

Appendix B

Appendix B

Lithologic Logs

PROJECT Mobil Bulk Plant

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W.O. W-4558-3 WELL NO. RW-2

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Elevation reference: Ground surface elevation:	Well co Casing	mple eleva	ted:				AS-BUILT DESIGN	
SOIL DESCRIPTION		SAMPLE	SAMPLE	BLOW	OVM READING	GROUND WATER	Flush-mounted steel monument	TESTING
Inferred medium dense, me brown SILT with gravel and sand, Slight odor noted.	oist, ' some -			-			Top of casing Concrete Bentonite seal	
Inferred meium dense, moi SILT with some sand and g Strong odor noted.	st, grey, provel.		-			-	Casing (Schedule-40 8-inch I.D. PVC)	-
Inferred, medium dense, w SILT with sond and organic Strong odor noted.	et, grey, s.				-	AD	< 10-20 sand filter pack	
10 - Inferred, dense, wet, dark organics (wood and peat) some sand and silt.	grey, with		-		-	_		• • •
- 15 -	-				-		Screen (8-inch I.D. PVC with 0.010-inch slots)	
	-						Threaded end cap	_
Boring terminated ot 18 fe	et.				-			
	-							-
- 25 -			- - -			-		-
	- - - - -		-		-			
- 30			-					
LEGE	ND Obser ATD	ved gr = at U	cundw ime of	ater le drilling	vel g)		RITTENHOUSE-ZEMAN & description Environmental Consultants 1400 140Lb Ave NE Beilevue, Washington 98005	

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

BORING NUMBER ______



PROJECT Mobil Bulk Plant

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 $W \cap W - 4558 - 3$

BORING NO. B-1A



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

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ef)	SOIL DESCRIPTION	ard ard	PLE BER	DINC	UND RA	STANDARD PENETRATION RESISTANCE						
5 0	Approximate ground surface elevation:	SAM	NUN	REA	GR0 WAT	0 10	A 2	Blows pe 0 3	r lool 0	40 5	LEST	
		<u> </u>	5-6	0			-					
	Boring terminated at approximately											
	31 feet]									• •	
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	LEGEND						MOIST	TURE CO	NTENT			
					[Plastic limit	Ĺ	Natural	Lie	nuid limit		
. <u>.</u>	2-inch OD split-spoon sample					BZA		RITTENH SSOCIA Sociechn Sovironm 400 140 Cellevue	OUSE- TES, IN ical & ical & ical C to Ave I Washin	ZEMAN d C. Tonsultan NE gton 980	ts 15	

PROJECT Mobil Bulk Plant

 $W \cap W - 4558 - 3$

BORING NO. B-8A



PROJECT Mobil Bulk Plant

W.O. W-4558-3

BORING NO B-15A





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

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Elevation .	reference: N/A	Well complet	ted: /	N/A				AS-BUILT DESIGN	Page 1
	SOIL DESCRIPTION				MO	DNID	(INI) IBK		TESTING
- 0 -		SAN	Σ	NLIN NLIN	COLC	OV1 KEA1	GRO WA1	Borina abandoned by backfilling	
		-		-		- - - -		with bentonite.	
	Loose, moist, brown, silty, fine to				_				
	mealum SAND interbeadea with sandy SiLT with trace gravel	graγ,		-1	3	17			
- 5 -		 		-2	-	29	•		
				5-3			ATD		
	Medium dense to dense, saturate gray, silfy, fine to medium SAND v	əd vith	s	5-4	41	80			
- 10 -	some wood debiis			-	-	-	-		
	Grades to grayish-black, silty, me to coarse SAND	dium		-		-			
]							
	Rottom of boting at 14 feat	·	S	-5	12				<u> </u>
- 15 -	Petroleum-like staining and oc observed in all samples	ior 🚽		-	-	_	-		
	Field FT-IR analysis of sample S- indicated > 10 000 ppm TPH	5		-					
		•		-	:				
- 20 -		_		-	-]	-4 			
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- 25 -				-	-	-	_		
				4		-			
- ₃₀				1		1			
Ī	LEGEND 2-inch O.D. split-spoon sample	Coserve ™ AiD≭at	d grou time d	undwa of arilli	iter levi	91		RZA AGRA, Inc. Geotechnical & Environmental Group	
	3-inch QD Shelby sampler							11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

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BB-1

Gray, moist to wet, silty, gravely 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 fast.

BB-3

Gray, moist to wet, gravelly SAND with some gravel. Slow seepage below approximately 2.5 feat; 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.

88-6

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

Page 1

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.

8B-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, gravely 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.

88-12

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 %-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, gravely 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

