0.003 U	0.0412686	0.003 U	0.002 U	0.003 U	0.002 U	0.003 U	0.49277	0.1186485
New PAH calculations from DB																
Carcinogenic PAHs (3 sig figs)		0.00748	0.00310 U	0.225	0.00354 U	0.0107	0.00311 U	0.00310 U	0.0394	0.00304 U	0.00248 U	0.00297 U	0.00247 U	0.00283 U	0.287	0.0725
Carcinogenic PAHs (2 sig figs)		0.0075	0.0031 U	0.22	0.0035 U	0.011	0.0031 U	0.0031 U	0.039	0.0030 U	0.0025 U	0.0030 U	0.0025 U	0.0028 U	0.29	0.073
Carcinogenic PAHs (all digits)		0.0074799	0.0030955 U	0.22459	0.00354095 U	0.0107261	0.0031106 U	0.0030955 U	0.039412	0.00304265 U	0.00248395 U	0.00296715 U	0.00246885 U	0.00283125 U	0.28676	0.072545

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	CE-1	CE-1	CE-1	CE-1	CE-2	CE-2	CE-2	CE-2	CE-2 *	CE-2	CE-2 *	CE-3	CE-3	CE-3	CE-3	CE-4	CE-4	CE-4
		2/18/2010	2/18/2010	2/19/2010	2/19/2010	2/18/2010	2/18/2010	2/22/2010	2/22/2010	2/22/2010	2/22/2010	2/22/2010	2/18/2010	2/18/2010	2/22/2010	2/22/2010	2/18/2010	2/18/2010	2/19/2010
	Depth[3]	0.5 to 1	0.5 to 3	6.5 to 8	7.5 to 7.5	1 to 4	3 to 3.5	2 to 4.5	4 to 8	4 to 8	7 to 7	7 to 7	1 to 4	3.5 to 4	4 to 8	4.5 to 4.5	0.5 to 4	2.5 to 3	5 to 7
TPH																			
Gasoline Range Organics		5.45 U	--	--	--	--	--	367	--	--	348	711	--	7.88 U	--	89.8	--	6.36 U	--
Diesel Range Organics		--	4.81 U	237	--	5,800	--	--	494	369	--	--	4.05 U	--	2,040	--	189	--	16
Motor Oil		--	6.79	286	--	661	--	--	55.9	60.8	--	--	4.05 U	--	304	--	446	--	40.5
VOCs																			
Benzene		0.00203 U	--	--	0.0158 U	--	0.189 U	0.00211 U	--	--	0.00234 U	0.00255 U	--	0.00214 U	--	0.0019	--	0.00564	--
SVOCs																			
Carcinogenic PAHs as B(a)P[4]		--	0.55852	0.1128	--	0.332005	--	--	0.23535	0.14868	--	--	0.07039	--	0.0392309	--	0.062055	--	0.0071545
New PAH calculations from DB																			
Carcinogenic PAHs (3 sig figs)		--	0.505	0.0971	--	0.283	--	--	0.186	0.121	--	--	0.0750	--	0.0276	--	0.0605	--	0.00629
Carcinogenic PAHs (2 sig figs)		--	0.51	0.097	--	0.28	--	--	0.19	0.12	--	--	0.075	--	0.028	--	0.061	--	0.0063
Carcinogenic PAHs (all digits)		--	0.50535	0.09712	--	0.28344	--	--	0.18578	0.1207	--	--	0.074986	--	0.027574	--	0.060511	--	0.0062853

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	CE-4	CE-5	CE-5	CE-5	CE-5	CE-6	CE-6	CE-6	CE-6	CE-7	CE-7	CE-7	CE-7	CE-8	CE-8	CE-8	CE-8 *
		2/19/2010	2/18/2010	2/18/2010	2/19/2010	2/19/2010	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011	6/13/2011
	Depth[3]	7 to 7	0.5 to 4	2.5 to 3	5 to 8	6 to 6	0.5 to 5	4 to 4	5 to 8	7.5 to 7.5	0.5 to 5	2 to 2	5 to 8	6 to 6	0.5 to 5	2.2 to 2.2	5 to 10	5 to 10
TPH																		
Gasoline Range Organics		5.4 U	--	5.93 U	--	6.39 U	--	1.12 J	--	3.83 J	--	142 B	--	2470 B	--	5.41 B	--	--
Diesel Range Organics		--	10.1	--	6.58	--	1.47 J	--	5390	--	5600	--	1740	--	5,290	--	2,540	2,580
Motor Oil		--	40.6	--	20.7	--	8.46 B	--	1220	--	4620	--	2030	--	5,810	--	2,850	2,820
VOCs																		
Benzene		0.00397	--	0.00245 U	--	0.0023 U	--	0.00166 U	--	0.00128 U	--	0.00175 J	--	0.053	--	0.0011 U	--	--
SVOCs																		
Carcinogenic PAHs as B(a)P[4]		--	0.0625177	--	0.00290705	--	0.00088726	--	0.261309	--	0.59763	--	0.553626	--	0.380409	--	0.2461205	0.241073
New PAH calculations from DB																		
Carcinogenic PAHs (3 sig figs)		--	0.0573	--	0.00273 U	--	0.000546	--	0.228	--	0.512	--	0.488	--	0.361	--	0.226	0.223
Carcinogenic PAHs (2 sig figs)		--	0.057	--	0.0027 U	--	0.00055	--	0.23	--	0.51	--	0.49	--	0.36	--	0.23	0.22
Carcinogenic PAHs (all digits)		--	0.057262	--	0.00272555 U	--	0.0005461	--	0.2283	--	0.5117	--	0.4881	--	0.3609	--	0.226475	0.22297

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	CE-8	CE-8 *	CE-SB01	CE-SB01	CE-SB01	CE-SB02	CE-SB02	EA-SB01	EA-SB01	EA-SB02	EA-SB02	EA-SB03 *	EA-SB03	EA-SB03	EA-SB03	EA-SB04
		6/13/2011	6/13/2011	10/23/2013	10/23/2013	10/23/2013	10/14/2013	10/23/2013	10/14/2013	10/28/2013	10/14/2013	10/28/2013	10/30/2013	10/30/2013	10/30/2013	10/30/2013	10/17/2013
	Depth[3]	8 to 8	8 to 8	4 to 5	9.5 to 10.5	24 to 24.5	4 to 5	19.5 to 20	4.5 to 5	19.5 to 20	4 to 5	21 to 21.5	4 to 5	4 to 5	12 to 12.5	19.5 to 20	4.5 to 5
TPH																	
Gasoline Range Organics		33.1 B	27.4 B	42.2	318	6.87 U	1920	9.01 U	697	25.2	120	46.2 U	124	98.6	25 U	9.02 U	613
Diesel Range Organics		--	--	20.2	786	4.93 U	1670	4.86 U	25100	87.2	1840	46.4	534	721	180	4.98 U	249
Motor Oil		--	--	19.2	661	4.93 U	205	4.86 U	3240	49.1	581	64.1	249	357	410	7.46	50.1
VOCs																	
Benzene		0.00155 U	0.00239 J	0.00265	0.126	0.00218 U	0.0176	0.00234 U	0.114 U	0.00195 U	0.00549	0.0119 U	0.00489	0.0171	0.00699 U	0.0027 U	0.0187
SVOCs																	
Carcinogenic PAHs as B(a)P[4]		--	--	0.726133	81.7425	0.04886665	0.224456	0.002 U	0.5927955	0.002 U	0.261857	0.01 U	0.066892	0.0813715	0.424714	0.00293505	0.01252905
New PAH calculations from DB																	
Carcinogenic PAHs (3 sig figs)		--	--	0.605	64.0	0.0358	0.168	0.00250 U	0.426	0.00249 U	0.225	0.0112 U	0.0505	0.0612	0.260	0.00250 U	0.00851
Carcinogenic PAHs (2 sig figs)		--	--	0.60	64	0.036	0.17	0.0025 U	0.43	0.0025 U	0.23	0.011 U	0.051	0.061	0.26	0.0025 U	0.0085
Carcinogenic PAHs (all digits)		--	--	0.60477	64.015	0.0357675	0.16763	0.00249905 U	0.425915	0.0024915 U	0.22519	0.011174 U	0.050507	0.061176	0.26018	0.00249905 U	0.0085085

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	EA-SB04	EA-SB05	EA-SB05	EA-SB06	EA-SB06	EA-SB06	EA-SB06	FA-SB01	FA-SB01 *	FA-SB01	FA-SB02	FA-SB02	FA-SB03	FA-SB03	FA-SB03
		10/23/2013	10/29/2013	10/29/2013	10/14/2013	10/28/2013	10/28/2013	10/28/2013	10/15/2013	10/25/2013	10/25/2013	10/15/2013	10/24/2013	10/24/2013	10/24/2013	10/24/2013
	Depth[3]	19.5 to 20	4.5 to 5	19 to 19.5	3.5 to 4.5	6 to 6.5	12 to 12.5	19.5 to 20	5 to 5.5	19.5 to 20	19.5 to 20	5 to 6	19.5 to 20	4 to 5	6.5 to 7	19.25 to 19.75
TPH																
Gasoline Range Organics		4.85 U	165	44.9 U	1,200	1480	47.5 U	5.78 U	110	5.33 U	5.38 U	432	6.73 U	30.3	175	5.96 U
Diesel Range Organics		4.82 U	1,300	20.8 U	1,200	750	21.8	6.05	662	4.94 U	4.89 U	8,360	4.97 U	144	77.6	4.93 U
Motor Oil		4.82 U	571	149	56 U	4.92 U	59.7	6.42	186	4.94 U	4.89 U	343	4.97 U	270	78.1	4.93 U
VOCs																
Benzene		0.00652	0.00914	0.00989 U	2.79	1.92	0.0827	0.00182 U	0.00257 U	0.00176 U	0.00178 U	0.0022 U	0.00193 U	0.00259	0.00193 U	0.00175 U
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.003 U	0.042333	0.01 U	0.1502214	0.3085254	0.153892	0.0029395	0.302975	0.002 U	0.002 U	0.1872005	0.002 U	0.0478557	0.0191474	0.002 U
New PAH calculations from DB																
Carcinogenic PAHs (3 sig figs)		0.00251 U	0.0327	0.0105 U	0.00655	0.0207	0.0664	0.00249 U	0.279	0.00247 U	0.00248 U	0.119	0.00248 U	0.0399	0.0176	0.00246 U
Carcinogenic PAHs (2 sig figs)		0.0025 U	0.033	0.010 U	0.0065	0.021	0.066	0.0025 U	0.28	0.0025 U	0.0025 U	0.12	0.0025 U	0.040	0.018	0.0025 U
Carcinogenic PAHs (all digits)		0.00251415 U	0.032727	0.0104945 U	0.006546	0.020726	0.06637	0.0024915 U	0.2789	0.00246885 U	0.00248395 U	0.118865	0.00248395 U	0.039904	0.017634	0.0024613 U

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	FA-SB04	FA-SB04	FA-SB05	FA-SB05	FA-SB06	FA-SB06	FA-SB06	FA-SB07	FA-SB07	KC-SB01 *	KC-SB01	KC-SB01	KC-SB02	KC-SB02	KC-SB02 *
		10/24/2013	10/24/2013	10/24/2013	10/24/2013	10/25/2013	10/25/2013	10/25/2013	10/25/2013	10/25/2013	10/30/2013	10/30/2013	10/30/2013	2/4/2014	2/10/2014	2/10/2014
	Depth[3]	4 to 5	19.5 to 20	4.5 to 5	19.5 to 20	4 to 5	7.5 to 8	19.5 to 20	4 to 5	19.5 to 20	4.5 to 5	4.5 to 5	24.5 to 25	4.5 to 5	6.5 to 7	19.5 to 20
TPH																
Gasoline Range Organics		106	6.68 U	29.6	6.58 U	13.8	381	9.12	14.3	5.27 U	4.68 U	4.23 U	6.46 U	15.7	29.9 U	30.7 U
Diesel Range Organics		105	4.96 U	49.3	4.94 U	86.1	3,130	4.89 U	24.1 U	4.94 U	25 U	24.9 U	4.86 U	95.1	13.4	5.08
Motor Oil		103	4.96 U	60	4.94 U	107	244 U	4.89 U	112	4.94 U	102	109	4.86 U	5.93	46.9	22.4
VOCs																
Benzene		0.0026	0.00214 U	0.00263	0.00202 U	0.00178 U	0.104 U	0.00182 U	0.00224 U	0.00168 U	0.00137 U	0.0017 U	0.00202 U	0.00152 U	0.00784 U	0.00815 U
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.190065	0.002 U	0.00549225	0.003 U	0.505989	0.074794	0.002 U	0.0967848	0.002 U	0.026091	0.095772	0.002 U	0.0030245	0.007 U	0.0076 U
New PAH calculations from DB																
Carcinogenic PAHs (3 sig figs)		0.171	0.00250 U	0.00508	0.00251 U	0.469	0.0319	0.00248 U	0.0883	0.00250 U	0.0251	0.0848	0.00248 U	0.00268	0.00731 U	0.00755 U
Carcinogenic PAHs (2 sig figs)		0.17	0.0025 U	0.0051	0.0025 U	0.47	0.032	0.0025 U	0.088	0.0025 U	0.025	0.085	0.0025 U	0.0027	0.0073 U	0.0076 U
Carcinogenic PAHs (all digits)		0.17144	0.00249905 U	0.0050822	0.00251415 U	0.4686	0.03188	0.0024764 U	0.088301	0.00249905 U	0.025095	0.084818	0.00248395 U	0.0026805	0.0073084 U	0.00755 U

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	KC-SB02	MW-A1	MW-A1	MW-A2	MW-A2	MW-A3	MW-A3	MW-A4	MW-A4 *	MW-A4	MW-A5	MW-A5	MW-A6	MW-A6	MW-7A	MW-7AB	MW-A8
		2/10/2014	2/4/2008	2/4/2008	2/4/2008	2/4/2008	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/24/2010	6/25/2010	6/25/2010	11/30/2010	12/1/2010	10/29/2013
	Depth[3]	19.5 to 20	7 to 7	8.5 to 8.5	6 to 6.5	7.5 to 8	10 to 11	20 to 21	20 to 21	15 to 15	15 to 15	10 to 10	20 to 20	12 to 12	20 to 20	1 to 1	11.5 to 12	6 to 6.5
TPH																		
Gasoline Range Organics		32.8 U	3.22 U	168	10.2 U	203	5.98 U	4.69 U	4.74 U	7.5 U	4.74 U	7.16 U	5.39 U	5.74 U	6.29 U	4.41 U	5.85 U	4.34 U
Diesel Range Organics		5.08	74.1	5,160	33.3	2,370	7.63	4.57 U	7.25	46.1	12.1	3.74 U	3.95 U	23.8	273	10	2.36	48.8 U
Motor Oil		16.3	79.5	471 U	290	279	22.1	6.81	17	81.1	12.2	4.7	4.06	119	482	228	2.93	535
VOCs																		
Benzene		0.00859 U	0.0322 U	0.0319 U	0.102 U	0.0355	0.00212 U	0.002 U	0.00192 U	0.002 U	0.00215 U	0.00236 U	0.00191 U	0.00225 U	0.00318 U	0.0009 U	0.00123 U	0.00152 U
SVOCs																		
Carcinogenic PAHs as B(a)P[4]		0.0075 U	--	--	--	--	0.0121667	0.062577023	0.013497	0.1729998	0.122063	0.0162077	0.00354135	0.01151025	0.127304	0.0329254	0.0028948	0.1333165
New PAH calculations from DB																		
Carcinogenic PAHs (3 sig figs)		0.00753 U	--	--	--	--	0.00996	0.0575	0.00667	0.0542	0.0342	0.0124	0.00292 U	0.00840	0.115	0.0329	0.00331	0.120
Carcinogenic PAHs (2 sig figs)		0.0075 U	--	--	--	--	0.0100	0.057	0.0067	0.054	0.034	0.012	0.0029 U	0.0084	0.12	0.033	0.0033	0.12
Carcinogenic PAHs (all digits)		0.0075349 U	--	--	--	--	0.009963	0.057476	0.006674	0.054214	0.03418	0.012402	0.00292185 U	0.008401	0.11532	0.032931	0.0033107	0.120265

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	MW-A8	PE-SB02	PE-SB02	PE-SB03	PE-SB03	PE-SB04	PE-SB04	PE-SB05	PE-SB05	PE-SB06	PE-SB06	PE-SB06	PE-SB07	PE-SB07	PE-SB07
		10/29/2013	10/22/2013	10/22/2013	10/16/2013	10/22/2013	10/22/2013	10/22/2013	2/7/2014	2/7/2014	2/7/2014	2/7/2014	2/7/2014	2/3/2014	2/7/2014	2/7/2014
	Depth[3]	14.5 to 15	6.5 to 7	19.5 to 20	4 to 5	19.5 to 20	4 to 5	19.5 to 20	8.5 to 9	19.5 to 20	6.5 to 7	11 to 11.5	19.5 to 20	4.5 to 5	10.5 to 11	12.5 to 13
TPH																
Gasoline Range Organics		5.34 U	1330	13.2	210	10 U	115	8.01 U	5.11 U	5.27 U	4.78 U	6.23 U	6.17 U	384	5.66 U	22.8
Diesel Range Organics		5 U	8,790	4.9 U	5,180	5.98	122 U	4.87 U	15	5.59 U	49.5	8.97	5.76 U	5550	5.69 U	68.5
Motor Oil		5 U	3,450	4.9 U	1,590	4.89 U	649	4.87 U	50.7	20.7	511	49	5.76 U	2700	5.69 U	29.7
VOCs																
Benzene		0.00172 U	0.00192 U	0.00192 U	0.00209 U	0.00287 U	0.00173 U	0.00229 U	0.00167 U	0.00192 U	0.00234 U	0.00195 U	0.00209 U	0.00213 U	0.00183 U	0.00213 U
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.002 U	0.5593369	0.003 U	0.0615071	0.004 U	0.0354661	0.004 U	0.0034139	0.003 U	0.0437901	0.00326165	0.003 U	0.4146625	0.003 U	0.01970075
New PAH calculations from DB																
Carcinogenic PAHs (3 sig figs)		0.00249 U	0.259	0.00284 U	0.0431	0.00410 U	0.0315	0.00368 U	0.00312	0.00282 U	0.0393	0.00299	0.00297 U	0.316	0.00285 U	0.0169
Carcinogenic PAHs (2 sig figs)		0.0025 U	0.26	0.0028 U	0.043	0.0041 U	0.032	0.0037 U	0.0031	0.0028 U	0.039	0.0030	0.0030 U	0.32	0.0029 U	0.017
Carcinogenic PAHs (all digits)		0.0024915 U	0.259179	0.0028388 U	0.043092	0.00409965 U	0.03153	0.00367685 U	0.0031249	0.00281615 U	0.039272	0.0029948	0.00296715 U	0.316205	0.0028539 U	0.0168785

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	PE-SB07	PE-SB07	PE-SB07 *	PE-SB07	PE-SB07	PE-SB07	PE-SB08	PE-SB08	PE-SB08	PE-SB08	PE-SB09	PE-SB09	PE-SB10	PE-SB10	SA-B-1
		2/7/2014	2/7/2014	2/7/2014	2/7/2014	2/7/2014	2/7/2014	2/6/2014	2/6/2014	2/6/2014	2/6/2014	2/10/2014	2/10/2014	2/6/2014	2/6/2014	12/30/2011
	Depth[3]	14.5 to 15	16.5 to 17	19.5 to 20	19.5 to 20	6.5 to 7	8.5 to 9	11 to 11.5	20.5 to 21	22.5 to 23	7 to 7.5	19.5 to 20	5 to 5.5	19.5 to 20	8.5 to 9	9
TPH																
Gasoline Range Organics		14.3	6.08 U	5.56 U	5.8 U	193	123	61.3	5.45	5.39 U	6.13 U	5.4 U	45.2	4.19 U	4.82 U	249 U
Diesel Range Organics		12.5	4.86 U	17.6	25.1	4,220	1,440	484	24.9	9.45	6.12	5.84 U	96.3	5.55 U	5.63	61.6
Motor Oil		5.57 U	8.08	62.2	24.8	2,200	450	748	27.9	8.97	5.89 U	8.33	435	5.55 U	5.32 U	122
VOCs																
Benzene		0.00196 U	0.0019 U	0.0018 U	0.00187 U	0.00203 U	0.00185 U	0.00217 U	0.00179 U	0.00184 U	0.00279 U	0.00178 U	0.00198 U	0.00152 U	0.00178 U	0.0154 U
SVOCs																
Carcinogenic PAHs as B(a)P[4]		0.003 U	0.003 U	0.003 U	0.003 U	0.20567725	0.0884605	0.159621	0.0036353	0.003 U	0.0041731	0.00349265	0.082304	0.0033721	0.003 U	0.01 U
New PAH calculations from DB																
Carcinogenic PAHs (3 sig figs)		0.00276 U	0.00299 U	0.00295 U	0.00299 U	0.139	0.0692	0.133	0.00294	0.00292 U	0.00290	0.00297 U	0.0529	0.00273 U	0.00263 U	0.0129 U
Carcinogenic PAHs (2 sig figs)		0.0028 U	0.0030 U	0.0030 U	0.0030 U	0.14	0.069	0.13	0.0029	0.0029 U	0.0029	0.0030 U	0.053	0.0027 U	0.0026 U	0.013 U
Carcinogenic PAHs (all digits)		0.0027633 U	0.0029898 U	0.00295205 U	0.0029898 U	0.1391425	0.069245	0.13285	0.0029362	0.00292185 U	0.0029042	0.00296715 U	0.052916	0.0027331 U	0.00263495 U	0.0129105 U

TABLE E-3: SOIL TPH AND BTEX RESULTS SINCE 2001[1,2]

ExxonMobil/ADC Property

Everett, Washington

Analyte	Sample Date	SA-B-2 * 12/30/2011	SA-B-2 12/30/2011	SA-B-3 1/3/2012	SA-B-4 1/5/2012	SA-B-5 1/6/2012	SA-B-6 1/13/2012	SA-B-7 2/9/2012	SA-B-8 3/26/2012	SA-B-9 3/27/2012	SA-B-10 3/27/2012	SA-B-11 3/27/2012
	Depth[3]	9	9	10	9	8	8	8	8	8	8	8
TPH												
Gasoline Range Organics		297 U	45.7 U	338 U	315 U	9.15 U	7.49 U	46.7	42.5 U	51.6 U	47 U	54.7 U
Diesel Range Organics		156	30.9	27.7 U	25.6 U	11.1	5.27 U	822	24.6 U	61.3	291	99.5
Motor Oil		363	125	189	123	40.2	5.98	1,040	173	649	907	641
VOCs												
Benzene		0.0184 U	0.0183 U	0.0227 U	0.643 UJ	0.00376 U	0.00224 U	0.0109 U	0.0188 U	0.0196 U	0.0198 U	0.0206 U
SVOCs												
Carcinogenic PAHs as B(a)P[4]		0.3531765	0.3070745	0.0701435	0.02 U	0.003 U	0.003 U	0.133976	0.016 U	0.016 U	0.019118	0.02 U
New PAH calculations from DB												
Carcinogenic PAHs (3 sig figs)		0.353	0.307	0.0701	0.0161 U	0.00308 U	0.00329 U	0.126	0.0156 U	0.0160 U	0.0163 U	0.0165 U
Carcinogenic PAHs (2 sig figs)		0.35	0.31	0.070	0.016 U	0.0031 U	0.0033 U	0.13	0.016 U	0.016 U	0.016 U	0.016 U
Carcinogenic PAHs (all digits)		0.3531765	0.3070745	0.0701435	0.0160815 U	0.0030804 U	0.0032918 U	0.126331	0.0156285 U	0.016006 U	0.016308 U	0.016459 U

