
APPENDIX B— AOCs SUPPORTING DOCUMENTATION

B-1 COLUMBIA RIVER SEDIMENTS AOC

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**JUB Engineers (1985)
Sediment Results**

TABLE IV.2.1
METAL CONTENTS (µg/g) OF RIVER SEDIMENTS

SITE	Al	Sb	Cd	Cu	Pb	Ni	Zn
Background NMFS	27000	<1	02.8	52.0	39.8	36.0	396
Dilution Zone							
7.1	20000	<1	01.2	31.0	23.3	49.0	259
7.3	19000	<1	00.9	35.0	11.6	32.0	204
Downriver							
Outside Boat Basin	18000	<1	01.10	35.0	22.8	31.0	233
Inside Boat Basin	16000	<1	00.50	39.0	19.5	35.7	168

TABLE IV.2.2
ORGANIC CONTENTS (µg/g) OF RIVER SEDIMENTS

PARAMETER	BACKGROUND	DILUTION ZONE		OUTSIDE	INSIDE
	7NMFS	7.1	7.3	BOAT BASIN	BOAT BASIN
Naphthalene	0.5	0.2	<0.08	<0.1	<0.2
Fluorene	<0.02	<0.01	<0.01	<0.01	<0.02
Phenanthrene	0.4	0.3	0.25	0.1	0.5
Anthracene	0.09	0.04	0.09	0.02	0.09
Fluoranthene	1.5	0.6	0.6	0.4	0.6
Pyrene	1	0.6	0.8	0.3	1
Benz(a)anthracene	1	0.6	2	0.3	1
Chrysene	0.8	0.7	3	0.3	1
Benzo(a)pyrene	0.7	0.8	2.8	0.3	0.9
Dibenz(a,h)anthracene	<0.1	1.5	2.2	<0.1	<0.1
Benzo(g,h,i)perylene	<0.1	0.8	2	0.3	0.2

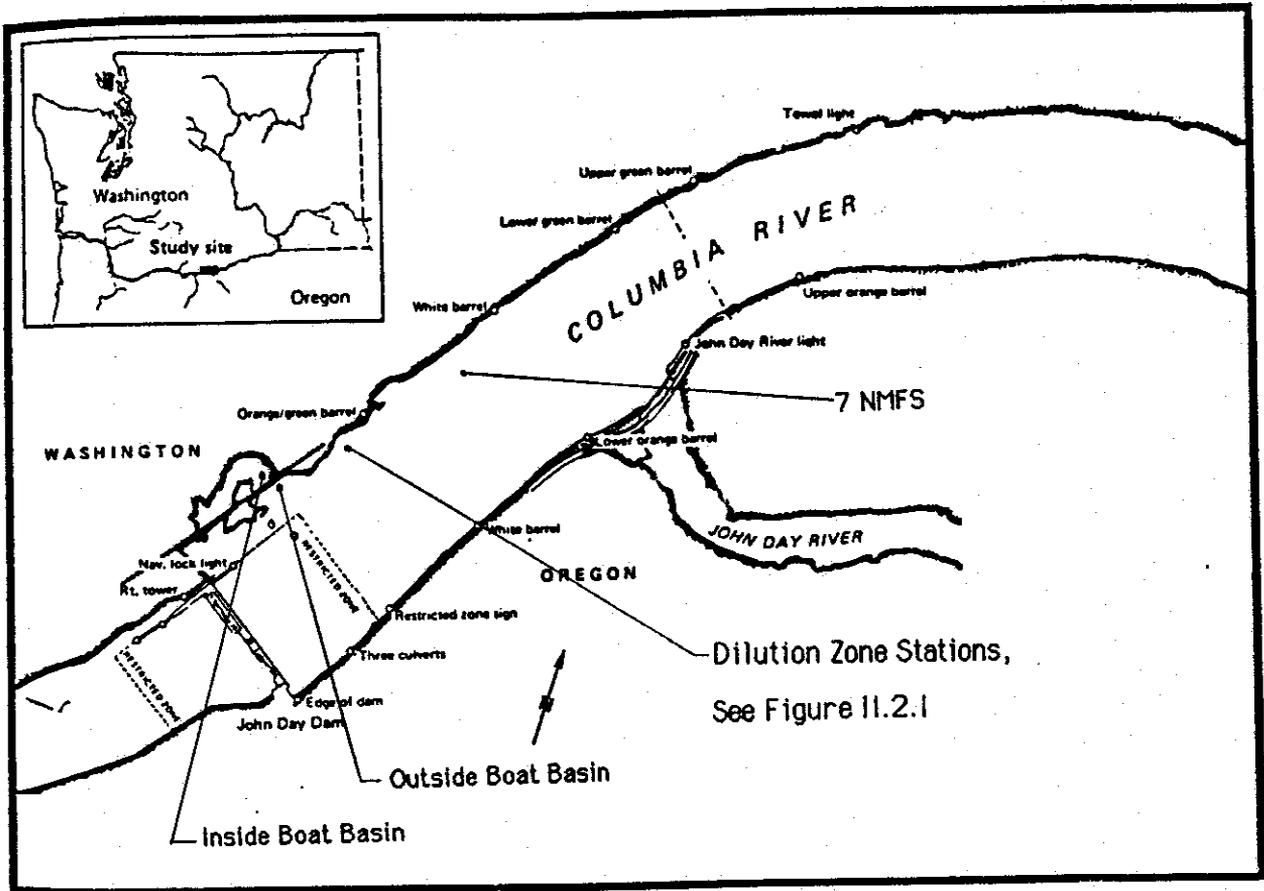


Figure 11.2.1
River Sediment Sampling Locations

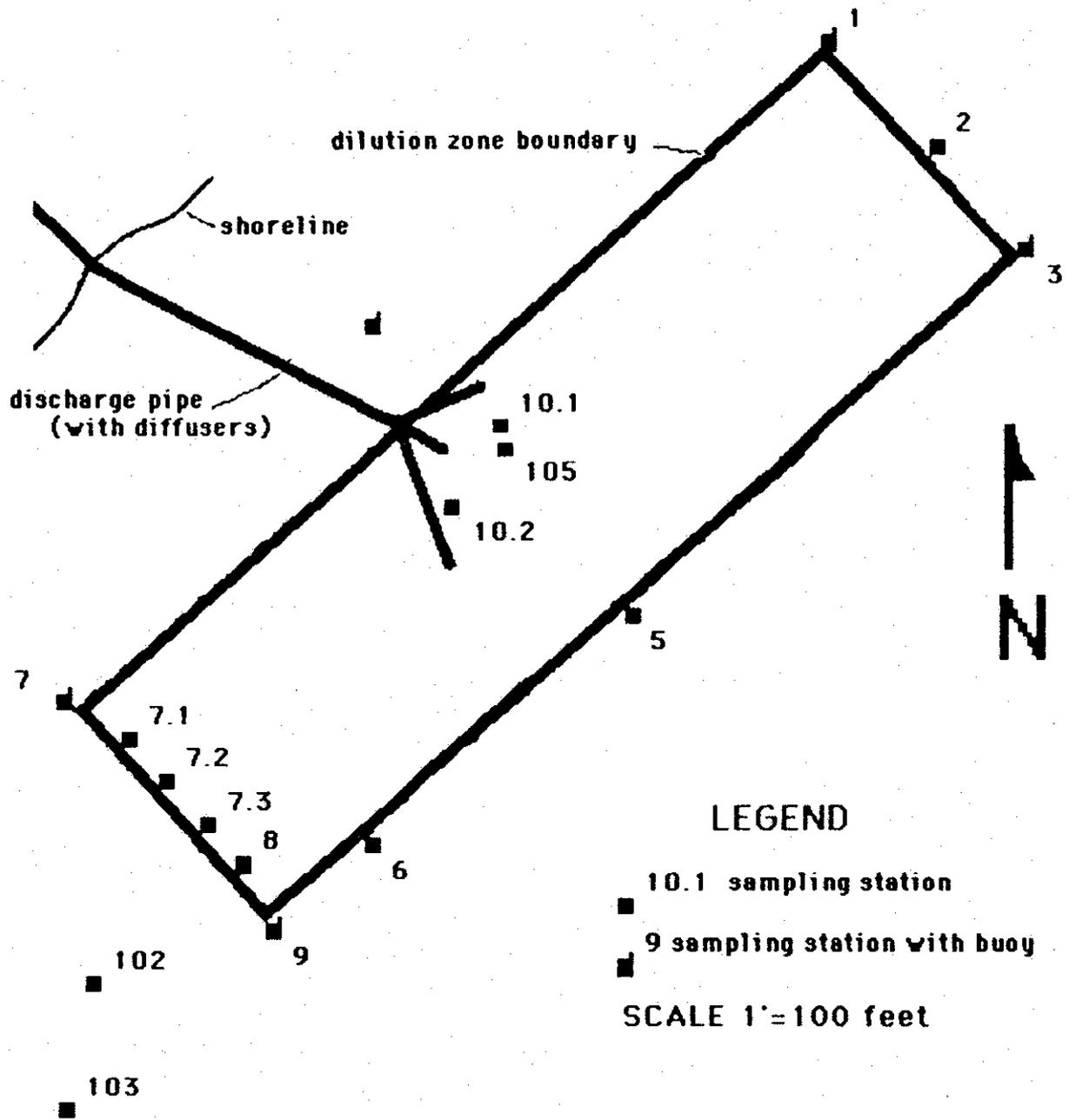


FIGURE II.2.2
 RIVER SEDIMENT AND WATER
 SAMPLING LOCATIONS
 NEAR THE DIFFUSERS

APPENDIX B-1

COLUMBIA RIVER SEDIMENTS AOC

**Damkaer and Dey (1986)
Columbia River Sediment Study**

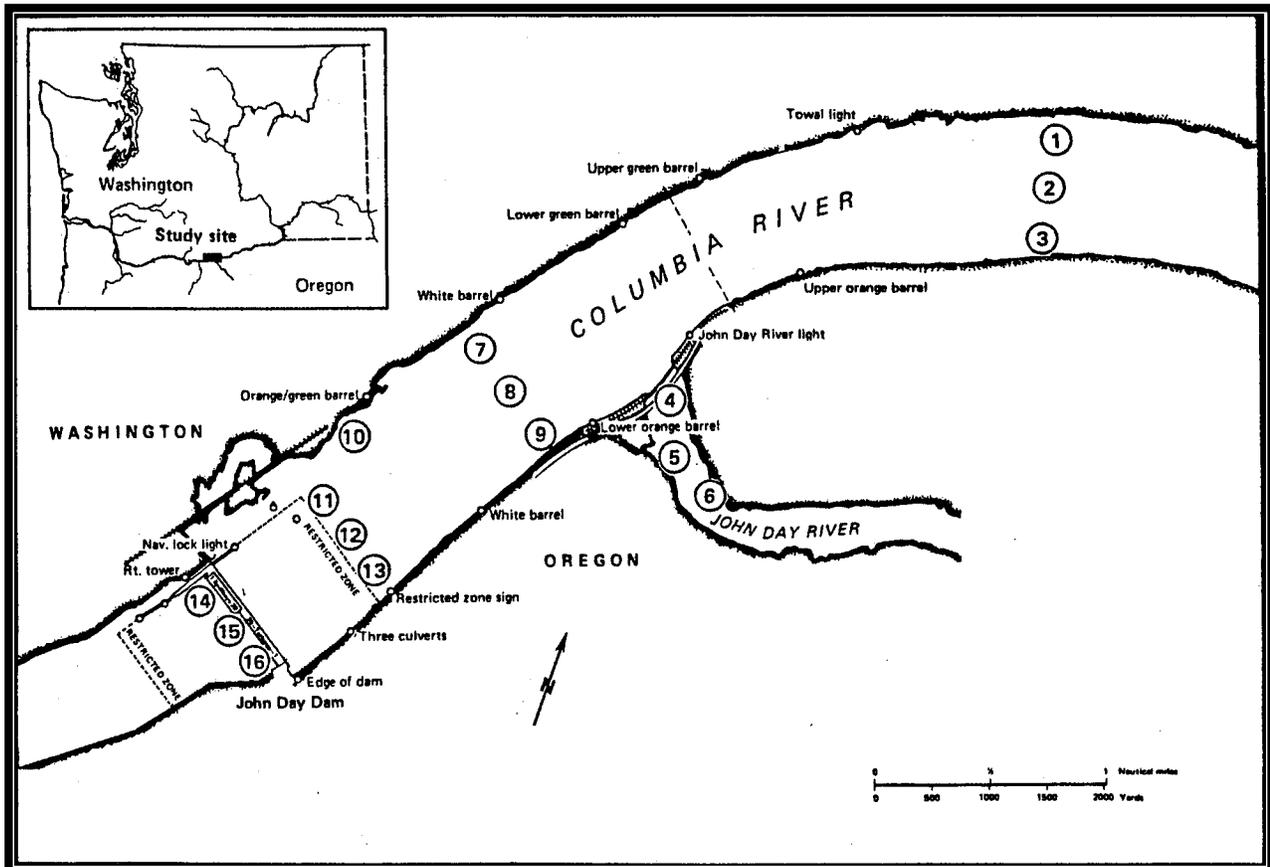


Figure 1.--Study area for adult salmonid passage-delay program, John Day Dam region, Columbia River. Circled numbers indicate sampling sites (sampling sites on downstream side of The Dalles and Bonneville Dams not shown).

Table 1.--Concentrations of aromatic compounds in sediment and water collected from the John Day Dam region, Columbia River.

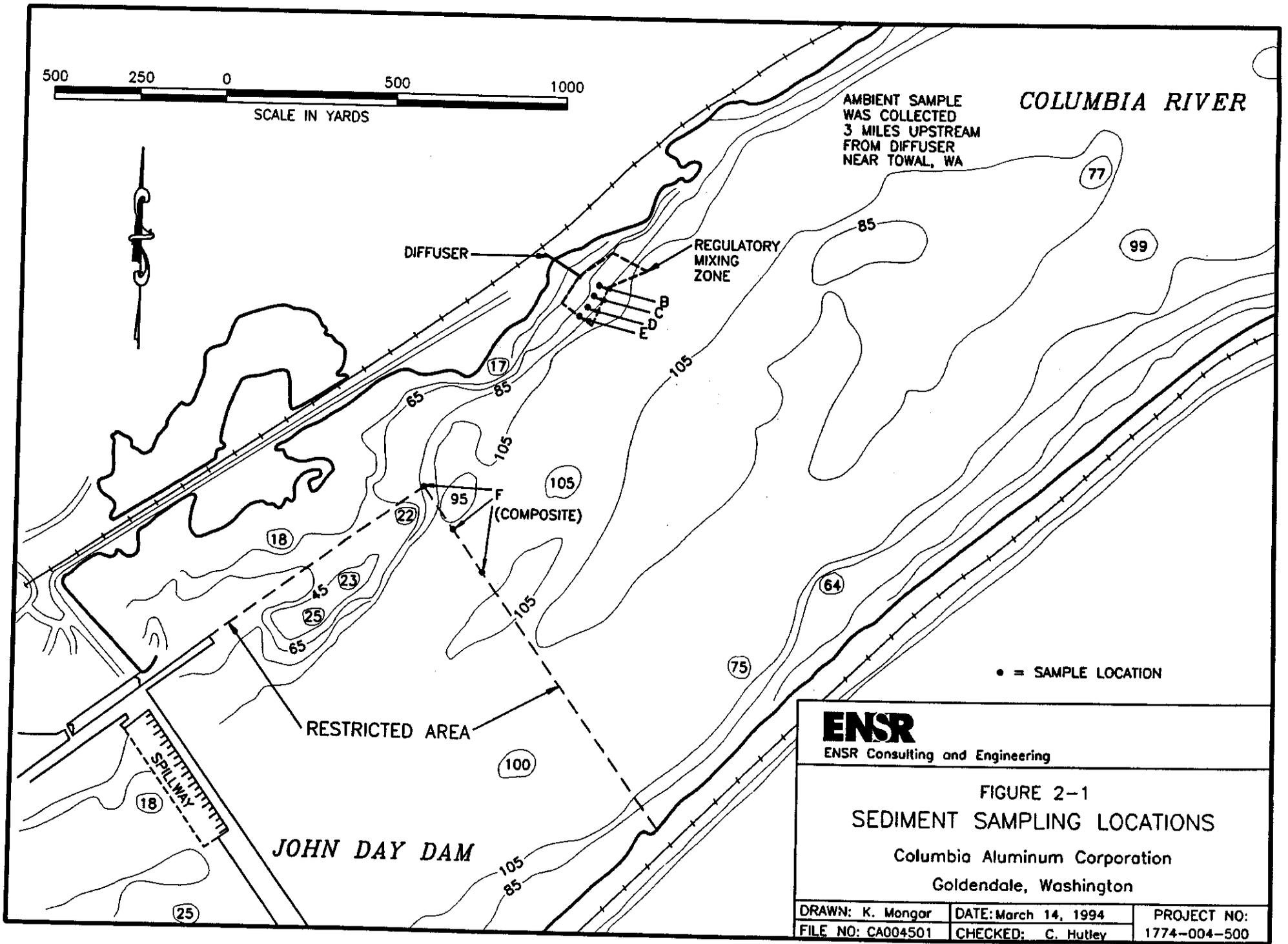
Compound	Settling pond water (ng/ml) 6/11/82	Sediment (ng/g, dry weight)							
		Station 2 4/24/82	Station 4 4/24/82	Station 10 4/24/82-1	Station 10 4/24/82-2	Station 10+ 6/11/82	Station 10 6/11/82	L1 6/11/82	L2 6/11/82
isopropylbenzene	<.08	<.83	<.83	<.83	<.83	<.5	3.0	13	<1.0
n-propylbenzene	<.09	<.92	<.92	<.92	<.92	<.5	1.5	<1.1	(1.0)
indan	0.09	<.87	<.87	<.87	<.87	<.5	1.2	3.7	1.4
tetramethylbenzene	<.08	(.83	<.83	(.83	(.83	<.5	<.5	<1.0	(1.0)
naphthalene	<.07	<.76	<.76	13	12	<.5	0.5	42	29
benzothiophene	<.10	<1.1	<1.1	<1.1	(1.1	4.0	10	3.4	4.7
2-methylnaphthalene	(.08	<.85	<.85	5.7	6.1	18	13	20	9.7
1-methylnaphthalene	<.07	<.40	<.70	2.9	3.2	6.6	11	19	33
biphenyl	<.08	<.80	<.80	<.80	<.80	<.5	<.5	.8	6.3
2,6-dimethylnaphthalene	0.08	<.82	0.82	<.82	<.82	<.5	0.8	2.9	<.7
acenaphthene	<.07	<.73	<.73	16	13	8.0	5.6	110	55
trimethylnaphthalene	<.08	<.72	3.4	<.72	<.72	<.5	4.4	<.7	<.7
fluorene	<.07	<.82	<.82	23	20	13	8.2	78	44
dlbenzothiophene	<.08	<.80	<.80	10	10	1.1	(.5	39	22
phenanthrene	<12	16	14	230	230	100	66	830	460
anthracene	<.07	(.85	<.85	140	140	37	16	200	88
1-methylphenanthrene	0.64	<.5	<.84	30	30	27	22	59	43
3,6-dimethylphenanthrene	0.25	<2.3	<2.3	25	25	11	11	53	26
fluoranthene	0.69	49	13	1100	1200	340	140	2000	1400
pyrene	0.51	49	14	1100	1200	360	150	2300	1500
benz[ajanthracene	0.52	20	4.3	1500	2000	280	100	1200	720
chrycene	1.5	39	12	4000	5800	780	310	2100	1500
benzo[e]pyrene	0.93	23	6.9	1800	2400	330	180	1300	770
benzo[a]pyrene	0.37	19	4.7	1700	2100	270	150	1200	720
perylene	<0.07	28	13	400	460	83	78	320	180
dlbenzanthracene	0.10	7.4	<1.9	630	700	140	94	430	280

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COLUMBIA RIVER SEDIMENTS AOC

ENSR (1994)

Baseline Sediment Characterization Report



ENSR
 ENSR Consulting and Engineering

FIGURE 2-1
 SEDIMENT SAMPLING LOCATIONS

Columbia Aluminum Corporation
 Goldendale, Washington

DRAWN: K. Mongar	DATE: March 14, 1994	PROJECT NO:
FILE NO: CA004501	CHECKED: C. Hutley	1774-004-500

TABLE 4-4a

**Analytical Results for PAHs
($\mu\text{g}/\text{kg}$ dry weight)**

Analyte	Station					
	A	B	C	D	E	F
Naphthalene	<20 ¹	<20	<20	<20	<20	<20
Acenaphthylene	<20	<20	<20	<20	<20	<20
Acenaphthene	<20	<20	<20	<20	<20	<20
Fluorene	<20	<20	<20	<20	<20	<20
Phenanthrene	27	18 ²	24	28	19 ²	32
Anthracene	<20	<20	6 ²	14 ²	8 ²	<20
2-Methylnaphthalene	<20	<20	<20	<20	<20	<20
Fluoranthene	83	58	71	70	52	95
Pyrene	77	54	64	59	45	83
Benz(a)anthracene	<200	<200	<200	60 ²	<200	<200
Chrysene	<200	<200	<200	70 ²	<200	<200
Benzo(b+k)fluoranthene	<400	<200	190 ²	190 ²	120 ²	<400
Benzo(a)pyrene	<200	<200	60 ²	80 ²	70 ²	<200
Indeno(1,2,3-cd)pyrene	<200	<200	90 ²	80 ²	100 ²	<200
Dibenz(a,h)anthracene	<200	<200	<200	<200	<200	<200
Benzo(g,h,i)perylene	<200	<200	<200	<200	80 ²	<200
Dibenzofuran	<20	<20	<20	<20	<20	<20

1 - "<" indicates that the analyte was not detected at the concentration shown.
2 - Estimated value.

TABLE 4-4b

**Analytical Results for PAHs
(mg/kg TOC)**

Analyte	Station					
	A	B	C	D	E	F
Naphthalene	ND ¹	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND
Acenaphthene	ND	ND	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND
Phenanthrene	1.5	5.0	4.3	7.6	7.9	1.6
Anthracene	ND	ND	1.1	3.8	3.3	ND
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND
Fluoranthene	4.7	16.1	12.7	18.9	21.7	4.6
Pyrene	4.4	15.0	11.4	15.9	18.8	4.0
Benz(a)anthracene	ND	ND	ND	16.2	ND	ND
Chrysene	ND	ND	ND	18.9	ND	ND
Benzo(b+k)fluoranthene	ND	ND	33.9	5.1	50	ND
Benzo(a)pyrene	ND	ND	10.7	21.6	29.2	ND
Indeno(1,2,3-cd)pyrene	ND	ND	16.1	21.6	41.7	ND
Dibenz(a,h)anthracene	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	33.3	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND
Total Organic Carbon	1.75%	0.36%	0.56%	0.37%	0.24%	2.05%

1 - "ND" indicates that the analyte was not detected.

TABLE 4-5

**Analytical Results for Metals
(mg/kg dry weight)**

Analyte	Station					
	A	B	C	D	E	F
Aluminum	65,300	54,200	55,500	51,800	56,400	64,000
Antimony	2.0	<1.0 ¹	1.0	<1.0	<1.0	3.0
Arsenic	18.4	3.7	5.3	5.6	4.0	19.5
Barium	639	651	706	598	727	596
Beryllium	2	2	2	2	2	2
Cadmium	7.8	0.7	1.3	0.8	0.6	7.6
Chromium	52	36	32	39	39	52
Cobalt	17	10	10	11	9	15
Copper	36	8	13	11	8	42
Lead	76.8	21.8	26.8	24.2	19.1	82.5
Manganese	846	573	632	650	547	1,006
Mercury	0.15	0.03	0.04	0.02	<0.01	0.16
Nickel	35	18	18	21	20	34
Silver	<0.5	<0.5	<0.5	<0.5	<0.5	1.3
Zinc	314	98	115	108	85	301

1 - "<" indicates that the analyte was not detected at the concentration shown.

TABLE 4-6

**Analytical Results for Oil and Grease,
Total Fluoride, and Cyanide**

Station	Oil and Grease (mg/kg)	Total Fluoride (mg/kg)	Total Cyanide (mg/kg)	Amenable Cyanide (mg/kg)
A	165	1,100	<0.8 ¹	NA ²
B	64	264	<0.8	NA
C	100	261	<0.8	NA
D	70	239	<0.8	NA
E	5	288	<0.8	NA
F	127	308	<0.8	NA

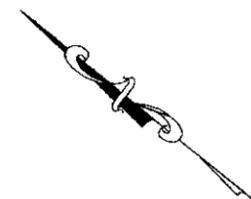
1 - "<" indicates that the analyte was not detected at the concentration shown.
 2 - Cyanide, amenable to chlorination, was not performed because no total cyanide was detected in any sample.