Page 2

					······································				
LOG OF EXPLORATORY BORING					Project No:	05-487-002 fican Dist	Boring No: W-1 Date: 2-23-90 Driller: Geotech		
```ocation of	boring:				Location: Bu Logged by: 4 Installation	lk Termina G. Stuesse Data: (Se	l-Everett, e Below)	Drilling Mathod: CMEC-55 Rollow Stem Auger Hole Diameter: 7" Page No: 1 of 1	
:h Graphic :) Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol {U.S.C.S.}	Water Level	Time:	Date:	Comments:	
	4.00		Ring @ 3.0'		0-3.0" Aspha 3.0' Organic wood shavings	alt : debris, s , slight c	hilty, brow	m, loose, moist, primarily	
				 ML	10.0' Silt,	brown, sof	t, wet, wo	od shavings, slight odor.	
				ML	15.0' Silt, ) petrole	brown, sof eum sheen (	t, wet, woo on <del>c</del> utting	od shavings, slight s.	
TD=23.0'					Installation C S B S D C C	Data: Screen: Slank: Sand: Dentonite: Concrete:	23.0' ~ 2 3.0' - 23.0' - 2 2.0' - 1 1.0' -	3.0' o 2.0' 1.0' 0	

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<u> </u>	ideation of b	EXI poring:	LOG ( PLORATOR)	OF 2 BORING		Project No: 05-487-002 Date: 2-22-90 Client: American Distributing Co Driller: Geotech Location: Bulk Terminal-Everett, Drilling Method: CMEC-5: Hollow Stem Auger Logged by: G. Stuesse Hole Diameter: 7" Installation Data: (See Below)						
epth (ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	P Water Leve	l Time:	Data:	Comments:			
0 - - 2 - - 5 - - 8 - - 0 -		11	TIP II	Ring @ 3.0'	5W SW	0-3" Grav 3-5" Sand, film of 5.0' Sand, grave OB OU	al; degraded fine-coarse gravel, slig on outside o fine-coarse l, slight, n tside of sam	asphalt. , grey, lo ht-moderat f sampler. a, grey, lo moderate o: mpler.	Ose, very moist, occasional e oily odor, dark brown, oily cose, wet, occasional fine ily, odor, dark brown oily film			
2 - 1 4 - 1 5 - 1 2 - 1 2 - 1 4 - 1 4 - 1	TD=23.0'				SW SW OL	15.0' Sand, grave; on cut 20.0' Sand, grave; on cut 23.0' Clay, organ	fine-coarse , slight-me side of sam fine coarse , slight-me side of sam brown, sof ic odor.	, grey, lo dium oily pler. , gray, lo dium oily p pler. t, wet, por	ocse, wet, occasional coarse odor, dark brown cily film ose, wet, occasional coarse odor, dark brown cily film ssible organic, very slight			
-					2	NOTE: The l heavi	over 3.0° o ng sanda.	f well cou:	ld not be sand packed due to			
					Ĩ	Installation	Data: Screen: Blank: Sand: Bentonite: Concrete:	23.0' - 3.0' - 2.0' - 1.0' -	3.0' 0' 2.0' 1.0' 0'			

LOG OF EXPLORATORY BORING						Project No: 05-487-002 Boring No: W-3 Date: 2-22-90 Client: American Distributing Co. Dribler: Second					
· · -	location of b	ooring:			· · · · · · · · · · · · · · · · · · ·	Client: American Distributing Co Driller: Geotech Location: Bulk Terminal-Everett, Drilling Method: CMEC-55 Hollow Stem Auger Logged by: G. Stuesse Eole Diameter: 7" Installation Data: (See Below) 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.)	Water Level	Time:	Date:	Comments:		
						0-J" Asphalt					
-		11		Ring Q 3.0'	SP	3.0' Sand, el eccasio	ight silty mal gravel	, fine-med ., πο odor.	lium, grey, loose, moist,		
					SP	7.0' Sand, sl occasio	ight sílty mal gravel	, fine-med , no eder.	ium, grey, loose, wat,		
					SP	15.0' Sand, a) occasion	light silt al gravel,	y, fine-mea , no oder.	dium, grey, loose, wet,		
-   -				_	SP	20.0' Sand, sl Occasion	ight silt) al gravel,	/, fine-mea . no odør.	lium, grey, loome, wet,		
	TD=23.0'	ŀ		r	1	NOTE: Vapors	from well	have H2S c	xdor.		
-						Installation D S B S Ca Ca	ata: creen: lank: and: entonite: oncrete:	23.0' - 3 3.0' - 23.0' - 2 2.0' - 1 1.0' -	 o'  o'		

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			LOG (	0F		Project No:	05-487-	-003		Boring No: W-4
_		EXP	LORATOR	Y BORING		Client: Ame	rican D	istributin	g Co.	Date: 2/22/90 Driller:
1	ocation of b	oring:				Location: Bu Eve Logged By: Installation	lk Term ≃rett, Data:	iinal WA See Below		Drilling Method: Hole Diameter: 7" Page No: 1 of 1
enth	Graphic	Blow/ft	Vapor Concer-	Sample type	e Soil Group	Water Level	Time	Date	Commen	ta:
(ft)	Log		tration (ppm)		(U.S.C.S.)					
0 -						0 +3" Concret	 8.	JI		
2 - 4 - 6 -		16	o	Ring @ 4'	SM	0 4' Sand, si wet, moderate	lty, fi odor,	ine to medi film of br	um grair own cil	ned, gray/brown, loose, on sampler.
8 - 0 - 2 - -						ê 10' Sand, si BOderate odor,	llty, f piece	ine to med. a of glass	ium grai , metal	.ned, gray/brown, loose, wet, and wood.
					OL	ê 15' Clay, or slight odor.	ganic,	brown, so:	t, wet,	pieces of wood, very
						@ ZO' Clay, or alight odor.	ganic,	brown, sof	t, wet,	pieces of wood, very
-	10421					Installation D	ata: S P S	Screen Mank Sand Sentonita	23' - ; 3' - ( 23' - ; 2' - ;	3. D 2.
-							c	Concrete	1' - 0	ו
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		EXI	LOG (	DF ( BORING		Project No:	05-487-0	03		Boring No: W-5	
- <del> </del>	location of t	oring:				Client: American Distributing Co. Driller: Location: Bulk Terminal Drilling Method: Everett, WA Hole Diameter: 7" Logged By: Page No: 1 of 1 Installation Data: See Below					
th (c)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comment	 ta:	
		28	50	Ring @ 3'	SP	0 - 5" Gravel 0 - 5" Gravel 0 3' Sand, fin moist, slight 0 6' Sand, fin wet, slight oc 0 - 5" Gravel 0 -	odor, p ne to me tor, fil	dium gra. ieces of dium grai m of brow	ined, sli wood and ined, slin on oil on	ghtly silty, gray, loose, metal. ghtly silty, gray, loose, cuttings.	
	TD=23'					e 13 Sand, fi wet, slight od e 20' Sand, fi wet, slight odd	ne to me or, film ne to me Dr, Cutt	dium gra dium gra: ings coat	ined, sli n gil on ined, sli ted with	ghtly silty, gray, loose, cuttings. ghtly silty, gray, loose, brown oil film	
					1	Installation Da	ita: Sc. Bl. San Be: Con	reen ank nd ntonite ncrete	23' - 3 3' - 0 23' - 2 2' - 1 1' - 0	, ,	
,											

			LOG	)F		Project No:	05-487-	-003		Boring No: W-6		
- ·-	tocation of b	EXI	LORATOR	BORING		Client: American Distributing Co. Driller: Location: Bulk Terminal Drilling Method: Everett, WA Hole Diameter: 7" Logged By: Page No: 1 of 1 Installation Data: See Below						
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	Commen	ts:		
0 - 2 - - 4 - - 8 - - .0 - - .2 - - 4 - - - - - - - - - - - - - - - - -	TD=23 '	19	30	Ring 0 3'	SM OL	<pre>@ 0 - S' Sand moist, slight @ 6' Sand, sl wet, slight o water and cut @ 10' Sand, v slight odor, : water and cut @ 20' Clay, or (nstallation C (nstallation C)</pre>	ightly dor, so tings. sry sil some gr tings. rganic,	ailty, fin some grave ailty, fin ome gravel, ity, fine to cavel, piece dark brown Screen Blank Sand Bentomite Concrete	fine to med pieces p medium as of wo d, soft, 23' - 3' - 2' - 1' -	o medium grained, gray, loose dium grained, gray, loose, of wood, brown oily film on a grained, gray, loose, wet, ood, brown oily film on wet, hydrogen aulfide odor.		

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<u></u> 4	location of b	EXF oring:	LOG C	F Boring		Project No: 05-487-003   Boring No: W-7     Client: American Distributing Co.   Date: 2/21/90     Location: Bulk Terminal   Driller: Geotech     Everett, WA   Drilling Method: CN     Logged By: G. Stuesse   Hollow-Stem A     Installation Data: Backfill with   Hole Diameter: 7"     Enviroplug   Page No: 1 of 1					
)epth (ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Seil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Солвел	ts:	
	TD-16'	5	TIPJ 400	Ring @ 3'	SM	<pre></pre>	lty, fi slight	ne to coar pily odor.	grain	ned, gray to dark gray, lo	

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:	'ocation of h		Project No: 05-487-003   Boring No: W-8     Date: 6/28/90     Client: American Distributing Co.   Driller: ESE     Location: Bulk Terminal   Drilling Method: Hand Auge     Everett, WA   Hole Diameter: 4"     Logged By: G. Stuesse   Page No: 1 of 1     Installation Data: See Below   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	Counter	
0 - - 2 - - 4 - - 6 - - 8 - - 8 - - 0 -					SM  ML	0 - 3' Sand, @ 3' - 10' Si	silty, lt, gra	brown, loo		st to wet, no odor. ght odor.
	TD-10'					Installation (	Data:	Screen Blank Sand Bentonite Concrete	10' - 2' - 10' - 1'1 .5' -	2' c 1' ' 5' 0

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-		EX	LOG ( PLORATOR:	OF Y BORING		Project No: Client: Ame	05-487- rican D	003 istributin	g Co.	Boring No: W-9 Date: 5/28/90 Driller: Drilling Method: Hand Auger Hole Diameter: 7* Page No: 1 of 1		
	location of b	oring;				Location: Bu Ev Logged By: Installation	lk Term erett,  Data: J	inal WA See Below				
)epth (ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample typ and Depth	e Soil Croup Symbol (U.S.C.S.)	p Water Level	Time	Date	Commen	ta:		
	TD=7.5*		(ppm)		HL.	0 - 3' \$ilt, @ 3' - 7.5' \$ Installation [	sandy, ilt, gr	brown, moi ay, wet, m Screen Blank Sand Bentonite Concrete	7.5' - 1.5' - 7.5' - 1.0' - 0.5' -	odor. odor. 1.5' 0 1.0' 0.5' 0		
-												

		•	LOG	OF		Project No:	05-487-	-001		Boting Not Well
,		EXI	PLORATOR	Y BORING						Date: 6/28/90
						Client: Ame	rican D	)istributin	ığ Co.	Driller:
	location of b	oring:				Location: Bu	lk Term	tinal	_	Drilling Method: Hand Auger
						Eve	erett,	WA		Bole Diameter: 7"
						Logged By:				Page No: 1 of 1
						Installation	Data:	See Below		
	(			- <del>, </del>					_	
			Vapor	Sample typ	e Soil Groug	Water Level	Time	Date	Commen	ta:
epth	Graphic	Blow/ft	Concen-	and Depth	Symbol				-	
(ft)	Log		tration		(U.S.C.S.)	1				
	Í		(bbm)							
			·	.   <u> </u>					[	
0 -			ľ		нь					
_			ł		1	0 - 2' Silt,	brown,	moist, pie	ees of w	ood and metal, no odor.
2 -				ļ		2' - 6' Pea	t, brow	wat, wet, no	odor.	
		i			7t	ļ				
6.					1					
Ĩ	TD=67							_		
-						installation ]	Data:	Screen	5.0' -	2.0'
-	1	ĺ	ĺ					Blank	2.0' -	o
-		ĺ						Sand	6.0' -	1.5'
-								Bentonite	1.5' -	0.5'
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		EXI	LOG ( PLORATOR)	df f Boring		Project No: Client: Ame	05-487-	-003		Boring No: W-11 Date: 5/28/90
ir	Scation of b	oring:				Location: Bu Ev Logged By: Installation	lk Term erett, Data:	Minal WA S <del>ee</del> Below	, ,	Drilling Method: Hand Auger Hole Diameter: 7" Page No: 1 of 1
epth ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample typ and Depth	e Soil Group Symbol (U.S.C.S.)	Water Level	Tim <del>e</del>	Date	Commer	nts:
0 - 2 - 4 - -					Pt	0 - 2' Peat, 2 2' - 6.5' P	silty, eat, b	brown, mo:	lat, no brown,	odor. oil sheen.
6 - - - - - -	TD=6.5'					Installation	Data;	Screen Blank Sand Bentonite Concrete	6.5' - 1.5' - 5.5' - 1.0' - 0.5' -	1.5' 0 1.0' 0.5' 0
-										
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		EXI	LOG PLORATOR	of Y Boring		Project No:	05-467	-003		Boring No: W-12 Date: 6/28/90
	location of b	poring:		***		Location: Bu Ev Logged By: Installation	lk Term erëtt, Data:	See Below	ig to.	Driller: Drilling Method: Hand Auge Hole Diameter: 7" Page No: 1 of 1
epth ([c)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample typ and Depth	e Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Commen	ts:
0 - - 2 -			<del></del>		SH	0 - 3' Sand,	silty,	brown, mo:	lst, no d	odor.
4					Pt	₩ 3' ~ 7.5' P	eat, si	ilty, brown	l, Wet, s	light odor.
8 -   - - -	TD=7.5'					Installation [	)ata:	Screen Blank Sand Bentonite Concrete	7.5' - 1.5' - 7.5' - 1.0' - 1 0.5' -	1.5' o 1.0' 0.5' 0
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-   -   -   -   -   -   -   -   -   -										
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		LORDALIZIN'	Y BOBING							
d location of )	boring:		E BORING		Client: Ame Location: Bu Ev Logged By: Installation	erican ulk Ter Verett, Data:	Distributin minal WA See Below	g Co.	Date: 5/28/90 Driller: Drilling Method: Han Hole Diameter: 7" Page No: 1 of 1	d Auge
h Graphic ) Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Commen	ta:	
				HL	0 ~ 4' Silt, cobbles, no d	some s	and and gra	wel, bra	own, moist, occasional	
					4' - 7' Silt, cobbles, no c	some dor.	sand and gr	avel, br	cown, moist, occasiona	1
TD=7'					Installation .	Data:	Screen Blank Sand Bentonite Concrete	7' - 2' - 7' - 1'	2' 0 1' 5' 0	
		2								

	EXPLORATORY BORING					Project No: Client: Ame Location: Bu Ev Logged By: Installation	05-487 rican 1 lk Terr erett, Data:	-003 Distributin minal WA See Below	ng Ca.	Boring No: W-14 Date: 6/28/90 Driller: Drilling Method: Band Auge: Hole Diameter: 7" Page No: I of 1		
pth (t)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample typ and Depth	e Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Саллел			
- 0 - 2 - 4 - 4					ML	0 - 6.5' Silt	., sand	y, moist to	g wat, ve	ery slight odor.		
-   -   -   -   -   -   -   -   -   -	TD=6.5'	-				Installation	Data:	Screen Blank Sand Bentonite Concrete	6.5' - 2.0' - 6.5' - 1.0' - 0.5' -	2.0' 0 1.0' 0.5' 0	Ŧ	
-   -   -   -												

	location of h	EXE	LOG ( LORATORY	BORING	<del></del>	Project No: Client: Ame	05-487- rican D	-003 Distributin	g Co.	Boring No: W-15 Date: 6/28/90 Co. Driller: Drilling Method: Hand Auger		
		~~ t A Hy i				Logged By: Installation	lk Term erett, Data:	dinal WA See Below		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	Commen	ts:		
0 2					ML	0 - 7' silt,	 Some 23		bles, m	bist to wet, slight odor.		
	τ <b>σ</b> =7'					Installation (	)ata: : ;	SCreen Blank Sand Bentonite Concrete	6.0' - 1.5' - 6.0' - 1.0' - 0.5' -	1.5' 0 1.0' 0.5' 0		
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1	ocation of b	EX.	Log PLORATOR	OF Y EORING		Project No: Client: Ame Location: Bu Ev Logged By: Installation	05-487 rican f lk Terr erett, Data:	-003 Distributin minal WA See Below	ng Co.	Boring No: W-16 Date: 6/28/90 Driller: Drilling Method: Band Auger Hole Diameter: 7" Page No: 1 of 1
∋pth ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample typ and Ospth	e Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Commen	ta:
0 - - 2 - 4 - -					mL	0 - 6' Silt, CObbles, oil	воре зи ол grot	and and gra	avel, po:	ist to wat, occasional
6 - - - - - - -	TD=6'					Installation	Data:	Screen Blank Sand Hentonite Concrete	6' - 2 2' - 0 6' - 1 I'5 .5' - 0	, ,
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			LOG	); 		Project No:	05-497-	-003		Boring No: W-17
		EXC	LORATOR	BORING						Date: 6/28/90
					·	- Client: Ame	rican D	Distributin	g Co.	Driller:
₹!	ocation of b	oring:				Location: Bu	lk Tern	inal		Drilling Method: Hand Auges
					•	Ev	erett,	WA		Hole Diameter: 7"
						Logged By:				Page No: 1 of 1
						Installation	Data			
						installation	Data.	pee perce		
	1	1	I	1						
		1	Vapor	Sample type	Soil Group	Water Level	Time	Date	Commen	ta:
Jepth	Graphic	Blow/ft	Concen-	and Depth	Symbol					
(It)	Log	Ì	tration		(U.S.C.S.)					
			(ppm)	ł				[		
	i	l F			ł					
0 -						·		I		<u> </u>
v			i							
-				]	ML-	0 - 6' Silt,	some s	and and gra	ivel, mod	ist to wet, occasional
2 -						cobbles, oil	on gra	und water e	surface.	
-										
4 -				}	,	í				
+				.						
ا _م						ļ				
-	TD≠6'	ļ				Installation	Data:	Screen	6' -	2 *
8 -								Blank	2' -	a
-		ļ		ļ				Sand	6' -	1'
-		Í						Bentopite	1'	51
-	1	ļ						Concrete	5/ -	0
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## Mobil Oll/ADC Bulk Plant Properties

PROJECT:

Ground	a reference: Unknown Well con surface elevation: Unknown Casing el	opieu evati	ed: icea:	19 M Unik	March nown	1996		AS-BUILT DESIGN	Page 1 of 1
(teel)	SOIL DESCRIPTION	SAMPLE	BHYT	NUMBER	BLOW	OVM READING	OROUND WATER	Flush-mounted cast iron monument	TESTING
	Gravel Surfacing over moist, brown, sitty, gravely SAND, non-odorous			-				Top of casing	
	Weathered, red clay brick			•	1			Bentonite	
	Moist, brown, silty, fine SAND with some gravel and minor brick fragments		G :	ው 1/ 3.σ		0.0		Cosing (Schedule-80	
5 -	-					-		I-hch I.D. PVC)	
F	Molst to wet, gray, fine to medium SAND, petroleum odor at 7.0 feet		G	ρ.η/ 10		27.0	3/22/96	10-20 sand filter pack	
	Grades to wet, gray, fine to coarse SAND (3-inch fine sandy sitt layer at 10.0 feet)			- - -		-	AID	Screen (1-Inch I.D. PVC	
- 10 -	-		5	οσ		7.0 -	-	with D.028-inch stots) Stip and cap	WIPH-D
	Bottom of boring at 12 feet.	6 <b>1</b>							
<b>⊢</b> ]						·			
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L 30⊥					1	[			·
, <u>I</u>	LEGEND 2-inch O.D. V Obs Geoprobe sompte 0/00	erved /00 =	l grou date	indwa obee	zieriev Hved	of		AGRA Earth & Environmental	
ABO	Observed groundwater level SEX ATD = at time of atiling With our at	<b>ra</b> lytic	cal te	nting				11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

### Mobil Oll/ADC Bulk PROJECT: Plant Properties

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

Elevatio `round	a reference: Unicnown surface elevation: Unicnown	Well com Casing ek	pletod syntion	: 19 N 1: Unio	farch nown	1996		AS-BUILT DESIGN	Page 1 of 1
HLLARD	SOIL DESCRIPTION		SAMPLE TYPE	SAMPLE NUMBER	BLOW	OVM	OROUND WATER	Rush-mounted cast iron monument	TESTING
	Asphalt and base course over in gray/brown, silty, gravely SAND	ost.		-				Top of casing Asphalt	
	Moist, gray, fine to coarse SAND some silt, non-odorous	with		GP-2/- 3.5		۔ مە		Bentonite Cosing	
- 5 -	Grades to gray/brown, sity, fine medium SAND, non-odorous	to _		_	-	-		(Schedule-80 1-inch I.D. PVC)	-
	2-inch fine sandy SLT layer at 7.3	f <del>oot</del>		GP-2/		11.0	3/22/R0	10-20 sand fiter pack	
	Grades to saturated, stained bio to medium SAND, strong petrole odor and LPH globules	um -		8.0			ATD	Screen (1-Inch I.D. PVC	
- 10 -	Fine SAND Interbedded with fine fragments	wood		GP-2/ 11.0		<i>11.</i> 0 '		0.028-inch slots) Slip end cap	WTPH-D
	Bottom of boring at 12 feet.	-		-		-			
- 15 -				-	-	-			-
				4		-			
		-				-			
		•				-			
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- 25 -					-	_			
		•		4		-			
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	LEGEND 2-inch O.D. Geoprobe sample Observed groundwater level ATD = at time of attling		rved gr 30 = da ciyfical	oundwa te obien	ier ieve veci	I		AGRA Earth & Environmental 11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

Drilling completed: 19 March 1996

### Mobil Oll/ADC Bulk

### PROJECT: Plant Properties

Elevation Ground 1	a reference: Unknown Well co surface elevation: Unknown Casing e	mplete Lievatie	al: <u>N</u> O na: Uni	t Appl Inown	icable		AS-BUILT DESIGN	Page 1 of 1
HLLL (Imp)	SOIL DESCRIPTION	SAMPLE	SAMPLE SAMPLE NUMBER	BLOW	OVM	<b>GROUND</b> WATER		TESTING
- 0 -	Asphalt and base course over moist, gray/brown fine SAND, non-odorous							
	Grades to moist to wet, gray, fine SAND, strong pertoleum odor and LPH		GP-3/ 3.0		11.0	ATD.	Bentonite adbondonment	
- 5 -	· -		GP-3/ 6.5	-	 17.0	_		WIPH-D
	Bottom of boring at 6.5 feet, due to refusal.			•				
- 10 -	-		-		-	-		
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- 20 -	-		-	-	<del>ب</del> ۰.	-		
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- 25 -				-	· ]	-		
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- 30			•		ļ		• 	
ļ Ţ	LEGEND 2-Inch O.D. Geoprobe somple	erved ( 1/00 = d	proundwo Iote obsei	ster leve wed	I		AGRA Earth & Environmental	
*	Cbserved groundwater level ustrial   ATD = at time of chiling ustrial   with 0 at. ustrial	nalylia	at teeling				11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

### Mobil Oil/ADC Bulk Plant Properties

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

Eevation	arterence: Unknown artere elevation: Unknown	Well con Casing ch	ploted evation	: 19 A : Unk	farch nown	1996	- /	AS-BUILT DESIGN	Page 1 of 1
DEPTH (foot)	SOIL DESCRIPTION		ALTAMAS BATYT	SAMPLE NUMBER	BLOW	OVM	GROUND WATER	Rush-mounted cost iron monument	TESTING
• • •	Asphait over base course over gray/brown, gravelly, silty SAND non-octorous	),						Top of casing Cerment	
. 5	Moist, brown/black/gray, slity, fi medium SAND with some grave and brick fragments, non-odor Moist to wet, gray/brown, fine S moderate petroleum odor	ine to el, wood xus AND,		GP-4/ 4.0 GP-4/	-	0.0 - - 7.0 -		Casing (Schedule-80 1-Inch I.D. PVC)	WIPHE
	Wood debris and LPH			GP-4/ 8.0		11.0		fitter pack	
10 -	Fine grained wood fragments, s petroleum staining and odor	Jight .		-	-	-		with 0.028-inch slots) Slip end cap	
	Bottom of boding at 12 feet.					-			
15 -		 -		-	-	-	-		
20 -		. <u> </u>		_	-	•			
		-		-		-			
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25 -		-		~	-	-			:
		-							
30⊥ ⊤	LEGEND 2-Inch O.D.		wed g	oundwa	ter iovo		[	AGRA	<u> </u>
*	Geoprope sample Observed groundwater level ATD = at time of dalling	SEX SEAL	aytica	itering				11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

Drilling completed: 19 March 1996

### Mobil Oll/ADC Bulk PROJECT: Plant Properties

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[	Elevati	on reference: Unknown	Well com	pleted	: 19 N	lanch	1996		AS-BUILT DESIGN	Page 1	
	Ground	i surface elevation: Unknown	vinition: Unknown						or I		
	DEPTH (foot)	SOIL DESCRIPTION		BAYT BYTYPE	SAMPLE NUMBER	BILOW	OVM READING	OROUND	Rush-mounted cast iron monument	TESTING	
	- 0 -	Asphalt and base course over m gray/black, fine SAND and brok gravel	noist. an .						Top of cosing Cement		
┟		Moist to wet, brown, fine SAND v some slit, trace petroleum odor	v#h 		GP-5/-		-		Asphalt	WIPH-D	
ł		Moist to wef, gray, fine SAND, str petroleum odor, LPH below 3.7 f	eat		GP-5/ 4.0	<b></b>		3/22/96	Cosing (Schedule-80 Linch I.D. PVC)		
	· · ·	Grades to moist, fine sandy SLT			67-5/ 6.5				10-20 sand filler pack		
ŀ		Ane grained wood debris with LF	ਅ						(1-inch I.D. PVC)		
		Saturated, gray, fine SAND with L	LPH		GP-5/ 8.0 -		-		0.028-inch slots) Slip end cap		
	· 10 -	Bottom of boring at 9.5 feet, refusal.	due tō			-	-				
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antat, inc.	30	· · · · · · · · · · · · · · · · · · ·			1						
	Ţ	LEGEND   2-inch O.D.   Geoprobe samples   Cobserved groundwater level   Cobserved groundwater level   ATD = at time of drilling						AGRA Earth & Environmental			
AGRA Ewite	*							11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918			

### Mobil Oll/ADC Bulk

### PROJECT: Plant Properties

Elevation Ground (	a mierence: Unknown Well con surface elevation: Unknown Casing el		AS-BUILT DESIGN	Page 1 of 1				
HTTABU (Isoal)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW	OVM READING	GROUND WATER	Rush-mounted cast iron monument	TESTING
	Asphati and base course over moist, gray, fine SAND with sit rich zones (2 to 3 feet - sity, gravely SAND with wood debris, non-odorous)						Asphatt	
- 5 -	Black, fine to medium sandy SLT and wood fragments, saturated with very viscous LPH		GP-6/ 35		15 -	ATD 1/22/96	Bentonite Casing (Schedule-80 1-inch I.D. PVC)	
	Ane to medium grained wood debris, petroleum odor, no LPH		67-6/ 6.0		-		10-20 sand filter pack	
- 10 -	Wood fragments saturated with very viscous LPH		- -		-	-	Screen (1-inch LD. PVC with 0.028-inch slots) Silp end cap	
	Bottom of boring at 12 feet.		-				ş dürəşinde zərkətərini i	
- 15 -			-	-	-	-		
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	-		-		•			
- 20 -	_			-	-	-		
	•							
- 25 -	- 		-	-	-	-		
20			-		- - -		· · · · ·	
I X	LEGEND 2-inch O.D. Geoprobe sample Colored groundwater level AID = gt time of dilling	Observed groundwater ievel water 0/00/00 = date observed water of an analytical testing water of an					AGRA Earth & Environmental 11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

# Mobil Oli/ADC Bulk PROJECT: Plant Properties

Elevatio Ground	Elevation reference: Unknown Ground surface elevation: Unknown		Well completed: Not Applicable Casing devation: Unknown					AS-BUILT DESIGN	Page 1 of 1
HLLAN)	SOIL DESCRIPTION		SAMPLE TYPE	SAMPLE NUMBER	BLOW	OVM READING	OROUND WATER		TESTING
	Asphalt and base course over n brown, fine SAND with some sit sandy SLT layer at 3.0 feet), non-odorous	ncist, (5-inch		GP-7/*				Bentonite	
- 5 -	Moist, brown, silty, gravelly SANL wood debris and very viscous U grading to fine grained wood d	owith H ebris		4.0 GP-7/- 5.5	-	-			WIPH-C/ STEX WIPH-O Ed.
	Bottom of boring at 7.0 feet, refusal.	due to		-					
- 10 -				- - -	-		-		
		-				-			
- 15 -				-	-	-			
		-		-		4			
		1		•		4			
- 20 -		-		-	-				
		1							
- 25 -		-			-		-		
20									
 	LEGEND 2-inch O.D. Geoprobe sample Observed groundwater level ATD = of time of chilling	025460 00/00 0/00/00 100+0/ 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+0 100+000+0	ed gro }= dati lytical (	undwole a observe leating	ir Sevet Ici			AGRA Earth & Environmental 11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	
#### Mobil Oil/ADC Bulk PROJECT: Plant Properties

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

Elevation	a reference: Unknown Well con surface elevation: Unknown Casing e		AS-BUILT DESIGN	Page 1 of 1				
HLLand	SOIL DESCRIPTION	SAMPLE	AAMPLE NUMBER	BLOW	OVM	<b>OROUND</b> WATER	Rush-mounted cast iron monument	TESTING
- 0 -	Asphalt and base course Minor recovery, moist, dark gray SAND,		62.8/ 3.0			•	Ground surface Top of cosing Asphalt Bentonite	
- 5 -	slight petroleum odor Moist, black to gray/green, fine sandy SILT with wood debris, 1° thick zone of LPH Rine grained wood debris saturated with LPH over gray/green SILT		GP-8/ 9.0		- -	1/2/76	Casing (Schedule-80 1-inch I.D. PVC) 10-20 sand filter pack Screen	WIPHG
- 10 -	Mionr recovery - sitty, fine SAND over fine grained wood debris, petroleum odor				-	_	(1-inch I.D. PVC with 0.028-inch slots) Stip end cap	STEX WIPH-D E
	Bottom of boring at 11 feet.				-			
15 -			-		-	_		
			-			_		
20-	-		-					
	-							
25 -	-		-	-		-		
			-		j			
30 L	LEGEND							
	1-inch O.D.     Col       Geoprobe sample     Axxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	voo = : naiyik	giounaw date ober ci testing	uved Ived	ul		Earth & Environmental 11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

Dtilling completed: 20 March 1996

#### Mobil Oll/ADC Bulk PROJECT: Plant Properties

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

Eleveti Groupe	on reference: Unknown I surface elevation: Unknown	Well com Casing els		AS-BUILT DESIGN Page 1 of 1						
(lool) Hi'Yel	SOIL DESCRIPTION		<b>JAMPLB</b> TYPB	AAMPLE NUMBER	BLOW	OVM READING	DROUND	Flush-mounted cast iron monument	TESTING	
- 0 -	Asphalt and base course Trace recovery; minor gravel ar fragments	xd wood						Ground surface Top of casing Asphatt Bentonite Casing Costand Io. 10		
- 5 -	Minor recovery; moist, gray, fine over minor wood debris and sar with gravel, strong petroleum o	SAND ndy SILT dor		GP-9/ 8.0		310	3/22/90	1-inch I.D. PVC) 10-20 sand filter pack	WTPH-&/ STEX WTPH-D Bd	
- 10 -		_		-	-	-	-	(1-inch I.D. PVC with 0.028-inch slots) Slip and cap		
	Bottom of boring at 12 feet,	•		-						
- 15 -				-		-	-			
- 20 -		  - 		•						
									4	
• 25 -					-				-	
				- 1					1	
30	LEGEND	1				•				
I ×	2-Inch O.D. Geoprobe sample 64 Observed groundwater lavel ATD = at time of chilling	Cherry RANGE C/CO/CO SEX SEX SEX SEX SEX SEX SEX SEX SEX SEX	nd grou = date /fical te	indwate observe	r lavai id			Earth & Environmental 11335 NE 122ad Way, Suite 100 Kirkland, Washington 98034-6918		

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Drilling completed: 20 March 1996

#### Mobil Oll/ADC Bulk **Diant Properties**

### W.O. 11-04558-09 WELL NO. GP-10

PROJE	CT: Plant Prope	rties				W.C	). ]]	1-04558-09 WELL NO. (	77-1U
Elevation n Ground sur	sterence: Unknown face elevation: Unknown	Well con Casing els	picted vatiò	1: 20 Å a: Unk	<i>l</i> larch nown	1996		AS-BUILT DESIGN	Page 1 of 1
HILAEO	SOIL DESCRIPTION		SAMPLE TYPE	SAMPLE NUMBER	BLOW	OVM	OROUND WATER	Rush-mounted cost iron monument	TESTING
	Asphait and base course over m brown/gray, silty, fine SAND, non-odorous Mokt, gray, fine sandy SLT with s gravel, slight petroleum odor	ome		GP-10/ 3.0		مرر	· · · · · · · · · · · · · · · · · · ·	Top of casing Cement Asphatt	
- 5 -	Woody debris saturated with LPh Moist to wet, gray/orange/brown gravely, medium to coarse SANI petroleum odor Wet, brown stained gray, fine sa SILT, strong petroleum odor, mino Wet, brown, fine grained wood o with LPH, minor saturated sand	i D, ndy x LPH Sebits		GP-10/ 7.0		-	3/722/796	(Schedula-80 1-inch I.D. PVC) 10-20 sand filter pack	WT#H-D
- 10	Saturated, gray, fine SAND with v debris, strong sulfur odor, slight petroleum odor Wood fragments	- boox		- ج۹-10/ 11.0	_	- 0.0		Screen (1-inch LD. PVC with 0.028-inch slots) Silp end cap	-
	Bottom of boring at 12 feet.	-				-			
- 15 -	а. 			-					-
- 20 -		-			-		_		
- 25 -					-	-			
		-		-					
	LEGEND inch 0.D. ieoprobe sample & Deserved groundwater level NID = at time of drilling	Como Q/CO/A	wed g D = do clytica	rounchwar ite observ i testing	ter lave ved			AGRA Earth & Environmental 11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

#### Mobil Oll/ADC Bulk

#### PROJECT: Plant Properties

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

	Elevatio Ground	na reference: Unknown V surface elevation: Unknown C	Well completed: 20 March 1996 Casing elevation: Unknown						AS-BUILT DESIGN	Page 1 of 1
	DEPTH (foet)	SOIL DESCRIPTION		SAMPLE	SAMPLE NUMBER	BLOW	OVM READING	<b>GROUND</b> WATER	Rush-mounted cast iron monument	TESTING
	- 0 -	Asphalt and base course over mol brown, silty, fine SAND, non-ociorou Moist, gray, silty, fine SAND with mo	st, s		GP-11/ 3.0		40		Ground surface Top of casing Asphalt Bentonite	
-	- 5 -	Moist, tan grading to gray, fine san SLT with interbedded wood debits, petroleum odor at 4.0 feet Wet to saturated, brown, sity, grav SAND, strong petroleum odor, mino	dy silght eily x LPH		GP-11/ 65		-	¥ 3/22/%	Casing (Schedule-80 1-inch I.D. PVC) 10-20 sand filter pack	`₩77+-D ₩17+-G/ #D2
	- 10 -	Saturated, black, fine SAND, trace petroleum odor	- 		GP-11/ 8.0" - 	_	ao -	_	Screen (1-inch LD. PVC with 0.028-inch slots) Slip end cap	WTPH-0 22
ļ		Bottom of boring at 12 feet.			-					
	- 15 -					-	-	-		-
	20 -		-		- - - - -	-				• • •
	25 -		-	1						
			4		- - -		-			-
<u>ormonial, in</u>	30	LEGEND	1							
AGRA Early an	ـــــــــــــــــــــــــــــــــــــ	2-inch O.D. Geoprobe sample Control groundwater level ATD = at time of datiling		vea gra ) = dat Micali	e observi e observi iesting	er isvef ect			Earth & Environmental 11335 NE 122ad Way, Suite 100 Kirkland, Washington 98034-6918	

# Mobil Oll/ADC Bulk PROJECT: Plant Properties

### W.O. 11-04558-09 WELLNO. GP-12

Elevation reference: Unknown Ground surface elevation: Unknown	Well completed: 20 March 1996 Casing elevation: Unknown						AS-BUILT DESIGN	Page 1 of 1
SOIL DESCRIPTION		SAMPLE TYPE	SAMPLE SAMPLE NUMBER	BLOW	OVM READING	GROUND WATER	Rush-mounted cast iron monument	TESTING
Asphalt and base course over black, gravely SAND, slight per odor	moist, troieum						Gitcund sufface Top of cosing Cernent	
Moist, gray/brown, fine to coar grading to brown, fine SAND w gravel, non-odorous	se SAND ith some						Asphalt Casing	
5 -	<b></b>		GP-12/ 8.0	-	-		(Schedule-80 1-inch LD, PVC) 10-20 sand filter pack	5 • •
	-				-	3/22/96	(1-inch I.D. PVC with 0.028-inch stots)	
10 - Wet, gray stained globules bloc SAND with gravel, strong petrol odor and minor LPH globules	sk fine eum		GP-12/ 10.0 GP-12/	-				WIRK
Saturated, gray, fine SAND with gravel, strong petroleum odor, i globules of LPH	some minor		11.0 GP-12/ 12.5		32		Sip end cap	WIPHO
15 - Bottom of boring at 14 feet.				-		-		
	•				-			
20 -	Ļ			•		-		
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	4			-				
25 -	]			-		-		
	a a							
30 LEGEND		erved	groundw					
		V00= 0	icte obre	wed	-1		Earth & Environmental	

Drilling completed: 19 March 1996

#### Mobil Oll/ADC Bulk PROJECT: Plant Properties

#### W.O. 11-04558-09 WELL NO. GP-13

Elevatio Ground	e reference: Unknown surface elevation: Unknown	Well con Casing el	Well completed: 20 March 1996 Casing elevation: Unknown AS-BUILT DESIGN						Page of 1	
(teel)	SOIL DESCRIPTION	1	<b>JAMPLE</b>	BL/L	NUMBER	BLOW	OVM	DROUND		TEST
- 0 -	Asphalt over dense, molst, gr gravely, fine to coarse SAND, non-odorous	<b>ду.</b>		G.	- 13/				Benlonite odbandonment	
	Grades to molst, gray/black, g fine to medium SAND, non-cd	proveily, onous		G.	-13/		-			WP
10	Wet/saturated, gray/black, sit SAND with some gravel and so debris, organic odor	y, fine me wood -		ср 10 7 4 3	-13/ 10	-		ATD		WIPH- BRE WIPH-Q
[	Bottom of boring at 12 feet									
15 -								-	•	
20 -										
25 -						•	· • •		- -	
		-					4			
30 L		1							· · ·	
Ţ	LEGEND 2-Inch O.D. Geoprobe sample Observed groundwater lawat ATD a of time of chilling		rved 00=:	l grour date :	ndwat obeen	ier ievei vect	I		AGRA Earth & Environmental 11335 NE 122ad Way, Suize 100	

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

BORING NUMBER ______

W.O. <u>W-4558-1</u>

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION Ground Surface Elevation Approximately Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	ST 0	ANDAF (14 10	RD PEN BLC 0 Ib. ha 20	LETRAT DWS PEI mmer, 3 D	TION I R FOO 0 Inch 30	RESIS T drop)		Έ.
Loose, wet to saturated, brown-gray, silty fine SAND and fine sandy SILT with a trace of gravel	-0							j	1	1 1	Ĭ	Ĩ
(Fill)	$\mathbf{F}$			$\nabla$								
	<u> </u>		┥┹╌│		·	▲						
Very loose to loose, saturated, gray, silty fine to medium SAND with a trace of grayel (Fill)	-5							·			-	·
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	-10				┃							
Total doth 111 fast												
Boring completed 9 March 1988	-							-				
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SAMPI ING	‡0			[		ļ			· ·	 		
I 2' OD SPUT SPOON SAMPLE	UND	WAT	ER Ø	SEAL					RY T	ESTS		
2.5' ID SHELBY SAMPLE WA	TERL	-EVEL	V	DATE			NP	NON PLA	STIC			
ULK SAMPLE AT TIME : * SAMPLE NOT RECOVERED	OF DF	RILLING		OBSERV WEL	VATION	۱ /	/				.IMIT TER	
			_			Z	PLASTIC	C LIMIT	ONTE	,		

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

BORING NUMBER _______

W.O. <u>W-4558-1</u>

PROJECT NAME Mobil 011 - Everett Buik Plant

SOIL DESCRIPTION	Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	s 0	STAN	DAR (140	D PE	NET LOWS	RATI PER Pr, 30	ON F FOO: Inch	RESIS r drop)	STAN 40	CE
Loose to medium dense, wet to saturated, g brown-gray, silty fine SAND and fine sandy with a trace of gravel (Fill)	gray and y SILT	-0 <b>-</b> - -			⊻.										
Very loose to loose, saturated, gray, silty SAND with a trace of gravel (Fill)	/ fine	-5		T				· · · · · · · · · · · · · · · · · · ·			· · ·				·
Soft, saturated, brown, silty PEAT Total depth 11½ feet		-10							·····					····	····
- Boring completed 9 March 1988	-	-15						······						 	
	-	-20				· · · · · · · · · · · · · · · · · · ·	••••••		· · · · · ·				• • • • • • • • • • • • • • • • • • •		
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							1988a - Balda 2008a - Balda 1989a - Balda			P 1.					
SAMPLING I 2° OD SPLIT SPOON SAMPLE II 3° OD SHELBY SAMPLE 7 2.5° ID FING SAMPLE BUILK SAMPLE	GROU	O JND	WAT EVEL		SEAL DATE	<u><u><u></u></u></u>			LAE • %		ATOF TER C	Y TI 2011	EST	3	
* SAMPLE NOT RECOVERED	AT TIME (	JF DF	BLLING		UBSER\ WÉLI	L TIP	JN:	Ź	PLAST		NA CC MIT		L WA	TER	

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

BORING NUMBER _______

PROJECT NAME Mobil Oil - Everett Bulk Plant

SOIL DESCRIPTION Ground Surface Elevation Approximately	Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	s o	TAN	DAR (140	D PE		RATI PER ar, 30	ON f FOO Inch	RESIS T drop)	STAN 1 40	CE
Loose, wet to saturated, dark brown, gray silty, fine SAND with a trace to some woo (Fill)	velly, od debris	-			V										
Very loose, saturated, wood debris		-5				 				· · · · ·		  	-	       	
Very loose to loose, saturated, dark brow and gray, silty, fine SAND (Fill)	m-gray	-						·		· · · · ·					
Soft, saturated, brown, silty PEAT		-10									·····				
Total depth 11½ feet Boring completed 9 March 1988						······								<b>.</b>	
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II 3' OD SHELBY SAMPLE 2.5' ID RING SAMPLE BULK SAMPLE	WA1 AT TIME C	FER L	EVEL			۵۳۱۰۰	ч		• % NP		ER C PLAS		INT OUID :	1 (MIT	
* SAMPLE NOT RECOVERED	I III III				WELL	TiP	1	2	LAST		NA CC IIT		L WAT	fEA	

RITTENHOUSE-ZEMAN & ASSOC., INC. Ge

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BORING NUMBER _MH-10

w.o. W-4558-1

otechnical /	Hydrogeological	Consultants
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PROJECT NAME _Mobil 0il - Everett Bulk Plant

DEPTH (FEET) TESTS STANDARD PENETRATION RESISTANCE **SAMPLING** GROUND WATER SOIL DESCRIPTION A BLOWS PER FOOT LAB L (140 lb. hammer, 30 Inch drop) Ground Surface Elevation Approximately Feet a 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)  $\nabla$ Very loose, saturated, dark brown and gray, silty fine SAND (Fill) -5 -10 Soft, saturated, brown, silty PEAT Total depth 11½ feet Boring completed 9 March 1988 15 ____ -20 **...** -25 -30 -35 40 GROUND WATER A SEAL SAMPLING LABORATORY TESTS I 2" OD SPLIT SPOON SAMPLE WATER CONTENT I 3' OD SHELBY SAMPLE DATE NP NON PLASTIC 2.5" ID RING SAMPLE - LIQUID LIMIT BULK SAMPLE OBSERVATION NATURAL WATER WELL TIP * SAMPLE NOT RECOVERED CONTENT - PLASTIC LIMIT



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

BORING NUMBER MU-11

W.O. <u>W-4558-1</u>

PROJECT NAME Mobil Oil - Everett Bulk Plant

Ground Surface Elevation Approximately	Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	0 0	TAN	DAR (140	DPE ABL	NETI LOWS	RATI PER Ir. 30	ON F FOOT Inch	iESIS r drop)	TAN 10	CE
Very loose, wet to saturated, gray and be silty, fine SAND with a trace of gravel a debris (Fill)	rown-gray, Ind wood		•		V		• · · · · · · · · · · · · · · · · · · ·					- - - - - - - - - - - - - - - - - - -			
Loose to medium dense, saturated, gray, s SAND with some fine sandy SILT and a trac gravel (Fill)	ilty fine e of	-5		I											· · · · · · ·
		- -10						·	·	·	······	 	 	··· ··	
Soft, saturated, brown, silty PEAT Total depth 11½ feet Boring completed.9 March 1988		- -						· ·	· · · · · · · · · · · · · · · · · · ·		н. 			·····	
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SAMPLING I 2' OD SPLIT SPOON SAMPLE II 3' OD SHELBY SAMPLE	GRO	UND	WAT		SEAL DATE	ł		,	LAE • %	BORA WAT			ESTS	! }	
* SAMPLE NOT RECOVERED	AT TIME (	FDFDF	LEVEL NLLING	<del>⊼¥6</del> ⊥ L	OBSER	VATIC L TIP	)N	2,	PLAST				QUID L WA'	Limit Ter	

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

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BORING NUMBER ________

- W.O. <u>W-4558-1</u>

PROJECT NAME __Mobil 0il - Everett Bulk Plant

SOIL DESCRIPTION	Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	STANDARD PENETRATION RE BLOWS PER FOOT (140 lb. hammer, 30 inch d 0 10 20 30						RESIS T drop)	SISTANCE		
Loose, wet to saturated, gray and brown-g silty, fine SAND with a trace of gravel an debris (Fill)	ray, nd wood	-0 -		I	▽										
Very loose to loose, saturated, gray, silt to medium SAND with a trace of gravel (Fil	y, fine	-5					· · · · · · · · · · · · · · · · · · ·		-					· ·	· · · · ·
Soft, saturated, brown, silty PEAT Total depth 11% feet		-10													· · · · ·
Boring completed 9 March 1988		- -15	i		:	· · · · · · · · · · · · · · · · · · ·			· · ·					· · · ·	
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SAMPLING	4	0							····						
I 2' OD SPLIT SPOON SAMPLE II 3' OD SHELBY SAMPLE 2.5' ID RING SAMPLE BULK SAMPLE * SAMPLE NOT RECOVERED	GRU( WA AT TIME (	UNU TER L DF DR	EVEL		SEAL DATE OBSERI WELI	/ATIC L TIP	N	1				TIC STIC TURA ATURA DNTEI	ESTS ENT IQUID AL WAT	) LIMIT TER	

RITTENHOUSE-ZEMAN & ASS Geotechnical / Hydrogeological C	OC., onsul	INC. tants	2	BOF PRC	RING I		<u>er M</u>	4-13 obil (	- Dil -	Ever	W.O. ett B	. <u></u>	<u>4568-1</u> 2)ant	L
SOIL DESCRIPTION	epth (Feet)	B TESTS	MPLING	KOUND ATER		STAN	NDAF	1D P5 ▲ 8 0 15.1		RAT 3 PER er, 30	ION I FOO	RESI: T	STAN	ICE
Ground Surface Elevation Approximately Feet		<b>1</b>	SA	AR N	0		10		20		30		40	50
Loose, wet to saturated, brown-gray, silty fine SAND with a trace to some gravel and wood debris (Fill)			]* 	V			····							- un
Loose, saturated, gray, silty SAND with some gravel (Fill)	5										-	-		
	10		B			-					- -		-	· · · · · ·
Total depth 11 ¹ / ₂ feet Boring completed 9 March 1988								······					· ····	
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SAMPLING GR I 2" OD SPLIT SPOON SAMPLE II 3" OD SHELBY SAMPLE 2.5" ID RING SAMPLE W BULK SAMPLE AT TIM		WATE		DATE	γΑτι				BOR & WA NON	ATO TER ( PLA:	RY T CONT STIC	EST ENT	S	<b></b> -J
* SAMPLE NOT RECOVERED			[	WEL	L TIP		Z	r PLAS	L. LI DIT	N. Ci MIT		AL WA	TER	

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

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BORING NUMBER <u>MW-14</u>	
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PROJECT NAME Mobil 011 - Everett Bulk Plant

W.O. <u><u>W-4558-1</u></u>

SOIL DESCRIPTION	Feet	DEPTH (FEET)	LAB TESTS	SAMPLING	GROUND WATER	0	BTAN	DAR (140	DPE ABi bb.h	NET LOWS Iammi 20	RATI PER ar, 30	ON F FOOT	RESIS r drop)	TAN	CE
Very loose to medium dense (variable), we saturated, dark brown to black, silty fin with some zones of wood, brick, etc. (Fi	et to ne SAND 11)	-0 1		<b>T·</b>	V.								-		
Loose, saturated, gray, silty SAND with a some gravel (Fill)	trace to	- -5									· · · · · · · · · · · · · · · · · · ·				
		-10													
Soft, saturated, brown, silty PEAT Total depth 11% feet Boring completed 9 March 1988							· · · · ·					- m. 			
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SAMPLING I 2' OD SPLIT SPOON SAMPLE I 3' OD SHELBY SAMPLE 7 2.5' ID RING SAMPLE	GROU		WATE		SEAL DATE				LAE • %	BORA WAT	ER O		ESTS	<u> </u>	<b></b>
BULK SAMPLE * SAMPLE NOT RECOVERED	AT TIME O	of Dri	ILLING	•707	OBSERV WELL	ATIC	N	Ź,	PLAST				iduid Il Wa' It	limit Teri	

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

KZA

BORING NUMBER _________

W.O. <u><u></u><u>W-4558-1</u></u>

PROJECT NAME Mobil Oil - Everett Bulk Plant (FEET) TESTS ...... STANDARD PENETRATION RESISTANCE SAMPLING GROUND WATER SOIL DESCRIPTION DEPTH ( A BLOWS PER FOOT LAB (140 lb. hammer, 30 inch drop) Ground Surface Elevation Approximately Feet n 10 20 30 40 50 n Very loose to loose, wet to saturated, dark brown and gray, silty fine SAND with a trace of gravel and wood debris (Fill)  $\nabla$ 5 Very loose, saturated, gray, silty, fine SAND with a trace of gravel (Fill) 10 Soft, saturated, brown, silty PEAT Total depth 113 feet Soring completed 9 March 1988 15 . .. . 20 -25 ·30 -35 40 GROUND WATER D SEAL SAMPLING LABORATORY TESTS I 2' OD SPLIT SPOON SAMPLE % WATER CONTENT I 3° OD SHELBY SAMPLE DATE NP NON PLASTIC 2.5" ID RING SAMPLE WATER LEVEL AT TIME OF DRILLING ATD BULK SAMPLE - LIQUID LIMIT OBSERVATION WELL TIP NATURAL WATER ★ SAMPLE NOT RECOVERED CONTENT PLASTIC LIMIT

RITTENHOUSE-ZEMAN & ASSOC., INC.

**KXA** 

BORING NUMBER ________

W.O. <u>W-4558-1</u>

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Georgenical / Hydrogeolog	ical Co	nsul	tants		PRO	JECT	NAM	<u>M</u>	obil	<u>011 -</u>	Ever	<u>et</u> t (	<u>duik</u> (	Plant	
SOIL DESCRIPTION		EPTH (FEET)	AB TESTS	AMPLING	ROUND A TER	s	TAN	IDAF (14	RD PE		RATI 3 PER er, 30	ON FOO	RESIS T drop)	STAN	ICE
Ground Surface Elevation Approximately	Feet			Ś	50	0		10		20	:	30		40	
Loose to medium dense, wet to saturated, b gray, gravelly, silty SAND with a trace to wood debris (Fill)	) rown - 9 Some			Ī	⊻.					····					
														· · · · · · · · · · · · · · · · · · ·	· · · · · ·
Soft, saturated, brown, silty PEAT Total depth 11 ¹ / ₃ feet		-10									· · · · · · · · · · · · · · · · · · ·			· · · · ·	
		-15							- 10 						
		- - -20				· · · · · · · · · · · · · · · · · · ·	·····	******			· · · · ·	- <b>-</b> -			
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SAMPLING I 2' OD SPLIT SPOON SAMPLE II 3' OD SHELBY SAMPLE 7 2.5' ID RING SAMPLE BULK SAMPLE * SAMPLE NOT RECOVERED	GROI WA AT TIME (	UND TER L OF DF	WATI		DATE OBSERV	VATIC L TIP	N	Ĺ						LIMIT TÉR	,

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

SORING NUMBER _______

W.O. <u>W-4558-1</u>

.

Geolechnical / Hydrogeological	Consu	ltant	5	PRC	JECT	NAM	EM	obil	011	- Eve	rett	<u>Bulk</u>	Plant	
	JEPTH (FEET)	AB TESTS	AMPLING	ROUND VATER	5	STAN	IDAF (14	RDP ALE	ENE LOW	TRA1 'S PEI ter, 3	TION R FOC 9 Inch	RESI T drop	STAN	ICE
Ground Surface Elevation Approximately Fe	et O		O	05	0		10		20		30		40	5
Loose to medium dense, wet to saturated, brown- gray to gray, silty, fine to medium SAND with a trace of gravel (Fill)				V		··· · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · ·				
<ul> <li>Very loose, saturated, gray, silty, fine to media SAND with trace of gravel, wood debris and black organics (Fill)</li> </ul>	um -5	·				· · · · · · · · · · ·	· · · · · ·			· · · · · · · · · · · · · · · · · · ·				
Soft, saturated, brown, silty PEAT		I								•• •• 	-	-		
lotal depth 11 ³ 4 feet Boring completed 10 March 1988 -	-15				·		·							
	-					 								-
ل ا ا	-20				•			· · · · · ·	•	· · ·				
	-25				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	····		· · · · · ·
	-				·····	· · · · · · · ·		· · · · ·	· · · · ·	· · · · · ·				
	-30	-	- - -		- 1,	·		 		· · · · · ·				· •
	-35				·				· · · ·	· · · · · · · · · · · · · · · · · · ·				
	40			-		•			·	· · · · ·	-			
SAMPLING GI I 2' OD SPLIT SPOON SAMPLE II 3' OD SHELBY SAMPLE 2.5' ID RING SAMPLE JULK SAMPLE AT TH * SAMPLE NOT RECOVERED	WATER ME OF D	LEVEL		DATE OBSERV		1	·			ATO				<b></b> ]
· <del>-</del>			L				L	PLAS		C MIT	ONTE	ТИ		

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нла RITTENHOUSE-ZEMAN & ASSOC., INC. BORING NUMBER MM-18 W.O. ____4558-1 Geotechnical / Hydrogeological Consultants PROJECT NAME Mobil Oil - Everett Bulk Plant DEPTH (FEET) TESTS STANDARD PENETRATION RESISTANCE SAMPLING SOIL DESCRIPTION GROUND WATER A BLOWS PER FOOT . By (140 lb. hammer, 30 inch drop) Ground Surface Elevation Approximately Feet 10 20 30 40 Loose to medium dense, wet to saturated, dark brown to black, gravelly, silty, fine SAND (Fill)  $\nabla$ 5 Loose, saturated, gray, silty, fine to medium SAND with a trace to some gravel and wood debris (Fill) 10 Soft, saturated, brown, silty PEAT Total depth 111/2 feet Boring completed 10 March 1988 15 -20 -25





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Bellevue, Washington 98007 (206) 7-16-8020



RITTENHOUSE-ZEMAN & ASSOCIATES, INC.



Geotechnical Consultants 1400 140th N.E. Bellevue, Washington 98007

(206) 746-8020



#### W.O. W-4558-3 WELL NO. MW-27

	i surface elevation:	Casing	; elev	ation:	20 00	une I:	997	AS-BUILT DESIGN	
DEPTII (feet)	SOIL DESCRIPTION		SAMPLE	SAMPLE	BLOW	OVM READING	GROUND	Flush-mounted steel monument	
	2" Asphall. Medium dense, moist, gray, s							Ground surface Top of casing Concrete Bentonite sea/	
5 -	fine SAND with hydrocarbon o	ndor -		5-1	15		ATD	Casing (Schedule-40 2-inch I.D. PVC)	
	Loose, wet, brown, PEAT with	oily		- - -				< 10-20 sand filler pack	
10 -	sheen and hydrocarbon odor			5-2	2		-	Screen (2-inch I.D. PVC with	80 41 81 60
	^r Loose, moist, gray, medium 3 hydrocarbon odor and sheen	AND -		-3-	4			Threaded end cap	80 41. 87. 60
15 -	Boring terminated at 13.5 feet.			+					
		-		4					
20 -						·.			
		4							
		4		4					
5 -				+		+			
i0		]		-		1		·	
I	LEGEN 2-inch 0.D. spiil-spoon sample	νD Obsern (ATD =	ved gro = al lin	undwat ne of di	er leve rilling)	ei I	Ē	RZA RITTENHOUSE-ZEMAN &	

W.O. W-4558-3 WELL NO. MW-28

~	Eleva Grou	ation reference: nd surface elevation:	Well con Casing	mple eleva	ted:	20 JL	ine 15	991	AS-BUILT DESIGN	
	O DEPTH (feel)	SOIL DESCRIPTION		SAMPLE TYPE	SAMPLE NUMBER	BLOW	OVM READING	GROUND WATER	Flush-mounted steel monument	TESTING
		2" Asphall. 3 inches brown/gray sandy	GRAVEZ		- -				Top of casing Concrete Bentonite seal	
	5 -	Loose, moist, gray silly line	SANO		5-1	2	-	ATD	Casing (Schedule-40 2-inch I.D. PVC)	
		Loose, moist, brown, PEAT lo strong hydrocarbon odor	ver,		5-2	2			< 10-20 sand filler pack	
	10 -								Screen (2-inch I.D. PVC Wilh 0.02-inch slots)	418,1 872x - 6010
		Loose, moist to wet, brown, s medium SAND with organics ( moderate hydrocarbon odor	vilty [peat]; -		5-3.	2			Threaded end cap	8015 418 1 67EX 6010
Ĺ	15 -	Boring terminated at 13.5 feet				Ē	+			
				ļ						1
	20 -					-	•.			4 4 4
	5 -	v								-
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			-		-					4
- 3	- بل			<u> </u>					· · · · · · · · · · · · · · · · · · ·	]
	3013 112 1 817X	2-inch 0.D. split-spoon sample Aio Soil Analysis (EPA Method shown)	→ L⊃ Observed - (ATD = a	i grou it time	ndwate: e of dri	level lling)		HNE	RZA RETENHOUSE-ZEMAN & ASSOCIATES, INC. Geolechnical & Environmental Consultants	
	( <u>8010</u> Deill	ing started: 20 /ups 1001	D_(1)	,					Bellevue, Weshington 98005	

Drilling started: 20 June 1991 Drilling completed: 20 June 1991

Logged by: JK

#### W.O. W-4558-3 WELL NO. MW-29

Eleva	ition reference:	Well co	mple	eted:	20 Ji	ine ts	991	AS PHILE DESIGN	
		Casing	elev:	ation:		1 75		AS-BUILI DESIGN	Ŋ
DEPT (feet)	SOIL DESCRIPTION		SAMPL	SAMPLI	BLOW	0VM EADING	ROUNE	Flush-mounted steel monument	TEST
Γ°-	2" to 3" Asphalt.		<u> </u>				9	Ground surface	
	Loose, moist, gray, sandy, g	ravel		-				Top of casing Concrete Bentonite seal Casing	8015
- 5 -	Loose, moist, gray fine sond grading into silty fine sand	y <i>SILT</i>		S-1	3		ATD	(Schedule-40 2-inch I.D. PYC)	478,7 BTEX 8010
	Loose, wet, black oil-saturate PFAT with wood	ed _		5-2	5			2 10-20 sand filler pack	8015 418 1 872X
- 10 -	I LAT WITT WOUL							(2-inch I.D. PYC with 0.02-inch slots)	<u>6010</u>
┝──┥				5-3	50/ 3"			Threaded end cap	
	Boring terminated at 13.5 feet	<u> </u>		1					
				+		+			-
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	LEGEI	4D							
Ţ	2-inch 0.D. split-spoon sample	Observe (ATD =	d grou at time	ndwate: e of dri	r level lling)		F	ZA RETTENHOUSE-ZEMAN &	
3013 418.1 815.7 6010	Soil Analysis (EPA Method shown)	Sample n	ol rec	overed				Geolechnical & Environmental Consultants 1400 140th Ave NE Bellevue, Washington 98005	
UUII	ing started: 20 June 1991	Dril	ling (	compi	leted:	20	June	1991 Logged by: JK	

#### W.O. W-4558-3 WELL NO. MW-30

Elevatio	n reference: surface elevation:	Well comp	leted:	20 J	une 1	991	AS-BUILT DESIGN	