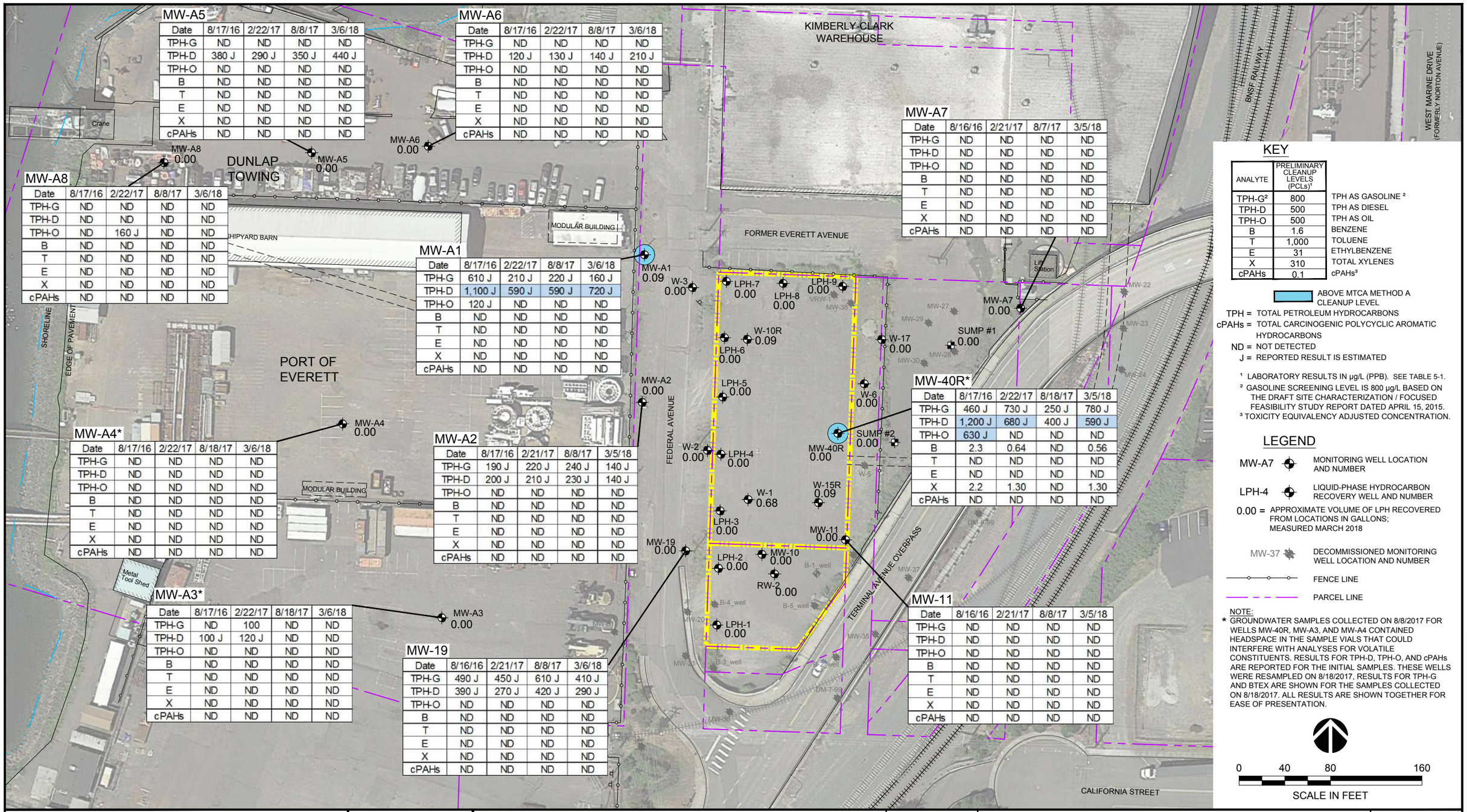
Notes:

1. Data qualifiers are as follows:
   J = detected at or above the reported estimate
   U = not detected
   UJ = estimated at the reporting limit
2. Results reported in milligrams per kilogram.
3. Depth measured in feet below ground surface.
4. The total toxic equivalent concentration was calculated following WAC 173-340-708(8)(e)

Abbreviations:

-- = no data available
B(a)P = benzo(a)pyrene
NA = not available
PAHs = polycyclic aromatic hydrocarbons
TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds

Appendix F



MW-A5

Date	8/17/16	2/22/17	8/8/17	3/6/18
TPH-G	ND	ND	ND	ND
TPH-D	380 J	290 J	350 J	440 J
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-A6

Date	8/17/16	2/22/17	8/8/17	3/6/18
TPH-G	ND	ND	ND	ND
TPH-D	120 J	130 J	140 J	210 J
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-A7

Date	8/16/16	2/21/17	8/7/17	3/5/18
TPH-G	ND	ND	ND	ND
TPH-D	ND	ND	ND	ND
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-A8

Date	8/17/16	2/22/17	8/8/17	3/6/18
TPH-G	ND	ND	ND	ND
TPH-D	ND	ND	ND	ND
TPH-O	ND	160 J	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-A1

Date	8/17/16	2/22/17	8/8/17	3/6/18
TPH-G	610 J	210 J	220 J	160 J
TPH-D	1,100 J	590 J	590 J	720 J
TPH-O	120 J	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-40R*

Date	8/17/16	2/22/17	8/18/17	3/5/18
TPH-G	460 J	730 J	250 J	780 J
TPH-D	1,200 J	680 J	400 J	590 J
TPH-O	630 J	ND	ND	ND
B	2.3	0.64	ND	0.56
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	2.2	1.30	ND	1.30
cPAHs	ND	ND	ND	ND

MW-A4*

Date	8/17/16	2/22/17	8/18/17	3/6/18
TPH-G	ND	ND	ND	ND
TPH-D	ND	ND	ND	ND
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-A2

Date	8/17/16	2/21/17	8/8/17	3/5/18
TPH-G	190 J	220 J	240 J	140 J
TPH-D	200 J	210 J	230 J	140 J
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-A3*

Date	8/17/16	2/22/17	8/18/17	3/6/18
TPH-G	ND	100	ND	ND
TPH-D	100 J	120 J	ND	ND
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-19

Date	8/16/16	2/21/17	8/8/17	3/6/18
TPH-G	490 J	450 J	610 J	410 J
TPH-D	390 J	270 J	420 J	290 J
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

MW-11

Date	8/16/16	2/21/17	8/8/17	3/5/18
TPH-G	ND	ND	ND	ND
TPH-D	ND	ND	ND	ND
TPH-O	ND	ND	ND	ND
B	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	ND	ND
X	ND	ND	ND	ND
cPAHs	ND	ND	ND	ND

KEY

ANALYTE	PRELIMINARY CLEANUP LEVELS (PCLs)[1]	
TPH-G[2]	800	TPH AS GASOLINE [2]
TPH-D	500	TPH AS DIESEL
TPH-O	500	TPH AS OIL
B	1.6	BENZENE
T	1,000	TOLUENE
E	31	ETHYLBENZENE
X	310	TOTAL XYLENES
cPAHs	0.1	cPAHs[3]

ABOVE MTCA METHOD A CLEANUP LEVEL

TPH = TOTAL PETROLEUM HYDROCARBONS
cPAHs = TOTAL CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
ND = NOT DETECTED
J = REPORTED RESULT IS ESTIMATED

[1] LABORATORY RESULTS IN µg/L (PPB). SEE TABLE 5-1.
[2] GASOLINE SCREENING LEVEL IS 800 µg/L BASED ON THE DRAFT SITE CHARACTERIZATION / FOCUSED FEASIBILITY STUDY REPORT DATED APRIL 15, 2015.
[3] TOXICITY EQUIVALENCY ADJUSTED CONCENTRATION.

LEGEND

MW-A7 — MONITORING WELL LOCATION AND NUMBER
LPH-4 — LIQUID-PHASE HYDROCARBON RECOVERY WELL AND NUMBER
0.00 = APPROXIMATE VOLUME OF LPH RECOVERED FROM LOCATIONS IN GALLONS; MEASURED MARCH 2018
MW-37 — DECOMMISSIONED MONITORING WELL LOCATION AND NUMBER
FENCE LINE
PARCEL LINE

NOTE:
* GROUNDWATER SAMPLES COLLECTED ON 8/8/2017 FOR WELLS MW-40R, MW-A3, AND MW-A4 CONTAINED HEADSPACE IN THE SAMPLE VIALS THAT COULD INTERFERE WITH ANALYSES FOR VOLATILE CONSTITUENTS. RESULTS FOR TPH-D, TPH-O, AND cPAHs ARE REPORTED FOR THE INITIAL SAMPLES. THESE WELLS WERE RESAMPLED ON 8/18/2017. RESULTS FOR TPH-G AND BTEX ARE SHOWN FOR THE SAMPLES COLLECTED ON 8/18/2017. ALL RESULTS ARE SHOWN TOGETHER FOR EASE OF PRESENTATION.

0 40 80 160
SCALE IN FEET

wood.

CLIENT:
EXXONMOBIL
AMERICAN DISTRIBUTING CO.

Wood Environment & Infrastructure Solutions, Inc.
600 University Street, Suite 600
Seattle, WA, U.S.A. 98101

DWN BY: APS
CHK'D BY: LV
DATUM: NAD 83 N FT
PROJECTION: WASP
SCALE: AS SHOWN

PROJECT
EXXONMOBIL/ADC PROPERTY
ECOLOGY SITE ID 2728

TITLE
GROUNDWATER SAMPLE ANALYSIS MAP
MARCH 5-6, 2018

DATE: JULY 2018
PROJECT NO: 6103180009
REV. NO.:
FIGURE No. F-1

Appendix G

Washington State Department of Ecology
Toxics Cleanup Program

Table 749-1

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	
Area (acres) / Points: 0.25 or less / 4; 0.5 / 5; 1.0 / 6; 1.5 / 7; 2.0 / 8; 2.5 / 9; 3.0 / 10; 3.5 / 11; 4.0 or more / 12	8
2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1	3
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	2
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	4
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	12

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]

Appendix H

January 21, 2015

Project 6103150009

Mr. Chung Yee
Washington State Department of Ecology
Headquarters
Toxics Cleanup Program
P.O. Box 47600
Olympia, Washington 98504-7600

Subject: **Change in Project Laboratory**
ExxonMobil/ADC Property, Ecology Site ID 2728
2717/2731 Federal Avenue, Everett, Washington
Ecology Agreed Order DE-6184

Dear Mr. Yee:

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), has prepared this letter on behalf of ExxonMobil Oil Corporation (ExxonMobil) and American Distributing Company (ADC) for the ExxonMobil/ADC Site located at 2717/2731 Federal Avenue in Everett, Washington (the Site). The purpose of this letter is to inform the Washington Department of Ecology (Ecology) that the project laboratory used for analysis of Site samples is being changed from TestAmerica Inc. (TestAmerica) to Eurofins Calscience Environmental Laboratories, located in Garden Grove, California (Eurofins). Both analytical laboratories are accredited by Ecology for the soil and groundwater analyses performed for the Site. This document details discrepancies that were recently identified in analytical results obtained for groundwater samples analyzed for total petroleum hydrocarbons (TPH) in the diesel range (TPH-D) by TestAmerica. These TPH-D analytical discrepancies and the results of a comparative study of TPH analytical results reported by TestAmerica and Eurofins are presented and discussed below. An independent evaluation of analytical results from both TestAmerica and Eurofins was also performed by an Ecology-accredited third-party analytical laboratory, Friedman & Bruya, Inc. (Friedman & Bruya), of Seattle, Washington. The results of that independent evaluation are included with this letter as Attachment A.

Starting in January 2015, soil, groundwater, and waste samples collected from the Site will be analyzed by Eurofins Calscience Environmental Laboratories, located in Garden Grove, California. Samples will no longer be submitted to TestAmerica for analysis.

1.0 BACKGROUND

TestAmerica has been the project laboratory for analysis of soil and groundwater samples collected at the Site since 2006. Semiannual groundwater monitoring results for individual wells reported by TestAmerica have been consistent during this time (AMEC, 2014).Results from TestAmerica over the past several years of monitoring using Method NWTPH-Dx with silica gel treatment (SGT) have consistently shown elevated levels for TPH-D in several wells, as noted by the summary of semiannual monitoring data for TPH presented in Table 1. The monitoring well locations are shown on the attached Figure 1. Elevated TPH-D levels have been consistently reported for downgradient wells

Amec Foster Wheeler Environment & Infrastructure, Inc.
600 University Street, Suite 600
Seattle, Washington
USA 98101-4107
Tel (206) 342-1760
Fax (206) 342-1761
www.amecfw.com

MW-A1, MW-A2, MW-A3, MW-A4, MW-A5, and MW-A6, and for the wells located near the source areas (MW-19 and MW-40R). Elevated levels of TPH in the motor oil range (TPH-O) were also reported for some wells during several semiannual sampling events. Table 1 summarizes TPH-D and TPH-O results reported by TestAmerica using Method NWTPH-Dx with SGT for semiannual groundwater monitoring samples collected from these eight wells since 2009.

As part of our work to prepare the Site Characterization/Focused Feasibility Study (SC/FFS) for the Site, samples were collected from downgradient monitoring wells MW-A5 and MW-A6 in May 2014 for analysis of extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) using Ecology methods NWTPH-EPH and NWTPH-VPH. The groundwater samples were submitted to TestAmerica for these analyses. Monitoring wells MW-A5 and MW-A6 were selected for EPH/VPH testing because they are downgradient from the source area on the ExxonMobil/ADC property and because of the relatively high TPH-D and TPH-O concentrations that had been reported for these wells during previous sampling events. The TPH-D concentrations had consistently been in the range of 1,000–3,000 micrograms per liter (µg/L) in MW-A5 since 2010 and in MW-A6 since 2011 (Table 1).

The EPH/VPH results reported by TestAmerica for the May 2014 groundwater samples wells showed results that were generally below the laboratory reporting limits for the various petroleum hydrocarbon fractions. These EPH/VPH results were entered into the Ecology MTCATPH11.1 spreadsheet to calculate the site-specific cleanup levels. The output from the MTCATPH11.1 spreadsheet indicated that the groundwater TPH levels in these wells were below the MTCA Method A cleanup level and approximately one order of magnitude less than the historic TPH-D results shown in Table 1 for wells MW-A5 and MW-A6. Due to these inconsistent results, ExxonMobil and ADC felt it was warranted to collect additional data to assess TPH concentrations in these wells and to explain the discrepancy in analytical results for EPH/VPH versus TPH-D.

The purpose of the comparative laboratory assessment presented here was to ascertain the reason for the discrepancy in results for petroleum hydrocarbons obtained by TestAmerica using Method NWTPH-Dx with SGT versus Methods NWTPH-EPH and NWTPH-VPH. The study design and results are described below.

2.0 COMPARATIVE EVALUATION DESIGN

A multi-faceted approach was implemented to evaluate the cause of discrepancy in TPH results. The approach comprised the following elements:

- An additional round of groundwater samples were collected from monitoring wells MW-A5 and MW-A6 in June 2014 for analyses.
- The samples collected in June 2014 were split in the field, and the split samples were submitted to two separate, Ecology-accredited laboratories (TestAmerica and Eurofins) for analysis of TPH-D, TPH-O, EPH, VPH, polycyclic aromatic hydrocarbons (PAHs), and selected volatile organic compounds (VOCs).
- Results of the June 2014 split sampling were evaluated for variation between the two laboratories.

- Split samples were collected during the scheduled semiannual sampling event in August 2014 from the full network of monitoring wells included in the semiannual sampling program. These split samples were submitted to TestAmerica and Eurofins for analysis of the semiannual monitoring parameters, which include TPH in the gasoline range (TPH-G), TPH-D, TPH-O, PAHs, and selected VOCs.
- Additional rounds of split samples were collected monthly from wells MW-A2, MW-A4, MW-A5, MW-A6, and MW-40R from September through December 2014. These split samples were also submitted to TestAmerica and Eurofins for analysis of TPH-D, TPH-O, PAHs, and selected VOCs. Starting with the September 2014 sampling event, analyses using method NWTPH-Dx were conducted both with and without SGT.
- A third, independent, Ecology-accredited laboratory (Friedman & Bruya) was retained to evaluate the analytical results obtained by the two laboratories for the split samples collected in June, August, and September 2014. Friedman & Bruya also reviewed the standard operating procedures (SOPs) used by the two laboratories for TPH analyses.
- Statistical analysis was conducted on the laboratory analytical results from the split samples to characterize the differences in analytical results reported by the two laboratories.

The wells sampled and analyzed for the comparative evaluation are summarized in Table 2. Additional details on the sampling program are described below.

2.1 Sampling and Analysis

Samples were collected and analyzed as described in Table 2. The samples were split in the field and analyzed by two Ecology-accredited laboratories: TestAmerica and Eurofins. The groundwater samples were collected in accordance with the routine groundwater sampling protocols that have been used at the Site.

Field Duplicates

Field duplicates were collected at monitoring wells MW-A5 and MW-A6 in June 2014. These field duplicate samples were not split; the duplicate was submitted only to the normal project laboratory, TestAmerica. Field duplicates were collected from monitoring well MW-A2 during the sampling events conducted in August through December, and these field duplicates were also split and submitted to both laboratories. All of the field duplicates were submitted with blind sample IDs.

Analytical Methods

The analyses conducted and the analytical methods used are summarized in Table 2. Silica gel treatment (SGT) of groundwater samples has been conducted routinely for Site samples since February 2008; the data shown in Table 1 reflect results that include SGT as part of the analytical method. As noted above, as part of this evaluation, both laboratories analyzed several rounds of samples for TPH both with and without SGT.

Data Evaluation Methods

Laboratory data were subjected to statistical testing using open source R applications. Laboratory results and the natural logarithm (base *e)* of the results for TPH-D were tested for a normal distribution using the Shapiro-Wilk normality test (*W* statistic). Based on the results of this test, the data were found to be log-normally distributed, and the natural logarithm of the values for TPH-D from the two laboratories were then evaluated using a paired *t*-test to determine if the differences in results produced from the two test laboratories were statistically significant. Analytical results were also compared by calculating the relative percent difference (RPD) in results between the two laboratories; the RPD was calculated for each data pair by dividing the difference between the two results by the average of the results and expressing the result as percent. Results were included in the statistical analyses only when the analyte was detected at both laboratories.

3.0 RESULTS

Results from the comparative evaluation study described above are presented on Tables 3, 4, and 5:

- Table 3: EPH and VPH results for June 19; 2014
- Table 4: TPH-G, TPH-D, and TPH-O results; and
- Table 5: PAHs and VOCs results.

The complete analytical data reports are included in Attachment B.

3.1 Results of the June 2014 Split Samples

Split samples collected in June 2014 from MW-A5 and MW-A6 were analyzed for EPH, VPH, PAHs, and both TPH-D and TPH-O using the SGT procedure.

- The results from the EPH/VPH analyses (Table 3) confirmed the low TPH concentrations reported by TestAmerica for the May 2014 EPH/VPH analyses. Results for EPH and VPH from the two laboratories were in generally good agreement, indicating that TPH concentrations were below cleanup levels.
- Results for TPH-D analyses (which included routine SGT) and TPH-O showed widely varying results between the two laboratories (Table 4). Results reported by TestAmerica were greater by factors of up to 9 for MW-A5 and 25 for MW-A6. Moreover, the results for duplicate samples reported by TestAmerica varied greatly (3,360 and 272 µg/L for MW-A5 and 3,270 and 2,550 µg/L for MW-A6).
- Results for VOCs and PAHs were very similar between the two labs. Most individual PAH compounds were not detected in either laboratory, although Eurofins analyzed for only a selected suite of compounds. TestAmerica reported higher concentrations of acenaphthene than Eurofins, but the reported concentrations were low. VOCs were not detected by either laboratory. The consistency of the results for EPH/VPH, VOCs, and PAHs indicates that all samples analyzed were representative of the same medium.

3.2 Results of Monthly Split Samples

Results for TPH-G, PAHs, and VOCs reported by the two laboratories for the monthly split samples generally show good agreement between the two laboratories (Tables 4 and 5). TPH-G was not reported in most samples analyzed, and when detected was present at low concentrations. Very few PAH compounds were detected above the reporting limit. When detected, individual PAHs were most often detected in the corresponding samples by both laboratories. In the few instances when PAHs were detected at only one lab, concentrations were very low and generally near or below the reporting limit specified by the other laboratory. Few VOC detections were reported and generally only at very low concentrations near or below the practical quantitation limit (PQL). Importantly, when individual PAH or VOC constituents were detected, they were often detected by both laboratories, confirming that the split samples represent the same medium.

As found in the June sampling event, the TPH-D and THP-O results in the August through December 2014 sampling vary widely between the two laboratories, in many cases by an order of magnitude or more (Table 4). The results for TPH-D presented in Table 4 show that the results reported by Eurofins were consistently lower than results reported by TestAmerica. These differences are noted for results with and without SGT, but the differences are more pronounced for samples analyzed using SGT.

3.3 Third-Party Review by Friedman & Bruya, Inc.

Freidman & Bruya, Inc. (Friedman & Bruya), was retained as an independent third party with expertise in TPH analytical methods. For both TestAmerica and Eurofins, Friedman & Bruya reviewed the analytical laboratory reports, chromatograms from TPH analyses, and standard analytical procedures for extraction, silica gel treatment, and TPH analysis. They were asked to provide an opinion on the nature and causes of the discrepancy in TPH results obtained by the two test laboratories (TestAmerica and Eurofins). Friedman & Bruya is an environmental laboratory located in Seattle, Washington, and is accredited by Ecology to perform analyses using the analytical methods used for this investigation. The independent review provided by Freidman & Bruya is included as Attachment A.

Friedman & Bruya provided the following findings:

- TPH-D results reported by Eurofins after SGT were much lower than results reported by TestAmerica for the corresponding samples.
- The low levels of EPH in comparison to TPH reported by both laboratories suggest that the much of the organic material present in the groundwater samples analyzed by both laboratories is polar.
- These high levels of polar compounds in samples are interfering with the TPH analyses.
- Both laboratories reported higher test results for TPH-D following SGT than for EPH, suggesting that the SGT procedures used by both laboratories are inadequate for removing polar compound interference from these samples.
- The discrepancy in results from both laboratories between EPH and TPH-D with SGT suggest that the column SGT method used in the EPH analysis is more effective than the

shake SGT method that is used by both laboratories for TPH-D analysis for removing polar compound interference.

- The low results reported for the EPH/VPH analyses show that very low concentrations of TPH were present in the groundwater samples tested for EPH/VPH.
- SGT of groundwater samples from the Site is appropriate because of the high concentrations of polar compounds in the groundwater, which is the source of the high TPH concentrations historically reported by TestAmerica.
- The TPH-D results following SGT reported by Eurofins more closely resemble the results of the EPH/VPH results reported by both laboratories.