APPENDIX B-1

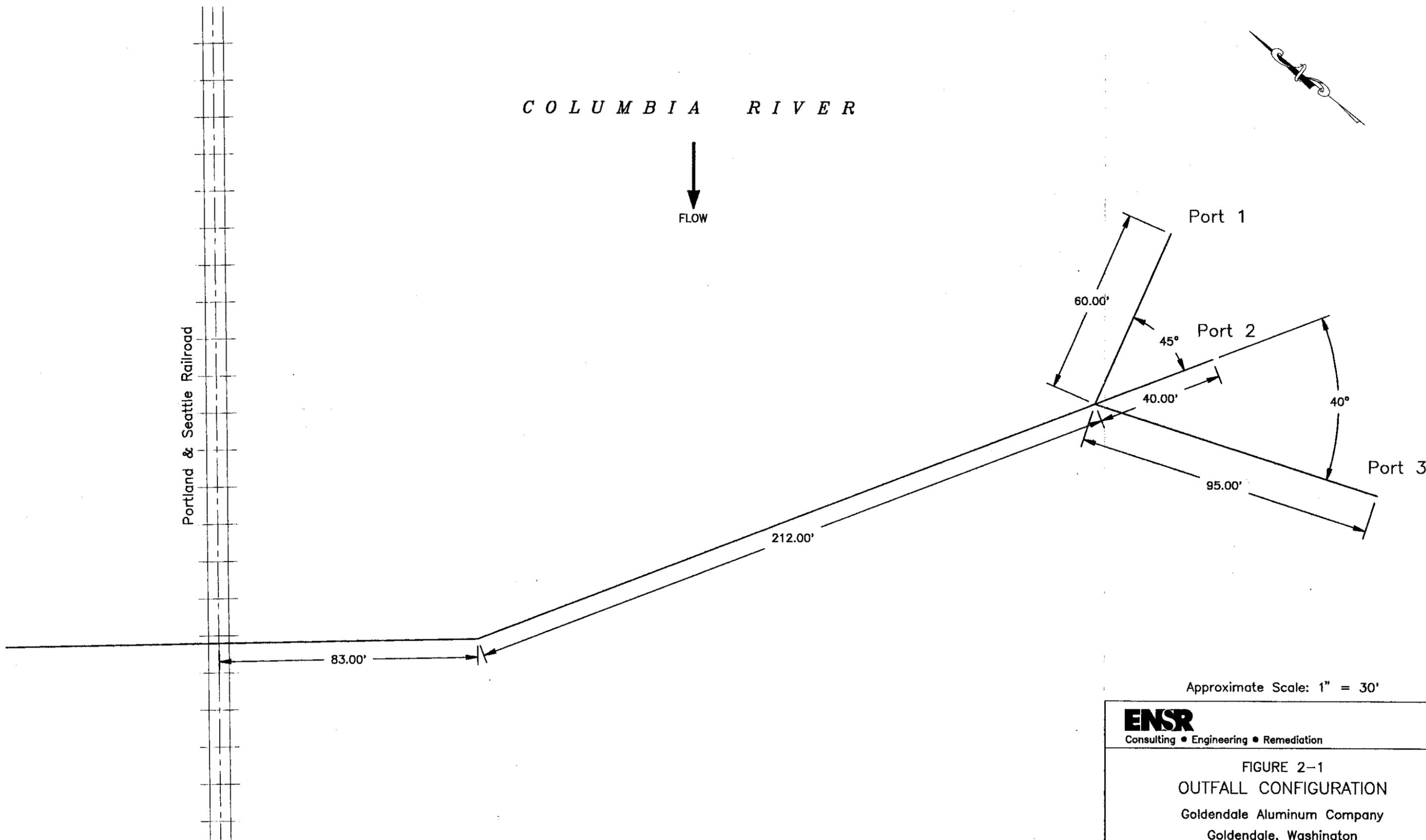
COLUMBIA RIVER SEDIMENTS AOC

**ENSR (1997)
Dilution Ratio/Mixing Zone Study**

C O L U M B I A R I V E R



Portland & Seattle Railroad



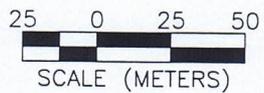
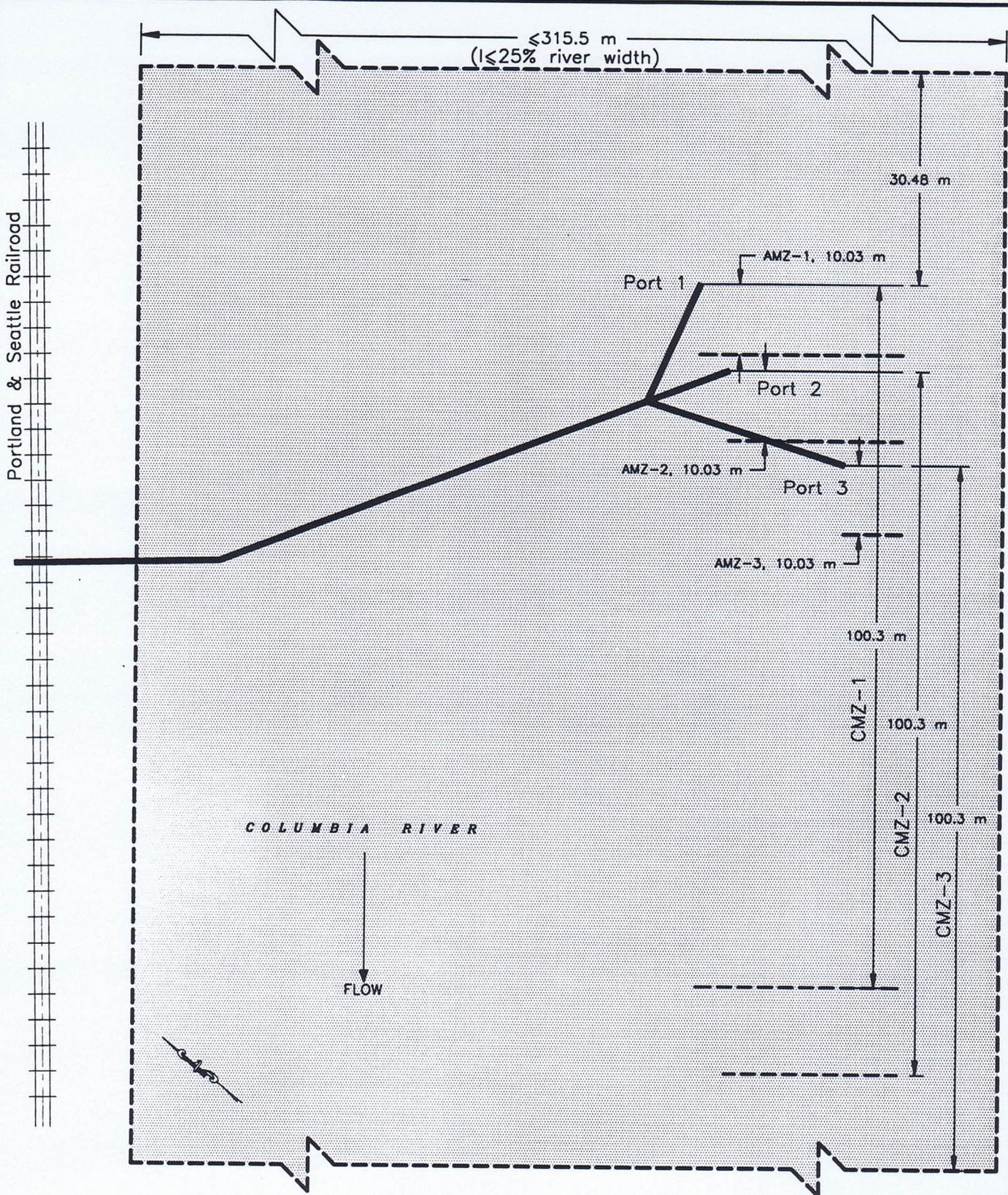
Approximate Scale: 1" = 30'

ENSR

Consulting • Engineering • Remediation

FIGURE 2-1
OUTFALL CONFIGURATION
Goldendale Aluminum Company
Goldendale, Washington

DRAWN: Mongar/Chin	DATE: January 1997	PROJECT NO:
FILE NO: GA1050D	CHECKED: Khangonkar	1774-010-500



NOTE:
 PLUME WIDTH (l) IS NOT TO EXCEED 25% OF THE RIVER WIDTH (1261.9 m). CHRONIC MIXING ZONE (CMZ) BOUNDARY IS 91.4 m+ DEPTH (8.8 m). ACUTE MIXING ZONE (AMZ) BOUNDARY IS 10% OF THE CMZ.

ENSR
 ENSR Consulting and Engineering

FIGURE 3-1
 ACUTE AND CHRONIC MIXING ZONE BOUNDARIES
 Goldendale Aluminum Company
 Goldendale, Washington

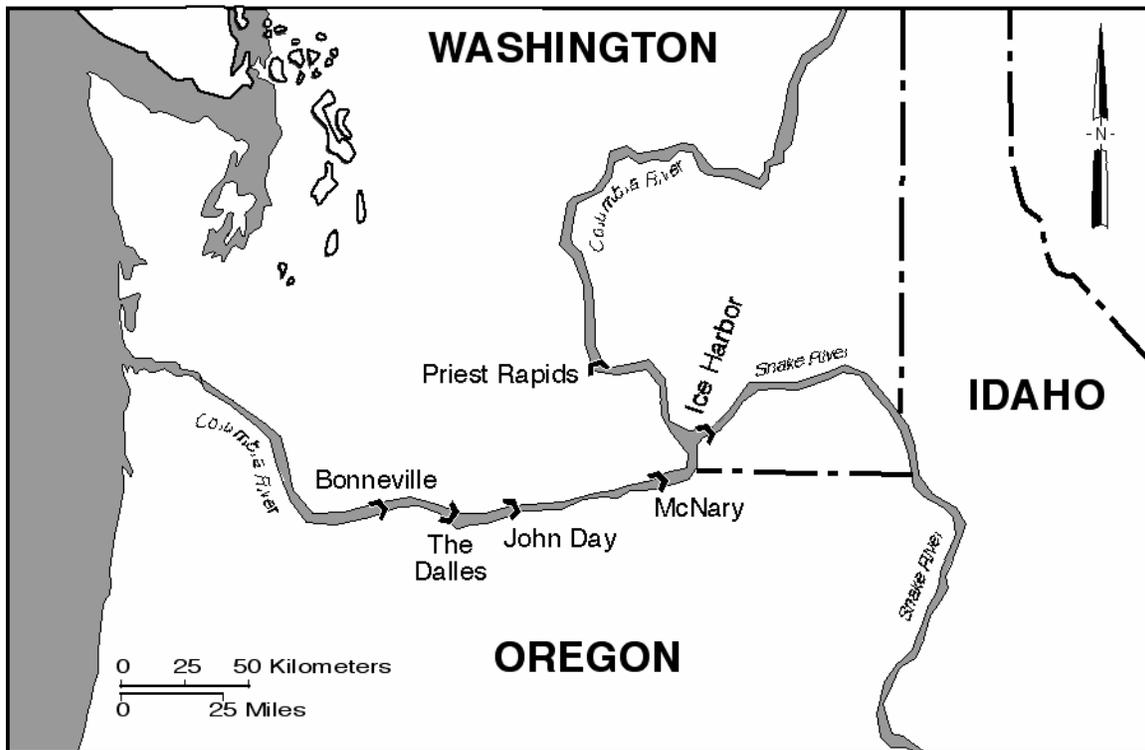
DRAWN: NTC/SDS	DATE: JANUARY 1997	PROJECT NO:
FILE: GA1050E	CHECKED: Khangaonkar	1774-010-500

APPENDIX B-1

COLUMBIA RIVER SEDIMENTS AOC

WSDH et al. (2005)

Sediment Survey of Potential Hanford Site Contaminants



G04070041.1

Figure 1. Map of Sediment Sampling Locations.

Table 1. Sediment Sampling Locations, 2003 (degrees_minutes.decimal minutes)

Impoundment	Location	Latitude	Longitude
Bonneville	OR Shore	45° 38.349'	121° 56.725'
	OR Beach	45° 34.477'	121° 55.952'
The Dalles	OR Shore	45° 37.340'	121° 06.796'
	WA Shore	45° 37.599'	121° 07.212'
John Day	OR Shore	45° 43.075'	120° 40.763'
	Midway	45° 43.250'	120° 40.836'
	WA Shore	45° 43.568'	120° 41.081'
McNary	OR Beach	45° 55.879'	119° 15.997'
	OR Shore	45° 55.999'	119° 15.562'
	2/3 From OR Shore	45° 56.545'	119° 15.388'
	WA Shore	45° 56.784'	119° 15.377'
	WA Beach	45° 56.775'	119° 14.692'

Table B.2. Concentrations of Metals in Columbia River Sediment ($\mu\text{g/g}$ dry wt.)

WDOE Proposed Standards														
	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb		
Proposed WA Sediment Quality Standard ^(a)	--	0.4	20	--	--	0.6	--	95	80	--	--	335		
Proposed WA Sediment Cleanup Screening Level ^(a)	--	0.6	51	--	--	1.0	--	100	830	--	--	430		
WDOE Results														
Sample No.	Location	Date	Al	Sb	As	Ba	Be	Cd	Ca	Cr	Co	Cu	Fe	Pb
B17BB8	Bonneville OR Shore	08/07/03	11,000	4.3	4.8	120	1.1	1.1	4,400	16	12	23	24,000	13
B17BB5	Bonneville OR Beach	08/07/03	11,000	3	1.5	79	0.74	1.5	4,500	15	21	16	42,000	4
B17B93	Dallas Dam OR Shore	08/07/03	12,000	4.5	4.6	120	1.1	1.4	4,800	18	13	23	27,000	14
B17B99	Dallas Dam WA Shore	08/08/03	5,500	2.6	3.3	72	0.65	0.65	3,100	9.4	10	7.5	22,000	7.3
B17B84	John Day WA Shore	08/08/03	18,000	5.5	7.4	170	1.4	2.4	5,900	25	19	34	37,000	22
B17B81	John Day Mid River	08/08/03	19,000	6.1	8.6	170	1.5	2.3	6,100	27	18	35	37,000	23
B17B78	John Day Dam OR Shore	08/08/03	22,000	5.9	9.5	210	1.5	2.5	6,800	30	22	46	44,000	27
B17B60	McNary Dam OR Shore	08/08/03	17,000	5.1	7.6	150	1.3	1.9	5,800	26	17	31	34,000	20
B17B57	McNary Dam OR Beach	08/08/03	2,900	2.4	2.1	53	0.6	1.2	3,500	3.7	12	7.1	24,000	2.1
B17B65	McNary 2/3 OR Shore	08/08/03	11,000	3.7	5.8	110	0.93	1.4	4,700	21	13	19	27,000	18
B17B66 (dup)	McNary 2/3 OR Shore	08/08/03	11,000	3.5	5.9	110	0.88	1.4	4,500	20	13	19	26,000	18
B17B72	McNary Dam WA Beach	08/08/03	3,800	2.5	1.8	68	0.62	1.2	3,700	5.7	13	8.2	27,000	2.5
B17B67	McNary Dam WA Shore	08/08/03	9,100	3.4	4.3	92	0.84	1.0	4,000	16	11	15	24,000	14
PNNL Results														
B17BK5	Bonneville Dam OR Shore	08/07/03	NA	0.84	5.96	NA	1.60	0.88	NA	57.3	NA	32.1	NA	18.7
B17BK5 (dup)	Bonneville Dam OR Shore	08/07/03	NA	0.86	6.09	NA	1.55	0.89	NA	59.0	NA	32.3	NA	18.4
B17BK1	Dalles Dam Mid. River	08/07/03	NA	0.6	5.57	NA	1.60	1.21	NA	57.2	NA	30.8	NA	17.6
B17BJ7	John Day Dam Mid. River	08/08/03	NA	0.82	9.90	NA	1.89	2.02	NA	69.3	NA	40.2	NA	25.6
B17BJ3	McNary 2/3 OR Shore	08/08/03	NA	0.7	7.55	NA	1.79	1.48	NA	73.2	NA	26.7	NA	24.7
SESP Results														
B17704	PRD-Grant Co. Side	07/14/03	NA	0.91	9.73	NA	1.56	8.93	NA	86.9	NA	50.0	NA	49.6
B17704 (dup)	PRD-Grant Co. Side	07/14/03	NA	0.9	9.50	NA	1.47	9.02	NA	86.9	NA	49.8	NA	50.2
B17702	PRD-Yakima Co. Side	07/14/03	NA	0.9	9.20	NA	1.50	5.99	NA	92.1	NA	45.9	NA	54.2

Table B.2. (contd)

WDOE Proposed Standards													
	Mg	Mn	Ni	K	Se	Ag	Na	Tl	V	Zn	Hg		
Proposed WA Sediment Quality Standard ^(a)	--	--	60	--	--	2.0	--	--	--	140	0.50		
Proposed WA Sediment Cleanup Screening Level ^(a)	--	--	70	--	--	2.5	--	--	--	160	0.75		
WDOE Results													
Sample No.	Location	Date	Mg	Mn	Ni	K	Se	Ag	Na	Tl	V	Zn	Hg
B17BB8	Bonneville OR Shore	08/07/03	4,200	510	16	1,400	1.3	2.1	340	2.1	58	140	0.21
B17BB5	Bonneville OR Beach	08/07/03	7,000	450	30	450	1.5	1.5	390	3	120	64	0.15
B17B93	Dallas Dam OR Shore	08/07/03	4,100	400	16	1,500	1.1	2.2	330	2.2	62	160	0.22
B17B99	Dallas Dam WA Shore	08/08/03	3,100	370	9.7	830	0.96	1.3	170	1.3	62	84	0.13
B17B84	John Day WA Shore	08/08/03	6,400	680	24	2,500	1.6	2.8	320	2.8	73	240	0.28
B17B81	John Day Mid River	08/08/03	6,700	770	25	2,500	1.5	3	320	3	71	250	0.3
B17B78	John Day Dam OR Shore	08/08/03	7,500	840	29	3,000	1.5	2.9	370	2.9	87	270	0.29
B17B60	McNary Dam OR Shore	08/08/03	6,700	640	25	2,300	1.3	2.5	280	2.5	64	220	0.25
B17B57	McNary Dam OR Beach	08/08/03	3,200	280	6.1	490	1.2	1.2	130	2.4	72	53	0.18
B17B65	McNary 2/3 OR Shore	08/08/03	5,500	630	20	1,700	0.93	1.9	220	1.9	50	240	0.19
B17B66 (dup)	McNary 2/3 OR Shore	08/08/03	5,300	600	19	1,700	0.88	1.8	220	1.8	48	230	0.12
B17B72	McNary Dam WA Beach	08/08/03	4,200	450	15	1,400	0.84	1.7	210	1.7	47	160	NA
B17B67	McNary Dam WA Shore	08/08/03	3,900	410	7.9	660	1.2	1.2	140	2.5	77	46	NA
PNNL Results													
B17BK5	Bonneville Dam OR Shore	08/07/03	NA	NA	25	NA	0.477	0.314	NA	0.445	NA	175	0.512
B17BK5 (dup)	Bonneville Dam OR Shore	08/07/03	NA	NA	27	NA	0.477	0.319	NA	0.462	NA	180	0.168
B17BK1	Dalles Dam Mid. River	08/07/03	NA	NA	24.0	NA	0.477	0.337	NA	0.535	NA	179	0.0533
B17BJ7	John Day Dam Mid. River	08/08/03	NA	NA	32	NA	0.477	0.433	NA	0.694	NA	261	0.105
B17BJ3	McNary 2/3 OR Shore	08/08/03	NA	NA	30	NA	0.477	0.438	NA	0.729	NA	276	0.0927
SESP Results													
B17704	PRD-Grant Co. Side	07/14/03	NA	NA	42	NA	0.477	0.484	NA	1.72	NA	591	0.167
B17704 (dup)	PRD-Grant Co. Side	07/14/03	NA	NA	42	NA	0.477	0.469	NA	1.74	NA	594	0.171
B17702	PRD-Yakima Co. Side	07/14/03	NA	NA	47	NA	0.477	0.447	NA	1.15	NA	495	0.187
(a) Michelsen (2003). Bold values are below the listed detection limit. Co = County; dup = Duplicate; NA = Not analyzed; PNNL = Pacific Northwest National Laboratory; PRD = Priest Rapids Dam; SESP = Surface Environmental Surveillance Project; WDOH = Washington State Department of Health.													

Table B.3. Simultaneously Extracted Metal/Acid Volatile Sulfide (SEM/AVS) Concentrations ($\mu\text{mol/g}$ dry wt.) for Columbia River Sediment

Sample No.	Location	Date	% Dry Weight	AVS	SEM Cd	SEM Cu	SEM Hg	SEM Ni	SEM Pb	SEM Zn
B17BK3	Bonneville Dam OR Shore	8/7/2003	49.0	3.631	0.0053	0.195	0.000009	0.103	0.054	1.487
B17BJ9	Dalles Dam OR. Shore	8/7/2003	48.9	4.166	0.0083	0.205	0.000016	0.097	0.059	1.791
B17BJ9 (dup)	Dalles Dam OR. Shore	8/7/2003	48.9	3.420	0.0080	0.198	0.000014	0.094	0.057	1.703
B17BK2	Dalles Dam WA Shore	8/7/2003	73.8	0.051	0.0033	0.068	0.000029	0.046	0.033	0.752
B17BJ5	John Day Dam OR Shore	8/8/2003	36.7	3.292	0.0143	0.419	0.000013	0.174	0.105	2.735
B17BJ6	John Day Dam Mid. River	8/8/2003	38.5	7.575	0.0143	0.286	0.000014	0.142	0.093	2.835
B17BJ8	John Day Dam WA Shore	8/8/2003	51.8	8.385	0.0161	0.274	0.000007	0.158	0.087	2.434
B17BJ1	McNary OR Shore	8/8/2003	39.3	4.900	0.0129	0.261	0.000019	0.155	0.083	2.388
B17BJ2	McNary 2/3 OR Shore	8/8/2003	57.7	0.118	0.0104	0.181	0.000161	0.098	0.074	2.224
B17BJ4	McNary WA Shore	8/8/2003	59.9	0.069	0.0090	0.145	0.000115	0.081	0.061	1.717
B17BJ4 (dup)	McNary WA Shore	8/8/2003	59.9	0.075	0.0087	0.142	0.000120	0.068	0.060	1.704
Detection Limit (mean DL used for AVS)				0.123	0.0001	0.0001	0.0000003	0.0001	0.00002	0.0009
B17703	Priest Rapids Grant Co. Side	7/14/2003	47.2	7.47	0.0770	0.3509	0.0000065	0.157	0.189	8.379
B17703 (dup)	Priest Rapids Grant Co. Side	7/14/2003	45.2	7.09	0.0743	0.38327	0.0000201	0.178	0.185	8.193
B17701	Priest Rapids Yakima Co. Side	7/14/2003	51.1	3.83	0.0442	0.46107	0.0000083	0.210	0.184	6.014
B17701(dup)	Priest Rapids Yakima Co. Side	7/14/2003	51.1	3.61	0.0430	0.46193	0.0000107	0.210	0.179	5.950
Bold = Value was below detection limit.				0.086	0.00006	0.00008	0.0000002	0.00005	0.00002	0.001
Co = County; dup = Duplicate. DL = Detection limit.										

Table B.5. Semivolatile Organic Compounds in Columbia River Sediment (all values in µg/kg dry wt.). All results were below the detection limits listed in Table B.4.