DEPTII (feet)	SOIL DESCRIPTION	SAMPLE	SAMPLE	BLDW COUNTS	DVM READING	GROUND	Flush-mounted steel monument	DNITESTING
$ [ \circ F ] $	2" Asphalt.				1		Ground surface	
	Loose, moist, gray, silty SAN						Concrete Bentonite seal Casing	
- 5	Loose, moist, gray, silly line		; - <i>ב</i> ן '	' 5 		ATD	(Schedule-40 2-inch I.D. PVC)	Ľ
	LOUSE, DIGER, ONY WOOD ONG I						2000 10-20 sand III.er pack	8015
	Very loose, wet, oily, gray me SAND with organics (wood an	dium	5-2	2			Screen (2-inch I.D. PYC	418.1 BTEX 6010
						-	₩iLh 0.02-inch slots)	- 8015
	Loose, wet (oily), black/browi and wood		5-3	8	_		Threaded end cap	418,1 BTEX 6010
15	Boring terminated at 13.5 feet		}	1	1	Ī		
- 15 -			-	<u> </u>	Ť			-
								-
- 20 -			-					-
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		-	-		1			-
- 25 -			1	-	+			-
			-		-			
			4	ĺ	1			-
. ₃₀	<u>, "</u>							]
7 2	-inch 0.D.	ND Observed a	าวมากรัษ	ter law	<b>-</b> ł	т	TT & RITTENHOUSE-TEXIN A	
	plit-spoon sample	Sample not	ime of	drilling)	)		CALLA ASSOCIATES INC. Geolechnical & Environmental Consultants 1400 140th Ave NE Bellevue, Washington 98005	
Drillin	g started: 20 June 1991	Drillin	g con	piete	d: <i>20</i>	) June	1991 Logged by: ./K	

Elevat	tion reference: 100.00 feet Well con Id surface elevation: Unknown Casing e	mpleted levation	1: 07 De n: 98.58	ecem I feet	ber 19	93	AS-BUILT DESIGN	Page 1
DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW	OVM teading	ROUND	Flush-mounted steel monument	TESTIN
	Asphaltic Concrete		<u></u>		<u> </u>		Ground surface	<u> </u>
- 5 -	Medium densø, wet, brownish-gray, fine SAND with gravel (Fill). Slight pertoleum- like odor observed		S-1	25	5		Top of casing Cement BentonIte Casing (Schedule-40 2-inch (D. RVC)	
- 10 -	Loose, wet to saturated, dark greenish- gray, SAND with some gravel and wood debris (Fill)		S-2	6	5	12/8/93	10-20 sand filter pack Screen (2-Inch I,D, PVC	
	Medium dense, saturated, dark gray, medium SAND with wood debris		S-3	22	5		with 0.010-inch slots) Riveted slip cap	
- 20 -	Bottom of boring at 15 feet.							
- 25 -				A				
	4				4			
30			-		1			
⊥ ▼	LEGEND 2-inch O.D. split-spoon sample Observed groundwater level	<u> </u>	<u> </u>		<u> </u>	 	RZA AGRA, Inc. Seotechnical & Environmental Group	
0/00/0							11535 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

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Elevatio Ground	on reference: 100.00 feet Well con surface elevation: Unknown Casing el	npleted levation	l: 07 De n: 99, 17	ecem 7 feet	ib <del>o</del> r 19	93	AS-BUILT DESIGN	Page 1
DEPTH ((cei)	SOIL DESCRIPTION	SAMPLE SAMPLE	SAMPLE	BLOW	OVM	ROUND	Flush-mounted steel monument	TESTING
	Gravel surface	<u> </u> 					Ground surface	
- 5 -	Mediun dense, wet to saturated, greenish-gray, gravelly, medium SAND (Fill) –		S-1	13	5	12/8/93	Cement Bentonite Ccsing (Schedule-40 2-Inch I.D. PVC)	
- 10 -	Médium dense, saturated, grayish-dark brown, medium SAND with gravel, some silt and wood fragments		S-2	17	5	_	10-20 sand fitter pack Screen (2-inch I.D, PVC with 0.010-inch slots)	
- 15 -	Medium dense, saturated, grayish-dark brown, silty, fine to medium SAND with some gravel and wood fragments		S-3	17	5		Riveted slip cap	
	Bottom of boring at 15 feet. No unusual staining or petroleum- like odors observed.				-			
- 20 -	- - - -			-	-	-		
• 25 -					+	-		
					, ,			
			4					
	LEGEND 2-inch O.D. split-spoon sample			1			RZA AGRA, Inc. Geotechnical & Environmental Group	· <u>·</u>
	Observed groundwater level à: 0/00/00 = date observed						11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

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	Elevati Ground	ion reference: 100.00 feet Well co d surface elevation: Unknown Casing e	mplei elevat	ion: 97	Dece	ember	1993	AS-BUILT DESIGN	Page 1
	DEPTH (feed)	SOIL DESCRIPTION	AMPLE	AMPLE	UMBER	SINDO	COUND	Flush-mounted	of 1 ESTING
	0 -	Asphaltic Concrete		<u>~   %</u>	<u>z =</u> 			Ground surface	
		Medium dense, wet to saturated, gray, medium to coarse SAND with some gravel (Fill)			2	5	12/8/5	Cement Bentonite	
	5 -	Medium dense, saturated, greenish-gray, silty, fine to medium SAND (Fill)				5	+	(Schedule-40 2-inch I.D. PVC)	
		Loose, safurated, brown, silty PEAT	┫ ┨ ┨ ┨ ╷		5	5		10-20 sand filter pack	
	10 -	Loose to medium dense, saturated, gray to brownish-gray, SAND with trace to some silt, gravel and wood fragments		S-4	8	5		Screen (2-inch I.D. PVC with 0.010-inch slots)	
		(Chunk of wood stuck in sample tube; S-5. blow count probably not representative)		<b>s-</b> 5	50/ 5	5		Riveted slip cap	
				S-6	11	5	       		
- 2	20 -	- -		S-7	6	5			
		- - - - - - - - 		S-8	10	5	•	Native soil backfill (caved)	
- 2	5 -			\$-9 -	17	5			
		Very stiff, saturated, brown, clayey SiL1 with organics (PEAT-Like)		S-10	14	5			
		Bottom of boring at 29 feet		s-11	17	5	_		
ال ا	0	No unusual staining or petroleum- like odors observed, LEGEND	<u> </u>	<u> </u>	[		1	RZA AGRA, Inc. Geotechnical & Environmental Group	
<u> </u>		2-inch O.D. spill-spoon sample 0/00/0 G/00/0	vəd gr 0 = da	ioundwi ite obse	ster levi Ned	91		11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

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Elevation reference: 100.00 feet	Well completed	i: 06 De	ecem	ber 19	93	AS BUILT DESIGN	Page 1
Ground surface elevation: Unknown	Casing elevation	n: 103.9	o feel	t 1		AS-BUILT DESIGN	of 1
	SAMPLE	SAMPLE	BLOW	OVM READING	GROUND WATTER	Flush-mounted steel monument	TESTING
Dense, molst, gray, silty, fine to m SAND with some gravel	nedlum	S-1	38	0		Ground surface Top of casing Cement Bentonite Casing (Schedule-40 2-inch I.D. PVC)	-
Loose, moist to saturated, gray, f sandy SILT with some gravel	ine	S-2	6	0	12/8/93	Screen (2-inch I.D. PVC with 0.010-inch slots)	-
- 15 - Bottom of boring at 15 feet.		S-3	4	0		Riveted slip cap	
Field FT-IR analysis of samples and S-2 Indicated TPH concentrations of <50 ppi	s S-1 m.	-				·	
			-				
- 25 -					-		
30-				-			<u> </u>
LEGEND 2-inch O.D. split-spoon sample						RZA AGRA, Inc. Geotechnical & Environmental Group	
Observed groundwater level     Observed groundwater level     Official D/D0/00 = date observed						11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	1

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Elevation reference: 100.00 feet Ground surface elevation: Unknown	Well complet Casing elevat	ted: 06 De ion: 09 01	eet	ber 19	93	AS-BUILT DESIGN	Page 1
SOIL DESCRIPTION	SAMPLE	TYPE SAMPLE NUMBER	MO.IH	OVM	ROUND VATER	Flush-mounted steel monument	of 1 TESTING
0 Medium dense, moist, blackish fine to medium SAND with som	-gray, silty, le gravel	S-1	19	0	12/8/93	Ground surface Top of casing Cement Bentonite Casing (Schedule-40 2-inch I D. BVC)	
Becomes very loose, with incre content 10 -	easing siit		2	0		Screen (2-inch I.D. PVC with	
Wood debris 15 Bottom of boring at 15 feet		5-3	4	0		Riveted slip cap	
- 20 -					_		
- 25 -					-		
30							
LEGEND 2-inch O.D. split-spoon sample						RZA AGRA, Inc. Geotechnical & Environmental Group	
Observed groundwater level 0/00/00 = date observed						11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

Elevation reference: 100.00 feet Ground surface elevation: Unknown	Well completed Casing elevation	l: 06 De n: 103.8	ecemi 7 feet	ber 19	93	AS-BUILT DESIGN	Page 1
SOIL DESCRIPTION	SAMPLE	SAMPLE	RI,OW COUNTS	OVM	ROUND WATER	Flush-mounted steel monument	TESTING
Medium dense, moist, gray, silty medium SAND with trace grave	, fine to	S-1	17	51		Ground surface Top of casing Cement Bentonite Casing (Schedule-40 2-inch I.D. PVC)	
Becomes very loose, saturated; petroieurn-like odor	strong	S-2	3	57	12/8/93	filter pack	
- 10 -			_	-		(2-Inch I.D. PVC with 0.010-Inch slots)	
Very loose, saturated, reddish-br medium to coarse SAND with so trace gravel and organics; petro seepage observed	rown, me siit, bleum	S-3	3	34		Riveted slip cap	
Bottom of boring at 15 feet.							
LEGEND	<u> </u>		<u> </u>	P	k	RZA AGRA, Inc. Geotechnical & Environmental Group	
Observed groundwater level 00,000 = date observed		-				11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

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		CT: Mobil/ADC		W.O. 11	-04558-09 WELL NO. A	/W-38
		or reference: Unknown William Constant Surface elevation: Unknown Constant Surface elevation Surface elevation Constant Surface elevation Surface elevation Constant Surface elevation	Vell completed: 05 June asing elevation: Unknow	ə 1996 vn	AS-BUILT DESIGN	Page 1 of 1
		हु SOIL DESCRIPTION	SAMPLE TYPE SAMPLE SAMPLE NUMBER NUMBER	COUNTS OVM READING GROUND WATER	2' above ground steel monument	TESTING
	- 5	Grass and Roots Loose, moist, dark brown, sitty SAN gravel (strong petroleum hydracarbon-like odor)	D with		Bentanite Casing (Schedule-40 2-inch I.D. PVC)	
	- 10	) - Medium dense, saturated, brown W CHIPS with trace silt (Fill) (strong	10 10 10 10 10 10 10 10 10 10		10-20 sand filter pack Screen (2-inch I.D. PVC with 0.02-inch slots)	-
		petroleum hydrocarbon-like odor)	10.0 11	0.0	Inreaded end cap	
ľ	15	Bottom of boring at 12.5 feet.			· · · · · · · · · · · · · · · · · · ·	· •
	20			· · · · ·		
	25				,	
						-
AGRA Earl	30	LEGEND 2-inch O.D. spit-spoon somple Grob somple	Observed groundwater leve ATD = at time of driting		SAGRA Earth & Environmental 11335 NE 122nd Way, Suite 100 Kirkland, Washington 98034-6918	

HOLE NO. LRW-1 W210-1 TOTAL DEPTH _150 Earth & Environmental DATE BEGUN 6/5/96 EATHER portly cloudy , 50's 41519C DATE COMPLETED **TEST BORING LOG** MOBILIADC GROUNDWATER TABLE RE EDENAME SAMPLING. 11-04558-09 T17 it in suth water ang an this RAC Sector And MEER 6.1 IT IS A LEAD IN 2897-111667 THE AND MALTOR TREA CASCAPE 0430 - - - -HSA 615/46 think to user . SAMAUNG MANANU (SATI STANLARU PENETRADEN TEST TATUBE REBING - D¢M SOIL DESCRIPTION GRASS AND ROOTS OVER BACKFILL BENTINDE TO APPROX. 5.6 Feat m dense, saturated, dark brain silly SAND with GARVER (Sm)- wood debris, free product (oil), strong ail. No sample For memorphyce 15-1 15 5.0 7 6 t stiff, montraturated, brown PEAT - trace silt, strong oder. HAUSINA 5pm. dense, saturated, gray brown SAND with silt(5P)-trace prat, wood debris from 10-10.5 feet, strong octor: HAVU = 40 ppm VPW-1 12 3 Stiff, submated, brown DEAT - treas silt, strong oder HINU = 5 pp-DRILL OUT TO 15' MEAVING SAND 0.5 THREADED CAP. 140 16 - 30" Drop_ BORING LOG SUMMARY

AGRA Facts & Environmental, los "Rev. 7/94)

MONITORING WELL AS-BUILT REPOR
PROJECT No. 11-04558-09
PROJECT NAME MOBIL / MOL
BORING/WELL I.D. Mu-1
DATE 4/5/95
1-
-BOVE GROUND REFER HEIGHT (IF APPLICABLE)
MONUMENT TYPE IF APPLICABLE
WELL CAP TYPE (OCKING
GROUT THE SACKS
BENTONITE SEAL /= SACKS
WELL CASING I.D. 9
TYPE OF CASING <u>Schoole 40 PUC</u>
TYPE OF CONNECTION / hread-d
- FILTER PACK/SIZE/#SACKS_CP(12
SLOT SIZE 0.030
DIAMETER OF BOREHOLE
ENDCAPTYPE thread-d (0.5' prite)
(~

KRW-1 HOLE NO. GAGRA SHEET ( OF ( WRW-1 TOTAL 0891- 15.0 Earth & Environmental DATE BEGUR. 6/5/96 THEF portly cloudy, 50's 415/96 **TEST BORING LOG** DATE COMPLETED SAMPLING GROUNDWATER TABLE - PROJECT NAME MOBIL/ 40C ATDHAT TIME OF DRILLING ASHAFTER SORANG PROJECT NUMBER 11-04558-09 T17 RAL DEPTHIN FEET 6.7 SECLOGIST ENGINEER M PER CALMUL LES ONTRA 0430 DRIGHT CONTACTOR CRED. CASCAPE Title 615196 METHOD USED H34 C ATE SAMPLING METHOD - SPT=STANDARD PENETRATION TEST IT=TUBE REBING - D & M SOFE DESCRIPTION GRASS AND GOOTS OVER BACKFILL BENTINITE TO APPROX. 510 Pear m. dense, saturated, dark brown silty SAND with GAAVER (3m)- wood debris, free product (011), strong sil. No symple For remander 5.0 7 T 5m m. Pt. Stiff, monstraturated, brown PEAT - trace silt, strong odor HNU=14ppm 1.5 G 12 II ip m. dense, salurated, gray brown SAND with silt (SP) - trace prot, 11 11 Sp. m. dense, salurated, gray brown SAND with silt (SP) - trace prot, 12 10-10.5 feet, strong odor. 13 10-10.5 feet, strong odor. 14 NU = 40 ppm t stiff, saturated, brown DEAT - trace silt, strong odor HAV = 5 ppm DRILL OUT TO 15' MEAVENA SAND 0.5 THREADED CAP. 140 16 - 30" Drop BORING LOG SUMMARY
# 🗳 ag ra Earth & Environmental

+2.0

6 SORFACE

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14.0 14.5

14.5

# MONITORING WELL AS-BUILT REPORT

SOIL TYPE DEPTH	
DRILLER/INSTALLER CASCADE	DATE
OBSERVED BY	BORING/
LCLATION	PROJECT
	Phujeus

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

ABOTE GROUND REFERENCEMENT (IF APPLICABLE)
MONUMENT PER APPLICABLE
WELL DAP TYPE locking

= SACKS

BENTONITE SEAL - = SACKS

WELL CASING LD. 41 TYPE OF CASING Schoolde 40 PUC TYPE OF CONNECTION Threaded

FILTER PACK/SIZE - SACKS 6812

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

12." DIAMETER OF BOREHOLE

ENDCAPTYPE threaded (0.5' points)

REMARKS

	ng No: AD+01		
Client: American Distributing Co. Drill Location of boring: Hole Logged by: D. Alford Installation Data: Backfill with enviroplug	Date: 1-15-90 Driller: D. Alford NA Drilling Method: Band Auger Hole Diameter:2" Page No: 1 of 1 nviroplug		
epth Graphic Blow/ft Concen- and Depth Symbol			
0       sample #         1       0.5-1.0'         2	ravel, very slight clay n, loose, very moist, ght grey brown, very nome gravel, light grey		

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_			LOG (	)F		Project No:	05-487-	.001		Boring No: AD-02
		ÉXE	LORATOR	( BORING						Date: 1-15-90
						Client: Ame:	rican D	istributir	ig Co.	Driller: D. Alford
- F.,	location of h	poring:				Location: Bu	lk Term	inal-Evere	ett. WA	Drilling Hethod: Hand Auger
		-								Role Diameter: 2"
						Logged by: D.	Alfor	A		
						Ingtallation	. A1101	U Desta ( 1 ) )		Page No: 1 of 1
							vala.	Backfill	with env	liobing
·	·			[2	10-12-0-				r	
			vapor	Sample type	Soll Graup	plwater Level	Time	Date	Commen	ts:
Jebru	Graphic	1810W/IC	Concen-	and Depth	Symbol		<u> </u>	[		
(ft)	Log		tration	[	(U.S.C.S.)	approx.				
			(ppm)			2.0'			•	
				l					l	
0 -					ļ	Grass				
-				Sample 🕏	sp	0.5-1.0' Sand	, coars	e grained	with occ	casional gravel, saturated,
1 -	តំលំណាំដែលហើ	1		0.5-1.0'	<u>_</u>	slig.	ht petr	coleum odo:	r.	ł
-										
2 -										
-				Sample @	ад	2.5-3.0' Sand	, coars	e grained	with ore	v/dreed clavey silt.
3 - 1				2.5-3.0'		organ	nic deb	ris, stron	a petrol	
-	TD = 3.0'					sheer	1 0n wa	ter,	- , poerdi	
4 -				1						
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			Í			<b>6</b>				-
-				-	ĺ	Groundwater at	appro:	ximately Z	•	
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			LOG	OF		Project No: 05-487-001 Boring No: AD-03					
		ZXI	LORATOR	Y BORING		_	Date: 1-15-90				
_						Client: Ame	rican D	istributin	σ Co.	Driller: D. Alford	
- - 1	location of b	oring:				Location; Bu	lk Term	inal-Evere	77. WA	Drilling Motheds Read August	
								THOT DIETE	, <i>M</i> A	Dilling Hechod: Band Auger	
						Logged by: D	Alfor	-		HDIE DIAMETER: 2"	
						Installation				Page No: 1 of 1	
						inscartación	Data:	PSCXEIII W	ith envi	robind	
	[	1	Vapor	Isamala tur					<u>.</u>		
enth	Graphic	Blow/f+	Concern	and beets		blwarer revel	T176	Date	Commen	ta:	
14+1	Log	]		and nebcu	Symbol						
(1-)	209		cracion	1	(0.s.c.s.	} Approx.					
			{ppm}			2.0'					
	711/101417114						<b></b>				
0 -						ļ					
-	YHIIHHH			Sample @	EC.	0.5-1.0 Sand	, coars	e grained,	with e	lay and occasional	
1 -	<i>WHITH HIT</i>			0.5-1.0'		ревы	les/gra	vel, light	brown,	moist, no odor.	
-	CHAIN MALLE			Sample 0	8⊂	1.5~2.0 Sand	, coars	e, grained	l, increa	ased clay content with	
z -	<u> 1/11/11/11/14/1</u>			1.5-2.0'	i	grav	el, lig	ht grey-br	own, wet	, no odor.	
-	10 - 2.0'					1					
3 - 6		ł	ĺ					•			
-			ĺ			Groundwater a	t appro	ximately 2	.0'		
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			LOG	OF		Project No: 05-487-001 Boring No.: AD-04						
		EX	PLORATOR:	Y BORING						Date: 1-15-90		
_						Client: Ame	rican D	istributin	σ Co.	Driller: D. Alford		
18.	ocation of b	poring:				Location: Bu	lk Term	inal-Evere	tt, WA	Drilling Method: Band Auger		
										Role Diameter: 2"		
						Logged by: D.	Alfor	d		Page No: 1 of 1		
						Installation	Data:	Backfill	with env	viroplug		
	1	T	Vapor	Sample typ	elSoil Grow		<b>711</b> -0		<b></b>	·		
epth	Graphic	Blow/ft	Concen-	and Depth	Symbol	P Hatel Devel	ттие	Date	Comment	58 :		
ťt)	Log		tration		(U.S.C.S.)	Approx	•					
			( 1199			9 inches						
		l										
σ -		ĺ	1				·	· · · ·				
-		ł		Sample @	ер	0.5-1.0 Sand,	gravel	ily, coarse	grained	sand, light brown to grey,		
1 -				0.5-1.0		moist	to wet	, ло odor.				
-	TD = 1.0'					1						
2 -		!	.									
						Groundwater a	t appro	wimately 9	inches.			
<u>- د</u>						1						
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LOC OF						Project No:	Boring No: AD-05					
		EXP	LORATORY	BORING		Date: 1-15-90						
-	. <u> </u>	-				Client: Ame	erican D	)istributin	g Co.	Driller: D. Alford		
łε	ocation of b	oring:				Location: Bu	lk Term	inal-Evere	tt, WA	Drilling Method: Band Auger		
										Hole Diameter: 2"		
						Logged by: D	. Alfor	đ		Page No: 1 of 1		
						Installation	Data:	Backfill w	ith envi	roplug		
_												
	}		Vapor	Sample type	Soil Group	Water Level	Time	Date	Commen	ts:		
pth	Graphic	Blow/ft	Сопсел-	and Depth	Symbol		i					
(t)	Log		tration		{V.S.C.S.}	Approx.						
		ļ	(ppm)		ļ	3.0'		ļ				
		l					[					
0 -		1			1							
-				Sample é	BC	0.5-1.0' San	d, claye	ey, coarse	grained	sand, light grey, loose,		
1 -				1.5-2.0		moi	st, some	a gravel, i	slight p	stroleum odor.		
-	17777777777777777777777777777			Sample 🖗	SC .	1.5-2.0' San	d, claye	ey, coarse	grained	, light grey, loose,		
2 -				1.5-2.0'		itom (	st, slig	ght petrole	eum odor.			
•	<i>ATHHHHH</i>			Sample 😫	BC	2.5-3.0' San	i, claye	ey, coarse	grained,	light grey, loose,		
3 - 1	<u> </u>			2.5-3.0	··	moi	st, some	e gravel, s	light pe	stroleum odor.		
-	TD = 3.0'											
4 -		[										
-				ĺ		Groundwater a	it appro	ximately B	. O'			
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			LOG	OF	· · · ·	Project No: 05-487-001 Boring No: AD-06						
		EX	PLORATOR	Y BORING						Date: 1-15-90		
_, ··						Client: Ame	rican D	) istributir	ν <b>σ</b> . Co.	Briller: D blford		
1	location of 1	boring:				Location: Bu	là Term	inal-Ever	.y .u.			
								THET STELE	124, FA	biling Recool Hand Auger		
						Logged by D				Hole Dlameter: 2"		
						Logged by: D.	. Allor			Page No: 1 of 1		
						1119 191191100	Data:	Backtill W	ith Envi	roplug		
	· · · · · · · · · · · · · · · · · · ·	1	Vanat	Eamla Au				····	· · ·			
onth	Graphia	BINNER	lon	Sampre typ	pe Soll Grou	piwater Level	Time	Date	Contraeri	TS:		
(Fr)		DIGW/IL		and Deptr	1 SYNDO1			İ <u>—</u>				
,	1 209		tration	L _	(0.5.0.5.)	Approx.		Ì	i			
	ļ	1	(ppm)			1.5'			ļ			
		.		· [		-   - <u> </u>			İ			
<b>u</b> -	[	1										
-		Ì		Sample @	\$p	0.5-1.0 Sand,	COAISC	grained,	gravelly	y, loose, moist, moderate		
1 -		ļ	i	0.5-1.0		odor.						
-	TD = 1.0'			-						1		
2 - ·				]								
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3 -					1	Groundwater at	t appro	ximately 5				
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		EXI	LOG C	F BORING		Project No:	05-487-	001		Boring No: AD-07	
	Nocation of b	ocriną:				Client: Ame Location: Bu Logged by: D Installation	Driller: D. Alford Drilling Method: Hand Aug Hole Diameter: 2" Page No: 1 of 1 .roplug	er			
pth ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level Approx. 5"	Time	Date	Совлеп	ts:	
-	TD = 1.0'			5ample @ 0.5-1.0"	<b>3</b> p	0.5-1.0 Sanc mode	l, coars	e grained, lor, ground	. gravel Water h	ly, loose, moist to wet, as irridescent film.	
-						Groundwater a	t appro	ximately 6	inches.	. è	
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· 1 - 1											

			LOG	OF		Project No:	05-487-	001		Bering No: ND-08			
		EXI	LORATOR	Y BORING		Date: 1-16-90							
	location of b	oring:			<u>.</u>	Location: Bu	Location: Bulk Terminal-Everet:, WA Drilling Method: Bend Auger Hole Diameter: 2"						
						Logged by: D Installation	. Alfor Data:	d Backfill w	ith envi	Page No: 1 of 1 roplug			
	Combin	Blankfe	Vapor	Sample type	Soil Group	Water Level	Time	Date	Comment	ta:			
(ft)	Log	BIOW/IC	tration	and Depth	(U.S.C.S.)	Approx.							
			(mqq)			5.0'							
0 -					BIT	Grass			·	· · · · · · · · · · · · · · · · · · ·			
1 -				0.5-1.0'		lig	int brow	m, dry, no	oder.	gravel, medium grained,			
2 -					an 	1.5-2.0' San to	d. coar dark br	Se grained	, gravel , moist,	ly, some silt/clay, light to no odor.			
				Sample @	80	2.5-3.0' San	d, clay	ey, with a	ccasiona	l gravel, light gray, moist			
- }			ĺ	112 210			ong per	TOTEUM COC	Ε.				
- 2				Sample @	BC	4.5-5.0' San	d, clay	ey, with o	ccasiona	l gravel, light grey, moist			
5 - 4	TD = 5.0'			4.5-5.0'		str	ong pet	roleum odo	r. Satu	rated at 5.0'			
-													
-		Į				Groundwater an	appro:	ximately 5	.0'				
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			LOG	OF		Project No:	05-487-	-001		Boring No: AD-09
		EXI	PLORATOR	Y BORING						Date: 1-16-90
·						Client: Ame	rican D	) istributin	la Co.	Driller: D. Alford
·	location of 1	poring:				Location: Bu	lk Term	inal-Evere	tt. WA	Drilling Method: Band Augus
										Vole Disperson 2"
						Logged by: D	. Alfor	-		Boot Man 2 and 4
						Installation	Data	- Backfill .	(	rage not 1 br 1
							0000	DOCALLIL W	ita Lnvi	robind
			Vapor	Sample typ	e Satl Grov		Tine			
epth	Graphic	Blow/ft	Concen-	and Depth	Symbol	P	7106	Date	Commen	ts:
(ft)	Log		Tration			)				
			(007)		1,0.0.0.3.	, vobrox.				
		ļ				1.5'				
<u> </u>					- [	-j!		l		
1 -		i i		Sample e	sp	0.5-1.0' San	id, coar	cse grained	), with d	occasional gravel, loose,
-				0.5-1.0		e tou	t, no d	dor.		
				Sample @	sp'	1.5-2.0 Sand	, with	gravel, sl	ightly ]	loose, wet, petroleum odor.
2 -				1.5-2.0'	ļ					
_	TD = 2.0'									
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4 -		ļ				Groundwater at	t appro	ximately 1	.51	
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		EXF	LOG C	DF ( BORING		Project No:	05-487-	001		Boring No: AD-10 Date: 1-16-90
1.		oring:	-			Client: Ame Location: Bu	rican D 1% Term Alfor	d	g Co. Lt, WA	Driller: D. Alford Drilling Method: Hand Auger Hole Diameter: 2"
						Installation	Data:	G Backfill w	ith Envi	rage No: 1 of 1 roplug
epth (ft)	Graphic Log	∃low/(t	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Commen	ts:
0 - - 1 - - 2 -	TD = 1.5'			Sample @ 0.5-1.0'	ab	0.5-1.0' San	d with erate p	gravel, lo etroleum o		, visible oil stains,
- 3 - 4 - -						Groundwater a	t appro	ximately 1	.257	
5 -										
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		EX	LOG ( PLORATOR)	OF Y BORING		Project No:	05-487-	-001		Boring No: AD-11	
2 ¹⁷ - 5 3	location of )	boring:	<del></del>	<u> </u>	<u>.                                    </u>	Client: Ame Location: Bu Logged by: D	rican f lk Term . Alfor	Distributi: Dinal-Ever: d	ng Co. Htt, WA	Driller: D. Alford Drilling Method: Hand Aug Hole Diameter: 2" Page No: 1 of 1	jer
				<u> </u>		Installation	Data:	Backfill w	ith Envi	roplug	
)epth ([t]	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	50il Group Symbol (U.S.C.S.)	Water Level Approx. 1.5'	Time	Date	Commen	ts:	
0 -	TD = 2.0'		(ppm)	Sample 0 0.5-1.0' Sample 0 1.5-2.0'	ab 	1.5' 0.5-1.0' San mod 1.5-2.0' San mod Groundwater a	d, grav erate p dy grav erate o	velly, loop petroleum n rel, loose, dor. ximately 1	.5'	t, visible oil stains, isible oil staining as abo	
						-					

		EX	Log Plopator	OF Y BORING		Project No:	05-487-	-001		Boring No: AD-12 Data: 1-16-90
~	.ocation of i	boring:				_ Client: Ame Location: Bu Logged by: D Installation	nrican D 1% Term . Blaes Data: .	listributi inal-Ever Backfill v	ng Co. ett, WA with Envi	Driller: D. Alford Drilling Method: Hand Auger Nole Diameter: 2" Page No: 1 of 1 roplug
'epth (ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Approx. 3.5'	Time	Date	Commen	ts:
0 - - 1 - - 7 -				Sample 0 0.5-1.0'	\$p	0.5-1.0' San no	d, with petrole	gravel, : 4m odor.	medium gr	rained, brown, loose, moist,
- 3 - - 4 - -	TD = 3.5'			Sample @ 2.5+3.0' Sample @ 3.0-3.5'	*p	2.5-3.0' San vis J.0-3.5' San petr	d, medi ible oi: d, mediu roleum c	um grained 1 staining 1m grained 2dor.	i, gravel J, strong L, gravel	ly, grey brown, loose, diesel odor. ly, grey, wet, strong
						Groundwater at	approx	imately 3	.5'	
-										
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-										
-					7					
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Isid location of boring:     Dilet: Aseries Distributing C     Dilet: 0. Alford       Isid location of boring:     Isid location Suck Tersand-Fyeret, WA Diling Method: Mand Kiele Diameter: 2"     Digged by: D. Alford       Isid     Craphic Log     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     angle type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     Bample type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     Bample type Soli Orcup Veter Love     Time Date Installation Date: Backfill with Enviroping       Isid     Diow/ft Concenter     Bample type Soli Orcup Veter Love     Time Orcup		·····		LOG I	OF		Project N	o: 05-487	-001		Boring No: AD-13
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<pre>pph Czaphic log low/f: Concern and Depth Soll Group Vater Level Time Date Concernts:</pre>							Logged by Installat:	: D. Alfo ion Data:	rd Backfill y	ith Envi	Fole Diameter: 2" Page No: 1 of 1 roplug
0       Sample 8       sa       0.5-1.0'       Sand, silty with occasional gravel, light brown-br moist, moderate petroleum oddr.         2       Sample 8       sp       2.0-2.5'       Sand, gravelly, fark brown, loose, very moist, vis petroleum staining, strong petroleum oddr.         3       TD • 2.5'       Sample 8       sp         4       Sample 8       sp       Sample 8         5       Sample 8       Sample 8       Sample 8         6       Sample 9       Sample 8       Sample 8         7       Sample 8       Sample 8<	pth ft)	Graphic Log	Blow/ft	Vapor t Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Approx. 2.5'	el Tire	Data	Commen	ts:
Z       Sample @       sp       2.0-2.5'       Sand, gravelly, dark brown, loose, very moist, vis petroleum staining, strong petroleum odor.         TD * 2.5'       TD * 2.5'       Groundwater spproximately 2.5'         Note:       Possible free product on ground water. Ground water intridencent film and oil streaming from soil in capil zone.					Sample @ 0.5-1.0'	3 <b>1</b> 5	0.5-1.01	Sand, sil	ity with or	casional roleum oc	gravel, light brown-brown Mor.
Groundwater approximately 2.5' Note: Possible free product on ground water. Ground water irrideacent film and oil streaming from soil in capil zone.		TD = 2.5'			Sample @ 2.0-2.5'	зр	2.0-2.5'	Sand, gra petroleum	velly, dær Hstaining,	strown,	loose, very moist, visible etroleum odor.
<pre>irridescent film and oil streaming from soil in capil rone. </pre>	-						Groundwate: Note: Poss	approxi	mately 2.5	, 	votos Conved unter bee
	-						irri zone	descent .	film and of	l stream	ing from soil in capillary
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		EXI	LOG ( PLORATOR	OF Y BORING		Project No:	 05-487-	-001		Boring No: AD-14 Data: 1-16-90
	location of 1	boring:			<u> </u>	Client: Ame Location: Bu Logged by: D Installation	rican D 1k Term . Alfor Data:	)istributin inal-Evere d Bacxfill w	ig Co. itt, WA ith Eπvi	Driller: D. Alford Drilling Method: Hand Auger Role Diameter: 2" Page No: 1 of 1 roplug
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	Commen	ta:
0 - - 1 - z -				Sample @ 0.5~1.0' Sample @	de de	0.5-1.0' San moi 2.0-2.5' San	d, grav st, mod d, grav	velly, coar Merate petr Velly, coar	rse grain	ned, brown-dark brown, loose, dor.
- 3 - 4 - -	TD = 2.5'			2.0-2.5'		ver Groundwater ap	y moist	ately 2.5'	etroleur	a odor, visible staining.
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		EXI	LOG C	DF BORING		Project No:	05-487-	001		Boring No: AD-15 Date: 1-17-90
i	Ocation of 1	boring:	- <b>#</b>			Client: Ame Location: Bu Logged by: D Installation	rican D lk Term . Blaes Data: 1	istributir inal-Evere Backfill w	ig Co. htt, WA ith Envi	Driller: D. Blace Drilling Method: Hand Auger Hole Diameter: 2" Page No: 1 of 1 .roplug
opth 'ft)	Graphic Log	Blow/ft	Vapor Concen- tration (ppm)	Sample type and Depth	Soil Group Symbol (U.S.C.S.)	Water Level	Time	Date	Comen	its:
0 - 1 - -				Sample @ 0.5-1.0'	sp	0.5-1.0' San odo	d, fine r.	to mediu	 # graine	d, brown, dry, loose, no
2 - 3 - 4 -	TD = 3.0'			Sample @ 2.5-3.0'	зр 	2.5-3.0' San Wet 3.0'- Gravel	d, medi , very -could	um grained strong gas not retain	l, gray i coline co sampla.	to black, loose, moist to dor.
- 5 - - -						Groundwater a	proxim	ately 3.0°		
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_		EXF	LOG C	DF BORING		Project No:	05-487-	001		Boring Ho: AD-16 Date: 1-17-90
 1£	cation of b	oring:				Location: Bu Logged by: D Installation	rican D lk Term Blaes Data: 1	istriþutir inal-Evere Backfill w	ig Co. ett, WA eith Envi	Driller: D. Blaes Orilling Method: Hand Auger Hole Diameter: 2" Page No: 1 of 1 .roplug
epth (ft)	Graphic Log	Blow/ft	Vapor Concen- tration (DDm)	Sample type and Depth	Soil Group Symbol (V.S.C.S.)	Water Level	Time	Date	Commen	ts:
0 - - I - 2 -	TD = 1.5'			Sample @ 0.5-1.0'	sp	Grase 0.5-1.0 Sand, petro	fine t leum st	o medium ( anining, )	grained, Wery str	gray, loose, wet, visible ong gasoline odor.
- 3~ - 4- -						Groundwater a	t appro	ximately 1	1.5'	
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			LOG	ÓF		Project No:	05-497-	001		Boring No: AD+17
		EXC	LORATOR	Y BORING						Date: 1-17-90
-						Client: Ame	cican D	istributin	g Co.	Driller: D. Blace
7	location of b	poring:				Location: Bu	lk Term	inal-Evere	et. WA	Drilling Nothods Band Lucas
										Pole Dismotory 20
						Logged by: D.	. 81 <i>8</i> 69			Note Diamater; 2"
						Thetallation	Datas			rage No: 1 of 1
							Data.	BACKTIII W	ith Envi:	roping
	1		Vapor	Sample tre					<u>.</u>	
eath	Graphic	Blow/ft	Concen-	and Deeth	Regora Group	piwater Level	Time	Date	Comment	Ls:
( ** )	Log		testin	and beben		· · · · · · · · · · · · · · · · · · ·				
(10)	209		cracion		(0.5.0.5.)	Approx.				
			(ppm)			1.0'	i			
<u> </u>				[	-	·   !				
						Grass				
				Sample @	sp	0.5-1.0' Sand	, mediu	um grained,	gravel,	dark grey loome, wet,
1 -	<u> </u>			0.5-1.0'	i	mode	rate ga	soline odd	or.	
-	TD # 1.0'			j						
2 -										
-		ĺ				Groundwater a	t appro	ximately 1	.01	
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			LOG	DF		Project No:	05-487-	001	•	Boring No: AD-18
		EX	PLORATOR	BORING						Date: 1-17-90
						Client: Ame	fican D	)istributin	σ Co.	Driller: D. Alford
- Le	pration of b	oring:	•••			Location: Bu	lk Term	issi-Ever		Delling Marbod, Bood Nume
							101 I 01 10	11191-57615	CC, MA	Dilling Method: Mand Auger
										Hole Diameter: 2"
						Logged by: D	. Blaes			Page No: 1 of 1
						Installation	Data:	Backfill w	ith Envi	roplug
		[	1	1	1	·[			1	
			Vapor	Sample type	Soil Group	Water Level	Time	Date	Commen	ts:
ptb	Graphic	Blow/ft	Concen-	and Depth	Symbol					
ft)	Log		tration		(U.S.C.S.)	Approx.		i	[	
	1		(ppm)			4.5'			Ì	4
		Í	I		l					
0 -	VI.I.H.I.I.H.I.I.I				1					
-	YHHHHH			Sample @	ac	0.5~1.0' Sand	, claye	ey, brown,	slightl	y cohesive, moist, no odor
1 -	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>			0.5-1.0'	BC	1.0-4.0' Sand	, mediu	um orained.	. clavev	, brown to grey, prganic
-						debr	is. med	iium dense	moist	moderate diase) odor at
z -			i			2.0-	3.01		. 20130,	
- -	HIIHHI									f
3 - I										
	14444444									
	<i></i>									
• -	677777777777777777777777777777777777777			Sambre 6	sc	4.0~4.5' Sand	, mediu	im grained,	clayey,	grey to black, moderate
-	<u>1744-1774-1376-</u>			4.0-5.0'		to 9.	light d	liesel odor	•	
5 -	TD = 4.5'									
-	ĺ			f						
-			ĺ	ļ		Groundwater at	appro	ximately 4	.5'	
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			LCG	OF		Project No:	05-487-	001		Boring No: AD-19
		EXC	LORATOR	Y BORING						Date: 1-17-90
_	_					Client: Ame	rican D	istributi	ng Co.	Driller: D. Blaes
3	ocation of b	oring:				Location: Bu	lk Term	inal-Ever	att, WA	Drilling Method: Hand Auger
										Hole Diameter: 2"
						Logged by: D.	. Blaes			Page No: 1 of 1
						Installation	Data: )	Backfill •	ith Envi	roplug
		1	Vapor	Sample type	soil Grou	Water Level	Time	Date	Commen	ta:
epth	Graphic	Blow/ft	Concen-	and Depth	Symbol			ł		
([t]	Log		tration		(u.s.c.s.)	Approx.				i i i i i i i i i i i i i i i i i i i
	_	ł	(ppm)			1.5'				
	1	ļ					i		1	
0 -					· [	Grass	<u> </u>	,	· /	
-				Sample @	qe	0.5-1.0' Sand	, fine	to medium	grained	, grey to black, loose,
1 -				0.5-1.0'	-	mois	t, zode	erate dies	el odor.	, , ,
- 1		Ł		Sample @		1.0-1.5' Sand	. fine	to medium	grained	. arey to black loose
2 -	TD = 1.5'	[		1.0-1.5		nois	t. soil	saturate	d with d	iesel fuel oil
-					1	(probable fre	e produ	ist on aro	undwater	
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4 -						Groundwater a	t appro	Ximatelv	1.51	
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## TEST PIT LOGS

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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	t
	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 sid	de 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

#### 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 Page 1

### APPENDIX D

# SELECTED GEOTECHNICAL BORING LOGS

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## LOG OF BORING NO. DM-7-99



GROUP A DAMES & MOORE GROUP COMPANY

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### LOG OF BORING NO. DM-8-99

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A DAMES & MOORE GROUP COMPANY

PROJECT: California Street Overcrossing PROJECT NO: 04333-041-189 WATER LEVEL: ¥ 5.00 ft PROJECT LOCATION: Everett, WA CLIENT NAME: Port of Everett ELEVATION: 18 ft DATE STARTED: December 1, 1999 DATE COMPLETED: December 1, 1999 TOTAL DEPTH: 50.00 ft DRILLING CONTRACTOR: Cascade Drilling WEATHER: Overcast, light rain FIELD ENGINEER: BBS DRILLER: Scott Kruger DRILLING METHOD: Hollow Stem Auger to Mud Rotary CHECKED BY: SAMPLING METHOD: D&M U, 300Ib hammer, 30" drop SAMPLE TYPE KEY: MOISTURE CONTENT (%) BLOWS PER FOOT ELEVATION (ft.) Relatively undisturbed sample В **Bag Sample** bg bg 2 SAMPLER DRIVEN (in) DEPTH (ft.) SAMPLE TYPE **GRAPHIC** SYMBOL FINES CONTENT ( uscs Disturbed sample DENSITY ( Sample attempt with no recovery SPT split spoon sample DÉSCRIPTION REMARKS -18 0 Asphalt SM/ Black SAND with some silt and trace fine grave! ML (fill)(very loose)(wet) Petroleum Odor Detected in samples 1, 2(0 - 10 feet below ground surface) PUD = 0 Ţ 13 15 19.6 2 SM Reddish brown medium SAND with some gravel and trace silt R (very dense)(wet), 10 5 5.1 18 3 18 78 13.9 52 2/7/00 Seattle, WA 9812 20 1193 18 18.9 87 DMSEA6.GDT 25 111.3 15.5 95 18 199 PROJEC104333041 12 30 V-118210. NOTES: PID is a Photo ionization Detector that detects the presence of volatile hydrocarbons LOG OF BORING DM-8-99 AMES & MOORE FIGURE A-10.1

Sheet 1 of 2



### MONITORING WELL NO. DM-6-99

PROJECT: California Street Overcrossing PROJECT NO: 04333-041-189 WATER LEVEL: ¥0.00 ft PROJECT LOCATION: Everett. WA CLIENT NAME: Port of Everett ELEVATION: +20.00 DATE STARTED: December 6, 1999 TOTAL DEPTH : 55.00 ft DATE COMPLETED: December 6, 1999 WEATHER Overcast, light rain DRILLING CONTRACTOR: Cascade Drilling FIELD ENGINEER: BBS DRILLER: Scott Kruger DRILLING METHOD: Hollow Stem Auger to Mud Rotary CHECKED BY: SAMPLING METHOD: D&M U, 300lb hammer, 30" drop SAMPLE TYPE KEY: MOISTURE CONTENT (%) FINES CONTENT (%) BLOWS PER FOOT ELEVATION (A.) Relatively undisturbed sample IR Bag Sample 6 0 SAMPLER DRIVEN (in) SAMPLE TYPE DEPTH (ft.) GRAPHIC SYMBOL USCS DENSITY ( Disturbed sample Sample attempt with no recovery SPT split spoen sample WELL CONSTRUCTION DÉSCRIPTION ELEVATION Y -20.0 Ô٠ Blackish Brown fine sandy SIL Twith trace gravel SM/ (possible fill)(soft)(moist) ML Gray brown predium to fine SAND with trace to some silt and fine SM -15.0 5gravel 99.6 25.3 1 18 15 (medium dense)(wet) Retroleum Ødor Detected in samples 1, 2 (0 - 10 feet below ground surface) PID =`8. 10.D 10 18 103.1 16.5 14 5.0 18 3,1 128.6 13,6 Real Provide State WA 9812 20 O)C 18 55 -5.0 25 1B 14.3 90.6 14.3 14 ML Dark gray SILT with some fine sand (very stiff)(low plasticity) 10.0 30 NOTES: PID is a Photo Ionization Detector that detects the presence of volatile hydrocarbons WELL MONITORING WELL DM-6-99 Bentonite grout SYMBOL DAMES & MOORE SYMI Well screen Bentonite plug

Filter Pack

A DAMES & MOORE GROUP COMPANY

Sheet 1 of 2

FIGURE A-8.1

Concrete plug









# APPENDIX B BORING LOGS

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Sec. 10

# LOG OF ROPING NO LIG-1

PROJECT PROJECT N PROJECT LOCATIC CLIENT NAM DATE STARTE DATE COMPLETE DRILLING CONTRACTO DRILLE DRILLING METHO SAMPLING METHO	CT: Californ IO: 04333-0 IN: Everett, ME: Port of I ED: Septem ID: Septem ID: Cascade ER: ID: Geoprol	ia Street Ove 41-189 WA Everett ber 25, 2000 ber 25, 2000 e Drilling be	ercros	Sing WATER LEVEL: ¥4.1 ELEVATION: 18 TOTAL DEPTH : 12. WEATHER: FIELD ENGINEER: T. I CHECKED BY: M.	<u>)0 ft</u> ft 00 ft Parkington McCabe
SAMPLER DRIVEN (In) FINES CONTENT (%) DRY DENSITY (pcf) MOISTURE CONTENT (%)	BLOWS PER FOOT SAMPLE TYPE	ELEVATION (ft.) DEPTH (ft.) LISCS	GRAPHIC SYMBOL	SAMPLE TYPE KEY: Relatively undisturbed sample Disturbed sample Sample attempt with no recovery SPT split spoon sample DESCRIPTION	rometer psf) REMARKS
EOPROBE GPJ URSSEA1.GDT 11/300 Seattle, WA 38121				Asphaftic Concrete. Gravet subgrade Dark brown silty peat Black silty sand with some woody peat Brown sand with some silt. h.c. odor Brown gray sand, wet. Boring completed at 12 feet. Backfilled with Bentonite. Ground water at 4 feet bgs.	PID = 3 ppm PID = 24 ppm PID = 2 ppm PID = 0 ppm No odor



Section 2

# LOG OF BORING UG-1

FIGURE G 1


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PROJECT: California Street Overcrossing PROJECT NO: 04333-041-189 PROJECT LOCATION: Everett, WA WATER LEVEL: \$5.00 ft CLIENT NAME: Port of Everett DATE STARTED: September 25, 2000 ELEVATION: 18 ft DATE COMPLETED: September 25, 2000 TOTAL DEPTH: 14.50 ft DRILLING CONTRACTOR: Cascade Drilling WEATHER: DRILLER: FIELD ENGINEER: T. Parkington DRILLING METHOD: Geoprobe CHECKED BY: M. McCabe SAMPLING METHOD: Geoprobe SAMPLE TYPE KEY: FINES CONTENT (%) DRY DENSITY (pcf) MOISTURE CONTENT (%) BLOWS PER FOOT ELEVATION (ft.) Relatively undisturbed sample В **Bag Sample** SAMPLER DRIVEN (In) SAMPLE TYPE DEPTH (fl.) Q **GRAPHIC** SYMBOL uscs Disturbed sample Pocket Penetrometer Sample attempt with no recovery Vane Shear (psf) SPT split spoon sample DESCRIPTION REMARKS -18 Ð. Asphaltic Concrete, GP Gravel subgrade SM Gray brown silty sand PID = 0 ppm Ţ 13 SM Red-tan sitty sand PID = 0 ppm SM/ Brown silty sand / sandy silt with lenses of woody peat. PID = 1 ppm ML. 10 R No evidence of hydrocarbons in water on rods Boring completed at 14.5 feet. Backfilled with bentonite. Groundwater at 5 feet bgs. 98121 ΜA 501 URSSEA1.GLB 20 PROBE. ù C T NOTES: LOG OF BORING UG-3

Sheet 1 of 1

FIGURE G 3

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FIGURE G 4

PROJECT: Californ PROJECT NO: 04333-0 PROJECT LOCATION: Everett CLIENT NAME: Port of DATE STARTED: Septem DATE COMPLETED: Septem DRILLING CONTRACTOR: Cascad DRILLING METHOD: Geopro SAMPLING METHOD: Geopro	nia Street Overcros 041-189 t, WA Everett nber 25, 2000 nber 25, 2000 de Drilling obe	WATER LEVEL: ¥ 6.00 ft ELEVATION: 19 ft TOTAL DEPTH : 12.00 ft WEATHER: FIELD ENGINEER: B. Strick CHECKED BY: M. McCa	cler abe
SAMPLER DRIVEN (In) FINES CONTENT (%) DENSITY {pd} MOISTURE CONTENT (%) BLOWS PER FOOT SAMPLE TYPE	ELEVATION (ft.) DEPTH (ft.) USCS GRAPHIC SYMBOL	SAMPLE TYPE KEY:       Bag Sample         Relatively undisturbed sample       Bag Sample         Disturbed sample       Pocket Penetrometer         Sample attempt with no recovery       Vane Shear (psf)         SPT split spoon sample       DESCRIPTION	er EMARKS
OBE.GRU URSSEA1.GDT 11/300 Seattle, WA 98121	19 0 GP SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P 4 SM P	Gravel         Brown silty sand with trace gravel. No odor.         PID         Gray silty sand         Dark brown silty sand with trace gravel and wood fragments.         PID         End of boring at 12 feet. Backfilled with bentonite. Ground water at 6 feet bgs.	= 0 ppm = 0 ppm = 0 ppm = 0 ppm
NOTES: URS	I <u>I</u> , <u>I</u> ,	LOG OF BORIN FIGURE G 5	IG UG-5

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PROJECT CL DATI DATE C DRILLING CO DRILLIN SAMPLIN	PROJECT N COJECT N CLOCATIO JENT NAM E STARTE COMPLETE INTRACTO DRILLE IG METHO IG METHO	CT: 0 E P ED: D : C ED: C C C C C C C C C C C C C C C C C C C	alifo 4333 veret ort o epter asca eopr	rnia Str 041-18 t, WA f Everet nber 26 nber 26 de Drill obe obe	eet ( 9 1t 3, 20( 5, 20( ing	Over 00 00	cros	WATER LEVEL: ¥5.0 ELEVATION: 18 1 TOTAL DEPTH : 12.0 WEATHER: FIELD ENGINEER: 8. 9 CHECKED BY: M. 1	<u>0 ft</u> 1 30 ft Strickler McCabe
SAMPLER DRIVEN (in) FINES CONTENT (%)	DENSITY (pcf) MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	SAMPLE TYPE KEY:       Bag Sample         Relatively undisturbed sample       Bag Sample         Disturbed sample       I         Sample attempt with no recovery       Vane Shear (point Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Section Sec	ometer sf) REMARKS
				-18 - -	0-	SM/ GM	8. 4. 8. 5. 5. 5.	Brown sitty gravel and sand	
			X	- - -13 -	- - -	SM		Gray silty sand, some gravel. No odor. Traces of brown color	PID = 0 ppm
				- -8	- 10-	SP		Some wood fragments. Brown sand, sift and gravel.	PID = 0 ppm PID = 0 ppm
				**	_			End of boring at 12 feet. Backfilled with bentonite. Ground water at 5 feet bgs.	-
NOTES:									
U	RS			. –				LOG OF BO FIGURE	<b>DRING UG-6</b>

PR( D DRILLIM D SA	F OJEC DATE OATE ( NG CC RILLI MPLI	PR PROJE T LOO LIENT TE ST COMP DONTR D NG M NG M	OJEC ECT N CATIO I NAM ARTE ACTO RILLE ETHO		alifo 4333 verei ort o epte asca ieopr	rnia Str -041-18 tt, WA f Evere mber 20 mber 20 de Drill robe	reet ( 9 tt 5, 20 6, 20 ling	Dver 00 00	cros	Sing WATER LEVEL: ¥ <u>2.0</u> ELEVATION: 16 f TOTAL DEPTH : 12.0 WEATHER: FIELD ENGINEER: B. S CHECKED BY: M. I	<u>0 ft</u> t 10 ft Strickler McCabe
SAMPLER DRIVEN (in)	FINES CONTENT (%)	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ii.)	nscs	GRAPHIC SYMBOL	SAMPLE TYPE KEY: Relatively undisturbed sample Disturbed sample Sample attempt with no recovery SPT split spoon sample DESCRIPTION	ometer sf) REMARKS
EOPROBE.GPJ URSSEA1.GLB URSSEA1.GDT 11/000 Seattle, WA 95121								SM		Asphalfic Concrete. Dark brown to gray silty sand with some gravel Some wood fragments Dark brown sand with some silt and gravel. End of boring at 12 feet. Backfilled with bentonite. Groundwater at 2 feet bgs.	PID = 0 ppm PID = 0 ppm PID = 0 ppm PID = 0 ppm
	ES:	R	S							LOG OF BO FIGURE	DRING UG-



FIGURE G 8

Sheet 1 of 1

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PRO PROJECT L CLIE DATE DATE CO DRILLING CON DRILLING SAMPLING	PROJECT: C OJECT NO: C OCATION: E ENT NAME: F STARTED: S MPLETED: S TRACTOR: C DRILLER: METHOD: C	Califor 14333-1 Evereth Port of Septen Cascac Geopro Geopro	nia Stre 041-189 I, WA Everett nber 26, nber 26, de Drillin obe	et C 200 200 ng	)ver( )0 )0	cros	Sing WATER LEVEL: ¥3.0 ELEVATION: 18 1 TOTAL DEPTH : 12.0 WEATHER: FIELD ENGINEER: B. S CHECKED BY: M. I	<u>0 ft</u> t )0 ft Strickler McCabe
SAMPLER DRIVEN (m) FINES CONTENT (%) DRY	DENSITY (pcf) MOISTURE CONTENT (%) BLOWS PER FOOT	SAMPLE TYPE	ELEVATION (ft.)	DEPTH (ft.)	uscs	GRAPHIC SYMBOL	SAMPLE TYPE KEY: Relatively undisturbed sample Disturbed sample Sample attempt with no recovery SPT split spoon sample DESCRIPTION	ometer sf) REMARKS
			-18 - - - - - - - - - - - - - - - - - -	0	GP		Gravel Brown to dark brown sand with some to trace silt and gravet. No odor. End of boring at 12 feet. Backfilled with Bentonite. Groundwater at 3 feet bgs.	PID = 0 ppm PID = 0 ppm PID = 0 ppm PID = 0 ppm
NOTES:	RS						LOG OF BO FIGURE	<b>RING UG-10</b> G 10

South States

	LUG OF BORING NO. UG-11	
PROJECT: California S PROJECT NO: 04333-041-1 PROJECT LOCATION: Everett, WA CLIENT NAME: Port of Ever DATE STARTED: September DATE COMPLETED: September DRILLING CONTRACTOR: Cascade Dr DRILLER: DRILLING METHOD: Geoprobe SAMPLING METHOD: Geoprobe	Street Overcrossing 189 A WATER LEVEL: ¥4.00 rett 26, 2000 ELEVATION: 18 ft 26, 2000 TOTAL DEPTH : 12.04 WEATHER: FIELD ENGINEER: B. S CHECKED BY: M. N	<u>) ft</u> 0 ft trickler lcCabe
SAMPLER BRIVEN (In) FINES CONTENT (%) DRNSITY (pct) MOISTURE CONTENT (%) BLOWS PER FOOT SAMPLE TYPE ELEVATION (fL)	Image: Second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star between the second star betw	meter sf) REMARKS
EEOPROBE GPU URSSEA1 GDT 11/3/00 Seattle, WA 98121	0       GP       Gravel.         SP       Brown to gray sand with some to trace silt and gravel. Faint odor.         V       No odor         10       End of boring at 12 feet. Backfilled with bentonite. Groundwater at 4 feet bgs.	PID = 0 ppm PID = 0 ppm PID = 0 ppm PID = 0 ppm
NOTES:		
URS	LOG OF BOI FIGURE	RING UG-11 G 11

Sheet 1 of 1

Section 2.

Contraction of the second second second second second second second second second second second second second s

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	LUG OF BURING NO. UG-12	oneet i of i
PROJECT: California Si PROJECT NO: 04333-041-1 PROJECT LOCATION: Everett, WA CLIENT NAME: Port of Even DATE STARTED: September 2 DATE COMPLETED: September 2 DRILLING CONTRACTOR: Cascade Dri DRILLER: DRILLING METHOD: Geoprobe SAMPLING METHOD: Geoprobe	reet Overcrossing 89 WATER LEVEL: ¥4. ett 26, 2000 ELEVATION: 18 26, 2000 TOTAL DEPTH : 12. WEATHER: FIELD ENGINEER: B. CHECKED BY: M.	<u>00 ft</u> ft 00 ft Strickler McCabe
SAMPLER DRIVEN (in) FINES CONTENT (%) DENSITY (pcf) MOISTURE CONTENT (%) BLOWS PER FOOT SAMPLE TYPE ELEVATION (ft.)	Image: Second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second s	rometer psf) REMARKS
TB URSSEA1.GOT 11/200 Seattle, WA 98121	0       SP       Brown sand with trace silt and gravel. No odor.         5       Some wood fragments.         10       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.	PID = 0 ppm PID = 0 ppm PID = 0 ppm PID = 0 ppm
NOTES: TURS	LOG OF BO FIGURI	<b>RING UG-12</b> E G 12

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# SOIL BORING AND WELL INSTALLATION DATA SHEET

									_			- <u></u>
Toject I	Name:		Californ	nia Street	Overcros	sing	Location:	California	St and Fede	sai Ave	•=	
TOJECI	Task No.:		53-0433	33041.00	00056		Weather	sunny, 60F				<u> </u>
rilling	Informa	tion										<u></u>
ale Sta	rted:		Thursda	ay, June 2	3, 2001		Annulus Dia	ncter:		2	inches	
ate Co	apleted:		Thursda	ay, June 2	1, 2001		Hammer Wei	ght and Drop	n:	NA	lbs and	NA inches
rilled I	By:		Kasey C	Joble		of Cascade Drilling	Sampler Typ	<b>t</b> :		3. stainless	steel split spoo	<u>n</u>
ogged	By:		Kate Pi	neo		of URS	Approximate	Surface Elev	ation:	NA	feet	
heeked	i By <del>.</del>		Dave R:	aubvogel		of URS	Groundwater	Level:		4	below ground :	surface
ritting	Method:		Direct P	ush			Total Depth:			13	below ground	Surface
rill Rig	; Турс:		Truck-n	nounted C	SeoProbe		Backfill Mate	rial:		bentonite c	hips, asphalt pa	ich
ell In	daltation	Data										
ype of	Well Cas	ing:	NA				Top of PVC	Elevation:		NA		······
iteen F	erforation	1:	NA				Type/Thicker	iss of Scals:		NA	<u> </u>	
iamete	r of Well:		NA				Type of Sand	Pack:		NA		
reene	i interval:	•	NA			· · · ·						
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Ę	thes	netra	ı.	S H	Sig				agra	a e		
<u>ă</u>		2 2 2	<u> </u>	30	55	Material Description	1 <b>.</b>		≩ប័ធ		Samples	Remarks
						Aspirati, graver road base.						
3		36/24		SM		Grav to brown Sit and fine Stud come year and	ar fine Gravel, d			16.1	TP1/1 5-4 5	Began sampling at 1.5'
2		20021		SP		Gray medium to coarse sand, mottled, moist.		1-	1		<i>x</i>	
3												
				MD.	Ĭ	Gray Silt and Clay, wood debris, moist.			1			
4		36/27	8:15	SM		Grading brown. Brown fine Sand and Silt, wet.			1	45	JP1/4.5-7.5	
5				L MT								
6				MIL.		Brown Shit and Clay, wet.						
,												
1		36/36	8:30	SM		Brown Sand and Silt with silty clay interbeds, gra-	ling black.			15	JP1/7.5-10	
8												
9												
10		36/12	8:45	SP		Brown medium to coarse Sand, medium soft, mon	led, wet.			5		Refusal at 10' bas. Moved 6
						,,,,,,	,			-	·	west and sampled 10 - 13'.
				-							1	1
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11 12												
11 12 13						BORING COMPLETED	AT 13					
11 12 13						BORING COMPLETED	AT 13					
11 12 13 14						BORING COMPLETED	AT 13					
11 12 13 14 15						BORING COMPLETED	<u>AT 13-</u>					
11 12 13 14 15 16						BORING COMPLETED.	AT 13					
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11 12 13 14 15 16 17						BORING COMPLETED	AT 13					
11 12 13 14 15 16 17 18						BORING COMPLETED	AT 13					

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NOTES: Groundwater level measured down-hole with water level indicator.

Sampled groundwater JP1/GW at 8:30. Slow recharge, very clear water. Slight organic odor in 10 - 13' sample. Not collected for each

	U	R	S					SOIL B	ORING	AND V	VELL I	NSTALLA	ATION DATA SHEET Boring ID: JP-2
	Proje	ct Inform	nation										Page 1 of
	Projec	ct Name:	· · ·	Califor	nia Street	Overero	SSIN 2	Location:	California	St and Fed	eral Ave		
	Projec	ct/Task N	ío.:	53-043	33041.00	00056		Weather:	sunny 605	- <b>Stale Fee</b>			
												-	
	Drilli	ng Inforr	mation		_								
	Date	Started:		Thursd	ay, Jone I	21, 2001		Annulus Dian	neter:		2	inches	
	Date (	Complete	d:	Thursd	ay, June 1	21, 2001		Hammer Wei	ght and Drop	r:	NA	lbs and	NA inches
	Drille	d By <del>.</del>		Kasey (	Goble		of Cascade Drilling	Sampler Type	:		3' stainless	steel split spoo	<u> </u>
	Logge	d By:		Kate Pi	πεο		of URS	Approximate	Susface Elev	ation:	NA	fect	
	Check	ted By:		Dave R	aubyogel		of <u>URS</u>	Groundwater	Level:		2.3	below ground	surface