As noted in the Friedman & Bruya report, SGT is needed to remove interference caused by polar compounds in Site groundwater. The prescribed SGT method specified in the NWTPH-Dx analytical procedure is a shake method and the SGT method prescribed for NWTPH-EPH analysis is a column method. Friedman & Bruya conclude that the column SGT method used in EPH analysis was more effective in removing polar compound interference for this Site, and thus, the low TPH results from EPH analysis observed in the May and June samples are representative of Site conditions.

3.4 Data Quality Review

The TestAmerica and Eurofins data packages were reviewed for data quality by Amec Foster Wheeler. This review was conducted in accordance with procedures used routinely for the Site. The data quality review memoranda are included as Attachment B. In general, TestAmerica data shows trends of a higher frequency of out of compliance laboratory quality control samples which can bias the environmental samples either high or low and indicates the laboratory has difficulty performing the requested analyses. In comparison, the Eurofins data review did not identify out of compliance laboratory quality control samples; however, two samples were qualified due to incomparable field duplicate results.

Results for analyses on samples collected at wells MW-A4 and MW-A5 on November 20, 2014, were rejected due to an error on the part of the shipping company; these samples were received by one of the project laboratories several days after the samples had been collected and at a temperature exceeding the maximum temperature established under project quality control criteria. These wells were resampled on December 5, 2014, so that true split samples were analyzed for comparison. Results from December 5, 2014, are reported and evaluated here.

3.5 Statistical Analysis of Laboratory Results

Statistical analysis was performed by Amec Foster Wheeler to assess differences in results reported by the two laboratories. Statistical testing included direct comparison of results from the two laboratories using RPD, testing for distribution normality using the Shapiro-Wilk test, and comparison of results from the two laboratories using the paired t-test. Results from these tests are presented below. Details for the Shapiro-Wilk testing and the paired t-test are included in Attachment C.

RPD was calculated for results reported by both laboratories that are at least five times greater than the reporting limit. The resulting RPDs are presented in Table 6. An RPD of 30 percent is often used

as a generally acceptable RPD for groundwater field duplicate samples; therefore, this value can be used as a guideline for comparing results from the two labs.

The RPDs listed in Table 6 for analytical results other than TPH-D and TPH-O are mostly acceptable. The RPD data in Table 6 show that results from the two laboratories for TPH-G and VOCs (benzene and total xylenes) were in very good agreement. For PAH analyses, results for 40 of the 69 individual results (i.e., 58 percent) were within the 30 percent criterion for field duplicate samples. For the 26 TPH-D results, RPDs were within the 30 percent criterion for only 3 sets of results, and RPDs ranged from 48 percent to 183 percent for the remaining 88 percent of the paired results (Table 6).

Table 7 presents a statistical summary of the RPD values in Table 6. The data in Table 7 show that the average RPD for TPH-G, VOCs, and PAHs were below or very near the 30 percent field duplicate criterion, whereas the average RPD for TPH-D was 95 percent. The RPD results for TPH-G, VOCs, and PAHs indicate that the split samples analyzed at the two laboratories were valid field duplicates. The RPD results for TPH-D and TPH-O indicate that the analyses for the two labs were in very poor agreement for these analytes.

Additional statistical testing was conducted to evaluate the significance of the differences in results for TPH-D following SGT reported by the two laboratories. The raw input data and statistical output from the statistical analysis run are presented in Attachment C.

The Shapiro-Wilk normality test showed the TPH-D results from both laboratories to be log-normally distributed (W = 0.94 and 0.94 and p = 0.090 and 0.14 for TestAmerica and Eurofins, respectively) (see Attachment C). Based on these results, both data sets were log-transformed for further statistical testing. The log-transformed laboratory results for TPH-D from the two laboratories were then subjected to a paired t-test to assess the statistical significance of the differences. The paired t-test indicated that the differences between the two sets of results were highly significant (t-value = 7.3; $p = 7.5 \times 10^{-8}$), with a mean difference of 1.32 in the natural logarithm of the reported data (corresponding to a factor of approximately 3.7. In other words, results from TestAmerica were on average approximately 3.7 times higher than results reported by Eurofins for the same split sample. The t-test results indicate that the two sets of TPH-D results are statistically distinct and independent sets of data.

4.0 DISCUSSION

Ecology guidance specifies that SGT should be used in cases where high levels of naturally occurring organic matter are present (Ecology 2011). As shown by results of the EPH analyses in comparison with TPH-D results without SGT, large quantities of polar organic compounds are the reason that elevated levels of TPH-D has historically been reported by TestAmerica in many samples from groundwater monitoring wells at the Site, including the downgradient wells. The potential for polar compounds unrelated to petroleum to be present in Site groundwater, especially downgradient of the ExxonMobil/ADC property, is consistent with the history of this area. The Site was originally developed on the shoreline of Port Gardner Bay, which originally consisted of lowlands, as evidenced by the peat deposits present beneath the Site east of Federal Avenue. In addition, historic fire insurance maps prepared by Sanborn indicate the on-property areas east of Federal Avenue were a marsh prior to development.

The area west of Federal Avenue was subsequently filled to create the current shoreline. Precise sources of fill material are unknown, but likely included dredge spoils, natural wood debris from historic log-rafting and storage along the Port Gardner Bay shoreline, peat, and other material potentially containing high levels of organic material. These sources, as well as the native marsh and nearshore mud flat deposits, would be expected to contribute large amounts of natural organic matter that contributes to the presence of significant concentrations of polar organic material in Site groundwater.

5.0 CONCLUSIONS

Based on the results from the comparative evaluation of laboratory results reported by TestAmerica and Eurofins and the independent review by Friedman & Bruya, the following conclusions are made:

- Results of analyses of split samples reported by TestAmerica and Eurofins showed good agreement for TPH-G, PAHs, VOCs, and EPH/VPH, indicating that the split samples are representative of the medium being addressed (i.e., groundwater at the ExxonMobil/ADC Site) and that the split samples are valid field duplicates.
- Results reported by TestAmerica for TPH-D analyses were routinely greater than results obtained by Eurofins for the same split sample. Based on statistical analysis of the results for TPH-D with SGT, TestAmerica reported results that were on average approximately 4 times greater than results reported by Eurofins.
- Groundwater samples from many of the Site monitoring wells contain high concentrations of polar organic compounds that interfere with TPH-D analyses. SGT is appropriate for removal of the interfering compounds as part of TPH-D analyses.
- TPH-D results for both labs showed a significant discrepancy relative to results for EPH, with TPH-D results greater than EPH results. Friedman & Bruya attributed this difference to more effective removal of polar compounds by the column SGT method employed for the EPH analyses compared with the shake method used by the two laboratories for TPH-D analyses. Friedman & Bruya concluded that EPH method results are more representative of TPH-D concentrations in groundwater at the Site.
- The shake SGT method employed by TestAmerica and Eurofins for TPH-D analyses achieved partial removal of polar compounds that interfere with TPH-D analyses; the SGT procedure employed by Eurofins appears to remove more of the interfering polar compounds than the procedure used by TestAmerica, as their TPH-D results were consistently lower.
- TPH-D results reported by Eurofins are more representative of the actual hydrocarbon content of samples, as based on results from EPH testing by both laboratories. The TPH-D results in downgradient MWs-A4, A5, and A6 are below MTCA Method A cleanup levels.
- Friedman & Bruya recommended the use of the column SGT procedure for analyses of TPH samples for this Site based on the high concentrations of polar compounds that are interfering with the TPH-D analyses.

- Results from the comparative evaluation suggest that TestAmerica had consistently been reporting inappropriately high TPH results for the downgradient monitoring wells due to interference by polar compounds present in Site groundwater.

6.0 CLOSURE

Based on the results of this evaluation and the recommendations provided by Friedman & Bruya, future laboratory testing for the ExxonMobil/ADC Site will be conducted by Eurofins. Results from Eurofins for TPH-D more closely matched results of EPH analyses, which is the more representative indicator for the presence of hydrocarbons at the Site. Eurofins is accredited by Ecology for all of the analytical methods used for the semiannual sampling events.

Sincerely yours,
Amec Foster Wheeler Environment & Infrastructure, Inc.

Leah Vigoren
Project Manager
Direct Tel.: (206) 838-8470
E-mail: leah.vigoren@amedfw.com

Larry McGaughey, PhD, PE
Senior Associate Engineer
Direct Tel.: (206) 342-1788
E-mail: larry.mcgaughey@amecfw.com

LV:lpm
"\\SEA2-FS1\Archive\ExxonMobil - Everett\070\Appendices\Appendix H Change in Project Laboratory\App H Change in Lab to print.pdf"

REFERENCES

AMEC Environment & Infrastructure, Inc. (AMEC), 2014, Semiannual Ground Water Report September 1, 2013, through February 28, 2014, April.

Washington State Department of Ecology (Ecology), 2011, Guidance for remediation of petroleum contaminated sites, Toxics Cleanup Program Publication No. 10-09-057, September.

Enclosures:
Table 1 – Selected Historical Analytical Results for Total Petroleum Hydrocarbons
Table 2 – Comparative Study Schedule
Table 3 – Results for EPH/VPH Analyses June 2014
Table 4 – Analytical Results for TPH in Split Groundwater Samples
Table 5 – Analytical Results for PAHs and VOCs in Split Groundwater Samples
Table 6 – Relative Percent Differences in Results between Laboratories
Table 7 – Summary Statistics for Relative Percent Differences in Results between Laboratories
Figure 1 – Monitoring Well Network
Attachment A – Friedman & Bruya Assessment
Attachment B – Laboratory Data Reports and Data Validation Memoranda
Attachment C – Statistical Data Input and Program Output

amec foster wheeler

TABLES

TABLE 1

SELECTED HISTORICAL ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS [1, 2]

ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	Date Sampled	TPH-Diesel (µg/L)	TPH-Oil (µg/L)
MTCA Method A CUL [3]		500	500
MW-19	3/1/2010	**854**	**585**
	3/1/2010 (dup.)	**824**	**563**
	8/18/2010	346 J	137 J
	8/18/2010 (dup.)	**508 J**	323 J
	11/18/2010	488	172
	2/17/2011	**570 J**	128 N
	5/18/2011	274 NJ	26.2 NJ
	11/29/2011	**621**	250 U
	2/22/2012	**512**	250 U
	8/29/2012	**543**	148
	2/21/2013	354	111
	8/22/2013	341	76.8 J
	2/25/2014	239	**571**
	8/27/2014	409	94.3 U
MW-40R	3/1/2010	**3,790**	**1,270**
	8/18/2010	**4,390**	**1,620**
	11/18/2010	**1,970**	413
	2/17/2011	**2,030 J**	**638 N**
	5/18/2011	**1,540 NJ**	208 NJ
	11/29/2011	**1,720**	248 U
	2/22/2012	**1,690**	295
	8/29/2012	**3,780 J**	**1,100 J**
	2/21/2013	**792 J**	113 J
	8/22/2013	**4,010**	**1,040**
	2/25/2014	**1,550**	203
	8/27/2014	**1,610 J**	276 J
MW-A1	2/25/2010	**3,390**	**545**
	8/18/2010	**2,200**	276
	11/18/2010	**2,140**	95.2 U
	2/18/2011	**3,260**	**529 N**
	5/18/2011	**2,350 J**	144 J
	11/28/2011	**15,600**	4,900 U
	2/21/2012	**4,530**	**847**
	8/29/2012	**2,190**	424
	2/21/2013	**802**	103
	8/27/2014	**1,240**	124
MW-A2	2/26/2010	**2,400**	499
	8/18/2010	**1,720**	233
	11/17/2010	**2,010**	97.1 U
	11/17/2010 (dup.)	**1,880**	95.2 U
	2/17/2011	**1,720 J**	421 N
	5/19/2011	**1,540**	468
	11/28/2011	**1,520**	243 U
	8/29/2012	**965**	133
	2/21/2013	**782**	118
	8/22/2013	**826**	93.9 J
	2/25/2014	**730**	94.3 U
	8/27/2014	**565**	95.7 UJ
	8/27/2014 (dup.)	**602**	94.8 U
MW-A3	8/18/2010	335	226
	11/18/2010	417	96.2 U
	2/17/2011	**791**	220 N
	5/19/2011	404 NJ	29.6 NJ
	11/29/2011	**643**	248 U
	2/22/2012	**826**	240 U
	8/29/2012	365	100 U
	2/21/2013	**655**	146
	8/22/2013	**864**	341
	2/25/2014	365	94.3 U
	8/26/2014	**906**	442
MW-A4	8/18/2010	483	**516**
	11/17/2010	**585**	396
	2/17/2011	**667**	**515 N**
	5/19/2011	416 NJ	215 NJ
	11/29/2011	**592**	288
	2/22/2012	**580**	**525**
	8/29/2012	**635**	356
	2/21/2013	**708**	472
	8/22/2013	**732**	343
	2/25/2014	590	223
	8/26/2014	360	94.3 U

TABLE 1

SELECTED HISTORICAL ANALYTICAL RESULTS
FOR TOTAL PETROLEUM HYDROCARBONS [1, 2]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	Date Sampled	TPH-Diesel (µg/L)	TPH-Oil (µg/L)	Well ID	Date Sampled	TPH-Diesel (µg/L)	TPH-Oil (µg/L)
MTCA Method A CUL [3]		**500**	**500**	**MTCA Method A CUL [3]**		**500**	**500**
MW-A5	8/18/2010	**2,070**	288	MW-A6	8/18/2010	**513**	145
	11/17/2010	**1,250 J**	98.0 U		11/17/2010	**796**	94.3 J
	2/17/2011	**2,800**	**523 N**		2/17/2011	**1,500**	273 N
	5/19/2011	**1,970**	195		5/19/2011	**1,370**	224
	11/28/2011	**1,880**	243		11/29/2011	**1,560**	245 U
	2/21/2012	**2,480**	250 U		2/21/2012	**1,960**	493
	8/29/2012	**2,830**	**514**		8/29/2012	**2,020**	357
	2/21/2013	**2,930**	380		2/21/2013	**2,740**	**598**
	8/22/2013	**3,670**	**555**		8/22/2013	**2,800**	**612**
	2/25/2014	**2,480**	200		2/25/2014	**2,840**	208
	8/26/2014	**2,160**	95.2 U		8/26/2014	**2,430**	174

Notes
1. Data qualifier flags are as follows:
   J = The result is an approximation.
   U = Analyte not detected at or above the reporting limit indicated.
   UJ = Analyte was not detected above the reporting limit. Indicated value is estimated reporting limit.
   N = presumptively identified due to spectral match issues.
   NJ = presumptively identified due to spectral match issues.
2. All analtyical results by TestAmerica.
3. MTCA Method A Cleanup Level, TPH-Diesel = 500 µg/L, MTCA Method A Cleanup Level, TPH-Oil = 500 µg/L
Bold indicates that the result is greater than MTCA Method A cleanup level.

Abbreviations
µg/L = microgram per liter
CUL = cleanup level
MTCA = Model Toxics Control Act
TPH = total petroleum hydrocarbons

TABLE 2

COMPARATIVE STUDY SCHEDULE[1]

ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Sampling Schedule	Wells Sampled	Analyses[2]
June 2014	MA-A1[3] MW-A2[3] MW-A4[3] MW-A5 MW-A6	EPH VPH TPH-D (C_{10}-C_{24}) w/SGT TPH-D (C_{10}-C_{24}) no/SGT (Eurofins only) TPH-O (C_{24}-C_{40}) w/SGT PAHs Select VOCs
August 2014 (Semiannual Monitoring)	MW-A1 MW-A2 MW-A3 MW-A4 MW-A5 MW-A6 MW-A7 MW-A8 MW-11 MW-19 MW-40R	TPH-G (C_6-C_{12}) TPH-D (C_{10}-C_{24}) w/SGT TPH-O (C_{24}-C_{40}) w/SGT PAHs Select VOCs
September 2014 October 2014 November 2014 December 2014	MW-A2 MW-A4 MW-A5 MW-A6 MW-40R	TPH-G (C_6-C_{12}) TPH-D (C_{10}-C_{24}) no/SGT TPH-D (C_{10}-C_{24}) w/SGT TPH-O (C_{24}-C_{40}) no/SGT TPH-O (C_{24}-C_{40}) w/SGT PAHs Select VOCs

Notes:

1. Samples were split in the field for analysis at both TestAmerica and Eurofins, except as noted.
2. EPH analyzed by Method NWTPH-EPH.
   VPH analyzed by Method NWTPH-VPH.
   TPH-D and TPH-O analyzed by Method NWTPH-Dx with (w/SGT) or without (no SGT) silica gel treatment.
   TPH-G analyzed by Method NWTPH-Gx.
   PAHs analyzed by EPA Method 8270D (Eurofins uses 8270C) with select ion monitoring.
   VOCs analyzed by EPA Method 8260B.
3. Analyzed only by TestAmerica and only for EPH/VPH.

Abbreviations:
EPA = U.S. Environmental Protection Agency
EPH = extractable petroleum hydrocarbons
PAHs = polycyclic aromatic hydrocarbons
SGT = silica gel treatment
TPH-G = total petroleum hydrocarbons in the gasoline range
TPH-D = total petroleum hydrocarbons in the diesel range
TPH-O = total petroleum hydrocarbons in the oil range
VOCs = volatile organic compounds
VPH = volatile petroleum hydrocarbons

TABLE 3

RESULTS FOR EPH/VPH ANALYSES, JUNE 2014[1]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	MW-A1	MW-A2	MW-A4	MW-A5 2			MW-A6		
Analytical Lab	TA	TA	TA	TA[2]		EU	TA [2]		EU
EPH (µg/L)									
C8-C10 Aliphatics	19.2 U	18.9 UR	19.2 UR	18.9 UR	19 UR	50 U	18.9 UR	18.7 UR	50 U
C8-C10 Aromatics	48.1 U	47.2 UJ	48.1 U	47.2 U	47.6 U	50 U	47.2 U	46.7 U	50 U
C10-C12 Aliphatics	9.62 U	17.4 J	9.62 UR	9.43 UR	9.52 UR	50 U	9.43 UR	9.35 UR	50 U
C10-C12 Aromatics	14.1	15.1 J	9.62 UJ	9.43 UJ	9.81 J	50 U	9.43 U	9.35 U	50 U
C12-C16 Aliphatics	28.8 U	28.5	28.8 U	28.3 U	28.6 U	50 U	28.3 U	28 U	50 U
C12-C16 Aromatics	75.6	37.7 UJ	38.5 U	37.7 U	38.1 U	50 U	37.7 U	37.4 U	50 U
C16-C21 Aliphatics	48.1 U	47.2 U	48.1 U	47.2 U	47.6 U	50 U	47.2 U	46.7 U	50 U
C16-C21 Aromatics	98.2	47.2 UJ	48.1 U	47.2 U	47.6 U	2.8	47.2 U	46.7 U	50 U
C21-C34 Aliphatics	48.1 U	47.2 U	48.1 U	47.2 U	47.6 U	50 U	47.2 U	68.5	50 U
C21-C34 Aromatics	48.1 U	47.2 UJ	48.1 U	47.2 U	47.6 U	16	47.2 U	46.7 U	50 U
VPH (µg/L)									
C5-C6 aliphatics (adjusted)	50 U	50 U	50 U	50 U	50 U	10 U	50 U	50 U	10 U
C6-C8 aliphatic (adjusted)	50 U	50 U	50 U	50 U	50 U	15 U	50 U	50 U	15 U
C8-C10 aliphatic (adjusted)	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	25 U
C8-C10 Aromatics	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	25 U
C10-C12 aliphatic (adjusted)	50 U	50 U	50 U	50 U	50 U	15 U	50 U	50 U	15 U
C10-C12 Aromatics	50 U	50 U	50 U	50 U	50 U	7.3	50 U	50 U	3.0
C12-C13 Aromatics	50 U	50 U	50 U	50 U	50 U	4.4	50 U	50 U	2.2

Notes:
1. Data qualifiers are as follows:
   J = The result is an approximation.
   U = Analyte not detected at or above the reporting limit indicated.
   UJ = Analyte was not detected above the reporting limit. Indicated value is estimated reporting limit.
   UR = Analyte was not detected at or above the reporting limit shown, but the result was rejected due to quality control issues.
2. The two results shown represent a primary and field duplicate sample.

Abbreviations:
µg/L = micrograms per liter
EPH = Extractable petroleum hydrocarbons
EU = Eurofins Calscience, Garden Grove, California
TA = TestAmerica, Nashville, Tennessee
VPH = Volatile petroleum hydrocarbons

TABLE 4

ANALYTICAL RESULTS FOR TPH IN SPLIT GROUNDWATER SAMPLES [1]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

all results in milligrams per liter (mg/L)

Well ID	MW-A1			MW-A2																			
Date Sampled	6/19/2014	8/27/2014		6/19/2014	8/27/2014				9/30/2014				10/29/2014				11/19/2014				12/18/2014			
Analytical Lab	TA	TA	EU	TA	TA[2]		EU[2]		TA[2]		EU[2]		TA[2]		EU[2]		TA[2]		EU[2]		TA[2]		EU[2]	
TPH-G (C6-C12)	--	100 U	630	--	100 U	100 U	130	120	100 U	500 U	130	140	156	160	180	180	146	100 U	150	160	178	165	140	160
TPH-D (C10-C24) no/SG	--	--	--	--	--	--	--	--	1,050	834	1200	350	1,190 J	3,000 J	500	550	938	999	220	300	849 J	952 J	320	340
TPH-D (C10-C24) w/SG	1,460	1,240	590	881	565	602	220	220	594 J	313 J	590 J	170 J	678 J	1,140 J	360	380	345 J	393	190	240	430 J	805 J	260	280
TPH-O (C24-C40) no/SG	--	--	--	--	--	--	--	--	168	181	320	100 U	305 J	784 J	100 U	100 U	197 J	284 J	100 U	100 U	158 J	164 J	100 U	100 U
TPH-O (C24-C40) w/SG	146	124	100 U	111	95.7 UJ	94.8 U	100 U	100 U	95.7 U	94.3 U	190	100 U	94.3 U	141	100 U	100 U	93.9 UJ	100 U	100 U	100 U	95.2 UJ	218 J	100 U	100 U

Well ID	MW-A3		MW-A4										MW-A5							
Date Sampled	8/26/2014		6/19/2014	8/26/2014		9/30/2014		10/29/2014		12/5/2014		12/18/2014	6/19/2014			8/26/2014		9/30/2014		10/29/2014	
Analytical Lab	TA	EU	TA	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA[2]		EU	TA	EU	TA	EU	TA	EU
TPH-G (C6-C12)	100 U	56 J	--	100 U	100 U	500 UJ	100 U	100 U	100 U	100 U	100 U	500 UJ	100 U	--	--	--	100 U	100 U	100 U	100 U	100 U	100 U
TPH-D (C10-C24) no/SG	--	--	--	--	--	768	86 J	1,340	210	849	100 U	281	100 U	--	--	590	--	--	155 J	310	4,500	790
TPH-D (C10-C24) w/SG	906	120	851	360	100 U	413	100 U	298	120	385	100 U	242	100 U	3,360	272 R	360	2,160	300	2,940	140	2,360	380
TPH-O (C24-C40) no/SG	--	--	--	--	--	469	100 U	839	100 U	663	100 U	106	100 U	--	--	--	--	--	94.3 UR	100 U	778	100 U
TPH-O (C24-C40) w/SG	442	100 U	374	94.3 U	100 U	112	100 U	95.7 U	100 U	146	100 U	98.8	100 U	333	93.9 UR	100 U	95.2 U	100 U	230	100 U	156	100 U

Well ID	MW-A5				MW-A6														MW-A7		MW-A8	
Date Sampled	12/5/2014		12/17/2014		6/19/2014		8/26/2014		9/30/2014		10/29/2014		11/20/2014		12/17/2014		8/27/2014		8/26/2014	
Analytical Lab	TA	EU	TA	EU	TA[2]		EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU
TPH-G (C6-C12)	100 U	100 U	100 U	100 U	--	--	--	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	100 U	100 U	100 U
TPH-D (C10-C24) no/SG	3,060	440	3,560 J	460	--	--	340	--	--	243 J	130	3,770	420	3,040	120	2,770 J	250	--	--	--	--	--	--
TPH-D (C10-C24) w/SG	2,090 J	170	2,810	230	3,270	2,550	130	2,430	100 U	3,150	100 U	1,730	190	1,080	100 U	2470	110	94.3 U	100 U	93.9 U	100 U		
TPH-O (C24-C40) no/SG	669	100 U	612 J	100 U	--	--	--	--	--	94.3 UR	100 U	561	100 U	468	100 U	383 J	100 U	--	--	--	--		
TPH-O (C24-C40) w/SG	184 J	100 U	274	100 U	272	230	100 U	174	100 U	159	100 U	94.8 U	100 U	100 U	100 U	168	100 U	94.3 U	100 U	93.9 U	100 U		

Well ID	MW-11		MW-19		MW-40R									
Date Sampled	8/27/2014		8/27/2014		8/27/2014		9/30/2014		10/29/2014		11/19/2014		12/17/2014	
Analytical Lab	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU
TPH-G (C6-C12)	100 U	100 U	208	190	500 U	460	500 U	480	562	460	640	500	559	460
TPH-D (C10-C24) no/SG	--	--	--	--	--	--	2,080 J	1,000	1,290	1,200	1,290	750	2,040 J	770
TPH-D (C10-C24) w/SG	96.2 U	100 U	409	190	1,610 J	690	1,540 J	540	637	730	733 J	590	1610	550
TPH-O (C24-C40) no/SG	--	--	--	--	--	--	500 J	100 U	351	160	444	200	644 J	100
TPH-O (C24-C40) w/SG	96.2 U	100 U	94.3 U	100 U	276 J	97 J	165 J	100 U	95.2 U	100 U	115 J	94	345	100 U

Notes:
1. Data qualifiers are as follows:
J = The result is an approximation.
U = not detected at or above the laboratory reporting limit shown.
UJ = not detected at or above value shown, which is the estimated reporting limit.
R = result is rejected due to surrogate non-compliance.
UR = Analyte was not detected at or above the reporting limit shown, but the result was rejected due to quality control issues.
2. The two results shown represent a primary and field duplicate sample.