Analyte	Proposed WA Sediment Quality Standard (a)	Proposed WA Cleanup Screening Level (a)	Columbia River Sediment Concentration						
			Bonneville OR SH	Dalles OR SH	Dalles WA SH	McNary 2/3 OR SH	Bonneville OR Beach	John Day WA SH	John Day Mid-River
2-Methylnaphthalene	470	560	330	330	330	330	330	330	330
Acenaphthene	1,060	1,320	330	330	330	330	330	330	330
Acenaphthylene	470	640	330	330	330	330	330	330	330
Anthracene	1,200	1,580	330	330	330	330	330	330	330
Benanthracene	4,260	5,800	330	330	330	330	330	330	330
Benzopyrene	3,300	4,810	330	330	330	330	330	330	330
Benzofluoranthenes	11,000	14,000	330	330	330	330	330	330	330
Benzoperylene	3,300	4,810	330	330	330	330	330	330	330
Chrysene	5,940	6,400	330	330	330	330	330	330	330
Dibenzanthracene	800	840	330	330	330	330	330	330	330
Fluoranthene	11,000	15,000	330	330	330	330	330	330	330
Fluorene	1,000	3,000	330	330	330	330	330	330	330
Indenopyrene	4,120	5,300	330	330	330	330	330	330	330
Napthalene	500	1,310	330	330	330	330	330	330	330
Phenanthrene	6,100	7,600	330	330	330	330	330	330	330
Pyrene	8,800	16,000	330	330	330	330	330	330	330
LPAH's	6,600	9,200	--	--	--	--	--	--	--
HPAH's	3,100	54,800	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	230	320	330	330	330	330	330	330	330
Butylbenzylphthalate	260	370	330	330	330	330	330	330	330
Dimethylphthalate	46	440	330	330	330	330	330	330	330
Di-n-octyl phthalate	26	45	330	330	330	330	330	330	330
Dibenzofuran	400	440	330	330	330	330	330	330	330

Table B.5. (contd)

Analyte	Proposed WA Sediment Quality Standard (a)	Proposed WA Cleanup Screening Level (a)	Columbia River Sediment Concentration					
			McNary 2/3 OR SH dup	John Day OR SH	McNary WA SH	McNary WA Beach	McNary OR Beach	McNary Dam OR SH
2Methylnaphthalene	470	560	330	330	330	330	330	330
Acenaphthene	1,060	1,320	330	330	330	330	330	330
Acenaphthylene	470	640	330	330	330	330	330	330
Anthracene	1,200	1,580	330	330	330	330	330	330
Benzanthracene	4,260	5,800	330	330	330	330	330	330
Benzopyrene	3,300	4,810	330	330	330	330	330	330
Benzofluoranthenes	11,000	14,000	330	330	330	330	330	330
Benzoperylene	3,300	4,810	330	330	330	330	330	330
Chrysene	5,940	6,400	330	330	330	330	330	330
Dibenzanthracene	800	840	330	330	330	330	330	330
Fluoranthene	11,000	15,000	330	330	330	330	330	330
Fluorene	1,000	3,000	330	330	330	330	330	330
Indenopyrene	4,120	5,300	330	330	330	330	330	330
Napthalene	500	1,310	330	330	330	330	330	330
Phenanthrene	6,100	7,600	330	330	330	330	330	330
Pyrene	8,800	16,000	330	330	330	330	330	330
LPAH's	6,600	9,200	-	-	-	-	-	-
HPAH's	3,100	54,800	-	-	-	-	-	-
Bis(2-ethylhexyl)phthalate	230	320	330	330	330	330	330	330
Butylbenzylphthalate	260	370	330	330	330	330	330	330
Dimethylphthalate	46	440	330	330	330	330	330	330
Di-n-octyl phthalate	26	45	330	330	330	330	330	330
Dibenzofuran	400	440	330	330	330	330	330	330

a) Michelsen, 2003. SH = Shore.

Table B.6. Sediment Grain Size Distributions for Columbia River Sediment

Sponsor ID	Sample Description	Date	Total Solids (%)	Grain Size (Percent of Total Weight Recovered)				
				Gravel (2.0 mm)	Sand, Very Coarse (1.0 mm)	Sand, Coarse (0.5 mm)	Sand, Medium (0.25 mm)	Sand, Fine (0.125 mm)
B17BM3	Bonneville Dam OR Shore Beach	08/07/2003	70.6	1.81	4.36	25.7	44.3	16.6
B17BM3 (Dup)	Bonneville Dam OR Shore Beach	08/07/2003	70.4	1.74	4.26	27.5	45.4	15.0
B17BM3 (Tri)	Bonneville Dam OR Shore Beach	08/07/2003	--	2.02	4.75	25.9	45.0	16.5
B17BM5	Bonneville Dam OR Shore	08/07/2003	53.2	0.02	0.16	0.39	1.33	15.0
B17BL9	Dalles Dam OR Shore	08/07/2003	50.7	0.04	0.10	0.19	0.47	3.23
B17BM1	Dalles Dam WA Shore	08/07/2003	72.3	0.11	0.13	4.02	39.6	34.6
B17BL4	Johns Dam OR. Shore	08/08/2003	39.3	0.42	0.03	0.16	0.24	0.38
B17BL5	Johns Dam Mid-River	08/08/2003	29.8	0.00	0.08	0.51	3.54	3.95
B17BL6	Johns Dam WA Shore	08/08/2003	43.0	0.00	0.05	0.16	0.79	4.56
B17BK7	McNary OR Shore Beach	08/08/2003	75.5	0.40	1.53	75.6	20.6	2.71
B17BK8	McNary OR Shore	08/08/2003	37.6	0.00	0.00	0.09	0.29	0.56
B17BK9	McNary 2/3 OR Shore	08/08/2003	54.6	0.00	0.00	0.04	0.46	1.82
B17BK9	McNary 2/3 OR Shore	08/08/2003	54.5	--	--	--	--	--
B17BL0 (Dup)	McNary 2/3 OR Shore,	08/08/2003	58.1	0.00	0.01	0.05	0.44	2.22
B17BL1	McNary WA Shore	08/08/2003	55.6	0.99	0.41	0.59	3.53	11.6
B17BL2	McNary WA Shore Beach	08/08/2003	81.3	0.43	0.11	1.19	86.2	10.1

Table B.6. (contd)

Sponsor ID	Sample Description	Date	Total Solids (%)	Grain Size (Percent of Total Weight Recovered)			
				Sand, Very Fine (0.0625 mm)	Silt	Clay	Check (Total % Recovered)
B17BM3	Bonneville Dam OR Shore Beach	08/07/2003	70.6	2.15	2.64	0.71	98.3
B17BM3 (Dup)	Bonneville Dam OR Shore Beach	08/07/2003	70.4	2.16	2.59	0.67	99.3
B17BM3 (Tri)	Bonneville Dam OR Shore Beach	08/07/2003	--	2.05	2.57	0.66	99.5
B17BM5	Bonneville Dam OR Shore	08/07/2003	53.2	21.50	50.2	14.1	103
B17BL9	Dalles Dam OR Shore	08/07/2003	50.7	28.30	59.4	9.35	101
B17BM1	Dalles Dam WA Shore	08/07/2003	72.3	17.10	4.23	1.70	101
B17BL4	Johns Dam OR. Shore	08/08/2003	39.3	2.36	69.4	27.1	100
B17BL5	Johns Dam Mid-River	08/08/2003	29.8	10.10	73.0	10.5	102
B17BL6	Johns Dam WA Shore	08/08/2003	43.0	14.70	64.3	15.2	99.8
B17BK7	McNary OR Shore Beach	08/08/2003	75.5	0.99	0.35	0.09	102
B17BK8	McNary OR Shore	08/08/2003	37.6	8.75	83.5	7.69	101
B17BK9	McNary 2/3 OR Shore	08/08/2003	54.6	35.7	48.3	6.38	92.7
B17BK9 (Dup)	McNary 2/3 OR Shore	08/08/2003	54.5	--	--	--	--
B17BL0	McNary 2/3 OR Shore	08/08/2003	58.1	39.60	51.3	7.67	101
B17BL1	McNary WA Shore	08/08/2003	55.6	30.6	47.9	5.54	101
B17BL2	McNary WA Shore Beach	08/08/2003	81.3	0.28	0.20	0.13	98.6
-- = No analysis/not applicable. Dup = Duplicate. Tri = Triplicate. RPD = Relative percent difference. RSD = Relative standard deviation.							

Table B.7. Total Organic Carbon Content (TOC) of Columbia River Sediment and Beach Sediment

Sample No.	Date	Location	TOC (mg/kg dry wt.)
B17BR8	07-Aug-03	Bonneville Dam OR Shore	13,300
B17BR7	07-Aug-03	Bonneville Dam OR Shore Beach	1,110
B17BR3	07-Aug-03	Dalles Dam OR Shore	12,300
B17BR5	07-Aug-03	Dalles Dam WA Shore	1,490
B17BP9	08-Aug-03	John Day Dam Mid-River	16,200
B17BP8	08-Aug-03	John Day Dam OR Shore	13,700
B17BR0	08-Aug-03	John Day Dam WA Shore	13,400
B17BP3	08-Aug-03	McNary-2/3 OR Shore	7,190
B17BP4	08-Aug-03	McNary-2/3 OR Shore	7,280
B17BP1	08-Aug-03	McNary-OR Shore Beach	216
B17BP2	08-Aug-03	McNary-Oregon Shore	12,600
B17BP6	08-Aug-03	McNary-WA Shore Beach	214
B17BP5	08-Aug-03	McNary-Wash. Shore	5,460

APPENDIX B-1

COLUMBIA RIVER SEDIMENTS AOC

USACE (1994)

Results from Site Inspection Report for John Day Dam

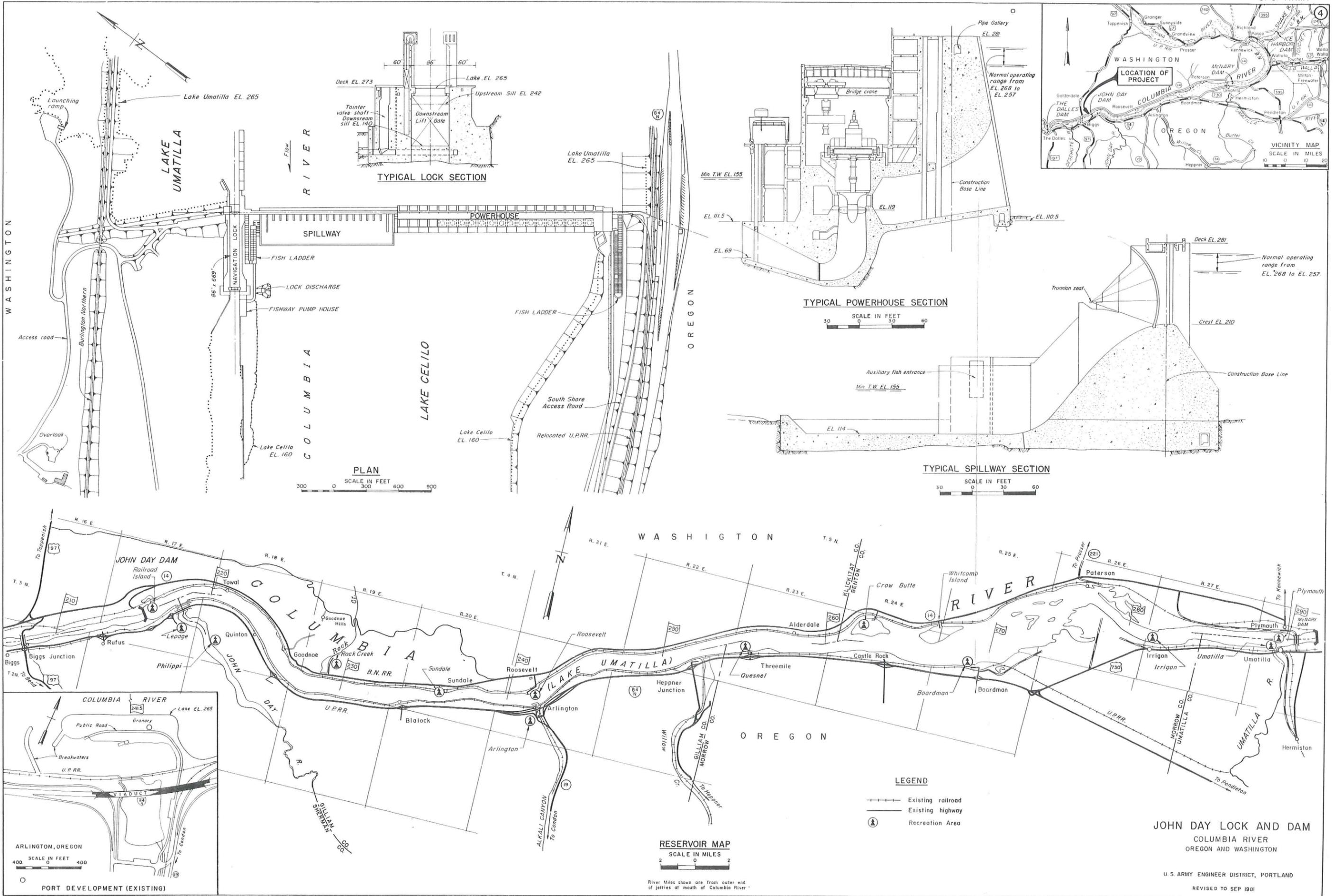


Figure 1, Principal Features of John Day Lock and Dam, Oregon / Washington

JOHN DAY LOCK AND DAM
COLUMBIA RIVER
OREGON AND WASHINGTON

U. S. ARMY ENGINEER DISTRICT, PORTLAND
REVISED TO SEP 1981

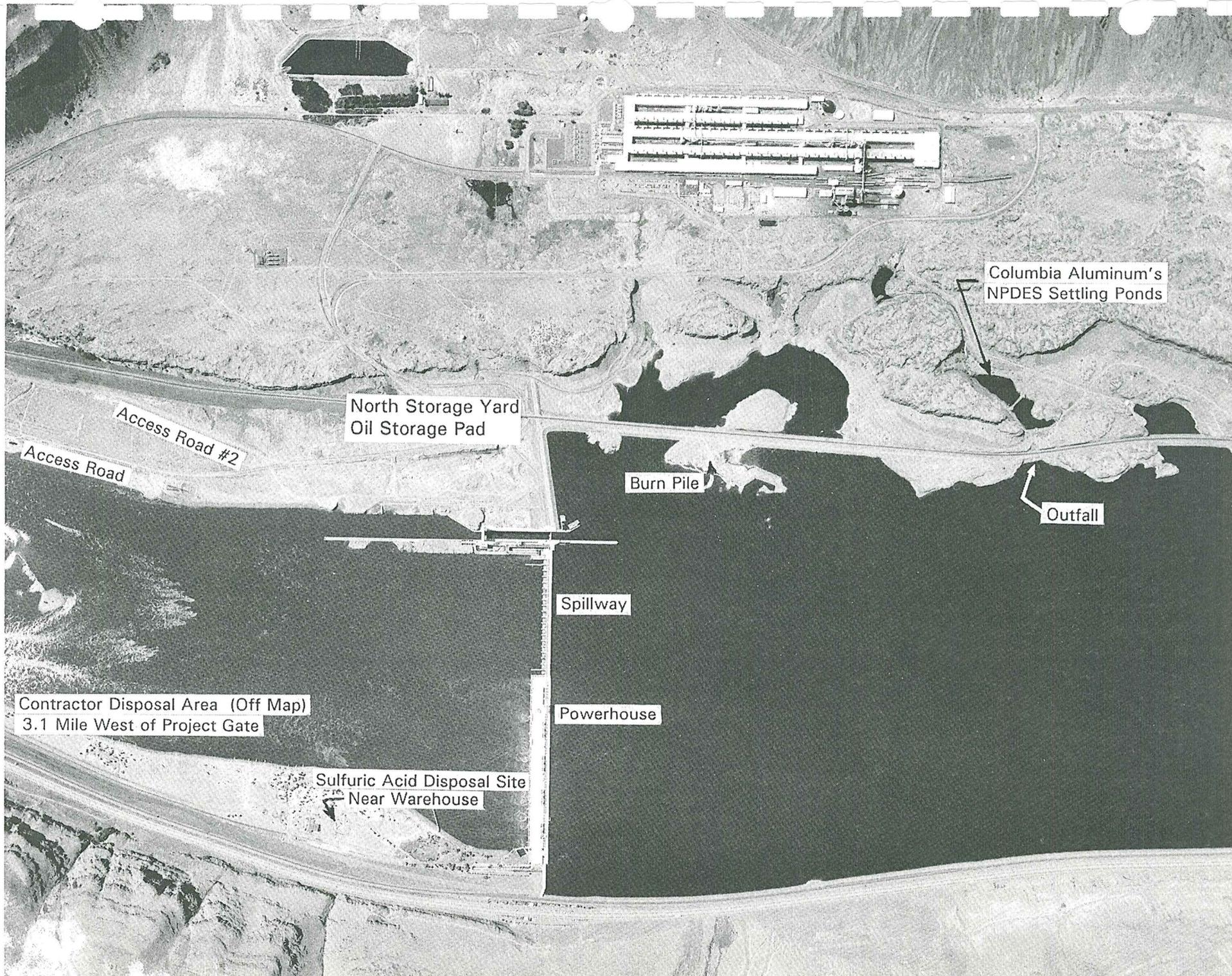
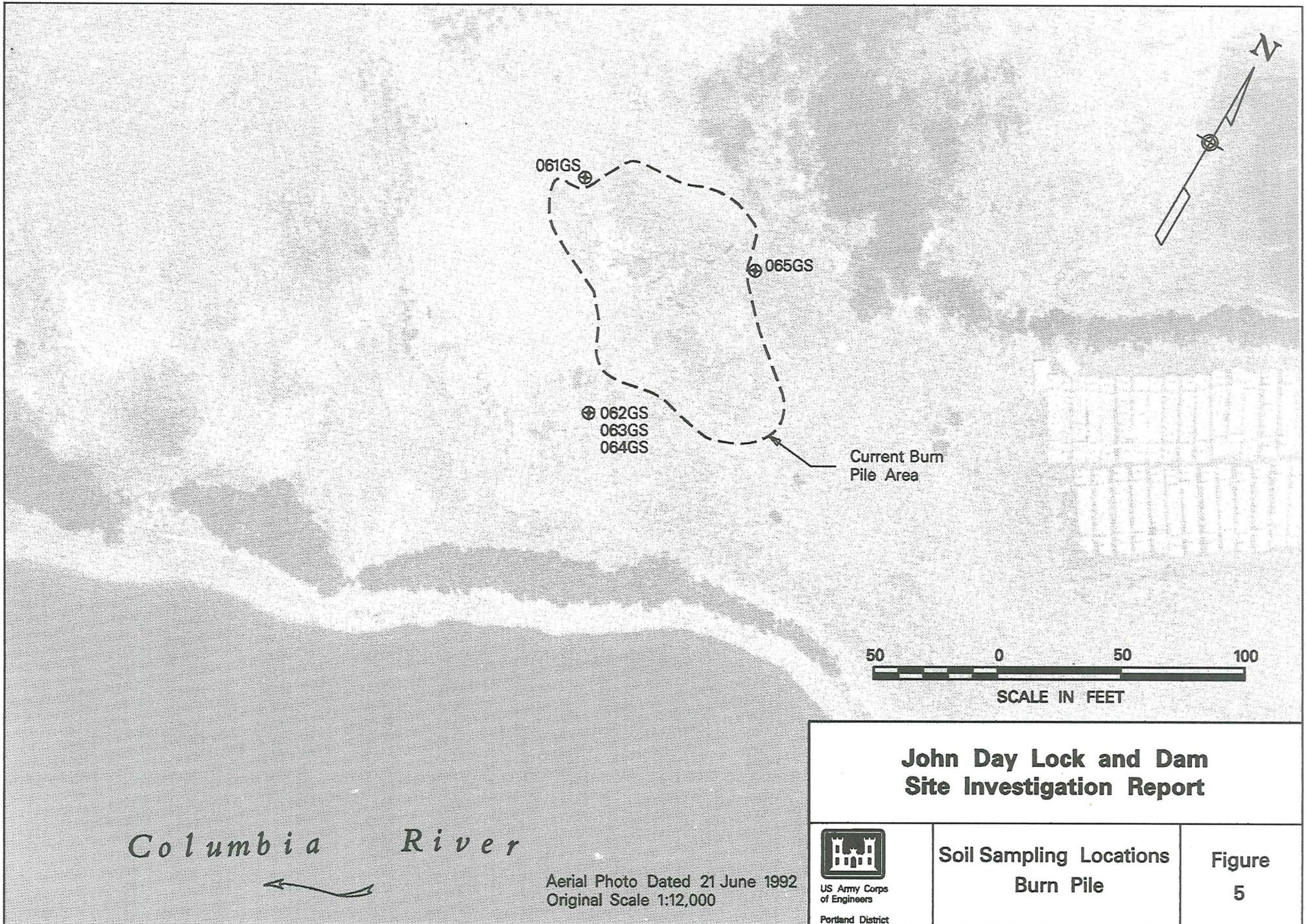


Figure 2, Sampling Areas at John Day Lock and dam, Oregon / Washington



John Day Lock and Dam Site Investigation Report



US Army Corps
of Engineers
Portland District

Soil Sampling Locations
Burn Pile

Figure
5

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No. Type / Matrix Sample Location Date	931028021GS	QA - 023GS 931028022GS	931028023GS	QC - 023GS 931028024GS	931028025GS
	Grab / Soil Const. Site 10/28/93				
VOLATILES (8240) mg/Kg					
Acetone	<0.01	<0.005	<0.01	<0.01	<0.01
Carbon Disulfide	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene	<0.005	<0.005	<0.005	<0.005	<0.005
Methylene Chloride	<0.005	0.008 (B-O)	<0.005	<0.005	<0.005
Benzene	<0.005	<0.005	<0.005	<0.005	<0.005
2-Butanone	<0.01	<0.01	<0.01	<0.01	<0.01
SEMIVOLATILES (8270) mg/Kg					
Acenaphthene	<0.36	<0.35	<0.35	<0.35	<0.35
Anthracene	<0.36	<0.35	<0.35	<0.35	<0.35
Butyl Benzo Phthalate	<0.36	<0.35	0.96	0.05 J-B	0.1 J-B
Benzo(a)anthracene	<0.36	<0.35	<0.35	<0.35	<0.35
Benzyl Alcohol	<0.36	<0.35	<0.35	<0.35	<0.35
bis-(2-Ethylhexyl)phthalate	<0.36	<0.35	<0.35	<0.35	<0.35
4-Bromophenyl phenyl ether	<0.36	<0.35	<0.35	<0.35	<0.35
Chrysene	<0.36	<0.35	<0.35	<0.35	<0.35
Di-n-butylphthalate	<0.36	<0.35	<0.35	<0.35	<0.35
Dibenzofuran	<0.36	<0.35	<0.35	<0.35	<0.35
Fluoranthene	<0.36	<0.35	<0.35	<0.35	<0.35
Fluorene	<0.36	<0.35	<0.35	<0.35	<0.35
2-Methylnapthalene	<0.36	<0.35	<0.35	<0.35	<0.35
Napthalene	<0.36	<0.35	<0.35	<0.35	<0.35
Phenanthrene	<0.36	<0.35	<0.35	<0.35	<0.35
Pyrene	<0.36	<0.35	<0.35	<0.35	<0.35
Phenol	<0.36	<0.35	<0.35	<0.35	<0.35
2-Methylphenol	<0.36	<0.35	<0.35	<0.35	<0.35
4-Methylphenol	<0.36	<0.35	<0.35	<0.35	<0.35

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No. Type Matrix Date	931028021GS	QA - 023GS 931028022GS	931028023GS	QC - 023GS 931028024GS	931028025GS
	Grab / Soil Const. Site 10/28/93				
METALS (6000) mg/Kg					
Aluminum	na	na	na	na	na
Antimony	na	na	na	na	na
Arsenic	10.1	18	19.9	17.5	3.1
Barium	na	na	na	na	na
Beryllium	na	na	na	na	na
Calcium	na	na	na	na	na
Cadmium	<0.43	<2.1	<0.42	<0.43	<0.42
Cobalt	na	na	na	na	na
Copper	21.6	19	22.2	21.6	17.3
Chromium	9.4	15	7.2	8.5	9.6
Iron	na	na	na	na	na
Lead	26.5	21	14.7	19.4	12.7
Mercury	<0.08	<0.1	<0.08	<0.08	<0.08
Magnesium	na	na	na	na	na
Manganese	na	na	na	na	na
Nickel	8.4	6.6	6.9	7.4	8.5
Potassium	na	na	na	na	na
Silver	<0.54	<2.1	<0.53	<0.53	<0.52
Sodium	na	na	na	na	na
Selenium	na	na	na	na	na
Thallium	na	na	na	na	na
Vanadium	na	na	na	na	na
Zinc	63.1	54	77.1	70.2	91.7
INORGANICS mg/Kg					
Cyanide (335.2)	na	na	na	na	na
PCBs / PESTICIDES (8080) mg					
DDD	<0.05	<0.05	<0.005	<0.005	<0.005
DDE	<0.01	<0.003	<0.01	<0.01	<0.01
DDE	<0.006	<0.003	<0.006	<0.006	<0.006
DDT	<0.02	<0.003	<0.02	<0.02	<0.02
Endosulfan II	<0.006	<0.003	<0.006	<0.006	<0.006
TRPH (418.1) mg/Kg	130	96	42.3	59.7	8.2
CORROSIVITY / pH (9045)	na	na	na	na	na