	Drillir	ig Metho	d:	Direct	Push			Total Depth:			6	below ground	surface .
	Drill F	Rig Type:		Truck-r	nounted (	GeoProbe	· · · · · · · · · · · · · · · · · · ·	Backfill Mate	ríal:		bentonite e	hips	
	Well	Installati	on Data				···						
.12 <b>'</b> 0	Туре о	of Welli C	asíng:	NA			· · · · · · · · · · · · · · · · · · ·	Top of PVC E	levation:		NA		
	Screen	n Perforal	ion:	NA				Type/Thicken	iss of Seals:		NA		
<u></u>	Diame	ter of We	=B:	NA				Type of Sand	Pack:		NA		
	Screen	ned Interv	ral:	NA									
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	<b>9</b>	9	A E		ation				i	Ē	fing:		
	4	2 S S	cover thes)		N H	иğ					e Real		
		ato	Per Er	Ē	30	3 ĝ	Material Description			Wel Con Dia	데레	Samples	Remarks
	0		36/24	9:15	MI.		Brown Sill and Clay, some fine Gravel, dry.		_		0	ም2/0-3	
1													
					SM		Fine Sand and Silt some fine General wet						
					0.4		The own met one, some the orare, wet.						
No.											0	JP2/3-6	
1	2												
ि													
ιa:	3		36/24	9:15	i -		Grading brown fine to coarse Sand and fine Gravel, a	kome Silt.					
1990) 1990)													
	•						Grading brown-gray line Sand and Sill, some fine to	coarse Gravel.					
·													-
	ŝ						Black fine Sand, saturated.						
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U.S.A	6						BORING COMPLETED AT	6					
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Groundwater level measured down-hole with water level indicator.

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Ртој	ect Infor	metion												4	Page L o
Proje	ect Name:		Califor	nia Stree	: Overcro:	ssing			Location:	Californi	a St and Fed	ierai Ave			
Ртоје	ect/Task N	ło.:	53-043	33041.00	0 00056				Weather:	sunny, 60	DF				
Drill	ling Infor	mation													
Date	Started:		Thursd	ay, June	21,2001				Annulus Dia	tineter:		- 2	inches		
Date	Complete	:đ:	Thursd	ay, June	21, 2001				Hanner We	ight and Dro	nb:	NA	lbs and	NA	inches
Drille	ed By:		Kasey	Goble		of	Cascade Dri	illing	Sampler Typ	e:		3' stainless	steel split spor	on	
Logg	ed By:		Kate Pi	neo		– ^{of}	URS		Approximate	Surface Ele	vation:	NA	_feet		
Chec	Ked By:	. <b>.</b> .	Dave R	aubvogei		_ of	URS		Groundwater	Level:			below ground	i surface	
	Pie Tome	ю;	Torak	rush	CanProha		·	<u>.</u>	Total Depih:			6	below ground	l surface	
	Kig i ype:			BOUDICO -	Georrooe			<u> </u>	Backfill Mate	rial:		bentonite c	hips		<u> </u>
Well	Installati	ion Data												<u>_</u>	
Туре	of Well C	asing:	NA						Top of PVC	Elevation:		NA	•••	·	
Scree	n Perfora	tiga:	NA						Type/Thicker	uss of Seals:		NA			
Dian	eter of W	ell:	NA						Type of Sand	Pack:		NA			
Scree	acd inter-	val:	NA												
			1	F	1						<u> </u>				
(cef	<u>هر</u>	in the second		Catio Catio							l in l	ding			
b;h	fees a	metra xcove xches	8	21	NĂ							E II		Î	
ğ	ă ë	885	<u> </u>	35	35			Material Description	on		∣>ំប៊ីដឹ	Qi dd	Samples	R	emarks
		DEADC	10:00	GP		Brown fine to	a medium Send	and fric Gravel, dry	1.			8.5	JP3/0-3		_
			1	ML		Brown-gray S	Silt and Clay, so	ome fine Gravel, dan	ър. 		1				
1															
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-		3606	10:00	- 514			and and Site out				4		•		
1		30/30	10:00	3.51		вгомв пде э:	ADD AND SHI, WO	E1.				6	JP3/3-6		
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	e.		i								•	1		I	
Ground	dwater lev	el measured o	lown-holi	with wa	ater le vež i	ndicator.				. <u> </u>		<u> </u>			

Proj	eci lafori	nation									
Proje	ect Naune:		Califor	nia Sirer	t Overcro	ssing	Location: Cali	fornia St and Fe	deral Ave		
Proje	ct/Task N	lo.:	53-043	33041.0	0 00056		Weather: sann	y, 60F			
	ipe Infor	mation					·····				
Date	Started:		Thursd	ay, June	21, 2001	·	Annulus Diameter:		2	inches	
Daic	Complete	d:	Thursd	ay, June	21, 2001		Hammer Weight and	Dтор:	NA	lbs and	NA inches
Drille	d By:		Kasey (	Goble		of Cascade Drilling	Sampler Type:		3' stainles	s steel split spo	on
Logg	ed By:		Kate Pi	nco		of URS	Approximate Surface	Elevation:	NA	feel	
Check No	ked By:		Dave R.	aubvoge	1	of URS	Groundwater Level:		2	_below ground	surface
Dri Bi Secu	ng Metho ni - T	d:	Direct F	Push			Total Depth:		10	below ground	i surface
	Rug 1ype:		I fuck-r	nounted	GeoProbe		Backfill Material:		bentonite	chips	
Vell	Installati	on Data								· ·	·
iype	of Well C	asing:	NA			·······	Top of PVC Elevatio	n:	NA		
veree: Norm	n Perforat	100) 	NA			···	Type/Thickenss of Se	cats:	NA		
inee:	ned interv	a:	NA			<u>_</u>	Type of Sand Pack:		NA		
			1	1					····		
Ç;	er 6	N Lon		ation	1			5	lings		
Э́н	ws pr	netrat cover ches)		S Sile	S H			Bram -	2 Kead		
ä	Bla	285	1 2	30	135	Material Descripti	on	<u> &gt;ਁJä</u>	Ĥġ	Samples	Remarks
Ĭ		_10/24	10:50	Gr		Brown-gray line Sand and Gravel, dry			280 - 300	JP4/0-3	Odor.
				5M		Gray fine Sand and Sill, some fine Gravel, dark	gray ash/sinder layer, dry.			ĺ	
1											
2									ļ		
						Grading brown fine Sand and Silt, little coarse (	iravel.				
3		36/12	10:45	SP		Brown fine to coarse SAND, little coarse Gravel	, wet.	·	270	JP4/3-6	Odor.
4								ļ			
5											
6			[			No saugh collected					
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7											
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		24/7	10-50	- SM		The medium Could and Cile unit. Dad homes up	-1			-	
				2.74			VU VENUS IIUICO.		<i></i>	JP'4/8-10	]
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roj	ect Inforu	nation										Pa
тоје	ct Name:		Californ	nia Street	Overcro	ssing	Location:	California	St and Fed	eral Ave		
тоје	ct/Task N	io.:	53-043;	33041.00	00056		Weather	<b>зиллу, 60</b>	F			
									••••		-	
). Till	ing Inform	mation										
)ate	Started:		Thursda	ay, June 2	1, 2001		Annulus Dian	eler.		2	inches	
)ate	Complete	d:	Thursda	ay, June 2	1, 2001		Hammer Weig	cht and Droj	p:	NA	bs and	NAinches
xille	ad By:		Kasey (	Joble		of Cascade Drilling	Sampler Type	:		3' stainless	steel split spoo	n
.ogg	ed By:		Kate Pir	nco		of <u>URS</u>	Approximate :	Surface Elev	vation:	NA	feet	
hee	ked By:		Dave R:	aubvogel		of <u>URS</u>	Groundwater .	Level:			_below ground	surface
	ng Methos	d;	Direct P	Push	N - P		Total Deptis:				_below ground :	surface
7/3() 	Rig Type:		Truck-n	nounted (	icoPtob		Backfill Mater	iał:		bentonite (	hips	
Velt	Installati	on Data										
уре	of Well C	asing:	NA				Top of PVC E	levation:		NA		· · · · · · · · · · · · · · · · · · ·
cite	n Perforat	ion:	NA				Type/Thicken	ss of Seals:		NA		
iam	cter of We	e)L.	NA			······································	Type of Sand 1	Pacic		NA		
cree	acd Interv	al:	NA				-					· · · · · · · · · · · · · · · · · · ·
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ងី	18 inch	Rec Pen	ц.	US S S	N E	Material Description			នំបីគឺ		Samples	Remarks
0		36/36	11:05	SM		Light gray fine Sand and Silt, some coarse Gravel, d	ry.			4.3	JP5/0-3	
1				м		Dark gray SB T and coarse Gravet		· · ·	-			
-												
		36/22	11:10	SM		Brown dense fine Sand and Sill, wet, grading gray.				1.5		
2												
3						Grading brown.				5.3	JP5/3-6	
Ì						r						
5												
				SP		Black fine to medium Sand and Gravel.			1			
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	Proj	ject Infor	mation									Page Lof 1
	Ртој	ect Name:		Califo	mia Stree	t Overer	ossing	Location: California	St and Fed	ieral Ave		
	Ртој	eev/Task N	ło.:	53-043	333041.0	0 00056		Weather: sunny, 601	P			
្នា	Dritt	ing Infor	milian		_						•	
	Date	Started:	14000	Thurse	lav. Jane	21, 2001						<u> </u>
	Date	Complete	sd:	Thursd	iay, June	21, 2001		Hammer Weight and Drog	):	<u>+</u>	- libs and	NA inches
蘈	Drill	ed By:		Kasey	Geble		of Cascade Drilling	Sampler Type:		3° stainless	steel split spor	on,
	Logg	ed By: ked By:		Kate P	inco		of	Approximate Surface Elev	ation:	NA	feet	
	Drilli	ing Metho	id:	Direct	Push			Groundwaler Level: Total Denth:		 Q	_below ground	surface
	Drilt	Rig Type:	:	Truck-	mounted	GeoProt	×	Backfill Material:		bentonite a	hips	
	Well	Installati	on Data									
~ <b>~</b> ~	Туре	of Well C	asing:	NA		_	,,,,,	Ton of PVC Elevation:		NA		
	Scree	n Perfora	tion:	NA				Type/Thickenss of Seais:		NA		
	Dian	eter of W	ell:	NA	- <del>.</del>			Type of Sand Pack:		NA		
	DETE		·al:	NA			······································				- <u>-</u>	
	8	٢6			tion	:			5	28		
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	å	Blo	19 20 10 19 20 10 19 20 10	- <u>F</u>	1 <u>2</u> 5	55	Material Description		Dia Con		Samples	Remarks
	ľ		JQ24	11:50	SM		Gray-brown line Sand and Silt, some coarse Grave	l, moltled, dry.		4.3	JP5/0-3	
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3												
	2											
-98 (	3		36/6	11:50			Grading wet.			[4		Poor recovery.
3												ŕ
	4											
~~ <b>9</b>												
											!	
	6		36/18	11:50			Grading peat noted.			1.5	JP5/6-9	
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	9							r pr				
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8 <u>-</u>	NOTE:	5:										
	Ground	iwater lev	el measured o	lown-hol	e with wa	nter level	indicator,					
2 ing.												

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roje	ct Inform	mation								_								Page
rojec	i Name:		Californ	via Street	Overcre	ossing				Location:	California	st and	Feder	al Ave	:			
ojzo	tvTask N	o.:	53-043	33041.00	00056				<u>.</u>	Weather:	sunny, 60	F						
ritti	na Infor	nation							· · · -									
ate :	Started:		Thursda	v. Jone 2	1. 2001					Annulus Dian	eler:					incher	·	
ate (	Complete	ef:	Thursda	v. June 2	1. 2001					Hammer Wei	nter.	<b>m</b>	-	 N/		the and	NA ii	oche a
rille	d By:	-	Kasev (	Jobie			Casea	ade Drilling		Sampler Type				l'stain	tess .	steel solit sooo	"	ine ne ș
sge	d By:		Kate Pir	160		of	URS			Approximate	Surface Elev	vation:	-	NA		feet		
neck	ed By:		Dave Ra	aubvogel		af	URS			Groundwater	Level:		-	2	-	below ground	surface	
óltir	ig Methor	d:	Direct P	ush		_				Total Depth:			-	9		below ground	surface	
ill F	lig Type:		Truck-m	nounted G	coProb	c.				Backfill Mate	rial:		1	centon	ile ch	hips		
elt 1	netailatk	an Dete								<b></b>								
pe o	of Well C	asing:	NA				• 	<u> </u>		Top of PVC E	levation:		1	NA				
Tees	n Perforat	ion:	NA							Type/Thicken	ss of Seals:		- L	NA				
ane	ner of ₩e	:11:	NA							Type of Sand	Pack:		_ _	NA				
366).	ed interv	ai:	NA															
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54	Bla încl	12 12 13 12 12 13		ទីកី	ទីមី			Materia	il Description			≯ੈ ਹੈ	ä	ē,	5	Samples	Ren	arks
1		30/30		SM		Light brown	inte Sand	and Sill, some	nne Gravel, dry				ł				Odor.	
	;													75		JP7/1-2		
						Grading dari	k gray.					1		20		JP7/2-3		
: [				SP		Brown fine t	ο πεόιυπ	n Sand, little coa	arse Gravel, wet			1						
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		260																
'		UNDE				1						1					No recovery.	
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Groundwater level measured down-bake with water level indicator. Groundwater sample JP7/GW collected at 12:20.

Project No. 201742       Forma: Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual Anual	
Stre: Corner Mobil OU Terminal 48-108       Date: 07/03/02         Drill Contractor:       Cascade Drilling, Inc. of Woodinville, WA         Sample Method:       None         Drill Rig:       CME-55         Location:       Southwest corner of property         Registration:       Ingravel next to Federal Avenue.         Location:       Site: Southwest corner of property         Registration:       Ingravel next to Federal Avenue.         Logged by:       Antonio Luna         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       State:         State:       St	_
Sample Method: None       Geologist: Antonio Luna         Drill Rig: CME-55       Bore Hole Diameter: B'. Signature:         Location: Southwest corner of property       Registration:         in gravel next to Federal Avenue.       Logged by: Antonio Luna         Stands       Stands         Stands       Stands         Stands       Stands         Location: Southwest corner of property       Registration:         In gravel next to Federal Avenue.       Logged by: Antonio Luna         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands       Stands         Stands	-
Sample Method: Name Geologist: Antonio Lana Drill Rig: <u>CME-55</u> Bore Hole Diameter:B" Signature: Location: Southwest corner of property Registration: in gravel next to Federal Avenue, Logged by: Antonio Luna drive for the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state	_
Drill Rig: CME-55 Bore Hole Diameter: Registration: Location: Southwest corner of property Registration: Ingred next to Federal Avenue. Logged by: Antonio Luna GEOLOGIC DESCRIPTION GEOLOGIC DESCRIPTION Removed steel well and point, backfilled with bentonite, capped with 1 foot of cement  	_
Location: Southwest corner of property Registration: in gravel next to Federal Avenue. Logged by: Antonio Luna Removed steel well and point, backfilled with bentonite, capped with 1 foot of cement -5- Total depth, 5 feet below ground surface	_
in gravel next to Federal Avenue. Logged by: Antonio Luna	_
GEOLOGIC DESCRIPTION	_
B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B       B	<b>ī</b> .
-5-     Total depth, 5 feet below ground surface	
Removed steel well and point, backfilled with bentonite, capped with 1 foot of cement       Image: capped with 1 foot of cement         -5-       Total depth, 5 feet below ground surface	
Removed steel well and point, backfilled with bentonite, capped with 1 foot of cement	
-6- Total depth, 5 feet below ground surface	2
-5- Total depth, 5 feet below ground surface	
-5- Total depth, 5 feet below ground surface	
5 Total depth, 5 feet below ground surface	
Total depth, 5 feet below ground surface	
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Site: Former: Mobil Oil Terminal 46-102 Date: 07/03/02. Drill Contractor: Caseade Drilling, Inc. of Woodinville, WA Sample Method: Rone Gologist: Antonio Luna Drill Rig: CME-55 Bore Hole Diameter: 10 ² Signature: Location: Southwest comer of property In gravel next to Federal Avenue Cogged by: Antonio Luna State of the state of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of the search of t		Project No.: 31174 Boring: NW21 Plate: 1 OF 1	
Sample Method: None       Drill Contractor: Cascade Drilling, Inc. of Woodinville, WA         Sample Method: None       Goologist: Antonio Luna         Drill Rg: OME-55       Bore Hole Diameter: 10: Signature:         Location: Southwest corner of property       Registration:         in gravel next to Federal Arenue       Logged by: Antonio Luna         Market       CECLOGIC DESCRIPTION         Market       Cascade with 1 foot of cement         -5-       Total depth, 6 feet below ground surface         -7       Total depth, 6 feet below ground surface		Site: Former Mobil Oil Terminal 46-108 Date: 07/03/02	2
Sample Method: MoneGeologist: Antonio Luna Drill Rig: CME-55Bore Hole Diameter: 10 ² Signature: Location:Ingest corner of propertyRegistration: in gravel next to Federal ArenueLogged by: Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna  # Antonio Luna 	ENVIRONMENTAL RESOLUTIONS, INC.	Drill Contractor: Cascade Drilling, Inc. of Woodinville, WA	~
Drill Rig: <u>CME-55</u> Bore Hole Diameter: <u>10"</u> Signature: Location: <u>Southwest corner of property</u> Registration: In gravel next to Pederal Arenue. Logged by Antonio Luna Removed schedule 40 PVC well easing, verderfilled to remove seal and sand sand pack, backfilled with beatonite, capped with 1 foot of cornent 5 Total depth, 6 feet below ground surface V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: Logged by Antonio Luna V/N Signature: V/N Signature: V/N Signature: Removed schedule 40 PVC well easing, verderfilled to remove seal and sand pack, backfilled with beatonite, capped with 1 foot of cornent S V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: V/N Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature: Signature	Sample Method: None	Geologist: Antonio Luna	
Location: Southrest corner of property	Drill Rig: CME-55	Bore Hole Diameter: <u>10" Signature</u>	_
in gravel next to Federal Avenue. Iogged by Antonio Luna GEOLOGIC DESCRIPTION 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 VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isory VN isor	Location: Southwest cor	ner of property	_
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Image: State of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state o	· · · · · · · · · · · · · · · · · · ·		5
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Removed schedule 40 PVC well casing, overdrilled to remove seal and sand pack, backkilled with 1 foot of cement     Image: Competitive seal and sand pack, backkilled with 1 foot of cement       -5     -5     -5       -5     -5       -6     Total depth, 6 feet below ground surface       -7     -7       -7     -7       -6     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7     -7       -7			
-5-     Total depth, 6 feet below ground surface     V/W       -6-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     -       -7-     - <td< td=""><td>f f f ··· f f ··· f f</td><td>Permered eshedula 40 PWC well easing</td><td></td></td<>	f f f ··· f f ··· f f	Permered eshedula 40 PWC well easing	
-5-     -       -5-     -       -5-     -       -6     feet below ground surface       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode       VN     incode <td></td> <td>overdrilled to remove seal and sand pack,</td> <td>-2</td>		overdrilled to remove seal and sand pack,	-2
-5- Total depth, 6 feet below ground surface          VN		backfilled with bentonite,	1
-5- Total depth, 6 feet below ground surface           -0           -1           -1           -2           -2           -3           -4           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5           -5		capped with 1 foot of cement	
Total depth, 6 feet below ground surface			
Total depth, 6 feet below ground surface			
Casing Diameter: <u>M/A</u> . Slot Size: <u>M/A</u> . Sand Size: <u>M/A</u> . Grout: <u>M/A</u> .		Total depth, 6 feet below ground surface	7
Casting Diameter: <u>N/A</u> . Slot Size: <u>N/A</u> . Sand Size: <u>N/A</u> . Grout: <u>N/A</u> .			
Casting Diameter: <u>N/A</u> . Slot Size: <u>N/A</u> . Sand Size: <u>N/A</u> . Sand Size: <u>M/A</u> . Crout: <u>M</u>			A
Casting Diameter: <u>N/A</u> . Slot Size: <u>N/A</u> . Sand Size: <u>N/A</u> . Sand Size: <u>N/A</u> . Grout:			z
Casting Diameter: <u>N/A</u> . Slot Size: <u>N/A</u> . Send Size: <u>N/A</u> . Grou			4
Casing Diameter: <u>N/A</u> . Slot Size: <u>N/A</u> . Sand Size: <u>N/A</u> . Sand Size: <u>N/A</u> . G			10
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	Project No.: 31174 Boring: Unknown Plate: 14	
EN ENVIRONMENTAL	Site: Former Mobil Oil Terminal 45-105 Date:	07/03/02
	Drill Contractor: Cascade Drilling, Inc. of Woodinvill	e, WA
Sample Method: None	Geologist: Antonio Lur	1a
Drill Rig: <u>CME55</u>	Bore Hole Diameter: <u>10"</u> Signature:	İ
Location: <u>Southwest</u> co	mer of property Registration:	
<u>in gravel nex</u>	t to Federal Avenue. Logged by: Antonio Lu	na
At a still State Sty 54	GEOLOGIC DESCRIPTION	AT ST
	· \$7	The last
	Well overdrilled to remove well casing.	
	seal, and sand pack, backfilled with bentonite,	
	capped with 1 foot of cement	
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	Total depth 6 feet below ground surface	
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DEPTH (ft bgs)	<b>GRAPHIC LOG</b>	USCS SYMBOL	SOIL DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	w	ELL SCHEMATIC
- 0			Surface: 0.2 feet of asphalt over 1.6 feet of gray fine to medium angular gravel (crushed rock base course) A vac-truck was utilized from 0 to 5 feet below the ground surface to ensure utilities were cleared.							Flush mount in cement seal Hydrated bentonite chip seal
- 5 - -		_SP-/1 \$ <u>M</u>	Medium dense, moist, brown, fine to coarse SAND with <u>some silt and trace fine gravel</u> Moist to wet, wood; possibly a large block		22	0.0	¥			2-inch PVC casing in 2/12 silica sand filter pack 2-inch PVC 10 slot screen in 2/12 silica sand filter pack
_ _ _10_		54	Loose, wet, brown, fine to medium SAND with trace siit and petroleum odor Becomes saturated and gray at 8.3 feet Water appeared viscus and sediments appeared to have a metalic luster from 8.3 to 9 feet Becomes medium dense at 9.5 feet		6	0.0	$\nabla$	A1_S-1_0204 Sheen Test None Observed A1_S-2_0204	)8	
	• <b>}</b>	GP- GM SP	silt and no odor observed at 10.4 feet Cobbel in sampler shoe Medium dense, saturated, dark gray, fine GRAVEL with some fine to medium sand and silt, light to medium sheen Medium dense, saturated, gray fine to medium SAND with trace silt and fine gravel and occasional organics (wood		21	0.0		Sheen Test Light Observed		
15- 			splinters) Approximatley 0.01 foot thick layers of wood splinters at 13 14, and 15 feet Becomes loose, with petroleum odor and no visible gravel a 14.5 feet	, at	14	0.0		Observed		2/12 silica sand Bentonite chips
  20			Approximatley 0.1 foot thick layer of stiff, moist, brown, SIL with numerous organics / organic SILT (plant fragments, wood fibers, roots) at 18 feet		14	0.0		<ul> <li>Sheen Test Light Observed</li> <li>Sheen Test</li> </ul>		
			Very stiff, moist, brown, SILT with trace fine to coarse sand and numerous organics / organic SILT with trace fine to		20	0.0		None Observed		
- <b>25</b>		-sp	<ul> <li><u>Becomes with occasional organics (roots) at 25 feet</u></li> <li><u>Medium dense, saturated, gray, fine to medium SAND with trace silt</u></li> <li>Exploration terminated at 26.5 feet below the existing grour</li> </ul>		17	0.0				
AMEC PORTLANI	NG M	ETHOD								
BORI BORI BORI DRILI CON LOGO	EHOLE L RIG: [RAC] GED B	E DIAMI CME FOR: C	ETER: 8 (in) GROUND SURFACE ELEVATION CASING ELEVATION: NA ascade Drilling, Inc./Scott START CARD/TAG ID: /BAB238 DRILLING DATES: 02/04/2008 - 0	: NA 2/04/2008		REM	ARKS:			
SNING Exx Com 7-91	onMo npan 5-15	obil / / y 716-B	American Distributing American Distributing American Distributing American Distributing Kirkland, Washington USA 98034 Tel (425) 820-4669 Fax (425) 821-3914	onmental, I Suite 100	nc.	ə	n	ec®	LO	G OF BORING MWA1

		GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	w	ELL SCHEMATIC		
	,+			Surface: moist, dark gray, angula (crushed rock) A vac-truck was utilized from 0 to	ar fine to medium gravel							Flush mount in cement seal		
	_			Approximatley 2 feet of wood wit to be blocks of wood treated with	leared. In creosote odor (appeared In creosote)							Hydrated bentonite chip seal		
- (	- 		SP- SM/ SP//	Very loose, moist, black, fine to i silt and numerous organics (woo Very loose, moist, brown, fine to Vsilt Stiff, wet to saturated, blue-gray,	nedium SAND with some // d splinters) // medium SAND with trace // sandy SILT with slight //		5	0.0	T	A2_S-1_02044 Sheen Test Light	)8	2-inch PVC casing in 2/12 silica sand filter pack 2-inch PVC 10 slot screen in 2/12 silica sand filter pack		
			ML SP	Sector Construction and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector and Sector an	organic SILT / SILT with // fragments) and petroleum //		11			A2_S-2_0204	08			
-1	<b>0-</b> 		SP	Stiff, moist, brown, SILT with sor lorganics (roots) Loose, moist to wet, gray, fine to slift and scattered organics (roots)	e to medium SAND with /// bodor and light sheen /// ne clay and numerous /// medium SAND with trace //		25	0.0		Sheen Test None Observed				
				meaium dense, saturated, gray, trace silt	line to mealum SAND with		17	0.0						
-1	5-			Becomes with occasional organi at 15 feet	cs (roots, plant fragments)		11	0.0		Sheen Test None		2/12 silica sand Bentonite chips		
				TIP of sampler shoe contained w SILT with numerous organics (ro	et, brown, organic SiLT / ots, plant fragments)		14	0.0		Observed				
-2	0-		OL/ML SP	Stiff, moist, brown, organic strati \ and trace fine to medium sand / \ clay and trace fine to medium sa	fied SILT with some clay stratified SILT with some / ind and numerous organics /		16	0.0		Sheen Test None Observed				
				\(roots, plant fragments) Medium dense, saturated, gray, trace silt and occasional organic Becomes no visible organics at 2	fine to medium SAND with s (roots, plant fragments) 22 feet		25	0.0		Observed				
5-17/08	5						25	0.0		Sheen Test None Observed				
ORTLAND.GD				Exploration terminated at 26.5 fe surface.	et below the existing ground									
AMEC P			ETHOD											
LGD.B	OREI	HOLE	E DIAM	ETER: 8 (in) GRO	JND SURFACE ELEVATION: NA	4		REM	ARKS					
	RILL	RIG:	CME	CASI	NG ELEVATION: NA									
DERAL				Cascade Drilling, Inc./Scott STAR	T CARD/TAG ID: /BAB237	1/2000								
			. ∟IVI		AMEC Easth and Easth	~2000					1			
R+WELL BOR	xxo omj	nMo pany	obil / / y	American Distributing	Avriec Earth and Environm 11335 NE 122nd Way, Suit Kirkland, Washington USA 98034 Tol. (425) 820 4659	e 100	IIC.	<b>Ə</b> l	M	ec		g of Boring Mwa2		
ENVR 7	915	15-15716-B Tel (425) 820-4669 Fax (425) 821-3914										PAGE 1 OF 1		

	o DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL I	DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	w	ELL SCHEMATIC
			SM	Asphalt. Gray, silty SAND (SM) with	grave	əl (Fill).							<ul> <li>Portland Cement</li> <li>Casing (Schedule 40 PVC, 2.0-inch I. D.)</li> <li>Hydrated Bentonite Chip Seal</li> <li>#2/12 Silica Sand</li> </ul>
	5		SM	Medium dense, slightly mo (SM) with some gravel; no	ist, gra discol	ay, fine to coarse, silty SAND		17	1.6		MWA3-5'		<ul> <li>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</li> </ul>
	10 		SP	Medium dense, wet, gray, some gravel and abundant (wood); no discoloration, n	fine to white o odor	coarse SAND (SP) with shells, some organics , no sheen.		12	1.3	V	MWA3-10' ^乙 TPH-D = 791		0.010-inch slots on outside)
	15 <u>-</u> -		SM	Medium dense, wet, gray, trace subrounded to suban odor.	fine to gular (	coarse, silty SAND (SM) with gravel; no discoloration, no		18	1.0		MWA3-15'		<ul> <li>End Cap (Schedule 40 PVC, 2.0-inch I. D.)</li> <li>Bentonite Chips</li> </ul>
11/11	20		SP	Very dense, wet, gray, med some silt, some shells, trad Boring terminated at 20 fee	dium to ce grav	o coarse SAND (SP) with		50/6"	1.2		MWA3-20'		
110 NEC PORTLAND.GDT 3/3													
	BORI BORE DRILL CONT	NG ME EHOLE _ RIG: TRACT	ETHOD DIAMI NA OR: C Y: A.S	: HSA ETER: 8 (in) ascade Drilling, Inc. peransky	ELEV GROU CASI STAF	ATION REFERENCE: NA JND SURFACE ELEVATION: NA NG ELEVATION: NA RT CARD/TAG ID: /BCM 305 LING DATES: 6/23/2010 - 6/24/20	010		REM/ Air ki D&M	ARKS: nife to samp	4 feet bgs for utili ler; field density is	ties clear approxir	ance. nate.
ENVR+WELL BORING	ExxonMobil / American Distributing Company 1-915-15716E					AMEC Earth and Environm 600 University Street, Suite Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761	iental, li e 1020	ıc.		an	nec ^Ø	LO	G OF BORING MW-A3 PAGE 1 OF 1

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL I	DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	w L	/ELL SCHEMATIC _Flush-mount Monument with Locking Cap
			SM	Asphalt (0.3 feet). Silty SAND (SM) with grave	əl (Fill	<u></u> ^	-						Portland Cement Casing (Schedule 40 PVC, 2.0-inch I. D.) Hydrated Bentonite Chip Seal
	- 5		SM	Medium dense, slightly mo (SM) with some gravel; no	ist, gra discol	ay, fine to coarse, silty SAND oration, no odor.		16	4.3		■ MW-A4-5'		Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with
_	-10			Moist to wet; no discolorati	on, nc	odor, no sheen.		21	4.5	$\nabla$	■ MW-A4-10'		in #20/40 Silica Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
_	-15			Same as above. wood ( < ⁻ odor.	l inch)	); petroleum hydrocarbon-like		26	6.7		■ MW-A4-15' 		End Cap (Schedule 40 PVC, 2.0-inch I. D.) 
	-20		SP	Medium dense, wet, gray, some silt and gravel, some no discoloration, no odor.	nediu orgai	m to coarse SAND (SP) with nics (wood), abundant shells;		26	4.6		■ MW-A4-20'		
DRTLAND.GDT 3/31/11	_ - <b>25</b> _ _ _				i Dys.								
MEC PC	_30												
GPJ A	BORI	NG MI	ETHOD	: HSA	ELE\								
.02LS.	BORE			EIER: 8 (IN)	GRO	UND SURFACE ELEVATION: NA	l III		Air k	AHKS: nife to	4 feet bgs for utili	ties clea	rance.
15716E	CONT	RACT	OR: C	ascade Drilling, Inc.	STAF	RT CARD/TAG ID: /BCM 306			D&M	samp	ler; field density is	approxi	mate.
1-915-	LOGO	GED B	Y: A.S	peransky	DRIL	LING DATES: 6/22/2010 - 6/24/20	010						
ENVR+WELL BORING	ExxonMobil / American Distributing Company 1-915-15716E					AMEC Earth and Environm 600 University Street, Suite Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761	nental, Ir e 1020	IC.	LOG OF BORING MW-A4				G OF BORING MW-A4 PAGE 1 OF 1

	o DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL E	DESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	w	ELL SCHEMATIC _Flush-mount Monument with Locking Cap
	- <b>0</b>  		SM	Asphalt. Gray, fine to coarse, silty S, from cuttings.)	AND (SM) with gravel. (Logged	-						<ul> <li>Portland Cement</li> <li>Casing (Schedule 40 PVC, 2.0-inch I. D.)</li> <li>Hydrated Bentonite Chip Seal</li> <li>#2/12 Silica Sand</li> </ul>
-	- 5		SP- SW	Very dense, slightly moist, g (SP/SW) with silt and coars	gray, medium to coarse SAND e gravel; no discoloration, no odor.		65	3.6		■ MWA5-5'		Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with 0.010-inch slot size
	-10— — —		SP	Dense, moist to wet (botton coarse SAND (SP) with sor discoloration, no odor.	n of sampler), gray, medium to ne fine sand with gravel; no		17	11	$\nabla$	■ MWA5-10'		Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
	-15 <u>-</u>  			Very dense, wet, gray, fine trace gravel.	to coarse SAND (SP) with silt,		67	3.2		■ MWA5-15' ^{//} TPH-D = 2,800; TPH-O = 523		— End Cap (Schedule 40 PVC, 2.0-inch I. D.) — Bentonite Chips
-	-20— — — 			Becomes coarse SAND (SI gravel. Boring terminated at 20 fee	P) with fine sand, some silt, trace		50/2"	3.5		■ MWA5-20'		
AEC PORTLAND.GDT 3/31/	_ _ 											
915-15716E.02LS.GPJ AN	BORI BORI DRILL CON	ING MI EHOLE L RIG: TRACI GED B	ETHOD E DIAM NA FOR: C	: HSA ETER: 8 (in) Cascade Drilling, Inc. peransky	ELEVATION REFERENCE: NA GROUND SURFACE ELEVATION: NA CASING ELEVATION: NA START CARD/TAG ID: /BCM 301 DRILLING DATES: 6/23/2010 - 6/24/2	A 010		REM Air ki D&M	ARKS: nife to	4 feet bgs for utili ler; field density i	ties clear s approxi	ance. mate.
ENVR+WELL BORING 1-	Exx Con 1-91	onMo npan	obil / /	American Distributing	AMEC Earth and Environn 600 University Street, Suit Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761	nental, li e 1020	nc.	LOG OF BORING MW-A5				G OF BORING MW-A5 PAGE 1 OF 1

	o DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL [	DESCI	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	V	VELL SCHEMATIC _Flush-mount Monument with Locking Cap
	5		SM	Asphalt (0.3 feet).	mediu (Fill); n	m, silty SAND (SM), some o discoloration, no odor, no		41	1.5		■ MWA6-5'		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
	-			Cobble; drilled through. Same as above; petroleum sheen.	ı hydro	carbon-like odor, some		26	2.2	$\nabla$	■ MWA6-12'		Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
	15- - - -		SM	Medium dense, wet, gray, f sand and silt lenses (< 2 in chips < 1 inch).	fine, sil ches),	Ity SAND (SM) with coarse abundant organics (wood		12			■ MWA6-15 		End Cap (Schedule 40 PVC, 2.0-inch I. D.) Bentonite Chips
[ 3/31/11	20		SP	Laminated peat to silty SAN bgs. Medium dense, wet, gray, f wood in shoe; petroleum hy Boring terminated at 21.5 f	ND to \$ ine to ydroca eet bg:	SILT (PT/SM/ML) at 20 feet medium SAND (SP) with rbon-like odor, ~15% sheen. s.		9	2.8		■ MWA6-20'		
MEC PORTLAND.GDT	- - 30-												
1-915-15716E.02LS.GPJ A	BORI BORE DRILL CONT	NG ME EHOLE L RIG: TRACT GED B	ETHOD E DIAMI NA OR: C Y: A.S	: HSA ETER: 8 (in) ascade Drilling, Inc. peransky	ELEV GROU CASII STAR DRILL	ATION REFERENCE: NA JND SURFACE ELEVATION: NA NG ELEVATION: NA IT CARD/TAG ID: /BCM 304 JNG DATES: 6/25/2010			REM/ Air ki D&M	ARKS: nife to sampl	4 feet bgs for utili er; field density is	ties clea approxi	irance. imate.
ENVR+WELL BORING	ExxonMobil / American Distributing Company 1-915-15716E					AMEC Earth and Environm 600 University Street, Suite Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761	ental, Ir e 1020	<b>1С.</b>	LOG OF BORING MW-A6				DG OF BORING MW-A6 PAGE 1 OF 1

	DEPTH (ft bgs)	SRAPHIC LOG	ISCS SYMBOL	SOIL I	DESC	RIPTION	SAMPLE	BLOW COUNT	<b>OLATILE</b> READING (ppm)	ROUNDWATER	FIELD AND ABORATORY FESTING	W	ELL SCHEMATIC
U AMEC PORTLAND.GDT 3/31/11	-0 - -0 - -0 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 - -10 -	NG M	THOD	No samples collected, for li 7AB boring log. Boring terminated at 15 fee	tholoc et bgs.	y descriptions refer to MW-							<ul> <li>with Locking Cap</li> <li>Portland Cement</li> <li>Casing (Schedule 40 PVC, 2.0-inch I. D.)</li> <li>Medium Bentonite Chips</li> <li>#2/12 Silica Sand</li> <li>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)</li> <li>End Cap (Schedule 40 PVC, 2.0-inch I. D.)</li> </ul>
2LS.GF	BORE	HOLE	DIAM	ETER: 8 (in)	GRO	UND SURFACE ELEVATION: NA	L.		REM	ARKS:			
716E.0.	DRILI	RIG:	Hollow	w Stem Auger	CASI	NG ELEVATION: NA							
15-157	CONTRACTOR: Cascade Drilling, Inc. STAF LOGGED BY: A.Speransky DRIL					RT CARD/TAG ID: /BLT 570							
4G 1-9	LOGGED BY: A.Speransky DRILL					LING DATES: 12/2/2010							
ENVR+WELL BORI	ExxonMobil / American Distributing Company 1-915-15716E					AMEC Earth and Environm 600 University Street, Suite Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761	ental, Ir e 1020	IC.	amec [®] LOG OF BORING MW-A7 PAGE 1 OF 1				G OF BORING MW-A7 PAGE 1 OF 1

	оDEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	- U -		SP	Surface: 0.3 feet of asphalt over Wet, olive-brown, medium to coa fine sand and silt; no discoloration	0.5 feet asphalt base arse SAND (SP) with some on, no odor.			61	$\nabla$			MW-7A-1 11/30/10
	_			Very loose.			2	3.2 - 6.1			■ :	S-1
	_			Becomes fine to coarse SAND	(SP).		2				■ :	5-2
	- 5 -						2	12			■ :	S-3
				No recovery. Driller reports very	loose SAND.		0					
	10-			No recovery.			0					2.5
			SM	Very loose, wet, olive to brown, f (SM), organics.	ine to coarse, silty SAND		10					5-0
			SM- SP	Medium dense, wet, yellow to ye silty SAND (SM/SP), trace grave	llow-brown, fine to coarse,		19	23 - 30				MW-7AB-12 12/1/10 S-6
	_			Sand increases.			05	80			■ 5	6-7
	-15		SM	Dense wet brown to olive-brown	n fine to coarse silty SAND		25 42	7.0			■ :	S-8
	_		OW	(SM); no discoloration, no odor.			74	1.3			■ :	S-9
				Becomes, moist, iron oxidation of foot heave.	liscoloration, approximately 1		26	2.5				S-10
	_		SM	Medium dense, wet, orange-brow trace gravel.	wn, fine, silty SAND (SM),		17					
	20— _		SM- ML	Medium dense, moist, gray to oli SILT (SM/ML) with iron oxidation	ve-gray, fine, silty SAND to		18				■ :	S-11
	_			Soft, gray SILT (ML).				4.4				S-12 (Shelby)
	_		ML	Stiff, moist, olive-gray SILT (ML)	with brown, fine organics.			0.0			■ S-	S-13
/31/11 	-25		SP	Very dense, wet, olive, fine to co	arse SAND (SP) with some		63 q/				■ :	S-14
0.GDT 3				Gravel increases in last 6 inches	of sampler shoe.		50	1.5 -			■ :	G-15
RTLAN	_			Becomes with gravel.			90	7.0				G-16
AMEC POF	_			Becomes with trace gravel. Lenses of moist, brown, silty SA	ND (SM) with brown, very fine		50/6"				■ :	G-17
S.GPJ	30 organics (approximately 4 inche 30RING METHOD: HSA ELE			: HSA ELE			50/5	REM	ARKS:			
E.02L	BOR	EHOLE		ETER: 8 (in) GRO	UND SURFACE ELEVATION: NA			Clear	ed to	5 feet bgs v	vith ha	nd auger and vacuum truck.
-15716	DRIL	L RIG:	Hollow	v Stem Auger CAS	ING ELEVATION: NA							
1-915	CON	TRAC	FOR: C	ascade Drilling, Inc.								
UNG UNG	LOGO	GED B	Y: A.S	peransky DRIL	LING DATES: 11/30/2010 - 12/1/2	2010						
ENVIRONMENTAL BC	Exxo Con 1-91	onMo npan 5-15	obil / A y 716E	American Distributing	AMEC Earth and Environmental, Inc. 600 University Street, Suite 1020 Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761				an	nec [®]		LOG OF BORING MW-7AB PAGE 1 OF 2

	SDEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL	DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
			SP- SM	Very dense, wet, olive, fine and silty sand; no discolora No samples collected due	e to coa ation, r to repo	arse SAND (SP/SM) with silt		0	NA			<b>.</b> S-	18
	-35-							50/5"					
	_			Boring terminated at 35.5 slurry via tremmie pipe.	feet bg	s; backfilled with bentonite							
	_ -40												
	-												
	-45	45-											
	-												
	-50	 50											
	-												
T 3/31/11	-55	55											
PORTLAND.GD	_												
AMEC	_												
.02LS.GPJ	60 BORI	NG M		: HSA	ELE	ATION REFERENCE: NA	<u> </u>	1	REM. Clear	ARKS: red to	5 feet bgs v	vith hand	d auger and vacuum truck.
1-915-15716E	DRILL RIG: Hollow Stem Auger CAS CONTRACTOR: Cascade Drilling, Inc.					NG ELEVATION: NA							
30RING	LOGGED BY: A.Speransky DRIL					LING DATES: 11/30/2010 - 12/1/2	2010						,
NVIRONMENTAL B	ExxonMobil / American Distributing Company 1-915-15716E				AMEC Earth and Environm 600 University Street, Suite Seattle, Washington USA 98101 Tel (206) 342-1760 Fax (206) 342-1761	and Environmental, Inc. sity Street, Suite 1020 shington 42-1760				ec ⁰	LOG OF BORING MW-7AB		

DEPTH (ft bas)	GRAPHIC LOG		USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
				Asphalt (5 inches), base gravel,	CAP fabric at 1 foot bgs.							
			SM	Silty SAND (SM), wood waste; po odor from 1 to 4 feet bgs.	etroleum hydrocarbon-like	-		60				
- 5			SM	Medium dense, moist, fine to coa gravel; gray discoloration, strong odor.	arse, silty SAND (SM) with		23	61 50 80	$\nabla$		S-	1 2
				hydrocarbon-like odor. Becomes olive-gray; some odor.	n, strong petroleum		16	19			■ S-	3
-10							8	7.0			S-	5
			5M	with organics (decayed wood); so petroleum hydrocarbon-like odor	ome discoloration, slight		11	1.5			■ S-	6
			57	coose, wei, gray, fine to medium gravel and coarse sand, some fir	אנת (אר) שוות siit, some ne organics.		9	0.4			S-	7 31-14' @1015 12/03/10
-1	<b>5</b> -			Driller reports soft material at 14				0.1			■ S-	8 (Shelby)
			SM	Loose, wet, dark gray, tine to coa some silt to silty sand with fine or odor.	arse SAND (SP/SM) with rganics; no discoloration, no		7	0.0			■ 3-	9 10
-20	<b>)    </b>  -		SP	Very loose, wet, gray, fine to coa organics and some decayed woo	rse SAND (SP) with silt, fine		2	0.0			■ S-	11
	-			Wood waste in sampler shoe. Becomes loose.			7	0.0			■ S-	12
-				Becomes medium dense, with or	rganics (fine wood).		13	0.0			■ S-	13
	<b>5</b>						13				■ S-	15
C PORTLANI				Decayed wood (4 inches).			19				AE S-	31-27' @ 1115 12/03/10 16
AME				Becomes very dense, gray.			50/6"				■ S-	17
Гар.S. ВС	) RING	ME	HOD:	HSA ELEV	ATION REFERENCE: NA		100/0	REM	ARKS			
6E.021	REHO	LE	DIAME	ETER: GRO	UND SURFACE ELEVATION: NA	•		Air k	nife to	4 feet bgs f	or utiliti	les clearance.
<b>PD</b>	ILL RI	G:	Hollov	v Stem Auger CAS	NG ELEVATION: NA							
DI 1-91:	ONTRA	CTC BY	DR: Ca	ascade Drilling, Inc. peransky DRIL	LING DATES: 6/22/2010 - 12/3/20	010						
ENVIRONMENTAL BO	xon <b>i</b> ompa 915-1	Mol iny 57 [.]	oil / A 16E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	ronmental, Inc. rkway N aneco Loo					LOG OF BORING AB-1 PAGE 1 OF 2	

	SDEPTH (ft bgs)	<b>GRAPHIC LOG</b>	USCS SYMBOL	SOIL DES	CRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	30 <u> </u>		SP	Very loose, wet, gray, fine to co organics and some decayed wo Wood (last 6 inches of sampler	parse SAND (SP) with silt, fine bod; no discoloration, no odor.		10					S-18
	_			Wood (last 6 inches)	).		19					S-19
	_		SM	Loose, wet, olive-brown, fine to	medium, silty SAND (SM) with		8					
	_		SP- SM	Medium dense, wet, gray, fine t	o medium SAND (SP/SM) with		19					
÷	35		_									
	_			Boring terminated at 35 feet bg slurry via tremmie pipe then pat	s; backfilled with bentonite tched with concrete on top.							
	-											
	-											
	_											
Γ	40-											
	_											
╞	45-											
	_											
	_											
	-											
	-											
H	50-											
	-											
2/11	55-											
DT 2/2	_											
AND.G	_											
PORTL	_											
AMECI	-											
L L		NG MF		: HSA EI				REM				
E.02LS	ORE	HOLE		ETER: GR	OUND SURFACE ELEVATION: NA	L		Air k	nife to	4 feet bgs	for ut	tilities clearance.
-15716	RILL	RIG:	Hollov	w Stem Auger CA	SING ELEVATION: NA							
1-915	ONT	RACT	OR: C	ascade Drilling, Inc.								
ORING	OGC	ED B	Y: A.S	peransky DRI	LLING DATES: 6/22/2010 - 12/3/20							
NVIRONMENTAL BU	Exxo Com -91	onMo ipany 5-157	obil / / / 716E	American Distributing	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 PAGE 2 OF 2	

	DEPTH (ft bgs)	<b>GRAPHIC LOG</b>	USCS SYMBOL	SOIL DES	CRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
			GW SM	Gravel surface. Gray, moist, fine to coarse, silt some petroleum hydrocarbon-l	y SAND (SM) with gravel (Fill);		NA NA NA	30 21 29				
-	5-		SM SM	Brownish, oily discolored, silty increased; strong hydrocarbon Dark brown, silty SAND (SM); hydrocarbon-like odor.	SAND (SM), silt content like odor. free product; strong petroleum		NA NA	61 49	$\nabla$		AB	1A 3.5-4.5 6/22/10
	_			bentonite chips.	gs, backnilled with medium							
-	10											
_	_ _ 15_											
	_											
÷	 20											
11	-											
TLAND.GDT 2/22/	25— 											
S.GPJ AMEC POF		IG ME	THOD	: Hand Auger ELI	EVATION REFERENCE: NA			REM	ARKS:	E \$4 \$ m		
NG 1-915-15716E.02	BORE DRILL CONT	HOLE RIG: RACT ED B	DIAMI OR: C Y: A.S	ETER: 3 (in) GR CA ascade Drilling, Inc./AS peranksy DR	OUND SURFACE ELEVATION: NA SING ELEVATION: NA ILLING DATES: 6/22/2010			AIT KI	inie lo	J IEEL DUS,	sampied	using nanu duger.
ENVIRONMENTAL BORI	Exxo Com	onMo pany 5-15	obil / / / 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	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 PAGE 1 OF 1

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
		GW	Asphalt (0.5 feet).		-						
		SM	CAP fabric at 1.5 feet bgs. Silty SAND and GRAVEL (SM).		-						
-5	<u> <u>w</u> <u>w</u> <u>w</u></u>	PT SM	Brown, gravel, sand, silt, wood v organic odor. Very loose, wet, brown, silty SAN	vaste, bricks (PT); strong		3	2.5 3.1	$\nabla$		AE S-	3-2-4.5-5' 6/21/10 1
			organics; some organic odor, 50	% sheen.		1	27			■ S-3	2
	6 879 879 879 879 87 8 879 879 870 879 87 971 979 87	PT	Dark brown wood waste, organic light material (PT); no sheen.	cs, some silt and sand, very		2	5.9			■ S-:	3
-10	- 77 77 7 7 77 77 77 77 7 77 77 7 77 77 7					2	3.0 4.5			■ S-	4 5 (Sholhu)
.	77 77 77 77 77 77 77 77 77 77 77 77		increasing sand content.								
		SP	Medium dense, wet, gray, fine to trace subrounded to subangular odor.	coarse SAND (SP) with silt, gravel; no discoloration, no		12	0.0			■ S-	7
-15	-					10				AE	, 3-2-14 6/23/10, Dup 1 8
	_		Some decayed organics. Silt increases.			10				■ S-!	9
						24				■ S-	10
			Wood at 20.5 feet. Some organics (wood chips < 1 sheen.	ps < 1 inch), trace gravel; no odor or		15	2.3			■ S-	11
	-			ſ		28				■ S-	12
11/22 - <b>25</b>			Becomes dense, trace organics.	- 07 feet has		40	2.1			■ S-	13
UD.GDT 2/	-		no samples collected from 25 (C	27 ieel bys.							
	<u>77 77 7</u> 7 77 77 <u>77 77 7</u>	SP PT	Very dense, wet, gray, fine to co some dark brown organics (woo Peat (PT).	arse SAND (SP) with silt,		27	1.9			■ S-	14
JAME ( -30-	-30 -30 -30 -30 -30 -30 -30 -30 -30 -30			arse SAND (SP) with silt, odor.		62	-				
DISTECTOR	RING M		: HSA ELE	VATION REFERENCE: NA			REM/ Air ki	ARKS: nife to	5 feet bgs	ior utiliti	es clearance.
12716E	LL RIG		CAS	ING ELEVATION: NA	•		From appro	&M sampler; field density is			
	NTRAC	ror: C Y: A.S	ascade Drilling, Inc. peransky DRIL	LING DATES: 6/21/2010 - 6/23/20	010						
EXIENTAL BOF	xonMe mpan )15-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	Imental, Inc. Way N ARE AE PAGE					LOG OF BORING AB-2 PAGE 1 OF 2	

	UEPIH (II bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	CRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
-	30- - -		SM	Dense, wet, brown, fine to coars organics (wood > 2 inches thick some gravel. Changed to D & M sampler at 3 Heaving sand.	se, silty SAND (SM) with ), 50% wood in sampler with 0 feet bgs.		37	1.1			■ S-	16 17
			SM	Dense, wet, yellow-brown, fine t with coarse sand, some gravel;	o medium, silty SAND (SM)		34	0.6			■ S-	18
÷	35—		SP	Very dense, wet, olive-grey, med little to no fines, some gravel.	dium to coarse SAND (SP),		51				■ S-	19
			SM	Very dense, wet, yellow-brown, (SM) with coarse sand, some gr	fine to medium, silty SAND avel; no odor.		65				■ S-	20
	_						72	0.7			■ S-:	21
	-0-						50/6''					
	-			Boring terminated at 40 feet bgs bentonite chips and capped with	s; backfilled with medium a concrete patch.							
	_											
	-01											
	_											
	_											
-{	50-											
	_											
	_											
, 2/22/11	55-											
AND.GD	_											
EC PORTL	-											
GPJ AME	50		TUCT									
B B	ORE	HOLE	E DIAMI	: пъя ЕLE ETER: 8 (in) GRC	VATION REFERENCE: NA	L		REM/ Air ki	ARKS: nife to	5 feet bgs i	for utiliti	es clearance.
915-15716 D		- RIG:		CAS	SING ELEVATION: NA			From appro	30 fee oximat	et bgs chan e.	ged to D	am sampler; field density is
PING 1	OGG	ED B	Y: A.S	peransky DRII	LLING DATES: 6/21/2010 - 6/23/20	010						
E C I	om -91	onMo ipany 5-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	91	n	eć	0	LOG OF BORING AB-2 PAGE 2 OF 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		
		SM	Asphalt (5 inches); CAP fabric @ 0.5 bgs. 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 21	1.1 3.7	$\nabla$		■ AB S-1	3-4.5-5' 6/21/10   2		
_ 10_			Becomes loose with increased silt content.		9 5	3.7			■ S-3	3		
-		SP SP	Very dense, wet, olive-brown SAND (SP) with silt, occasional gravel; no discoloration, no odor.		50/1"	1.4			■ S-4	1		
 15 -	70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70	PT	Wood waste (PT), some very loose, gray, silty sand and trace gravel; organic odor.		3	5.9			■ S-5	5		
-			No recovery. Soft material.						■ S-6	ያ (Shelby)		
<b>20</b>	2 <u>1</u> 2 <u>1</u> 2	SP	Dense, wet, olive-brown SAND (SP) with silt, gravel and some wood; no odor.		21	0.0			<ul> <li>AB S-7</li> <li>S-8</li> </ul>	3-20' 6/22/10 7 3		
			Becomes olive-gray, some gravel; no discoloration, no odor.		31	0.0 0.0			<ul><li>S-9</li><li>S-1</li></ul>	9		
			Heave; added water to hole. Becomes gray with occasional wood (non-decayed) and little		30	0.0 0.0			<ul> <li>S-1</li> <li>S-1</li> </ul>	12		
					64 83	0.0			■ S-1	3		
BOR BOR DRIL DRIL CON LOG	BOREHOLE DIAMETER: 8 (in)       GROUND SURFACE ELEVATION: NA         DRILL RIG:       CASING ELEVATION: NA         CONTRACTOR: Cascade Drilling, Inc.       DRILLING DATES: 6/21/2010 - 6/22/2010											
Exxi Exxi Cor 1-91	ExxonMobil / American Distributing Company       AMEC Earth and Environmental, Inc. 11810 North Creek Parkway N Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001       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 DES	CRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
------------------	-----------------	----------------------	-----------------------	---------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------	-------------------	---------------------------	---------------------------	------------------	--------------------	---------	--------------------------------------
Ē	30		SP	Dense, wet, olive-brown SAND wood; no odor.	(SP) with silt, gravel and some			0.0			■ :	S-14
	_			Becomes olive-gray, no organic	cs, trace gravel and some silt.		77	0.0			■ 9	S-15
	-						50/2"					
	-			D&M sampler.			50/5"					5-16
F	35-						50/5"					S-17
	_		-SP	No recovery.	fine to coarse SAND (SP) with	-						
	_		01	fine sand lenses stained with in	on-oxide.						_	
┢	40			Boring terminated at 40 feet ba	s: backfilled with modium		50/2"					5-18
	_			bentonite chips.								
	_											
┢	45-											
	-											
	_											
╞	50-											
	_											
	-											
22/11	55—											
GDT 2/	_											
TLAND	-											
C POR	-											
J AME	60											
D2LS.GF	BORII	NG MI	ETHOD	: HSA ELE				REM Air k	ARKS: nife ar	d vactor tru	uck to	5 feet bgs for utilities clearance.
5716E.(	SORE	HOLE	= DIAMI	EIER: 8 (in) GR	OUND SURFACE ELEVATION: NA	L		At 34 appr	feet b	ogs changed te.	l to D8	M sampler; field density is
1-915-1	ONT	RAC	TOR: C	ascade Drilling, Inc.								
BNING	.OGG	ED B	Y: A. S	Speransky DRI	LLING DATES: 6/21/2010 - 6/22/20	010						
ENVIRONMENTAL BC	Exxo Com	onMo ipan 5-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	nental, l Ny N	nc.	91	M	eć	0	LOG OF BORING AB-3 PAGE 2 OF 2

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
- 0 -		SM	Asphalt (4 inches thick), gravel b fabric at 1 foot bgs. Moist, gray, fine to coarse, silty S organics (wood chips); strong or	ase (2 inches thick), CAP SAND (SM) with gravel (Fill), ganic odor.	-						
- 5 - - - -		SM	Medium dense, moist, gray, fine with gravel; gray discoloration, st like odor.	to coarse, silty SAND (SM) rong petroleum hydrocarbon-		18 7 3	>455 >500	$\nabla$		<ul> <li>S-</li> <li>S-</li> <li>S-</li> </ul>	1 2 3
10 	R		Wood waste, silt and sand.			10	3.3 1.4			<ul> <li>S</li> <li>S</li> </ul>	4 (Shelby) 5
- - -15-		ΓI	Wood waste.	ayed wood waste) with some		3	7.3 8.3			<ul> <li>S-</li> <li>S-</li> </ul>	6 7
-	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	SP	Medium dense, wet, gray, mediu silt, trace gravel; no discoloratior	m to coarse SAND (SP) with a, no odor.		21 24	2.0 0.0			<ul> <li>S-4</li> <li>AE S-4</li> </ul>	8 34-17' 6/23/10 9
- <b>20</b> -			Some gravel; no discoloration, n	o odor.		12 25	0.0			S-	10
			Becomes fine to coarse SAND (Sodor. Becomes dense. Becomes very dense, fine organ	SP); no discoloration, no		22 36	0.0			S-	13
PORTLAND.GDT 2			No organics; no discoloration, no	odor.		50 38	0.0 0.0			<ul><li>S-</li><li>S-</li></ul>	15