Abbreviations:
-- = not analyzed
EU = Eurofins Calscience, Garden Grove, California
TA = TestAmerica, Nashville, Tennessee
TPH = total petroleum hydrocarbons
TPG-D = total petroleum hydrocarbons diesel range
TPH-G = total petroleum hydrocarbons gasoline range
TPH-O = total petroleum hydrocarbons motor oil

TABLE 5

ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES[1]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	MW-A1			MW-A2															
Date Sampled	6/19/2014	8/27/2014		6/19/2014	8/27/2014				9/30/2014				10/29/2014				11/20/2014			
Analytical Lab	TA	TA	EU	TA	TA[2]		EU[2]		TA[2]		EU[2]		TA[2]		EU[2]		TA[2]		EU[2]	
PAHs (µg/L)																				
1-Methylnaphthalene	0.0948 U	1.06	0.51	0.0948 U	0.0943 U	0.0943 U	0.075 J	0.061 J	0.0966	0.1	0.084 J	0.095 U	0.508	0.533	1.6	2.1	0.259	0.267	0.28	0.27
2-Methylnaphthalene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Acenaphthene	0.102	0.515	0.50	0.397	0.455	0.468	0.44	0.37	0.441	0.444	0.45	0.35	0.476	0.482	0.61	0.69	0.589	0.531	0.61	0.48
Acenaphthylene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.104	0.0943 U	0.11	0.099
Anthracene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.032	0.035	0.0943 U	0.0943 U	0.029	0.027
Benz[a]anthracene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Benzo(a)pyrene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Benzo(b)fluoranthene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Benzo(g,h,i)perylene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Benzo(k)fluoranthene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Chrysene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Dibenzo(a,h)anthracene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Fluoranthene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Fluorene	0.168	0.449	0.47	0.439	0.443	0.492	0.42	0.34	0.425	0.443	0.37	0.31	0.529	0.560	1.0	1.2	0.763	0.644	0.94	0.80
Indeno(1,2,3-cd)pyrene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.096 U	0.095 U	0.0943 U	0.0943 U	0.096 U	0.096 U
Naphthalene	0.0948 U	0.0952 U	0.096 U	0.135	0.219	0.238	0.095 U	0.097 U	0.191	0.197	0.097 U	0.095 U	0.136	0.162	0.096 U	0.095 U	0.164	0.183	0.21	0.20
Phenanthrene	0.0948 U	0.0952 U	0.096 U	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.058	0.099	0.0943 U	0.0943 U	0.027	0.096 U
Pyrene	0.0948 U	0.0952 U	0.14	0.0948 U	0.0943 U	0.0943 U	0.095 U	0.097 U	0.0952 U	0.0948 U	0.097 U	0.095 U	0.0948 U	0.0943 U	0.022	0.022	0.0943 U	0.0943 U	0.096 U	0.096 U
VOCs (µg/L)																				
1,2-Dichloroethane	0.5 U	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	0.5 U	0.5 U	0.50 U	0.5 U	0.5 U	0.5 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U	0.5 U	0.5 U	0.50 U	0.50 U
Ethylbenzene	0.5 U	0.5 U	1.0 U	0.5 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U
Hexane	0.5 U	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl t-butyl ether	0.5 U	0.5 U	1.0 U	0.5 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U
Toluene	0.5 U	0.5 U	1.0 U	0.5 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	0.5 U	1.0 U	1.0 U
Total Xylenes	1.5 U	1.5 U	1.0 U	1.5 U	1.5 U	1.5 U	1.0 U	1.0 U	1.5 U	1.5 U	1.0 U	1.0 U	1.5 U	1.5 U	1.0 U	1.0 U	1.5 U	1.5 U	1.0 U	1.0 U
Ethylene dibromide	0.5 U	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 5

ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES[1]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	MW-A2 cont.				MW-A3		MW-A4											MW-A5				
Date Sampled	12/18/2014				8/26/2014		6/19/2014	8/26/2014		9/30/2014		10/29/2014		12/5/2014		12/18/2014		6/19/2014			8/26/2014	
Analytical Lab	TA[2]		EU[2]		TA	EU	TA	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA[2]		EU	TA	EU
PAHs (µg/L)																						
1-Methylnaphthalene	0.315	0.314	0.28	0.40	0.0952 U	0.095 U	0.202	0.225	0.25	0.252	0.21	0.478	0.49	0.187	0.13	0.737	0.44	0.0948 U	0.0948 U	0.096 U	0.0952 U	0.043 J
2-Methylnaphthalene	0.0939 U	0.0943 U	0.035 J	0.043 J	0.0952 U	0.095 U	0.127	0.161	0.17	0.14	0.11	0.713	0.77	0.203	0.13	1.1	0.63	0.0948 U	0.0948 U	0.096 U	0.0952 U	0.036 J
Acenaphthene	0.51	0.493	0.42	0.35	0.697	0.93	1.92	2.18	2.5	2.71	2.6 J	3.2	3.6	2.51	1.9	3.34	2.0	2.55	2.71	0.034	2.5	4.3
Acenaphthylene	0.108	0.0943 U	0.071 J	0.067 J	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.092 J	0.0962 U	0.028 J	0.0943 U	0.017 J	0.0952 U	0.018 J	0.0948 U	0.019 J	0.0948 U	0.0948 U	--	0.0952 U	0.13
Anthracene	0.0939 U	0.0943 U	0.018 J	0.020 J	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.15	0.0962 U	0.074	0.112	0.11	0.0952 U	0.057 J	0.142	0.085 J	0.0948 U	0.0948 U	--	0.0952 U	0.10
Benz[a]anthracene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.027 J	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.020 J	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.026 J
Benzo(a)pyrene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.096 U	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.095 U	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.10 U
Benzo(b)fluoranthene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.096 U	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.095 U	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.10 U
Benzo(g,h,i)perylene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.096 U	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.095 U	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.10 U
Benzo(k)fluoranthene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.096 U	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.095 U	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.10 U
Chrysene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.029 J	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.010 J	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.034 J
Dibenzo(a,h)anthracene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.096 U	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.095 U	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.10 U
Fluoranthene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.074 J	0.106	0.107	0.20	0.146	0.12	0.137	0.17	0.115	0.059 J	0.126	0.082 J	0.0948 U	0.0948 U	--	0.0952 U	0.080 J
Fluorene	0.72	0.71	0.60	0.59	0.514	0.60	0.612	0.676	0.86	0.865	0.81	1.16	1.3	0.864	0.64	1.38	0.89	0.0948 U	0.0948 U	--	0.0952 U	0.10
Indeno(1,2,3-cd)pyrene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.0962 U	0.096 U	0.0962 U	0.099 U	0.0943 U	0.096 U	0.0952 U	0.095 U	0.0948 U	0.095 U	0.0948 U	0.0948 U	--	0.0952 U	0.10 U
Naphthalene	0.119	0.144	0.18	0.17	0.0952 U	0.095 U	1.11	1.25	1.2	0.846	0.68	4.35	3.3	1.8	1.2	7.22	3.5	0.0948 U	0.0948 U	0.034	0.0952 U	0.27
Phenanthrene	0.0939 U	0.0943 U	0.096 U	0.095 U	1.42	1.6	0.534	0.647	0.93	0.771	0.64	0.961	1.0	0.718	0.51	1.18	0.70	0.0948 U	0.0948 U	--	0.103	0.27
Pyrene	0.0939 U	0.0943 U	0.096 U	0.095 U	0.0952 U	0.067 J	0.0948 U	0.0962 U	0.17	0.0962 U	0.080 J	0.0943 U	0.11	0.0952 U	0.059 J	0.0948 U	0.048 J	0.0948 U	0.0948 U	--	0.0952 U	0.085 J
VOCs (µg/L)																						
1,2-Dichloroethane	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	0.5 U	0.5 U	0.50 U	--	--
Benzene	0.5 U	0.5 U	0.50 U	0.50 U	0.5 U	0.50 U	0.5 U	0.5 U	0.50 U	0.5 UJ	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.16 J	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U
Ethylbenzene	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 UJ	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 U	1.0 U
Hexane	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	0.5 U	0.5 U	1.0 U	--	--
Methyl t-butyl ether	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 UJ	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 U	1.0 U
Toluene	0.5 U	0.5 U	1.0 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 UJ	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 U	1.0 U
Total Xylenes	1.5 U	1.5 U	1.0 U	1.0 U	1.5 U	1.0 U	0.5 U	1.5 U	1.0 U	1.5 UJ	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	0.5 U	0.5 U	1.0 U	1.5 U	1.0 U
Ethylene dibromide	--	--	--	--	--	--	1.5 U	--	--	--	--	--	--	--	--	--	--	1.5 U	1.5 U	1.0 U	--	--

TABLE 5

ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES[1]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	MW-A5 cont.								MW-A6											
Date Sampled	9/30/2014		10/29/2014		12/5/2014		12/17/2014		6/19/2014			8/26/2014		9/30/2014		10/29/2014		11/20/2014		12/17/2014	
Analytical Lab	TA	EU	TA	EU	TA	EU	TA	EU	TA[2]		EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU
PAHs (µg/L)																					
1-Methylnaphthalene	0.0943 U	0.16	0.0943 U	0.095 U	0.0943 U	0.019 J	0.0943 U	0.096 U	0.0948 U	0.0948 U	0.097 U	0.0952 U	0.095 U	0.0952 U	0.28	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
2-Methylnaphthalene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.017 J	0.0943 U	0.014 J	0.0948 U	0.0948 U	0.097 U	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Acenaphthene	2.49	3.4	2.38	1.1	2.28	1.4	2.06	1.9	0.266	0.177	0.097 U	0.23	0.41	0.619	0.63	0.323	0.25	0.314	0.27	0.287	0.10
Acenaphthylene	0.0943 U	0.096 U	0.0943 U	0.011 J	0.0943 U	0.015 J	0.0943 U	0.025 J	0.0948 U	0.0948 U	--	0.0952 U	0.020 J	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Anthracene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.032 J	0.0943 U	0.017 J	0.0948 U	0.0948 U	--	0.0952 U	0.023 J	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.023 J	0.0943 U	0.095 U
Benz[a]anthracene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Benzo(a)pyrene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Benzo(b)fluoranthene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Benzo(g,h,i)perylene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Benzo(k)fluoranthene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Chrysene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Dibenzo(a,h)anthracene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Fluoranthene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.013 J	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.066 J	0.0952 U	0.069 J	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.023 J
Fluorene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.027 J	0.0943 U	0.085 J	0.0948 U	0.0948 U	--	0.0952 U	0.087 J	0.127	0.13 J	0.0948 U	0.097 U	0.0943 U	0.045 J	0.0943 U	0.019 J
Indeno(1,2,3-cd)pyrene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.096 U	0.0943 U	0.096 U	0.0948 U	0.0948 U	--	0.0952 U	0.095 U	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Naphthalene	0.0943 U	0.096 U	0.0943 U	0.095 U	0.0943 U	0.013 J	0.0943 U	0.043 J	0.0948 U	0.0948 U	0.097 U	0.0952 U	0.11	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.022 J
Phenanthrene	0.0943 U	0.096 U	0.0943 U	0.016 J	0.0943 U	0.022 J	0.0943 U	0.024 J	0.0948 U	0.0948 U	--	0.0952 U	0.023 J	0.0952 U	0.095 U	0.0948 U	0.097 U	0.0943 U	0.095 U	0.0943 U	0.095 U
Pyrene	0.0943 U	0.025 J	0.0943 U	0.013 J	0.0943 U	0.013 J	0.0943 U	0.056 J	0.0948 U	0.0948 U	--	0.0952 U	0.056 J	0.0952 U	0.059 J	0.0948 U	0.045 J	0.0943 U	0.039 J	0.0943 U	0.022 J
VOCs (µg/L)																					
1,2-Dichloroethane	--	--	--	--	--	--	--	--	0.5 U	0.5 U	0.50 U	--	--	--	--	--	--	--	--	--	--
Benzene	0.5 U	0.17 J	0.5 U	0.19 J	0.5 U	0.18 J	0.5 U	0.22 J	0.5 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U
Ethylbenzene	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U
Hexane	--	--	--	--	--	--	--	--	0.5 U	0.5 U	1.0 U	--	--	--	--	--	--	--	--	--	--
Methyl t-butyl ether	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U
Toluene	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U
Total Xylenes	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	0.5 U	0.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U
Ethylene dibromide	--	--	--	--	--	--	--	--	1.5 U	1.5 U	1.0 U	--	--	--	--	--	--	--	--	--	--

TABLE 5

ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES[1]
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	MW-A7		MW-A8		MW-11		MW-19		MW-40R									
Date Sampled	8/27/2014		8/26/2014		8/27/2014		8/27/2014		8/27/2014		9/30/2014		10/29/2014		11/19/2014		12/17/2014	
Analytical Lab	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU
PAHs (µg/L)																		
1-Methylnaphthalene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.122	0.11	12.3	11	11.3	8.7	15.8	3.7	18.2	3.7	13.6	8.9
2-Methylnaphthalene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	1.47	1.3	0.899	0.62	0.826	0.18	1.15	0.43	0.756	0.48
Acenaphthene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.164	0.12	0.877	0.72	0.87	0.55	0.903	0.48	1.01	0.45	0.838	0.61
Acenaphthylene	0.0952 U	0.10 U	0.0962 U	0.019 J	0.0952 U	0.097 U	0.0952 U	0.099 U	0.115	0.096 U	0.190 U	0.095 U	0.106	0.099 U	0.121	0.064 J	0.0947	0.079 J
Anthracene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.110	0.096 U	0.190 U	0.095 U	0.0943 U	0.040 J	0.0943 U	0.040 J	0.0939 U	0.055 J
Benz[a]anthracene	0.0952 UJ	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Benzo(a)pyrene	0.0952 UJ	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Benzo(b)fluoranthene	0.0952 UJ	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Benzo(g,h,i)perylene	0.0952 UR	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Benzo(k)fluoranthene	0.0952 UJ	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Chrysene	0.0952 UJ	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.045 J	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.013 J	0.0939 U	0.019 J
Dibenzo(a,h)anthracene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Fluoranthene	0.0952 UR	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.076 J	0.190 U	0.039 J	0.0943 U	0.039 J	0.0943 U	0.030 J	0.0939 U	0.041 J
Fluorene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.050 J	0.815	0.74	0.799	0.52	0.855	0.43	0.88	0.47	0.77	0.62
Indeno(1,2,3-cd)pyrene	0.0952 UR	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.0962 U	0.096 U	0.190 U	0.095 U	0.0943 U	0.099 U	0.0943 U	0.096 U	0.0939 U	0.096 U
Naphthalene	0.0952 U	0.10 U	0.0962 U	0.081 J	0.0952 U	0.012 J	0.306	0.099 U	0.817	0.096 U	0.370	0.095 U	0.272	0.099 U	0.41	0.31	0.327	0.43
Phenanthrene	0.0952 U	0.10 U	0.0962 U	0.020 J	0.0952 U	0.097 U	0.0952 U	0.099 U	0.604	0.42	0.524	0.29	0.457	0.10	0.595	0.25	0.458	0.28
Pyrene	0.0952 U	0.10 U	0.0962 U	0.095 U	0.0952 U	0.097 U	0.0952 U	0.099 U	0.151	0.10	0.190 U	0.071 J	0.0943 U	0.064 J	0.116	0.047 J	0.0939 U	0.059 J
VOCs (µg/L)																		
1,2-Dichloroethane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	0.50 U	0.5 U	1.7	1.67	2.1	0.5 U	0.96	0.592	0.61	0.576	0.58
Ethylbenzene	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.30 J	0.5 U	0.33	0.5 U	0.17 J	0.5 U	0.15 J	0.5 U	1.0 U
Hexane	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Methyl t-butyl ether	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U
Toluene	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	1.0 U	0.5 U	0.50 J	0.5 U	0.44	0.5 U	0.39	0.5 U	0.30 J	0.5 U	1.0 U
Total Xylenes	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	1.0 U	1.5 U	2.6 J	2.78	2.4	1.5 U	2.1	1.96	1.5 J	1.77	1.5 J
Ethylene dibromide	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:
1. Data qualifiers are as follows:
   J = The result is an approximation.
   U = not detected at or above the laboratory reporting limit shown.
   UJ = not detected at or above value shown, which is the estimated reporting limit.
2. The two results shown represent a primary and field duplicate sample.

Abbreviations:
-- = not analyzed
µg/L = micrograms per liter
EU = Eurofins Calscience, Garden Grove, California
PAHs = polycyclic aromatic hydrocarbons
TA = TestAmerica, Nashville, Tennessee
VOCs = volatile organic compounds

TABLE 6

RELATIVE PERCENT DIFFERENCE IN RESULTS BETWEEN LABORATORIES[1]

ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	Date Sampled	Analyte	Results TA	Results EU	Results RPD
Total Petroleum Hydrocarbons					
MW-A2	8/27/2014	TPH-G	156	180	14
MW-A2 FD			160	180	12
MW-A2	11/19/2014		146	150	3
MW-A2	12/18/2014		178	140	24
MW-A2 FD			165	160	3
MW-40R	10/29/2014		562	460	20
	11/19/2014		640	500	25
	12/17/2014		559	460	19
MW-A1	8/27/2014	TPH-D	1,240	590	71
MW-A2	8/27/2014		565	220	88
	9/30/2014		594	590	1
	10/29/2014		678	360	61
	11/19/2014		345	190	58
	12/18/2014		430	260	49
MW-A2 FD	8/27/2014		602	220	93
	9/30/2014		313	170	59
	10/29/2014		1,140	380	100
	11/19/2014		393	240	48
	12/18/2014		805	280	97
MW-A3	8/26/2014		906	120	153
MW-A4	10/29/2014		298	120	85
MW-A5	8/26/2014		2,160	300	151
	9/30/2014		2,940	140	182
	10/29/2014		2,360	380	145
	12/5/2014		2,090	170	170
	12/17/2014		2,810	230	170
MW-A6	10/29/2014		1,730	190	160
	12/17/2014		2,470	110	183
MW-19	8/27/2014		409	190	73
MW-40R	8/27/2014		1,610	690	80
	9/30/2014		1,540	540	96
	10/29/2014		637	730	14
	11/19/2014		733	590	22
	12/17/2014		1,610	550	98
MW-40R	8/27/2014	TPH-O	276	97	96
	11/19/2014		115	94	20
Volatile Organic Compounds					
MW-40R	9/30/2014	Benzene	1.67	2.1	23
	11/19/2014		0.592	0.61	3
	12/17/2014		0.576	0.58	1
	9/30/2014	Total Xylenes	2.78	2.4	15
	11/19/2014		1.96	1.5	27
	12/17/2014		1.77	1.5	16
Polycyclic Aromatic Hydrocarbons					
MW-A1	8/27/2014	Acenaphthene	0.515	0.50	3
		1-Methylnaphthalene	1.06	0.51	70
MW-A2	8/27/2014	Acenaphthene	0.455	0.44	3
	9/30/2014	Acenaphthene	0.441	0.45	2
		Fluorene	0.425	0.37	14
	10/29/2014	Acenaphthene	0.476	0.61	25
		Fluorene	0.529	1.00	62
	11/20/2014	Acenaphthene	0.589	0.6	4
		Fluorene	0.763	0.9	21
	12/18/2014	Acenaphthene	0.51	0.42	19
		Fluorene	0.72	0.60	18
MW-A2 FD	8/27/2014	Acenaphthene	0.468	0.37	23
		Fluorene	0.443	0.42	5
	10/29/2014	Fluorene	0.560	1.20	73
	11/20/2014	Acenaphthene	0.531	0.5	10
		Fluorene	0.644	0.8	22
	12/18/2014	Acenaphthene	0.493	0.35	34
		Fluorene	0.71	0.59	18
MW-A3	8/26/2014	Acenaphthene	0.697	0.93	29
		Fluorene	0.514	0.60	15
		Phenanthrene	1.42	1.6	12

TABLE 6

RELATIVE PERCENT DIFFERENCE IN RESULTS BETWEEN LABORATORIES[1]

ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Well ID	Date Sampled	Analyte	Results		
			TA	EU	RPD
MW-A4	8/26/2014	Acenaphthene	2.18	2.5	14
		Fluorene	0.676	0.86	24
		Naphthalene	1.25	1.2	4
		Phenanthrene	0.647	0.93	36
	9/30/2014	Acenaphthene	2.71	2.6	4
		Fluorene	0.865	0.81	7
		Naphthalene	0.846	0.68	22
		Phenanthrene	0.771	0.64	19
	10/29/2014	Acenaphthene	3.24	3.60	11
		Fluorene	1.16	1.30	11
		1-Methylnaphthalene	0.478	0.49	2
		2-Methylnaphthalene	0.713	0.77	8
		Naphthalene	4.35	3.30	27
		Phenanthrene	0.961	1.00	4
	12/5/2014	Acenaphthene	2.51	1.9	28
		Fluorene	0.864	0.64	30
		Naphthalene	1.8	1.2	40
		Phenanthrene	0.718	0.51	34
	12/18/2014	1-Methylnaphthalene	0.737	0.44	50
		2-Methylnaphthalene	1.1	0.63	54
		Acenaphthene	3.34	2	50
		Fluorene	1.38	0.89	43
		Naphthalene	7.22	3.5	69
		Phenanthrene	1.18	0.7	51
MW-A5	8/26/2014	Acenaphthene	2.5	4.3	53
	9/30/2014	Phenanthrene	2.49	3.4	31
	10/29/2014	Phenanthrene	2.38	1.1	74
	12/5/2014	Acenaphthene	2.28	1.4	48
	12/17/2014	Acenaphthene	2.06	1.9	8
MW-A6	9/30/2014	Acenaphthene	0.619	0.63	2
MW-40R	8/27/2014	Acenaphthene	0.877	0.72	20
		Fluorene	0.815	0.74	10
		1-Methylnaphthalene	12.3	11	11
		2-Methylnaphthalene	1.47	1.3	12
	9/30/2014	Acenaphthene	0.87	0.55	45
		Fluorene	0.799	0.52	42
		1-Methylnaphthalene	11.3	8.7	26
		2-Methylnaphthalene	0.899	0.62	37
	10/29/2014	1-Methylnaphthalene	15.8	3.7	124
	11/19/2014	1-Methylnaphthalene	18.2	3.7	132
		2-Methylnaphthalene	1.15	0.43	91
		Acenaphthene	1.01	0.45	77
		Fluorene	0.88	0.47	61
		Phenanthrene	0.595	0.25	82
	12/17/2014	1-Methylnaphthalene	13.6	8.9	42
		2-Methylnaphthalene	0.756	0.48	45
		Acenaphthene	0.838	0.61	31
		Fluorene	0.77	0.62	22

Notes
1. Results reported in micrograms per liter.