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No.	931028051GS	931028052GS	QA - 052GS 931028053GS	QC - 052GS 931028054GS	931028055GS
Type	Grab / Soil	Grab / Soil	Grab / Soil	Grab / Soil	Grab / Soil
Matrix	NS - Oil Pad	NS - Oil Pad	NS - Oil Pad	NS - Oil Pad	NS - Oil Pad
Date	10/28/93	10/28/93	10/28/93	10/28/93	10/28/93
METALS (6000) mg/Kg					
Aluminum	na	na	na	na	na
Antimony	na	na	na	na	na
Arsenic	2.3	2.3	1.9	2.1	1.8
Barium	na	na	na	na	na
Beryllium	na	na	na	na	na
Calcium	na	na	na	na	na
Cadmium	<0.42	<0.43	<2.1	<0.42	<0.41
Cobalt	na	na	na	na	na
Copper	14.8	20.3	24	17.8	12.7
Chromium	12	13.6	12	14.4	10.4
Iron	na	na	na	na	na
Lead	6.9	35.6	115	54.5	15.6
Mercury	<0.08	<0.09	<0.1	<0.08	<0.08
Magnesium	na	na	na	na	na
Manganese	na	na	na	na	na
Nickel	10.4	9.6	10	10.1	9
Potassium	na	na	na	na	na
Silver	<0.52	<0.54	<2.1	<0.52	<0.51
Sodium	na	na	na	na	na
Selenium	na	na	na	na	na
Thallium	na	na	na	na	na
Vanadium	na	na	na	na	na
Zinc	39.1	121	2080	129	299
INORGANICS mg/Kg					
Cyanide (335.2)	na	na	na	na	na
PCBs / PESTICIDES (8080) mg					
DDD	<0.01	<0.01	<0.03	<0.01	<0.01
DDE	<0.006	<0.006	<0.03	<0.006	<0.006
DDT	<0.02	<0.02	<0.03	<0.02	<0.02
Endosulfan II	<0.006	<0.006	<0.03	<0.006	<0.006
TRPH (418.1) mg/Kg	25	6670	5840	4800	4440
CORROSIVITY / pH (9045)	na	na	na	na	na

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No. Type Matrix Date	931028041GS Grab / Soil NS - Access Rd. 10/28/93	931028042GS Grab / Soil NS - Access Rd. 10/28/93	QA - 042GS 931028043GS Grab / Soil NS - Access Rd. 10/28/93	QC - 042GS 931028044GS Grab / Soil NS - Access Rd. 10/28/93
METALS (6000) mg/Kg				
Aluminum	na	na	na	na
Antimony	na	na	na	na
Arsenic	1	0.59	<2.0	<0.56
Barium	na	na	na	na
Beryllium	na	na	na	na
Calcium	na	na	na	na
Cadmium	0.4	<0.40	<2.0	<0.40
Cobalt	na	na	na	na
Copper	11.8	17.7	12	10.5
Chromium	4.5	3.3	2.5	3.1
Iron	na	na	na	na
Lead	9	7.9	3	8
Mercury	<0.08	<0.07	<0.1	<0.08
Magnesium	na	na	na	na
Manganese	na	na	na	na
Nickel	7.1	4.5	<5.0	4.8
Potassium	na	na	na	na
Silver	<0.51	<0.51	<2.0	<0.51
Sodium	na	na	na	na
Selenium	na	na	na	na
Thallium	na	na	na	na
Vanadium	na	na	na	na
Zinc	46.6	44.6	36	48.1
INORGANICS mg/Kg				
Cyanide (335.2)	<0.49	<0.49	na	<0.47
PCBs / PESTICIDES (8080) mg				
DDD	<0.02	<0.02	<0.05	<0.02
DDE	<0.006	<0.006	<0.003	<0.006
DDT	<0.02	<0.02	<0.003	<0.02
Endosulfan II	<0.006	<0.006	<0.003	<0.006
TRPH (418.1) mg/Kg	na	na	<0.2	na
CORROSIVITY / pH (9045)	na	na	na	na

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No. Type / Matrix Sample Location Date	931028045GS Grab / Soil NS - Access Rd. 10/28/93	931028046GS Grab / Soil NS - Access Rd. 10/28/93	931028047GS Grab / Soil NS - Access Rd. 10/28/93	931029061GS Grab / Soil Burn Pile 10/29/93
VOLATILES (8240) mg/Kg				
Acetone	<0.01	<0.01	<0.01	0.2
Carbon Disulfide	<0.005	<0.005	<0.005	<0.005
Toluene	0.008	0.004 J	0.02	<0.005
Xylene	<0.005	<0.005	<0.005	<0.005
Methylene Chloride	<0.005	<0.005	<0.005	0.008 B-O
Benzene	<0.005	<0.005	<0.005	0.02
2-Butanone	<0.01	<0.01	<0.01	0.01
SEMIVOLATILES (8270) mg/Kg				
Acenaphthene	<0.33	<0.33	<0.33	<0.33
Anthracene	<0.33	<0.33	<0.33	<0.33
Butyl Benzo Phthalate	<0.33	<0.33	<0.33	<0.33
Benzo(a)anthracene	<0.33	<0.33	<0.33	<0.33
Benzyl Alcohol	<0.33	<0.33	<0.33	<0.33
bis-(2-Ethylhexyl)phthalate	<0.33	<0.33	<0.33	<0.33
4-Bromophenyl phenyl ether	<0.33	<0.33	<0.33	<0.33
Chrysene	<0.33	<0.33	<0.33	<0.33
Di-n-butylphthalate	0.07 J-B	0.08 J-B	0.03 J-B	<0.33
Dibenzofuran	<0.33	<0.33	<0.33	<0.33
Fluoranthene	<0.33	<0.33	<0.33	<0.33
Fluorene	<0.33	<0.33	<0.33	<0.33
2-Methylnapthalene	<0.33	<0.33	<0.33	<0.33
Napthalene	<0.33	<0.33	<0.33	<0.33
Phenanthrene	<0.33	<0.33	<0.33	<0.33
Pyrene	<0.33	<0.33	<0.33	<0.33
Phenol	<0.33	<0.33	<0.33	<0.33
2-Methylphenol	<0.33	<0.33	<0.33	<0.33
4-Methylphenol	<0.33	<0.33	<0.33	<0.33

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No.	931029062GS	QA - 062GS 931029063GS	QC - 062GS 931029064GS	931029065GS	931029081GS
Type / Matrix	Grab / Soil	Grab / Soil	Grab / Soil	Grab / Soil	Grab / Soil
Sample Location	Burn Pile	Burn Pile	Burn Pile	Burn Pile	NS - Access Rd #2
Date	10/29/93	10/29/93	10/29/93	10/29/93	10/29/93
VOLATILES (8240) mg/Kg					
Acetone	<0.005	<0.005	0.02	<0.005	<0.005
Carbon Disulfide	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	<0.005	0.009	<0.005	<0.005	<0.005
Xylene	<0.005	0.006	<0.005	<0.005	<0.005
Methylene Chloride	<0.005	<0.005	0.009 B-O	0.01 B-O	0.006 B-O
Benzene	<0.005	0.007	<0.005	<0.005	<0.005
2-Butanone	<0.01	<0.01	<0.01	<0.01	<0.01
SEMIVOLATILES (8270) mg/Kg					
Acenaphthene	<0.33	<0.71	<0.33	<0.71	<0.33
Anthracene	<0.33	<0.71	<0.33	<0.71	<0.33
Butyl Benzo Phthalate	<0.33	<0.71	<0.33	<0.71	<0.33
Benzo(a)anthracene	<0.33	<0.71	<0.33	<0.71	<0.33
Benzyl Alcohol	0.39 J	<0.71	<0.33	<0.71	<0.33
bis-(2-Ethylhexyl)phthalate	0.58 J	<0.71	<0.33	<0.71	<0.33
4-Bromophenyl phenyl ether	<0.33	<0.71	0.59 J	<0.71	<0.33
Chrysene	<0.33	<0.71	<0.33	0.46 J	<0.33
Di-n-butylphthalate	<0.33	<0.71	<0.33	<0.71	<0.33
Dibenzofuran	<0.33	<0.71	<0.33	<0.71	<0.33
Fluoranthene	<0.33	<0.71	<0.33	1.2	<0.33
Fluorene	<0.33	<0.71	<0.33	<0.71	<0.33
2-Methylnapthalene	<0.33	<0.71	<0.33	<0.71	<0.33
Napthalene	<0.33	<0.71	<0.33	<0.71	<0.33
Phenanthrene	0.73	<0.71	<0.33	0.72	<0.33
Pyrene	<0.33	<0.71	<0.33	1	<0.33
Phenol	3.3	2.1	1.9	<0.71	<0.33
2-Methylphenol	0.34 J	<0.71	<0.33	<0.71	<0.33
4-Methylphenol	0.73	<0.71	<0.33	<0.71	<0.33

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No. Type Matrix Date	931029062GS	QA - 062GS 931029063GS	QC - 062GS 931029064GS	931029065GS	931029081GS
	Grab / Soil Burn Pile 10/29/93	Grab / Soil NS - Access Rd #2 10/29/93			
METALS (6000) mg/Kg					
Aluminum	na	na	na	na	na
Antimony	na	na	na	na	na
Arsenic	3.6	4.5	4.2	6.3	1.3
Barium	na	na	na	na	na
Beryllium	na	na	na	na	na
Calcium	na	na	na	na	na
Cadmium	<2.0	<2.0	<2.0	<2.0	<2.0
Cobalt	na	na	na	na	na
Copper	58	48	47	58	18
Chromium	22	20	22	32	9.4
Iron	na	na	na	na	na
Lead	44	51	73	72	317
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium	na	na	na	na	na
Manganese	na	na	na	na	na
Nickel	15	14	14	21	5.4
Potassium	na	na	na	na	na
Silver	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	na	na	na	na	na
Selenium	na	na	na	na	na
Thallium	na	na	na	na	na
Vanadium	na	na	na	na	na
Zinc	205	173	164	224	51
INORGANICS mg/Kg					
Cyanide (335.2)	na	na	na	na	na
PCBs / PESTICIDES (8080) mg					
DDD	<0.003	<0.003	<0.003	<0.03	<0.003
DDE	<0.003	<0.003	<0.003	<0.03	<0.003
DDT	<0.003	<0.003	<0.003	<0.03	<0.003
Endosulfan II	<0.003	<0.003	<0.003	<0.03	<0.003
TRPH (418.1) mg/Kg	758	520	923	601	215
CORROSIVITY / pH (9045)	na	na	na	na	na

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No.	931029031GS	931029032GS	QC - 032GS
Type / Matrix	Grab / Soil	Grab / Soil	931029033GS
Sample Location	SS - Acid Site	SS - Acid Site	Grab / Soil
Date	10/29/93	10/29/93	SS - Acid Site
			10/29/93
VOLATILES (8240) mg/Kg			
Acetone	na	na	na
Carbon Disulfide	na	na	na
Toluene	na	na	na
Xylene	na	na	na
Methylene Chloride	na	na	na
Benzene	na	na	na
2-Butanone	na	na	na
SEMIVOLATILES (8270) mg/Kg			
Acenaphthene	na	na	na
Anthracene	na	na	na
Butyl Benzo Phthalate	na	na	na
Benzo(a)anthracene	na	na	na
Benzyl Alcohol	na	na	na
bis-(2-Ethylhexyl)phthalate	na	na	na
4-Bromophenyl phenyl ether	na	na	na
Chrysene	na	na	na
Di-n-butylphthalate	na	na	na
Dibenzofuran	na	na	na
Fluoranthene	na	na	na
Fluorene	na	na	na
2-Methylnapthalene	na	na	na
Napthalene	na	na	na
Phenanthrene	na	na	na
Pyrene	na	na	na
Phenol	na	na	na
2-Methylphenol	na	na	na
4-Methlyphenol	na	na	na

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No. Type Matrix Date	931029031GS Grab / Soil SS - Acid Site 10/29/93	931029032GS Grab / Soil SS - Acid Site 10/29/93	QC - 032GS 931029033GS Grab / Soil SS - Acid Site 10/29/93
METALS (6000) mg/Kg			
Aluminum	na	na	na
Antimony	na	na	na
Arsenic	1.2	1.8	1.6
Barium	na	na	na
Beryllium	na	na	na
Calcium	na	na	na
Cadmium	<0.43	<0.44	<0.44
Cobalt	na	na	na
Copper	17.8	16.8	18.6
Chromium	7.8	7.1	8.3
Iron	na	na	na
Lead	39	6.2	9.6
Mercury	<0.08	<0.08	<0.09
Magnesium	na	na	na
Manganese	na	na	na
Nickel	6.9	7.6	9.3
Potassium	na	na	na
Silver	<0.53	<0.54	<0.55
Sodium	na	na	na
Selenium	na	na	na
Thallium	na	na	na
Vanadium	na	na	na
Zinc	42	47.1	53.6
INORGANICS mg/Kg			
Cyanide (335.2)	na	na	na
PCBs / PESTICIDES (8080) mg			
DDD	na	na	na
DDE	na	na	na
DDT	na	na	na
Endosulfan II	na	na	na
TRPH (418.1) mg/Kg	na	na	na
CORROSIVITY / pH (9045)	7.8	8.6	8.5

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No.	QA - 032GS	931029035GS
Type / Matrix	931029034GS	931029035GS
Sample Location	Grab / Soil	Grab / Soil
Date	SS - Acid Site	SS - Acid Site
	10/29/93	10/29/93

VOLATILES (8240) mg/Kg

Acetone	na	na
Carbon Disulfide	na	na
Toluene	na	na
Xylene	na	na
Methylene Chloride	na	na
Benzene	na	na
2-Butanone	na	na

SEMIVOLATILES (8270) mg/Kg

Acenaphthene	na	na
Anthracene	na	na
Butyl Benzo Phthalate	na	na
Benzo(a)anthracene	na	na
Benzyl Alcohol	na	na
bis-(2-Ethylhexyl)phthalate	na	na
4-Bromophenyl phenyl ether	na	na
Chrysene	na	na
Di-n-butylphthalate	na	na
Dibenzofuran	na	na
Fluoranthene	na	na
Fluorene	na	na
2-Methylnapthalene	na	na
Napthalene	na	na
Phenanthrene	na	na
Pyrene	na	na
Phenol	na	na
2-Methylphenol	na	na
4-Methlyphenol	na	na

APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

	QA - 032GS	
Sample No.	931029034GS	931029035GS
Type	Grab / Soil	Grab / Soil
Matrix	SS - Acid Site	SS - Acid Site
Date	10/29/93	10/29/93

METALS (6000) mg/Kg

Aluminum	na	na
Antimony	na	na
Arsenic	1.4	2.6
Barium	na	na
Beryllium	na	na
Calcium	na	na
Cadmium	<2.2	0.44
Cobalt	na	na
Copper	17	29.6
Chromium	5.6	14.7
Iron	na	na
Lead	8	41.4
Mercury	<0.1	<0.09
Magnesium	na	na
Manganese	na	na
Nickel	8.9	13.2
Potassium	na	na
Silver	<2.2	<0.55
Sodium	na	na
Selenium	na	na
Thallium	na	na
Vanadium	na	na
Zinc	39	89.9

LEGEND:

na = Not Analyzed
 J = Estimated value
 J-B = Analyte found in blank and sample
 B-O = Analyte found in blank and sample

INORGANICS mg/Kg

Cyanide (335.2)	na	na
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PCBs / PESTICIDES (8080) mg

DDD	na	na
DDE	na	na
DDT	na	na
Endosulfan II	na	na

TRPH (418.1) mg/Kg

	na	na
--	----	----

CORROSIVITY / pH (9045)

8.9	7.9
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APPENDIX D JOHN DAY SITE INSPECTION CHEMICAL ANALYTICAL RESULTS - OCTOBER 1993

Sample No.	931028091GS	931028093GS	931028094GS	931028041GS
Type / Matrix	Grab / Soil	Grab / Soil	Grab / Soil	Grab / Soil
Sample Location	Background	Background	Background	NS - Access Rd.
Date	10/28/93	10/28/93	10/28/93	10/28/93
TCLP				
Metal / Method mg/L				
Arsenic (6010)	<0.05	<0.05	<0.05	<0.05
Barium (6010)	1.1	0.62	0.71	0.75
Cadmium (6010)	<0.004	<0.004	<0.004	<0.004
Chromium (6010)	<0.005	<0.005	<0.005	<0.005
Lead (6010)	<0.03	<0.03	<0.03	<0.03
Mercury (7470)	<0.0002	<0.0002	<0.0002	<0.0002
Selenium (6010)	<0.005	<0.05	<0.05	<0.05
Silver (6010)	<0.005	<0.005	<0.005	<0.005

Sample No.	931028042GS	931028045GS	931028046GS	931028047GS
Type / Matrix	Grab / Soil	Grab / Soil	Grab / Soil	Grab / Soil
Sample Location	NS - Access Rd.			
Date	10/28/93	10/28/93	10/28/93	10/28/93
TCLP				
Metal / Method mg/L				
Arsenic (6010)	<0.05	<0.05	<0.05	<0.05
Barium (6010)	1.3	0.67	0.88	0.27
Cadmium (6010)	<0.004	<0.004	<0.004	<0.004
Chromium (6010)	<0.005	<0.005	<0.005	<0.005
Lead (6010)	<0.03	<0.03	<0.03	<0.03
Mercury (7470)	<0.0002	<0.0002	<0.0002	<0.0002
Selenium (6010)	<0.05	<0.05	<0.05	<0.05
Silver (6010)	<0.005	<0.005	<0.005	<0.005

APPENDIX B-2

GROUNDWATER IN THE UPPERMOST AQUIFER AOC

B-2.1 WELL LOGS

B-2.2 CROSS-SECTIONS

B-2.3 GEOLOGIC MAP

APPENDIX B-2.1

PRODUCTION WELLS LOGS (WELLS #1, 2, AND 3)

Well #1

STATE OF WASHINGTON P- 9272
DEPARTMENT OF ECOLOGY

WELL LOG

Record by Driller

Source Well Report

Location: State of WASHINGTON

County Klickitat

Area

Map

SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 21, T. 3 N., R. 17 E.

Drilling Co. R. J. Strasser

Address Blvd. SE Sunset Lane Portland Ore.

Method of Drilling Cable & Rotary Date Sept 28, 19 71

Owner Harvey Aluminum Co

Address Star Rte 677 Box 46 Goldendale, Wa.

Land surface, datum ft. above 9-8-71

SWL: 270' Date 9-8-71, 19 71 Dims: 16" x 100'

0		
21		

Diagram of Section

CORRELATION	Industrial MATERIAL	From (feet)	To (feet)
-------------	---------------------	-------------	-----------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses, if material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	Basalt, frac. w/ boulders	0	7'
	" " , gray, dark	7	10'
	" Gray	10	24'
	" Brown, gray	24	38'
	" gray	38	57'
	Basalt, frac, gray	57	58'
	Basalt, hard, gray	58	71'
	" , gray, med-hard	71	95'
	" , gray-brown	95	103'
	" , gray, dark	103	107'
	" , gray, hard	107	119'
	Basalt, gray, fractured	119	121'
	" " , hard	121	173'
	" " , frac, hard	173	187'
	Basalt, gray, dark, porous	187	210'
	" " , hard	210	215'

Turn up

Sheet 3 of 3 sheets

File number 3, 17E 21E

The Dep. The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Harvey Aluminium
No. 3, 17, 21C

WELL LOG.—Continued

CORRELATION	MATERIAL	From (feet)	To (feet)
	Depth forward	<u>215'</u>	
	Basalt, gray, dark, porous	215	228
	Basalt, fractured, gray	228	234
	" , brown, frac	234	236
	" , gray, frac	236	240
	" , gray, hard	240	326
	" , gray, dark, frac.	326	338
	Basalt, gray, med-hard	338	350
	" , gray, hard	350	396
	Basalt, gray, dk, med-hard	396	434
	" , gray, hard	434	450
	" , gray, dk, porous	450	467
	Basalt, gray, hard	467	498
	Basalt, black, porous	498	514
	" , gray, dark	514	527
	" , " , hard	527	571
	Basalt, brown-black, porous	571	584
	Basalt, black	584	613
	Basalt, brown-black	613	637
	Basalt, brown, soft	637	640
	Basalt, hard, gray	640	829
	Basalt, gray, hard, frac	829	896
	Basalt, black	896	946
	Basalt, br-black	946	989
	Basalt, black, hard	989	1000
	Casing: 20" Dia	0	7'
	12" Dia	+3	550'
	Perforations: Torch $\frac{3}{8}$ " x 6"	490	550'
	528 pnf.		
	Surface seal: - Cement grout	0	32'
	Pump Test: - Yield - 840 gpm w/215' DD @ 24 hrs		
	G30 - Pump off - 644 - 311' 645 - 306' slow recovery		

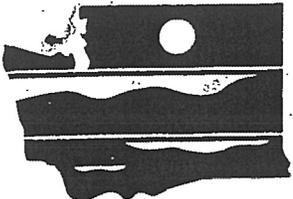
S. F. No. 7449 OS - (Rev. 4-71).

Temp H₂O - 62°

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

PWSID = 22460

Source # 2



WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Well Tagging Form

Unique Well Tag No: AFL-825

RECORD VERIFICATION (check one)

- Well Report available (please attach this form to the well report and submit it to the Ecology Regional Office near you)
- Verification inconclusive
- Well Report not available

WELL OWNERSHIP, IF DIFFERENT FROM WELL REPORT

First Name: _____ Last Name: _____
 Street Address: _____
 City: _____ State: _____

LOCATION OF WELL, IF DIFFERENT FROM WELL REPORT

Well Address: _____
 City: _____ County: _____
 T. _____ N. R. _____ W.M. Sec. _____ 1/4 of the _____

FOR AGENCY USE ONLY

Latitude _____ " "
 Longitude _____ " "

- GPS
- Topographic Map
- Survey
- Computer generated

Elevation at land surface _____ feet/meters (circle one)

- Digital Altimeter
- Topographic Map
- Other _____

Additional information, if available:

- Location marked on topographic map (please attach)
- Location marked on air photo (please attach)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

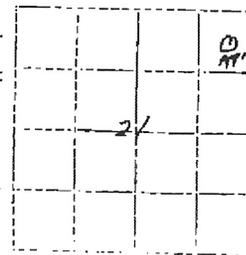
Well # 2

P-9272

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WELL LOG

Record by Driller
Source Well Report



Location: State of WASHINGTON
County Klickitat
Area
Map
NE 1/4 NE 1/4 sec 21, T. 3 N., R. 17 E.

Drilling Co. R.J. Strasser
Address 810 SE Sunset Lane Redland Ore
Method of Drilling Cable rotary Date Sept 27, 1971
Owner Harvey Alving
Address Star Route 677 Box 46 Gribbleville Ore
Land surface, datum ft. above
 below
SWL: 243' Date 4/28/71, 19... Dims.: 10.8' x 504'

CORRELATION	Other MATERIAL	From (feet)	To (feet)
-------------	----------------	-------------	-----------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses, if material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	Fill, rock, fractured	0	2'
	Cement (Fill)	2	5'
	Basalt, frag. wickoys seams	3	12'
	" , gray, med-hard	12	18'
	" , gray, hard	18	84'
	Basalt, brown, frag.	84	104'
	" , gray, hard	104	123'
	" , porous, black	123	130'
	" , gray, hard	130	185'
	" , gray, porous	185	190'
	Basalt, gray, med-hard	190	199'
	Basalt, gray, porous	199	204'
	Basalt, gray, med-hard	204	250'
	Basalt, gray, hard	250	326'
	Basalt, black, frag.	326	334'
	Basalt, gray, med-hard	334	346'

Turn up

Sheet of sheets

3N NE 21A
File number

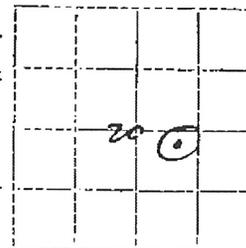
The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Well #3

STATE OF WASHINGTON Per Appli. 10092
 DEPARTMENT OF CONSERVATION 9272
 DIVISION OF WATER RESOURCES

WELL LOG

Record by..... Driller
 Source..... Driller report



Location: State of WASHINGTON
 County..... Klickitat
 Area.....
 Map.....

.....NW¼ SE ¼ sec 20 T. 3 N., R. 17 E. Diagram of Section

Drilling Co. R. J. Strasser Drilling Co.
 Address 8110 SE Sunset Lane, Portland, Or.
 Pottery

Method of Drilling..... cable & / Date 4/22, 1971
 Owner..... Harvey Aluminum

Address Star Rt. 677 Box 46, Goldendale, Wa.

Land surface, datum..... ft. above
 below
 SWL:..... 228' Date..... 4/8....., 1971 Dims:.....