02LS.GPJ AMEC	ING MI	SM ETHOD				50	0.0 REM	ARKS: nife to	4 feet bgs f	S-	17 es clearance.
BOR DRIL CON LOG	EHOLE L RIG: TRACI GED B	- Diami for: C Y: A.S	EIEH: 8 (IN) GRO CASI ascade Drilling, Inc. peransky DRIL								
Exx Con 1-91	onMo npan 15-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	nental, Ir iy N	nc.	91	m	ec	<b>()</b>	LOG OF BORING AB-4 PAGE 1 OF 2

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DES	CRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
ſ	30		SM	Dense to very dense, wet, yello coarse, silty SAND (SM) with tra-	w-brown, fine to medium ace subrounded gravel,		61	0.0				S-18
	_			Becomes dense, olive-gray, fine	e, silty SAND (SM) with some		31					
	_		ML	Stiff, moist, gray SILT (ML), son	ne fine sand with clay, trace		31	0.0				S-19
	_			Very dense, gray, fine to coarse	SAND (SP), little fines: no							S-19A S-20
$\left  \right $	35-			discoloration, no odor.			61					
				Boring terminated at 35.5 feet b Backfilled with medium bentonit	rgs. te chips, concrete patch at top.							
	40											
	_											
	_											
	_											
╞	45-											
	_											
	-											
	_											
	-											
F	50											
	_											
22/11	55-											
3DT 2/	_											
AND.C	_											
PORTI	-											
AMEC	-											
S.GPJ	60 BORII	NG MI	ethod	: HSA ELE	VATION REFERENCE: NA	<u> </u>		REM	ARKS:			
3E.02L	BORE	HOLE		ETER: 8 (in) GRG	OUND SURFACE ELEVATION: NA			Air kı	nife to	4 feet bgs t	for uti	lities clearance.
5-1571	DRILL	. RIG:		CAS	SING ELEVATION: NA							
1-91	CONT	RACI	TOR: C	ascade Drilling, Inc.								
BORING	LOGG	ED B	Y: A.S	peransky DRI	LLING DATES: 6/21/2010							
INVIRONMENTAL E	Exxo Com 1-91	onMo ipany 5-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	ental, li y N	nc.	91	M	eć		LOG OF BORING AB-4 PAGE 2 OF 2

	исгин (m ogs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	0-			Asphalt (6 inches thick), rock dra	in beneath, CAP fabric at 1							
			SM	Moist, gray, silty SAND (SM) with strong petroleum hydrocarbon-lik	n fine to coarse gravel (Fill); ke odor, sheen.	-		4.4				
				Becomes moist; very strong petr 50% sheen; oily.	oleum hydrocarbon-like odor;			30	$\nabla$			
			SM	Wet wood waste, bricks, silty SA 100% sheen.	ND (SM) mixture (Fill); oily;		10	>100	_		■ AE S-	35-5' 6/25/10 1
	1 1	2 22 2 22 2 22 2 22 2 22 2 22 2 22 2 2	SM- PT	Very loose, wet, brown, fine to co organics (peat); 100% sheen. Trace gravel.	parse, silty SAND (SM), with		3	125 400			■ S-	2
		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Very loose, wet, gray, silty SAND petroleum hydrocarbon-like odor	9 (SM), wood waste; strong , 75% sheen.		2	>200			■ S-	4
Γ		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Wood waste, some gray sand.			2				■ S-	5 (Shelby)
			PT	Becomes loose, wood waste (PT hydrocarbon-like odor, sheen.	); strong petroleum		9	75.7			■ S-	6
-1	5	00 00 7 77 77 77 77 7 77 77 77 77 77 77		, ,			13	>200			■ S-	7
		77 77 7 77 77 77 77 7 77 77		Voru strong potroloum hydrocarh	on like oder 100% shoon		11	>200			■ S-	8
	  2	77 77 7 77 77 77 77 7 77 77			on-like odor, 100 % sheen.		8	200			■ S-	9
-2	20-		SM	Medium dense, wet, gray, fine to	coarse, silty SAND (SM).		11	021			■ S-	10
			SP	Medium dense, wet, yellow-brow with silt and some organics (woo hydrocarbon-like odor, 25% shee	n, fine to coarse SAND (SP) d); slight petroleum en		12	3.8			S-	11
	_		SM	Dense, wet, olive-brown, fine to o discoloration, no odor.	coarse, silty SAND (SM); no		26	3.5			S-	12
2/11				Becomes loose.			9	4.2			• 5-	13
.GDT 2/2	_			Becomes medium dense, trace g inch).	gravel, trace organics (< 1		30	32			• •	14
DRTLAND				Trace to some gravel; no discolo	ration, no odor.		26	5.2			5-	15
AMEC PC	_			Becomes dense, fine organics.			34				■ S-	17
B.GPU	80—⊥ ORIN	IG ME	THOD	: HSA ELEV	ATION REFERENCE: NA		1	REM	ARKS			
9E.02L\$	ORE	HOLE		ETER: GRO	UND SURFACE ELEVATION: NA	L		Air ki feet k	nife to ogs. A	5 feet bgs, It 31 feet bg	sample: s chang	s collected using hand auger to 5 ed to D&M sampler; field density
<b>D</b>	RILL	RIG:		CASI	NG ELEVATION: NA			up				
NG 1-916	onti ogg	RACT	'OR: C Y: A.Si	ascade Drilling, Inc. peransky DRIL	LING DATES: 6/25/2010							
BORI				-				1				
	xxo om	nMo pany	obil / / / 716⊑	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000	iental, li ly N	ıс.	<b>Ə</b> I	n	eď	0	LOG OF BORING AB-5
₹Ľ	-910	- 13/	IUE		Fax (425) 368-1001							PAGE 1 OF 2

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DES	SCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	-30		SM SM	Dense, wet, olive-brown, fine to discoloration, no odor. Heave. D&M sampler at 31 feet bgs. Wet. olive-brown, medium to co some medium to coarse sand, subrounded gravel. No recovery.	o coarse, silty SAND (SM); no coarse, silty SAND (SM) with trace subangular to		37 44 50/4"					S-18
	-35-			Paring terminated at 25.5 fact	bas		59					S-19
	_			Boring backfilled with medium patch at surface.	bgs. bentonite chips and cement							
	-40											
	_											
-	-45											
	_											
-	-50											
	_											
T 2/22/11	-55											
PORTLAND.GD	_											
BPJ AMEC F	-60											
JG 1-915-15716E.02LS.C	BORI BORE DRILI CONT	NG MI EHOLE L RIG: TRACI	ETHOD E DIAMI FOR: C Y: A S	: HSA EL ETER: GF CA ascade Drilling, Inc.	EVATION REFERENCE: NA ROUND SURFACE ELEVATION: NA ISING ELEVATION: NA	L		REM Air kr feet t is ap	ARKS: nife to ogs. A proxin	5 feet bgs, t 31 feet bg nate.	samp Is cha	les collected using hand auger to 5 nged to D&M sampler; field density
ENVIRONMENTAL BORI	Exxo Com 1-91	onMo npan 5-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	ental, l y N	nc.	<b>Ə</b> I	m	eć	0	LOG OF BORING AB-5 PAGE 2 OF 2

	o DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DES	SCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WE	ELL SCHEMATIC
			GW SM	Gravel surface. Gray, moist, silty SAND (SM) strong petroleum hydrocarbon	with gravel; gray discoloration, -like odor.		NA	90 99 >110		AB5A 0.5-1.1' AB5A		
-	5 —			Very strong petroleum hydroca Moist, dark brown, wood waste discoloration, strong petroleun Becomes wet; free product.	arbon-like odor. 2; oily free product, oily n hydrocarbon-like odor.		NA NA NA	>300 >1,000 >1,500 700	$\nabla$	AB5A 3-3.5' AB5A 4-4.5' AB5A 5-5.5'		
	_			Boring terminated at 5.5 feet b	ıgs.							
-1	10— — —											
-1												
	_											
-2	 20											
AND.GDT 2/22/11	-											
		IG ME	THOD	: Hand Auger EL	EVATION REFERENCE: NA							
T O D B	orei Rill Ontf	HOLE RIG: RACT ED B ¹	DIAMI NA OR: C (: A.S	ETER: 3 (in) GF CA ascade Drilling, Inc. ST peranksy DF	ROUND SURFACE ELEVATION: NA ASING ELEVATION: NA FART CARD/TAG ID: NA RILLING DATES: 6/22/2010	l.		REM/ Air ki	ARKS: nife to	5 feet bgs, sample	d using h	and auger.
INVR+WELL BORING	Exxo Comp -915	nMo pany 5-157	bil / / / /16E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	iental, li iy N	nc.	91	n	ec®	LOG	G OF BORING AB-5A PAGE 1 OF 1

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DE	SCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	w	ELL SCHEMATIC
ŀ	-0-			Asphalt (6 inches), gravel bas	se, cap fabric at 1 foot bgs.							
	_			Brown, free product on water	approximately 25%.							
-	_ _ _ 5 _			Water seeps into drain rock, free product on water table ap Boring terminated at 3.5 feet bentonite chips and capped w	impossible to vacuum. Brown, oproximately 25%. bgs; backfilled with medium vith concrete patch.							
	_											
	_											
	_											
	_											
	-10-											
	_											
	_											
	_											
	_											
	-15-											
	-20											
/11	-25											
2/22	-											
D.GD ¹	-											
TLAN	-											
C POF	-											
AME	-30- BORI	NG MF	THOD	: Air Knife F	LEVATION REFERENCE: NA							
S.GPJ	BORE	EHOLE		ETER: G	ROUND SURFACE ELEVATION: NA			REM	ARKS:			
E.02L	DRILI	L RIG:	NA	C	ASING ELEVATION: NA			Air k	nife to	3 feet bgs, no sam	ples coll	ected.
15716	CONT	FRACT	OR: C	ascade Drilling, Inc. S	TART CARD/TAG ID: NA							
1-915-	LOGO	GED B	Y: A.S	peranksy D	RILLING DATES: 6/21/2010							
ENVR+WELL BORING	Exxo Con 1-91	onMo npany 5-157	obil / / / 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	ental, lı y N	nc.	91	m	ec®	LO	G OF BORING AB-6 PAGE 1 OF 1

	DDEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	•			Asphalt (5 inches).								
			SM	Gray, moist, silty, fine to coarse s wood, glass (Fill); grayish discolo hydrocarbon-like odor, staining.	SAND (SM) with gravel, oration, petroleum							
-	5		SM	Medium dense, moist to wet (at b silty SAND (SM) with gravel; gray petroleum hydrocarbon-like odor	pottom), gray, fine to medium, vish discoloration, strong , sheen ~50%.		9	12			AF	91-5'
	10		SM	Dense, wet, gray, fine to coarse, subrounded gravel; no discolorat hydrocarbon-like odor, no sheen.	silty SAND (SM) with some		25	3.1			AF	21-10'
-	5- 		ML	Organics. Brown wood waste with silt (ML), some organic odor.	laminated; no discoloration,		26	5.1			AF	21-15'
	_			Boring terminated at 17 feet bgs; installed and sampled temporary from 5 to 15 feet bos	sand installed to 15 feet bgs; well with screened interval							
TLAND.GDT 2/16/11	20— — — — 25— —			Backfilled with medium bentonite surface.	e chips; cement patch at							
EC PORT	_											
GPJ AME	30							<b>-</b> -				
E.02LS.(	ORI	NG MI EHOLF		: HSA ELEV ETER: 8 (in) GRO	(A LION REFERENCE: NA			REM. Air k	ARKS: nife ar	d vactor tru	uck to 4	feet bgs for utilities clearance.
-15716E	RILI	RIG:		CASI	NG ELEVATION: NA			Sam bgs;	pled w field d	ith hand aug ensity is ap	ger to 5 proxima	feet bgs, D&M sampler to 17 feet te.
NG 1-915.	ONT	RACI	ror: C Y: A.S	ascade Drilling, Inc. peransky DRIL	LING DATES: 6/23/2010 - 6/24/20	)10						
ENVIRONMENTAL BORI	Exx Corr -91	onMo npan 5-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	ental, Ir y N	nc.	91	m	eć	3	LOG OF BORING AP-1 PAGE 1 OF 1

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING		TESTING AND LABORATORY DATA
			SP SM	Asphalt (0.3 feet). Olive-brown, fine to coarse SANI Moist to wet, fine, silty SAND (SM organics, micaceous; gray discol hydrocarbon-like odor.	D (SP) with silt. M), with some dark brown oration, strong petroleum		>100	$\nabla$			■ A	P2-1' 11/30/10
		- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	SM- PT	Wet, dark brown, fine to coarse, waste; strong petroleum hydroca Oily wood waste.	silty SAND (SM) with wood rbon-like odor.		25					
_	  10 -	を		Dark brown, silty SAND; strong p odor, sheen. Orange to dark brown, wood was odor.	betroleum hydrocarbon-like ste (PT); no discoloration, no		3.5 - 6.0					
_	_  15_		SM SP	Wet, brown, fine to coarse, silty 5 some petroleum hydrocarbon-like Wet, yellow-brown, medium to co and some silt, trace gravel; no di	SAND (SM) with organics; e odor, 30% sheen. parse SAND (SP) with fine sand scoloration, no odor.		0.0				A	P2-14' 12/07/10
	_			Boring terminated at 15 feet bgs; chips.	backfilled with fine bentonite							
_	<b>20</b> — 											
DT 2/22/11												
J AMEC PORTLAND.G				- Duch proho								
1-915-15716E.02LS.GP.	BOREHOLE DIAMETER: 4 (in) DRILL RIG: Push-probe GROUND SURFACE ELEVATION: NA CONTRACTOR: Cascade Drilling, Inc. START CARD/TAG ID: NA LOGGED BY: A.Speransky DRILLING DATES: 11/30/2010 - 12/7/2010										feet bgs for utilities clearance.	
DIRECT PUSH BORING	LOGGED BY: A.Speransky       DRILLING DATES: 11/30/2010 - 12/7/2010         ExxonMobil / American Distributing Company       AMEC Earth and Environmental, Inc. 11810 North Creek Parkway N Bothell, Washington USA 98011         1-915-15716E       Tel (425) 368-1000 Fax (425) 368-1001											LOG OF BORING AP-2 PAGE 1 OF 1

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING		TESTING AND LABORATORY DATA
- 0 -		SM	Asphalt (0.3 feet). Moist to wet, gray, fine to coarse (Fill); no discoloration, no odor. Wet, olive-gray, fine, silty SAND gray discoloration, petroleum hyd sheen.	(SM), trace gravel, micaceous;		2.2	$\nabla$			■ A	P3-1' 11/30/10
- 5 - -	20 20 20 20 20 20 20 20 20 20 20 20 20 2	SM- PT	Wet, brown, fine to coarse, silty sorganics, bricks. Wood waste; product, 100% she hydrocarbon-like odor.	SAND (SM) with gravel,		80					
- - -10- -	F 70       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7       7		Trace gravel; sheen. Dark brown wood waste with son hydrocarbon-like odor.	ne silt; some petroleum		0.2				A	P3-9' 12/07/10
- - -15-			Driller reports soft material. Gro	undwater rose up to surface.							
-	-		Boring terminated at 15 feet bgs; chips.	; backfilled with fine bentonite							
<b>20</b> - - -	-										
- - <b>25</b> - 1 - <b>25</b> -	-										
AMEC PORTLAND.	_										
BOF BOF BOF BOF BOF BOF BOF BOF BOF BOF	RING M REHOLI LL RIG: NTRAC GGED B	ETHOD E DIAM Push- FOR: C Y: A.S	: Push-probe ELEN ETER: 4 (in) probe GRO cascade Drilling, Inc. STAF peransky DRIL	/ATION REFERENCE: NA UND SURFACE ELEVATION: NA RT CARD/TAG ID: NA LING DATES: 11/30/2010 - 12/7/201	10		REM. Air ki	ARKS: nife an	d vactor tru	uck to S	feet bgs for utilities clearance.
DIRECT PUSH BORING	xonMe mpan 15-15	obil / / y 716E	American Distributing	AMEC Earth and Environmer 11810 North Creek Parkway Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	ntal, Ir N	nc.	ə	m	eć		LOG OF BORING AP-3 PAGE 1 OF 1

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	CRIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING		TESTING AND LABORATORY DATA
- 0 -		SM SM	Asphalt (0.3 feet). Moist to wet, olive-gray, fine to r gravel; iron-oxide discoloration. Wet, gray, fine to coarse, silty S discoloration, no odor.	medium, silty SAND (SM), trace		0.0	$\nabla$			■ A	P4-1' 11/30/10
5   		SP SM SM- PT SP	Wet, olive-gray, fine to coarse S Wet, olive, fine to medium, silty no odor. Wet, red-brown, fine to medium gravel. brown organics. Dark brown wood waste. Wet, olive-gray, fine to coarse S gravel; no discoloration, no odor	AND (SP) with some silt.		0.0				A	P4-6' 12/07/10
10- - - - -15- -		SM	Dark brown, wood waste (decay Brown, silty SAND (SM). Wet, yellow-brown, coarse SAN medium sand, little to no fines, t discoloration, no odor. Boring terminated at 15 feet bgs chips.	Pred) with some silt; no odor.						A	P4-15' 12/07/10
- - <b>20</b> - -	-										
	-										
30-300 BOR BOR BOR BOR Lance Lance Lance BOR BOR Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance Lance	30       30         30       BORING METHOD: Push-probe         BORING METHOD: Push-probe       ELEVATION REFERENCE: NA         BOREHOLE DIAMETER: 4 (in)       REMARKS:         DRILL RIG: Push-probe       GROUND SURFACE ELEVATION: NA         CONTRACTOR: Cascade Drilling, Inc.       START CARD/TAG ID: NA         COGGED BY: A.Speransky       DRILLING DATES: 11/30/2010 - 12/7/2010										
Exx Cor 1-9	AGED BY: A.Speransky DRILLING DATES: 11/30/2010 - 12/7/2010 AMEC Earth and Environmental, Inc. 11810 North Creek Parkway N Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001 Fax (425) 368-1001 PAGE 1 OF 1										

	DEPTH (ft bgs)	<b>GRAPHIC LOG</b>	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING		TESTING AND LABORATORY DATA
			SM	Asphalt (0.3 feet). Wet, gray, fine to coarse, silty SA discoloration, no odor. Trace gravel, some organics (wo strong petroleum hydrocarbon-lik	AND (SM) with gravel; no od waste); gray discoloration, ce odor, 100% sheen.		>200	$\nabla$				AP5-1' 11/30/10 AP5-1.5' 12/07/10
		を 1 1 1 1 1 1 1 1 1 1 1 1 1	SM- PT	Some gravel, refuse (bricks), da petroleum product on wood wast Wood waste; strong petroleum h	rk brown wood waste; e		>300					
_		下 下 下 下 市 市 市 市 市 市 市 市 市 市 市 市 市		Petroleum product on liner.			>300					
				Wet, dark brown, fine to coarse, waste, refuse (bricks); petroleum hydrocarbon-like odor.	silty SAND (SM) with wood product, strong petroleum		36					AP5-14.5' 12/07/10
	15 <u>-</u> -	1. <u>2</u> 24 1. <u>24</u> 1. <u>24</u>		Boring terminated at 15 feet bgs; chips.	backfilled with fine bentonite							
	20- -											
	_ _ _25_											
ORTLAND.GDT 2/22/1	_											
AMEC PO	30											
a 1-915-15716E.02LS.GPJ ≠	BORI BORE DRILLI CONT	DREHOLE DIAMETER: 4 (in)       REMARKS:         Air knife and vactor truck to 5 feet bgs for utilities clearance.         DRTRACTOR: Cascade Drilling, Inc.       START CARD/TAG ID: NA         DGGED BY: A.Speransky       DRILLING DATES: 11/30/2010 - 12/7/2010										
DIRECT PUSH BORING	Exxo Com 1-91	OGGED BY: A.Speransky       DRILLING DATES: 11/30/2010 - 12/7/2010         ExxonMobil / American Distributing company       AMEC Earth and Environmental, Inc. 11810 North Creek Parkway N Bothell, Washington USA 98011         -915-15716E       Tel (425) 368-1000 Fax (425) 368-1001										

		<b>GRAPHIC LOG</b>	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
Γ	, –			Asphalt (0.3 feet), 0.5 feet aspha	It base.							
			SP	Gray, fine to coarse SAND (SP) discoloration, petroleum hydroca	with silt and gravel; gray rbon-like odor.				$\nabla$			AP6-1 11/30/10
				Petroleum product was rising to t	he surface.							
- 5	5-			Rod dropped to 7 feet bgs unexp the rod.	ectedly. Oil is dripping from							
	_	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SM- PT	Dark brown, wet, silty SAND (SM product, strong petroleum hydroc	l) and wood waste; petroleum arbon-like odor.		5					S-1
-1	0	77 77 7 77 7 7 77 7 7 77 7 7 77	PT				2					02
		7 77 7 77 77 7 77 77 77 77 77 77 7 77 77		No recovery (wood waste). (Log	ged from drill cuttings.)		0					
	2 	77 77 7 77 7 77 77 7 77 7 7 77 7 7 77 7		No recovery (wood waste).			24					S-3
-1	- <u>4</u> 24 24 -15- <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24 <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24 <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24 <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24</u> <u>24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>24 24 24 24 <u>2</u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u></u>			Wood Waste (decays wood) (PT); petroleum product, p odor.	a, fine and large, 6 inch thick betroleum hydrocarbon-like		4					S-4
	2 	70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70 70		No recovery (wood waste); petro drill cuttings.)	eum product. (Logged from		1 0					
-2	0-	77 7 7 77 77 7 77 7 77 7 77 7 77 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	ML- PT	Soft, wet, dark brown, SILT (ML) petroleum product; petroleum hy	and wood waste (PT);		4					S-5
			SM	No recovery. Silty SAND (SM) o	n ring lines.		18					
				Medium dense, wet, yellow-brow (SM) with trace fine organics; no	n, fine to coarse, silty SAND discoloration, no odor.		29	0.4 -				S-6 AP6-23' 12/02/10 S-7
5/18/11				Abundant fine organics, trace fin	e gravel.		50/6"	16 1.5				S-8
LAND.GDT			SP	Fine to coarse SAND (SP) with s	ome gravel.		20	3.1 - 4.5				S-9
MEC PORT	ML Stiff, olive to gr		ML	Stiff, olive to gray SILT (ML) with plastic.	sand, trace gravel, slightly		8	1.4				S-10
	<u>o</u>							0.0				S-11
BC BC	orin Orei	ig me Hole	ethod E diami	: HSA ELEV ETER: GRO	ATION REFERENCE: NA UND SURFACE ELEVATION: NA			REM/ Air ki	ARKS: nife ar	nd vactor tru	uck t	o 5 feet bgs for utilities clearance.
15716 ID	RILL	RIG:	Hollov	w Stem Auger CASI	NG ELEVATION: NA							
NG 1-915-	DNTI DGG	RACT	OR: C	ascade Drilling, Inc. peransky DRIL	LING DATES: 11/30/2010 - 12/2/3	2010						
BORIT												
VIRONMENTAL C	xxo om 915	nMo pany 5-157	obil / / / 716E	American Distributing	AMEC 7376 SW Durham Road Portland, Oregon USA 97224 Tel (503) 639-3400		(	<b>Ə</b> I	M	ec	C	LOG OF BORING AP-6
Ľ.					rax (503) 620-7892							PAGE 1 OF 2

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	Soil de	SCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	30		ML	Stiff to very stiff, moist, gray t sand, iron oxidation; no disco	o olive-gray SILT (ML) with fine loration, no odor.		16	0.0				AP6-30' 12/02/10
	_			Becomes very stiff, gray, trac odor.	e organics; no discoloration, no		31	0.0				S-12 S-13
			SM SP	Brown, wet, fine to medium, s Dense, wet, olive-gray, fine to	silty SAND (SM).		38					S 14
╞	35	ात जना	SM	Becomes silty SAND (SM) wi			31					5-14
	-			Boring terminated at 35.5 fee	t bgs; backfilled with bentonite							
	-			slurry via tremmie pipe.								
	-											
	40											
	40											
	_											
	-											
┢	45	-										
	-											
	-											
	-50-											
	_											
	4											
-	-											
2/18/1	55-											
D.GDT	-											
RTLAN												
EC PO												
PJ AM	60											
J2LS.G	BORI	NG MI	ETHOD	:HSA E	LEVATION REFERENCE: NA			REM. Air k	ARKS: nife ar	d vactor tru	uck te	o 5 feet bgs for utilities clearance.
5716E.(	BORE	HOLE		LIER: G	HOUND SURFACE ELEVATION: NA	L						
-915-15	CONT	RACI	FOR: C	ascade Drilling, Inc.								
RING 1	LOGG	ED B	Y: A.S	peransky D	RILLING DATES: 11/30/2010 - 12/2/	2010						
ENVIRONMENTAL BOF	Exxc Com 1-91	onMo pan 5-15	obil / / y 716E	American Distributing	AMEC 7376 SW Durham Road Portland, Oregon USA 97224 Tel (503) 639-3400 Fax (503) 620-7892			91	n	ec		LOG OF BORING AP-6 PAGE 2 OF 2

	DEPTH (ft bgs)	<b>GRAPHIC LOG</b>	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	VOLATILE READING (ppm)	GROUNDWATER	GW SCREENED INTERVAL	FIELD TESTING		TESTING AND LABORATORY DATA
	-		SP	Asphalt (0.3 feet). Moist, gray, fine to coarse SAND sheen.	(SP), some gravel, shells;	<u>н</u>	11	$\nabla$			<b>—</b> A	AP7-1' 10/28/10
	_		SM	Wet, gray, fine to medium, silty S shells; gray discoloration, strong odor, 100% sheen.	AND (SM), some gravel, petroleum hydrocarbon-like							
_	5 — 	2012 2012 2012 2012 2012 2012 2012 2012	SM- PT	Wet, gray to dark brown (organic (SM) with wood waste; some pro	s), fine to medium, silty SAND		90					
	_		SP	Wet, olive-gray, coarse SAND (S medium sand, some silt; slight pe	P) with gravel, some fine to etroleum hydrocarbon-like odor.		16					
	10— _	रू रू र २ २४ २२ <u>२२ २२ २</u>	PT	Decayed wood waste.			13					AP7-10' 12/02/10 DUP6
	_	で で で で で で で で で で で で で で	SP- PT	Wet, olive-gray, coarse SAND (S coarse sand.	P) with gravel and fine to							
	 15	<u></u>	SP	Dark brown wood waste. Wet, olive, fine to medium SAND no discoloration, no odor, no she	(SP) with silt and trace gravel;		2.8				F A	AP7-15' 12/02/10
5-15716E.02LS.GPJ AMEC PORTLAND.GDT 2/22/11		NG MB EHOLE L RIG:	ETHOD E DIAMI Push- TOR: C	Boring terminated at 15 feet bgs; chips. : Push-probe ELEV ETER: 4 (in) probe GROI ascade Drilling, Inc. STAF	backfilled with fine bentonite			REM Air k	ARKS:	d vactor tru	uck to a	5 feet bgs for utilities clearance.
ING 1-91	_OGC	GED B	Y: A.S	peransky DRIL	LING DATES: 10/28/2010 - 12/2/201	0						
TECT PUSH BOR	Exxe Com 1-91	onMo npany 5-157	obil / / / 716E	American Distributing	AMEC Earth and Environmer 11810 North Creek Parkway Bothell, Washington USA 98011 Tel (425) 368-1000 Eax (425) 368-1001	ntal, Ir N	nc.	91	M	ec	0	LOG OF BORING AP-7

	oDEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
	-0-		SP	Surface: 0.3 feet of asphalt over Wet, olive-brown, medium to coa fine sand and silt; no discoloration	0.5 feet asphalt base arse SAND (SP) with some n, no odor.			61	$\nabla$			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					
	-10			No recovery.			0				_	
			SM	Very loose, wet, olive to brown, f (SM), organics.	ine to coarse, silty SAND		10					8-5
	_		SM- SP	Medium dense, wet, yellow to ye silty SAND (SM/SP), trace grave	llow-brown, fine to coarse,		19	23 - 30				MW-7A-12 12/1/10 S-6
	_			Sand increases.			25	80				S-7
	-15			Dense wet brown to olive-brown			42	7.0				S-8
	_		Cim	(SM); no discoloration, no odor.				1.3				S-9
	_			foot heave.	iscoloration, approximately 1		26	2.5				S-10
			SM	Medium dense, wet, orange-brow trace gravel.	vn, fine, silty SAND (SM),		17					
	20-		SM- ML	Medium dense, moist, gray to oli SILT (SM/ML) with iron oxidation	ve-gray, fine, silty SAND to discoloration.		18	4.4				S-11
	-		ML	Soft, gray SILT (ML).								
_	_		ML	Stiff, moist, olive-gray SILT (ML)	with brown, fine organics.		63	0.0				S-13
T 2/18/1	25		SP	Very dense, wet, olive, fine to co silt, trace gravel, micaceous; no	arse SAND (SP) with some discoloration, no odor.		94					S-14
AND.GD	_			Gravel increases in last 6 inches	of sampler shoe.		56	1.5 - 2.5				S-15
PORTL	_			becomes with graver.			50/6"	7.0				S-16
J AMEC				Becomes with trace gravel. Lenses of moist, brown, silty SAI organics (approximately 4 inches	ND (SM) with brown, very fine s thick).		50/5"					S-17
)2LS.GP	BORI	NG ME	ETHOD	: HSA ELEV	ATION REFERENCE: NA	_		REM. Clear	ARKS: red to	5 feet bgs v	vith h	and auger and vacuum truck.
5716E.i	Bore Drili	-HOLE L RIG:	Hollov	LIEH: 8 (IN) GRO w Stem Auger CASI	UND SURFACE ELEVATION: NA	L						
1-915-1	CONT	RACT	OR: C	ascade Drilling, Inc.								
DRING	LOGO	GED B	Y: A.S	peransky DRIL	LING DATES: 11/30/2010 - 12/1/2	2010						
VVIRONMENTAL BC	Exxo Com 1-91	onMo npany 5-157	obil / / y 716E	American Distributing	AMEC 7376 SW Durham Road Portland, Oregon USA 97224 Tel (503) 639-3400 Eax (503) 620-7892			91	M	ec	0	LOG OF BORING MW-7AB

	ЗDEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL [	DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD TESTING		TESTING AND LABORATORY DATA
			SP- SM	Very dense, wet, olive, fine and silty sand; no discolora No samples collected due f	to coation, r to repo	arse SAND (SP/SM) with silt to odor. orted heave.		0	NA			■ S-1	8
	-35-							50/5"					-
	-			Boring terminated at 35.5 for slurry via tremmie pipe.	eet bg	s; backfilled with bentonite							
-	_ -40												
	_												
-	-45												
	_												
	-50												
	_												
2/18/11	-55-												
TLAND.GDT 2	_	5 - -											
J AMEC POI													
PLS.GP	BORI	RING METHOD: HSA				ATION REFERENCE: NA			REM	ARKS:	5 feet bas w	ith hand	auger and vacuum truck
16E.02	BORE	HOLE		ETER: 8 (in)	GRO	UND SURFACE ELEVATION: NA	L		Jical	54 10 1	Nya V		anger and faodum traon.
15-157	DRILI	RIG:	Hollow	w Stem Auger	CASI	NG ELEVATION: NA							
NG 1-9	LOGO	GED B	юн: С Y: A.S	ascade Drilling, Inc. peransky	DRIL	LING DATES: 11/30/2010 - 12/1/2	2010						
ENVIRONMENTAL BORI	Exxo Con 1-91	onMo npany 5-15	obil / / y 716E	American Distributing	_	AMEC 7376 SW Durham Road Portland, Oregon USA 97224 Tel (503) 639-3400 Fax (503) 620-7892			91	m	eć	0	LOG OF BORING MW-7AB PAGE 2 OF 2

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	Soil D	ESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	N 	/ELL SCHEMATIC _Flush-mount Monument with Locking Cap
	<b>0</b>		SM	Asphalt. Gray, silty SAND (SM) with (	gravel (Fill).	-						Portland Cement Casing (Schedule 40 PVC, 2.0-inch I. D.) Hydrated Bentonite Chip Seal
	5		SM	Medium dense, slightly mois (SM) with some gravel; no d	t, gray, fine to coarse, silty SAND iscoloration, no odor.		17	1.6		MWA3-5'		Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with 0.010-inch slot size in #20/40 Silica
		SP Medium dense, wet, gray, f some gravel and abundant (wood); no discoloration, no			he to coarse SAND (SP) with		12	1.3	$\nabla$	MWA3-10'		Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
			SM	Medium dense, wet, gray, fir trace subrounded to subang odor.	ne to coarse, silty SAND (SM) with ular gravel; no discoloration, no		18	1.0		MWA3-15'		End Cap (Schedule 40 PVC, 2.0-inch I. D.) Bentonite Chips
-;	20		SP	Very dense, wet, gray, media some silt, some shells, trace Boring terminated at 20 feet	um to coarse SAND (SP) with gravel; no discoloration, no odor. / bgs.		50/6"	1.2		MWA3-20'		
LAND.GDT 2/16/11	25— _ _											
AEC PORT	30-											
1-915-15716E.02LS.GPJ AN	SORII SORE DRILL CONT	ng me Ehole L rig: Tract Ged b	THOD DIAMI NA OR: C Y: A.S	: HSA I ETER: 8 (in) ( ascade Drilling, Inc. S peransky I	ELEVATION REFERENCE: NA GROUND SURFACE ELEVATION: NA CASING ELEVATION: NA START CARD/TAG ID: /BCM 305 DRILLING DATES: 6/23/2010 - 6/24/20	010		REM Air k D&M	ARKS: nife to samp	4 feet bgs for utili ler; field density is	ties clea	rance. mate.
ENVR+WELL BORING	Exxo Com	onMo npany 5-157	obil / / / 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	nental, li iy N	nc.	91	m	ec®	LO	OG OF BORING MW-A3 PAGE 1 OF 1

	DEPTH (ft bgs)	GRAPHIC LOG	JSCS SYMBOL	SOIL DES	CRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	/OLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY FESTING	W	Filush-mount Monument
	-0-		SM	Asphalt (0.3 feet). Silty SAND (SM) with gravel (Fi	II) / -							Portland Cement Casing (Schedule 40 PVC, 2.0-inch I. D.)
	_											— Hydrated Bentonite Chip Seal
ŀ	-5- _		SM	Medium dense, slightly moist, g (SM) with some gravel; no disco	ray, fine to coarse, silty SAND ploration, no odor.		16	4.3		■ MW-A4-5'		— #2/12 Silica Sand
-	_  _10			Moist to wet; no discoloration, n	o odor, no sheen.		21	4.5	$\nabla$	■ MW-A4-10'		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)
-	15  			Same as above. wood ( < 1 incl hydrocarbon-like odor.	n); some petroleum		26	6.7		■ MW-A4-15'		End Cap (Schedule 40 PVC, 2.0-inch I. D.) Bentonite Chips
-	_ -20 _		-sp	Medium dense, wet, gray, medi some silt and gravel, some orga no discoloration, no odor.	um to coarse SAND (SP) with anics (wood), abundant shells;		26	4.6		■ MW-A4-20'		
-	_  _25_			Boring terminated at 20 feet bgs	5.							
ORTLAND.GDT 2/16/	_											
MEC P	-30											
GPJ 4	BORI	NG ME		: HSA ELE				REM	VBK¢.			
E.02LS	DRIL	L RIG:	NA	CAS	SING ELEVATION: NA			Air k	nife to	4 feet bgs for utili	ties clea	rance.
-915-15716		RACT	OR: C	ascade Drilling, Inc. STA	NRT CARD/TAG ID: /BCM 306	010		D&M	sampl	er; field density is	approxi	mate.
ENVR+WELL BORING 1	Exxe Con 1-91	onMo npany 5-157	obil / / / 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	iental, li y N	nc.	91	m	ec®	LO	G OF BORING MW-A4 PAGE 1 OF 1

DEDTH (# has)	(sR2 1) 11 112	GRAPHIC LOG	USCS SYMBOL	SOIL DESC	RIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	W	/ELL SCHEMATIC _Flush-mount Monument with Locking Cap
-0			SM	Asphalt.	(SM) with gravel. (Logged	-						Portland Cement Casing (Schedule 40 PVC, 2.0-inch I. D.) Hydrated Bentonite Chip Seal #2/12 Silica Sand
- 5			SP- SW	Very dense, slightly moist, gray, (SP/SW) with silt and coarse gra	medium to coarse SAND vel; no discoloration, no odor.		65	3.6		■ MWA5-5'		Well Screen (Pre-packed Schedule 40 PVC, 2.0-inch I. D. with 0.010-inch slot size in #20/40 Silica
-1	<b>0</b> *  		SP	Dense, moist to wet (bottom of s coarse SAND (SP) with some fin discoloration, no odor.	ampler), gray, medium to		17	11	$\nabla$	■ MWA5-10'		Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
-1:	<b>5</b>  			Very dense, wet, gray, fine to coa trace gravel.	arse SAND (SP) with silt,		67	3.2		■ MWA5-15'		<ul> <li>End Cap (Schedule 40 PVC, 2.0-inch I. D.)</li> <li>Bentonite Chips</li> </ul>
-2	0	<u>9:11</u>		Becomes coarse SAND (SP) wit gravel. Boring terminated at 20 feet bgs.	h fine sand, some silt, trace		50/2"	3.5		■ MWA5-20'		
PORTLAND.GDT 2/16/11	5- - - -											
BC	0⊥ DRIN	IG ME	THOD	: HSA ELE	ATION REFERENCE: NA							
BC	DRE	HOLE	DIAMI	ETER: 8 (in) GRO	UND SURFACE ELEVATION: NA	L .		REM	ARKS:			
J16E.02	RILL	RIG:	NA	CASI	NG ELEVATION: NA			Air ki D&M	nife to I samn	4 feet bgs for utili ler; field density is	ties clea	rance.
00 -915-15 DJ -915-15	DNT	RACT ED B	OR: C Y: A.SI	ascade Drilling, Inc. STAI peransky DRIL	RT CARD/TAG ID: /BCM 301 LING DATES: 6/23/2010 - 6/24/20	010			F	, <b>,</b>		
	xxo om 915	nMo pany 5-157	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	iental, li y N	nc.	<b>Ə</b> I	n	ec®	LO	G OF BORING MW-A5 PAGE 1 OF 1

	DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	Soil de	ESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
-	- 0 — — — — — — — — — — — — — — — — — — —		SM	Asphalt (0.3 feet).	edium, silty SAND (SM), some ill); no discoloration, no odor, no		41	1.5		■ MWA6-5'	Portland Cement     Casing (Schedule 40     PVC, 2.0-inch I. D.)      Hydrated Bentonite     Chip Seal     #2/12 Silica Sand     #2/12 Silica Sand     Well Screen     (Pre-packed     Schedule 40 PVC,     2.0-inch I. D. with     0.010-inch slot size
	-10— — —			Cobble; drilled through. Same as above; slight petrol some sheen.	eum hydrocarbon-like odor,		26	2.2	$\nabla$	■ MWA6-12'	Sand on inside, PVC Schedule 40, 3.0-inch I. D. with 0.010-inch slots on outside)
	-15- - - - -20-		SM	Medium dense, wet, gray, fin sand and silt lenses (< 2 incl chips < 1 inch).	e, silty SAND (SM) with coarse hes), abundant organics (wood		12	28		MWA6-15	End Cap (Schedule 40 PVC, 2.0-inch I. D.) Bentonite Chips
2 PORTLAND.GDT 2/16/11			54	Nogs. Medium dense, wet, gray, fin wood in shoe; some petroleu sheen. Boring terminated at 21.5 fee	e to medium SAND (SP) with m hydrocarbon-like odor, ~15%		9			- MIVVA0-20	
1-915-15716E.02LS.GPJ AMEC	-30 BORI BORI DRILI CONT	ING MI EHOLE L RIG: TRAC1 GED B	ethod E Diam Na Tor: C Y: A.S	ETER: 8 (in) C Cascade Drilling, Inc. S peransky E	ELEVATION REFERENCE: NA GROUND SURFACE ELEVATION: NA CASING ELEVATION: NA GTART CARD/TAG ID: /BCM 304 DRILLING DATES: 6/25/2010	<u> </u>		REM Air ki D&M	ARKS: nife to samp	4 feet bgs for utili ler; field density is	ties clearance. approximate.
ENVR+WELL BORING	Exxo Con 1-91	onMo npany 5-15	obil / / y 716E	American Distributing	AMEC Earth and Environm 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	nental, li iy N	nc.	91	m	ec®	LOG OF BORING MW-A6 PAGE 1 OF 1

DEPTH (ft bgs)	GRAPHIC LOG	USCS SYMBOL	SOIL D	ESCRIPTION	SAMPLE	BLOW COUNT SPT N VALUE	VOLATILE READING (ppm)	GROUNDWATER	FIELD AND LABORATORY TESTING	WELL SCHEMATIC
- 0 - - - - - - - - - - - - - - - - - -			No samples collected, for lif	hology descriptions refer to MW-						Portland Cement Casing (Schedule 4 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, PV Schedule 40, 3.0-inch I. D. with 0.010-inch slot son outside) End Cap (Schedule 40 PVC, 2.0-inch I. D.)
PI AMEC PORTLAND.GDT 2/16/11		тнор	Boring terminated at 15 fee	t bgs.						
Hand Content of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second sec	EHOLE L RIG: TRACT GED B	DIAMI Hollov OR: C (: A.S	ETER: 8 (in) w Stem Auger ascade Drilling, Inc. peransky	GROUND SURFACE ELEVATION: NA CASING ELEVATION: NA START CARD/TAG ID: /BLT 570 DRILLING DATES: 12/2/2010	A		REM/	ARKS:		
EXX Con 1-91	onMo npany 15-157	bil / / / /16E	American Distributing	AMEC Earth and Environn 11810 North Creek Parkwa Bothell, Washington USA 98011 Tel (425) 368-1000 Fax (425) 368-1001	nental, Ir iy N	ıc.	91	n	ec®	LOG OF BORING MW-A7 PAGE 1 OF 1

PROJE	JECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA							Log of Bo	rin	g No. Bl	N-SB04
BORIN	G LO	CATI	ON:	BNSF Pro	operty	· · · · ·	E	ELEVATION AND DAT	UM:		
DRILLI	NG C	ЭNТ	RAC	TOR: Case	ade Dril	ling, Inc.	C 1	DATE STARTED: 10/21/13		DATE FINI 10/21/13	SHED:
DRILLI	NG M	ЕТН	OD:	Hollow	-stem au	ıger	T 2	OTAL DEPTH (ft.): 25.0		MEASURIN Ground S	NG POINT: urface
DRILLI	NG E	QUIF	MEN	T: CME 7	5		C	DEPTH TO WATER (ft.)		FIRST NA	COMPL. NA
SAMPI		ΙΕΤΙ	HOD	Modified	Californi	a drive sampler [18" x 2.5"]	L	OGGED BY:			
НАММ	ER W	EIGH	HT:	300 lb		DROP: 30 in	F	RESPONSIBLE PROFE	ESSI	IONAL:	REG. NO.
EPTH feet)	SAN o le	/IPLI	ws/	DVM ADING opm)	N	DESCRIPTION AME (USCS): color, moist, % by wt., plast. cementation, react. w/HCl, geo. i	densit inter.	y, structure,		RE	EMARKS
Щ÷	San	San	о В С	С Щ Ц		Surface Elevation: NA	Ą				
_					WE (10`	LL-GRADED SAND with SILT (SW-SM): YR 3/4), moist, 85% fine to coarse sand, regulated gravel (up to 0.75" in ging)	dark 10% fi	yellowish brown ines, 5% fine	_		
1-					SUD	rounded gravel (up to 0.75 in size).			_	Cleared to	10 feet bgs
2-										with vacuur	n truck.
									_	BN-SB04-1 collected fre	02113 is om interval 0 to
3-									_	10 FT.	
	2113			0.1							
-	4-4-10			0.1					_		
5-	N-SB0								_	No sheen.	
-	ш				wet	at 5.3 FT.			_		
6-											
7-									_		
_									_		
8-									—		
9-									_		
_									_		
10-		$\overline{)}$		0.2					_	No sheen.	
-     11-			10								
		$\left( \right)$	9	0.3					_	No sheen.	
12-		$\left \right\rangle$	14						-	No sheen.	
-   13-		$\square$	11 13	0.3	WE (10)	LL-GRADED SAND with SILT (SW-SM): YR 5/6), moist, medium dense, 85% fine t	yellov	wish brown rse sand, 10%			
-						s, 5% fine subrounded gravel (up to 0.75'	" in siz	ze), mottling.	_	No sheen.	
14-		$\left  \right\rangle$	12 15 16	0.3 0.4	SIL [®] to n in s	TY SAND (SM): dark yellowish brown (10 nedium sand, 20% fines, 5% fine subroun ize).	0YR 3 nded g	/4), wet, 75% fine ravel (up to 0.75"		No sheen.	
15-		r V		•						<b>O</b>	AKBOREV (REV. 8/2011)
		а	mea					Project No. 39	1157	16G.02	Page 1 of 2

PROJE	ECT:	Exx 27 ⁻	xonN 17/2	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA	Log of Bori	ing No. BN	I-SB04	(cont'd)	
DEPTH (feet)	Sample No.	Sample IdM	Blows/ G Foot	OVM READING (ppm)	DESC NAME (USCS): color, moist, % cementation, read	RIPTION 6 by wt., plast. density, struc ct. w/HCl, geo. inter.	cture,	F	REMARKS	
HLADON HLADON 16- - 16- - 17- - 18- - 20- - 21- - 22- - 23- - 24- - 23- - 23- - 24- - 23- - 23- - 24- - 23- - 23- - 24- - 23- - 23- - 24- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - 23- - - -	BN-SB04-24.5-102113	Sample	Jsmold         17         20         21         20         21         20         17         20         21         20         21         20         21         20         21         20         21         20         21         20         17         26         27         17         22         17         22         17         22         17         22         18         27         12         20         13         14         17         17         13         14         17          13          14          17          13          14          17          18          17          17          17	OMU OV 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.4	DESC         NAME (USCS): color, moist, %         cementation, read         ✓         Very dark grayish brown (10YR 3         WELL-GRADED SAND with SILT         brown (10YR 3/2), wet, medium of 10% fines, 5% fine subrounded g         Heaving Sand.         SILTY SAND (SM): dark yellowis dense, 75% fine to coarse sand, gravel (up to 0.75" in size).         SILTY SAND (SM): dark yellowis dense, 60% fine to coarse sand, gravel (up to 0.75" in size), mottle         SILT (ML): very dark gray (10YF fines, 10% fine sand, 5% fine sut size), trace shells.         Bottom of Boring @ 25.0 FT. Aba	RIPTION 6 by wt., plast. density, struct 5/2), 7 (SW-SM): very dark gray bense, 85% fine to coarse ravel (up to 0.75" in size). 8 brown (10YR 4/4), wet, 20% fines, 5% fine subrou sh brown (10YR 4/4), wet, 35% fines, 5% fine subrou ed. 3/1), wet, no plasticity, sti prounded gravel (up to 0.75 indoned with bentonite to s	cture,	No sheen No sheen No sheen No sheen No sheen No sheen No sheen No sheen	REMARKS	
32-	-						-			
		a	me	^{co}			Project No. 391157	16G.02	Page 2 of 2	

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA							Log of Boring No. BN-SB05				
BORIN	G LO	САТ	ION:	BNSF Pro	operty	ELE	EVATI	ON AND DATU	M:		
DRILLI	NG C	ЭNT	RAC	TOR: Case	cade Drilling, Inc.	DA 10/	TE ST /21/13	ARTED:		DATE FIN 10/21/13	IISHED:
DRILLI	NG M	ETH	OD:	Hollow	/-stem auger	TO 24	TAL D	DEPTH (ft.):		MEASUR Ground S	ING POINT: Surface
DRILLI	NG E	QUI	PMEN	NT: CME 7	75	DE	PTH T	O WATER (ft.)		FIRST	COMPL.
SAMPI		ИЕТ	HOD	Modified	California drive sampler [18" x 2.5"]	LO	GGED	BY:			
HAMMER WEIGHT: 300 lb			HT:	300 lb	DROP: 30 in	RE	RESPONSIBLE PROFESSIONAL: John Long			ONAL:	REG. NO. L.Hg. 1354
EPTH (feet)	SAN No.	MPL mble	oot G	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., p cementation, react. w/HCl,	plast. density, geo. inter.	structi	ure,		R	EMARKS
	Sal	Sai	BR	С Ш О В	Surface Elevation:	NA					
_				0.0	WELL-GRADED SAND with SILT (SW- (10YR 3/4), moist, 85% fine to coarse s	SM): dark ye and, 10% fine	ellowis es, 5%	h brown fine	_		
1-					subrounded gravel (up to 0.75" in size), trace brick and wood debris. FILL.	trace rounde	d cobl	bles,	_	Cleared to	5 feet bgs with
									-	vacuum tre	uck.
2-										BN-SB05- collected f	102113 is rom interval 0 to
3-									_	5 FT.	
-	13								-		
4-	t-1021								-		
5-	SB05-4			0.0							
	BN-0	$\mathbb{N}$		0.0	Wet @ 5 FT.					No sheen.	
6-		Å	7 8						_	No sheen	
-		$\left( \right)$	10	0.0	WELL-GRADED SAND with SILT (SW-	SM): dark gr	ayish	brown	_		
7-		X	10		(10YR 3/2), wet, medium dense, 90% fii 5% fine subrounded gravel (up to 0.75"	ne to coarse s in size).	sand,	5% fines,		No sheen.	
8-		$\square$	11 10	0.0					_		
-		$\mathbb{N}$	11	0.1					_	No sheen.	
9-		[]	26 15	0.1					-	No sheen.	
10-		$\overline{\mathbb{N}}$		0.1							
-			11 14						$\left  - \right $	No sheen.	
11-		$\left( \right)$	16	0.1					-	No sheen.	
–   12–			14								
-		$\left \right\rangle$	14	0.1		<b>CM</b> ), your of -	vel	wich		No sheen.	
13- 13- 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2				85% fine to c	ик gra coarse	sand,	-	No sheen.			
						312C).		-			
							No sheen.				
15-			12								
		а	me	0				Project No. 3911	57 [.]	16G.02	Page 1 of 2
		1.00									

PROJECT: ExxonMobil/ADC Final Data Invest 2717/2731 Federal Ave. Everett, W	igation 'A	Log of Boring No. BN-SB05 (cont'd)				
DEPTH C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet) C (feet)	DESCRIPT S): color, moist, % by v cementation, react. w/l	ION wt., plast. density, structure, HCl, geo. inter.	R	EMARKS		
16         Heaving Sand.           16         0.2           16         0.2           16         12           17         19			No sheen.			
18         17         SANDY SILT (M           21         21         very stiff, 60% fir	L): yellowish brown ( ies, 40% fine to medi	10YR 5/4), wet, low plasticity, um sand.	No sheen.			
19-       21       SILT (ML): very fines, 5% fine sa size).         20-       10       size).         21-       10       size).         21-       10       size).         22-       10       10         23-       10       8         23-       8       8         24-       4       4	dark gray (10YR 3/1) nd, trace fine subrour	, wet, low plasticity, stiff, 93% nded gravel (up to 0.75" in				
25       8         26       8         27       1         28       1         30       1         31       1         32       1	@ 24.5 FT. Abandor	ed with bentonite to surface.				
amec ^Q		Project No. 3	39115716G.02	Page 2 of 2		

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA							Log of Boring No. BN-SB06					
BORIN	G LO	CAT	ION:	BNSF Pr	operty			ELEVATION AND	DATUM	:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Dril	lling, Inc.		DATE STARTED: 10/21/13		DA1 10/2	E FIN 21/13	ISHED:
DRILLI	NG M	ЕТН	OD:	Hollow	-stem au	uger		TOTAL DEPTH (ft. 24.5	):	ME/ Gro	SURI	NG POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	5			DEPTH TO WATER	R (ft.)	FIRS	т	COMPL. NA
SAMPI	_ING I	ИЕТ	HOD	: Modified	Californ	ia drive sampler [18" x 2.5"]		LOGGED BY:				
HAMMER WEIGHT: 300 lb				300 lb		DROP: 30 in		RESPONSIBLE PI John Long	ROFESS	SIONAL	:	REG. NO. L.Hg. 1354
EPTH feet)	SAI o uble	UPL uble	ws/ Sa	DVM ADING ppm)	N	DESCRIPTION AME (USCS): color, moist, % by wt., pla cementation, react. w/HCl, ge	st. dens o. inter	sity, structure,			R	EMARKS
ā	Sar	Sar	0 Blo Flo	С Щ Ц		Surface Elevation:	NA			_		
-					WE (10)	ELL-GRADED SAND with SILT (SW-SM YR 3/4), moist, 85% fine to medium sa younded gravel (up to 0.75" in size)	4): dar nd, 10%	k yellowish brown % fines, 5% fine	-	-		
1-					Suc	nounded graver (up to 0.75° in size).			-	Clea	red to	5 feet bgs with
2-									_	-   vacu	um tru	ICK.
_									_	BN-S	B06-1 cted fr	02113 is rom interval 0 to
3-									-	5 FT	-	
-	213			0.0					-	-		
4-	6-4-10			0.2	We	t @ 4 FT.			_	No s	heen.	
5-	N-SB0	. /		0.0					-	-		
-		$\mathbb{N}$	4						-	-		
6-		$\square$	6 7	0.0	SIL	TY SAND (SM): dark yellowish brown	(10YR	3/4), wet, medium		No s	heen.	
7-		$\mathbb{N}$		0.0	gra	vel (up to 0.75" in size), mottled.			_	-	haan	
-		Ŵ	10 21						-		neen.	
8-		$\square$	28	0.0					-	No s	heen.	
9-		$\square$	12 14						_	-		
_		X	16	0.0			A): dor	k vollowich brown		No s	heen.	
10-		$\mathbb{N}$	13		(10) (10)	YR 3/4), wet, medium dense, 90% fine	to coa	rse sand, 10%	-	No s	heen.	
		[]	15 18	0.0	inic				-	-		
-		$\mathbb{N}$		0.0					-	No s	heen.	
12-			16 20						-	No s	heen.	
-		$\left( \right)$	20	0.0					-	-		
13-			19							No s	heen.	
14-		$\left \right\rangle$	21 21	0.0	SIL der	TY SAND (SM): dark yellowish brown se, 80% fine to medium sand, 20% fine	(10YR es.	3/4), wet, medium		No s	heen.	
-			14						-	-		
15-				<u>_</u>				<b>D</b> · · · ·		7400.00	c	DAKBOREV (REV. 8/2011)
Project No. 391157160									/16G.02		Page 1 of 2	

PROJE	ECT:	N-SB06 (cont'd)						
DEPTH (feet)	Sample No.	Sample Elong	Foot C	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	IPTION by wt., plast. density, structure . w/HCI, geo. inter.	e,	REMARKS
- 16-		X	24 21 28	0.0	WELL-GRADED SAND with SILT (10YR 3/4), wet, medium dense, 8 fines, 5% fine subrounded gravel (	(SW-SM): dark yellowish bro 5% fine to coarse sand, 10% up to 0.75" in size).	own	No sheen.
17-			31 30 26	0.0	Heaving Sand.		-	No sheen.
18-	-		27 29 21	0.0			-	No sheen. No sheen.
20-			25 31 10	0.0	— brown (10YR 5/3),		-	
21-			10 20 10	0.0			-	
23-	102113		20 20 31	0.0	SILTY SAND (SM): dark yellowish medium dense, 80% fine to coarse WELL-GRADED SAND with SILT wet, dense sand, 90% fine to coar	n brown (10YR 4/4), moist, e sand, 20% fines. (SW-SM): brown (10YR 5/3) se sand, 10% fines.	),	
24	BN-SB06-24		33 36	0.0	Bottom of Boring @ 24.5 FT. Abar	ndoned with bentonite to surfa	ace.	
26 -							-	
28-							-	
29-	-						_	
31-							_	
32-							_	
Project No. 39115716								OAKBOREV (REV. 8/2011) 716G.02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA							Log of Boring No. BN-SB07			
BORIN	IG LOO	CAT	ION:	BNSF Pr	operty	ELEVATION AND DATUM	M:			
DRILLI	NG C	ЭNT	RAC	TOR: Case	cade Drilling, Inc.	DATE STARTED: 10/18/13		DATE FINISHED: 10/18/13		
DRILLI	NG M	ЕТН	OD:	Hollow	-stem auger	TOTAL DEPTH (ft.): 25.0		MEASURING POINT: Ground Surface		
DRILLI	NG EO	QUIF	MEN	NT: CME 7	/5	DEPTH TO WATER (ft.)		FIRST COMPL.		
SAMPI				Modified	California drive sampler [18" x 2 5"]	LOGGED BY:		NA NA		
						J. Bellamy, LG RESPONSIBLE PROFES	SSIC	DNAL: REG. NO.		
	John Long					John Long		L.Hg. 1354		
DEPTH (feet)	SAMPLES U a a b k for the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of the formation of				nsity, structure, r.		REMARKS			
	Sa	Sa	ВШ		Surface Elevation: NA					
_	-			0.5	WELL-GRADED SAND with SILT (SW-SM): da (10YR 3/4), moist, 85% fine to coarse sand, 10% subrounded gravel trace cobbles	rk yellowish brown 6 fines, 5% fine	_			
1-					sublounded gravel, frace cobbles.		$\left  - \right $	Cleared to 10 feet bgs		
-							$\left  - \right $	with vacuum truck.		
2-	-							BN-SB07-102113 is a		
2								to 10 FT.		
5					Wet @ 3 FT.			No Sheen.		
4-	1813									
_	7-4-10						_			
5-	N-SB0						_			
-	B						_			
6-	-						$\left  - \right $			
-	-						$\left  - \right $			
7-	-						$\left  - \right $			
-	-						$\left  - \right $			
8-	-						-			
-	-									
9-										
10-	-			0.0						
	-	$\mathbb{N}/$		0.0	WELL-GRADED SAND with SILT (SW-SM): da (10YR 3/4), wet, medium dense, 90% fine to coa	rk yellowish brown arse sand, 10%		No Sheen.		
11-		X	12 13		fines.		$\left  - \right $			
_		( )	15	0.0			$\left  - \right $	No Sheen.		
12-		V	0	0.0			-	No Sheen		
-			9 12				$\left  - \right $			
13-		$\left( \right)$	15	0.0			$\left -\right $	No Sheen.		
–		V	8				$\left  - \right $			
14-		$ \rangle \rangle$	8				-	No Sheen.		
		$\left \right $	U	0.0 0.0			$\left  - \right $			
15-		r		0			·	OAKBOREV (REV. 8/2011)		
		а	me			Project No. 3911	571	6G.02 Page 1 of 2		

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No. BN-SB07									
DEPTH (feet) No. Sample Foows/ Foows/ READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, read	RIPTION by wt., plast. density, structure, t. w/HCl, geo. inter.	REMARKS						
	WELL-GRADED SAND with SILT (10YR 3/4), wet, medium dense, 9 fines.	(SW-SM): dark yellowish brown 90% fine to coarse sand, 10%	No Sheen.						
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	WELL-GRADED SAND with SILT (10YR 3/4), wet, medium dense, s fines. Heaving Sand.	(SW-SM): dark yellowish brown 90% fine to coarse sand, 10%	No Sheen. 						
19-     9     0.0       -     -     14       20-     14     19			No Sheen.						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	very dark gray (10YR 3/1).								
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	•		<ul> <li>No Sheen.</li> <li>No Sheen.</li> <li>No Sheen.</li> </ul>						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			 No Sheen. 						
	Bottom of Boring @ 25 FT. Aband	loned with bentonite to surface.							
27-									
29-									
			_						
			_						
33			OAKBOREV (REV. 8/2011)						
amec ^o	Project No. 3911	5716G.02 Page 2 of 2							

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA							Log of Boring No. CE-SB01				
BORIN	G LO	САТ	ION:	City of Ev	verett Right of Way	E		ON AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	D	OATE ST	ARTED:		DATE FINI 10/23/13	SHED:
DRILLI	NG M	ETH	OD:	Hollow	/-stem auger	Т 2	OTAL D	EPTH (ft.):		MEASURI Ground S	NG POINT: urface
DRILLI	NG E	QUIF	PME	NT: CME 7	······································	D	EPTH TO	O WATER (ft.)		FIRST NA	COMPL.
SAMPL	ING I	ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	L	OGGED	BY:		1	
HAMM	ER W	EIGI	HT:	300 lb	DROP: 30 in	3 R	RESPON	SIBLE PROFES	SSI	onal:	REG. NO.
EPTH (feet)	SAMPLES				plast. density geo. inter.	y, structu	ıre,		RE	EMARKS	
	Sai	Sai	ы В г	RE C	Surface Elevation:	NA					
_					SILTY SAND (SM): very dark gray (10) medium sand, 30% fines, 5% fine subro	YR 3/1), moi ounded grav	ist, 65% /el (up to	fine to 0.75").	_		
1-									-	Cleared to	5 feet bgs with
2										vacuum tru	ck.
									_	CE-SB01-4 collected fr	-102313 is om interval 0 to
3-									_	5 FT.	
_	13								_		
4-	H-1023			11.6					-		
	SB01-4			26					-		
5-	CE-9	$\mathbb{N}$		20	Wet @ 5 FT.					No sheen.	