Abbreviations
EU = Eurofins Calscience, Garden Grove, California
FD = field duplicate
RPD = relative percent difference
TA = TestAmerica, Nashville, Tennessee
TPH-D = total petroeum hydrocarbons diesel
TPH-G = total petroleum hydrocarbons gasoline
TPH-O = total petroleum hydrocarbons oil

TABLE 7

SUMMARY STATISTICS FOR RELATIVE PERCENT DIFFERENCE IN RESULTS BETWEEN LABORATORIES

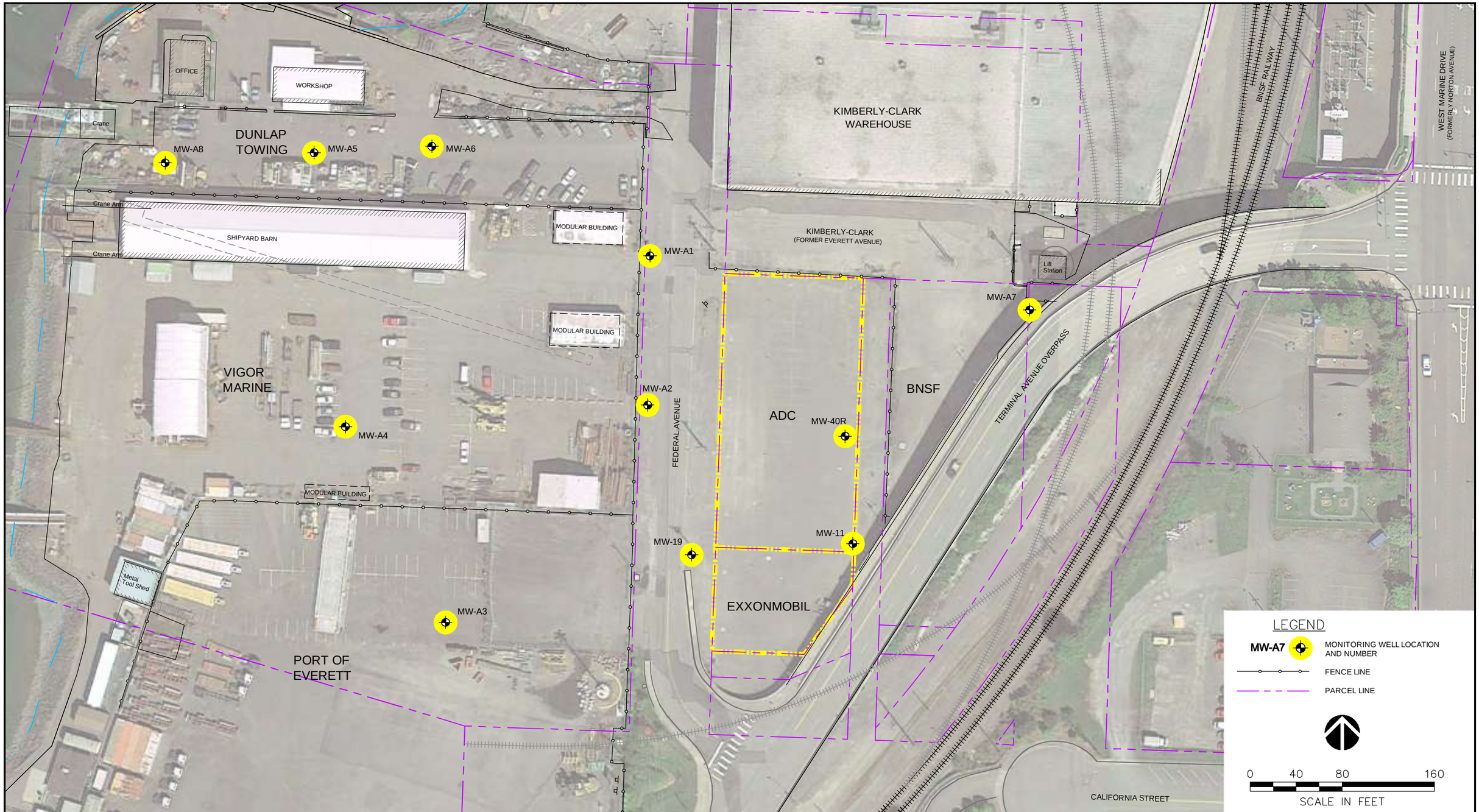
ExxonMobil/ADC Property, Ecology Site ID 2728
Everett, Washington

Analyte	Number of Measurements	Relative Percent Difference		
		Minimum	Maximum	Average
TPH-G	8	3	25	15
TPH-D	26	1	183	96
TPH-O	2	20	96	58
VOCs	6	1	27	14
PAHs	69	2	132	33

Abbreviations:

PAHs = polycyclic aromatic hydrocarbons
TPH-D = total petroleum hydrocarbons in the diesel range
TPH-G = total petroleum hydrocarbons in the gasoline range
TPH-O = total petroleum hydrocarbons in the oil range
VOCs = volatile organic compounds

FIGURES



CLIENT LOGO

CLIENT:
EXXONMOBIL
AMERICAN DISTRIBUTING CO.

AMEC
Environment & Infrastructure, Inc.
600 University Street, Suite 600
Seattle, WA, U.S.A. 98101

DWN BY:	APS
CHK'D BY:	LV
DATUM:	NAD 83 N FT
PROJECTION:	WASP
SCALE:	AS SHOWN

PROJECT
EXXONMOBIL/ADC PROPERTY
ECOLOGY SITE ID 2728

TITLE
MONITORING WELL NETWORK

DATE:	2015
PROJECT NO:	6103150009
REV. NO.:	
FIGURE No.	1

S:\6103-0009\002_GW Feb2014 Report\CAD\EXM_GWAlt-MNA_121714.dwg — MWlocations-letter — Jan. 13, 2015 12:41pm — adam.stenberg

ATTACHMENT A

Friedman & Bruya Assessment

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 18, 2014

Leah Vigoren, Project Manager
AMEC Environment & Infrastructure, Inc.
One Union Square
600 University Street, Suite 600
Seattle, WA 98101

Dear Ms. Vigoren:

As requested, we have reviewed the documents provided by AMEC Environment & Infrastructure, Inc. regarding the 2717 and 2713 Federal Avenue, Everett, WA project. These documents included analytical data generated from the testing of water samples for total petroleum hydrocarbons (TPH) as diesel and motor oil, extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) by TestAmerica (TA) Nashville and Eurofins in June, August, and September 2014. In addition, we have reviewed the standard operating procedures (SOPs) for TPH, EPH, VPH, silica gel, and aqueous sample extractions provided by the laboratories.

It is our understanding that TA Nashville has been used exclusively for the analysis of groundwater samples from the 2717 and 2713 Federal Avenue, Everett, WA site for several years. During this time period, TA Nashville reported TPH results for two wells in the range of 2,500-3,000 ug/L. In May 2014, TA Nashville analyzed a sample from one of the wells for EPH/VPH and reported that EPH was non-detect. TA Nashville could provide no explanation for the difference between the high level of TPH reported and the non-detect EPH result. To elucidate this issue, a monthly sampling program was initiated in which split samples were submitted to TA Nashville and to the other contract laboratory available to analyze site samples (Eurofins). In June 2014, both laboratories were requested to analyze split samples for TPH and EPH/VPH. In August, both laboratories were requested to analyze samples for TPH with silica gel cleanup, and in September, TPH with and without silica gel cleanup. Review of the data generated shows that the TPH results reported by the two laboratories differ substantially, with Eurofins' results significantly lower than TA's.

The purpose of this evaluation is to understand the reason for the differences between the results reported by the two laboratories and to evaluate which laboratory provided more representative results of the actual site conditions. Review of the documents provided included, but was not limited to, evaluation of raw analytical data, laboratory bench sheets, chromatograms, quality assurance data, laboratory calculations, and laboratory extraction and analytical procedures. Information regarding the sample matrices, such as the sample pH and presence or absence of sediment or sheen in the samples, was also evaluated. Our findings are provided below.

- **Comparison of TPH Results:** Review of the documents provided shows that discrepancies exist between the TPH results generated by TA Nashville and Eurofins. For example, a summary of the results of the TPH as diesel (TPH-D) analysis without silica gel for the samples MW-A5 and MW-A6 is provided as Table 1. A summary of the results of the TPH-D analysis with silica gel for the samples MW-A5 and MW-A6 is provided as Table 2.

Table 1. TPH-D Without Silica Gel for MW-A5 and MW-A6 (Results reported in ppb)

Laboratory	TA Nashville			Eurofins		
Sampling Event Date	June 2014	Aug 2014	Sept 2014	June 2014	Aug 2014	Sept 2014
MW-A5	no data	no data	155 [a]	590	no data	310
MW-A6	no data	no data	243 [a]	340	no data	130

a - The surrogate recovery was outside of control limits (4-6%) indicating poor extraction efficiency.

Table 2. TPH-D With Silica Gel for MW-A5 and MW-A6 (Results reported in ppb)

Laboratory	TA Nashville			Eurofins		
Sampling Event Date	June 2014	Aug 2014	Sept 2014	June 2014	Aug 2014	Sept 2014
MW-A5 w/ sg	3360	2160	2940	360	300	140
MW-A6 w/ sg	3270	2430	3150	130	<100	<100

Review of Table 1 shows that no data were available and/or the data were unreliable from TA Nashville regarding the level of TPH-D before silica gel in the samples MW-A5 and MW-A6. For the only sampling event for which data are available (Sept 2014), the levels of TPH-D reported are similar between the 2 laboratories. However, the low recovery of the surrogate for the results from TA Nashville indicate that much higher results may be present. Adjusting the TA Nashville results for the low surrogate recovery by multiplying the reported values by approximately 20, yield results that are considerably different (greater than 10 fold) than those reported by Eurofins.

Review of Table 2 shows that considerable differences (approximately 10 fold) exist between TA Nashville and Eurofins. In addition, the TA Nashville results in Table 2 can be used to predict the June and August 2014 TA Nashville results. The action of silica gel is to remove polar material from sample extracts. This means that the TPH-D results will always be higher than the TPH-D silica gel results. Since the use of silica gel should remove non-hydrocarbon material from the samples, the TA Nashville TPH data for Table 1 should all exceed 2,000 ppb based on the results shown in Table 2.

Comparison of the data generated shows that the TPH-D results reported by Eurofins before silica gel are much lower than those those expected from TA Nashville. The discrepancy in these results may be due to sample inhomogeneity and/or anomalies in Eurofins' extraction procedure that were not readily identified.[1]

Review of Table 2 shows that TA Nashville's TPH-D after silica gel results were much higher than Eurofins' results. TA Nashville reported greater than 2,000 ppb TPH-D after silica gel, while Eurofins reported less than 400 ppb in the samples MW-A5 and MW-6. These differences may be due to the practice followed by each laboratory when treating each sample with silica gel.

Silica gel cleanup is used to remove interfering non-hydrocarbon or polar material from hydrocarbon material in sample extracts prior to analysis. This cleanup is typically performed using one of two methods: the "Shake" method or the "Column" method. The "Shake" method involves adding a small amount (typically less than 1 gram) of silica gel to the sample extract and shaking the vial to remove polar compounds. The "Column" method involves passing the sample extract through a glass column filled with approximately 3-10 grams of silica gel to remove polar compounds. The "Shake" method of silica gel cleanup has been shown to be less effective in separating polar compounds from hydrocarbons in TPH analysis compared to the "Column" method.[2] In addition,

[1] Solvent, solvent extraction time, temperature of the sample, and the addition of solvent to the sample container can all have an impact on sample results and are virtually impossible to assess after analyses are conducted.
[2] Zemo, D.A., Synowiec, K.A., Magaw, R.I. and Mohler, R.E. (2013), Comparison of Shake and Column Silica Gel Cleanup Methods for Groundwater Extracts to Be Analyzed for TPHd/DRO. Groundwater Monitoring & Remediation, 33: 108-112. doi: 10.1111/gwmr.12032. http://www.onlinelibrary.wiley.com/doi/10.1111/gwmr.12032/pdf

EPA method 3630 references the "Column" method, not the "Shake" method, for silica gel cleanup of sample extracts. [3]

Comparison of the SOPs provided shows that TA Nashville and Eurofins perform their TPH-D silica gel cleanup procedures using the "Shake" method. The differences seen in the reported TPH-D results after silica gel between TA and Eurofins is likely due at least in part to the laboratories' use of the "Shake" method of silica gel cleanup, which may or may not be adequate to effect the removal of the majority of polar compounds present in the samples.

- **Comparison of TPH and EPH Results:** Review of the documents shows that discrepancies exist between the TPH silica gel results and EPH results generated by TA Nashville and Eurofins. A summary of these results for the samples MW-A5 and MW-A6 is provided as Table 3. For comparison, the aliphatic and aromatic fractions of the EPH analysis have been totaled to show a total EPH value.

Table 3. TPH-D w/SG and Total EPH for MW-A5 and MW-A6 (Results reported in ppb)

Analysis	TPH-D with Silica Gel		Total EPH	
Laboratory	**TA Nashville**	**Eurofins**	**TA Nashville**	**Eurofins**
Sampling Event Date	**June 2014**	**June 2014**	**June 2014**	**June 2014**
MW-A5	3360	360	<340	18.8
MW-A6	3270	130	<340	<50

Review of Table 3 shows that TA Nashville identified greater than 3,000 ppb TPH-D after silica gel in the samples MW-A5 and MW-A6, while Eurofins identified less than 400 ppb. The results of the EPH analysis for these samples were reported as non-detect or nearly non-detect by both TA Nashville and Eurofins.

Both the TPH-D with silica gel analysis and the EPH analysis use silica gel to remove non-hydrocarbon or polar material from hydrocarbon material in sample extracts. If the silica gel cleanup proved effective in both cases, the TPH-D and EPH results should be similar. However, review of the results generated shows that the TPH-D with silica gel results were much higher than the EPH results for both laboratories. The level of material remaining after the TPH-D silica gel cleanup indicates that the "Shake" method of cleanup used by TA Nashville and

[3] US Environmental Protection Agency. *Method 3630C: Silica Gel Cleanup, Rev. 3.* December 1996. USEPA. http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/3630c.pdf.

Eurofins was inadequate at removing polar compounds present in the samples. In addition, the reduction in the level of material after EPH analysis compared to the TPH analysis is an indication that the vast majority of the material present in the samples MW-A5 and MW-A6 is polar in nature.

Furthermore, review of each laboratory's SOP shows that the EPH analysis was performed by passing the sample extracts through a large glass column filled with approximately 6 or 10 grams of silica gel. This procedure is similar to the TPH-D silica gel "Column" method described above. The reduction in the level of material after EPH analysis compared to the TPH analysis is an indication that the "Column" method of silica gel cleanup is more effective at removing polar compounds in sample extracts than the laboratories' "Shake" method.

Finally, it should be noted that comparison of the data generated shows that Eurofins' TPH-D results after silica gel (130-360 ppb) are more similar to the non-detect or nearly non-detect EPH results than TA Nashville's results (greater than 3,000 ppb).

In conclusion, the discrepancies seen between TA Nashville and Eurofins' TPH results before silica gel may be due to sample inhomogeneity and/or anomalies in Eurofins' extraction procedure that were not readily identified. Review of the data provided shows that many of the samples at the site contain a significant level of polar compounds that interfere with the analysis of TPH. Silica gel treatment of the sample extracts is appropriate to remove the polar compounds present in these samples prior to TPH analysis. The discrepancies seen between TA Nashville and Eurofins' TPH results after silica gel and their EPH results are likely due at least in part to the laboratories' use of the "Shake" method of silica gel cleanup. Based on the data generated, the "Column" method of silica gel cleanup provides more effective removal of the interfering polar compounds than the laboratories' "Shake" methods. Finally, it should be noted that comparison of the data generated shows that Eurofins' TPH-D results after silica gel are more similar to the non-detect or nearly non-detect EPH results than TA Nashville's results.

Further testing of water samples at the site using the "Column" method of silica gel cleanup is recommended, if warranted. In addition, TPH analysis of the samples both with and without silica gel, as well as TPH analysis of a matrix spike with and without silica gel, may be useful in further characterizing the material present at this site. Finally, use of a secondary polar reverse surrogate in the TPH extraction may

also be useful in monitoring the efficiency of the laboratory's silica gel cleanup procedures.

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.

Michele Costales Poquiz
Chemist

Enclosures
c: leah.vigoren@amec.com, larry.mcgaughey@amec.com
GMX1118R.DOC

ATTACHMENT B

Laboratory Data Reports (to be provided separately) and Data Validation Memoranda

Memo

To: Leah Vigoren
From: Crystal Neirby
Tel: (206) 342-1760
Fax: (206) 342-1761
Date: January 21, 2015

Project: 6103140009
cc: Project File

Subject: ExxonMobil/ADC Site – June 2014 Split Groundwater Sampling
Data Quality Review – TestAmerica SDG 490-55979-1

This memorandum presents a summary data quality review for analyses of five primary ground water samples, two groundwater field blanks, and one trip blank collected on June 19, 2014. The samples were submitted to TestAmerica Laboratories, Inc., located in Nashville, Tennessee, a laboratory certified by the Washington State Department of Ecology (Ecology). The samples were analyzed for the following analytes:

- Volatile organic compounds (VOCs) by EPA Method 8260B (only benzene, toluene, ethylbenzene, total xylenes, methyl tert-butyl ether, 1,2-dibromoethane, 1.2-dichloroethane, and hexane were reported);
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D with select ion monitoring (SIM);
- Total petroleum hydrocarbons (TPH) as diesel (TPH-D) (reported as C10-C24) and motor oil (reported as C24-C40) by NWTPH-Dx with silica gel cleanup;
- Extractable petroleum hydrocarbons (EPH) by Ecology Method NWTPH-EPH; and
- Volatile petroleum hydrocarbons (VPH) by Ecology Method NWTPH-VPH.

The sample IDs, sample collection dates, laboratory sample IDs, and analyses conducted on the samples are listed in the table below.

Sample ID	Well ID	Sample Collection Date	Laboratory Sample ID	Requested Analyses
XOM061914-01	MW-A4	6/19/2014	490-55979-1	all
XOM061914-02	MW-A5	6/19/2014	490-55979-2	all
XOM061914-06	MW-A5 field duplicate	6/19/2014	490-55979-3	all
XOM061914-03	MW-A6	6/19/2014	490-55979-4	all
XOM061914-07	MW-A6 field duplicate	6/19/2014	490-55979-5	all
XOM061914-04	MW-A1	6/19/2014	490-55979-6	all
XOM061914-05	MW-A2	6/19/2014	490-55979-7	all
Trip Blank-01	Trip Blank	6/19/2014	490-55979-8	VOCs

Upon receipt by the laboratory, information from the sample jars was compared to the chain-of-custody forms. The temperatures of the coolers were recorded as part of the check-in procedure, and were less than the maximum acceptable temperature of 6 degrees Celsius (°C).

The analytical results for these samples were reviewed in accordance with the requirements specified in EPA National Functional Guidelines (EPA, 2008), the analytical methods referenced by the laboratory, Amec Foster Wheeler data review procedures, and the laboratory quality control limits. The EPA guidelines referenced above were written specifically for the Contract Laboratory Program, and have been modified for the purposes of this data quality review where they differ from EPA SW-846 method requirements.

All of the certified laboratory reports were reviewed to assess the following criteria: chain-of-custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS) and LCS duplicates (LCSD) and matrix spike (MS) samples; and analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD). This level of data review is equivalent to an EPA Level 2A data review.

Samples were analyzed for the methods identified in the introduction to this report and were evaluated for the following criteria.

1. **Holding Times** – Acceptable.

   The pH of each sample was measured prior to analysis, and the pH of sample MW-A4 (XOM061914-01) was equal to 7 at the time of analysis, above the method required pH of 2. The holding time for samples not preserved at a pH of 2 is 7 days, and the sample was analyzed within the holding time.

2. **Blanks** – Acceptable.

3. **LCS/LCSD** – Acceptable except as noted:

   EPH by NWTPH-EPH: The recoveries for C8-C10 aliphatics and C10-C12 aliphatics were 5 and 26 percent, below the control limits of 50 to 150 and 70 to 130 percent, in the aliphatic range LCS analyzed on June 27, 2014. These ranges were not detected in the associated samples; therefore, the results are rejected due to the possible low analytical bias.

   The recovery for C10-C12 aromatics was 61 percent, below the control limits of 70 to 130 percent, in the aromatic range LCS analyzed in June 27, 2014. This range was not detected in the associated samples; therefore, the results are qualified as estimated and flagged with a “J” due to the possible low analytical bias.

   The recoveries for C8-C10 aliphatics and C10-C12 aliphatics were 26 and 49 percent, below the control limits of 50 to 150 and 70 to 130 percent, in the aliphatic range LCS analyzed on July 1, 2014. The results for these ranges were rejected in the samples that were below detection, and were qualified as estimated and flagged with a “J” in the samples with detections.

4. **MS/MSD** – Acceptable except as noted:

   EPH by NWTPH-EPH: The recoveries for C8-C10 aliphatics and C10-C12 aliphatics were below the control limits in the MS/MSD performed with sample MW-A4 (XOM061914-01).

Results for these carbon ranges were previously rejected in the associated samples due to low LCS/LCSD recoveries and are not further qualified.