CORRE- LATION	MATERIAL	From (feet)	To (feet)
------------------	----------	----------------	--------------

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses, if material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

	Industrial		
	fill	0	27
	Sand, Clay & gravel, brown	27	33
	rock, brown	33	47
	basalt, black	47	61
	basalt, gray	61	73
	basalt, dark gray	73	154
	basalt, dark gray (crevices)	154	198
	basalt, black porous	198	226
	basalt, gray	226	232
	basalt, black broken	232	244
	basalt, black	244	249
	basalt, black broken	249	266
	basalt, black	266	281
	basalt, porous black	281	308
	basalt, soft porous	308	339

17-28

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

HARVEY ALUMINIUM

WELL LOG.—Continued

No. /

CORRELATION	MATERIAL	From (feet)	To (feet)
	Depth forward	—	
	basalt, brown & black	339	351
	basalt, hard gray	351	355
	basalt, gray (crevices)	355	372
	basalt, porous black	372	425
	basalt, hard gray	425	487
	basalt, very hard gray	487	491
	basalt, gray	491	523
	basalt, porous black	523	550
	basalt, hard black	550	572
	basalt, very hard black	572	575
	basalt, hard dark gray	575	579
	basalt, dark gray	579	616
	basalt, Black & brown	616	617
	basalt, black	617	621
	basalt, black porous	621	623
	basalt, gray	623	654
	silt stone	654	683
	basalt, gray	683	792
	basalt, slightly porous gray	792	830
	basalt, gray	830	845
	basalt, broken dark gray	845	850
	basalt, gray	850	858
	basalt, broken gray	858	878
	basalt, gray	878	899
	basalt, dark gray, broken	899	923
	basalt, hard gray	923	961
	basalt, dark gray broken	961	1048
	basalt, dark gray	1048	1088
	basalt, gray	1088	1128
	Casing: 20" from 0 to 30'		
	Perforations: 3/8 x 6"		
	Pump test: 1000 gpm with 238' DD after 24 hrs		
	S. F. No. 7449—OS—12-65. 880 " " 167' DD " 6 h		

APPENDIX B-2.1

BAMW-DESIGNATED WELL LOGS (BAMW WELLS 1-4)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

RESOURCE PROTECTION WELL REPORT

CURRENT
 Notice of Intent No. RE03830

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in circle)
 Construction 361589
 Decommission ORIGINAL INSTALLATION Notice
 of Intent Number _____

Type of Well ("x" in circle)
 Resource Protection
 Geotech Soil Boring

Consulting Firm URS Corp.

Property Owner Columbia Gorge Aluminum

Unique Ecology Well ID
 Tag No: BBH 650 BAMW-1

Site Address 85 John Day Dam Rd.

City Goldendale County: Klickitat

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Location NE1/4 SE1/4 Sec 20 Twn 3 R17 WWM circle or one WWM

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____
 Long Deg _____ Long Min/Sec _____

Driller Engineer Trainee Name (Print) Timothy S. Smith

Tax Parcel No. 0317200000100

Driller/Engineer/Trainee Signature [Signature]

Cased or Uncased Diameter 8" 57-162 Static Level 134

Driller or Trainee License No. 2837

Work/Decommission Start Date 10-13-09

Work/Decommission Completed Date 10-14-09

If trainee, licensed driller's Signature and License no. _____

Construction/Design	Well Data	Formation Description
	Drill method - Air Rotary Casing - 2" sch. 80 PVC +3-142 Screen - 2" sch. 80 PVC .010 Prepack Sand - 10/20 140-162' Seal - 3-140 Aboveground monument w/ posts Centralizers placed at 138, 88, 38'	0-29 silty sand w/ gravel 29-51 Decomposed Basalt 51-132 Hard Basalt 132-154 weathered Basalt 154-162 Decomposed Basalt with sand & gravel

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OCT 30 2009

DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-1

Sheet 1 of 3

Date(s) Drilled	10/13/09	Logged By	B. Cassem	Checked By	D. Weatherby
Drilling Method	Air Rotary	Drill Bit Size/Type	8-inch	Total Depth of Borehole	162.0 feet
Drill Rig Type	Schramm T-300	Drilling Contractor	Environmental West Exploration	Approximate Surface Elevation	466.15 feet
Groundwater Level and Date Measured	142 feet bgs 10/14/09	Location	Latitude 45° 43' 38.25433" Longitude 120° 42' 16.60870"		
Well Construction:	See Well Detail				

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
465	0		SP-SM	SILTY SAND TO POORLY GRADED SAND [SM/SP], brown to brown red, moist, basalt fragments ranging from 1 inch to 1 foot, angular to subangular. [FILL]		Top of Casing Elevation =468.51 feet Temporary casing from 0-52 feet, bentonite chips from 0 to 142 feet bgs.
455	10		SP	POORLY GRADED SAND [SP], brownish red, moist, loose, fine grained, angular to subangular.		@ 32 feet bgs water seep
425	40			BASALT, angular fragments, intermixed with medium grained sand. <i>Grades to fractured vesicular basalt, black with yellow-orange weathering on edges.</i>		Centralizer @ 45 feet bgs water seep
415	50			BASALT, black, microcrystalline, non-porous, fractured.		Temporary casing to 52 feet bgs. Pulled as well was constructed.
410	60					

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-1

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-1

Sheet 2 of 3

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
405	60			BASALT, black, microcrystalline, fractured.		Hard drilling at approx. 10 feet/hour.
400						
395	70					
390						
385	80					
380						
375	90					Centralizer
370						
365	100					
360						
355	110					
350						
345	120					
340						
330	130					

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-1

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-1

Sheet 3 of 3

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
335	130			BASALT, black, microcrystalline, fractured.		
330						
325	140					Centralizer 2 feet of 20-40 sand 140-142 feet bgs.
320				@144 to 146 feet bgs hole caving, highly fractured basalt, non-porous, increase in water, difficulty advancing due to caving. Becomes less fractured.		142 to 162 feet bgs, 2 inch OD 10 slot PVC screen placed with a 10-20 sand pre-pack.
315	150			Highly fractured basalt zone. Becomes less fractured.		
310						
305	160			Highly fractured, weathered basalt. Caving, unable to advance.		
300				Terminated boring at 162 feet bgs due to caving. Well Construction: 2 inch OD PVC from 3 feet above surface to screen. Screen is a 20 feet 2 inch OD 10 slot screen with a 10-20 PVC pre pack sand. 2 feet of 20-40 sand placed above the screen followed by bentonite chips to surface. 2 feet of concrete placed as seal. 3 foot steel well monument with lockable cap.		
295	170					
290						
285	180					
280						
275	190					
270						
200						

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-1

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

RESOURCE PROTECTION WELL REPORT CURRENT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Notice of Intent No. RE03838

Construction/Decommission ("x" in circle) 361524

- Construction
- Decommission. ORIGINAL INSTALLATION Notice of Intent Number _____

- Type of Well ("x" in circle)
- Resource Protection
 - Geotech Soil Boring

Consulting Firm URS Corp.

Property Owner Columbia Gorge Aluminum

Unique Ecology Well ID Tag No: SBH 648 BAMW-2

Site Address 85 John Day Dam Rd.

City Goldendale County: Klickitat

Location NE 1/4 SE 1/4 Sec 20 Twn 3 R 17 WWM circle of one

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0317200000100

Cased or Uncased Diameter 8" 37-241 Static Level 132

Work/Decommission Start Date 10-9-09

Work/Decommission Completed Date 10-12-09

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee Name (Print) Timothy S. Smith

Driller/Engineer/Trainee Signature [Signature]

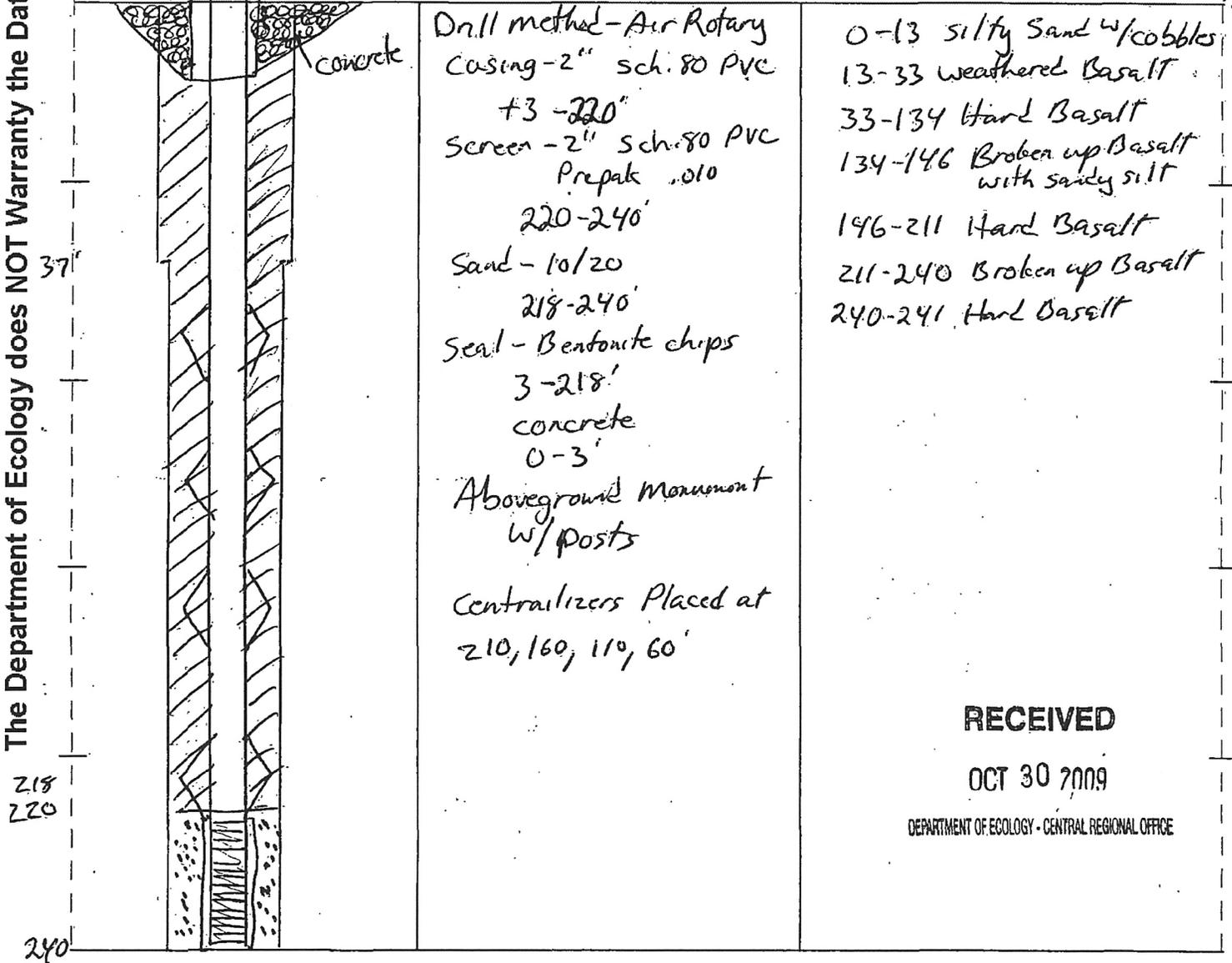
Driller or Trainee License No. 2837

If trainee, licensed driller's Signature and License no. _____

Construction/Design

Well Data

Formation Description



Drill method - Air Rotary
 Casing - 2" sch. 80 PVC
 +3 - 220"
 Screen - 2" sch. 80 PVC
 Prepak .010
 220-240'
 Sand - 10/20
 218-240'
 Seal - Bentonite chips
 3-218'
 concrete
 0-3'
 Aboveground monument
 w/ posts
 Centralizers Placed at
 210, 160, 110, 60'

0-13 silty Sand w/ cobbles
 13-33 weathered Basalt
 33-134 Hard Basalt
 134-146 Broken up Basalt
 with sandy silt
 146-211 Hard Basalt
 211-240 Broken up Basalt
 240-241 Hard Basalt

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DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

Project: LMC Goldendale NPDES
Project Location: Goldendale, WA
Project Number: 25696946

Log of Boring BAMW-2

Sheet 1 of 4

Date(s) Drilled	10/8/09 - 10/12/09	Logged By	B. Cassem	Checked By	D. Weatherby
Drilling Method	Air Rotary	Drill Bit Size/Type	8-inch	Total Depth of Borehole	240.0 feet
Drill Rig Type	Schramm T-300	Drilling Contractor	Environmental West Exploration	Approximate Surface Elevation	479.67 feet
Groundwater Level and Date Measured	219 feet bgs 10/13/09	Location	Latitude 45° 43' 53.57152" Longitude 120° 41' 41.24386"		
Well Construction:	See Well Detail				

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
0			SM	SILTY SAND [SM], brown grey, medium to very dense, dry to moist w/ organics and basalt fragments.		Top of Casing Elevation =482.65 feet Temporary casing set from 0-37 feet bgs.
475				Basalt boulder		
470	10					Large volume of water 10 to 35 feet bgs. Approx. 50 gal/min @ 17:35 hours.
465			SP	POORLY GRADED SAND [SP], black, fine grained sand consisting of basalt, angular to subangular.		
460	20			BASALT, black with yellow-orange weathering, vesicular.		Centralizer
455						
450	30			Grades to highly fractured.		
445				Grades to non-vesicular.		
440	40			Grades to weathered.		Placed 2 feet of bentonite to seal the 8" outer casing. Difficult drilling.
435				BASALT, black, microcrystalline, non-porous. Hard Drilling.		
430	50					
425				Between about 54 to 56 feet bgs has yellow-orange weathering, non-porous, no water.		Driller call easy drilling
420	60					@ 57 feet bgs water seepage observed.

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-2

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-2

Sheet 2 of 4

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
60				BASALT, black, microcrystalline, non-porous.		Hard drilling.
415						
410	70					Centralizer
405						
400	80					
395				VOLCANIC ASH, Grey, tuffaceous, fine grained. No water.		
390	90					
385				BASALT, dark grey to black, microcrystalline, non-porous.		Slight water infiltration. Able to advance.
380	100					End of day 10/09/09 @ 97 feet bgs.
375						
370	110					
365						
360	120					Centralizer
355				<i>Becomes fractured. No weathering or vesicles.</i>		
350				BASALT, black, microcrystalline, non-porous, few fractures.		
350	130					

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-2

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-2

Sheet 3 of 4

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
130				BASALT, black, microcrystalline, non-porous, few fractures.		
345						
340	140					Difficult drilling.
335						
330	150					
325						
320	160					
315						
310	170					Centralizer
305						
300	180			Becomes fractured. No weathering or vesicles.		Easy drilling.
295						Easy drilling, no water.
290	190			BASALT, black, microcrystalline, non-porous.		Increase in hardness, difficult drilling.
285						
280	200					

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-2

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-2

Sheet 4 of 4

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
				BASALT , black, microcrystalline, non-porous.		
	275			<i>Becomes weathered and fractured.</i>		Water increasing.
	270			BASALT , black, microcrystalline, few fractures.		2 feet of caving, able to advance.
	210				Centralizer	
	265					
	260					
	220					
	255					
	250			<i>Becomes highly fractured, slightly weathered, water-bearing.</i>		
	230					
	245					
	240			Terminated boring at 240 feet bgs. Well Construction: 2"OD PVC from 3' above surface to screen. Screen is a 20' 2"OD 10 slot screen with a 10-20 PVC pre pack sand. 2' of 20-40 sand placed above the screen followed by bentonite chips to surface. 2' of concrete placed as seal. 3' steel well monument with lockable cap.		
	235					
	230					
	250					
	225					
	220					
	260					
	215					
	210					
	270					

▽

218-220 feet bgs
 20-40 sand placed
 220-240 feet bgs, 2"
 OD, 10 slot PVC
 screen with a 10-20
 sand pre-pack.

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-2

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

RESOURCE PROTECTION WELL REPORT

CURRENT

Notice of Intent No. RE03238

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in circle) 361590

- Construction
- Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

Type of Well ("x" in circle)

- Resource Protection
- Geotech Soil Boring

Consulting Firm URS Corp.

Property Owner Columbia Gorge Aluminum

Unique Ecology Well ID _____

Site Address 85 John Day Dam Rd.

Tag No: BBH 649 BAMW-3

City Goldendale County: Klickitat

Location NE 1/4 SE 1/4 Sec 20 Twn 3 R 17 WWM or one WWM

Lat/Long (s, t, r) Lat Deg _____ Lat Min/Sec _____ still REQUIRED) Long Deg _____ Long Min/Sec _____

Tax Parcel No. 0317200000100

Cased or Uncased Diameter 8" stub 0-17.5' 6 1/2" open 17.5-131' Static Level 116

Work/Decommission Start Date 10-7-09

Work/Decommission Completed Date 10-8-09

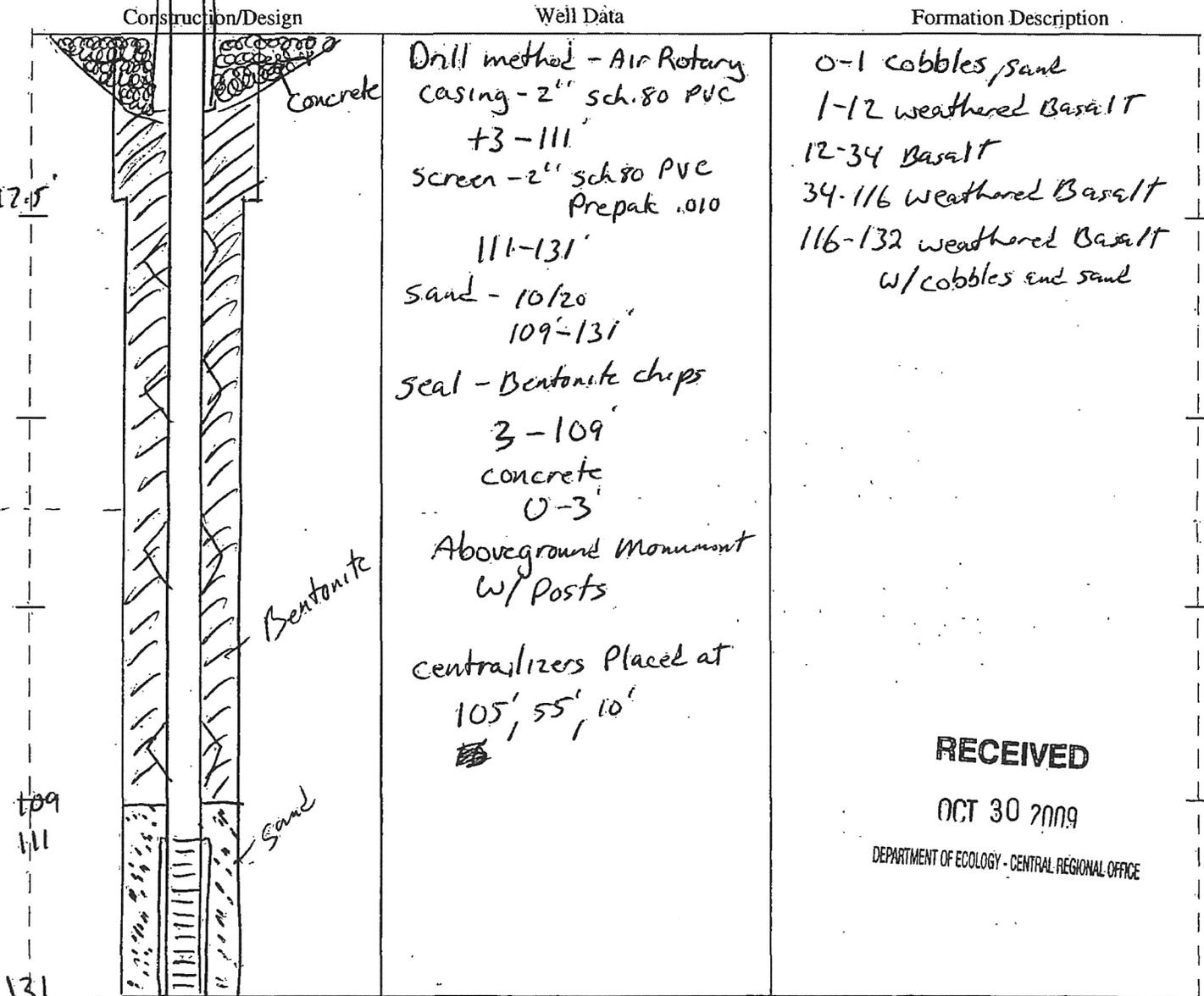
WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee Name (Print) Timothy S. Smith

Driller/Engineer/Trainee Signature [Signature]

Driller or Trainee License No. 2837

If trainee, licensed driller's Signature and License no. _____



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DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

Project: LMC Goldendale NPDES
Project Location: Goldendale, WA
Project Number: 25696946

Log of Boring BAMW-3

Sheet 1 of 3

Date(s) Drilled	10/7/09	Logged By	B. Cassem	Checked By	D. Weatherby
Drilling Method	Air Rotary	Drill Bit Size/Type	8-inch	Total Depth of Borehole	133.0 feet
Drill Rig Type	Schramm T-300	Drilling Contractor	Environmental West Exploration	Approximate Surface Elevation	491.41 feet
Groundwater Level and Date Measured	116 feet bgs 10/08/09	Location	Latitude 45° 44' 02.01806" Longitude 120° 41' 30.57514"		
Well Construction:	See Well Detail				

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
490	0		SM	SILTY SAND [SM], brownish grey, medium to very dense, moist w/ organics.		Top of Casing Elevation =494.07 feet Temporary casing installed from 0 to 17.5 feet bgs during drilling.
485				BASALT, black, microcrystalline, non-porous, few fractures.		
480	10					Centralizer
475						
470	20					
465						
460	30					
455						
450	40			Fractures filled with green material.		
445						
440	50					
435						
430						
425						
420						
415						
410						
405						
400						
395						
390						
385						
380						
375						
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195						
190						
185						
180						
175						
170						
165						
160						
155						
150						
145						
140						
135						
130						
125						
120						
115						
110						
105						
100						
95						
90						
85						
80						
75						
70						
65						
60				Becomes yellowish brown, highly weathered, fractured, subrounded cuttings.		

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-3

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-3

Sheet 2 of 3

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
430	60			BASALT, yellowish brown, highly weathered, fractured, subrounded cuttings.		Centralizer
425						
420	70			BASALT, black, microcrystalline, non-porous, few fractures, no water.		
415						
410	80					
405						
400	90					
395						
390	100					
385						
380	110		GP	POORLY GRADED GRAVEL [GP], fine to medium grained, subangular to subrounded, composed of microcrystalline basalt.		Centralizer 2 feet of 20-40 sand
375						111-131 feet bgs 2" OD; 10 slot screen with a 10-20 pre-pack.
370	120					
365						
360						
355						
350						
345						
340						
335						
330						
325						
320						
315						
310						
305						
300						
295						
290						
285						
280						
275						
270						
265						
260						
255						
250						
245						
240						
235						
230						
225						
220						
215						
210						
205						
200						
195						
190						
185						
180						
175						
170						
165						
160						
155						
150						
145						
140						
135						
130						

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-3

Project: LMC Goldendale NPDES
Project Location: Goldendale, WA
Project Number: 25696946

Log of Boring BAMW-3

Sheet 3 of 3

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
360	130			BASALT , microcrystalline, non-porous, few fractures.		
				POORLY GRADED GRAVEL , subrounded, fine to medium grained, basalt with coarse sand, subrounded. Terminated boring at 133 feet bgs due to caving. Well Construction: 2"OD PVC from 3' above surface to screen. Screen is a 20' 2"OD 10 slot screen with a 10-20 PVC pre pack sand. 2' of 20-40 sand placed above the screen followed by bentonite chips to surface. 2' of concrete placed as seal. 3' steel well monument with lockable cap.		Due to caving screen set to 131 feet bgs.
355						
350	140					
345						
340	150					
335						
330	160					
325						
320	170					
315						
310	180					
305						
300	190					
295						
200						

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-3

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

RESOURCE PROTECTION WELL REPORT CURRENT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Notice of Intent No. RE03835

Construction/Decommission ("x" in circle) 361587

Type of Well ("x" in circle)

- Construction
- Decommission ORIGINAL INSTALLATION Notice of Intent Number _____

- Resource Protection
- Geotech Soil Boring

Consulting Firm URS Corp.

Property Owner Columbia Gorge Aluminum

Unique Ecology Well ID

Site Address 85 John Day Dam Rd.

Tag No: BBH 647 BAMW-4

City Goldendale County: Klickitat

Location NE 1/4 SE 1/4 Sec 20 Twn 3 R17 WWM circle or one WWM

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 03172000000100

Cased or Uncased Diameter 8" 0-37 Static Level 199

Work/Decommission Start Date: 10-16-09

Work/Decommission Completed Date 10-19-09

WELL CONSTRUCTION CERTIFICATION: I, constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true, to my best knowledge and belief.