6-		X	4 3						_	0	
_		$\vdash$	3	142	Pieces of wood brick fragments glass	ceramic tile	fragme	ents rock		Sneen	
7-		X	5	134	pieces (up to 1"). FILL.		s nugine		-	Sheen, visi	ble product,
_		$\bowtie$	20						-	petroleum hydrocarbo	n-like odor.
8-		$\square$		96.8						Sheen, visi	ble product,
9-	~	$\square$	3						_	hydrocarbo	n-like odor.
_	10231;	X	2	64.6	DEAT (DT): raddiab brown (2 5VD 2 5/	2) wat caft	mixed	with		Sheen, visi petroleum	ble product,
10-	1-9.5-		3	76.1	SANDY SILT (ML). FILL.	5), wei, son	., mixeu v	with	_	hydrocarbo Sheen. visi	n-like odor. ble product.
_	E-SBC	$\bigcirc$	4 4						-	petroleum hvdrocarbo	n-like odor.
11-	0	$\left[\right]$		35						Sheen, visi petroleum	ble product,
12-			4 4						_	hydrocarbo Sheen net	n-like odor.
_		$\left \right $	4	64.9 71 5	SILTY SAND (SM): very dark grav (10)	YR 3/1), mo	ist, loose	e, 65%		hydrocarbo	n-like odor.
$\begin{vmatrix} 13 - \\ 2 \end{vmatrix}$ fine to medium sand, 30% fines, 5% fine subrounded gravel (up 0.75").					l (up to	$\left  - \right $	Sheen, pet	roleum			
							hydrocarbo	n-like odor.			
14-		$\mathbb{N}$		44.3	PEAT (PT): reddish brown (2.5YR 2.5/: SANDY SILT (ML).	3), wet, soft	, mixed v	with		Sheen, visi petroleum	ble product,
15-		$ \rangle$	4		· · · ·					hydrocarbo	
		a	me	es.				Project No. 391	157	16G.02	Page 1 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No. CE-SB01 (cont'd)								
DEPTH (feet)	Sample No.	Sample	Blows/ G Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, structu t. w/HCI, geo. inter.	ıre,	REMARKS	
			2 2 1 2 1 3 2 4	29	PEAT (PT): reddish brown (2.5Yf SANDY SILT (ML).	R 2.5/3), wet, soft, mixed wit	th	Sheen, visible product, petroleum hydrocarbon-like odor. Sheen, visible product, petroleum hydrocarbon-like odor.	
 20 21 22 23 23 24 25 26 26 27 28 28 29 30	CE-SB01-24-102313		4 4 3 2 12 20 20 21 22	7.5 3.4 5.9 2.6 1.2	PEAT (PT): reddish brown (2.5Yf matter. SANDY SILT (ML): very dark gra soft, 60% fines, 40% fine to mediu ORGANIC SOIL (PT): reddish bra 100% organic matter. Piece of rock from 22 FT to 22.5 F SILTY SAND (SM): very dark gra dense, 65% fine to medium sand, gravel (up to 0.75"), wood debris. Bottom of Boring @ 24.5 FT. Aba	R 2.5/3), wet, soft, 100% org y (10YR 3/1), wet, no plastic im sand. own (2.5YR 2.5/3), wet, stiff T. y (10YR 3/1), moist, mediur 30% fines, 5% fine subrour	ganic	Sheen. Sheen. Sheen. No sheen.	
32-							-		
33-		a	me	e Q		Pr	oject No. 391157	оаквопеч (Rev. 8/2011) 716G.02 Раде 2 of 2	

PROJE	ROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. CE-SB02				
BORIN	G LO	CAT	ION:	City of Ev	verett Rig	ght of Way	ELEVAT NA	ION AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Dril	lling, Inc.	DATE S 10/23/1	TARTED: 3		DATE FIN 10/23/13	NISHED:
DRILLI	NG M	ETH	OD:	Hollow	-stem au	ıger	TOTAL 20.0	DEPTH (ft.):		MEASUR Ground S	ING POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	'5		DEPTH	TO WATER (ft.)		FIRST NA	COMPL. NA
SAMPL	ING I	ИЕТ	HOD	: Modified	Californi	ia drive sampler [18" x 2.5"]	LOGGE	DBY:			
HAMMER WEIGHT: 300 lb			300 lb		DROP: 30 in	RESPO	ESPONSIBLE PROFESSIONAL:			REG. NO.	
DEPTH (feet)	N SAMPLES SAMPLES SAMPLES SAMPLES SADING SAMPLE SADING SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES SAMPLES			OVM EADING (ppm)	N	DESCRIPTION AME (USCS): color, moist, % by wt., plast. de cementation, react. w/HCl, geo. inte	nsity, struc er.	ture,		F	REMARKS
	ŝ	Š	<u> </u>	RI	011	Surface Elevation: NA		0/ 5			
_					SIL	TY SAND (SP-SM): dark brown (10YR 3/3), dium sand, 30% fines, 5% fine subrounded g	moist, 65 Iravel (up	% fine to to 0.75"),	_		
1-					WOU				_	Cleared to	5 feet bgs with
2_										vacuum tr	uck.
									_		
3-									_		
_	413								_		
4-	4-101			1096					-		
5-	-SB02-			162							
_	ĊĖ	K	3 4		We	t @ 5 FT.			_	Sheen, vis petroleum	sible product,
6-		$\mathbb{X}$	4	222						Sheen, pe	troleum
7-		$\mathbb{N}$	2	76.9					_	Chaon no	
_		$\square$	2						_	Sheen, pe hydrocarb	on-like odor.
8-		Ŕ	3 2	108	PE/ SIL	AT (PT): reddish brown (2.5YR 2.5/3), wet, s TY SAND (SM), nails, glass fragments, copp	soft, mixed ber wire (<	d with 1cm in		Sheen, pe hydrocarb	troleum on-like odor.
9-		X	2		SIZE	<i>3).</i> FILL.			—	Sheen, pe	troleum
10-		$\left[\right]$		79.4 87.5						nydrocarb	on-like odor.
_			4 4						_	Sheen, pe hydrocarb	troleum on-like odor.
11-		$\square$	5	20.9					-	Sheen, pe hydrocarb	troleum on-like odor.
12-		Ŵ	2 2 2	24					-	Sheen, pe	troleum
								Sheen ne	troleum		
$\begin{vmatrix} - \\ 14 \end{vmatrix} \qquad \begin{vmatrix} 8 \\ 7 \\ \end{vmatrix}$							_	hydrocarb	on-like odor.		
_		$\left \right\rangle$	5 5						_	Sheen, pe hydrocarb	troleum on-like odor.
15-			Ö								OAKBOREV (REV. 8/2011)
Project No. 391								157 <i>°</i>	16G.02	Page 1 of 2	

PROJE	ECT:	Exxonl 2717/2	). CE	-SB02 (cont'd)			
DEPTH (feet)	Sample No.	Sample Blows/ Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
		3 3 3 4 4	6.5 4.6	PEAT (PT): reddish brown (2.5YR matter, nails, glass fragments, hyd	2.5/3), wet, soft, 100% organic rogen sulfide-like odor. FILL.		Sheen, petroleum hydrocarbon-like odor. Sheen. No sheen.
18-	-102313	6 7 10	3.2 0.8	SILTY SAND (SM): very dark gray to medium sand, 25% fines, 5% fir PEAT (PT): reddish brown (2.5YR matter, nails, hydrogen sulfide-like	v (10YR 3/1), wet, loose, 70% fine le subrounded gravel. 2.5/3), wet, soft, 100% organic odor.		No sheen. Sheen.
20	CE-SB02-20	10		SILTY SAND (SM): very dark gray to medium sand, 25% fines, 5% fir Bottom of Boring @ 20 FT. Abando	(10YR 3/1), wet, loose, 70% fine le subrounded gravel. oned with bentonite to surface.		No sheen.
 22	-						
23-	-					-	
25- - 26-	-					-	
27 -	-						
28- - 29-	-						
30	-					-	
32-	-					-	
33-	I	ame	ං		Project No.	391157	OAKBOREV (REV. 8/2011) 16G.02 Page 2 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. EA-SB01				
BORIN	G LO	САТ	ION:	ExxonMo	bil/ADC	ELEVAT NA	ION AND DATU	M:			
DRILLI	NG C	ОNT	RAC	TOR: Case	cade Drilling, Inc.	DATE ST 10/28/13	TARTED: 3		DATE FIN 10/28/13	IISHED:	
DRILLI	NG M	ETH	OD:	Hollow	r-stem auger	TOTAL E 20.0	DEPTH (ft.):		MEASUR Ground S	ING POINT: Surface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75	DEPTH T	O WATER (ft.)		FIRST NA	COMPL. NA	
SAMPI	_ING I	ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGED J. Bellar	DBY: my, LG				
HAMMER WEIGHT: 300 lb				300 lb	DROP: 30 in	RESPON John Lo	ISIBLE PROFES	SSI	ONAL:	REG. NO. L.Hg. 1354	
DEPTH (feet)	ample No.	ample 14	slows/ G Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.				R	REMARKS	
	S	S	ш	۲	Surface Elevation: NA		10				
					Asphalt (0.5 inches), road base (13 inches), CAF inches.	' fabric at	18				
1_											
									Cleared to	5 feet bgs with	
2-					SILTY SAND (SM): very dark gray (10YR 3/1), n medium sand, 40% fines, 5% fine subrounded gr wood debris, cobbles, ceramic pieces. FILL.	noist, 55% avel (up t	6 fine to o 0.75"),		vacuum tr	UCK.	
3-											
-								-			
4-	1413							-			
-	1-10			161				-			
5-	-SB0	/ /		139				$\left -\right $	Sheen, vis	sible product.	
-	EA	V	1		Wet @ 5.5 FT.			-	petroleum	en like oder	
6-			1					-	Sheen, vis	sible product.	
-		$\left  \right\rangle$	1	134 135				_	petroleum hydrocarb	on-like odor.	
-		X	1 1 2	50.0	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, ve SILTY SAND (SM), rootlets. FILL.	ery soft, n	nixed with	_	Sheen, vis petroleum hydrocarb	sible product, on-like odor.	
8-		$\mathbb{N}$	1	53.6	SILTY SAND (SM): very dark gray (10YR 3/1), n 55% fine to medium sand, 40% fines, 5% fine su (up to 0.75"), wood debris, nails, glass fragments	noist, very brounded 5. FILL.	/ loose, gravel	_	Sheen, pe hydrocarb	troleum on-like odor.	
9-		$\square$	2 3	75.8	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, ve	ery soft, n	nixed with		Sheen, vis petroleuyr	sible product, n	
10-			10	120	SILTY SAND (SM): very dark gray (10YR 3/1), v 55% fine to medium sand, 40% fines, 5% fine su (up to 0.75"), wood debris, nails, glass fragments	vet, mediu brounded	ım dense, gravel	_	hydrocarb Sheen, pe hydrocarb	on-like odor. troleum on-like odor.	
11-		$\square$	15		Wood pieces.						
		$\mathbb{N}/$			SILTY SAND (SM): very dark gray (10YR 3/1), v	vet, loose	, 55% fine		Sheen, vis	sible product,	
12-			5 6 9	34.7	to medium sand, 40% fines, 5% fine subrounded 0.75"), wood debris, nails, glass fragments. FILL.	gravel (u	p to	_	hydrocarb	on-like odor.	
13 WELL-GRADED SAND with SILT (SW-SM): very dark gray (10YR							$\left  - \right $				
13-		X	12		3/1), wet, medium dense, 85% fine to coarse san	id, 10% fi	nes, 5%		No sheen,	petroleum	
							$\left  \right $	nyurocarb			
14-		$\square$		20.3					No sheen, hydrocarb	petroleum on-like odor.	
15-		$ \rangle$	10								
			ma	2			Project No. 3011	157	166.02	DakBOREV (REV. 8/2011)	
		d	me				1 10/001110. 5911		100.02	1 age 1 01 Z	

PROJE	ROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No. EA-SB01 (cont'd)									
DEPTH (feet)	Sample No.	Sample I	Blows/ G Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	tIPTION by wt., plast. density, stru w/HCl, geo. inter.	ucture,	REMARKS		
	EA-SB01-102813 Samp	Samp	00y M018 75 856 869 556	60 20.3 26.3 43.5 10 10	NAME (USCS): color, moist, % cementation, react WELL-GRADED SAND with SILT 3/1), wet, loose, 90% fine to coars mixed with PEAT, reddish brown ( sulfide-like odor. Bottom of Boring @ 20 FT. Aband and cement to surface.	by wt., plast. density, stru . w/HCl, geo. inter. (SW-SM): very dark gra e sand, 10% fines, wood (SW-SM): very dark gra e sand, 10% fines, wood 2.5YR 2.5/3), hydrogen oned with bentonite to 1	FT bgs	Sheen, petroleum hydrocarbon-like odor. Sheen, petroleum hydrocarbon-like odor. Sheen, petroleum hydrocarbon-like odor. No sheen. Sheen. No sheen.		
28-	-						-			
30-	-						-			
31- - 32-	-						-			
33 Project No. 3911								OAKBOREV (REV. 8/2011) 716G.02 Page 2 of 2		
PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. EA-SB02				
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BORIN	IG LO	САТ	ION:	ExxonMo	bil/ADC	ELEVATION AND DATU	M:			
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Drilling, Inc.	DATE STARTED: 10/28/13		DATE FINIS 10/28/13	SHED:	
DRILLI	NG M	ЕТН	IOD:	Hollow	<i>u</i> -stem auger	TOTAL DEPTH (ft.): 20.0		MEASURIN Ground St	IG POINT: urface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75	DEPTH TO WATER (ft.)		FIRST NA	COMPL. NA	
SAMPI	_ING I	ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, I G				
HAMM	ER W	EIGI	HT:	300 lb	DROP: 30 in	RESPONSIBLE PROFES	SSIC	ONAL:	REG. NO. L.Hg. 1354	
DEPTH (feet)	SAI No.	MPL mble	ows/ oot	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inter	sity, structure, r.		RE	MARKS	
	- Sa	Sa	<u> </u>	RI	Surface Elevation: NA		$\left  \right $			
	-				Asphalt (5 inches), road base (10 inches), CAP f	abric at 15 inches.	$\left  - \right $			
1-	-						$\left  - \right $	Cleared to P	- foot has with	
2-	-				SILTY SAND (SM): very dark gray (10YR 3/1), r mediums and, 30% fines, 5% fine subrounded gi cobbles. FILL	noist, 65% fine to ravel (up to 0.75"),	_	vacuum truc	ck.	
-	-						$\left -\right $			
3-	-						$\left -\right $			
	1413			121						
-	2-4-10			421						
5-	-SB02			33.3			$\left  - \right $	Oha an a iail	ala waa duud	
-	E	$\mathbb{N}$	4		Wet $@55$ ft with wire and wood debris		_	petroleum	bie product,	
6-	-	$\square$	3				$\left -\right $	Sheen, visit	n-like odor. ble product,	
	-	$\bigwedge$	_	18.3 30.4			-	petroleum hydrocarboi	n-like odor.	
7-		X	3 2					Sheen, visit	ple product,	
8-	-	$\bowtie$	3	64				hydrocarboi	n-like odor.	
_	-	K	3 9				_	Sheen, visit petroleum	ole product,	
9-	-	X	4		— Mixed with PEAT, reddish brown (2.5YR 2.5/3)		-	hydrocarboi Sheen, visit	n-like odor. ple product.	
-		$\bigotimes$	5	61.6 8.6	SILTY SAND (SM): very dark gray (10YR 3/1), v	wet, loose, 65% fine	$\left  - \right $	petroleum	n-like odor.	
10-		$\left \right\rangle$	6	0.0	to mediums and, 30% fines, 5% fine subrounded 0.75"), glass pieces. FILL.	l gravel (up to	$\left  - \right $	Sheen, visit	ole product,	
11-		$\square$	0	42.8	Mixed with PEAT, reddish brown (2.5YR 2.5/3)			hydrocarbo	n-like odor.	
	-	$\mathbb{N}$					$\left  - \right $	Sheen.		
12-			3 3				$\left  - \right $	Sheen, netr	oleum	
-		$\vdash$	4	16.1			$\left -\right $	hydrocarbo	n-like odor.	
13-		$ \rangle$	2		PEAT (PT): reddish brown (2.5YR 2.5/3), wet, s	oft, mixed with	$\left  - \right $			
14-		$\square$	3 6	9.8	wood pieces and SILTY SAND (SM).					
-		$\mathbb{N}$		5.0	WELL-GRADED SAND with SILT (SW-SM): ver 3/1), wet, loose, 90% fine to medium sand, 10%	ry dark gray (10YR fines.		No sheen.		
15-		$ \rangle$	4						KBOREV (REV. 8/2011)	
		a	me	e o		Project No. 3911	1571	6G.02	Page 1 of 2	

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No.	ΕA	-SB02 (cont'd)
	S۵	MPL	FS	(5				
DEPTH (feet)	Sample No.	Sample	Blows/ Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	NPTION by wt., plast. density, structure, w/HCl, geo. inter.		REMARKS
- 16-		X	5 4	21.6 19.6	PEAT (PT): reddish brown (2.5YF with POORLY-GRADED SAND w sulfide-like odor.	R 2.5/3), wet, medium stiff, mixed th SILT (SP-SM), hydrogen	_	Sheen.
17	-		5 5 5	9.6			_	Sheen.
-		$\bigotimes$	6 5	0.0			_	Sheen.
18-	-	$\mathbb{A}$	-	12 3 2			_	Sheen.
19-			6 5	0.2			_	No sheen.
20-	2813	$\bigtriangledown$	4		PEAT (PT): reddish brown (2.5YF organic, trace fine subrounded gra	R 2.5/3), wet, medium stiff, 100% ivel (up to 0.75"), wood pieces,	_	No sheen.
21-	B02-21-10		4 4	7.1	Bottom of Boring @ 21.5 ET Abo	idoned with bentonite to 1 FT bas		
22-	EA-S				and cement to surface.	idoned with benchnite to TTT bys	_	
23-							_	
24-	-						_	
25-	-						_	
26-							_	
27-	-						_	
28-	•						_	
29-							-	
							_	
							_	
32-							_	
33-							_	
				•				OAKBOREV (REV. 8/2011)
		а	me	2		Project No. 39	91157	16G.02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. EA-SB03					
BORIN	IG LO	CAT	ION:	ExxonMo	bil/ADC	ELEVAT NA	ION AND DATU	M:			
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	DATE ST 10/30/13	TARTED: 3		DATE FIN 10/30/13	ISHED:	
DRILLI	NG M	ETH	OD:	Hollow	-stem auger	TOTAL E 20.0	DEPTH (ft.):		MEASURI Ground S	NG POINT: Surface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	'5	DEPTH T	O WATER (ft.)		FIRST NA	COMPL. NA	
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"] LOGGED BY: J. Bellamy, LG						DBY: my, LG					
НАММ	MMER WEIGHT: 300 lb DROP: 30 in RESPONSIBLE PROF John Long					NSIBLE PROFES	SSI	onal:	REG. NO. L.Hg. 1354		
DEPTH (feet)	SAI No.	ample	lows/ 🛱 Foot	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inter	sity, struct	ure,	-	R	EMARKS	
	й	ů	8	R	Surface Elevation: NA						
					Asphalt (7 inches), road base (8 inches). WELL-GRADED SAND with SILT (SW-SM): ver 3/1), moist, 70% fine to coarse sand, 20% fine su (up to 0.75"), 10% fines, cobbles, wood debris. F	y dark gra ibrounded ILL.	ay (10YR I gravel	_	Cleared to vacuum tru EA-SB03-4 collected f 5 FT.	5 feet bgs with uck. 5-103013 is rom interval 0 to	
4-  5- 6- 7- 8-	EA-SB03-5-103013		7 3 3 2 3 3	155 29.6 3.2 10.5	Wet @ 5 FT. Wood pieces WELL-GRADED SAND with SILT (SW-SM): ver 3/1), moist, 70% fine to coarse sand, 20% fine su (up to 0.75"), 10% fines, cobbles, wood debris. F SILTY SAND (SM): very dark gray (10YR 3/1), v to medium sand, 20% fines, 5% fine subrounded debris, rootlets. SILTY SAND (SM): dark gray (10YR 4/1) wet k	y dark gra ibrounded ILL. vet, loose gravel, w	ay (10YR 1 gravel , 75% fine rood		Petroelum hydrocarbon-like odor. Sheen, petroleum hydrocarbon-like odor.		
9- - 10-			1 2 2 2	10.7 5.7	medium sand, 15% fines, 5% fine subrounded gr rootlets.	avel, woo	d debris,	   	No sheen. Sheen.		
11 - - 12 - - 13 -	EA-SB03-12-103013		2 3 3 4 4	1.7 0.7 0.5	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, se matter, hydrogen sulfide-like odor.	ret, soft, 100% organic - - - No sheen. - 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.         15       15       Droiot No.1						DYR 4/1),		No sheen.	DAKBOREV (REV. 8/2011)		
		а	mee				Project No. 3911	5/′	10G.02	Page 1 of 2	

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring N						No. EA-S	B03 (cont'd)
DEPTH (feet)	Sample No.	Sample T	Blows/ G Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
 16			6 7 3 4 6	0.8 0.5	WELL-GRADED SAND with SILT wet, loose, 90% fine to medium sa sulfide-like odor.	(SW-SM): dark gray (10YR 4, ind, 10% fines, hydrogen	/1), No	sheen.
	013		8 7 5	0.6	PEAT (PT): reddish brown (2.5YF matter, with pieces of wood, hydro POORLY-GRADED SAND with SI	R 2.5/3), wet, soft, 100% organ gen sulfide-like odor. LT (SP-SM): dark gray (10YR	ic No	sheen.
20-	EA-SB03-20-103		3 4 4	0.3	4/1), wet, loose, 90% fine to media sulfide-like odor, mixed with PEAT Bottom of Boring @ 20 Ft. Abando and cement to surface.	um sand, 10% fines, hydrogen	s	sheen.
 22  23								
 24 –  25 –							_	
26 - - 27 -							-	
28-  29- 								
30- - 31- -								
32-  33-		a	mea	9		Proje		04KBOREV (REV. 8/2011) 02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. EA-SB04				
BORIN	IG LO	CAT	ION:	ExxonMc	bil/ADC	ELEVATI NA	ION AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Drilling, Inc.	DATE ST 10/23/13	ARTED: 3		DATE FIN 10/23/13	IISHED:
DRILLI	NG M	ETH	OD:	Hollow	/-stem auger	TOTAL D	DEPTH (ft.):		MEASUR	ING POINT:
DRILLI	NG E	QUI	PMEN	NT: CME 7	75	DEPTH T	O WATER (ft.)		FIRST	COMPL.
				Madified		LOGGED	) BY:		NA	NA
SAMPI	LING	VIEI	HOD		California drive sampler [18 x 2.5 ]	J. Bellar	ny, LG			
HAMM	ER W	EIG	HT:	300 lb	DROP: 30 in	John Lo	ng	501	UNAL.	L.Hg. 1354
DEPTH (feet)	Sample No.	Sample 1	Blows/ S Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. dens cementation, react. w/HCl, geo. inter Surface Elevation: NA	sity, structi	ure,	-	R	REMARKS
					Asphalt (7 inches), road base (6 inches), CAP fal	bric at 15.	6 inches.			
					WELL-GRADED SAND with SILT and GRAVEL ( dark gray (10YR 3/1), moist, 70% fine to coarse s subrounded gravel (up to 0.75"), 10% fines, wood	(SW-SM): sand, 20% d debris. F	very ǿ fine FILL.	_	Cleared to vacuum tru	9 5 feet bgs with uck.
4-  5-  6-  7-	EA-SB04-5-101713		4 5 3	541 327 333	Wet @ 5 FT.				Sheen, vis petroleum hydrocarb Sheen, pe hydrocarb	sible product, on-like odor. troleum on-like odor.
8-	-	$\left \right\rangle$	10 10 12	99.9	Wood pieces.	(0)4/ 014)		_	Sheen, pe	troleum on-like odor.
9-	-	$\left \right $	15 15		dark gray (10YR 3/1), moist, 70% fine to coarse s subrounded gravel (up to 0.75"), 10% fines, wood	sand, 20% d debris. F	6 fine ILL.	_	hydrocarbo	on-like odor.
-	-	$\vdash$		6.1	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, st	iff. 100%	organic	-	hydrocarb	on-like odor.
10-	-	$\left \right\rangle$	8 10 10		matter, pieces of wood.	,	- 9	_	Sheen, pe hydrocarb	troleum on-like odor.
11-		$\left \right\rangle$	4	14.8 7.5				_	Sheen, pe hydrocarb [,]	troleum on-like odor.
12-	-	$\left \right\rangle$	4 6	14.7	SILTY SAND (SM): very dark gray (10YR 3/1), w to medium sand, 20% fines, 5% fine subrounded 0.75") mixed with PEAT, reddish brown (2.5YR 2	vet, loose, gravel (up /5/3), woo	, 75% fine p to od.		No sheen.	
13-		$\square$	2 23						Sheen, pe hydrocarb	troleum on-like odor.
14-	-	$\left  \right\rangle$	6	4.6				-	Sheen, pe hydrocarb	troleum on-like odor.
15-		<i>y</i> \		-					(	OAKBOREV (REV. 8/2011)
		а	me	co o			Project No. 3911	57	16G.02	Page 1 of 2

PROJI	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring I						ng No. EA	A-SB04 (cont'd)
DEPTH (feet)	Sample No.	Sample	Blows/ S Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, struc t. w/HCl, geo. inter.	ture,	REMARKS
- 16-		X	7 10	2.2 1.2				No sheen, petroleum hydrocarbon-like odor.
17-	-	$\left  \begin{array}{c} \\ \\ \\ \\ \\ \end{array} \right $	12 11 18 13	2.8	SILTY SAND (SM): very dark gra 75% fine to medium sand, 20% fir (up to 0.75").	y (10YR 3/1), wet, medium les, 5% fine subrounded g	n dense, ravel –	No sheen.
18-		$\left  \right\rangle$	16 22		Poor recovery, pieces of rock wed POORLY-GRADED SAND with SI	ged in sampler shoe. LT (SP-SM): very dark gr		No sheen.
- 20	-SB04-2010231	X	16 20 20	1.6	Bottom of Boring @ 20 FT. Aband	l (up to 0.75"), wood debris	s	No sheen.
21-	EA				and cement to surface.		-	
22 -	-						-	
_ 24 - _	-						-	
25- - 26-	-							
27 -	-							
28-	-						_	
30-	-						_	
31-	-						-	
32-	-						_	OAKBOREV (REV. 8/2011)
		а	me	^o		F	Project No. 391157	216G.02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. EA-SB05				
BORIN	G LO	САТ	ION:	ExxonMo	bil/ADC	ELEVATION AND DATUM	1:			
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	DATE STARTED: 10/29/13	DATE FINIS 10/29/13	HED:		
DRILLI	NG M	ETH	OD:	Hollow		TOTAL DEPTH (ft.): 20.0	MEASURING Ground Su	G POINT: rface		
DRILLI	NG E	QUIF	PMEN	NT: CME 7	/5	DEPTH TO WATER (ft.)	FIRST	COMPL.		
SAMPI	ING I	ИЕТ	HOD	Modified	California drive sampler [18" x 2.5"]	LOGGED BY:				
HAMM	HAMMER WEIGHT: 300 lb DROP: 30 in RESPONSIBLE PROI					RESPONSIBLE PROFES	SIONAL:	REG. NO. L.Ha. 1354		
EPTH feet)	SAI o j	UPL uble	oot S	MVC ADING ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. d cementation, react. w/HCl, geo. ir	ensity, structure, ter.	REM	IARKS		
	Sai	Sai	ВĘ	с П С .	Surface Elevation: NA		_			
_				-	Asphalt (7 inches), No CAP fabric.		_			
1- - 2-					SILTY SAND with GRAVEL (SM): very dark b moist, 60% fine to medium sand, 25% fines, 1 gravel (up to 0.75"), wood debris, cobbles, nai FILL.	rown (10YR 2/2), 5% fine subrounded s, pieces of glass.	Cleared to 5 Vacuum truch	feet bgs with <.		
3-						-	-			
4-	1913					-	_			
	5-5-10			122		-	-			
5-	EA-SB0	$\bigvee$	2	4.0	Wet @ 5 FT.	-	No sheen.			
6-		$\square$	3 4	3.6		-	No sheen.			
7-		$\bigotimes$	1 1 1	0.9		-	_ Sheen.			
8-		$\left \right\rangle$	2	1.4		-	No sheen.			
9-			1	0.8		-	No sheen.			
10-			1 1	_		-	No sheen.			
11-			2 8	0.7	PEAT (PT): reddish brown (2.5YR 2.5/3), wet matter, hydrogen sulfide-like odor.	soft, 100% organic	No sheen.			
12-			8				- No sheen			
13-		$\left \right\rangle$	20 21	0.8	PEAT (PT): reddish brown (2.5YR 2.5/3), wet mixed with wood pieces and SILTY SAND (SM sulfide-like odor.	soft, organic matter I), hydrogen	No sheen.			
14-		$\left \right\rangle$	20	4.9		-	_ No sheen.			
15-		$\square$	4							
		a	me	0		Project No. 39115	оак 5716G.02 Р	age 1 of 2		
L				<del>.</del>				-		

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Borin						g No. E	A	-SB05 (cont'd)
et)	SA	MPL	ES	NIC €	DESCR	IPTION			REMARKS
DEF (fe	Samp No.	Samp	Blow	OV REAI (pp	NAME (USCS): color, moist, % cementation, react	by wt., plast. density, structur . w/HCl, geo. inter.	re,		
		X	4 5	1.63	PEAT (PT): reddish brown (2.5YF mixed with wood pieces, hydroger	2.5/3), wet, soft, organic m sulfide-like odor.	atter		No sheen.
16- -			8 10	20.3	WELL-GRADED SAND with SILT 3/2), wet, medium dense, 90% fine mixed with 10% PEAT, hydrogen s	(SW-SM): dark brown (10Y e to coarse sand, 10% fines sulfide-like odor.	̈́R	_	No sheen.
17-		$\square$	14 8	3.0 17				_	No sheen.
18-	913	$\left \right $	8 5	17	PEAT (PT): reddish brown (2.5YF mixed with wood pieces, hydroger	2.5/3), wet, soft, organic m sulfide-like odor.	atter		No sheen.
19-	305-20-102		6 6 8	27.3	WELL-GRADED SAND with SILT 3/2), wet, medium dense, 90% fine mixed with 10% PEAT and pieces	(SW-SM): dark brown (10Y to coarse sand, 10% fines of wood, hydrogen sulfide-li	R ke /—	_	No sheen.
20-	EA-SI	$\mid$			odor. PEAT (PT): reddish brown (2.5YF mixed with wood pieces, hydroger	2.5/3), wet, soft, organic m sulfide-like odor.	atter	_	
21-					Bottom of Boring @ 20 FT. Aband and cement to surface.	oned with bentonite to 1 FT	bgs	-	
22-								_	
23-								_	
24-								_	
25–								_	
26-								_	
27-								_	
28-								_	
29-								_	
								-   -	
								-	
								-	
								_	
		а	me	c ^o		Pro	oject No. 3911	571	оакволее (Rev. 8/2011) 6G.02 Page 2 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. EA-SB06			
BORIN	IG LO	САТ	ION:	ExxonMo	bil/ADC	ELEVAT	ION AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	DATE ST 10/28/13	TARTED: 3		DATE FIN 10/28/13	IISHED:
DRILLI	NG M	ETH	OD:	Hollow	r-stem auger	TOTAL D 20.0	DEPTH (ft.):		MEASURI Ground S	NG POINT: Surface
DRILLI	NG E	QUIF	PMEN	IT: CME 7	/5	DEPTH T	O WATER (ft.)		FIRST NA	COMPL. NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"] LOGGED BY: J. Bellamy, LG							DBY: my, LG			
HAMM	ER W	EIG	HT:	300 lb	DROP: 30 in	RESPON John Lo	NSIBLE PROFES	SSIC	ONAL:	REG. NO. L.Hg. 1354
DEPTH (feet)	Sample No.	Sample	Blows/ S Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. dens cementation, react. w/HCl, geo. inter. Surface Elevation: NA	ity, struct	ure,	-	R	EMARKS
	EA-SB06-12-102813 EA-SB06-6-102813 EA-SB06-5-101413 S		3 3 3 4 1 1 1 2 2 1 1 2 8 8 8 9 20 21 20	417 868 671 7.6 4.2 78.2 78.2 8 9.3 3.2 2.6 2.4	Surface Elevation:         NA           Asphalt (6 inches).         SILTY SAND (SM): gray (10YR 5/1), moist, 75% sand, 20% fines, 5% fine subrounded gravel (up t           Wet @ 6 FT.         SILTY SAND (SM): gray (10YR 5/1), wet, loose, medium sand, 20% fines, 5% fine subrounded gramixed with PEAT, reddish brown (2.5YR 2.5/3) ar           SILTY SAND (SM): very dark gray (10YR 3/1), w 75% fine to medium sand, 20% fines, 5% fine subrounded gramixed with PEAT, reddish brown (2.5YR 2.5/3) ar           SILTY SAND (SM): very dark gray (10YR 3/1), w 75% fine to medium sand, 20% fines, 5% fine sub (up to 0.75").           SILTY SAND (SM): very dark gray (10YR 3/1), w 75% fine to medium sand, 20% fines, 5% fine sub (up to 0.75").           SILTY SAND (SM): very dark gray (10YR 3/1), w 75% fine to medium sand, 20% fines, 5% fine sub (up to 0.75").           SILTY SAND (SM): very dark gray (10YR 3/1), w 75% fine to medium sand, 20% fines, 5% fine sub (up to 0.75"), mixed with PEAT, reddish brown (2.5YR 2.5/3) tiff, organic matter, pieces of wood, hydrogen su ORGANIC SOIL (PT): reddish brown (2.5YR 2.5/3) stiff, organic matter, pieces of wood, metal debris brown, SANDY SILT (ML), hydrogen sulfide-like c	fine to m o 0.75"). 75% fine avel (up to avel (up to avel (up to brounded 5YR 2.5/ 3), wet, r fide-like 3), wet, r s, mixed to brounded	to o 0.75"), bieces. oose, gravel oose, gravel 3) and medium odor. medium with		Cleared to vacuum tru EA-SB06-1 collected f 5 FT. Sheen, pe hydrocarbo No sheen, hydrocarbo No sheen, hydrocarbo No sheen, hydrocarbo No sheen, hydrocarbo No sheen, hydrocarbo No sheen, hydrocarbo No sheen. No sheen. No sheen. No sheen. No sheen. No sheen.	5 feet bgs with uck. 5-101413 is rom interval 0 to troleum on-like odor. petroleum on-like odor. petroleum on-like odor. petroleum on-like odor. troleum on-like odor.
15-		<u>v</u> \		•					(	DAKBOREV (REV. 8/2011)
		а	med	2			Project No. 3911	571	6G.02	Page 1 of 2

PROJE	ROJECT:ExxonMobil/ADCFinal Data Investigation 2717/2731Log of Boring No.Log of Boring No.						EA-	SB06 (cont'd)
DEPTH (feet)	Sample No.	Sample	Blows/ G Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
 16 -  17 -	-		4 5 8 10 14	1.5 1.3 1.2	SILTY SAND (SM): brown (10YR	5/3), wet, medium dense, 75% % fine subrounded gravel (up to		No sheen. No sheen.
	813		8 8 5	1.3	0.75") WELL-GRADED SAND with SILT wet, loose, 85% fine to coarse sar subrounded gravel, wood pieces.	(SW-SM): dark gray (10YR 4/1), d, 10% fines, 5% fine		No sheen. No sheen.
20-	EA-SB06-20-102		6 6 8	1.2	2 inch piece of gravel. Bottom of Boring @ 20 FT. Aband and cement to surface.	oned with bentonite to 1 FT bgs		No sheen.
22-							_	
20 -							_	
26-							_	
27 -							_	
29- - 30- -	-							
31- - 32- -								
33-		а	me	e P		Project No. 39	115716	оаквопеч (печ. 8/2011) GG.02 Page 2 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. FA-SB01			
BORIN	G LO	САТ	ION:	Federal A	we (West Right-of-Way)	ELEVAT NA	ION AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	DATE S ⁻ 10/25/1	TARTED: 3		DATE FIN 10/25/13	IISHED:
DRILLI	NG M	ЕТН	OD:	Hollow	stem auger	TOTAL [ 20.0	DEPTH (ft.):		MEASUR Ground S	ING POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	5	DEPTH	TO WATER (ft.)		FIRST NA	COMPL. NA
SAMPI	ING N	ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGE	DBY:			
НАММ	ER W	EIGI	HT:	300 lb	DROP: 30 in	RESPON	NSIBLE PROFES	SSI	ONAL:	REG. NO.
EPTH (feet)	SAN No.	MPL mble	oot Sala	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inter	sity, struct	ure,		F	EMARKS
	Sal	Sa	음띠	RE (	Surface Elevation: NA					
	FA-SB01-5.5-101513		5	76 60 34.7	SILTY SAND (SM): dark yellowish brown (10YR fine to medium sand, 30% fines, 10% fine subrou 0.75"), wood debris, bricks, and cobbles present. Wet @ 5.5 FT.	3/4), moi unded gra . FILL.	st, 60% vel (up to		Cleared to vacuum tr Sheen, vis petroleum hydrocarb Sheen, pe hydrocarb Sheen, vis	5 feet bgs with uck. sible product, on-like odor. troleum on-like odor.
			5 3 3 1 5	19.2	WELL-GRADED SAND with SILT (SW-SM): ver 3/1), wet, loose, 85% fine to coarse sand, 10% fi subrounded gravel (up to 0.75").	ry dark gra nes, 5% f	ay (10YR ine		petroleum hydrocarb Sheen, vis petroleum hydrocarb Sheen, pe hydrocarb	on-like odor. sible product, on-like odor. troleum on-like odor
10-		$\mathbb{N}/$		14.7	Pieces of wood.					
			8 8		WELL-GRADED SAND with SILT (SW-SM): ver 3/1), wet, loose, 85% fine to coarse sand, 10% fi subrounded gravel (up to 0.75").	ry dark gra nes, 5% f	ay (10YR ine	_	Sheen, pe hydrocarb	troleum on-like odor.
11-		$\square$	8	20.7	SILTY SAND (SM): very dark gray (10YR 3/1), v to coarse sand, 20% fines, 5% fine subrounded g	wet, loose gravel (up	, 75% fine to 0.75").	-	Sheen, pe hydrocarb	troleum on-like odor.
12-		$\left \right\rangle$	5 4 5	6.1 11.8				_	Sheen, pe hydrocarb	troleum on-like odor.
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").					ay (10YR ine	_	No sheen, hydrocarb	petroleum on-like odor.		
14-		$\left \right $	9	7.5	PEAT (PT): reddish brown (2.5YR 2.5/3), wet, m with SILTY SAND with GRAVEL and wood debri	nedium sti s.	iff, mixed	_	Sheen, pe hydrocarb	troleum on-like odor.
15-		¥ \								OAKBOREV (REV. 8/2011)
		а	me	eo.			Project No. 3917	157 [.]	16G.02	Page 1 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No. FA-S								-SB01 (cont'd)
DEPTH (feet)	Sample No.	Sample IT	Blows/ S Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, structu t. w/HCI, geo. inter.	ure,	REMARKS
	B01-20-102513		8 10 3 4 4 4 15 17 23 10 13 13	2.2 7.6 2.2 2.2 1	WELL-GRADED SAND with SILT 3/1), wet, loose, 85% fine to coars subrounded gravel (up to 0.75"). mixed with PEAT, reddish brown ( sulfide-like odor. WELL-GRADED SAND with SILT 3/1), wet, medium dense, 85% fin fine subrounded gravel (up to 0.75 (ML).	(SW-SM): very dark gray ( e sand, 10% fines, 5% fine 2.5YR 2.5/3), hydrogen (SW-SM): very dark gray ( e to coarse sand, 10% fines ") mixed with dark brown, S	(10YR	Sheen, petroleum hydrocarbon-like odor. Sheen. Sheen. No sheen. No sheen.
- 21- - 22- - 23- - 24- - 25- - 26- - 27- - 27- - 28-	FA-SI				Bollom of Boring @ 20 FT. Abanc	oned with bentonite to surfa	ace	No sheen.
20 - 29 - 30 -	-						-	
31-  32-  33-	-		<b>~</b> ~~	~		Dr		04KB0REV (REV. 8/2011)
L		a	inet	~			,	

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. FA-SB02			
BORIN	IG LO	CAT	ION:	Federal A	ve (West Right-of-Way)	ELEVAT NA	ION AND DATUM:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	DATE S ⁻ 10/24/1	TARTED: 3	DATE FI 10/24/1	NISHED: 3
DRILLI	NG M	ЕТ⊦	IOD:	Hollow	r-stem auger	TOTAL E	DEPTH (ft.):	MEASUF	RING POINT: Surface
DRILLI	NG E	QUII	PMEN	NT: CME 7	/5	DEPTH	ΓΟ WATER (ft.)	FIRST	COMPL.
SAMPI	_ING I	ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGE	D BY:		
НАММ	ER W	EIG	HT:	300 lb	DROP: 30 in	RESPON	NSIBLE PROFESS	IONAL:	REG. NO.
EPTH feet)	SAI o o	UPL ple	es vs/	NVM ADING ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. der cementation, react. w/HCl, geo. inte	jonn LC nsity, struct r.	ure,		L.Hg. 1354
Щ÷	San	San	98 P	С П Ц	Surface Elevation: NA				
_	-				WELL-GRADED SAND (SW): very dark gray (1 100% fine to medium sand	0YR 3/1),	moist,		
1-	-						_		
_	-						_	Cleared t	o 8 feet bgs with ruck.
2-	-						_		
-							_		
3-	-						_		
4-	-						_		
							_		
5-	-10151			150			_	Sheen, tr	ace free product,
-	B02-5-						_	petroluen odor.	hydrocarbon
6-	FA-S				Wet @ 6 FT.		_	Sheen, p	etroluem
7-	-						_	Sheen n	etroluem
-							_	hydrocart	oon odor.
8-		$\overline{)}$		44.8 5.6	WELL-GRADED SAND with SILT (SW-SM): ve	ry dark gra	ay (10YR	Sheen, p	etroluem
9-	-	X	10 6			inico.	_	nyurocan	
-	-	$\vdash$	3	38.9			_	hydrocart	etroluem oon odor.
10-	-	M	5	1.6			-	Sheen, p	etroluem
- –		$[/ \$	5 5	20 E				hydrocarl	oon odor.
- 11		$\backslash/$		20.3	WELL-GRADED SAND with SILT (SW-SM): ve 3/1), wet, loose, 80% fine to medium sand. 10%	ry dark gra fines, 10%	ay (10YR % fine	No sheer	l.
12-			6 7		subrounded gravel, wood debris (roots).	,,	_	Sheen	
-		$\left( \right)$	9	7.4 5.6			_		
13-		$ \rangle$	4	0.0			-	Sheen.	
14-		$\square$	4 3	32					
I		$\mathbb{N}$		U.2			_	No sheer	l.
15-		/ \	3						OAKBOREV (REV. 8/2011)
Project No. 391157							716G.02	Page 1 of 2	

PROJE	ECT:	Exx 271	on <b>i</b> 7/2	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA	Log of Bor	ring No. F	A-SB02 (cont'd)
DEPTH (feet)	Sample No.	Sample T	Blows/ G Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react.	IPTION by wt., plast. density, stru . w/HCl, geo. inter.	icture,	REMARKS
- 16		$\mathbb{X}$	5 5	2.2 3.2	SANDY SILT (ML): very dark brow medium stiff, 65% fines, 35% fine t hydrogen sulfide-like odor.	vn (10YR 2/2), wet, no p to medium sand, wood c	lasticity, lebris,	No sheen.
 17		$\square$	4 5 9	1.2	SILTY SAND (SM): very dark gray medium dense, 65% fine to coarse subrounded gravel (up to 0.75" in s	(10YR 3/1), wet, loose sand, 30% fines, 5% fir size), hydrogen sulfide o	to ne - dor.	No sheen. 
		$\mathbb{N}$	13 14		SILTY SAND (SM): very dark gray medium dense, 80% fine to coarse subrounded gravel (up to 0.75" in s	/ (10YR 3/1), wet, loose sand, 15% fines, 5% fir size), wood debris, hydro	to ne	No sheen.
_ 19-	413	$\left \right\rangle$	14	0.8	Sumue ouor.		-	No sheen. 
 20 <i>_</i> _	302-20-102	X	7 8 11	0.6	Mixed with reddish brown (2.5 YR :	3.5/3) PEAT.	-	No sheen. 
- 21-	FA-SE				Bottom of Boring @ 20 F I. Abando	oned with bentonite to si	urface. -	_
_ 22_							-	_
_ 23_							=	-
 24 <i>_</i> _							-	-
 25							=	-
_ 26-							-	-
 27 <i>_</i> _							-	-
28-							-	-
29-							-	_
30 <i>-</i> -							-	_
31-							-	_
32- -							-	-
33-								OAKBOREV (REV. 8/2011)
		a	me	co.			Project No. 39115	5716G.02 Page 2 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. FA-SB03			
BORIN	IG LO	CAT	ION:	Federal /	Ave (West Right-of-Way)	ELEVAT NA	ION AND DATUM	Л:		
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Drilling, Inc.	DATE S 10/24/1	TARTED: 3	DATE 10/24	FINISHED: /13	
DRILLI	NG M	ETH	OD:	Hollov	v-stem auger	TOTAL I 20.0	DEPTH (ft.):	MEAS Grour	URING POINT: nd Surface	
DRILLI	NG E	QUIF	PMEN	NT: CME	75	DEPTH ⁻	TO WATER (ft.)	FIRST NA	COMPL. NA	
SAMPI	_ING I	MET	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGE	D BY: mv. I G			
HAMMER WEIGHT:     300 lb     DROP:     30 in     RESPONSIBLE PROI       John Long							NSIBLE PROFES	SIONAL:	REG. NO. L.Hg. 1354	
DEPTH (feet)	ample No.	MPL amble	lows/ S Foot	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plas cementation, react. w/HCl, gec	t. density, struc b. inter.	ture,		REMARKS	
	ů_	ŝ	B	R	Surface Elevation: N		anna da b	_		
	FA-SB03-6.5-102413 FA-SB03-4-102413		4 4 4 5 7 9 6 7 8 8 9 9	9.4 9.5 23.4 7.4 2.6 0.5 0.5	brown (10YR 3/2), moist, 85% fine to mediu fine subrounded gravel ( up to 0.75"), wood Wet @ 5 FT. SILTY SAND (SM): dark brown (10YR 3/3) medium sand, 30% fines, 10% fine subrour mixed with SANDY SILT (ML) dark greenist SILTY SAND (SM): very dark gray (10YR 3 coarse sand, 30% fines 5% fine subrounde WELL-GRADED SAND with SILT (SW-SM 3/1), wet, loose, 85% fine to coarse sand, 1 subrounded gravel (up to 0.75").	um sand, 10% debris (roots). debris (roots). ), wet, loose, 60 hded gravel (up h gray (10GY 4 3/1), wet, 65% d gravel (up to ): very dark gr 0% fines, 5% f	5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5% 5	<ul> <li>Cleared vacuur</li> <li>FA-SB collecter</li> <li>FA-SB</li> <li>FA-SB</li> <li>Sheen,</li> <li>hydroc</li> <li>Sheen,</li> <li>hydroc</li> <li>Sheen,</li> <li>hydroc</li> <li>Sheen,</li> <li>hydroc</li> <li>No she</li> <li>No she</li> <li>No she</li> <li>No she</li> </ul>	d to 5 feet bgs with n truck. 03-4-102413 is ed from interval 0 to een. petroleum arbon-like odor. petroleum arbon-like odor. een.	
_		$\mathbb{N}$	5	0.0			-	en.		
12         // 7         0.6         SILTY SAND (SM): very dark gray (10YR 3/1), wet, loose, 80% fine to medium sand, 20% fines.           13-         7         0.6         7					e, 80% fine	_ No she _   _ No she	en.			
-   14- 			8 8 13	2.1		5/3).		     No she	en.	
15-		/		<u>^</u>	L				OAKBOREV (REV. 8/2011)	
		а	me	c ^o			Project No. 39115	5716G.02	Page 1 of 2	

PROJE	COJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring							-SB03 (cont'd)
DEPTH (feet)	Sample No.	Sample	Blows/ S	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
16-	-		15 19 15 17	0.4 0.2	WELL-GRADED SAND with SILT 3/1), wet, medium dense, 75% fine fine subrounded gravel, rootlets.	(SW-SM): very dark gray (10YR to coarse sand, 10% fines, 5%		No sheen. No sheen.
17-	-		22 10 11 14	0.2				No sheen. No sheen.
19- 	\-SB03-20-102413		16 17 22	0.2	mixed with PEAT, reddish brown (	2.5YR 2.5/3).		No sheen.
21-	ΕA							
22-	-							
24 - - 25 -	-							
26-	-							
27- - 28-	-						_	
29 - - 30 -	-							
31-	-							
32- - 33-	-						_	OAKBOREV (REV. 8/2011)
		a	me	20		Project No	. 391157	16G.02 Page 2 of 2

PROJE	CT:	Ex> 271	on <b>i</b> 7/2	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA	Log of Boring No. FA-SB04				
BORIN	G LO	CAT	ION:	Federal A	Ave (West Right-of-Way)	ELEVAT NA	TION AND DATUM	1:		
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Drilling, Inc.	DATE S 10/24/1	TARTED: 3	DATE 10/24	FINIS /13	HED:
DRILLI	NG M	ЕТН	OD:	Hollow	v-stem auger	TOTAL I 20.0	DEPTH (ft.):	MEAS Grou	URIN nd Su	G POINT: rface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75	DEPTH	TO WATER (ft.)	FIRST		COMPL.
SAMPL		ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGE	D BY:			
НАММ	ER W	EIGI	HT:	300 lb	DROP: 30 in	RESPO	NSIBLE PROFES	SIONAL:		REG. NO.
EPTH eet)	SAMPLES     O       E     0       DESCRIPTION       NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo, inter.					ture,		RE	MARKS	
Ш <del>ў</del>	Sam Nc	Sam	Blov Fo	O REA (pi	Surface Elevation: N/	A				
- 1-					POORLY-GRADED SAND with SILT (SP-SM brown (10YR 3/2), moist, 85% fine to medium fine subrounded gravel ( up to 0.75").	/): very dark n sand, 10%	grayish fines, 5% - -	- Cleare	d to 5	feet bgs with
2							-	FA-SB - collect 5 FT.	04-4- ed fro	k. 102413 is m interval 0 to
4-	-4-102413			2.3			-	_		
5-	A-SB04	N /		0.1	Wet @ 5 FT.		-	_   No she	een. p	etroleum
-	ш		2		SANDY SILT (ML): dark greenish gray (5GY	( 4/1), wet, sc	oft, non	- hydroc	arbon	-like odor.
6- - 7-		$\left \right\rangle$	2 3 1	0.8 0.1	plasticity, 70% fines, 30% fine sand. SILTY SAND (SM): dark greenish gray (5G) fine to medium sand, 30% fines, 5% fine sub 0.75").	Y 4/1), wet, lo prounded grav	ose, 65% /el (up to -	-   No she -   -   No she	een. een.	
8-		$\square$	1 2	0.1	Mixed with PEAT, reddish brown (2.5yr 2.5/3	8), burnt wood	l debris.			
_		$\mathbb{N}$	1				_		en.	
9-			5 11	0.1			-	No she	een.	
10-			10	0.2				No she	een.	
11-		$\left \right\rangle$	11 9 11	0.1	WELL-GRADED SAND with SILT (SW-SM): 3/1), wet, loose, 85% fine to coarse sand, 10 subrounded gravel (up to 0.75").	very dark gr 0% fines, 5% f	ay (10YR fine -	_ No she	een.	
12		$\square$	11 12 14	0.1			-	_ _ No she	een.	
13-			10 10	0.2			-	_ No she	een.	
14-		$\left \right\rangle$	7	0.2	└── hydrogen sulfide-like odor.		-	_   No she -	een.	
15-			5						OAł	(BOREV (REV. 8/2011)
Project No. 391157									P	age 1 of 2

PROJE	ECT:	Exx 271	(on) 7/2	Mobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA	Log of Boring No	D. FA	-SB04 (cont'd)
DEPTH (feet)	Sample No.	Sample	Blows/ G Foot	OVM READING (ppm)	DESCRI NAME (USCS): color, moist, % l cementation, react.	PTION by wt., plast. density, structure, w/HCl, geo. inter.		REMARKS
- 16	-	$\left \right\rangle$	5 5 5	2.8 21.6	WELL-GRADED SAND with SILT ( 3/1), wet, loose, 85% fine to coarse subrounded gravel (up to 0.75"), m (2.5yr 2.5/3).	SW-SM): very dark gray (10YR e sand, 10% fines, 5% fine ixed with PEAT, reddish brown		No sheen. No sheen.
- 17-		$\left \right\rangle$	6 7	9.9	3/1), wet, loose, 85% fine to coarse subrounded gravel (up to 0.75"), hy	swi-Swi): very dark gray (10YR e sand, 10% fines, 5% fine /drogen sulfide-like odor.		No sheen.
18-	-	Å	6 8 10	1.9	3/1), wet, loose, 85% fine to coarse subrounded gravel (up to 0.75"), m (2.5yr 2.5/3).	e sand, 10% fines, 5% fine ixed with PEAT, reddish brown	_	No sheen.
19- -	20-102413	X	6 5	0.3	WELL-GRADED SAND with SILT ( 3/1), wet, loose, 85% fine to coarse subrounded gravel (up to 0.75"), hy	SW-SM): very dark gray (10YR e sand, 10% fines, 5% fine /drogen sulfide-like odor.	_	No sheen.
20-	FA-SB04-2		8		Bottom of Boring @ 20 FT. Abando	oned with bentonite to surface.		
21-	-						_	
22-	-						_	
23- - 24-							_	
24 - 25-	-						_	
- 26-	-						_	
_ 27 -	-						_	
- 28-	-						_	
29-	-						_	
30- _	   						_	
31- -							_	
32 - _	-						_	
33-		L						OAKBOREV (REV. 8/2011)
		а	me	c ⁰		Project No.	391157	16G.02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log	Log of Boring No. FA-SB05			
BORIN	G LO	CAT	ION:	Federal	Ave (West Right-of-Way)	ELEVATION NA	I AND DATUN	1:		
DRILLI	NG C	ОИТ	RAC	TOR: Cas	scade Drilling, Inc.	DATE STAR 10/24/13	TED:	DATE FI 10/24/1	NISHED: 3	
DRILLI	NG M	ETH	OD:	Hollow	<i>w</i> -stem auger	TOTAL DEP 20.0	'TH (ft.):	MEASUF Ground	RING POINT: Surface	
DRILLI	NG E	QUIF	PMEN	NT: CME	75	DEPTH TO V	WATER (ft.)	FIRST NA	COMPL. NA	
SAMPL	ING N	ИЕТ	HOD	: Modified	J California drive sampler [18" x 2.5"]	LOGGED BY J. Bellamy,	r: LG			
HAMM	ER W	EIGI	HT:	300 lb	DROP: 30 in	RESPONSIE John Long	BLE PROFES	SIONAL:	REG. NO. L.Hg. 1354	
EPTH (feet)	SAN ople	UPL apdu	oot S	OVM ADING ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast cementation, react. w/HCl, geo	t. density, structure, . inter.	,		REMARKS	
	Sar	Sar	임면	RE (	Surface Elevation: N	IA				
_					SILTY SAND (SM): dark gray (10YR 4/1), r medium sand. 30% fines. 5% fine subround	moist, 65% fine to led gravel (up to 0.	.75")	_		
1-					,,,,,,,		_	_		
_							-	Cleared t	o 8 feet bgs with ruck.	
2-							-	EA-SB05	-4-102413 is	
_							-	- collected	from interval 0 to	
3-							-			
_							-	-		
4-	02413						-	-		
	)5-4-1			0.0			-	-		
5-	A-SB(						_	_		
6-	ш				Wet @ 5.5 FT.		_	_		
_							-	_		
7-							-	_		
_							-	-		
8-		7		1.0	SILTY SAND (SM): dark gray (10YR 4/1), r	moist, loose, 65% t	fine to	No sheer	I.	
_		IV.	5		medium sand, 30% fines, 5% fine subround mixed with PEAT reddish brown (2.5YR 2.5	led gravel (up to 0. /3).	.75"),	-		
9-		$ \rangle$	8 12				-	No sheer	I.	
10		$\square$	12	0.3 0.3	WELL-GRADED SAND with SILT (SW-SM)	: dark gray (10YR	R 4/1),	-		
		X	8		subrounded gravel.	lines, 5% line	_	No sheer	I	
11-		$\left( \square \right)$	9 9	0.5			-	-		
_			0				-	No sheer	l.	
12-			ŏ 7				-	No sheer	I.	
-		$\vdash$	9	0.3			-	-		
13-		$ \rangle$	6	0.0			-	No sheer	l.	
_		$ \rangle$	7 9	07.0	- wet, loose, 75% fine to medium sand, 10%	fines, 15% fine	-	-		
14-		$\bigtriangledown$	J	27.9	subrounded gravel.			No sheer	I.	
15-		$\square$	5							
		2	mor	~		Pri	oiect No 39115	5716G 02	OAKBOREV (REV. 8/2011)	
L		d	met	-			-,			

PROJE	-SB05 (cont'd)							
≝ £	SAI	MPLI <u> </u>	ES	NG NG €	DESCF			REMARKS
DEP (fee	Samp No.	Samp	Blows Foot	OV READ (pp	NAME (USCS): color, moist, % cementation, reac	by wt., plast. density, structure, t. w/HCl, geo. inter.		
_		X	7 9	0.3		(SWL-SM): very dark grav (10VE		No sheen.
16-	-		6 6	8.9	3/1), wet, loose, 85% fine to media subrounded gravel, hydrogen sulfi	um sand, 10% fines, 5% fine de-like odor.	-	No sheen.
17-	-	$\square$	9	10.1			_	No sheen.
18-	-	$\square$	5 6	1.6	PEAT (PT): reddish brown (2.5YF organics, with pieces of wood.	R 2.5/3), wet, medium stiff, 100%		No sheen.
19-	-20-102413	X	11 14	5.9	WELL-GRADED SAND with SILT 3/1), wet, medium dense, 90% find plant debris, hydrogen sulfide-like	(SW-SM): very dark gray (10YR e to medium sand, 10% fines, odor.	2 _	No sheen.
20-	FA-SB05		10		Bottom of Boring @ 20 FT. Aband	oned with bentonite to surface.		
21-	-						_	
22-	-						_	
- 23-	-						_	
	-							
	_						_	
25-	-							
26-							_	
27 -	-							
_ 28-	-							
-							_	
	_						_	
30-	-						_	
31-	-						_	
32-	-							
33-							_	
		2	me	ø		Proiect I	No. 3911571	OAKBOREV (REV. 8/2011) 16G.02 Page 2 of 2
L		0		-				

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA								Log of Boring No. FA-SB06			
BORIN	G LO	CAT	ION:	Federal A	Ave (Wes	st Right-of-Way)	ELEVAT NA	ION AND DATU	M:			
DRILLI	NG C	ONT	RAC	TOR: Case	cade Dril	ling, Inc.	DATE S ⁻ 10/25/1	TARTED: 3		DATE FINI 10/25/13	SHED:	
DRILLI	NG M	ETH	OD:	Hollow	/-stem au	ıger	TOTAL [ 20.0	DEPTH (ft.):		MEASURIN Ground S	NG POINT: urface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75		DEPTH	TO WATER (ft.)		FIRST NA	COMPL. NA	
SAMPL	LING N	MET	HOD	: Modified	Californi	a drive sampler [18" x 2.5"]	LOGGEI J. Bella	D BY: my, LG				
НАММ	ER W	EIGI	HT:	300 lb		DROP: 30 in	RESPON John Lo	NSIBLE PROFES	SSI	ONAL:	REG. NO. L.Hg. 1354	
E     SAMPLES     O     DESCRIPTION       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples     Image: Samples     Image: Samples       Image: Samples     Image: Samples     Image: Samples							ture,		RI	EMARKS		
	Sa	Sa	ВЦ	RE	٨٥٣	Surface Elevation: NA						
	306-4-102513			0.4	SIL fine 0.75	nait (0.5 incres). TY SAND (SM): dark yellowish brown (10YR to medium sand, 30% fines, 10% fine subroi 5"), cobbles present.	3/4), moi unded gra	ist, 55% ivel (up to		Cleared to vacuum tru FA-SB06-4 collected fr 5 FT.	5 feet bgs with ck. -102513 is om interval 0 to	
5- - 6-	FA-SE		3 2	0.8	We	t @ 5 FT.			_	No sheen. Sheen, pet	roleum	
	6-7.5-102513		4 4 5	31.2 55	WE 3/1) sub	LL-GRADED SAND with SILT (SW-SM): ver , wet, loose, 85% fine to coarse sand, 10% fi rounded gravel (up to 0.75").	ry dark gra nes, 5% f	ay (10YR îine	_	hydrocarbo Sheen, pet hydrocarbo	n-like odor. roleum n-like odor.	
9-	FA-SB0		7 6 6	42					_	Sheen, pet	roleum n-like odor. roleum	
10-		M	9	33.9					_	No sheen, hvdrocarbc	petroleum n-like odor.	
									_	Sheen, pet	roleum n-like odor.	
12-		$\left \right\rangle$	5 6 6	20.9 20.7					_	No sheen, hydrocarbo	petroleum n-like odor.	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									_	Sheen, pet hydrocarbo Sheen, pet	roleum n-like odor. roleum	
15-		M	9							hydrocarbo	n-like odor.	
Project No. 391157								1571	0 16G.02	AKBOREV (REV. 8/2011) Page 1 of 2		
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PROJE	CT:	No. FA	-SB06 (cont'd)					
DEPTH (feet)	Sample No.	Sample IT	Blows/ 60 Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, react	RIPTION by wt., plast. density, structure, w/HCI, geo. inter.		REMARKS
			12 15 9 10 13 4 4	8.5 11.6 3.2	WELL-GRADED SAND with SILT 3/1), wet, medium dense, 85% fine fine subrounded gravel (up to 0.75 Heaving sand.	(SW-SM): very dark gray (10Y e to coarse sand, 10% fines, 5% ").	R	No sheen, petroleum hydrocarbon-like odor. Sheen, petroleum hydrocarbon-like odor. Sheen, petroleum hydrocarbon-like odor.
  	FA-SB06-20-102513		4 8 6 5	7.9 5.1	3/1), wet, loose, 60% fine to coars gravel (up to 0.75"), 10% fines, wi WELL-GRADED SAND with SILT 3/1), wet, medium dense, 85% fine fine subrounded gravel (up to 0.75 Bottom of Boring @ 20 Ft. Abando and cement to surface.	(SW-SM). Very dark gray (101 e sand, 30% fine subrounded th wood debris. (SW-SM): very dark gray (10Y e to coarse sand, 10% fines, 5% "). oned with bentonite to 1 FT bgs		No sheen. No sheen.
21-    23-								
 24 25								
26- - 27- -								
20 - 29 - 30 -							-	
31- 32-							-	
33-		а	mec	à		Project	No. 391157	0AKBOREV (REV. 8/2011) 16G.02 Page 2 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. FA-SB07					
BORIN	G LO	CAT	ION:	Federal A	Ave (Wes	st Right-of-Way)	ELEV.	ATION AND DATU	M:			
DRILLI	NG C	ОNT	RAC	TOR: Cas	cade Dril	ling, Inc.	DATE 10/25	STARTED: 5/13		DATE FIN 10/25/13	ISHED:	
DRILLI	NG M	ETH	OD:	Hollow	/-stem au	ıger	TOTA 20.0	L DEPTH (ft.):		MEASURI Ground S	NG POINT: Surface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75		DEPT	H TO WATER (ft.)		FIRST NA	COMPL. NA	
SAMPI		ИЕТ	HOD	: Modified	Californi	a drive sampler [18" x 2.5"]	LOGO J. Be	ED BY: llamy, LG				
НАММ	ER W	EIGI	HT:	300 lb		DROP: 30 in	RESP John	ONSIBLE PROFE	SSI	IONAL:	REG. NO. L.Hg. 1354	
DEPTH (feet)	ample No.	ample AD	lows/ Foot	OVM EADING (ppm)	N	DESCRIPTION AME (USCS): color, moist, % by wt., plast. der cementation, react. w/HCl, geo. inte	nsity, str er.	ucture,		R	EMARKS	
	Š	ő	<u> </u>	R	011	Surface Elevation: NA			_			
_					SIL	to medium sand, 30% fines, 10% fine subro	≺ 3/4), n ounded g	noist, 60% gravel (up to	_			
1-					0.7	5").			_	Cleared to	5 feet has with	
								-	vacuum tru	ick.		
2-									-	FA-SB07-4	-102513 is	
-									-	collected fr 5 FT.	om interval 0 to	
3-												
4-	2513			0.1								
	1-4-10			••••								
5-	-SB0			0.0		w (40VD 5/4) Wet @ 5 FT			_	Nechoon		
-	E E		4		gra	iy (101R 5/1), wel @ 5 F1.			_	NO Sheen.		
6-			4		— mix	ed with pieces of wood.			-	No sheen.		
-		( )	5	2.1 15	WE	LL-GRADED SAND with SILT (SW-SM): ve	ry dark	gray (10YR	-			
/-		X	5		3/1) sub	), wet, loose, 85% fine to coarse sand, 10% f rounded gravel, rootlets.	lines, 5%	% fine		No sheen,	petroleum	
8-		$\square$	6	0.5					_	Nashaan		
_		$ \rangle$	6						-	NO Sheen.		
9-			9 15						-	No sheen.		
10-		$\square$	10	0.4 0.2								
		X	8 16							No sheen.		
11-		$\left( \right)$	16	0.3					_	No sheen.		
–   12–			7									
- 12 -		$\square$	8 9	0.1						No sheen.		
13-		$\mathbb{N}$	8	0.2					_	No choor		
-		$\square$	9						_			
14-		$\bigwedge$		0.3					-	No sheen.		