5. **Laboratory Duplicates** – Acceptable except as noted:

   TPH as diesel by NWTPH-Dx: The laboratory duplicate relative percent difference (RPD) for C10-C24 was 170 percent in the laboratory duplicate performed with sample XOM061914-06. The laboratory stated extraction difficulties resulted in the low values for the primary analysis. The C10-C24 and C24-C40 results for sample XOM061914-06 were rejected due to the quality control issues encountered with this analysis.

   Sample XOM061914-06 was a blind field duplicate sample for XOM061914-02, and the results of the laboratory duplicate reported on the quality control page showed good agreement with the results for sample XOM061914-02. This is further evidence of the analytical issues encountered with the primary analysis of sample XOM061914-06, which supports rejecting the C10-C24 and C24-C40 results for sample XOM061914-06.

6. **Field Duplicates** – Acceptable except as noted:

   Two field duplicates were submitted during this sampling event. Primary and duplicate results are summarized in the table below. The RPDs for the field duplicate are within 30 percent for concentrations greater than five times the reporting limit and the differences are no greater than the reporting limit for sample concentrations less than five times the reporting limit, except for the primary and duplicate results for C10-C24 and C24-C40 for samples XOM061914-02/XOM061914-06. The RPD is not calculated for results that are less than five times the reporting limit, as indicated on the table below by "NC."

   As stated above, the C10-C24 and C24-C40 results for field duplicate sample XOM061914-06 are rejected, and are not further qualified due to the field duplicate results.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
XOM061914-02/ XOM061914-06	acenaphthene C10-C24 C24-C40	2.55 3360 333	2.71 272 ND	0.0948 93.9 93.9	6 170 NC
XOM061914-03/ XOM061914-07	acenaphthene C10-C24 C24-C40	0.266 3270 272	0.177 2550 230	0.0948 93.9 93.9	NC 25 17

Notes
µg/L = micrograms per liter
NC = not calculated
RPD = relative percent difference

7. **Surrogates** – Acceptable except as noted:

   EPH by NWTPH-EPH: the surrogate 2-bromonaphthene was recovered at 50 percent, below the control limits of 60 to 140 percent, in the aromatic-range method blank associated with analysis on July 1, 2014. Sample results are not qualified due to surrogate recoveries in associated quality control samples.

The recovery for one of four surrogates, 2-bromonaphthene, was 54 percent, below the control limits of 60 to 140 percent for sample XOM061914-05. The low recovery equates to a low bias in the samples; therefore, sample results associated with this surrogate are qualified as estimated with detections flagged with a "J" and non-detections flagged with "UJ".

TPH as diesel by NWTPH-Dx: The surrogate recovery for sample XOM061914-06 (MW-A5 FD) was 7 percent, below the control limits of 50 to 150 percent. The laboratory stated in the case narrative that there was insufficient sample volume to re-extract and reanalyze the sample. The C10-C24 and C24-C40 results are rejected due to the low surrogate recovery and the results of the field and laboratory duplicates.

8. **Reporting Limits and Laboratory Flags** – Acceptable.

OVERALL ASSESSMENT OF DATA

The TA work order 490-55979-7 is 95 percent complete. Evaluation of the data usability is based on EPA's guidance documents. Except for the rejected data, the remaining data are acceptable and meet the project's data quality objectives.

Sample Identifications and Qualified Results

Sample ID	Method	Qualified Analyte	Qualified Result	Qualifier Reason
XOM061914-01	EPH	C8-C10 Aliphatics C10-C12 Aliphatics C10-12 Aromatics	19.2 UR 9.62 UR 9.62 UJ	LCS recoveries
XOM061914-02	EPH	C8-C10 Aliphatics C10-C12 Aliphatics C10-12 Aromatics	18.9 UR 9.43 UR 9.43 UJ	LCS recoveries
XOM061914-06	EPH " " NWTPH-Dx "	C8-C10 Aliphatics C10-C12 Aliphatics C10-12 Aromatics C10-C24 C24-C40	19.0 UR 9.52 UR 9.81 J 272 R 93.9 UR	LCS recoveries " " lab/field duplicate RPDs and surrogate recovery
XOM061914-03	EPH	C8-C10 Aliphatics C10-C12 Aliphatics	18.9 UR 9.43 UR	LCS recoveries
XOM061914-07	EPH	C8-C10 Aliphatics C10-C12 Aliphatics	18.7 UR 9.35 UR	LCS recoveries
XOM061914-04	EPH	C8-C10 Aliphatics C10-C12 Aliphatics	19.2 UR 9.62 UR	LCS recoveries
XOM061914-05	EPH	C8-C10 Aliphatics C10-C12 Aliphatics C8-C10 Aromatics C10-C12 Aromatics C12-C16 Aromatics C16-C21 Aromatics C21-C34 Aromatics	18.9 UR 17.4 J 47.2 UJ 15.1 J 37.7 UJ 47.2 UJ 47.2 UJ	LCS recoveries " surrogate recovery " " " "
Trip Blank-01		None		

REFERENCES

EPA, 2008, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-08-001, June.

Memo

To:	Leah Vigoren	Project:	6103140009
From:	Crystal Neirby Danille Jorgensen	cc:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	April 8, 2014		

Subject: ExxonMobil/ADC Site – February 2014 Semiannual Ground Water Sampling
EPA Level 3 Data Quality Review – SDG 490-47364-1

This memorandum presents a summary data quality review for analyses of one primary groundwater sample, one groundwater field duplicate, and six trip blanks collected on February 25, 2014. The samples were submitted to TestAmerica, located in Nashville, Tennessee, a laboratory certified by the Washington State Department of Ecology (Ecology).

The samples were analyzed for the following constituents:

- Volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B (only benzene, toluene, ethylbenzene, total xylenes, and methyl tert-butyl ether were reported);
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D with select ion monitoring (SIM);
- Total petroleum hydrocarbons (TPH) as gasoline (reported as C6-C12) by Ecology Method NWTPH-Gx; and
- TPH as diesel (reported as C10-C24) and motor oil (reported as C24-C40) by Ecology Method NWTPH-Dx, with silica gel cleanup.

The sample IDs, sample collection date, laboratory sample ID, and analyses conducted on the samples are listed in the table below.

Sample ID	Sample Collection Date	Laboratory Sample ID	Requested Analyses
MWA7-022514	2/25/14	490-47364-1	VOCs, PAHs, TPH
DUP-022514	2/25/14	490-47364-2	VOCs, PAHs, TPH
Trip Blank	2/25/14	490-47364-3	VOCs
Trip Blank	2/25/14	490-47364-4	VOCs
Trip Blank	2/25/14	490-47364-5	VOCs
Trip Blank	2/25/14	490-47364-6	VOCs
Trip Blank	2/25/14	490-47364-7	VOCs
Trip Blank	2/25/14	490-47364-8	VOCs

The analytical results for these samples were reviewed in accordance with the requirements specified in EPA National Functional Guidelines (EPA, 2008), the analytical methods referenced by the laboratory, AMEC data review procedures, and the laboratory quality control limits. The EPA guidelines referenced above were written

specifically for the Contract Laboratory Program, and have been modified for the purposes of this data quality review where they differ from EPA SW-846 method requirements.

This certified laboratory report was reviewed to assess the following: chain-of-custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS) and matrix spike (MS) samples; analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD) or LCS and laboratory control sample duplicates (LCSD); initial and continuing calibrations; recalculation of instrument and sample results from the laboratory responses; and comparison of the recalculated results to laboratory reported results. This level of data review is equivalent to EPA Level 3 validation.

Upon receipt by the laboratory, the sample jar information was compared to the chain-of-custody forms. The temperatures of the coolers were recorded as part of the check-in procedure, and were less than the maximum acceptable temperature of 6 degrees Celsius (°C).

Samples were analyzed using the methods identified in the introduction to this report, and the results were evaluated for the following criteria.

1. **GC/MS Instrument Performance Check (VOCs and PAHs)** – Acceptable
2. **Holding Times** – Acceptable.
3. **Blanks** – Acceptable.

   Trip blanks were submitted with every cooler containing samples for VOC analysis. The sample results were not qualified.

   Method blanks were analyzed for every batch of 20 samples for each method reviewed.
4. **LCS/LCSD** – Acceptable.
5. **MS/MSD** – Acceptable except as noted:

   <u>VOCs by 8260</u>

   The recovery of methyl tert-butyl ether (64%) was less than the lower laboratory-specified control limit in the MS analysis performed on sample MWA7-022514.The results for nondetected methyl tert-butyl ether from sample MWA7-022514 was qualified as estimated and flagged with UJ due to potential matrix interference.

   <u>PAHs by 8270</u>

   The laboratory performed an MS/MSD analysis for sample MWA7-022514. The percent recoveries were within laboratory-specified control limits in the MS/MSD, with the following exceptions. The recoveries of benzo[a]anthracene (43%), benzo[a]pyrene (12%), benzo[b]fluoranthene (12%), benzo[g,h,i]perylene (9%), benzo[k]fluoranthene (13%), chrysene (52%), dibenz(a,h)anthracene (9%), and indeno[1,2,3-cd]pyrene (8%) were less than lower laboratory-specified limits in the MS sample. Additionally, the RPDs between the MS and MSD recoveries were greater than the laboratory-specified control limit for anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene , benzo[g,h,i]perylene, benzo[k]fluoranthene , chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene. Data limitations are summarized below.

- AMEC qualified the results for nondetected benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene from sample MWA7-022514 as estimated and flagged the results with UJ due to potential matrix interference and analytical imprecision.
- AMEC qualified the results for nondetected anthracene, fluoranthene, fluorene, phenanthrene, and pyrene from sample MWA7-022514 as estimated and flagged the results with UJ due to analytical imprecision.

6. **Laboratory Duplicates** – Acceptable.
7. **Field Duplicates** – Acceptable. DUP-022514 was collected as a field duplicate of sample MWA7-022514.
8. **Surrogates** – Acceptable.
9. **Internal Standards** – Acceptable.
10. **Reporting Limits and Laboratory Flags** – Acceptable.
11. **Initial Calibrations** – Acceptable
12. **Continuing Calibrations** – Acceptable
13. **Calculation Check** – Acceptable

OVERALL ASSESSMENT OF DATA

The TestAmerica sample delivery group 490-47364 is 100 percent complete. Evaluation of the data usability is based on EPA's guidance documents. Few problems were identified, and analytical performance was generally within specified limits. The data are acceptable and meet the project's data quality objectives.

A summary of qualified results is presented in the table below.

Sample Identifications and Qualified Results

Sample ID	Qualified Analyte	Qualified Result	Units	Qualifier
MWA7-022514	Methyl t-butyl ether	0.5	µg/L	UJ
MWA7-022514	benzo[a]anthracene	0.0943	µg/L	UJ
MWA7-022514	benzo[a]pyrene	0.0943	µg/L	UJ
MWA7-022514	benzo[b]fluoranthene	0.0943	µg/L	UJ
MWA7-022514	benzo[g,h,i]perylene	0.0943	µg/L	UJ
MWA7-022514	benzo[k]fluoranthene	0.0943	µg/L	UJ
MWA7-022514	chrysene	0.0943	µg/L	UJ
MWA7-022514	dibenz(a,h)anthracene	0.0943	µg/L	UJ
MWA7-022514	indeno[1,2,3-cd]pyrene	0.0943	µg/L	UJ
MWA7-022514	anthracene	0.0943	µg/L	UJ
MWA7-022514	fluoranthene	0.0943	µg/L	UJ

Sample ID	Qualified Analyte	Qualified Result	Units	Qualifier
MWA7-022514	fluorene	0.0943	µg/L	UJ
MWA7-022514	phenanthrene	0.0943	µg/L	UJ
MWA7-022514	pyrene	0.0943	µg/L	UJ

REFERENCES

EPA, 2008, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-08-001, June.

Memo

To: Leah Vigoren
From: Crystal Neirby
Tel: (206) 342-1760
Fax: (206) 342-1761

Date: January 21, 2015

Project: 6103140009
cc: Project File

Subject: ExxonMobil/ADC Site – TestAmerica Analytical Split Groundwater Sampling Data Quality Review – SDGs 490-62707-1, 490-65219-1, 490-66967-1, 490-68031-1, and 490-69152-1

This memorandum presents a summary data quality review for analyses of 22 primary groundwater samples, four groundwater field duplicate samples, and five trip blanks collected during four separate sampling events that took place between September and December 2014. The samples were submitted to TestAmerica, located in Nashville, Tennessee, a laboratory certified by the Washington State Department of Ecology (Ecology).

The samples were analyzed for the following analytes:

- Selected volatile organic compounds (VOCs) (benzene, toluene, ethylbenzene, m,p-xylenes, o-xylenes, total xylenes, and methyl tert-butyl ether) by U.S. Environmental Protection Agency (EPA) Method 8260B;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270D with select ion monitoring (SIM);
- Total petroleum hydrocarbons (TPH) as gasoline by Ecology Method NWTPH-Gx; and
- TPH as diesel and motor oil by Ecology Method NWTPH-Dx (analyses were performed with and without silica gel cleanup).

The sample IDs, well locations, laboratory sample delivery group numbers, sample collection dates, and requested analyses are listed in the table below.

Sample ID	Monitoring Well ID	Laboratory SDG	Sample Collection Date	Requested Analyses
XOM093014-01	MW-A4	490-62707-1	9/30/2014	all
XOM093014-02	MW-A6	490-62707-1	9/30/2014	all
XOM093014-03	MW-A5	490-62707-1	9/30/2014	all
XOM093014-04	MW-A2	490-62707-1	9/30/2014	all
XOM093014-05	MW-40R	490-62707-1	9/30/2014	all
XOM093014-11	Field Duplicate of MW-A2	490-62707-1	9/30/2014	all
Trip Blank-01	--	490-62707-1	9/30/2014	VOCs
XOM102914-01	MW-A4	490-65219-1	10/29/2014	all

Sample ID	Monitoring Well ID	Laboratory SDG	Sample Collection Date	Requested Analyses
XOM102914-02	MW-A5	490-65219-1	10/29/2014	all
XOM102914-03	MW-A6	490-65219-1	10/29/2014	all
XOM102914-04	MW-A2	490-65219-1	10/29/2014	all
XOM102914-05	MW-40R	490-65219-1	10/29/2014	all
XOM102914-11	Field Duplicate of MW-A2	490-65219-1	10/29/2014	all
Trip Blank	--	490-65219-1	10/29/2014	VOCs
XOM111914-01	MW-A2	490-66967-1	11/19/2014	all
XOM111914-02	MW-40R	490-66967-1	11/19/2014	all
XOM112014-03	MW-A4	490-66967-1	11/20/2014	all
XOM112014-04	MW-A5	490-66967-1	11/20/2014	all
XOM112014-05	MW-A6	490-66967-1	11/20/2014	all
XOM111914-11	Field Duplicate of MW-A2	490-66967-1	11/19/2014	all
Trip Blank	--	490-66967-1	11/20/2014	VOCs
XOM120514-01	MW-A4	490-68031-1	12/5/2014	all
XOM120514-02	MW-A5	490-68031-1	12/5/2014	all
Trip Blank	--	490-68031-1	12/5/2014	VOCs
XOM121714-01	MW-A5	490-69152-1	12/17/2014	all
XOM121714-02	MW-A6	490-69152-1	12/17/2014	all
XOM121714-03	MW-40R	490-69152-1	12/17/2014	all
XOM121714-04	MW-A4	490-69152-1	12/17/2014	all
XOM121714-05	MW-A2	490-69152-1	12/17/2014	all
XOM121714-11	Field Duplicate of MW-A2	490-69152-1	12/17/2014	all
Trip Blank	--	490-69152-1	12/17/2014	VOCs

The analytical results for these samples were reviewed in accordance with the requirements specified in EPA National Functional Guidelines (EPA, 2008), the analytical methods referenced by the laboratory, Amec Foster Wheeler data review procedures, and the laboratory quality control limits. The EPA guidelines referenced above were written specifically for the Contract Laboratory Program, and have been modified for the purposes of this data quality review where they differ from EPA SW-846 method requirements.

All of the certified laboratory reports were reviewed to assess the following criteria: chain-of-custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS) and LCS duplicates (LCSD) and matrix

spike (MS) samples; and analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD). This level of data review is equivalent to an EPA Level 2A data review.

Upon receipt by the laboratory, information from the sample jars was compared to the chain-of-custody forms. The temperatures of the coolers were recorded as part of the check-in procedure, and were less than the maximum acceptable temperature of 6 degrees Celsius (°C), except for the following:

- The cooler containing samples collected from monitoring wells MW-A4 and MW-A5 on November 20, 2014, was received by the laboratory several days after the samples had been collected at a temperature exceeding 6 °C. The purpose of the samples addressed in this data review was to compare groundwater analytical results for the same samples at two separate laboratories. Samples MW-A4 and MW-A5, collected on November 20, 2014, were resampled on December 5, 2014. So that true split samples for comparison, the results from December 5, 2014, are evaluated here, and the results for samples collected from these two wells on November 20, 2014, are rejected.

Samples were analyzed using the methods identified in the introduction to this report, and the results were evaluated for the following criteria.

1. **Holding Times** – Acceptable except as noted:

   BTEX by 8260B and TPH-G by NWTPH-Gx: Though the samples were collected in preserved bottles, when verified by the laboratory, the pH of the following samples was not at the method required pH of <2: XOM093014-1, XOM102914-02, XOM112014-03, XOM120514-01, and XOM121714-04.

   The technical holding time for samples not preserved at a pH of <2 is 7 days from collection to analysis. Samples that were analyzed past this holding time are qualified as estimated with detected results flagged with a “J” and non-detected results flagged with a “UJ.”

2. **Blanks** – Acceptable except as noted:

3. **LCS/LCSD** – Acceptable except as noted:

   TPH-D and TPH-O by NWTPH-Dx (with silica gel)
   The recovery for C10-C24 in the LCS associated with samples in work order 490-69152 and analysis batch 217902 was 36 percent, below the control limits of 51 to 132 percent. The C10-C24 and C24-C40 results in the associated sample, XOM121714-05, were qualified as estimated and flagged with a “J” due to the potential low bias.

4. **MS/MSD** – Acceptable

5. **Laboratory Duplicates** – Acceptable except as noted:

   TPH-D and TPH-O by NWTPH-Dx (with silica gel)

   The relative percent difference (RPD) for C10-C24 was 45 percent and for C24-C40 in laboratory duplicate samples was 67 percent, greater than the control limit of 41 percent. The laboratory duplicate analysis was performed with sample XOM120514-02, and sample results were also qualified due to low surrogate recoveries (see below). Sample results are not qualified further as a result of the laboratory duplicate analyses.

The RPD for C24-C40 in the laboratory duplicate analysis performed with sample XOM121714-11 was 58 percent, greater than the control limit of 41 percent,. The C24-C40 results for sample XOM121714-11 were qualified as estimated and flagged with a "J."

TPH-D and TPH-O by NWTPH-Dx (without silica gel)

The RPD for C10-C24 in the laboratory duplicate analysis performed with sample XOM121714-05 was 60 percent, greater than the control limits of 41 percent. The results for C10-C24 and C24-C40 were qualified as estimated in sample XOM121714-05 and flagged with a "J."

6. **Field Duplicates** – Acceptable.

Field duplicates were collected during each of the sampling events and are identified in the table below. The field duplicate RPD is not calculated if both the primary and duplicate results are not at least five times greater than the reporting limit, as indicated in the table below by "NC." In these cases, the difference between the primary and duplicate results should not exceed the value of the reporting limit. As shown in the table below, RPDs were acceptable where calculated. In cases when the RPDs could not be calculated, the differences between the primary and duplicate results were acceptable, except as indicated in the table below by **bold** type. The primary and field duplicate results that do not have acceptable RPDs are qualified as estimated and flagged with a "J.", except where previously qualified due to additional non-compliant quality control results

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
XOM093014-04/ XOM093014-11	C10-C24 (no SG)	1050	834	95.7	23
	C24-C40 (no SG)	168	181	95.7	NC
	C10-C24 (with SG)	594	313	95.7	**NC**
XOM102914-04/ XOM102914-11	1-methylnaphthalene	0.508	0.533	0.0948	5
	acenaphthene	0.476	0.482	0.0948	1
	fluorene	0.529	0.560	0.0948	6
	C6-C12	156	160	100	NC
	C10-C24 (with SG)	678	1140	94.3	**51**
	C24-C40 (with SG)	94.3 U	141	94.3	NC
	C10-C24 (no SG)	1190	3000	94.3	**86**
	C24-C40 (no SG)	305	784	94.3	**NC**
XOM111914-01/ XOM111914-11	acenaphthene	0.589	0.531	0.0943	10
	fluorene	0.763	0.644	0.0943	17
	C6-C12	146	100 U	100	NC
	C10-C24 (with SG)	345	393	93.9	13
	C24-C40 (with SG)	93.9 U	93.9 U	93.9	NC
	C10-C24 (no SG)	938	999	93.9	6

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
	C24-C40 (no SG)	197	284	93.9	**36**
XOM121714-05/ XOM121714-11	acenaphthene	0.510	0.493	0.0939	3
	fluorene	0.720	0.710	0.0939	1
	C6-C12	178	165	100	8
	C10-C24 (with SG)	430	952	95.2	**76**
	C24-C40 (with SG)	95.2 U	164	95.2	NC
	C10-C24 (no SG)	849	805	95.2	5
	C24-C40 (no SG)	158	218	95.2	**NC**

Notes
µg/L = micrograms per liter
RPD= relative percent difference

7. **Surrogates** – Acceptable except as noted:

TPH-G by NWTPH-Gx

Work Order 490-62707-1: Surrogate recoveries for samples XOM093014-01, XOM093014-03, XOM093014-04, and XOM093014-11 were between 151 and 155 percent, respectively, greater than the control limits of 50 to 150 percent. TPH-G was not detected in the samples; therefore, results are not affected by the potential high bias and are not qualified.

TPH-D and TPH-O by NWTPH-Dx (without silica gel)

The surrogate recoveries for samples XOM093014-02 and XOM093014-03 were 6 and 4 percent, respectively, below the control limits of 50 to 150 percent. The TPH-D results are qualified as estimated and flagged with a "J." TPH-O was not detected in the samples; therefore, the results are rejected due to the bias associated with the extremely low surrogate recoveries.

The surrogate recovery for sample XOM093014-05 was 32 percent, also below the control limits of 50 to 150 percent. The TPH-D and TPH-O results in sample XOM093014-05 were qualified as estimated due to the potential low bias.

The surrogate recovery for sample XOM102914-11 was 37 percent, below the control limits of 50 to 150 percent. The TPH-D and TPH-O results in sample XOM102914-11 were qualified as estimated due to the potential low bias.

The surrogate recoveries in samples XOM121714-01, XOM121714-02, XOM121714-03, and XOM121714-11 were between 40 and 47 percent, below the control limits of 50 to 150 percent. The TPH-D and TPH-O results in samples XOM121714-01, XOM121714-02, XOM121714-03, and XOM121714-11were qualified as estimated due to the potential low bias.

The surrogate recoveries in the laboratory duplicates performed with samples XOM121714-05 and XOM121714-03 were below the control limits of 50 to 150 percent at 37 and 40 percent, respectively. Associated sample results are not qualified based on surrogate recoveries in quality control samples; therefore, sample results are not qualified due to the low surrogate recoveries.

TPH-D and TPH-O by NWTPH-Dx (with silica gel)

The surrogate recovery in sample XOM093014-05 was 40 percent, below the control limits of 50 to 150 percent. The TPH-D and TPH-O results in sample XOM093014-05 were qualified as estimated due to the potential low bias.