Driller Engineer Trainee Name (Print) Timothy S. Smith

Driller/Engineer/Trainee Signature: [Signature]

Driller or Trainee License No. 2837

If trainee, licensed driller's Signature and License no. _____

Construction/Design	Well Data	Formation Description
	<p>Drill method - Air Rotary</p> <p>concrete casing - 2" sch. 80 PVC</p> <p>+3 - 200'</p> <p>Screen - 2" sch 80 PVC</p> <p>1010 Prepak</p> <p>Sand - 10/20</p> <p>198-220</p> <p>Seal - Bentonite chips</p> <p>3-198</p> <p>concrete</p> <p>0-3</p> <p>Aboveground Monument w/ posts</p> <p>centralizers placed at 195, 145, 95, 45</p>	<p>0-2 Fill</p> <p>2-62 Hard Basalt</p> <p>62-137 weathered Basalt</p> <p>137-169 decomposed Basalt with coarse sand</p> <p>169-192 weathered Basalt</p> <p>192-220 decomposed Basalt</p>

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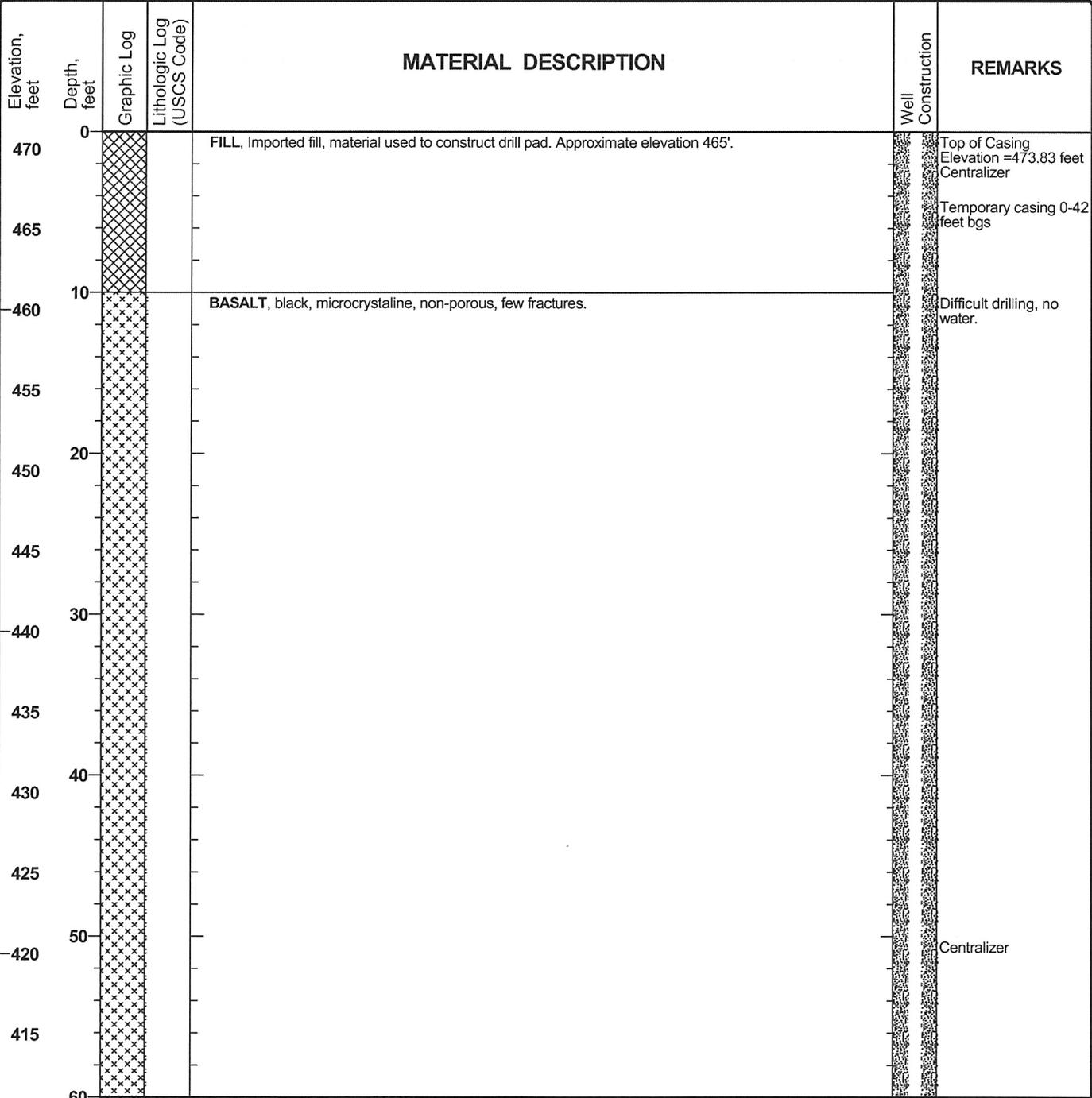
OCT 30 2009

DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

Project: LMC Goldendale NPDES
Project Location: Goldendale, WA
Project Number: 25696946

Log of Boring BAMW-4
 Sheet 1 of 4

Date(s) Drilled	10/15/09 - 10/18/09	Logged By	B. Cassem	Checked By	D. Weatherby
Drilling Method	Air Rotary	Drill Bit Size/Type	8-inch	Total Depth of Borehole	220.0 feet
Drill Rig Type	Schramm T-300	Drilling Contractor	Environmental West Exploration	Approximate Surface Elevation	471.10 feet
Groundwater Level and Date Measured	198 feet bgs 10/20/09	Location	Latitude 45° 43' 51.69306" Longitude 120° 41' 31.10083"		
Well Construction:	See Well Detail				



Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-4



Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-4

Sheet 2 of 4

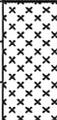
Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
410	60			BASALT, black, microcrystal, non-porous, few fractures.		
405						
400	70					
395						
390	80			Becomes highly fractured, highly weathered with yellow orange weathering on fracture edges, angular fragments.		Difficult drilling.
385						
380	90					
375						
370	100					Centralizer
365						
360	110					
355						
350	120		SP	POORLY GRADED SAND [SP], light gray, very fine to fine grained, possible ash?		
345						
340				BASALT, black, microcrystalline, fractured.		
335						
330						

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-4

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-4

Sheet 3 of 4

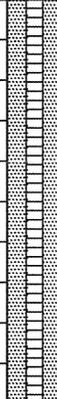
Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
340	130			BASALT, black, microcrystalline, fractured.		
335			CL	LEAN CLAY [CL], reddish brown, low plasticity, dry to moist, soft to stiff. Top/bottom of basalt layer.		
330	140		SP	POORLY GRADED SAND [SP], light gray, very fine to fine grained, possible ash, subangular basalt fragments intermixed with fine sand.		
325						
320	150					Centralizer
315						
310	160					Drill losing circulation due to fine sand/ash.
305						
300	170					
295						
290	180					Drill stuck due to cave in of fine sand/ash. Foam added to hole to continue advancing.
285						
280	190			BASALT, black, microcrystalline, non-porous, highly fractured.		
275						
270						
265						
260						
255						
250						
245						
240						
235						
230						
225						
220						
215						
210						
205						
200						
				@ 199 Feet becomes vesicular basalt, reddish-orange, moderately fractured, porous, water-bearing.		2 feet of 20-40 sand + centralizer.

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-4

Project: LMC Goldendale NPDES
 Project Location: Goldendale, WA
 Project Number: 25696946

Log of Boring BAMW-4

Sheet 4 of 4

Elevation, feet	Depth, feet	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	Well Construction	REMARKS
270				BASALT, vesicular, reddish-orange, moderately fractured, porous.		200-220 feet bgs, 2" OD, 10 slot screen with a 10-20 pre-pack.
265	210					
260						
255						
250	220			Terminated boring at 220 feet bgs. Well Construction: 2"OD PVC from 3' above surface to screen. Screen is a 20' 2"OD 10 slot screen with a 10-20 PVC pre pack sand. 2' of 20-40 sand placed above the screen followed by bentonite chips to surface. 2' of concrete placed as seal. 3' steel well monument with lockable cap.		
245						
240	230					
235						
230	240					
225						
220	250					
215						
210	260					
205						
270						

Report: PORT_WELL_GOLDENDALE; File: LMC GOLDENDALE NPDES.GPJ; 11/18/2010 BAMW-4

APPENDIX B-2.1

EAST SURFACE IMPOUNDMENT (SWMU #2) VICINITY WELL LOGS

TABLE 1
Existing Well Identification and Elevation Summary
Columbia Gorge Aluminum Smelter Site
Goldendale, WA.
Page 1 of 2

Well Identification	Ecology Well Log No.	Well Location (NAD83')		Ground Surface Elevation (ft-NGVD88')	Top of Well Casing Elevation (ft-NGVD88')
		Northing	Easting		
Monitoring Wells					
ESI-1		1592845.5	147148.97	524.4	NF
IB-1	138187	1591849.7	146594.95	518.2	519.60
IB-10	138182	1593869.9	146600.50	518.4	519.78
IB-11	136408	1594534.8	147023.54	517.6	518.99
IB-12A	138185	1592393.6	146612.30	510.0	513.53
IB-13	138180	1593639.0	145707.74	328.0	329.89
IB-13A	138180	1593639.0	145707.74	328.0	329.69
IB-2	138179	1592042.6	147613.07	516.4	517.31
IB-2A	136406	1591875.3	147544.96	512.7	513.85
IB-3	138183	1593750.7	148315.14	531.7	533.15
IB-4	136410	1593586.4	147423.11	524.2	525.81
IB-5	138181	1592464.7	145956.71	501.5	503.26
IB-5A	138186	1592464.7	145956.71	501.4	503.04
IB-5AA	138186	1592464.7	145956.71	500.0	502.82
IB-6	138184	1591701.3	146012.82	492.1	493.25
IB-7	NF	1591798.4	145427.63	471.8	473.57
IB-8	136409	1592059.5	145411.57	460.6	462.36
IB-9	136407	1593309.1	146344.12	504.5	505.21
MW-1 **	NF	1594332.8	148747.06	538.4	541.36
MW-10 **	NF	1593063.1	146907.80	512.4	514.79
MW-8 **	NF	1592255.2	147362.38	519.3	520.92
MW-9 **	NF	1592350.8	146645.90	511.3	513.84
MW-10A	138153	1585727.9	143372.84	425.0	427.95
MW-11A	296244	1585625.3	144029.68	454.0	456.21
MW-12A	138160	1585051.0	142942.35	439.0	441.38
MW-13A	138156	1585533.2	143219.83	428.0	430.09
MW-14A	138155	1585915.6	143531.53	429.0	431.65
MW-15A	296245	1586150.7	143701.39	436.0	438.47
MW-18	390596	1584732.9	141060.71	346.0	348.40
MW-2A	143048	1585435.4	144171.67	486.0	488.63
MW-2B **	NF	1585435.4	144171.67	485.0	487.69
MW-3A **	143053	1585432.1	142735.02	408.0	410.35
MW-3B **	NF	1585432.1	142735.02	408.0	410.90
MW-4A **	NF	1586246.1	142993.13	419.0	421.92
MW-7B **	NF	1584958.7	143609.60	464.0	466.93
MW-8A	138157	1584970.5	143846.08	490.0	492.97
MW-9A	138158	1585321.4	143098.07	436.0	438.22
MW-E7	556369	1590904.0	146693.4	498.3	497.84
BAMW-3	627949	1591433.2	146134.86	491.4	494.07
MW-16A	NF	1586266.2	144098.65	467.22	468.54
MW-17A	NF	1586466.0	144227.1	459.93	461.91
MW-6B **	NF	1586207.1	143936.33	452.0	454.97
BAMW-2	627933	1590676.1	145278.59	479.7	482.65
MW-E1	NF	1590620.9	145322.78	NF	NF
MW-E1-A	556363	1590805.0	145509.59	484.0	486.60
MW-E3	556420	1591215.7	145713.85	487.1	489.88
MW-E4	556365	1591285.9	145722.37	479.8	481.89
MW-E8	556367	1591354.4	146092.30	492.0	491.69
BAMW-1	627937	1588156.1	143733.92	466.2	468.51
MW-W1	556374	1587932.0	143689.82	452.7	455.11
MW-W2	556375	1588107.1	143678.91	460.9	462.81
MW-W3	556371	1588219.9	143783.97	472.4	474.53
MW-W4	556372	1588142.3	144012.36	491.6	491.65
BAMW-4	627935	1591396.2	145086.02	471.1	473.83

ESI

West SPL Storage Area and West Surface Impoundment (WSI) well logs

WSI

TABLE 1
Existing Well Identification and Elevation Summary
Columbia Gorge Aluminum Smelter Site
Goldendale, WA.
Page 2 of 2

Well Identification	Ecology Well Log No.	Well Location (NAD83')		Ground Surface Elevation (ft-NGVD88')	Top of Well Casing Elevation (ft-NGVD88')
		Northing	Easting		
Production Wells					
Well #1	296437	1588174.8	144651.26	NF	NF
Well #2	296436	1591175.7	146347.32	NF	NF
Well #3	296435	1587390.3	143951.14	NF	NF

Notes and abbreviations:

** Denotes change in well nomenclature (well name on construction log has been changed as indicated)

NAD83' = North American Datum 83' (horizontal position)

NGVD88' = National Geodetic Vertical Datum 88' (vertical position)

NF = Not Found

DRAFTER: SAC

APPROVED: LER

CHECKED:

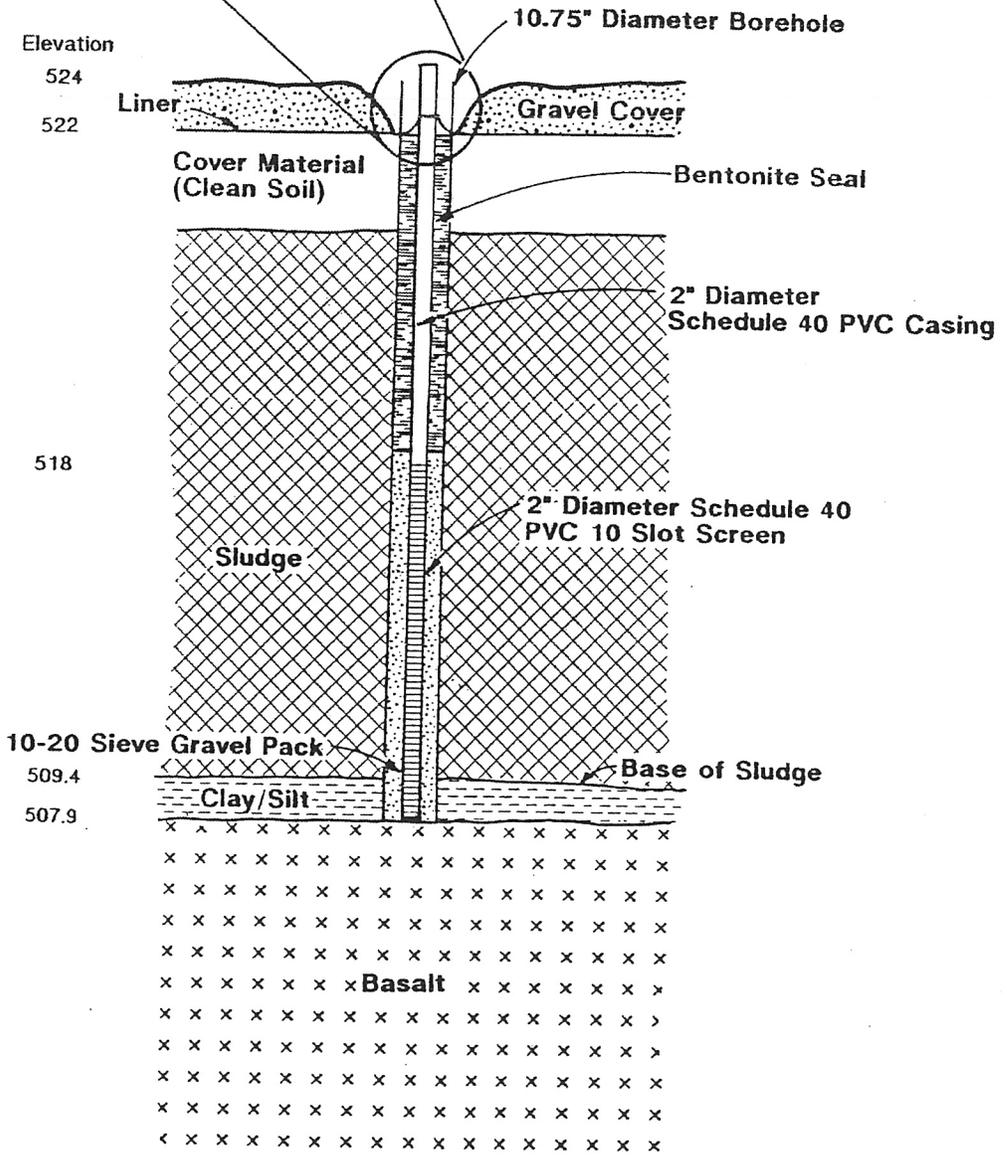
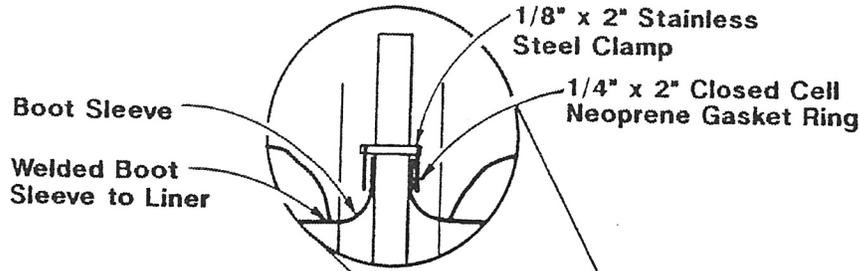
DRAWING:

FILE NO.:

PRJCT NO.: CO144.10

MAY 1992

DWG DATE:



**CONSTRUCTION DETAILS FOR
MONITORING WELL ESI-1**

Commonwealth Aluminum
Goldendale Facility

FIGURE

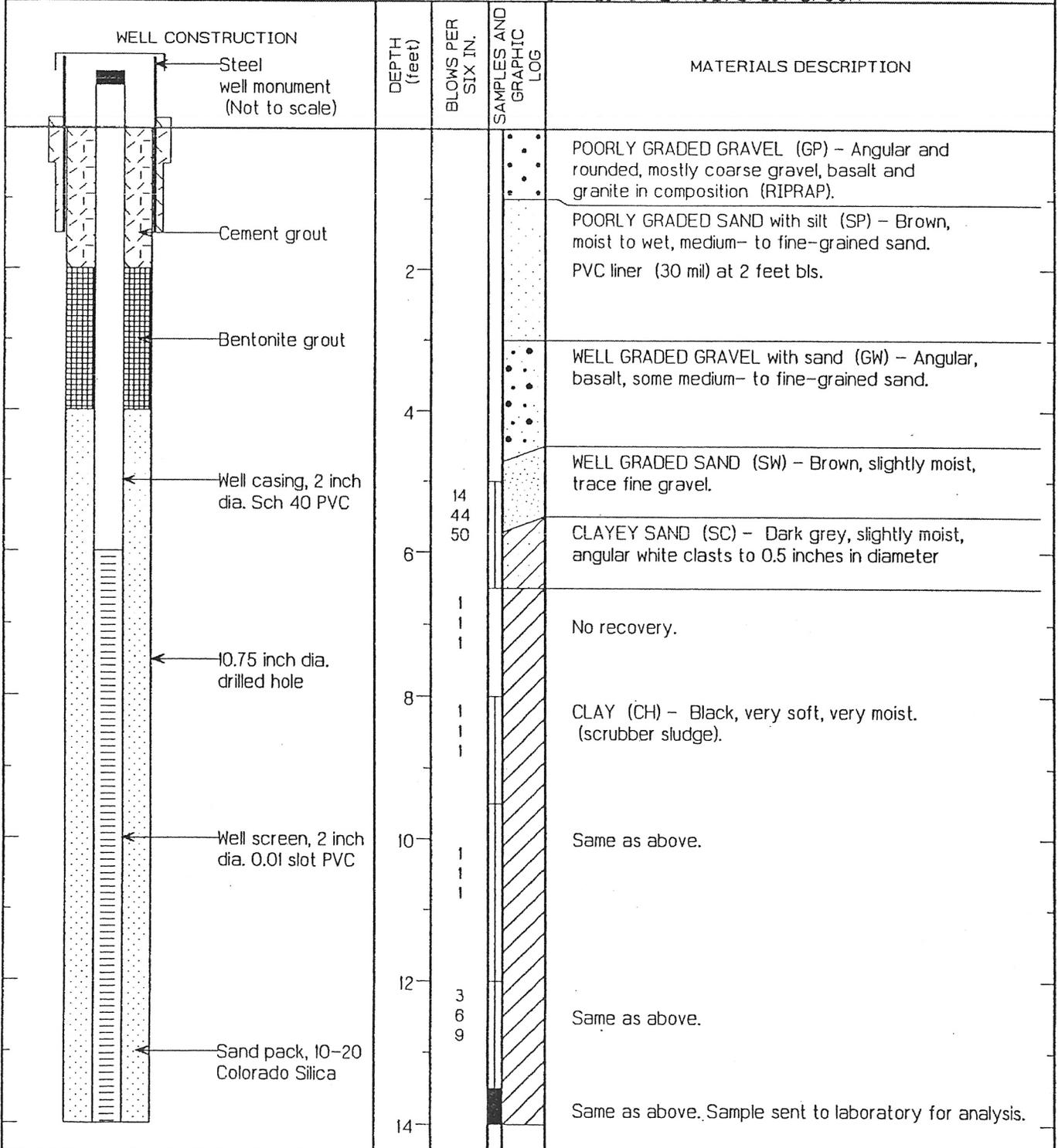
4

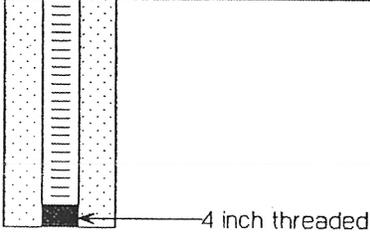
PROJECT NAME: COLUMBIA ALUMINUM
 PROJECT NO: CO144.01

LOG OF ESI-1
 Page 1 of 2

CLIENT NAME: MARTIN MARIETTA
 PROJECT LOCATION: GOLDENDALE, WASHINGTON
 DATE STARTED: 22-DEC-92
 DATE COMPLETED: 22-DEC-92
 LOGGED BY: L. ROBERTS
 CHECKED BY: L. ROBERTS

SURFACE ELEV: 524.40feet
 DATUM: 527.45 feet msl
 DRILL COMPANY: GEOTECH
 DRILLER: MIC & MARLO
 DRILL METHOD: HOLLOW STEM AUGER
 SAMPLING METHOD: SPLIT SPOON



WELL CONSTRUCTION	DEPTH (feet)	BLOWS PER SIX IN.	SAMPLES AND GRAPHIC LOG	MATERIALS DESCRIPTION
 <p>4 inch threaded PVC end cap</p>	<p>16</p> <p>18</p> <p>20</p> <p>22</p> <p>24</p> <p>26</p> <p>28</p> <p>30</p>	<p>50/5"</p>		<p>CLAYEY SILT (ML) - Dark grey-black, very moist, medium dense. Sample sent to laboratory for analysis.</p> <p>Same as above, dark green, (Native soil).</p> <p>Same as above, varigated black and green.</p> <p>Contact basalt (BEDROCK).</p> <p>Borehole terminated at 16.5 feet bls.</p> <p>Elevation of sludge/ native soil contact = 509.4 feet msl.</p> <p>Elevation of native soil/ bedrock contact = 507.9 feet msl.</p> <p>No ground water encountered.</p>

**SUBSURFACE
EXPLORATION LOG**

EST

BORING NO. _____
SHEET _____ OF _____

WELL NO. IB-1

Page 1 of 3

JOB NO. 010945.05 JOB TITLE EST Closure/Post Closure Plans
 LOCATION CWA Goldendale FEATURE _____
 DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____ DATE _____
 DRILLING CONTRACTOR West Coast Drilling REF. EL. NA DATUM _____
 SAMPLE HAMMER: WT. _____ DROP _____ DRILLER _____ INSPECTOR _____
 TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
3'								Surface - 3': Brown Sand	
5'								3' - 5': Basalt brown, weathered	
14'								5' - 14': Basalt grey	
26.5'								14' - 26.5': Basalt brown, medium brown	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND IS NOT WARRANTED TO BE REPRESENTATIVE OF OTHER LOCATIONS.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans WELL NO. IB-1
 LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____
 DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____
 DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
26.5'								26.5' - 33': Basalt Grey, some fractures	
33'								33' - 41': Basalt Grey & Brown, some fractures	
41'								41' - 47': Broken Basalt, Grey	
47'								47' - 61': Basalt, Grey, Vesicular	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE TIME INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF OTHER LOCATIONS.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010-945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO.: IB-1

LOCATION CWA Goldendale FEATURE _____

Page 3 of 3

DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____

DATE _____

DILLING CONTRACTOR West Coast Drilling DRILLER _____ REF. EL. NA DATUM _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
47'								47'- 61': Basalt, Grey, Vesicular	
61'								61'- 64': Basalt, Brown, Vesicular	
64'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE TIME INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF OTHER LOCATIONS OR TIMES.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-2
Page 1 of 2

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____
DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0' - 2'								Surface - 2': Brown, sandy silt with clay	
2' - 6'								2' - 6': Brown clay with some cobbles	
6' - 9'								6' - 9': Slightly damp, semi-fractured basalt, brown, vesicular	
9' - 23'								9' - 23': Medium hard grey basalt	
23' - 26'								23' - 26': Brown basalt, vesicular, some fractures	
26' - 37'								26' - 37': Basalt, medium hard, grey	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC LOCATION

SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-2
 Page 2 of 2

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans
 LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____
 HILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____
 DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
26'								26' - 37': Basalt, medium hard, grey	
37'								37' - 44': Grey basalt, some fractures, water at 43'	
44'								44' - 59': More fractures, brown and grey basalt	
59'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY TO THE BOREHOLE IDENTIFIED ABOVE.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-2A

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

LL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0								Surface - 7': Sand and basalt cobbles	
7								7' - 17': Basalt, medium hard, grey	
17								17' - 21': Brown vesicular basalt	
21								21' - 26': Grey basalt, hard	
26									



SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-3

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____
Page 1 of 2

DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

ILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
4'								1' - 4': Brown clay	
7'								4' - 7': Sandy brown, some clay	
9'								7' - 9': Grey fractured basalt	
20'								9' - 20': Hard grey basalt	
24'								20' - 24': Vesicular grey basalt (water at 20')	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE TIME INDICATED. IT IS NOT WARRANTED TO BE CORRECT FOR OTHER LOCATIONS OR TIMES.