-			9						-			
15-				0				Duel (M. OS.)		400.00	DAKBOREV (REV. 8/2011)	
Project No. 3911								157	16G.02	Page 1 of 2		

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No							A-SB07 (cont'd)
DEPTH (feet)	Sample No.	Sample	Blows/ 5	OVM READING (ppm)	DESCRI NAME (USCS): color, moist, % cementation, react.	PTION by wt., plast. density, structure, w/HCl, geo. inter.		REMARKS
- 16	-	X	9 11 10	0.1 1.8	WELL-GRADED SAND with SILT ( 3/1), wet, loose, 85% fine to coarse subrounded gravel, rootlets, mixed (2.5YR 2.5/3).	SW-SM): very dark gray (10YF e sand, 10% fines, 5% fine with PEAT reddish brown	2	No sheen.
 17	-	Д	10 11	0.1	PEAT (PT): reddish brown (2.5YR POORLY-GRADED SAND with SIL	2.5/3), wet, stiff, mixed with T, hydrogen sulfide odor.		
		M	10		WELL-GRADED SAND with SILT ( 3/1), wet, medium dense, 85% fine fine subrounded gravel, rootlets.	SW-SM): very dark gray (10YR to medium sand, 10% fines, 5%	~	No sheen.
-	-	$\left( \right)$	14 16	0.3	Pieces of wood. WELL-GRADED SAND with SILT (	SW-SM): very dark gray (10YR		No sheen.
19- -	20-102513	X	15 15	0.1	3/1), wet, loose, 85% fine to mediu subrounded gravel, rootlets.	m sand, 10% fines, 5% fine	_	No sheen.
20-	PE-SB01-		18		Bottom of Boring @ 20 FT. Abando	ned with bentonite to surface.		
21-							_	
22-	_						_	
- 23-	-						_	
-	-						_	
							_	
25-	-						_	
26-	-						_	
27 –	-						_	
- 28-	-						_	
- 20							_	
-							_	
30-	-						_	
31-								
32-	-						_	
		a	me	co.		Project I	No. 39115	716G.02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Data Investigation Everett, WA	Log of Boring No. KC-SB01			
BORIN	G LOO	САТ	ION:	Kimberly	Clark		ELEVATION AND DATU	M:		
DRILLI	NG C	ЭNT	RAC	TOR: Cas	cade Dril	ling, Inc.	DATE STARTED: 10/30/13		DATE FIN 10/30/13	ISHED:
DRILLI	NG M	ЕТН	OD:	Hollow	/-stem au	iger	TOTAL DEPTH (ft.):		MEASURI	NG POINT:
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75		DEPTH TO WATER (ft.)		FIRST	COMPL.
SAMPI			нор	· Modified	Californi	a drive sampler [18" x 2 5"]	LOGGED BY:		NA	NA
			IT.		Californi		J. Bellamy, LG RESPONSIBLE PROFES	SSI	ONAL:	REG. NO.
HAIVIIVI				300 lb		DROP: 30 in	John Long			L.Hg. 1354
DEPTH (feet)	ample No.	ample	slows/ 6 Foot	OVM EADING (ppm)	N	AME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inte	sity, structure, r.		R	EMARKS
	<i>S</i>	ũ	8	2		Surface Elevation: NA	(SW/ SM): dark			
_					brov	wn (10YR 3/3), wet, 70% fine to coarse sand	, 20% fine	_		
1-					sub	rounded to rounded gravel (up to 0.75"), 10%	o fines, cobbles.	-	Cleared to	5 feet bas with
_								-	vacuum tru	uck.
2-								-	KC-SB01-	103013 is
-								-	collected fi 5 FT.	rom interval 0 to
3-										
4-	13									
	-1030			0.1				_		
5-	B01-5			0.2					No obcon	
_	KC-S	$\mathbb{N}$	•		3/3)	, wet, loose, 85% fine to coarse sand, 10% f	ines, 5% fine	_	No sneen.	
6-			8 5		sub	rounded to rounded gravel (up to 0.75").		-	No sheen.	
_		$\left( \right)$	5	0.3 0.3				-		
7-		IX.	3	0.0				-	No sheen.	
-		$\backslash \setminus$	2 2	0.1						
		$\mathbb{N}/$		0.1					No sheen.	
9-		X	4		WE 3/3)	LL-GRADED SAND with SILT (SW-SM): da	rk brown (10YR 1d, 10% fines, 5%			
		$\left( \rightarrow \right)$	5	0.1	fine	subrounded to rounded gravel (up to 0.75"),	wood pieces.	$\left  - \right $	No sheen.	
10-			40	0.2	day	k aray (10Y 4/1) no wood pieces		$\left  - \right $	No sheen	
-			12		val ▼			$\left  - \right $		
11-		$\left( \rightarrow \right)$	16	0.1				$\left  - \right $	No sheen.	
_		IV.	5					-		
12-		$ \rangle \rangle$	15 21	0.4				$\left  - \right $	No sheen.	
12-		$\left[ \right]$		0.1						
		X	15 17						No sheen.	
14-		$\left( \right)$	21	0.1				$\left  - \right $		
								$\left  - \right $	No sheen.	
15-		$\mathbb{Z}$	11						(	DAKBOREV (REV. 8/2011)
Project No. 39							Project No. 391	157 [.]	16G.02	Page 1 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No. KC-SB01 (C									
DEPTH (feet) Sample	SAMPLe No. Sample	Blows/ S Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, structure, t. w/HCl, geo. inter.		REMARKS		
  17		16 21 19 20 21	0.1 0.2 0.2	WELL-GRADED SAND with SILT brown (10YR 3/2), wet, medium de 10% fines. Heaving sand.	(SW-SM): very dark grayish ense, 90% fine to coarse sand,		No sheen. No sheen. No sheen.		
18- - 19- - 20-		18 22 21 15 17 19	0.1 0.2 0.1				No sheen. No sheen.		
21 - _ 		18 22 24 14 18	0.2 0.2	WELL-GRADED SAND with SILI brown (10YR 3/2), wet, medium de 10% fines, 5% fine subrounded to 4 inch cobble stuck in shoe of spli	(SW-SM): very dark grayish ense, 85% fine to coarse sand, rounded gravel (up to 0.75"). t-spoon sampler.		No sheen. No sheen.		
23	01-25-103013	19 20 20 24	0.3 0.2	SILTY SAND (SM): dark gray (10 75% fine to medium sand, 25% fir	YR 5/3), wet, medium dense, es.		No sheen. No sheen.		
26 - 26 - 27 -	KC-SB			Bottom of Boring @ 25 FT. Aband	oned with bentonite to surface.				
 28 29									
30- - 31- - 32-						-			
33	ä	ame	දුන		Project No.	391157	оаквоге (Rev. 8/2011) 16G.02 Раде 2 of 2		

PROJE	CT:	Exx 271	on <b>i</b> 7/2	/lobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA	Log of Boring No. PE-SB02				
BORIN	G LO	CATI	ION:	Vigor Ma	rine (Port of Everett Leasehold Property)	ELEVATION AND DATU	ATUM:			
DRILLI	NG C	ТИС	RAC	TOR: Case	cade Drilling, Inc.	DATE STARTED: 10/22/13		DATE FINI 10/22/13	SHED:	
DRILLI	NG M	ETH	OD:	Hollow	r-stem auger	TOTAL DEPTH (ft.): 20.0		MEASURII Ground S	NG POINT: urface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	5	DEPTH TO WATER (ft.)	ŀ	NA	COMPL. NA	
SAMPL	ING N	ΛΕΤΙ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG				
НАММ	ER W	EIGł	HT:	300 lb	DROP: 30 in	RESPONSIBLE PROFES	SSIO	NAL:	REG. NO. L.Hg. 1354	
DEPTH (feet)	SAN No.	/IPLI	ows/ 🕅 Foot	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inter	sity, structure,		RI	EMARKS	
	Sa	Sa	BR	R	Surface Elevation: NA					
- 1-					Asphalt (o inches), base graver (10 inches).		_			
							-   (	Cleared to acuum tru	5 feet bgs with ck.	
2-					WELL-GRADED SAND with SILT (SW-SM): ver 3/1), moist, 85% fine to medium sand, 10% fines subrounded gravel ( up to 0.75" in size), brick de	y dark gray (10YR , 5% fine bris. FILL.	_			
3-							_			
4-							_			
				40			-			
5-		$\bigvee$	8	40 90.8			- -	No sheen.		
6-	-102213	$\wedge$	6 7	88	Wet @ 6 FT.		- s	Sheen, free Detroleum	e product,	
7-	E-SB02-7	X	10	4.1			_   ł	hydrocarbo Sheen, free	n-like odor e product,	
8-	P	$\left( \right)$	10 12	2.2				iydrocarbo Sheen	n-like odor	
- 0-		X	5				_			
		$\left( \right)$	5 5	4.7			- r	No sheen.		
10-		X	10 9	2.2			5	Sheen.		
11-		$\left( \right)$	10	0.8			-	No sheen.		
12-			7 9				-	No sheen.		
		$\square$	10 a	3.2 4.1	SILTY SAND (SM): very dark gray (10YR 3/1), v to medium sand, 20% fines, 5% fine subrounded in size).	vet, loose, 75% fine gravel (up to 0.75"	s	Sheen.		
14-		$\left \right\rangle$	10	1.3				No sheen.		
15-		$ \rangle\rangle$	15						AKBOREV (REV. 8/2011)	
		a	me	² 0		Project No. 3911	15716	G.02	Page 1 of 2	

PROJEC	CT:	Exx 271	on <b>i</b> 7/27	/lobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA	Log of Bor	ing No. Pl	E-SB02	(cont'd)
DEPTH (feet)	Sample No.	Sample N	Blows/ 6	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, stru . w/HCl, geo. inter.	cture,	F	REMARKS
 16		X	14 15 9 10	1.3 1.1	SILTY SAND (SM): very dark gray 65% fine to medium sand, 30% fin (up to 0.75" in size), no sheen, hyd	/ (10YR 3/1), wet, mediu es, 5% fine subrounded trogen sulfide-like odor.	m dense, gravel -	No sheen	
17 – – 18 –		$\left \right\rangle$	12 12 13	4			-	No sheen	
19-	-102213	$\left  \right\rangle$	14 14 11	0.5			-	No sheen.	
20-	PE-SB02-20		10 14	0.0	Bottom of Boring @ 20 FT. Aband and cement to surface.	oned with bentonite to 1	FT bgs	-	
22-							-	-	
23-							-	-	
24								-	
26-							-	-	
27-							-	-	
29-							-	-	
30- - 31-							-	-	
32-							-	-	
33		a	me	à			Project No. 39115	716G.02	OAKBOREV (REV. 8/2011) Page 2 of 2

PROJE	CT:	Exx 271	onN 7/2	/lobil/AD0 731 Fede	Final Data Investigation ral Ave. Everett, WA	Log of Boring No. PE-SB03				
BORIN	G LO	CATI	ON:	Vigor Ma	rine (Port of Everett Leasehold Property)	ELEVAT NA	ION AND DATUN	И:		
DRILLI	NG C	ΟΝΤΙ	RAC	TOR: Case	cade Drilling, Inc.	DATE ST 10/22/1	TARTED: 3	DATE FINISHED: 10/22/13		
DRILLI	NG M	ETH	OD:	Hollow	-stem auger	TOTAL E 20.0	DEPTH (ft.):		MEASUR Ground S	ING POINT: Surface
DRILLI	NG E	QUIP	MEN	NT: CME 7	5	DEPTH 1	ΓΟ WATER (ft.)		FIRST NA	COMPL. NA
SAMPL	ING I	METH	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGEI J. Bella	D BY: my, LG			
НАММ	ER W	EIGH	IT:	300 lb	DROP: 30 in	RESPONSIBLE PROFES			ONAL:	REG. NO. L.Hg. 1354
DEPTH (feet)	ample No.		ows/ 0	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inter	sity, struct	ure,		R	EMARKS
	S	ŝ	8	R	Surface Elevation: NA			_		
	PE-SB03-5-101613		8 20 12 8 7 6 6 10 10 3 4 6 8 9 12 6 8 8	46 44 13.1 18 3.8 22 2.4 1.6 1.1 1.0 5.6	WELL-GRADED SAND with SILT (SW-SM): ver 3/1), moist, 95% fine to medium sand, 5% fines.         Wet @ 5.25 FT.         WetLL-GRADED SAND with SILT (SW-SM): ver 3/1), wet, loose, 95% fine to medium sand, 5% fi debris.	y dark gra	ay (10YR ay (10YR ay (10YR a wood		Cleared to vacuum tri Sheen, fre petroleum hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe hydrocarb Sheen, pe	e product, on-like odor e product, on-like odor troleum on-like odor troleum on-like odor troleum on-like odor
-		X	10				-	-		
15-		V V		0						OAKBOREV (REV. 8/2011)
		a	me				Project No. 3911	571	6G.02	Page 1 of 2

PROJE	ROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA Log of Boring No.							E-SB03 (cont'd)
DEPTH (feet)	Sample No.	Sample IT	Blows/ S Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, stru . w/HCl, geo. inter.	icture,	REMARKS
16-	-	$\mathbb{X}$	10 10 7 9	3.1 1.0	SANDY SILT (ML): very dark brow medium stiff, 65% fines, 35% fine hydrogen sulfide-like odor.	vn (10YR 2/2), wet, no p sand, trace wood debris,	lasticity,	No sheen No sheen
17-	-	$\left \right\rangle$	9 8 7	2.4	SILTY SAND (SM): very dark gray to medium sand, 20% fines, hydro	y (10YR 3/1), wet, loose, gen sulfide-like odor.	80% fine	No sheen
19-	102213	$\left  \right\rangle$	8 9	0.6 1.5	SANDY SILT (ML): dark brown (1 loose, 70% fines, 30% fine to med odor.	0YR 3/3), wet, no plastic ium sand, hydrogen sulfi	ity, ide-like	No sheen
20-	PE-SB03-20-		10 10	1.5	Bottom of Boring @ 20 FT. Aband and cement to surface.	oned with bentonite to 1	FT bgs	
21-	-						_	
23-	-						-	
24-	-						_	
26-	-						_	
27 -	-						-	
28-	-						-	
-   30-   -	-						-	
31-	-						_	
33-	-							OAKBOREV (REV. 8/2011)
		а	med	0			Project No. 391157	716G.02 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA							Log of Boring No. PE-SB04			
BORIN	G LO	САТ	ION:	Port of Ev	verett	ELEV NA	ATION AND DATUN	<b>/</b> :		
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Drilling, Inc.	DATE 10/2	E STARTED: 2/13	DATE FII 10/22/13	NISHED:	
DRILLI	NG M	ETH	OD:	Hollow	/-stem auger	TOT# 20.0	AL DEPTH (ft.):	MEASUR Ground	ING POINT: Surface	
DRILLI	NG E	QUI	PMEN	NT: CME 7	75	DEPT	TH TO WATER (ft.)	FIRST NA	COMPL. NA	
SAMPL	LING N	MET	HOD	: Modified	California drive sampler [18" x 2.5"]	LOG J. Be	GED BY: ellamy, LG			
НАММ	ER W	EIG	HT:	300 lb	DROP: 30 in	RESI John	PONSIBLE PROFES	SIONAL:	REG. NO. L.Hg. 1354	
EPTH (feet)	No.	MPL mble	oot SS	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., pla cementation, react. w/HCl, ge	ast. density, st eo. inter.	ructure,	F	REMARKS	
	Sa	Sa	≝╙	RE	Surface Elevation:	NA		_		
_					Asphalt (6 inches), base gravel (12 inches	5).	•	_		
1-								_ Cleared to	5 feet bas with	
					SILTY SAND (SM): your dark gray (10VE	2/1) moint		<ul> <li>vacuum ti</li> </ul>	uck.	
2-					fine to coarse sand, 25% fines, 10% fine s 0.75" in size), wood debris.	subrounded g	pravel ( up to	PE-SB04- collected	102213 is from interval 0 to	
3-								5FI.		
4-	102213			0.0				_		
	SB04-`			1.0			•	_		
5-	ЪË	$\mathbb{N}$		4.6				No sheen		
6-		M	4 4 5					No sheen		
7-				0.2 3.4				_		
'_		X	2			A): verv dark		No sheen		
8-		$\left( \right)$	3	0.3	3/1), wet, loose, 90% fine to medium sand	d, 10% fines.		_		
_		X	6		SANDY SILT (ML): dark brown (10YR 3/3 medium stiff, 60% fines, 40% fine to medi (nossible railroad tie)	3), wet, no pla um sand, woo	asticity, od debris	-		
9-		$\left  \right\rangle$	8 10	0.0	WELL-GRADED SAND with SILT (SW-SN 3/1), wet, loose, 90% fine to medium sand	M): very dark	gray (10YR	No sheen		
10-		$\left \right\rangle$	4	0.0	Pieces of wood.	,,		_ No sheen	_	
-   11-		$\square$	4	0.0	WELL-GRADED SAND with SILT (SW-SM 3/1), wet, loose, 90% fine to medium sand	M): very dark I, 10% fines.	gray (10YR	_		
		$\mathbb{N}$	6	0.0				No sheen		
12-			6 6	10				No sheen		
13-		$\bigvee$		0.4						
_			4		SANDY SILT (ML): very dark brown (10Y	′R 2/2), wet, r	no plasticity,			
14 <i>-</i> _		$\left  \right\rangle$	3	0.9	medium stiff, 70% fines, 30% fine sand, w sulfide odor.	vood debris, h	ydrogen	_ No sheen		
15-		$  \rangle \rangle$	6						OAKBOREV (REV. 8/2011)	
		a	me	² 0			Project No. 3911	5716G.02	Page 1 of 2	

PROJECT: ExxonMobil/ADC 2717/2731 Fede	PE-SB04 (cont'd)		
DEPTH (feet) No. Food (ppm) (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	IPTION by wt., plast. density, structure, t. w/HCl, geo. inter.	REMARKS
L (19)       edues       is work       with ware         16-       7       1.0       9.0         16-       7       9.0         17-       9       0.1         18-       17       18         19-       51201-100       14         19-       51201-100       14         20-       53-       14         21-       14       17         22-       1       14         23-       1       14         23-       1       14         23-       1       14         23-       1       14         23-       1       14         23-       1       14         23-       1       14         23-       1       14         24-       1       14         25-       1       14         26-       1       14         27-       1       14         28-       1       14         30-       1       14         30-       1       14         30-       1       14         31-       1       14	DESCF NAME (USCS): color, moist, % cementation, read SANDY SILT (ML): very dark brow medium stiff, 70% fines, 30% fine sulfide odor. SILTY SAND (SM): very dark gra 60% fine to coarse sand, 40% fine sulfide odor. SILTY SAND (SM): very dark gra 60% fine to coarse sand, 40% fine SANDY SILT (ML): very dark gra stiff, 70% fines, 30% fine sand, we Bottom of Boring @ 20 FT. Aband and cement to surface.	RIPTION by wt., plast. density, structure, t. w/HCl, geo. inter. wn (10YR 2/2), wet, no plasticity, sand, wood debris, hydrogen y (10YR 3/1), wet, medium dense, as, hydrogen sulfide odor. y (10YR 3/1), wet, medium dense, as, hydrogen sulfide odor. y (10YR 3/1), wet, no plasticity, bod debris, hydrogen sulfide odor. loned with bentonite to 1 FT bgs	REMARKS   No sheen.   No sheen.   No sheen.   No sheen.   No sheen.   No sheen.   No sheen.   No sheen.   No sheen.   No sheen.
amec [®]		Project No. 391	OAKBOREV (REV. 8/2011) 15716G.02 Page 2 of 2

PROJE	ECT:	Ex 27	xon 17/2	/obil// 731 Fo	ADC Final ederal Ave	l Data Invest e. Everett, W	igation ′A			Log of	Well	No. N	IW-A8
BORIN	IG LC	DCA ⁻	FION:	Dunla	ap Towing (	Port of Evere	tt Leasehold F	Property)	TOP OF Ground	CASING EI Surface	LEVATION	AND DA	TUM:
DRILL	ING C	CON	TRAC	TOR:	Cascade [	Drilling, Inc.			DATE ST 10/29/1	ARTED:		DATE F 10/28/	INISHED: 13
DRILL	ING N	METI	HOD:	Hollov	w-stem aug	er			TOTAL D 15.5	15.5 SCREEN INTERVAL (†			N INTERVAL (ft.):
DRILL	ING E	EQU	IPME	NT: C	ME 75				DEPTH T WATER (1	0  FIRST ^{ft.):} 13	COMPL. 11.75	CASING	3:
SAMP	LING	ME	THOD	: Modi	ified Califorr	nia drive sam	pler [18" x 2.5	"]	LOGGED	) by: my, LG			
HAMM	ER V	VEIG	GHT: 3	00 lb		DROP: 3	0 in		RESPON John Lo	ISIBLE PRO	OFESSION	IAL:	REG. NO. L.Hg. 1354
EPTH feet)	mple Jo.	mple	es Sout	DVM eading	NAME (U	USCS): color, n cementatio	DESCRIPTION noist, % by wt., on, react. w/HCI	l plast. density, stru , geo. inter.	icture,		WELL AND	. CONSTR D/OR DRIL	UCTION DETAILS LING REMARKS
	Sai	Sai	ы В ц	° Å		Surfac	e Elevation: N	NA			× 81		
_	-				Aspha	It (6 inches).					Tra	ffic Rated	d Well Box
1-	_				WELL- (10YR 10% fii	-GRADED SAI 3/3), moist, 80 ne subrounded	ND with SILT ( 0% fine to coar d gravel (up to (	SW-SM): dark br se sand, 10% fine 0.75"), cobbles, b	rown es, prick,			Portland ( 2"Schedu	Cement le 40 PVC Well
2-	-				metal p	pieces. FILL.					× ·	Casing	
-	-										<b>–</b> – 8	3-inch dia	meter borehole
3-	-										H S	Hydrated Seal	Bentonite Chip
4-	-										2	2" Schedu	le 40 PVC
	-										V	Vell casir	ng
5-			8 6	0.1									
6-	02913	X	Ū	0.2									
_	V-A8-6-1		22	0.3									
7-	W	$\mathbb{N}$	30 30	0.1									
-													
8-		$\square$	9 8 6	0.1	SILTY loose, subrou	SAND (SM): 75% fine to co	dark brown (1) barse sand, 25%	0YR 3/3), moist, % fines, 5% fine					
9-		$\square$	٩	0.0	WELL-	-GRADED SAI	ND with SILT (	SW-SM): dark br	rown		1997 1997 1997 1997 1997 1997 1997 1997	2/12 Col	orado Silica
10-		$\mathbb{N}$	20 21	0.0	(10YR sand, ²	3/3), moist, n 10% fines, 10%	nedium dense, 6 fine subround	80% fine to coars ded gravel (up to	se			Sand	
		Ň			0.75").						2 2 V	2" Schedu Vell casir	ule 40 PVC ng (0.010 slot)
11-	-	$\left( \right)$	18 21	0.0									
40			22										
12-		Д	22	0.0									
13-	-	$\mathbb{N}$	28 31	0.1	Cobble	e at 12.5 FT to	13 Ft.						
-	-				└ ↓ brown	n (10YR 4/3). \	NET @ 13.5 F	T.					
14-		$\left \right\rangle$	20 21		1	(, , · · · · , · · · · , · · · · · ·							
45	1		24	0.1									
15-		5		~	·					Project No.	391157160 0	0A	KWELLV_TOC (REV. 8/2011)
1			ame							i i oject NO.	001107100.0	~	1 age 1 UIZ

PROJE	ECT:	Ex: 27	xon <b>i</b> 17/2 ⁻	/lobil/A 731 Fe	ADC Final Data Investigation ederal Ave. Everett, WA	Log of Well No. MW-A8 (cont'd)					
DEPTH (feet)	Sample No.	Sample M	Blows/ Foot	OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., pla cementation, react. w/HCl, g	ast. density, structure, eo. inter.	WELL DE ⁻ DRIL	CONSTRUCTION TAILS AND/OR LING REMARKS			
16-	MW-A8-15-102913			-	WELL-GRADED SAND with SILT (SW (10YR 3/3), moist, medium dense, 80 sand, 10% fines, 10% fine subrounded 0.75").	/-SM): dark brown % fine to coarse d gravel (up to	2" Scher endcap	dule 40 PVC			
17-	-				Bottom of Boring @ 15.5 FT.		-				
18-	-										
19-	-										
20-											
21-											
22-	-										
23-	-										
24-	-										
25-	-										
26-	-										
27-	-										
28-	-						-				
29- -	-						-				
30-	-						-				
31-	-						-				
32-	-										
33-				0		1		DAKWELLV_TOC (REV. 8/2011)			
		ā	me	co.			Project No. 39115716G.02	Page 2 of 2			

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Data Investigation . Everett, WA	Log of Boring No. BN-SB08				
BORIN	IG LO	САТ	ION:	BNSF Pr	operty		ELEVAT NA	ION AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Dril	ling, Inc.	DATE ST 2/4/14	TARTED:		DATE FIN 2/10/14	ISHED:
DRILLI	NG M	ETH	OD:	Hollow	/-stem au	ıger	TOTAL E 20.0	DEPTH (ft.):		MEASURI Ground S	NG POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75		DEPTH 1	TO WATER (ft.)		FIRST	COMPL.
SAMPI		ИЕТ	HOD	: Modified	Californi	ia drive sampler [18" x 2.5"]	LOGGE	DBY:		101	
НАММ	ER W	EIGI	HT:	300		DROP: 30	RESPON John Lo	NSIBLE PROFES	SSI	ONAL:	REG. NO. L.Hg. 1354
DEPTH (feet)	SAN No.	MPL mble	ows/ S oot	OVM EADING (ppm)	N	DESCRIPTION AME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inte	sity, struct r.	ure,		R	EMARKS
	Sal	Sa	吕프			Surface Elevation: NA					
-					WE (10)	ELL-GRADED SAND with SILT (SW-SM): da YR 3/4), moist, 75% fine to coarse sand, 15%	rk yellowis 5 fines, 10	sh brown % fine	_		
1-					sub	rounded gravel (up to 0.75° in size). FILL.			-	Cleared to	5.5 feet bgs
										with vacuu	m truck.
-	-								_		
3-									_		
-									-		
4-	4										
5-	5-0204			0.0					_	Chase	
-	B08-5.				We	t at 5.5'.			_	Sheen	
6-	BN-S			0.2 0.1	Tra	ce wood debris.			-	No Sheen	
7-		$\left  \right\rangle$	6		۲						
	-		8	0.2					_	No Sheen	
8-	-	$\left \right\rangle$	5						_	No Sheen	
-		$  \setminus$	6						-		
9-		$\left[ \right]$		0.3 0.2	PO 3/2)	ORLY-GRADED SAND (SP): very dark gray ), wet, medium dense, 95% fine to medium sa	ish brown and, 5% fi	(10YR nes.	_	No Sheen	
10-	-	$  \setminus$	10 13		— Sim	nilar to above but with trace fine subangular g	ravel (up t	to 0.75" in	_	No Sheen	
-		$\left  \right\rangle$	12	0.3	▼ size	e).			-		
11-		$\left  \right\rangle$	15							No Sheen	
12-			10	0.7	WE bro	ELL-GRADED SAND with GRAVEL (SW): ve wn (10YR 3/2), wet, medium dense, 80% fine	ry dark gra to coarse	ayish e sand,	_	No Shaar	
-		$\left \right\rangle$	5	0.2	15%	% fine subrounded gravel (up to 1" in size), 5%	% fines.		$\left  - \right $	NU SHEEN	
13-		$  \rangle$	11 10	<b>0</b> 4					$\left  - \right $	No Sheen	
14-		$\left[ \right]$		0.1	WE	ELL-GRADED SAND (SW): very dark gravish medium dense, 90% fine to coarse sand 50	ı brown (1 % fine sub	0YR 3/2), rounded			
-		$  \setminus$	13 9		gra	vel (up to 1" in size), 5% fines.			_	No Sheen	
15-			10								DAKBOREV (REV. 8/2011)
		а	me	¢9				Project No. 6103	3140	009	Page 1 of 2

PROJE	ECT:	Exx 271	kon <b>i</b> 17/2	/lobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA	Log of Boring No	. BN	I-SB08 (cont'd)			
_	SAM	MPLI	ES	U							
DEPTH (feet)	Sample No.	Sample	Blows/ Foot	OVM READIN (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, structure, t. w/HCl, geo. inter.		REMARKS			
				0.3				No Sheen			
		$\left  \right\rangle$	14	0.4			-				
16-		$  \rangle$	12				_	No Sheen			
-		$\square$	15	0.4	POORLY-GRADED SAND (SP)	dark vellowish brown (10YR 4/4)					
17-		$\left  \right\rangle$	40		wet, medium dense, 95% fine to c	oarse sand, 5% fines, trace	_	No Sheen			
-		$  \rangle $	12		subrounded gravel (up to 1" in siz	e).	_				
18-			12	0.4			_				
_		$\left \right\rangle$					_	No Sheen			
19-		$  \setminus  $	15								
			16	03	SILTY SAND (SM): dark yellowis	h brown (10YR 4/4), wet, medium	_	No Sheen			
20				0.0	dense, rominie to medium sand,	2070 mildo.					
20-		$  \setminus  $	10					No Sheen			
-		$  \rangle$	12 13	~ ~			-				
21-			10	0.3 0.5			_				
		$\left  \right\rangle$	8	0.0							
22-		$  \rangle$	13		SANDY SILT (ML): very dark gra medium stiff 70% fines 30% fine	y (10YR 3/1), wet, no plasticity,	_				
		$\square$	. 14	0.5	gravel (up to 1" in size).		<u> </u>				
23-	1014	$\left  \right\rangle$	44		SILT (ML): very dark gray (10YR	3/1), wet, no plasticity, stiff, 95%	_				
	4-02		18	0.5	size), trace shells.	rounded gravel (up to 0.75" in	_				
24-	308-2		11								
_	S-SE				Bottom of Boring @ 24.0 F1. Abai	ndoned with bentonite to surface.	_				
25-	ш						_				
26-											
20											
27-							-				
-							-				
28-							-				
-							-				
29-											
-							-				
30-							_				
							_				
31-							_				
_							_				
32-							_				
							_				
33-											
		_						OAKBOREV (REV. 8/2011)			
		а	me	20		Project No.	610314	Page 2 of 2			
PROJE	CT:	Exx 271	on <b>i</b> 7/2	/lobil/AD0 731 Fede	CFinal [ ral Ave.	Data Investigation Everett, WA		Log of Bo	ring	g No. B	N-SB09
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BORIN	G LOO	CAT	ION:	BNSF Pro	operty		E	LEVATION AND DAT	JM:		
DRILLI	NG C	ЭNT	RAC	TOR: Case	cade Dril	ling, Inc.	D	ATE STARTED: /4/14		DATE FIN 2/10/14	ISHED:
DRILLI	ING CONTRACTOR: Cascade Drilling, Inc.     DATE STARTED 2/4/14       ING METHOD:     Hollow-stem auger     TOTAL DEPTH (1)       ING EQUIPMENT: CME 75     DEPTH TO WATE       UNG METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     Modified California drive sampler [18" x 2.5"]     J. Beilamy, LG       ING METHOD:     MARE (USCS): color molst, %0 with, plast density, structure, cementation, react. w/HCl, geo. inter.       Suface Elevation:     NA       WELL-GRADED GRAVEL with SAND (GW): gray moist, 80% fine to coarse sand, 5% fines. FILL.       Wet @ 2 FT.     Filter fabric observed at 3 FT.       VWELL-GRADED SAND with SILT (SW-SM): dark yellowish brow							OTAL DEPTH (ft.): 0.0		MEASURI Ground S	NG POINT: Surface
DRILLI	NG EQ	NG CONTRACTOR: Cascade Drilling, Inc.     DATE STARTED: 2/4/14       NG METHOD:     Hollow-stem auger       NG EQUIPMENT: CME 75     DEPTH TO WATEF       ING METHOD:     Modified California drive sampler [18" x 2.5"]     LOGGED BY: J. Bellamy, LG       SAMPLES     Ø 0 0 0     DROP: 30     DESCRIPTION       SAMPLES     Ø 0 0 0     DROP: 30     DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. wHCl, geo. inter.       Sufface Elevation:     NA       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.       Wet @ 2 FT.     Filter fabric observed at 3 FT.       Wet @ 2 FT.     Filter fabric observed at 3 FT.       Wet @ 2 FT.     Filter fabric observed at 3 FT.       UPC @ 3.0, 0,1     Meaving Sand.						EPTH TO WATER (ft.)		FIRST NA	COMPL. NA
SAMPI		ΛET	HOD	: Modified	Californi	a drive sampler [18" x 2.5"]	L( J.	OGGED BY: . Bellamv. LG			
НАММ	ER W	EIGI	HT:	300		DROP: 30	R Jo	ESPONSIBLE PROFE	ESSI	ONAL:	REG. NO. L.Hg. 1354
DEPTH (feet)	SAMPLES     O     DESCRIPTION            •••••••••••••••••••••••••••••						R	EMARKS			
	Se_	Se	B	R		Surface Elevation: NA	۹	maint 00% fina			
_					to c	LL-GRADED GRAVEL with SAND (GW): oarse subrounded gravel (up to 3" in size	: gray i e), 15%	fine to coarse	_		
1-					341	u, 370 miles. File.			-	Cleared to	9 feet bgs with
2-										vacuum in	JCK.
_					We	t @ 2 FT.			_		
3-					Filte	er fabric observed at 3 FT.			-		
4-											
									_		
5-									_		
-									-		
-0											
7-									_		
-	<del></del>				WE	LL-GRADED SAND with SILT (SW-SM):	dark y	vellowish brown			
8-	02041			0.1	(10 sub	YR 3/4), wet, medium dense, 70% fine to rounded gravel (up to 0.75" in size), 15%	coarse fines.	e sand, 15% fine			
9-	3B09-9								_	No Sheen	
	BN-9								-		
10-				0.3 0.4	Hea	aving Sand.				No Sheen	
11-		$  \rangle  $	1 15						_	No Sheen	
-			21	0.3					-		
12-		$\left  \right\rangle$	13						_	No Sheen	
13-			25 20	0.2					_	No Choon	
-		$\left  \right\rangle$	19	0.2					-	NU SHEEN	
14-			20 15	0.2						No Sheen	
15-		$\square$		0.2							
			mo	~				Project No. 610	)314	009	Page 1 of 2
		d	me					1 10/001110. 010			·

PROJECT: ExxonMobil/ADO 2717/2731 Fede	C Final Data Investigation eral Ave. Everett, WA	Log of Boring No. E	Log of Boring No. BN-SB09 (cont'd)				
DEPTH (feet) No. Foot Foot READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, structure, t. w/HCI, geo. inter.	REMARKS				
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	POORLY-GRADED SAND (SP): wet, medium dense, 95% fine to n subrounded gravel (up to 0.75" in POORLY-GRADED SAND (SP): wet, medium dense, 95% fine to n subrounded gravel (up to 0.75" in	dark yellowish brown (10YR 3/4), nedium sand, 5% fines, trace size). dark yellowish brown (10YR 3/4), nedium sand, 5% fines, trace size).	No Sheen  No Sheen No Sheen No Sheen No Sheen No Sheen No Sheen No Sheen No Sheen No Sheen No Sheen				
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Bottom of Boring @ 25.0 FT. Aba	ndoned with bentonite to surface.					
amec ^Q		Project No. 610	314009 Page 2 of 2				

PROJE	CT:	Ex> 271	(001) 17/2	/lobil/ADC 731 Fede	C Final D ral Ave.	Data Investigation Everett, WA	Log of Bo	rin	g No. K	C-SB02
BORIN	G LO	CAT	ION:	Kimberly	Clark		ELEVATION AND DAT	UM:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drill	ing, Inc.	DATE STARTED: 2/4/14		DATE FIN 2/10/14	ISHED:
DRILLI	NG M	ETH	OD:	Limited	d Access	Hollow-stem auger	TOTAL DEPTH (ft.): 20.0		MEASURI Ground S	NG POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 5	5 modifie	ed	DEPTH TO WATER (ft.	)	FIRST NA	COMPL. NA
SAMPL	LING N	ИЕТ	HOD	: Modified	Californi	a drive sampler [18" x 2.5"]	LOGGED BY: J. Bellamy, LG			
НАММ	ER W	EIGI	HT:	150		DROP: 30	RESPONSIBLE PROF John Long	ESSI	ONAL:	REG. NO. L.Hg. 1354
DEPTH (feet)	SAMPLES     O     DESCRIPTION       Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image: Image:						R	EMARKS		
	Sa	Sa	Ξu	R B		Surface Elevation: NA				
	.14				Asp POC 95% fine	halt (4 Inches) DRLY-GRADED SAND (SP): very dark gray fine to medium sand, 5% fines, trace coarse subrounded gravel (up to 0.75" in size). FILL	(10YR 3/1), moist, e sand and trace		Cleared to vacuum tru	5 feet bgs with ick.
	KC-SB02-5-02041		8	6.3 0.2	Wet	@ 5 FT.			Trace She	en
6-	)2-7-021014		6 8	0.0	SIL ⁻ to m size	ΓΥ SAND (SM): very dark gray (10YR 3/1), v edium sand, 20% fines, 5% fine subrounded ).	vet, loose, 75% fine gravel (up to 1" in		No Sheen	
-	KC-SB(	$\left[ \right]$	6 6		PEA with	T (PT): reddish brown (2.5YR 2.5/3), wet, m SANDY SILT (SM).	nedium stiff, mixed	_	No Sheen	
8-		$\left  \right $	9 8	0.7 0.0	POO	DRLY-GRADED SAND (SP): very dark gray e, 95% fine to medium sand, 5% fines, mottl	(10YR 3/1), wet, ed.		No Sheen	
9-			10 10	0.1				_	No Sheen	
10-		$\left  \right\rangle$	14 28					_	No Sheen	
11-		$\left  \right $	30	0.4 0.2				_	No Sheen	
12-			20 20 20	0.4				_	No Sheen	
13-			15 19 21		PO0 mec subi	DRLY-GRADED SAND (SP): very dark gray lium dense, 95% fine to coarse sand, 5% fine rounded gravel (up to 0.75" in size).	(10YR 3/1), wet, es, trace	_	No Sheen	
14 <i>-</i>   -		$\bigwedge$	16	0.2 0.3				_	No Sheen	
15-									(	OAKBOREV (REV. 8/2011)
	Project No. 610									Page 1 of 2

PROJECT	т: Е 2	Exx 271	onN 7/27	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA	Log of Borir	ng No. KC	C-SB02 (cont'd)
DEPTH (feet) Sample	SAM No.	Sample 1	Blows/ 60 Foot	OVM READING (ppm)	DESCRI NAME (USCS): color, moist, % l cementation, react.	PTION by wt., plast. density, structu w/HCl, geo. inter.	ure,	REMARKS
$\begin{array}{c} \Box & = & \mbox{res} \\ & - & \\ & 16 - & \\ & 17 - & \\ & 18 - & \\ & 19 - & \\ 19 - & \\ 20 - & \\ 21 - & \\ & 22 - & \\ & 23 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 23 - & \\ & 22 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 23 - & \\ & 31 - & \\ & 32 - & \\ & 32 - & \\ & 32 - & \\ & & \\ & 31 - & \\ & & \\ & 32 - & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & $	KC-SB02-20-021014	Sa	15 15 15 16 17 17 15 18 23 7 9 12	0.2 0.0 0.0 11.0	POORLY-GRADED SAND (SP): v medium dense, 95% fine to coarse subrounded gravel (up to 0.75" in s hydrogen sulfide odor. PEAT (PT): reddish brown (2.5YR Bottom of Boring @ 20.0 FT. Aband and cement to surface.	w/HCl, geo. inter. ery dark gray (10YR 3/1), sand, 5% fines, trace ize) mixed with PEAT (PT 2.5/3), wet, medium stiff. doned with bentonite to 2 I		No Sheen No Sheen No Sheen No Sheen No Sheen
33		aı	mec	ġ		P	roject No. 610314	OAKBOREV (REV. 8/2011) 009 Page 2 of 2

PROJE	ECT:	Ex> 271	onN 7/27	/lobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA		Log of Bori	ng No.	PE-SB05		
BORIN	IG LOO	САТ	ION:	Dunlap T	owing (Port of Everett Leasehold Property)	)	ELEVATION AND DATUM	Л:			
DRILLI	NG C	ОNT	RAC	TOR: Case	cade Drilling, Inc.		DATE STARTED: 2/4/14	DATE 2/7/14	FINISHED:		
DRILLI	NG M	ETH	OD:	Hollow	r-stem auger		TOTAL DEPTH (ft.): 20.0	MEASI Groun	JRING POINT: d Surface		
DRILLI	NG EQ	QUIF	PMEN	NT: CME 7	'5		DEPTH TO WATER (ft.)	FIRST NA	COMPL. NA		
SAMPI		ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]		LOGGED BY:				
НАММ	ER W	EIGI	HT:	300	DROP: 30		RESPONSIBLE PROFES	SIONAL:	REG. NO. L.Hg. 1354		
DEPTH (feet)	Sample No.	Sample 14	Blows/ S Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., p cementation, react. w/HCl,	plast. dens geo. inter	sity, structure,		REMARKS		
	0,	0,		<u></u>	Asphalt (5 inches)	NA		_			
					SILTY SAND with GRAVEL (SM): dark 3/4), moist, 65% fine to coarse sand, 20 (up to 0.75" in size), 15% fines. FILL.	yellowish % fine su	n brown (10YR Ibrounded gravel		I to 5 feet bgs with truck.		
5- 5- 6- 7- 8- 9-	05-9-021014		5 5 50/6 5	4 0.6 0.4 0.4	WELL-GRADED SAND (SW): dark yell moist, loose, 95% fine to coarse sand, 5 WELL-GRADED SAND (SW): dark yell moist, loose, 90% fine to coarse sand, 5 subrounded gravel (up to 0.75" in size),	lowish bro 5% fines. lowish bro 5% fines, wood del	own (10YR 3/4), FILL. own (10YR 3/4), 5% fine oris. FILL.		en en en		
_	PE-SE	$\square$	7	0.3	SILTY SAND (SM): very dark gray (10Y to medium sand, 20% fines.	YR 3/1), w	vet, loose, 80% fine	No She	en		
10- - 11-			4 5 11	0.5 0.3	SANDY SILT (ML): very dark gray (10Y 80% nonplastic fines, 20% fine to mediu gravel (up to 2" in size), wood debris (tw SILTY SAND (SM): very dark gray (10)	/R 3/1), w um sand, ⁻ vigs), hyd /R 3/1), w	vet, medium stiff, trace subrounded rogen sulifde odor. vet, medium dense,	_ No She _   _ No She	en		
			12 14 19	0.3	80% fine to medium sand, 20% fines, tra cemented.	ace fine g	jravel, trace peat,	 No She 	en		
13-		$\left  \right\rangle$	21					_   No She	en		
 	-		20 20 16	0.3 0.2	POORLY-GRADED SAND (SP): black dense, 95% fine to medium sand, 5% fir gravel, trace peat, yellow specks.	(10YR 2/ nes, trace	R 2/1), wet, medium trace fine subrounded No Sheen				
15-			01						OAKBOREV (REV. 8/2011)		
Project No. 610314009 Page 1 of 2											

PROJE	ECT:	Exx 271	onN 7/27	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA Log of Boring No.	PE	-SB05 (cont'd)
	SAN		-9				
DEPTH (feet)	Sample No.	Sample	Blows/ 6 Foot	OVM READING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.		REMARKS
- 16-		$\backslash$	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
- 17			5 5 8	0.4	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
- 18			6 7	0.3	SANDY SILT (ML): very dark gray (10YR 3/1), wet, medium stiff, 70% nonplastic fines, 30% fine to medium sand. POORLY-GRADED SAND (SP): very dark gray (10YR 3/1), wet,	_	No Sheen
- 19-	1714		9	0.3	loose, 95% fine to medium sand, 5% nonplastic fines, trace fine subrounded gravel. Trace wood debris mixed in POORLY-GRADED SAND (SP).	_	No Sheen
_ 20-	B05-20-020		6 9 12	0.4	Bottom of Boring @ 20.0 FT. Abandoned with bentonite to 2 FT bas		No Sheen
 21	PE-S				and cement to surface.	_	NO OTICET
 22-						_	
23						_	
 24 <i>_</i> _						_	
25-						_	
26-						_	
27 <i>-</i>						_	
28-						_	
29-						_	
30-						_	
31- -						-	
32-						-	
33-	I						OAKBOREV (REV. 8/2011)
		a	me	0	Project No. 61	0314	009 Page 2 of 2

PROJE	ECT:	Exx 271	kon <b>i</b> 17/2	/lobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA	Log of Boring No. PE-SB06				
BORIN	IG LO	CAT	ION:	Vigor Ma	rine (Port of Everett Leasehold Property)	ELEVAT NA	ION AND DATU	M:		
DRILLI	NG C	ONT	RAC	TOR: Case	cade Drilling, Inc.	DATE ST 2/4/14	TARTED:		DATE FIN 2/7/14	ISHED:
DRILLI	NG M	ETH	OD:	Hollow	r-stem auger	TOTAL E 20.0	DEPTH (ft.):		MEASURI Ground S	NG POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75	DEPTH 1	TO WATER (ft.)		FIRST NA	COMPL. NA
SAMPI	_ING	MET	HOD	: Modified	California drive sampler [18" x 2.5"]	LOGGED	D BY: my, LG			
HAMM	ER W	EIG	HT:	300	DROP: 30	RESPON John Lo	NSIBLE PROFES	SSI	ONAL:	REG. NO. L.Hg. 1354
DEPTH (feet)	SAMPLES     O     DESCRIPTION       a     b     b     b     b       a     c     b     b     b       a     c     b     b     b       b     c     b     b     b       b     c     b     b     b       b     c     b     b     b       b     c     b     b     b       b     c     c     c       b     c     c     c					ure,		R	EMARKS	
	σ	0	ш	Щ	Surface Elevation: NA Asphalt (5""			-		
 1- _ 2- _	-				WELL-GRADED SAND with GRAVEL (SW): da (10YR 3/4), moist, 75% fine to coarse sand, 15% gravel (up to 1" in size), FILL.	ark yellowis 6 fine subr	sh brown rounded		Cleared to vacuum tru	5 feet bgs with ıck.
3- - 4- -	-				Concrete rubble, filter fabric at 5'.			_		
5- - 6-			5	2.4 3.6	WELL-GRADED SAND (SW): dark yellowish bi moist, loose, 90% fine to coarse sand, 10% non	own (10Yi plastic fine	R 3/4), es, FILL.	_	No Sheen	
-	0714	X	1			2 2/4)		_	No Sheen	
7  8	PE-SB06-7.5-020		8 8 11	1.6 2.0 13.3	SILTY SAND (SM): dark yellowish brown (10YF 75% fine to coarse sand, 20% nonplastic fines, s gravel ( up to 2" in size), wood debris, FILL. Wet @ 7 FT.	5% fine su	st, loose, brounded	_ _ _	Sheen, trac petroleum hydrocarbo Sheen	ce product, on-like
9-	-		8 10 15	11.6	WELL-GRADED SAND with GRAVEL (SW): ve 3/1), wet, medium dense, 80% fine to coarse sa subrounded gravel (up to 1" in size), 5% nonplas	ery dark gra nd, 15% fil stic fines.	ay (10YR ne	_	Sheen	
10-	020714	$\left  \right\rangle$	10 12 15					_	Sheen, trae petroleum hydrocarbo	ce product, on-like
11-	SB06-11.5-		10	12	POORLY-GRADED SAND (SP): very dark gray medium dense, 95% fine to medium sand, 5% n	[,] (10YR 3/ [,] onplastic f	1), wet, fines.	_	No Sheen	
12-	ЪЕ-0		10 11						No Sheen	
13-					No recovery.			_	No Sheen	
14-			12	10 13.8	WELL-GRADED SAND with GRAVEL (SW): ve 3/1), wet, medium dense, 85% fine to coarse sa fines, trace subrounded gravel (up to 0.75" in siz	ery dark gra nd, 15% n ze).	ay (10YR onplastic	_	No Sheen	
		2	me	æ			Project No. 6103	3140	009	Page 1 of 2
		0	me	-			.,		-	· J · · · -

PROJECT:	. PE-	SB06 (cont'd)				
DEPTH (feet) Sample No.	Sample Blows/ Foot	OVM READING (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	IPTION by wt., plast. density, structure, t. w/HCl, geo. inter.		REMARKS
	11 14 11 11 9 7 7 7 9 13 15 20	1.8 3.9 8.3 5	WELL-GRADED SAND with GRA 3/1), wet, medium dense, 85% fin fines, trace subrounded gravel (up POORLY-GRADED SAND (SP): loose, 95% fine to medium sand, 8 PEAT (PT), hydrogen sulfide-like Bottom of Boring @ 20.0 FT. Abar and cement to surface.	VEL (SW): very dark gray (10YR e to coarse sand, 15% nonplastic o to 0.75" in size). very dark gray (10YR 3/1), wet, 5% nonplastic fines, with trace odor.		No Sheen No Sheen No Sheen No Sheen No Sheen
22 - 23- - 24- - 25- - 26- - 27- 28- - 29- - 30- - 31-						
32- 33-	ame	දුල		Project No.	61031400	OAKBOREV (REV. 8/2011) 09 Page 2 of 2

PROJE	CT:	Ex> 271	kon <b>i</b> 17/2	/lobil/AD0 731 Fede	C Final [ eral Ave.	Data Investigation . Everett, WA	L	.og of Bori	in	g No. P	E-SB07
BORIN	G LO	CAT	ION:	Vigor Ma	rine (Por	t of Everett Leasehold Property)	ELEVAT NA	ION AND DATU	M:		
DRILLI	NG C	ОМТ	RAC	TOR: Cas	cade Dril	lling, Inc.	DATE S ⁻ 2/4/14	TARTED:		DATE FIN 2/7/14	IISHED:
DRILLI	NG M	ETH	OD:	Hollow	/-stem au	ıger	TOTAL [ 20.0	DEPTH (ft.):		MEASUR Ground	ING POINT: Surface
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75		DEPTH ⁻	TO WATER (ft.)		FIRST NA	COMPL. NA
SAMPL	ING N	ИЕТ	HOD	Modified	Californi	ia drive sampler [18" x 2.5"]	LOGGEI J. Bella	D BY: my, LG			
HAMM	IAMMER WEIGHT: 300 DROP: 30 RESPONSIBLE PRO John Long				NSIBLE PROFES	SSI	ONAL:	REG. NO. L.Hg. 1354			
DEPTH (feet)	SAI Vo.	MPL mble	ows/ G	OVM EADING (ppm)	N	DESCRIPTION AME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inter	sity, struct	ture,		F	REMARKS
	Sa	Sa	BR	RE		Surface Elevation: NA					
_					Asp	ohalt.			_		
1- - 2- -					PO 90% grav	ORLY-GRADED SAND (SP): very dark gray 6 fine to coarse sand, 5% nonplastic fines, 5% vel (up to 1" in size). FILL.	(10YR 3/ 6 fine sub	1), moist, rounded		Cleared to vacuum tr	9 5 feet bgs with uck.
3-					Wo	od debris mixed in the POORLY-GRADED SA	AND.		_		
4- - 5-	SB07-5-020314			100 71.6	WE 95% We	LL-GRADED SAND (SW): very dark gray (1 6 fine to coarse sand, 5% nonplastic fines. FI t @ 4.5 FT.	0YR 3/1), LL.	moist,	-	Sheen vis	sible product.
6-	7-7-020714 PE-9		4 5 9	60	WE loos sub	LL-GRADED SAND (SW): very dark gray (1 se, 95% fine to coarse sand, 5% nonplastic fi rounded gravel (up to 0.75" in size).	0YR 3/1), nes, trace	wet,	-	petroleum hydrocarb Sheen, vis petroleum hydrocarb	on-like odor. sible product, on-like odor.
8-	0714 PE-SB0		16 19 18	33						Sheen, vis petroleum hydrocarb Sheen, vis	sible product, on-like odor. sible product,
9-	B07-9-02		8 5	71	Ţ Sim	ilar as above but with trace wood debris.			_	petroleum hydrocarb	on-like odor.
_	4 PE-S	$\square$	8	43					_	petroleum hvdrocarb	on-like odor.
10-	1-02071		18 18	4.0					_	Sheen, vis petroleum	sible product,
11-	E-SB07-1	$\setminus$	18						_	hydrocarb No Sheen	on-like odor.
12-	13-020714 PE		16 15 18	4.0					_	No Sheen	
13-	<b>ED-SB407-</b>		15 18	11.4						Trace She	en
14-	)7-15-ሙ	$\vdash$	21	12.2					_	No Sheen	
-	E-SB(		14	4.5					$\left  - \right $		
15-	ц.			•					<u> </u>		OAKBOREV (REV. 8/2011)
	emec [®] Project No. 610314								314(	009	Page 1 of 2

PROJE	CT:	Exx 271	onN 7/27	/lobil/AD0 731 Fede	C Final Data Investigation ral Ave. Everett, WA	Log of Boring No.	PE	-SB07 (cont'd)
DEPTH (feet)	Sample No.	Sample IN	Blows/ S Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
- 16-	1714	$\left  \right $	15 19	9.9	SILTY SAND (SM): very dark gray 80% fine to medium sand, 20% no subrounded gravel (up to 0.75" in s	/ (10YR 3/1), wet, medium dense, nplastic fines, trace fine size), trace PEAT.	_	No Sheen
	-SB07-17-020		13 20 15	14.5 12.2			_	No Sheen
	ΡΕ		10 10 12	8.4			_	Sheen
19-	7-20-020714		6 8 8	4.8	DEAT (DT): raddiab brown (2.5)(	2.5/2) wat madium stiff 100%		No Sheen
20-	PE-SB0		J		Bottom of Boring @ 20.0 FT. Abar and cement to surface.	idoned with bentonite to 2 FT bgs		No Sheen
 22							_	
23-							_	
24-							_	
25-							_	
27-							_	
28-							_	
29-								
31-							_	
32-							-  -  -	
33-								OAKBOREV (REV. 8/2011)
		а	me	<u>0</u>		Project No. 6	10314	009 Page 2 of 2

PROJE	CT:	Ex> 271	on <b>i</b> 7/2	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA		Log of Boring No. PE-SB08				
BORIN	G LO	САТ	ION:	Vigor Ma	rine (Port of Everett Leasehold Property)	ELE NA	VATION AND DA	TUM:			
DRILLI	NG C	ONT	RAC	TOR: Cas	cade Drilling, Inc.	DAT 2/4/	E STARTED: 14		DATE FIN 2/6/14	IISHED:	
DRILLI	NG M	ЕТН	OD:	Hollow	/-stem auger	тот 20.0	AL DEPTH (ft.):		MEASUR Ground S	ING POINT: Surface	
DRILLI	NG E	QUIF	PMEN	NT: CME 7	/5	DEP	TH TO WATER (	ft.)	FIRST NA	COMPL. NA	
SAMPL	ING I	ИЕТ	HOD	: Modified	California drive sampler [18" x 2.5"]	LOG	GED BY:				
HAMMER WEIGHT: 300					DROP: 30	RES Johi	RESPONSIBLE PROFESSIONAL: John Long			REG. NO. L.Hg. 1354	
DEPTH (feet)	No.	MPL mble	ows/ S oot	OVM EADING (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., pla cementation, react. w/HCl, ga	TION y wt., plast. density, structure, w/HCl, geo. inter.			F	EMARKS	
	Sa	Sa		RE	Surface Elevation:	NA					
_					Asphalt.			_			
1-					WELL-GRADED SAND (SW): very dark 9 85% fine to coarse sand, 10% fines, 5% r	gray (10YR 3 nonplastic fin	3/1), moist, es. FILL.	_	Cleared to	5 feet bgs with	
2-						·		_	vacuum tr	UCK.	
_								_			
3-											
4-								_			
				0.0				_			
		$\mathbb{N}$		0.0					No Sheen		
6-	0614		6 6 7		SILTY SAND (SM): very dark gray (10YR fine to coarse sand, 35% nonplastic fines, gravel (up to 0.75" in size), wood debris.	R 3/1), moist, , trace fine si	loose, 65% ubrounded	_	No Sheen		
7-	8-7.5-02		3	0.0	SANDY SILT (ML): very dark gray (10YR	2 3/1), wet, so	oft, 65%		No Sheen		
8-	PE-SB0		5 8	0	POORLY-GRADED SAND (SP): very dat	u. rk gray (10YI	R 3/1), wet,	_	No Shoon		
_		$\left  \right\rangle$	3	0.0	subrounded gravel (up to 0.75" in size).	plastic lines,	trace line	-	NO SHEEH		
9-			5 8	2.0				_	No Sheen		
10-	4	$\left  \right\rangle$	4					-	No Sheen		
11_	-02061		4 5								
	08-11.5		5	2.2	WELL-GRADED SAND (SW): very dark g loose, 85% fine to coarse sand, 10% nonj	gray (10YR 3 plastic fines,	3/1), wet, 5% fine	_	Sheen, pe hydrocarb	troleum on-like odor	
12-	PE-SB	$\left \right\rangle$	5 8	21	subrounded graver (up to 2 In Size).				Sheen, pe	troleum on-like odor	
13-		$\left  \right $	٨	3.2					Sheen ne	troleum	
		$  \setminus$	4 5 7	2.0				-	hydrocarb	on-like odor	
14-		$\square$	^	2.9 6.6					Sheen, pe hydrocarb	troleum on-like odor	
15-			б		<u> </u>					OAKBOREV (REV. 8/2011)	
		а	me	^c o			Project No.	610314	009	Page 1 of 2	

PROJECT: ExxonMobil/ADC 2717/2731 Feder	Final Data Investigation ral Ave. Everett, WA	Log of Boring No.	. PE-SB08 (cont'd)
DEPTH (feet) Sample No. Foot Sample Foot (ppm)	DESCF NAME (USCS): color, moist, % cementation, reac	RIPTION by wt., plast. density, structure, t. w/HCI, geo. inter.	REMARKS
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	WELL-GRADED SAND with GRA 3/1), wet, medium dense, 65% fin rounded to subrounded gravel (up fines, glass fragments. POORLY-GRADED SAND (SP):	Sheen, petroleum hydrocarbon-like odor Sheen, petroleum hydrocarbon-like odor Sheen, petroleum hydrocarbon-like odor Sheen, petroleum	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	medium dense, 90% fine to coars fine subrounded gravel. POORLY-GRADED SAND (SP): loose, 95% fine to medium sand, s subrounded gravel (up to 0.75" in	e sand, 5% nonplastic fines, 5% very dark gray (10YR 3/1), wet, 5% nonplastic fines, trace size).	<ul> <li>hydrocarbon-like odor</li> <li>Sheen, petroleum</li> <li>hydrocarbon-like odor</li> </ul>
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	POORLY-GRADED SAND (SP): medium dense, 95% fine to mediu trace subrounded gravel (up to 0.7 (PT), hydrogen sulfide odor. Bottom of Boring @ 23.0 FT. Abar and cement to surface.	very dark gray (10YR 3/1), wet, im sand, 5% nonplastic fines, 75" in size) mixed with trace PEAT	Sheen, petroleum - hydrocarbon-like odor - No Sheen - No Sheen - No Sheen
24 - - 25 - - 26 -			
 27 28			
29- - 30- - 31-			
32- 33- 33-		Project No. 6	оаквогеч (rev. 8/2011) 610314009 Раде 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA			Log of Boring No. PE-SB09								
BORIN	IG LO	САТ	ION:	Port of Ev	verett		ELEVATI NA	ION AND DATU	M:		
DRILLI	NG C	ОИТ	RAC	TOR: Case	cade Drill	ing, Inc.	DATE ST 2/4/14	DATE STARTED:         DATE FINISH           2/4/14         2/10/14		IISHED:	
DRILLING METHOD: Hollow-stem auger				TOTAL D 20.0	DEPTH (ft.):	MEASURING POINT: Ground Surface		ING POINT: Surface			
DRILLI	NG E	QUIF	PMEN	NT: CME 7	75		DEPTH T	O WATER (ft.)		FIRST NA	COMPL. NA
SAMPLING METHOD: Modified California drive sampler [18" x 2.5"]				LOGGED	) BY: mv. LG						
НАММ	ER W	EIGI	HT:	300		DROP: 30	RESPON John Lo	ISIBLE PROFES	SI	ONAL:	REG. NO. L.Hg. 1354
EPTH feet)	SAN lo o	uple nple	oot C	DVM ADING ppm)	NA	DESCRIPTION ME (USCS): color, moist, % by wt., plast. den cementation, react. w/HCl, geo. inte	isity, structi r.	ure,		F	REMARKS
	Sar	Sar	BIG	RE (		Surface Elevation: NA					
_	-				Asp	halt.			_		
1-					WE mois fine	LL-GRADED SAND (SW): dark yellowish br st, loose, 85% fine to coarse sand, 10% non subrounded gravel (up to 0.75" in size). FILL	own (10YF plastic fine 	R 3/4), is, 5%	_	Cleared to vacuum tr	5 feet bgs with uck.
2-	-										
3-									_		
4-	-										
_	1014								_		
5-	9-5.5-02			1.0	Wet	@ 5 FT.			_	Sheen	
6-	PE-SB06	$\left[ \right]$	6 7							Shoon	
_		$\boxtimes$	18	0.2 0.0					_	Sheen	
7-		$\left  \right\rangle$	5 10		POO	DRLY-GRADED SAND (SP): very dark gray e. 95% fine to medium sand. 5% nonplastic	(10YR 3/1 fines. trace	I), wet, e		No Sheen	
8-	-		9	0.5	subi	rounded gravel (up to 0.75" in size).	·		_	Trace She	en
-		$\left  \right\rangle$	2	0.3	PEA	AT (PT): reddish brown (2.5YR 2.5/3), wet, s	oft, 100%	organic			
9-		$\square$	3	0.0	PEA	T (PT): reddish brown (2.5YR 2.5/3), wet, s	oft, mixed	with	$\left  - \right $	No Sheen	
10-		$\left  \right\rangle$	6		FU				$\left -\right $	No Sheen	
 11-			5 6	0.0 0.1						No Sheen	
 12-		$\left  \right\rangle$	6	•••	POO	DRLY-GRADED SAND (SP): very dark gray e, 95% fine to medium sand. 5% nonplastic	(10YR 3/1 fines, trace	I), wet, e PEAT			
-		$\square$	8	0.2	(PT)	)			$\left  - \right $	No Sheen	
13-		$\left  \right\rangle$	9							No Sheen	
14-		$\square$	8 6	0.2					$\left  - \right $	No Charry	
_		$\left  \right\rangle$	10	0.9					$\left  - \right $	NO Sheen	
15-			10								OAKBOREV (REV. 8/2011)
		а	me	20				Project No. 6103	140	009	Page 1 of 2

PROJE	PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA					Log of Boring No	). PE	-SB09 (cont'd)
DEPTH (feet)	Sample No.	Sample IT	Blows/ G Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
			10 10 5 5 4 9	2.0 8.6 0.6	POORLY-GRADED SAND (SP): loose, 95% fine to medium sand, 5 PEAT (PT), hydrogen sulfide-like c	very dark gray (10YR 3/1), wet, 5% nonplastic fines, mixed with odor.		No Sheen No Sheen No Sheen
18-  19-  20-	-SB09-5.5-021014		14 15 8 8 9	2.6 7.0	PEAT (PT): reddish brown (2.5YF organic, hydrogen sulfide-like odor Bottom of Boring @ 20.0 ET. Abar	2 2.5/3), wet, medium stiff, 100%		No Sheen No Sheen No Sheen
21- 22- 23-	PE				and cement to surface.	aonea with bentonite to 2 F I bgs		
 24 25								
26-  27-  28-								
29- 30- 31-							-	
32- 33-								OAKBOREV (REV. 8/2011)
		а	me	0		Project No.	610314	009 Page 2 of 2

PROJECT: ExxonMobil/ADC Final Data Investigation 2717/2731 Federal Ave. Everett, WA						Log of Boring No. PE-SB10				
BORIN	IG LO	САТ	ION:	Vigor Ma	rine (Port of Everett Leasehold Property)		ELEVATION AND DATUM: NA			
DRILLI	NG C	ЭNТ	RAC	TOR: Case	cade Drilling, Inc.		DATE STARTED: 2/4/14	DATE FINISHED: 2/6/14		IISHED:
DRILLING METHOD: Hollow-stem auger						TOTAL DEPTH (ft.): 20.0		MEASUR Ground S	ING POINT: 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 RESP John			RESPONSIBLE PROFI John Long	ESSI	ONAL:	REG. NO. L.Hg. 1354				
DEPTH (feet)	SAMPLES     O       a     b       b     b       a     b       b     b       b     b       b     b       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c       c     c <t< td=""><td>ity, structure,</td><td></td><td>R</td><td>EMARKS</td></t<>			ity, structure,		R	EMARKS			
	- Sa	S	BR	R	Surface Elevation:	NA				
_	-			-						
1-					WELL-GRADED SAND (SW): Very dark ( 80% fine to coarse sand, 15% nonplastic f gravel, Fill.	gray (10 fines, 59	% fine subrounded	_	Cleared to vacuum tre	5 feet bgs with uck.
2-								_		
3-	-							_		
4	-							_		
-	-							-		
5-	-		10	1.5 0.2	WELL-GRADED SAND (SW): very dark g medium dense, 80% fine to coarse sand, fine subrounded gravel, Fill.	gray (10 15% no	YR 3/1), moist, nplastic fines, 5%		No Sheen	
-0	-		16	0.2				_	No Sheen	
7-		$\left  \right\rangle$	21 21					_	No Sheen	
8-	5-021014		20	0.0 0.0				_	No Sheen	
9-	B10-8.5		16 15	0.0	Wet @ 8.5 FT.			_	No Sheen	
- 10	PE-S	$\left  \right\rangle$	16	0.0				_		
- 10		$\left  \right\rangle$	9 7						No Sheen	
11-		$\left  \right\rangle$	7	0.0 0.0				_	No Sheen	
12-	-	$\left  \right\rangle$	8 7					_	No Sheen	
–   13–		$\left  \right $	5	5.8						