The surrogate recoveries for samples XOM111914-01 and XOM111914-02 were 49 and 44 percent, respectively, below the control limits of 50 to 150 percent. The TPH-D and TPH-O results in samples XOM111914-01 and XOM111914-02 were qualified as estimated due to the potential low bias.

The surrogate recovery for sample XOM120514-02 was 48 percent, below the control limits of 50 to 150 percent. The TPH-D and TPH-O results in sample XOM120514-02 were qualified as estimated due to the potential low bias.

The surrogate recovery for the LCS associated with analysis batch 217902 in work order 490-69152-1 was 37 percent, below the control limits of 50 to 150 percent. Associated samples results are not qualified based on surrogate recoveries in quality control samples; therefore, sample results are not qualified due to the low surrogate recovery.

VOCs by EPA 8260B

The surrogate toluene-d8 was recovered at 131 percent in sample XOM121714-04, greater than the control limits of 70 to 130 percent. The affected compounds were not detected in the sample; therefore, results are not affected by the potential high bias and are not qualified.

8. **Reporting Limits and Laboratory Flags** – Acceptable.

   The laboratory reported detections between the MDL and RL and qualified these results as estimated with a “J” flag. The results are reported as qualified and are not further qualified as a result of this review.

OVERALL ASSESSMENT OF DATA

Analytical results for TestAmerica sample delivery groups 490-62707-1, 490-65219-1, 490-66967-1, 490-68031-1, and 490-69152-1 are 95 percent complete. Evaluation of data usability is based on EPA’s guidance documents. Few problems were identified, and analytical performance was generally within specified limits. Except for the rejected results, the data are acceptable and meet the project’s data quality objectives.

A summary of qualified results is presented in the table below.

Sample Identifications and Qualified Results

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM093014-01	benzene toluene ethylbenzene total xylenes MTBE C6-C12	0.50 UJ 0.50 UJ 0.50 UJ 1.5 UJ 0.50 UJ 500 UJ	analyzed past the technical holding time
XOM093014-02	C10-C24 (no SG) C24-C40 (no SG)	243 J 94.3 UR	low surrogate recovery
XOM093014-03	C10-C24 (no SG) C24-C40 (no SG)	155 J 94.3 UR	low surrogate recovery
XOM093014-04	C10-C24 (with SG)	594 J	field duplicate RPD
XOM093014-05	C10-C24 (no SG) C24-C40 (no SG) C10-C24 (with SG) C24-C40 (with SG)	2,080 J 500 J 1,540 J 165 J	low surrogate recoveries “
XOM093014-11	C10-C24 (with SG)	313 J	field duplicate RPD
Trip Blank-01	none		
XOM102914-01	none		
XOM102914-02	none		
XOM102914-03	none		
XOM102914-04	C10-C24 (no SG) C10-C24 (with SG) C24-C40 (with SG)	678 J 1,190 J 305 J	field duplicate RPDs
XOM102914-05	none		
XOM102914-11	C10-C24 (no SG) C24-C40 (no SG) C10-C24 (with SG)	3000 J 784 J 1140 J	low surrogate recovery “ field duplicate RPD
Trip Blank	none		
XOM111914-01	C10-C24 (with SG) C24-C40 (with SG) C24-C40 (no SG)	345 J 93.9 UJ 197 J	low surrogate recovery field duplicate RPD
XOM111914-02	C10-C24 (with SG) C24-C40 (with SG)	733 J 115 J	low surrogate recovery
XOM112014-03	all	all rejected	results reported from data package 490-68031-1
XOM112014-04	all	all rejected	results reported from data package 490-68031-1
XOM112014-05	none		
XOM111914-11	C24-C40 (no SG)	284 J	field duplicate RPD
Trip Blank	none		
XOM120514-01	none		

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM120514-02	C10-C24 C24-C40	2,090 J 184 J	low surrogate recovery
Trip Blank	none		
XOM121714-01	C10-C24 (no SG) C24-C40 (no SG)	3560 J 612 J	low surrogate recovery
XOM121714-02	C10-C24 (no SG) C24-C40 (no SG)	2770 J 383 J	low surrogate recovery
XOM121714-03	C10-C24 (no SG) C24-C40 (no SG)	2040 J 644 J	low surrogate recovery
XOM121714-04	C6-C12	500 UJ	analyzed past the technical holding time
XOM121714-05	C10-C24 (with SG) C24-C40 (with SG) C10-C24 (no SG) C24-C40 (no SG)	430 J 95.2 UJ 849 J 158 J	LCS recoveries “ laboratory duplicate RPD ”
XOM121714-11	C10-C24 (with SG) C24-C40 (with SG) C10-C24 (no SG) C24-C40 (no SG)	952 J 164 J 805 J 218 J	field duplicate RPD laboratory duplicate RPD surrogate recoveries “
Trip Blank	none		

REFERENCES

EPA, 2008, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-08-001, June.

Memo

To: Leah Vigoren
From: Crystal Neirby
Tel: (206) 342-1760
Fax: (206) 342-1761
Date: January 21, 2015

Project: 6103140009
cc: Project File

Subject: ExxonMobil/ADC Site – June 2014 Split Groundwater Sampling
Data Quality Review – Eurofins SDG 14-06-1614

This memorandum presents a summary data quality review for analyses of two primary groundwater samples and one trip blank collected on June 19, 2014. The samples were submitted to Eurofins CalScience, located in Garden Grove, California, a laboratory certified by the Washington State Department of Ecology (Ecology). The samples were analyzed for the following analytes:

- Volatile organic compounds (VOCs) by EPA Method 8260B (only benzene, toluene, ethylbenzene, total xylenes, methyl tert-butyl ether, 1,2-dibromoethane, 1.2-dichloroethane, and hexane were reported);
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C with select ion monitoring (SIM) (only 1-methylnaphthalene, 2-methylnaphthlane, and naphthalene were reported);
- Total petroleum hydrocarbons (TPH) as diesel (TPH-D) (reported as C10-C24) and motor oil (reported as C24-C40) by NWTPH-Dx with silica gel cleanup;
- Extractable petroleum hydrocarbons (EPH) by Ecology Method NWTPH-EPH; and
- Volatile petroleum hydrocarbons (VPH) by Ecology Method NWTPH-VPH.

The sample IDs, sample collection dates, laboratory sample IDs, and analyses conducted on the samples are listed in the table below.

Sample ID	Well ID	Sample Collection Date	Laboratory Sample ID	Requested Analyses
XOM061914-08	MW-A5	6/19/2014		all
XOM061914-09	MW-A6	6/19/2014		all
Trip Blank-02	Trip Blank	6/19/2014		VOCs

Upon receipt by the laboratory, information from the sample jars was compared to the chain-of-custody forms. The temperatures of the coolers were recorded as part of the check-in procedure, and were less than the maximum acceptable temperature of 6 degrees Celsius (°C).

The analytical results for these samples were reviewed in accordance with the requirements specified in EPA National Functional Guidelines (EPA, 2008), the analytical methods referenced by the laboratory, Amec Foster Wheeler data review procedures, and the laboratory quality control limits. The EPA guidelines referenced above were written specifically for the Contract Laboratory Program, and have

been modified for the purposes of this data quality review where they differ from EPA SW-846 method requirements.

All of the certified laboratory reports were reviewed to assess the following: chain-of-custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS) and LCS duplicates (LCSD) and matrix spike (MS) samples; and analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD). This level of data review is equivalent to an EPA Level 2A data review.

Samples were analyzed for the methods identified in the introduction to this report and were evaluated for the following criteria.

1. **Holding Times** – Acceptable.
2. **Blanks** – Acceptable.
3. **LCS/LCSD** – Acceptable except as noted:

   The LCS recovery for o-xylene was 126 percent, which is greater than the control limits of 74 to 122 percent. The high recovery equates to a possible high bias in the samples. Because o-xylene was not detected in the samples, sample results are not affected by the possible high bias and are not qualified.
4. **MS/MSD** – Acceptable.
5. **Laboratory Duplicates** – Acceptable.
6. **Field Duplicates** – Acceptable.

   Field duplicates were not submitted.
7. **Surrogates** – Acceptable.
8. **Reporting Limits and Laboratory Flags** – Acceptable.

OVERALL ASSESSMENT OF DATA

The CalScience work order 14-06-1614 is 100 percent complete. Evaluation of the data usability is based on EPA's guidance documents. Few problems were identified and analytical performance was generally within specified limits. The data are acceptable and meet the project's data quality objectives.

Sample Identifications and Qualified Results

Sample ID	Qualified Analyte
XOM061914-08	none
XOM061914-09	none
Trip Blank-02	none

REFERENCES

EPA, 2008, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-08-001, June.

Memo

To: Leah Vigoren
From: Crystal Neirby
Tel: (206) 342-1760
Fax: (206) 342-1761
Date: January 21, 2015

Project: 6103140009
cc: Project File

Subject: ExxonMobil/ADC Site – Eurofins Analytical Split Groundwater Sampling Data Quality Review – SDGs 14-08-2237, 14-10-0161, 14-10-2521, 14-11-1758, 14-12-0694, and 14-12-1855

This memorandum presents a summary data quality review for analyses of 33 primary groundwater samples, five groundwater field duplicate samples, and six trip blanks collected during five separate sampling events that took place between August and December 2014. The samples were submitted to Eurofins Calscience, located in Garden Grove, California, a laboratory certified by the Washington State Department of Ecology (Ecology).

The samples were analyzed for the following analytes:

- Selected volatile organic compounds (VOCs) (benzene, toluene, ethylbenzene, m,p-xylenes, o-xylenes, total xylenes, and methyl tert-butyl ether) by U.S. Environmental Protection Agency (EPA) Method 8260B;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270C with select ion monitoring (SIM);
- Total petroleum hydrocarbons (TPH) as gasoline by Ecology Method NWTPH-Gx; and
- TPH as diesel and motor oil by Ecology Method NWTPH-Dx both with and without silica gel cleanup.

The sample IDs, well locations, laboratory sample delivery group numbers, sample collection dates, and requested analyses are listed in the table below.

Sample ID	Monitoring Well ID	Laboratory SDG	Sample Collection Date	Requested Analyses
XOM082614-12	MW-A4	14-08-2237	8/26/2014	all
XOM082614-13	MW-A8	14-08-2237	8/26/2014	all
XOM082614-14	MW-A5	14-08-2237	8/26/2014	all
XOM082614-15	MW-A6	14-08-2237	8/26/2014	all
XOM082614-16	MW-A3	14-08-2237	8/26/2014	all
XOM082714-17	MW-A1	14-08-2237	8/27/2014	all
XOM082714-18	MW-A2	14-08-2237	8/27/2014	all
XOM082714-19	MW-19	14-08-2237	8/27/2014	all
XOM082714-20	MW-40R	14-08-2237	8/27/2014	all
XOM082714-21	MW-11	14-08-2237	8/28/2014	all
XOM082714-22	MW-A7	14-08-2237	8/27/2014	all

Sample ID	Monitoring Well ID	Laboratory SDG	Sample Collection Date	Requested Analyses
XOM082714-24	Field duplicate of MW-A2	14-08-2237	8/28/2014	all
Trip Blank-03	--	14-08-2237	8/28/2014	VOCs
XOM093014-06	MW-A4	14-10-0161	9/30/2014	all
XOM093014-07	MW-A6	14-10-0161	9/30/2014	all
XOM093014-08	MW-A5	14-10-0161	9/30/2014	all
XOM093014-09	MW-A2	14-10-0161	9/30/2014	all
XOM093014-10	MW-40R	14-10-0161	9/30/2014	all
XOM093014-12	Field Duplicate of MW-A2	14-10-0161	9/30/2014	all
Trip Blank-02	--	14-10-0161	9/30/2014	VOCs
XOM102914-06	MW-A4	14-10-2521	10/29/2014	all
XOM102914-07	MW-A5	14-10-2521	10/29/2014	all
XOM102914-08	MW-A6	14-10-2521	10/29/2014	all
XOM102914-09	MW-A2	14-10-2521	10/29/2014	all
XOM102914-10	MW-40R	14-10-2521	10/29/2014	all
XOM102914-12	Field Duplicate of MW-A2	14-10-2521	10/29/2014	all
Trip Blank	--	14-10-2521	10/29/2014	VOCs
XOM111914-06	MW-A2	14-11-1758	11/19/2014	all
XOM111914-07	MW-40R	14-11-1758	11/19/2014	all
XOM112014-08	MW-A4	14-11-1758	11/20/2014	all
XOM112014-09	MW-A5	14-11-1758	11/20/2014	all
XOM112014-10	MW-A6	14-11-1758	11/20/2014	all
XOM111914-12	Field Duplicate of MW-A2	14-11-1758	11/19/2014	all
Trip Blank	--	14-11-1758	11/20/2014	VOCs
XOM120514-03	MW-A4	14-12-0694	12/5/2014	all
XOM120514-04	MW-A5	14-12-0694	12/5/2014	all
Trip Blank	--	14-12-0694	12/5/2014	VOCs
XOM121714-06	MW-A5	14-12-1855	12/17/2014	all
XOM121714-07	MW-A6	14-12-1855	12/17/2014	all
XOM121714-08	MW-40R	14-12-1855	12/17/2014	all
XOM121714-09	MW-A4	14-12-1855	12/18/2014	all
XOM121714-10	MW-A2	14-12-1855	12/18/2014	all

Sample ID	Monitoring Well ID	Laboratory SDG	Sample Collection Date	Requested Analyses
XOM121714-12	Field Duplicate of MW-A2	14-12-1855	12/18/2014	all
Trip Blank	Trip Blank	14-12-1855	12/18/2014	VOCs

The analytical results for these samples were reviewed in accordance with the requirements specified in EPA National Functional Guidelines (EPA, 2008), the analytical methods referenced by the laboratory, Amec Foster Wheeler data review procedures, and the laboratory quality control limits. The EPA guidelines referenced above were written specifically for the Contract Laboratory Program, and have been modified for the purposes of this data quality review where they differ from EPA SW-846 method requirements.

All of the certified laboratory reports were reviewed to assess the following criteria: chain-of-custody compliance; holding time compliance; presence or absence of laboratory contamination as demonstrated by method and trip blanks; laboratory control samples (LCS) and LCS duplicates (LCSD) and matrix spike (MS) samples; and analytical precision as the relative percent (%) difference between replicate sample results (i.e., laboratory and field duplicates) or MS and matrix spike duplicates (MSD). This level of data review is equivalent to an EPA Level 2A data review.

Upon receipt by the laboratory, information from the sample jars was compared to the chain-of-custody forms. The temperatures of the coolers were recorded as part of the check-in procedure, and were less than the maximum acceptable temperature of 6 degrees Celsius (°C).

Groundwater wells MW-A4 and MW-A5 were resampled on December 5, 2014. The purpose of the samples addressed in this data review was to compare groundwater analytical results from two separate laboratories. The cooler containing samples collected from monitoring wells MW-A4 and MW-A5 on November 20, 2014, was received by the other laboratory several days after the samples had been collected at a temperature exceeding 6°C. So that true split samples were analyzed for comparison, the results from December 5, 2014, are evaluated here, and the results for samples collected from these two wells on November 20, 2014, are rejected.

Samples were analyzed using the methods identified in the introduction to this report, and the results were evaluated for the following criteria.

1. **Holding Times** – Acceptable.
2. **Blanks** – Acceptable except as noted:

   PAHs by EPA 8270C
   Naphthalene was detected in the method blank associated with work order 14-10-0161 at a concentration between the method detection limit (MDL) and reporting limit (RL) of 0.039 µg/L. The naphthalene results for the associated samples that were also between the MDL and RL were reported as non-detected at the RL. Sample results that were either greater than the RL or not detected were not affected by the blank contamination and were not qualified.

3. **LCS/LCSD** – Acceptable

4. **MS/MSD** – Acceptable
5. **Laboratory Duplicates** – Acceptable
6. **Field Duplicates** – Acceptable.

   Field duplicates were collected during each of the sampling events and are identified in the table below. The field duplicate relative percent difference (RPD) is not calculated if both the primary and duplicate results are not at least five times greater than the reporting limit, as indicated in the table below with "NC." In these cases, the difference between the primary and duplicate results should not exceed the value of the reporting limit. As shown in the table below, RPDs were acceptable where calculated. In cases when the RPDs could not be calculated, the differences between the primary and duplicate results were acceptable, except for results for TPH as diesel for XOM093014-09 and XOM093014-12. The TPH as diesel results for both the primary and duplicate samples are qualified as estimated and flagged with a "J."

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
XOM082714-18/ XOM082714-22	TPH as diesel	220	220	100	NC
	TPH as gasoline	130	120	100	NC
	1-methylnaphthalene	0.075	0.061	0.095	NC
	acenaphthene	0.44	0.37	0.095	NC
	fluorene	0.42	0.34	0.095	NC
XOM093014-09/ XOM093014-12	TPH as diesel	590	170	100	**NC**
	TPH as motor oil	190	<100	100	NC
	TPH as gasoline	130	140	100	NC
	1-methylnapthalene	0.084	<0.095	0.095	NC
	acenaphthene	0.45	0.35	0.095	NC
	fluorene	0.37	0.31	0.095	NC
XOM102914-09/ XOM102914-12	TPH as diesel (no SG)	500	550	100	10
	TPH as diesel (with SG)	360	380	100	NC
	TPH as gasoline	180	180	100	NC
	1-methylnaphthalene	1.6	2.1	0.095	27
	acenaphthene	0.61	0.69	0.095	12
	fluorene	1.0	1.2	0.095	18
XOM111914-06/ XOM111914-12	TPH as diesel (no SG)	220	300	100	NC
	TPH as diesel (with SG)	190	240	100	NC
	TPH as gasoline	150	160	100	NC
	naphthalene	0.21	0.20	0.096	NC
	1-methylnaphthalene	0.28	0.27	0.096	NC
	acenaphthylene	0.11	0.099	0.096	NC

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
	acenaphthene	0.51	0.48	0.096	6
XOM121814-10/ XOM121814-12	TPH as diesel (no SG)	320	340	100	NC
	TPH as diesel (with SG)	260	280	100	NC
	TPH as gasoline	140	160	100	NC
	fluorine	0.60	0.59	0.096	2

Notes
µg/L = micrograms per liter
RPD= relative percent difference

7. **Surrogates** – Acceptable.
8. **Reporting Limits and Laboratory Flags** – Acceptable.

   The laboratory reported detections between the MDL and RL and qualified these results as estimated with a "J" flag. The results are reported as qualified and are not further qualified as a result of this review.

OVERALL ASSESSMENT OF DATA

The Eurofins sample delivery groups 14-08-2237, 14-10-0161, 14-10-2521, 14-11-1758, 14-12-0694, and 14-12-1855 are 100 percent complete. Evaluation of the data usability is based on EPA's guidance documents. Few problems were identified, and analytical performance was generally within specified limits. Except for the rejected results, the data are acceptable and meet the project's data quality objectives.

A summary of qualified results is presented in the table below.

Sample Identifications and Qualified Results

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM082614-12	none		
XOM082614-13	none		
XOM082614-14	none		
XOM082614-15	none		
XOM082614-16	none		
XOM082714-17	none		
XOM082714-18	none		
XOM082714-19	none		
XOM082714-20	none		
XOM082714-21	none		

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM082714-22	none		
XOM082714-24	none		
Trip Blank-03	none		
XOM093014-06	none		
XOM093014-07	naphthalene	0.095 U	method blank contamination
XOM093014-08	none		
XOM093014-09	TPH as diesel	590 J	field duplicate RPD
XOM093014-10	none		
XOM093014-12	TPH as diesel	170 J	field duplicate RPD
Trip Blank-02	none		
XOM102914-06	none		
XOM102914-07	none		
XOM102914-08	all	all rejected	results reported from data package 14-12-0694
XOM102914-09	all	all rejected	results reported from data package 14-12-0694
XOM102914-10	none		
XOM102914-12	none		
Trip Blank	none		
XOM111914-06	none		
XOM111914-07	none		
XOM112014-08	none		
XOM112014-09	none		
XOM112014-10	none		
XOM111914-12	none		
Trip Blank	none		
XOM120514-03	none		
XOM120514-04	none		
Trip Blank	none		
XOM121714-06	none		
XOM121714-07	none		
XOM121714-08	none		
XOM121714-09	none		
XOM121714-10	none		
XOM121714-12	none		
Trip Blank	none		

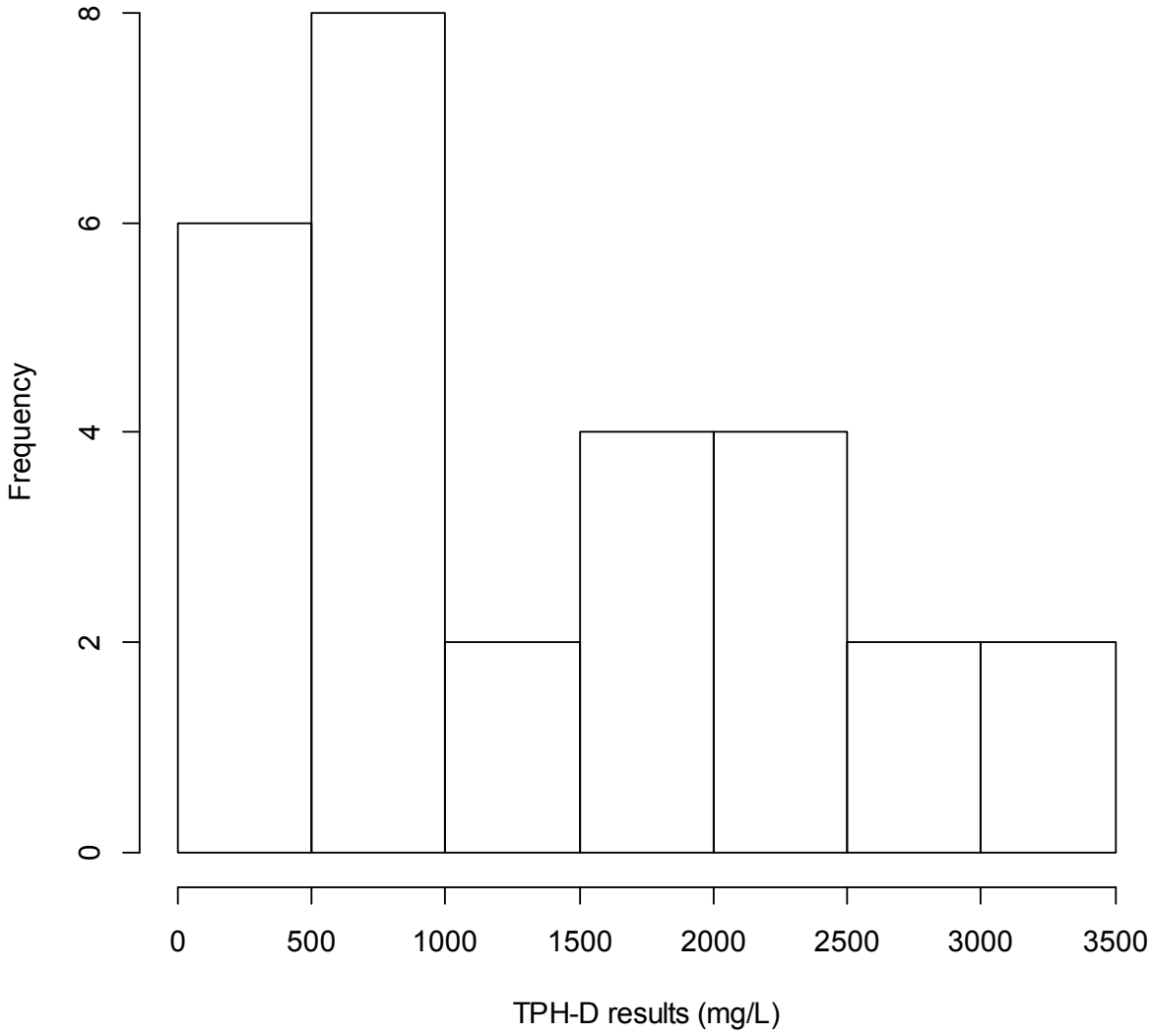
REFERENCES

EPA, 2008, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-08-001, June.