SUBSURFACE EXPLORATION LOG

BORING NO. _____ SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. TB-3 Page 2 of 2

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____
 DRILL Cable Tool _____ ANGLE NA BEARING NA REF. EL. NA DATUM _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
20'									
24'								20' - 24': Vesicular grey basalt (water @20')	
26'								24' - 26': Hard, grey basalt	
30'								26' - 30': Hard, basalt, red	
35'								30' - 35': Hard, grey basalt	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-4

Page 1 of 2

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

DRILL Cable Tool ANGLE NA BEARING NA DATE _____

DRILLING CONTRACTOR West Coast Drilling REF. EL. NA DATUM _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0' - 2'								Surface - 2': Sand	
2' - 12'								2' - 12': Hard grey basalt, some fractures	
12' - 29'								12' - 29': (water @ 12') Basalt medium hard, brown, some fractures	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREOF APPLIES ONLY AT THE SPECIFIC POINTS

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

WELL NO. IB-4

Page 2 of 2

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

DRILLING METHOD Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
29'								29' - 42': Basalt, hard, grey	
42'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY TO THE BOREHOLE IDENTIFIED ABOVE.



SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB - 5

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans
 LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____
 DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____
 DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
3'								Surface - 3': Sand	
16'								3' - 16': Basalt, grey, fractured (water @15')	
21'								16' - 21': Basalt, red	
30'								21' - 30': Basalt, grey, hard	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWS VERTICAL CORRECTIONS ONLY AT THE FEET

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

WELL NO. IB-5A and IB-5AA

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

WELL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0 - 5'								Surface - 5': Sand, brown	
5' - 16'								5' - 16': Basalt, grey, some fractures	
16' - 21'								16' - 21': Red basalt	
21' - 150'								21' - 150': Basalt, hard, grey with some fractures	

S

150'

NOTE: THE LOG OF SUBSURFACE CONDITIONS IS THE PROPERTY OF WEST ENGINEERING CORPORATION

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____
WELL NO. IB - 6
Page 1 of 2

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____
CABLE TOOL Cable Tool ANGLE NA BEARING NA DATE _____

DRLING CONTRACTOR West Coast Drilling DRILLER _____ REF. EL. NA DATUM _____
SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
1'								Surface - 1': Sand	
12'								1' - 12': Basalt, vesicular with fractures, grey	
24'								12' - 24': Basalt, grey brown, vesicular	
								24' - 27': Basalt, grey with fractures	

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-6

Page 2 of 2

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRIILLING CONTRACTOR West Coast Drilling DRILLER _____ DATUM _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
36'								27' - 36': Basalt, grey, hard	
								36' - 41': Basalt, grey, hard with fractures	
63'								41' - 63': Basalt, medium hard, grey	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON ARE FOR INFORMATION ONLY.

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

WELL NO. IB-7

page 1 of 2

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ DATE _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0 - 4'								Surface - 4': Brown sand	
4' - 18'								4' - 18': Basalt, highly fractured	
18' - 30'								18' - 30': Basalt, grey some brown	

SUBSURFACE EXPLORATION LOG

BORING NO. _____ SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB - 7 Page 2 of 2

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____

DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____

DRLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
30'									
								30' - 43': Basalt, hard grey	
43'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC LOCATION

SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-8
 Page 1 of 7

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____
 DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____
 DRILLING CONTRACTOR West Coast Drilling DRILLER _____ DATUM _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
3'								Surface - 3': Sand	
45'								3' - 45': Brown and grey basalt fractures	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE INDICATED. IT IS NOT WARRANTED TO BE...

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

WELL NO. IB-8

Page 2 of 7

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

WELL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRIILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
45'								45' - 76': Hard grey basalt	
76'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY TO THE BOREHOLE IDENTIFIED BY THE BOREHOLE NUMBER AND LOCATION SHOWN ON THE LOG SHEET.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans Page 3 of 7
 LOCATION CWA Goldendale FEATURE _____
 WELL NO. IB-8
 DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____ DATE _____
 DRILLING CONTRACTOR West Coast Drilling REF. EL. NA DATUM _____
 SAMPLE HAMMER: WT. _____ DROP _____ DRILLER _____ INSPECTOR _____
 TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
76'									
108'								76' - 108' : Fractured grey basalt	
137'								108' - 137' : Fractured weathered grey basalt	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF OTHER LOCATIONS OR DATES.



SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans WELL NO. IB-8
LOCATION CWA Goldendale FEATURE _____ Page 4 of 7

DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____ DATE _____
DRILLING CONTRACTOR West Coast Drilling REF. EL. NA DATUM _____

SAMPLE HAMMER: WT. _____ DROP _____ DRILLER _____ INSPECTOR _____
TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
137'									
144'								137' - 144': Hard basalt	
								144' - 166': Fractured basalt	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DEPTH INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF OTHER LOCATIONS OR DEPTHS.

SUBSURFACE EXPLORATION LOG

BORING NO. _____ SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-8

LOCATION CWA Goldendale FEATURE _____

Page 5 of 7

DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____

ILLING CONTRACTOR West Coast Drilling DRILLER _____ REF. EL. NA DATE _____ DATUM _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
166'									
207'								166' - 207': Vesicular, medium hard	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DATE INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-8
Page 6 of 7

LOCATION CWA Goldendale FEATURE _____

DP Cable Tool ANGLE NA BEARING NA COORDINATES _____ DATE _____

DIGGING CONTRACTOR West Coast Drilling REF. EL. NA DATUM _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
207'								207' - 213': Fractures	
213'								213' - 279': Hard, grey basalt	
279'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIED LOCATION.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-8
 Page 7 of 7

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____
 DR Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
279'								279' - 301': Basalt vesicular, water	
301'								301' - 306': Basalt, hard	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY TO THE...

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____
WELL NO. IB-9

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans
LOCATION CWA Goldendale FEATURE _____
DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____ DATE _____
DRILLING CONTRACTOR West Coast Drilling REF. EL. NA DATUM _____
SAMPLE HAMMER: WT. _____ DROP _____ DRILLER _____ INSPECTOR _____
TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0								Surface - 10': Sand and silt, brown	
10								10' - 15': Basalt, grey, medium hard	
15									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC LOCATION INDICATED. IT IS NOT WARRANTED FOR OTHER USES.



SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. TR-10

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____

DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____ DATE _____
 _____ REF. EL. NA DATUM _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS. (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0 - 12'								Surface - 12': Sand	
12' - 24'								12' - 24': Basalt grey, some brown, fractured and vesicular (water at 18')	
24' - 31'								24' - 31': Basalt medium hard	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE LOCATION INDICATED. IT IS NOT VALID FOR OTHER LOCATIONS.



SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-11

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____
 DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ DATUM _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
0'								Surface - 3': Sand	
3'								3' - 5': Sand and clay	
5'								5' - 7': Sand	
7'								7' - 15': Basalt, grey, hard	
15'								15' - 17': Basalt vesicular	
17'								17' - 29': Basalt, hard grey	
29'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY TO THE BOREHOLE IDENTIFIED ABOVE.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-12A
Page 1 of 2

LOCATION CWA Goldendale FEATURE _____
DRILL Cable Tool ANGLE NA BEARING NA COORDINATES _____

RILLING CONTRACTOR West Coast Drilling DRILLER _____ DATE _____
SAMPLE HAMMER: WT. _____ DROP _____ REF. EL. NA DATUM _____
TYPE _____ INSPECTOR _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION
0' - 9'								Surface - 9': Sand, some silt
9' - 16'								9' - 16': Fractured basalt
16' - 19'								16' - 19': Fractures, rock
19' - 30'								19' - 30': Basalt, brown, medium hard

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE DEPTH INDICATED. IT IS NOT WARRANTED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT OTHER LOCATIONS.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-12A

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans Page 2 of 2
 LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____
 DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____
 DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
33'								33' - 64': Basalt, hard grey	
64'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON IS BASED ON THE LOG OF SUBSURFACE CONDITIONS SHOWN ON THE PREVIOUS PAGE.

SUBSURFACE EXPLORATION LOG

BORING NO. _____ SHEET _____ OF _____

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

WELL NO. IB-13 and IB 13A
Page 1 of 4

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____

DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____

DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
29'								Surface - 29': Basalt, grey, fractures	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND DATE INDICATED.

SUBSURFACE EXPLORATION LOG

BORING NO. _____
 SHEET _____ OF _____
 WELL NO. IB-13 and IB 13A
 Page 2 of 4

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans
 LOCATION CWA Goldendale FEATURE _____ COORDINATES _____
 METHOD Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____
 DRILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____
 SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
29'								29' - 71': Basalt, grey, hard	
71'									

SUBSURFACE EXPLORATION LOG

BORING NO. _____

SHEET _____ OF _____

WELL NO. IB-13 and IB 13A

Page 3 of 4

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____

RILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATE _____

DILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
71'								71' - 103': Basalt, hard grey fractures	
								(water at 89')	
103'									

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE TIME OF LOGGING.

SUBSURFACE EXPLORATION LOG

BORING NO. _____ SHEET _____ OF _____

WELL NO. TB-13 & TB-13
Page 4 of 4

JOB NO. 010945.05 JOB TITLE ESI Closure/Post Closure Plans

LOCATION CWA Goldendale FEATURE _____ COORDINATES _____ DATE _____

DRILL Cable Tool ANGLE NA BEARING NA REF. EL. NA DATUM _____

DILLING CONTRACTOR West Coast Drilling DRILLER _____ INSPECTOR _____

SAMPLE HAMMER: WT. _____ DROP _____ TYPE _____

DEPTH FEET	LITHOLOGY	SAMPLE C-CORE B-BAG CK-CHUNK R-RING	TUBE SAMPLE NO.	PENETRATION RESISTANCE BLOW/FT.	DRY DENSITY PCF	MOISTURE CONTENT, %	SOIL CLASS., (U.S.C.S.)	MATERIAL DESCRIPTION	GROUNDWATER
103'								103' - 108': Basalt, hard and grey	
								108' - 153': Basalt, vesicular with fractures	

NOTE: THE LOG OF SUBSURFACE CONDITIONS SHOWN HEREON APPLIES ONLY AT THE SPECIFIC BORING LOCATION AND AT THE TIME OF DRILLING.

MW-1 (G-1)

File Original and First Copy with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. _____

Permit No. _____

(1) OWNER: Name Martin Marietta Aluminum Address P.O. Box 711 The Dalles, Or. 97058

(2) LOCATION OF WELL: County Klickitat SE & SE 1/4 Sec 28 T. 5N N. R. 7 W.M.

Bearing and distance from section or subdivision corner
16 R

PROPOSED USE: Domestic Industrial Municipal
Monitoring Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well G-1
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 152 ft. Depth of completed well 27 ft.

(6) CONSTRUCTION DETAILS: P.V.C.
Casing installed: 4" Diam. from 1 ft. to 27 ft.
Threaded " Diam. from _____ ft. to _____ ft.
Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No SCREEN
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No TIMCO
Manufacturer's Name _____ Model No. _____
Type P.V.C. Diam. 4 Slot size 40 from 22 ft. to 27 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
Gravel placed from 19 ft. to 27 ft.

Surface seal: Yes No To what depth? 19 ft.
Material used in seal: BENSEAL & GRANULAR BEN
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 8 ft. below top of well Date 4-4-84
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" 35 G.P.M." W/ AIR TEST "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test 4-4-84
Pump test: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Minimum flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOPSOIL	0	3
LOOSE BROKEN BASALT	3	19
BASALT GREY & BAN SOLID	19	27
BASALT GREY HARD	27	152

DATE: JUN 18 1984

NOTE:

THIS IS A MONITORING WELL AND WAS BACK PLUGGED W/ BENSEAL FROM 152-27. ALL BENTONITE MIXTURES CONSISTED OF 1/2-2 LBS OF BENTONITE PER 1 GALLON OF WATER.

RECEIVED
MAY 29 1984

DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started 4-3, 1984. Completed 4-4, 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME West Coast Drilling Co., Inc. (Person, firm, or corporation) (Type or print)

Address 220 Academy St. Mt. Angel, Or. 97362

[Signed] Steven M. Stadler (Well Driller)

License No. 0860 Date 5-4, 1984

OK 10/17/84

(USE ADDITIONAL SHEETS IF NECESSARY)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

File Original and First Copy with Department of Ecology
Second Copy - Owner's Copy
Third Copy - Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No. _____
Permit No.

(1) OWNER: Name Martin Marietta Address F.O. Box 711 The Dallas, Cr. 97058

(2) LOCATION OF WELL: County Clatsop 1/4 NE 1/4 Sec 21 T. 3 N. R. 25 W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal
Monitoring Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well G-8
(if more than one)....
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 14 ft. Depth of completed well 14 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 4 " Diam. from 41 ft. to 9 ft.
Threaded " Diam. from _____ ft. to _____ ft.
Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No Timco
Manufacturer's Name _____
Type P.V.C. Model No. _____
Diam. 4 Slot size 40 from 9 ft. to 14 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
Gravel placed from 0 ft. to 1 1/2 ft.

Surface seal: Yes No To what depth? _____ ft.
Material used in seal _____
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name X
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level... _____
Static level 4 ft. below top of well Date 4-23-84
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Csp. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal/min. with _____ ft. drawdown after _____ hrs.
"NO YIELD" TEST WAS MADE.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Ballot test _____ gal/min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
<u>LOOSE BROKEN ROCK</u>	<u>0</u>	<u>6</u>
<u>BASALT GREY HRD</u>	<u>6</u>	<u>11</u>
<u>BASALT GREY + BRN</u>		
<u>FRACTURED</u>	<u>11</u>	<u>14 W</u>

RECEIVED

MAY 29 1984

DEPARTMENT OF ECOLOGY
NORTHWEST REGION

Work started 4-23 1984 Completed 4-23 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

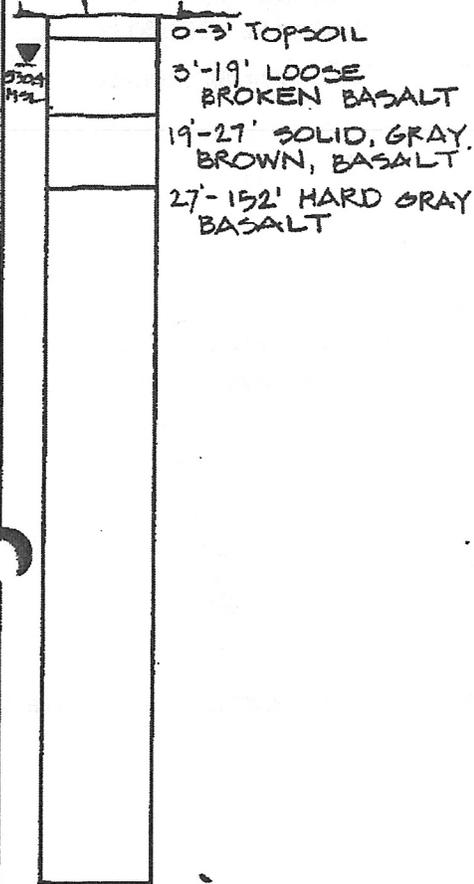
NAME West Coast Drilling Co. Inc.
(Person, firm, or corporation) (Type or print)

Address 220 Academy St. Mt. Angel, Cr. 97362

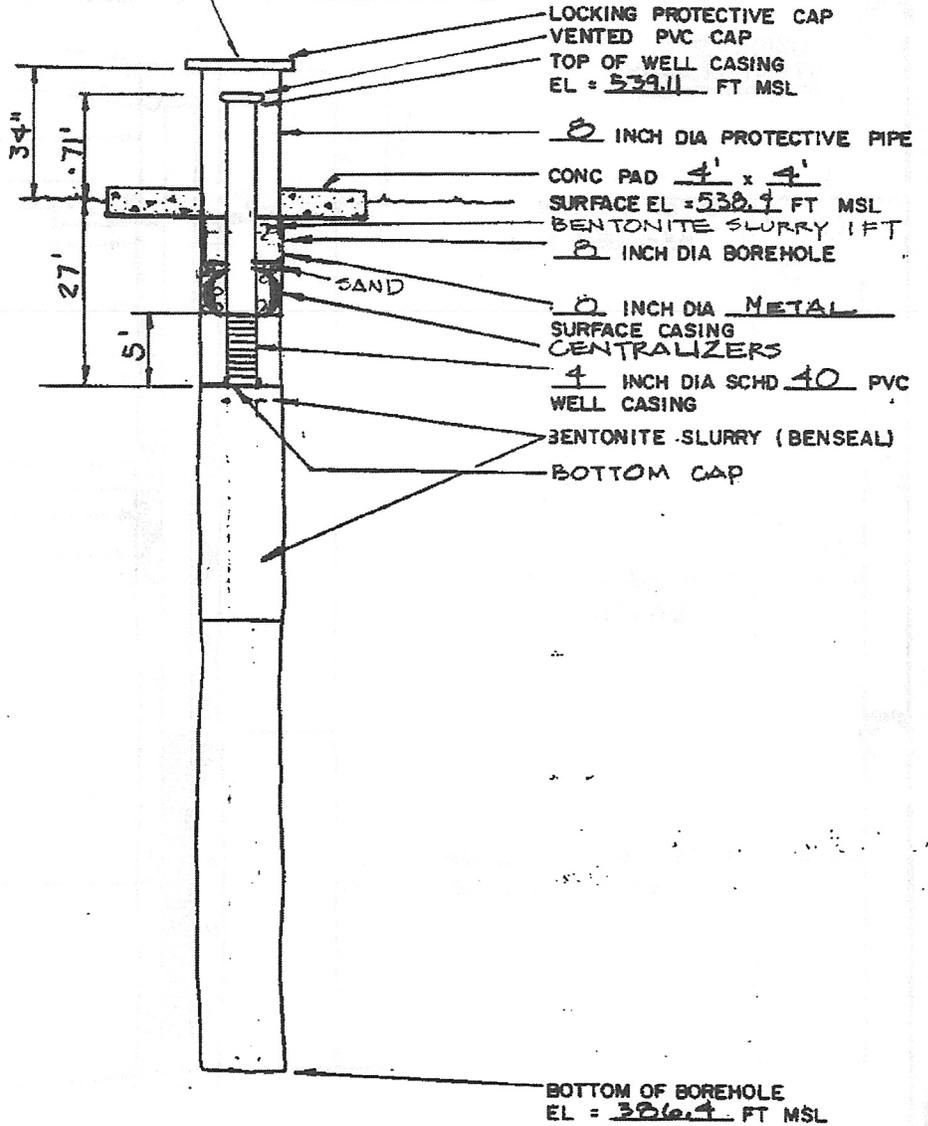
(Signed) Steven M. Stadel
(Well Driller)

License No. 0860 Date 5-4 1984

BOREHOLE STRATIGRAPHY



WELL CONSTRUCTION



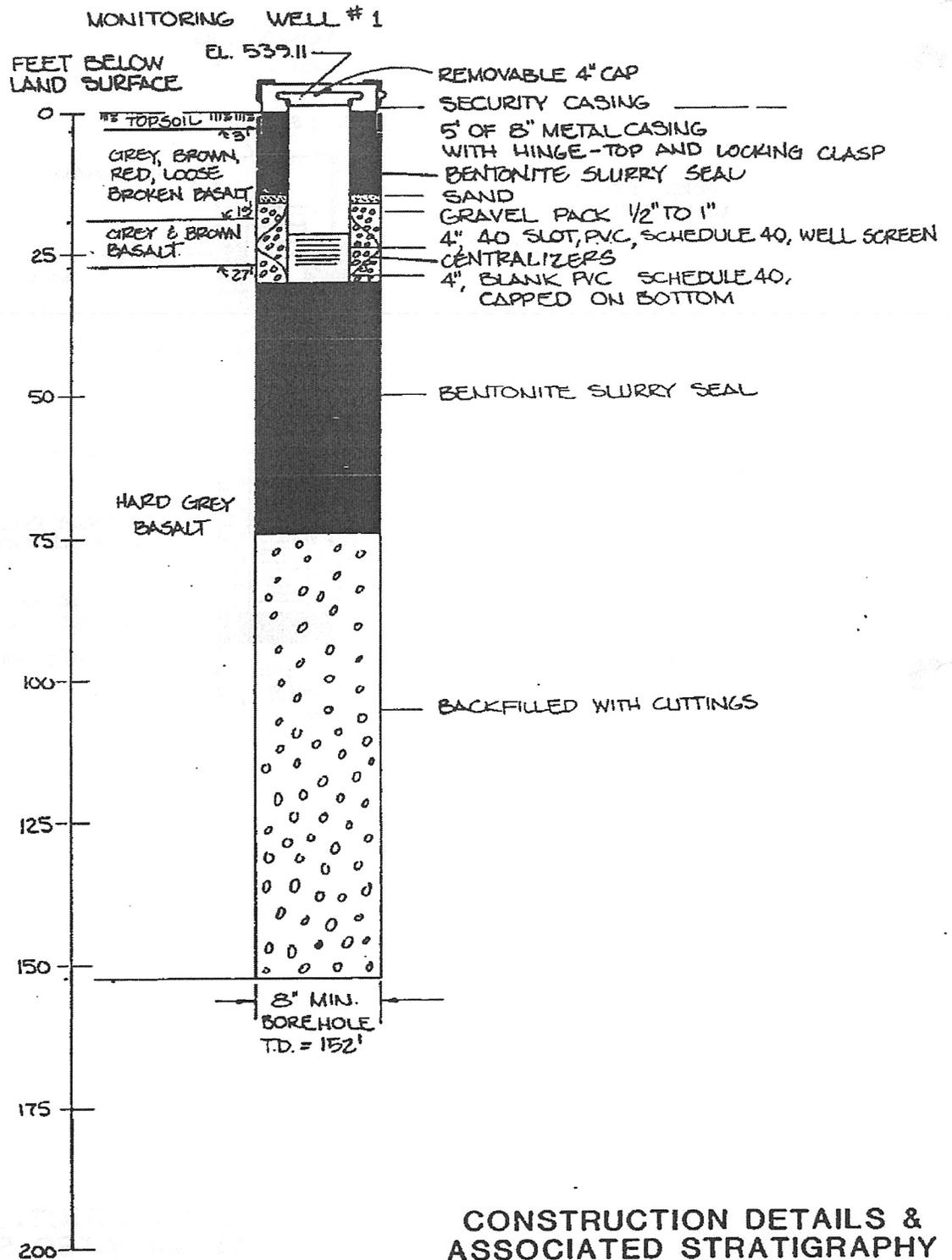
OGDEN SURVEYING EQUIPMENT CO. 84420

PROJECT NAME : Commonwealth
 PROJECT NO. : 60014.003.04
 BORING NO. : _____
 WELL NO. : 6-1

DRILLING DATE : April 3, 1984
 WELL INSTAL DATE : April 4, 1984
 INSTALLED BY : West Coast
 PREPARED BY : _____

DESIGN BY	ROP	CHECKED BY	SRR & JEB	MONITOR WELL CONSTRUCTION DIAGRAM	APPROVED	
SURVEY BY	Jackson	SCALE	NTS		DATE	
DRAWN BY	6	DWG. NO.	60014.003.04	Commonwealth Aluminum-Goldendale	April 1986	