		$  \setminus$	5 5	-	SANDY SII T (MI ). yery dark aray (10VD	2/1) 14	et medium stiff		No Sheen	
14       .4       0.4       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), hydrogen sulfide-like odor				ace fine AT (PT), hydrogen		No Sheen				
15-			1							OAKBOREV (REV. 8/2011)
		a	me	o.			Project No. 61	0314	009	Page 1 of 2

PROJE	CT:	Exx 271	(on <b>l</b> ) 7/2	/lobil/AD0 731 Fede	C Final Data Investigation eral Ave. Everett, WA	Log of Boring No	. PE	-SB10 (cont'd)
DEPTH (feet)	Sample No.	Sample	Blows/ G Foot	OVM READING (ppm)	DESCR NAME (USCS): color, moist, % cementation, react	IPTION by wt., plast. density, structure, . w/HCl, geo. inter.		REMARKS
- 16			6 7 5	0.2	WELL-GRADED SAND (SW): ver loose, 90% fine to coarse sand, 5% subrounded gravel (up to 0.75" in (PT).	ry dark gray (10YR 3/1), wet, % nonplastic fines, 5% fine size), mixed with trace PEAT	/	No Sheen No Sheen
		$\left  \right\rangle$	4 5 8	0.0 0.0	SANDY SILT (ML): very dark gray 83% nonplastic fines, 17% fine to subrounded gravel (up to 0.75" in debris, hydrogen sulfide-like odor.	/ (10YR 3/1), wet, medium stiff, coarse sand, trace fine size), trace PEAT (PT), wood	_	No Sheen
18-	4	$\square$	10 10	0.0	WELL-GRADED SAND (SW): ver loose, 90% fine to coarse sand, 5% subrounded gravel (up to 1" in size	y dark gray (10YR 3/1), wet, % nonplastic fines, 5% fine e).		No Sheen
19-	0-02101		12 15	0.0	SILT (ML): very dark gray (10YR fines, 10% fine to medium sand, w	3/1), wet, stiff, 90% nonplastic rood debris.		No Sheen
20-	PE-SB10-2		20		WELL-GRADED SAND (SW): ver medium dense, 90% fine to coarse fine subrounded gravel (up to 1" in	y dark gray (10YR 3/1), wet, e sand, 5% nonplastic fines, 5% size).		No Sheen
21-					Bottom of Boring @ 20.0 FT. Abar and cement to surface.	ndoned with bentonite to 2 FT bgs	_	
22-							_	
23-							_	
24 –							_	
25–							_	
26-							_	
27 –							_	
28-							_	
29-							_	
							_	
							_	
							_	
							_	
		a	mer	2		Proiect No. 0	610314	009 Page 2 of 2
		0		-		,		



# Appendix C





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

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.

4. DATE OF SURVEY: AUGUST 20TH THROUGH 25TH, 2010. SUPPLEMENTAL SURVEYING ON

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

ட SIGN ⊠ JUNCTION BOX •• BOLLARDS

^{CB}□ CATCH BASIN/INLET

MW ( MONITORING WELL

SB ⊘ SOIL BORING

🔘 STORM DRAIN MANHOLE

Exxon Mobil / American Distribution Co.

Sheet

Job Number:

J10-55.02

of

GRAPHIC SCALE

( IN FEET )



# Appendix D

#### **Calculated Maximum Tide Flux Travel Distance**

ExxonMobil/ADC Property Ecology Site ID 2728





MW-A5 hydrau	lic conductivity						
				Distance			
	Mean Water			from Port			
	Level 25 hour			Gardner Bay			K
Well	(NGVD88)	units	Datum	(feet)	K (cm/sec)	K based on	(inch/hour)
MW-A3	6.413	feet	NGVD88	368	6.35E-03		9.0
MW-A4	4.747	feet	NGVD88	234	6.35E-03	MW-A5	9.0
MW-A5	5.605	feet	NGVD88	230	6.35E-03		9.0
				Effective		% of voids for	
Everett Tide	12.3	feet	MLLW	Porosity	0.3	sand	
(June 6,2016)	10.5	feet	NGVD88				
S	Seepage veolocity	$S_v =$	Ki/n _e				
					6.25 hour travel		
	К	i	n _e	$S_v$ (inch/hour)	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 hydrau	lic conductivity						
				Distance			
	Mean Water			from Port			
	Level 25 hour			Gardner Bay			ĸ
Well	(NGVD88)	units	Datum	(feet)	K (cm/sec)	K based on	(inch/hour)
MW-A3	6.413	feet	NGVD88	368	9.28E-03		13.2
MW-A4	4.747	feet	NGVD88	234	9.28E-03	MW-A6	13.2
MW-A5	5.605	feet	NGVD88	230	9.28E-03		13.2
				Effective		% of voids for	
Everett Tide	12.3	feet	MLLW	Porosity	0.3	sand	
(June 6,2016)	10.5	feet	NGVD88				
S	eepage veolocity	S _v =	Ki/n _e				
					6.25 hour travel		
	К	i	n _e	$S_{\scriptscriptstyle V}$ (inch/hour)	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		



	CLIENT: EXXONMOBIL AMERICAN DISTRIBUTING CO.	DWN BY: APS CHK'D BY: LV	PROJECT EXXO EC
WOOd.	Wood Environment & Infrastructure Solutions, Inc. 600 University Street, Suite 600 Seattle, WA, U.S.A. 98101	NAVD88 FT PROJECTION: WASP SCALE: AS SHOWN	TITLE TIDAL SCHEN

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

### 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;

Project:

cc:

6103140009 Project File

- 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.

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	XOM010515-100	1/5/2015	15-01-0127-6	all
Field Duplicate				
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

The sample IDs, sample collection dates, laboratory sample IDs, and analyses conducted on the samples are listed in the table below.

Memo April 15, 2015 Page 2 of 7



Sample Location	Sample ID	Sample	Laboratory	Requested
		<b>Collection Date</b>	Sample ID	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	XOM010715-101	1/7/2015	15-01-0330-9	all
Field Duplicate				
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	XOM010815-102	1/8/2015	15-01-0445-9	all
Field Duplicate				
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

Memo April 15, 2015 Page 3 of 7



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



Memo April 15, 2015 Page 4 of 7

XOM010715-18 and XOM010715-101. The TPH-G results in these two samples are qualified	d
as estimated and flagged with a "J."	

		Primary	Duplicate	Reporting	
Sample ID/		Result	Result	Limit	RPD
Field Duplicate ID	Analyte	(µg/L)	(µg/L)	(µg/L)	(%)
XOM010515-06/	TPH-D	320	320	100	0
XOM010515-100	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/	TPH-D	1,300	970	100	29
XOM010715-101	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/	TPH-D	3,000	3,000	100	0
XOM010815-102	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

 $\mu$ g/L = micrograms per liter

RPD= relative percent difference

### 8. Surrogates - Acceptable except as noted:

### <u>NWTPH-Gx</u>

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."

Memo April 15, 2015 Page 5 of 7



### 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

<u>NWTPH-Dx</u>: 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

#### <u>NWTPH-Dx</u>

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.

#### <u>NWTPH-Gx</u>

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

<u>NWTPH-Dx:</u> 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

<u>NWTPH-Dx:</u> 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

Memo April 15, 2015 Page 6 of 7



reference fuel standard. The chromatograms were not reviewed as part of the Level 2B review; the results are reported and are not qualified.

<u>NWTPH-Gx</u>: 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

<u>NWTPH-Dx:</u> 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.

<u>NWTPH-Gx</u>: 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 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 Identifications and Qualified Results

Memo April 15, 2015 Page 7 of 7



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

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
Deta Comulad	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	01/06/2015	01/06/2015
Date Sampled																FD		1
TPU as Casalina	100.11	100.11	100	100 11	100 11	100 11	100 11	140	200	200	100 11	120 NU	(10	100 11	110	110	100.11	100 11
TPH as Gasoline	100 U	120	200	100 0	100 0	240	140	140	390	290	100 U	130 NJ	610	100 U	220	220	110 0	100 U
TPH as Diesei	100 U	100 11	200	8,600	450	240	100 11	140	970	100 11	100 U	100 U	790	730 NJ	320	320	100 11	100 U
	100 0	100.0	100.0	4100	230	100.0	100.0	130	180	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 Mathulaanhthalana	0.20		0.45	0.10	1 2	0.22	0.007.11		4.2	2.2		0.000 11	11	10	0.22	0.10	0.000 11	11
2 Methylnaphthalene	0.28	0.095 0	0.45	0.10	1.5	0.005 11	0.097 0	0.095 0	4.5	5.2	0.095 0	0.096 U		1.2	0.22	0.006 11	0.096 0	1.1
2-Methylnaphthalene	0.096 0	0.095 0	0.095 0	0.095 0	0.15	0.095 0	0.097 0	0.095 0	0.095 0	0.15	0.095 0	0.096 0	0.53	0.68	0.096 0	0.096 0	0.096 0	1.6
Acenaphtheleus	0.096 0	1.2	0.94	0.65	0.64	0.56	0.15	0.24	0.85	0.83	0.095 0	0.096 0	0.91	0.66	0.68	0.71	0.62	4.4
Acenaphthylene	0.096 0	0.095 0	0.095 0	0.027	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0
Anthracene Renze (a) enthreeses	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 U	0.096 0	0.096 0	0.096 U	0.096 0	0.13
Benzo (a) anthracene	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0
Benzo (a) pyrene	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 U	0.096 0	0.096 0
Benzo (b) fluorantnene	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0
Benzo (g,n,i) perviene	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 U	0.096 0	0.096 0	0.096 U	0.096 0	0.096 0
Christian	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0
Chrysene	0.096 0	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0
Dibenz (a,h) anthracene	0.096 U	0.095 U	0.095 U	0.095 U	0.096 U	0.095 0	0.097 0	0.095 U	0.095 0	0.096 U	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 U	0.096 U	0.096 0
Fluoranthene	0.096 U	0.095 0	0.095 0	0.095 0	0.096 0	0.095 0	0.097 0	0.095 0	0.095 0	0.096 0	0.095 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	0.096 0	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 0	0.096 0	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

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	01/07/2015	01/08/2015	1/7/2015	01/08/2015	1/8/2015 FD	01/08/2015
TPH (ug/L)										ΓD						
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

ExxonMobil/ADC Property

		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
	Sample Date	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
Analyte	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
ТРН																			
Total Petroleum Hydrocarbo	ns	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																			

ExxonMobil/ADC Property

		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
	Sample Date	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
Analyte	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
ТРН																			
Total Petroleum Hydrocarbor	ns	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																			

ExxonMobil/ADC Property

		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
	Sample Date	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
Analyte	Depth ³	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ТРН	· · · · ·																		
Total Petroleum Hydrocarbo	ns	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																			

ExxonMobil/ADC Property

		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
	Sample Date	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
Analyte	Depth ³	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ТРН																			
Total Petroleum Hydrocarbo	ns	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																			

ExxonMobil/ADC Property Everett, Washington

B-24 MW-10 B-21 B-21 B-22 B-22 B-23 B-23 B-24 B-24 B-25 B-25 Sample Date 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 Analyte Depth³ 23.5 to 24 27.5 to 29 3 to 5.5 1.5 to 3 NA NA NA NA 2 to 4 NA NA NA ТРН Total Petroleum Hydrocarbons 12000 27 360 1,800 1,691 6,421 260 1,300 560 76 29.8 1,260 Gasoline Range Organics -------------------------Diesel Range Organics ------------------------Motor Oil -----------------------------VOCs Benzene 0.035 0.05 U --------0.05 U 0.05 U ----0.015 U --SVOCs Carcinogenic PAHs as B(a)P⁴ ------------------------

MW-11	MW-12	MW-15	MW-16	MW-17	MW-18
3/9/1988	3/9/1988	3/9/1988	3/9/1988	3/9/1988	3/9/1988
1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3	1.5 to 3
9,480	5 U	3,030	5 U	124	777
0.362	0.015 U	0.158 U	0.015 U	0.015 U	0.048
ExxonMobil/ADC Property

		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
	Sample Date	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
Analyte	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
ТРН																		
Total Petroleum Hydrocarbor	าร	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																		

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		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
	Sample Date	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
Analyte	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
ТРН																			
Total Petroleum Hydrocarbo	ns	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		

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		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
	Sample Date	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
Analyte	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
ТРН																			
Total Petroleum Hydrocarbor	ns																		
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			

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		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
	Sample Date	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
Analyte	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
ТРН																			
Total Petroleum Hydrocarbo	ns																		
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

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		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
	Sample Date	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
Analyte	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
ТРН																
Total Petroleum Hydrocarbo	ns															
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

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		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
	Sample Date	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
Analyte	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
ТРН																
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)F	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	om DB															
Carcinogenic PAHs (3 sig fig	zs)	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 fig	(s)	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 digi	ts)	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

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		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
	Sample Date	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
Analyte	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
ТРН																	
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	m DB																
Carcinogenic PAHs (3 sig fig	(sj	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 fig	(s)	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 digit	ts)	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

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BN-SB06 * BN-SB04 BN-SB04 BN-SB05 BN-SB05 BN-SB06 BN-SB06 BN-SB07 BN-SB07 BN-SB08 BN-SB Sample Date 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 2/10/2 Depth³ 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 Analyte ТРН 5.86 U Gasoline Range Organics 8.15 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 L Diesel Range Organics 12.8 5.85 U 13.2 5.89 L 4.46 U 4.84 U 27.1 4.94 U 4.82 U 4.87 U 4.93 U Motor Oil 4.46 U 4.84 U 236 30 4.93 U 23.4 19.1 5.89 เ 4.94 U 4.87 U 16 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 SVOCs Carcinogenic PAHs as B(a)P⁴ 0.00827585 0.003 U 0.225606 0.004 U 0.003 U 0.003 U 0.0412686 0.003 U 0.002 U 0.003 0.0114253 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 0.0029 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 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 0.002967

08	BN-SB09	BN-SB09	B-POE	<b>B-WROW</b>
014	2/4/2014	2/10/2014	11/3/2010	7/1/2010
24	8.5 to 9	23.5 to 24	NA	NA
J	5.71 U	4.82 U	579	365
J	5.6 U	5.46 U	5,540	3,400
J	19.1	5.46 U	4,560	406
U	0.00166 U	0.00184 U	0.0116	0.118 U
U	0.002 U	0.003 U	0.49277	0.1186485

7 U	0.00247 U	0.00283 U	0.287	0.0725
U	0.0025 U	0.0028 U	0.29	0.073
'15 U	0.00246885 U	0.00283125 U	0.28676	0.072545

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		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
	Sample Date	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
Analyte	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
ТРН																			
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	m DB																		
Carcinogenic PAHs (3 sig fig	s)		0.505	0.0971		0.283			0.186	0.121			0.0750		0.0276		0.0605		0.00629
Carcinogenic PAHs (2 sig fig	s)		0.51	0.097		0.28			0.19	0.12			0.075		0.028		0.061		0.0063
Carcinogenic PAHs (all digit	s)		0.50535	0.09712		0.28344			0.18578	0.1207			0.074986		0.027574		0.060511		0.0062853

ExxonMobil/ADC Property Everett, Washington

		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 *
	Sample Date	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
Analyte	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
ТРН																		
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 fro	om DB																	
Carcinogenic PAHs (3 sig fi	gs)		0.0573		0.00273 U		0.000546		0.228		0.512		0.488		0.361		0.226	0.223
Carcinogenic PAHs (2 sig fi	gs)		0.057		0.0027 U		0.00055		0.23		0.51		0.49		0.36		0.23	0.22
Carcinogenic PAHs (all digi	its)		0.057262		0.00272555 U		0.0005461		0.2283		0.5117		0.4881		0.3609		0.226475	0.22297

ExxonMobil/ADC Property Everett, Washington

CE-SB02 CE-SB02 EA-SB CE-8 CE-8 * CE-SB01 CE-SB01 CE-SB01 EA-SB01 EA-SB01 EA-SB02 EA-SB02 Sample Date 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/ Depth³ 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 Analyte 8 to 8 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 Diesel Range Organics 20.2 4.93 U 1670 25100 87.2 1840 534 786 4.86 U 46.4 ----Motor Oil 19.2 661 4.93 U 205 4.86 U 3240 49.1 581 249 64.1 ----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 0.004 SVOCs Carcinogenic PAHs as B(a)P⁴ 0.726133 81.7425 0.04886665 0.224456 0.002 U 0.5927955 0.002 U 0.261857 0.01 U 0.0668 ----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 0.050 ----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 0.05 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 0.050 --

03 *	EA-SB03	EA-SB03	EA-SB03	EA-SB04
2013	10/30/2013	10/30/2013	10/30/2013	10/17/2013
5	4 to 5	12 to 12.5	19.5 to 20	4.5 to 5
4	98.6	25 U	9.02 U	613
4	721	180	4.98 U	249
9	357	410	7.46	50.1
189	0.0171	0.00699 U	0.0027 U	0.0187
892	0.0813715	0.424714	0.00293505	0.01252905

05	0.0612	0.260	0.00250 U	0.00851
51	0.061	0.26	0.0025 U	0.0085
507	0.061176	0.26018	0.00249905 U	0.0085085

ExxonMobil/ADC Property Everett, Washington

EA-SB06 EA-SB06 EA-SB04 EA-SB05 EA-SB05 EA-SB06 EA-SB06 FA-SB01 FA-SB01 * FA-SB01 FA-SB02 Sample Date 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 10/15/201 Analyte Depth³ 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 ТРН 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 Diesel Range Organics 4.82 U 1,300 20.8 U 6.05 662 4.89 U 8,360 1.200 750 21.8 4.94 U Motor Oil 4.82 U 571 149 59.7 6.42 186 4.94 U 4.89 U 343 56 U 4.92 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 SVOCs Carcinogenic PAHs as B(a)P⁴ 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 New PAH calculations from DB Carcinogenic PAHs (3 sig figs) 0.00251 U 0.0327 0.00655 0.0207 0.0664 0.00249 U 0.279 0.00247 U 0.00248 U 0.119 0.0105 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 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

	FA-SB02	FA-SB03	FA-SB03	FA-SB03
.3	10/24/2013	10/24/2013	10/24/2013	10/24/2013
	19.5 to 20	4 to 5	6.5 to 7	19.25 to 19.75
	6.73 U	30.3	175	5.96 U
	4.97 U	144	77.6	4.93 U
	4.97 U	270	78.1	4.93 U
	0.00193 U	0.00259	0.00193 U	0.00175 U
5	0.002 U	0.0478557	0.0191474	0.002 U
	0.00248 U	0.0399	0.0176	0.00246 U
	0.0025 U	0.040	0.018	0.0025 U

0.0024613 U

0.00248395 U 0.039904 0.017634

ExxonMobil/ADC Property Everett, Washington

		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 *
	Sample Date	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
Analyte	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
ТРН																
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	94	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	om DB															
Carcinogenic PAHs (3 sig fig	zs)	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 fig	js)	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 digit	ts)	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

ExxonMobil/ADC Property

		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
	Sample Date	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
Analyte	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
ТРН																		
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	m DB																	
Carcinogenic PAHs (3 sig fig	s)	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 fig	s)	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 digit	s)	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

ExxonMobil/ADC Property Everett, Washington

		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
	Sample Date	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
Analyte	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
ТРН																
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)F	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	om DB															
Carcinogenic PAHs (3 sig fig	zs)	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 fig	zs)	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 digi	ts)	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

ExxonMobil/ADC Property Everett, Washington

PE-SB08 PE-SB07 PE-SB07 PE-SB07 * PE-SB07 PE-SB07 PE-SB07 PE-SB08 PE-SB08 PE-SB08 PE-SB09 Sample Date 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 Analyte Depth³ 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 ТРН 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 Diesel Range Organics 4.86 U 17.6 24.9 12.5 25.1 4,220 1,440 484 9.45 6.12 5.84 U Motor Oil 5.57 U 8.08 62.2 24.8 2,200 450 748 27.9 8.97 5.89 U 8.33 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 SVOCs Carcinogenic PAHs as B(a)P⁴ 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 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 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 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

PE-SB09	PE-SB10	PE-SB10	SA-B-1
2/10/2014	2/6/2014	2/6/2014	12/30/2011
5 to 5.5	19.5 to 20	8.5 to 9	9
45.2	4.19 U	4.82 U	249 U
96.3	5.55 U	5.63	61.6
435	5.55 U	5.32 U	122
0.00198 U	0.00152 U	0.00178 U	0.0154 U
0.082304	0.0033721	0.003 U	0.01 U

0.0529	0.00273 U	0.00263 U	0.0129 U
0.053	0.0027 U	0.0026 U	0.013 U
0.052916	0.0027331 U	0.00263495 U	0.0129105 U

## ExxonMobil/ADC Property

Everett, Washington

		SA-B-2 *	SA-B-2	SA-B-3	SA-B-4	SA-B-5	SA-B-6	SA-B-7	SA-B-8	SA-B-9	SA-B-10	SA-B-11
	Sample Date	12/30/2011	12/30/2011	1/3/2012	1/5/2012	1/6/2012	1/13/2012	2/9/2012	3/26/2012	3/27/2012	3/27/2012	3/27/2012
Analyte	Depth ³	9	9	10	9	8	8	8	8	8	8	8
ТРН												
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	94	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	om DB											
Carcinogenic PAHs (3 sig fig	js)	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 fig	js)	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 digit	ts)	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

····· · · · · · · · · · · · · · · · ·									
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
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
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

#### 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**





C:\Users\adam.stenberg\appdata\local\temp\AcPublish_4552\EXM-GWData-Contours-Mar2018_042618.dwg - FigF-1_Mar2018 (2) - Jul. 05, 2018 4:03pm - adam.stenber



#### GROUNDWATER SAMPLE ANALYSIS MAP MARCH 5-6, 2018

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F-1



# Appendix G





#### Table 749-1

#### Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) <u>undeveloped land</u> 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. Points Area (acres) 0.25 or less 4 5 0.5 1.0 6 1.5 7 2.0 8 X 2.5 9 10 3.0 3.5 11 4.0 or more 12 2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter 3 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 4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the 2 box to the right. If no, enter a score of 2.^c 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. 6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the 12 right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.

#### 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 <u>successional</u> 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-<u>successional</u> native plant communities present; relatively high species diversity; used by an uncommon or rare species; <u>priority habitat</u> (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



Chung Yee Washington State Department of Ecology January 21, 2015 Page 2 of 9

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 ( $\mu$ g/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.



Chung Yee Washington State Department of Ecology January 21, 2015 Page 3 of 9

- 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.



Chung Yee Washington State Department of Ecology January 21, 2015 Page 4 of 9

#### 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.



Chung Yee Washington State Department of Ecology January 21, 2015 Page 5 of 9

#### 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



Chung Yee Washington State Department of Ecology January 21, 2015 Page 6 of 9

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



Chung Yee Washington State Department of Ecology January 21, 2015 Page 7 of 9

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.



Chung Yee Washington State Department of Ecology January 21, 2015 Page 8 of 9

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.



Chung Yee Washington State Department of Ecology January 21, 2015 Page 9 of 9

> 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.

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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



TABLES



#### TABLE 1

### SELECTED HISTORICAL ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS^{1, 2}

ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

		TPH-Diesel				TPH-Diesel	TPH-Oil
Well ID	Date Sampled	(µg/L)	(µg/L)	Well ID	Date Sampled	(µg/L)	(µg/L)
	lethod A CUL ³	500	500		Method A CUL ³	500	500
	3/1/2010	854	585		2/26/2010	2,400	499
	3/1/2010 (dup.)	824	563		8/18/2010	1,720	233
	8/18/2010	346 J	137 J		11/17/2010	2,010	97.1 U
	8/18/2010 (dup.)	508 J	323 J		11/17/2010 (dup.)	1,880	95.2 U
	11/18/2010	488	172		2/17/2011	1,720 J	421 N
	2/17/2011	570 J	128 N		5/19/2011	1,540	468
M\A/ 10	5/18/2011	274 NJ	26.2 NJ	MW-A2	11/28/2011	1,520	243 U
10100-13	11/29/2011	621	250 U		8/29/2012	965	133
	2/22/2012	512	250 U		2/21/2013	782	118
	8/29/2012	543	148		8/22/2013	826	93.9 J
	2/21/2013	354	111		2/25/2014	730	94.3 U
	8/22/2013	341	76.8 J		8/27/2014	565	95.7 UJ
	2/25/2014	239	571		8/27/2014 (dup.)	602	94.8 U
	8/27/2014	409	94.3 U		8/18/2010	335	226
	3/1/2010	3,790	1,270		11/18/2010	417	96.2 U
	8/18/2010	4,390	1,620		2/17/2011	791	220 N
MW-40P	11/18/2010	1,970	413		5/19/2011	404 NJ	29.6 NJ
	2/17/2011	2,030 J	638 N		11/29/2011	643	248 U
	5/18/2011	1,540 NJ	208 NJ	MW-A3	2/22/2012	826	240 U
MW-40R	11/29/2011	1,720	248 U		8/29/2012	365	100 U
	2/22/2012	1,690	295		2/21/2013	655	146
	8/29/2012	3,780 J	1,100 J		8/22/2013	864	341
	2/21/2013	792 J	113 J		2/25/2014	365	94.3 U
	8/22/2013	4,010	1,040		8/26/2014	906	442
	2/25/2014	1,550	203		8/18/2010	483	516
	8/27/2014	1,610 J	276 J		11/1//2010	585	396
	2/25/2010	3,390	545		2/17/2011	667	515 N
	8/18/2010	2,200	276		5/19/2011	416 NJ	215 NJ
	11/18/2010	2,140	95.2 U		11/29/2011	592	288
	2/18/2011	3,260	529 N	MW-A4	2/22/2012	580	525
M\\/_A1	5/18/2011	2,350 J	144 J		8/29/2012	635	356
	11/28/2011	15,600	4,900 U		2/21/2013	708	472
	2/21/2012	4,530	847		8/22/2013	732	343
	8/29/2012	2,190	424		2/25/2014	590	223
	2/21/2013	802	103		8/26/2014	360	94.3 U
	8/27/2014	1,240	124				



#### TABLE 1

### SELECTED HISTORICAL ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS^{1, 2}

ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

		TPH-Diesel	TPH-Oil			TPH-Diesel	TPH-Oil
Well ID	Date Sampled	(µg/L)	(µg/L)	Well ID	Date Sampled	(µg/L)	(µg/L)
MTCA Method A CUL ³		500	500	MTCA N	lethod A CUL 3	500	500
	8/18/2010	2,070	288		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
MW-A5	2/21/2012	2,480	250 U	MW-A6	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

#### <u>Notes</u>

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  $\mu$ g/L, MTCA Method A Cleanup Level, TPH-Oil = 500  $\mu$ g/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 SCHEDULE¹

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-A5 MW-A5 MW-A6 MW-A7 MW-A8 MW-11 MW-19 MW-40R	TPH-G (C6-C12) TPH-D (C10-C24) w/SGT TPH-O (C24-C40) 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.

 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.
Applyzed by Lost Amethod 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
## RESULTS FOR EPH/VPH ANALYSES, JUNE 2014¹ 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	ТА	T/	<b>A</b> ²	EU	TA	2	
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	
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	
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	
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	
C12-C16 Aliphatics	28.8 U	28.5	28.8 U	28.3 U	28.6 U	50 U	28.3 U	28 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	
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	
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	
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	
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	
VPH (µg/L)									
C5-C6 aliphatics (adjusted)	50 U	50 U	50 U	50 U	50 U	10 U	50 U	50 U	
C6-C8 aliphatic (adjusted)	50 U	50 U	50 U	50 U	50 U	15 U	50 U	50 U	
C8-C10 aliphatic (adjusted)	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	
C8-C10 Aromatics	50 U	50 U	50 U	50 U	50 U	25 U	50 U	50 U	
C10-C12 aliphatic (adjusted)	50 U	50 U	50 U	50 U	50 U	15 U	50 U	50 U	
C10-C12 Aromatics	50 U	50 U	50 U	50 U	50 U	7.3	50 U	50 U	
C12-C13 Aromatics	50 U	50 U	50 U	50 U	50 U	4.4	50 U	50 U	

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



FU
LU
50 U
50 U
50 U
50 U
50 U
50 U
50 U
50 U
50 U
50 U
10 U
15 U
25 U
25 U
15 U
3.0
2.2

Amec Foster Wheeler Page 1 of 1

#### ANALYTICAL RESULTS FOR TPH IN SPLIT GROUNDWATER SAMPLES¹ ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

all results in milligrams per liter (mg/L)

Well ID	ľ	MW-A1											MW-A2									
Date Sampled	6/19/2014	8/2	7/2014	6/19/2014		8/27/	2014			9/30/	2014		10/29	/2014		11/19	/2014			12/18	/2014	
Analytical Lab	ТА	TA	EU	TA	T/	$\Lambda^2$	El	J ²	T	A ²	E	U ²	TA ²	EU ²	T	A ²	E	$U^2$	T	A ²	E	:U 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					Ν	IW-A4										MW-A5				
Date Sampled	8/26/2	014	6/19/2014	8/26/2	014	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	Т	A 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		М	W-A5							MW-A	6						MW	-A7	MW	-A8
Date Sampled	12/5/2	014	12/17	7/2014	(	6/19/2014		8/26/	2014	9/30/2014	10/29	9/2014	11/20	/2014	12/17	/2014	8/27/2	2014	8/26/2	2014
Analytical Lab	TA	EU	TA	EU	T/	$\lambda^2$	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	J 100 U	100 U	100 U	100 U	100 U	100 U	100 UJ	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 0	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 0	J 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	MV	V-19				MW-4	l0R				
Date Sampled	8/27/2	014	8/27	/2014	8/27/2	2014	9/30/2014	10/29/2	2014	11/19/2	2014	12/17/2014	4
Analytical Lab	TA	EU	TA	EU	TA	EU	TA EU	TA	EU	TA	EU	TA EU	U
TPH-G (C6-C12)	100 U	100 U	208	190	500 U	460	500 U 480	562	460	640	500	559 460	30
TPH-D (C10-C24) no/SG							2,080 J 1,000	1,290	1,200	1,290	750	2,040 J 77	70
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	50
TPH-O (C24-C40) no/SG							500 J 100 U	351	160	444	200	644 J 100	00
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	อบ

#### 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:

EU = Eurofins Calscience, Garden Grove, California

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

## -- = not analyzed

TA = TestAmerica, Nashville, Tennessee



## ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES¹ 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	T	A ²	E	U ²	Т	A ²	E	U ²	T/	A ²	E	U ²	Т	A ²	E	U 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																



## ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES¹ ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

Well ID		MW-A	2 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	Т	A ²	E	U ²	TA	EU	TA	TA	EU	TA	EU	TA	EU	TA	EU	TA	EU	Т	A 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		



## ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES¹ ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

Well ID				MW-A	5 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	Т	A 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										



#### ANALYTICAL RESULTS FOR PAHs AND VOCs IN SPLIT GROUNDWATER SAMPLES¹ ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

Well	ID MW	V-A7	MM	/-A8	MW	/-11	MM	/-19					MW-4	0R				
Date Samp	ed 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 L	ab 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																		
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



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## TABLE 6

## RELATIVE PERCENT DIFFERENCE IN RESULTS BETWEEN LABORATORIES¹ ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

	Date			Results	
Well ID	Sampled	Analyte	ТА	EU	RPD
	T	otal Petroleum Hydroc	arbons		
MW-A2	9/27/2014		156	180	14
MW-A2 FD	0/2//2014		160	180	12
MW-A2	11/19/2014		146	150	3
MW-A2	12/18/2014	трн с	178	140	24
MW-A2 FD	12/10/2014	111-0	165	160	3
	10/29/2014		562	460	20
MW-40R	11/19/2014		640	500	25
	12/17/2014		559	460	19
MW-A1	8/27/2014		1,240	590	71
	8/27/2014		565	220	88
	9/30/2014		594 679	590	1
IVIVV-AZ	10/29/2014		070 345	300 100	58
	12/18/2014		430	260	49
	8/27/2014		602	220	93
	9/30/2014		313	170	59
MW-A2 FD	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
MVV-A4	10/29/2014	TPH-D	298	120	85
	9/30/2014		2,100	140	182
MW-A5	10/29/2014		2,340	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
	8/27/2014		1,610	690 540	08
MW-40R	9/30/2014		1,540 637	540 730	90 14
10100-4010	11/19/2014		733	590	22
	12/17/2014		1,610	550	98
	8/27/2014		276	97	96
10100-40K	11/19/2014	IFH-U	115	94	20
	1	<b>/olatile Organic Comp</b>	ounds		
	9/30/2014	_	1.67	2.1	23
	11/19/2014	Benzene	0.592	0.61	3
MW-40R	0/20/2014		0.576	0.58	15
	9/30/2014 11/19/2014	Total Xylenes	2.70	2.4	27
	12/17/2014	i otal Ayleneo	1.77	1.5	16
	Poly	ycyclic Aromatic Hydr	ocarbons	-	
	8/27/2014	Acenaphthene	0.515	0.50	3
10100-7-11	0/21/2014	1-Methylnaphthalene	1.06	0.51	70
	8/27/2014	Acenaphthene	0.455	0.44	3
	9/30/2014	Acenaphthene	0.441	0.45	2
	<u> </u>		0.425	0.37	14 25
MW-A2	10/29/2014	Fluorene	0.529	1 00	62
	44/00/00/11	Acenaphthene	0.589	0.6	4
	11/20/2014	Fluorene	0.763	0.9	21
	12/18/2014	Acenaphthene	0.51	0.42	19
	12/10/2014	Fluorene	0.72	0.60	18
	8/27/2014	Acenaphthene	0.468	0.37	23
	10/20/2014	Fluorene	0.443	0.42	5 73
MW-A2 FD	10/29/2014		0.521	0.5	10
	11/20/2014	Fluorene	0.644	0.0	22
	10/10/0011	Acenaphthene	0.493	0.35	34
	12/18/2014	Fluorene	0.71	0.59	18
		Acenaphthene	0.697	0.93	29
MW-A3	8/26/2014	Fluorene	0.514	0.60	15
		Phenanthrene	1.42	1.6	12

Amec Foster Wheeler Page 1 of 2

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## TABLE 6

## RELATIVE PERCENT DIFFERENCE IN RESULTS BETWEEN LABORATORIES¹ ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

	Date			Results	
Well ID	Sampled	Analyte	TA	EU	RPD
		Acenaphthene	2.18	2.5	14
	8/26/2014	Fluorene	0.676	0.86	24
	0/20/2014	Naphthalene	1.25	1.2	4
		Phenanthrene	0.647	0.93	36
		Acenaphthene	2.71	2.6	4
	0/30/2014	Fluorene	0.865	0.81	7
	9/30/2014	Naphthalene	0.846	0.68	22
		Phenanthrene	0.771	0.64	19
		Acenaphthene	3.24	3.60	11
		Fluorene	1.16	1.30	11
	10/29/2014	1-Methylnaphthalene	0.478	0.49	2
Μ//_Δ4	10/20/2014	2-Methylnaphthalene	0.713	0.77	8
		Naphthalene	4.35	3.30	27
		Phenanthrene	0.961	1.00	4
		Acenaphthene	2.51	1.9	28
	12/5/2014	Fluorene	0.864	0.64	30
	12/0/2014	Naphthalene	1.8	1.2	40
		Phenanthrene	0.718	0.51	34
		1-Methylnaphthalene	0.737	0.44	50
		2-Methylnaphthalene	1.1	0.63	54
	12/18/2014	Acenaphthene	3.34	2	50
	12/10/2014	Fluorene	1.38	0.89	43
		Naphthalene	7.22	3.5	69
		Phenanthrene	1.18	0.7	51
	8/26/2014	Acenaphthene	2.5	4.3	53
	9/30/2014	Phenanthrene	2.49	3.4	31
MW-A5	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
		Acenaphthene	0.877	0.72	20
	8/27/2014	Fluorene	0.815	0.74	10
	0/21/2014	1-Methylnaphthalene	12.3	11	11
		2-Methylnaphthalene	1.47	1.3	12
		Acenaphthene	0.87	0.55	45
	9/30/2014	Fluorene	0.799	0.52	42
		1-Methylnaphthalene	11.3	8.7	26
		2-Methylnaphthalene	0.899	0.62	37
MW-40R	10/29/2014	1-Methylnaphthalene	15.8	3.7	124
		1-Methylnaphthalene	18.2	3.7	132
		2-Methylnaphthalene	1.15	0.43	91
	11/19/2014	Acenaphthene	1.01	0.45	77
		Fluorene	0.88	0.47	61
		Phenanthrene	0.595	0.25	82
		1-Methylnaphthalene	13.6	8.9	42
	12/17/2014	2-ivietnyinaphthalene	0.756	0.48	45
		Acenaphthene	0.838	0.61	31
		Fluorene	0.77	0.62	22

<u>Notes</u>

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

> Amec Foster Wheeler Page 2 of 2

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## SUMMARY STATISTICS FOR RELATIVE PERCENT DIFFERENCE IN RESULTS BETWEEN LABORATORIES

ExxonMobil/ADC Property, Ecology Site ID 2728 Everett, Washington

	Number of	Relative Percent Difference			
Analyte	Measurements	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



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## ATTACHMENT A

Friedman & Bruya Assessment

## 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.

## ENVIRONMENTAL CHEMISTS

Leah Vigoren November 18, 2014 Page 2

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.

• **<u>Comparison of TPH Results</u>**: 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.

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

Table 1. TPH-D Without Silica Gel for MW-A5 and MW-A6 (Results reported in ppb)

a - The surrogate recovery was outside of control limits (4-6%) indicating poor extraction efficiency.

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

Table 2. TPH-D With Silica Gel for MW-A5 and MW-A6 (Results reported in ppb)

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.

## ENVIRONMENTAL CHEMISTS

Leah Vigoren November 18, 2014 Page 3

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

## ENVIRONMENTAL CHEMISTS

Leah Vigoren November 18, 2014 Page 4

EPA method 3630 references the "Column" method, not the "Shake" method, for silica gel cleanup of sample extracts.  $^{\rm 3}$ 

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.

• <u>**Comparison of TPH and EPH Results:**</u> 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.

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	

Table 3. TPH-D w/SG and Total EPH for MW-A5 and MW-A6 (Results reported in ppb)

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.

## ENVIRONMENTAL CHEMISTS

Leah Vigoren November 18, 2014 Page 5

> 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 nondetect 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

## ENVIRONMENTAL CHEMISTS

Leah Vigoren November 18, 2014 Page 6

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.

(mulule Postal Poquiz

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

## 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):

Proiect:

CC:

6103140009 Project File

- 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	Laboratory	Requested Analyses
		<b>Collection Date</b>	Sample ID	
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	6/19/2014	490-55979-3	all
	field duplicate			
XOM061914-03	MW-A6	6/19/2014	490-55979-4	all
XOM061914-07	MW-A6	6/19/2014	490-55979-5	all
	field duplicate			
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

Memo January 21, 2015 Page 2 of 5



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:

<u>EPH by NWTPH-EPH:</u> 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:

<u>EPH by NWTPH-EPH:</u> 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).

Memo January 21, 2015 Page 3 of 5



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:

<u>TPH as diesel by NWTPH-Dx</u>: 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:

<u>EPH by NWTPH-EPH:</u> 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.

Memo January 21, 2015 Page 4 of 5



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".

<u>TPH as diesel by NWTPH-Dx:</u> 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.

			Qualified	
Sample ID	Method	Qualified Analyte	Result	Qualifier Reason
		C8-C10 Aliphatics	19.2 UR	LCS recoveries
XOM061914-01	EPH	C10-C12 Aliphatics	9.62 UR	
		C10-12 Aromatics	9.62 UJ	
		C8-C10 Aliphatics	18.9 UR	
XOM061914-02	EPH	C10-C12 Aliphatics	9.43 UR	LCS recoveries
		C10-12 Aromatics	9.43 UJ	
	EPH	C8-C10 Aliphatics	19.0 UR	LCS recoveries
	**	C10-C12 Aliphatics	9.52 UR	"
XOM061914-06	**	C10-12 Aromatics	9.81 J	"
	NWTPH-Dx	C10-C24	272 R	lab/field duplicate RPDs
	"	C24-C40	93.9 UR	and surrogate recovery
XOM061014 02	ЕДЦ	C8-C10 Aliphatics	18.9 UR	
XUIVIU0 1914-03	EPN	C10-C12 Aliphatics	9.43 UR	LCS recoveries
XOM061014.07	ЕДН	C8-C10 Aliphatics	18.7 UR	LCS recoveries
XUIVIU01914-07	CFN	C10-C12 Aliphatics	9.35 UR	ECS recoveries
XOM064044.04	ЕДЦ	C8-C10 Aliphatics	19.2 UR	
XUIVI061914-04		C10-C12 Aliphatics	9.62 UR	LCS recoveries
		C8-C10 Aliphatics	18.9 UR	
		C10-C12 Aliphatics	17.4 J	LCS recoveries
		C8-C10 Aromatics	47.2 UJ	"
XOM061914-05	EPH	C10-C12 Aromatics	15.1 J	surrogate recovery "
		C12-C16 Aromatics	37.7 UJ	"
		C16-C21 Aromatics	47.2 UJ	"
		C21-C34 Aromatics	47.2 UJ	"
Trip Blank-01		None		

## Sample Identifications and Qualified Results

Memo January 21, 2015 Page 5 of 5



## 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
	Danille Jorgensen
Tel:	(206) 342-1760
Fax:	(206) 342-1761
Date:	April 8, 2014

Project: 6103140009 cc: Project File

## 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	Laboratory Sample ID	Requested Analyses
	Date		
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



Memo April 8, 2014 Page 2 of 4

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:

## VOCs by 8260

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.

## PAHs by 8270

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.



Memo April 8, 2014 Page 3 of 4

- 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.
- 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



Memo April 8, 2014 Page 4 of 4

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

## 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	
			Collection	Requested
Sample ID	Monitoring Well ID	Laboratory SDG	Date	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	490-62707-1	9/30/2014	all
	MW-A2			
Trip Blank-01		490-62707-1	9/30/2014	VOCs
XOM102914-01	MW-A4	490-65219-1	10/29/2014	all

Project: cc:

6103140009 Project File

Memo January 21, 2015 Page 2 of 8



			Sample	
			Collection	Requested
Sample ID	Monitoring Well ID	Laboratory SDG	Date	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	490-66967-1	11/19/2014	all
	MW-A2			
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

Memo January 21, 2015 Page 3 of 8



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:

<u>BTEX by 8260B and TPH-G by NWTPH-Gx</u>: 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.

Memo January 21, 2015 Page 4 of 8



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

		Primary	Duplicate	Reporting	
Sample ID/		Result	Result	Limit	RPD
Field Duplicate ID	Analyte	(µg/L)	(µg/L)	(µg/L)	(%)
XOM093014-04/	C10-C24 (no SG)	1050	834	95.7	23
XOM093014-11	C24-C40 (no SG)	168	181	95.7	NC
	C10-C24 (with SG)	594	313	95.7	NC
XOM102914-04/	1-methylnaphthalene	0.508	0.533	0.0948	5
XOM102914-11	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/	acenaphthene	0.589	0.531	0.0943	10
XOM111914-11	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

Memo January 21, 2015 Page 5 of 8



		Primary	Duplicate	Reporting	
Sample ID/		Result	Result	Limit	RPD
Field Duplicate ID	Analyte	(µg/L)	(µg/L)	(µg/L)	(%)
	C24-C40 (no SG)	197	284	93.9	36
XOM121714-05/	acenaphthene	0.510	0.493	0.0939	3
XOM121714-11	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

 $\mu g/L = micrograms per liter$ 

RPD= relative percent difference

## 7. Surrogates – Acceptable except as noted:

## TPH-G by NWTPH-Gx

<u>Work Order 490-62707-1</u>: 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.

Memo January 21, 2015 Page 6 of 8



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.

Memo January 21, 2015 Page 7 of 8



## Sample Identifications and Qualified Results

Sample ID	Qualified Analyte	Qualified Results	Qualifier Reason
XOM093014-01	benzene	0.50 UJ	
	toluene	0.50 UJ	
	ethylbenzene	0.50 UJ	analyzed past the technical
	total xylenes	1.5 UJ	holding time
	MTBE	0.50 UJ	
	C6-C12	500 UJ	
XOM093014-02	C10-C24 (no SG)	243 J	
	C24-C40 (no SG)	94.3 UR	low surrogate recovery
XOM093014-03	C10-C24 (no SG)	155 J	
	C24-C40 (no SG)	94.3 UR	low surrogate recovery
XOM093014-04	C10-C24 (with SG)	594 J	
			field duplicate RPD
XOM093014-05	C10-C24 (no SG)	2,080 J	
	C24-C40 (no SG)	500 J	
	C10-C24 (with SG)	1,540 J	low surrogate recoveries
	C24-C40 (with SG)	165 J	
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)	678 J	
	C10-C24 (with SG)	1,190 J	
	C24-C40 (with SG)	305 J	field duplicate RPDs
XOM102914-05	none		
XOM102014-11	C10-C24 (no SG)	3000 J	low surrogate recoverv
XOIW102314-11	C24-C40 (no SG)	784 J	"
	C10-C24 (with SG)	1140 J	field duplicate RPD
Trip Blank	none		
XOM111914-01	C10-C24 (with SG)	345 J	low surrogate recovery
	C24-C40 (with SG)	93.9 UJ	
	C24-C40 (no SG)	197 J	field duplicate RPD
XOM111914-02	C10-C24 (with SG)	733 J	low ourragate recovery
	C24-C40 (with SG)	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		

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Memo January 21, 2015 Page 8 of 8

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

### 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);

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- 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	Laboratory	Requested Analyses
		<b>Collection Date</b>	Sample ID	
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 ( $^{\circ}$ 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

Memo January 21, 2015 Page 2 of 2



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

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Date: January 21, 2015

## 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	Requested
Sample ID	Monitoring Well ID	Laboratory SDG	<b>Collection Date</b>	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

Project: cc:

6103140009 Project File Memo January 21, 2015 Page 2 of 7



			Sample	Requested
Sample ID	Monitoring Well ID	Laboratory SDG	<b>Collection Date</b>	Analyses
XOM082714-24	Field duplicate of	14-08-2237	8/28/2014	all
	MW-A2			
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	14-10-0161	9/30/2014	all
	MW-A2			
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	14-10-2521	10/29/2014	all
	MW-A2			
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	14-11-1758	11/19/2014	all
	MW-A2			
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

Memo January 21, 2015 Page 3 of 7



			Sample	Requested
Sample ID	Monitoring Well ID	Laboratory SDG	Collection Date	Analyses
XOM121714-12	Field Duplicate of	14-12-1855	12/18/2014	all
	MW-A2			
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  $\mu$ g/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

Memo January 21, 2015 Page 4 of 7



- 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."

		Primary	Duplicate	Reporting	
Sample ID/		Result	Result	Limit	RPD
Field Duplicate ID	Analyte	(µg/L)	(µg/L)	(µg/L)	(%)
XOM082714-18/	TPH as diesel	220	220	100	NC
XOM082714-22	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/	TPH as diesel	590	170	100	NC
XOM093014-12	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/	TPH as diesel (no SG)	500	550	100	10
XOM102914-12	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/	TPH as diesel (no SG)	220	300	100	NC
XOM111914-12	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

Memo January 21, 2015 Page 5 of 7



Occurring ID/		Primary	Duplicate	Reporting	
Sample ID/		Result	Result	Limit	RPD
Field Duplicate ID	Analyte	(µg/L)	(µg/L)	(µg/L)	(%)
	acenaphthene	0.51	0.48	0.096	6
XOM121814-10/	TPH as diesel (no SG)	320	340	100	NC
XOM121814-12	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

IN D- relative percent unlerence

### 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		

Memo January 21, 2015 Page 6 of 7



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		

Memo January 21, 2015 Page 7 of 7



### 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



# Histogram of TestAmerica Groundwater Data

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.



# Histogram of log of TestAmerica Groundwater Data

Shapiro-Wilk normality test

data: ExxonInput\$TA2 W = 0.9366, p-value = 0.09076 *The log-transformed data are more nearly normally distributed.* 



# Histogram of Eurofins Groundwater Data

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.

# Histogram of log of Eurofins Groundwater Data



Shapiro-Wilk normality test

data: ExxonInput\$EU2W = 0.9446, p-value = 0.1443The log-transformed Eurofins data are also more nearly normally distributed.

# Difference Between TestAmerica and Eurofins Groundwater Data



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.



log of TestAmerica & Eurofins Groundwater Data Differences

log of TPH-D result differences

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.