ATTACHMENT C

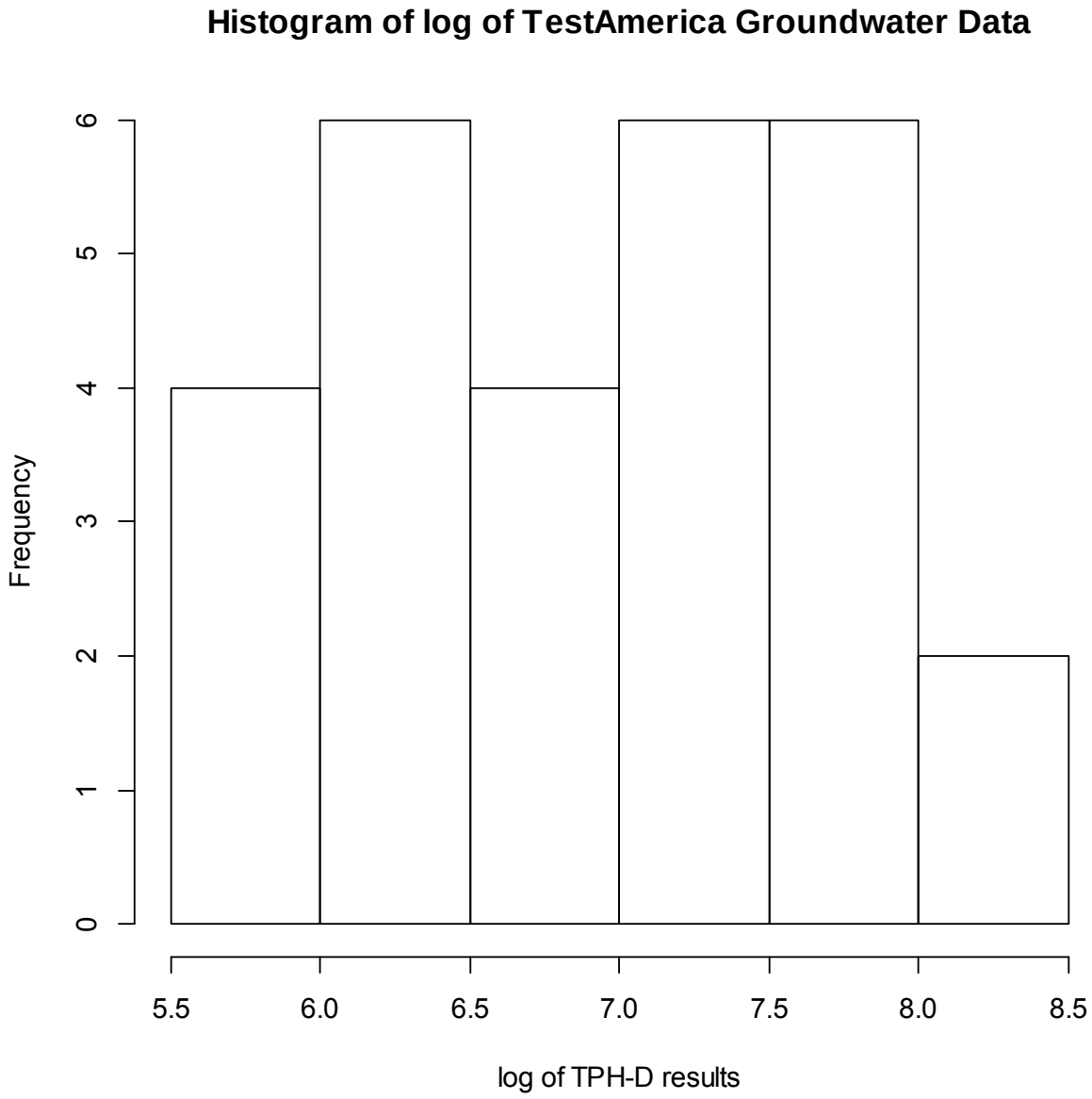
Statistical Data Input and Program Output

"Well.ID","Date","Analyte","TestAmerica","Eurofins"
"1","MW-A1","8/27/2014","TPH-D",1240,590
"2","MW-A2","8/27/2014","TPH-D",565,220
"3","MW-A2","9/30/2014","TPH-D",594,590
"4","MW-A2","10/29/2014","TPH-D",678,360
"5","MW-A2","8/27/2014","TPH-D",602,220
"6","MW-A2","9/30/2014","TPH-D",313,170
"7","MW-A2","10/29/2014","TPH-D",1140,380
"8","MW-A2","11/19/2014","TPH-D",345,190
"9","MW-A2","11/19/2014","TPH-D",393,240
"10","MW-A2","12/18/2014","TPH-D",430,260
"11","MW-A2","12/18/2014","TPH-D",805,280
"12","MW-A3","8/26/2014","TPH-D",906,120
"13","MW-A4","10/29/2014","TPH-D",298,120
"14","MW-A5","6/19/2014","TPH-D",3360,360
"15","MW-A5","8/26/2014","TPH-D",2160,300
"16","MW-A5","9/30/2014","TPH-D",2940,140
"17","MW-A5","10/29/2014","TPH-D",2360,380
"18","MW-A5","12/05/2014","TPH-D",2090,170
"19","MW-A5","12/17/2014","TPH-D",2810,230
"20","MW-A6","6/19/2014","TPH-D",3270,130
"21","MW-A6","10/29/2014","TPH-D",1730,190
"22","MW-A6","12/17/2014","TPH-D",2470,110
"24","MW-19","8/27/2014","TPH-D",409,190
"25","MW-40R","8/27/2014","TPH-D",1610,690
"26","MW-40R","9/30/2014","TPH-D",1540,540
"27","MW-40R","10/29/2014","TPH-D",637,730
"28","MW-40R","11/19/2014","TPH-D",733,590
"29","MW-40R","12/19/2014","TPH-D",1610,550



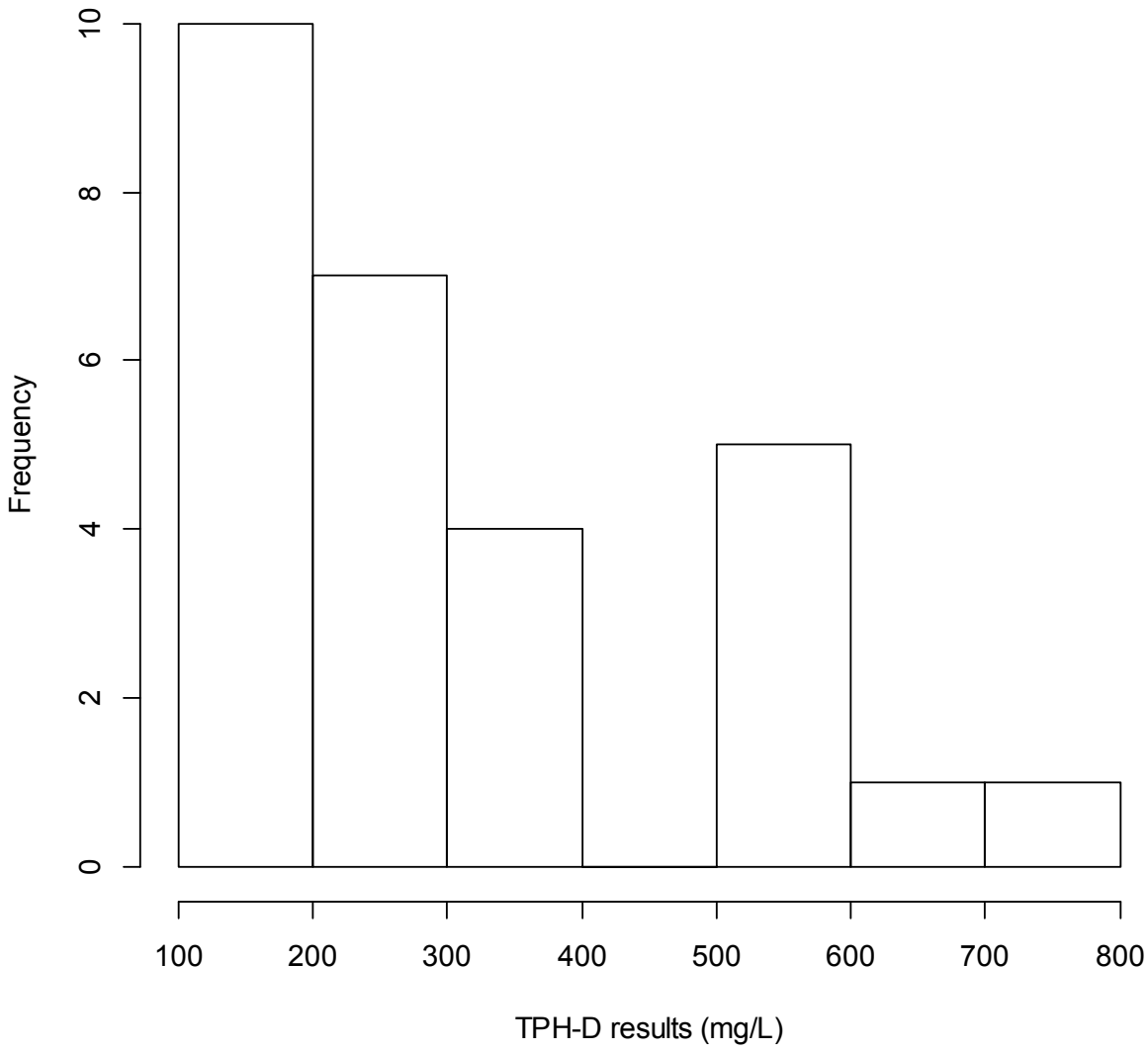
Shapiro-Wilk normality test

data: ExxonInput$TestAmerica
W = 0.8842, p-value = 0.004975
The TestAmerica data are not normally distributed, as is typical of environmental data.



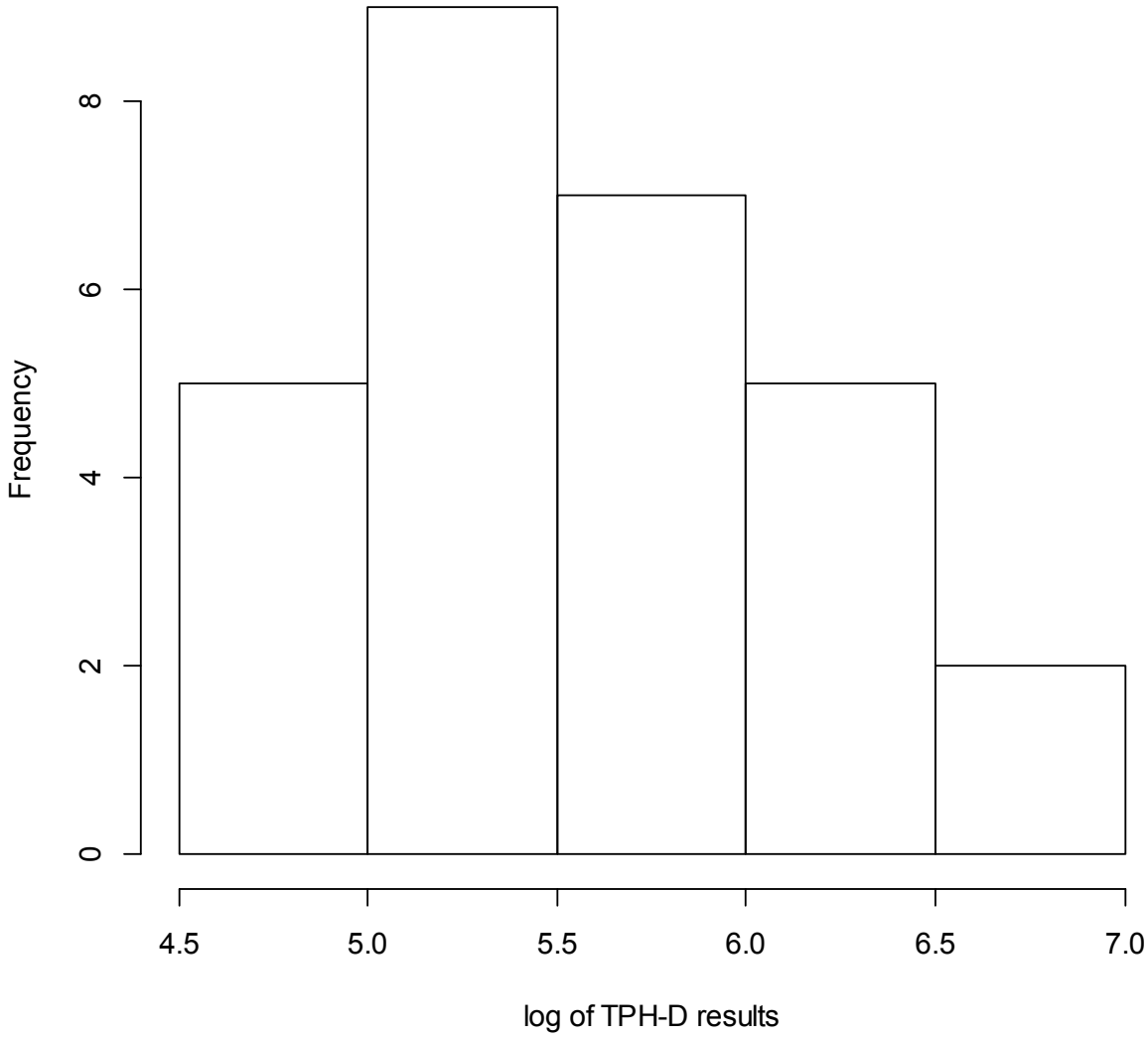
Shapiro-Wilk normality test

data: ExxonInput$TA2
W = 0.9366, p-value = 0.09076
The log-transformed data are more nearly normally distributed.



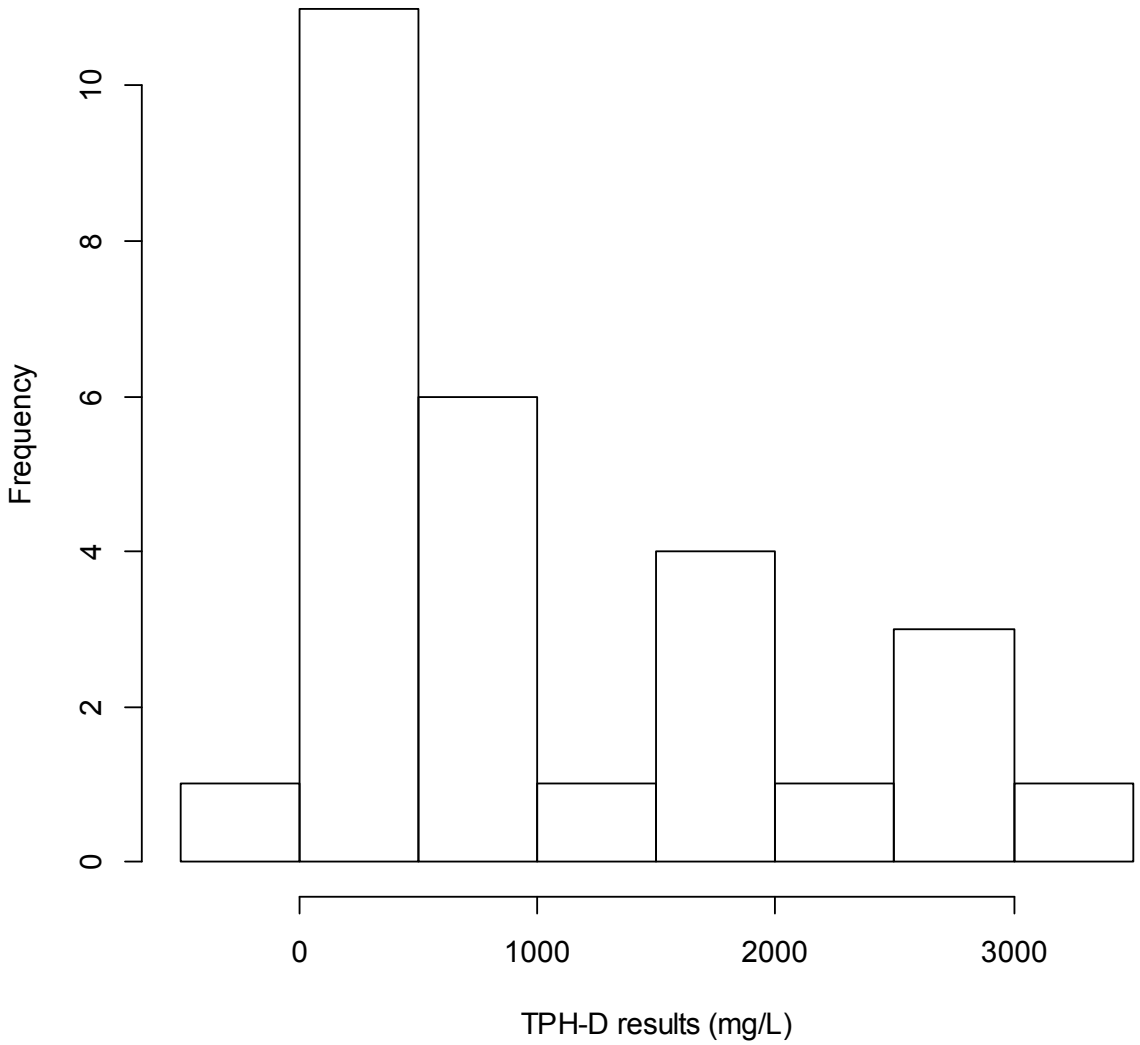
Shapiro-Wilk normality test

data: ExxonInput$Eurofins
W = 0.8773, p-value = 0.003502
The Eurofins data are not normally distributed, as is typical of environmental data.



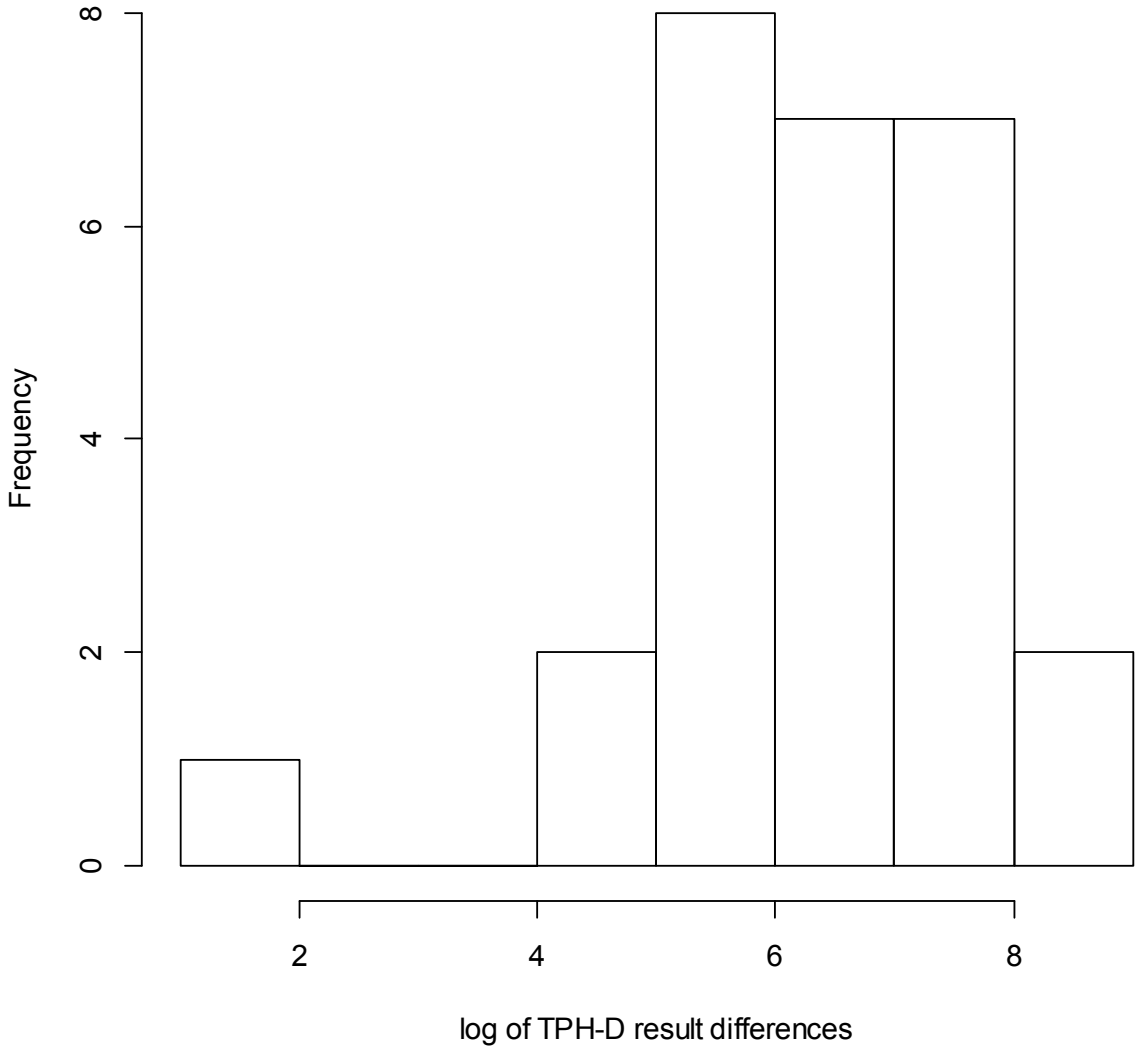
Shapiro-Wilk normality test

data: ExxonInput$EU2
W = 0.9446, p-value = 0.1443
The log-transformed Eurofins data are also more nearly normally distributed.



Shapiro-Wilk normality test

data: ExxonInput$Diff
W = 0.8605, p-value = 0.001534
The paired differences between the TestAmerica and Eurofins results are not normally distributed.



Shapiro-Wilk normality test

data: ExxonInput$Diff2
W = 0.8683, p-value = 0.002708
The log of the paired differences between the TestAmerica and Eurofins results are better, but still not normally distributed.

Bartlett test of homogeneity of variances

data: list(ExxonInput$EU2, ExxonInput$TA2)
Bartlett's K-squared = 2.2935, df = 1, p-value = 0.1299
The two sets of log-transformed groundwater data have reasonably homogenous variance.

Paired t-test

data: ExxonInput$TA2 and ExxonInput$EU2
t = 7.3013, df = 27, p-value = 7.465e-08
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 0.9519751 1.6961636
sample estimates:
mean of the differences
1.324069

Using the log-transformed results, there is a highly significant difference between the two sets of data. This is a better check of the difference significance than in the original units, because the log transformation adjusts for skewed distributions.