MW-1

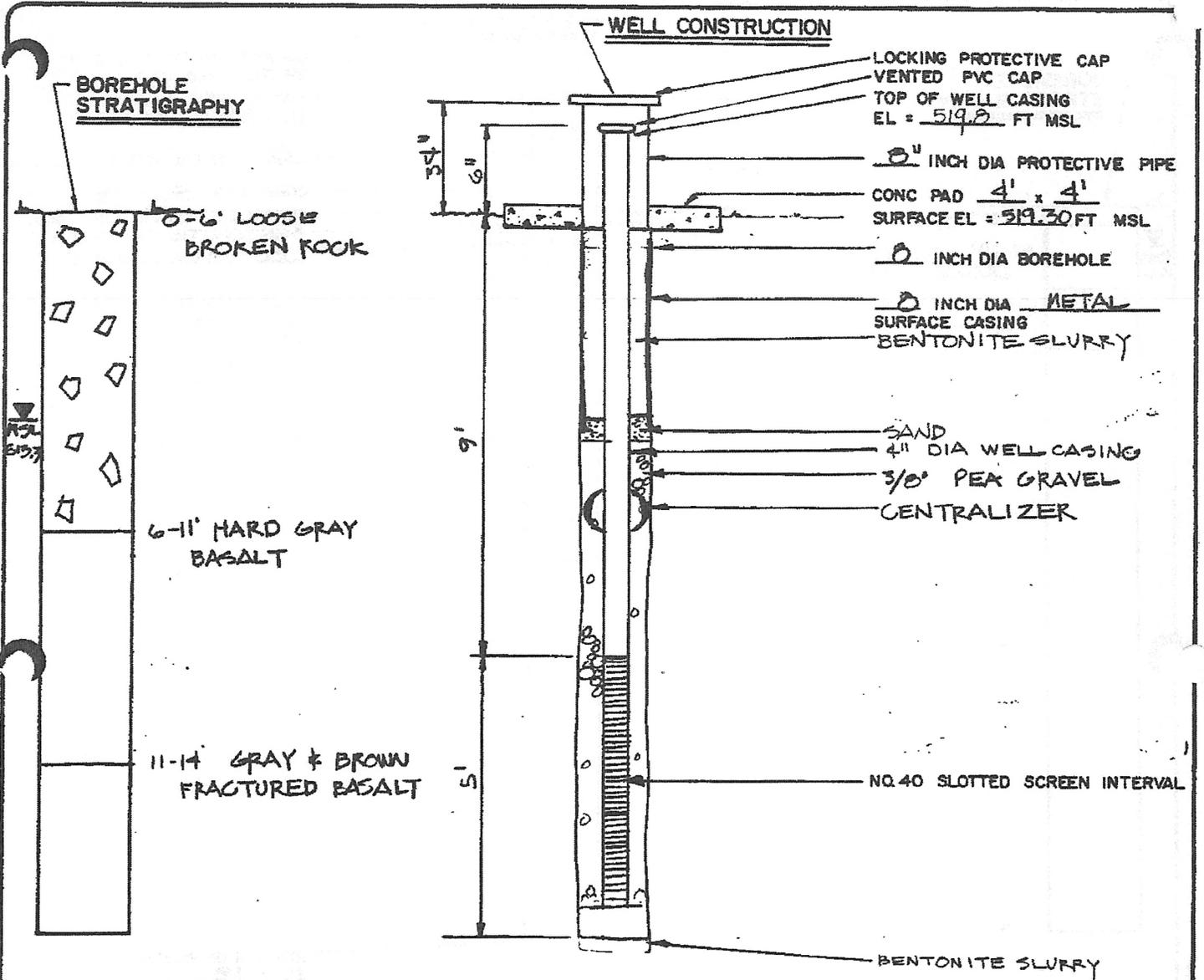


CONSTRUCTION DETAILS & ASSOCIATED STRATIGRAPHY

MONITOR WELL NO. 1
COMMONWEALTH ALUMINUM

ApX A 1985

MW-8



PROJECT NAME : Commonwealth
 PROJECT NO. : 60014.003.04
 BORING NO. : _____
 WELL NO. : B

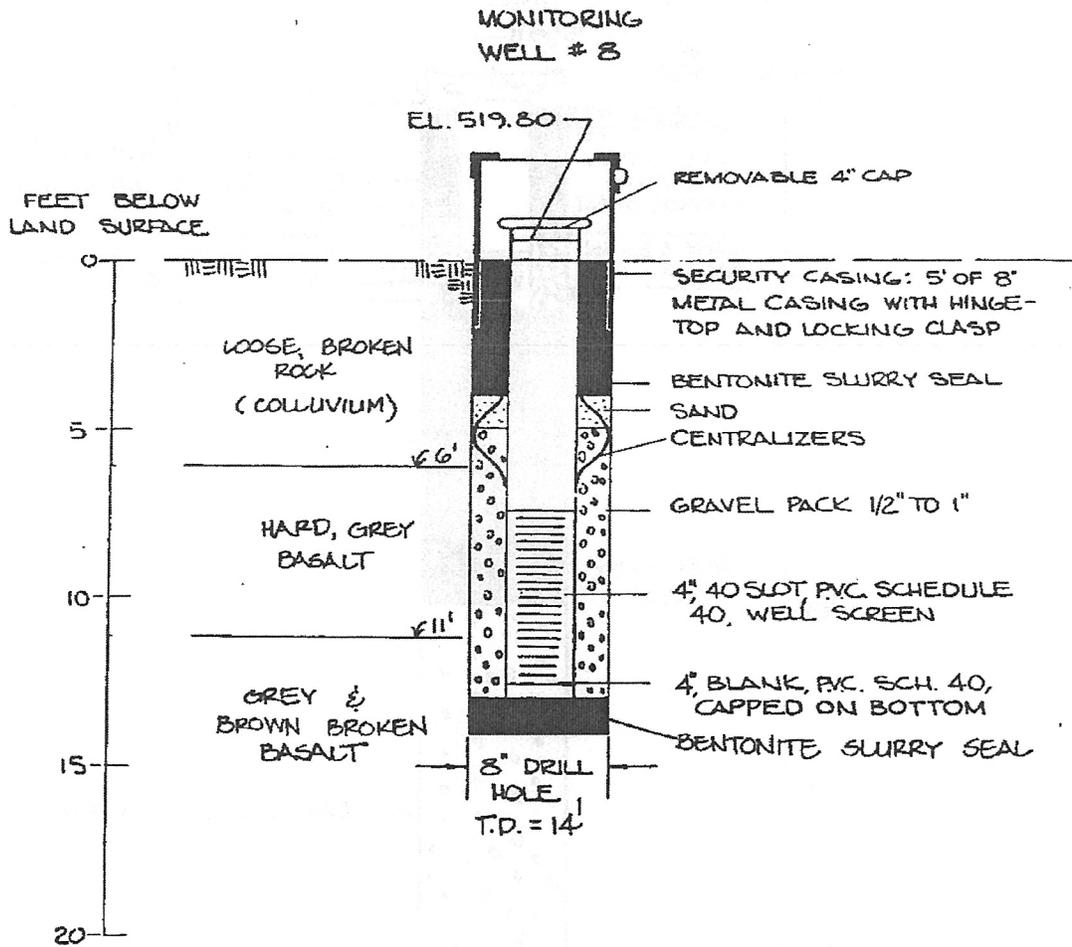
DRILLING DATE : April 23, 1984
 WELL INSTAL DATE : April 23, 1984
 INSTALLED BY : West Coast
 PREPARED BY : _____

OGDEN SURVEYING EQUIPMENT CO. 94420

DESIGN BY	ROP	CHECKED BY	SRR & JEB	MONITOR WELL CONSTRUCTION	APPROVED	
SURVEY BY	Jackson	SCALE	NTS	DIAGRAM	DATE	
DRAWN BY	G	DWG. NO.	60014.003.04	ESI GWQAP 1985 PLAN Commonwealth Aluminum-Goldendale	April 1986	

CenturyWest, Sept 1985

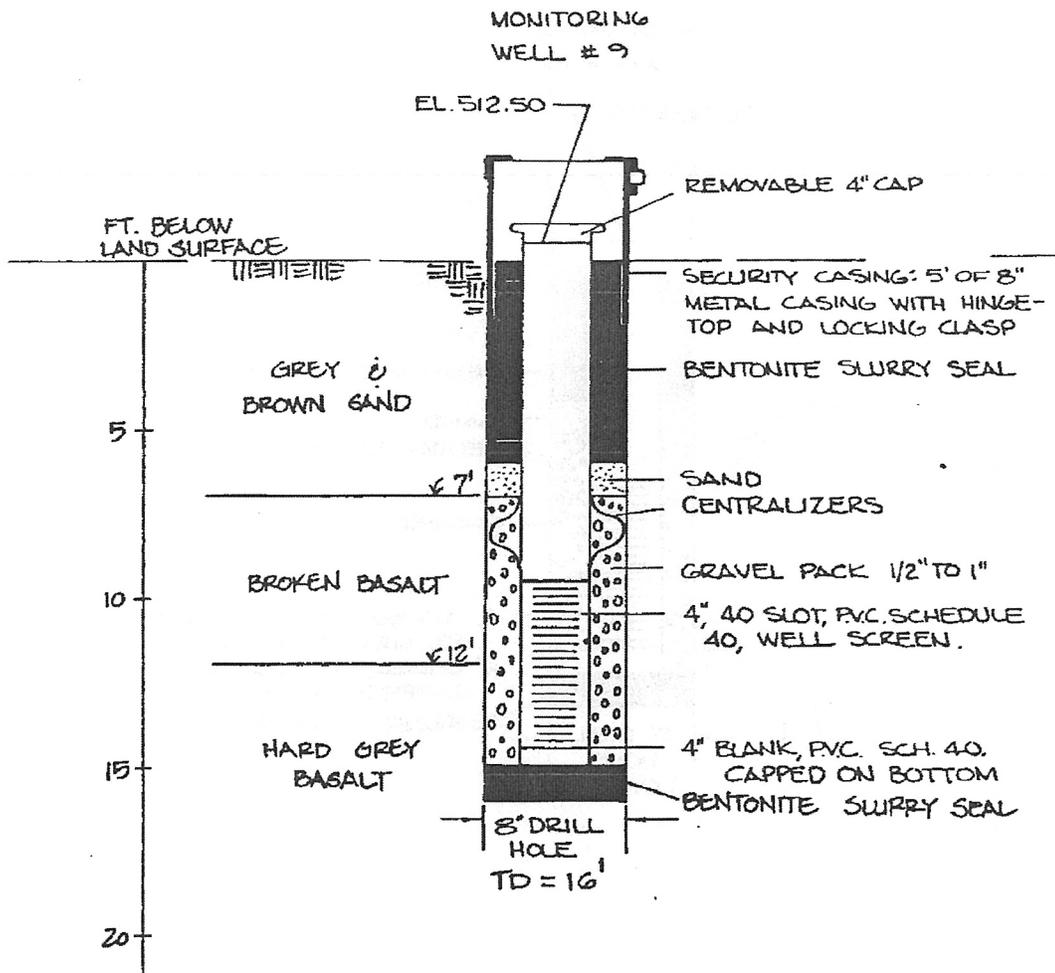
MW-8



CONSTRUCTION DETAILS & ASSOCIATED STRATIGRAPHY

**MONITOR WELL NO. 8
COMMONWEALTH ALUMINUM**

MW-9



CONSTRUCTION DETAILS & ASSOCIATED STRATIGRAPHY

**MONITOR WELL NO. 9
COMMONWEALTH ALUMINUM**

MW-9

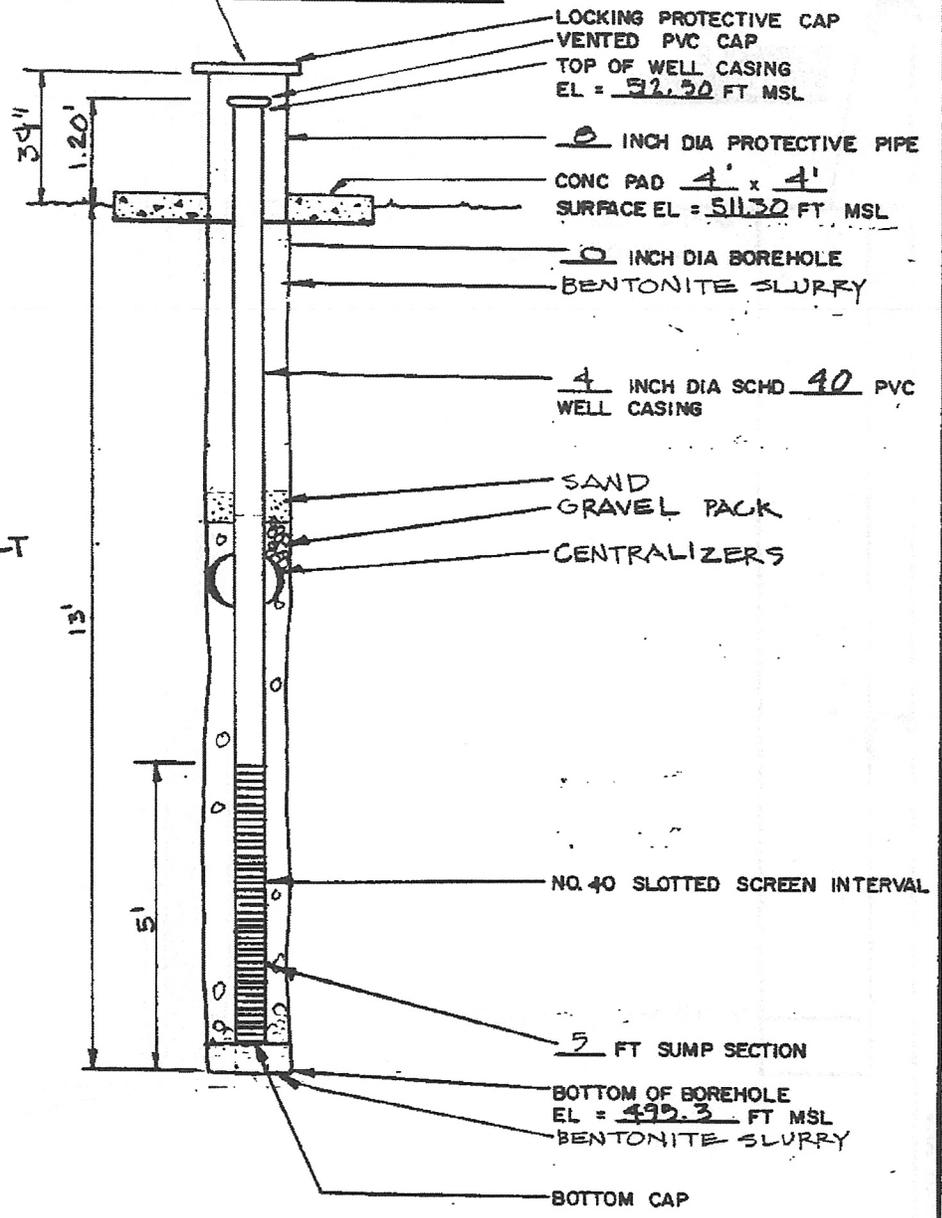
BOREHOLE STRATIGRAPHY

0-7' GRAY + BROWN SAND

7'-12' BROKEN BASALT

12'-16' HARD GRAY BASALT

WELL CONSTRUCTION



- LOCKING PROTECTIVE CAP
- VENTED PVC CAP
- TOP OF WELL CASING
EL = 52.50 FT MSL
- 0 INCH DIA PROTECTIVE PIPE
- CONC PAD 4' x 4'
SURFACE EL = 51.30 FT MSL
- 0 INCH DIA BOREHOLE
- BENTONITE SLURRY
- 4 INCH DIA SCHD 40 PVC WELL CASING
- SAND GRAVEL PACK
- CENTRALIZERS
- NO. 40 SLOTTED SCREEN INTERVAL
- 5 FT SUMP SECTION
- BOTTOM OF BOREHOLE
EL = 49.3 FT MSL
- BENTONITE SLURRY
- BOTTOM CAP

PROJECT NAME: Commonwealth
 PROJECT NO.: 60014.003.04
 BORING NO.: _____
 WELL NO.: 6-9

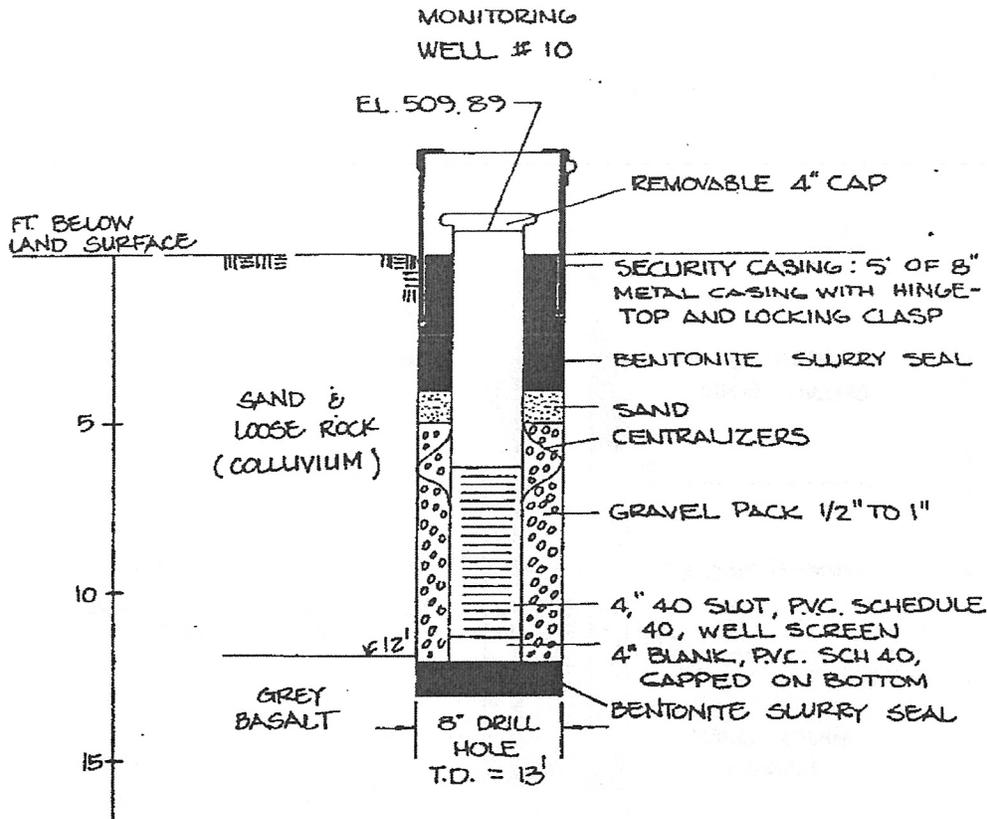
DRILLING DATE: April 20, 1984
 WELL INSTAL DATE: April 23, 1984
 INSTALLED BY: West Coast
 PREPARED BY: _____

OGDEN SURVEYING EQUIPMENT CO. 94420

DESIGN BY	ROP	CHECKED BY	SRR & JEB	MONITOR WELL CONSTRUCTION	APPROVED	
SURVEY BY	Jackson	SCALE	NTS	DIAGRAM	DATE	
DRAWN BY	G	DWG. NO.	60014.003.04	ESI GWQAP 1985 PLAN Commonwealth Aluminum-Goldendale	April 1986	

Century West Engineering Sept 1985

MW-10

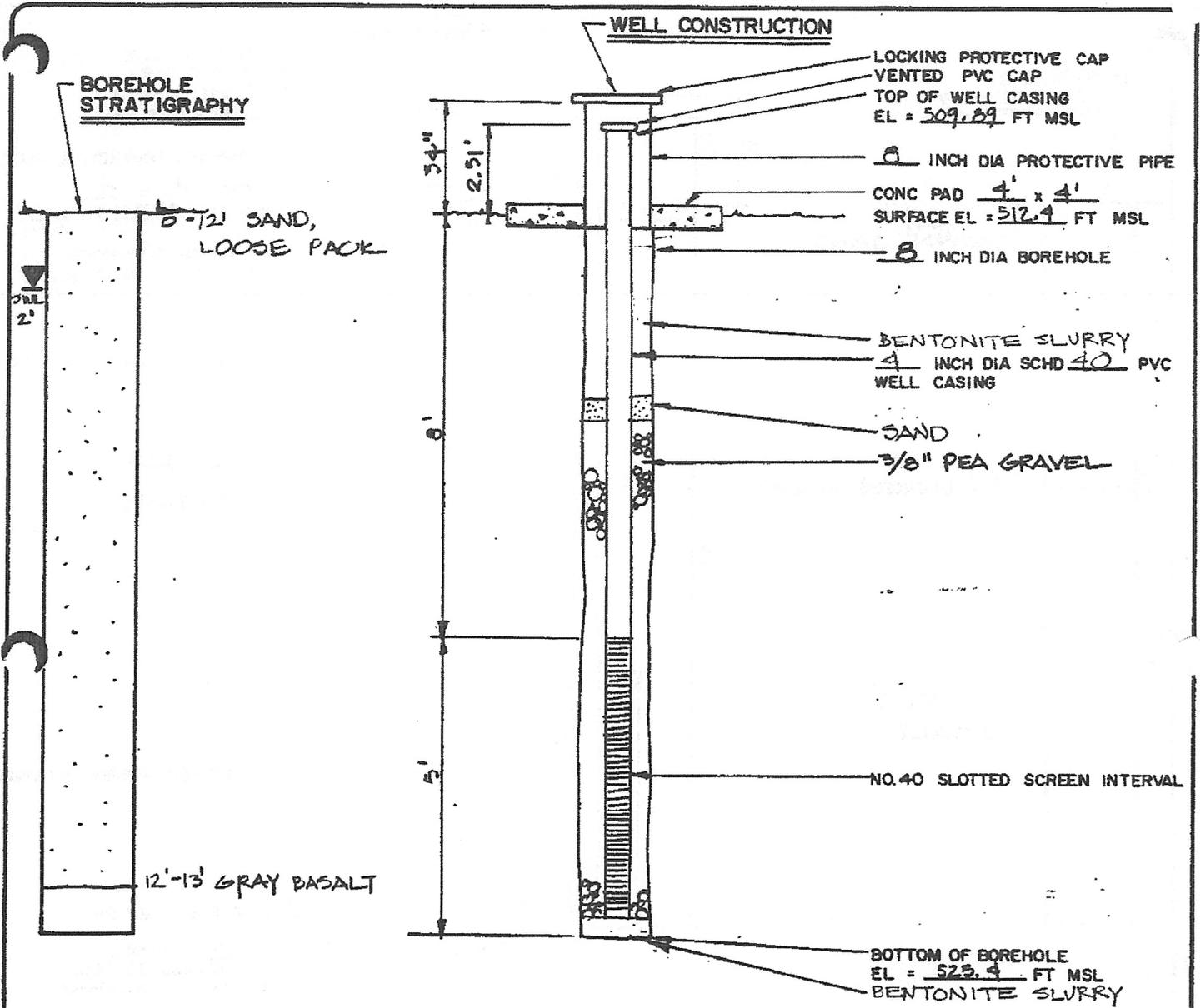


CONSTRUCTION DETAILS & ASSOCIATED STRATIGRAPHY

**MONITOR WELL NO. 10
COMMONWEALTH ALUMINUM**

ESI GW Assessment 1985

MW-10



PROJECT NAME : Commonwealth
 PROJECT NO. : 60014.003.04
 BORING NO. : _____
 WELL NO. : 10

DRILLING DATE : April 23, 1984
 WELL INSTAL DATE : April 23, 1984
 INSTALLED BY : West Coast
 PREPARED BY : _____

OCDEN SURVEYING EQUIPMENT CO. 04450

DESIGN BY	ROP	CHECKED BY	SRR & JEB	MONITOR WELL CONSTRUCTION	APPROVED	
SURVEY BY	Jackson	SCALE	NTS	DIAGRAM	DATE	
DRAWN BY	6	DWG. NO.	60014.003.04	ESI GWQAP 1985 PLAN Commonwealth Aluminum Goldendale	April 1986	

APPENDIX B-2.1

EAST END LANDFILL (SWMU #17) VICINITY WELL LOGS

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60012

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction
 Decommission 318819

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number: _____

Property Owner Goldendale Aluminum Co.

Consulting Firm URS Corp.

Site Address 85 John Day Dam Rd.

Unique Ecology Well IDTag No. BAS414 MW-EI-A

City Goldendale County Klickitat

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Location NE 1/4-1/4 NW 1/4 Sec 21 Twn 3 R 17

EWM or WWM

Driller Engineer Trainee

Name (Print Last, First Name) Sink Ronald

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____
 still REQUIRED) Long Deg _____ Min _____ Sec _____

Driller/Engineer /Trainee Signature [Signature]

Tax Parcel No. 03172100000200

Driller or Trainee License No. 2661

Cased or Uncased Diameter 6" Static Level 10'

Work/Decommission Start Date 6/23/08

If trainee, licensed driller's Signature and License Number: _____

Work/Decommission Completed Date 6/23/08

Construction Design	Well Data	Formation Description
<p>Concrete - bentonite - sand</p>	<p>Drill Method: Air Rotary Casings: 2" sch 40 PVC + 2.5' to 8' Screen: 2" sch 40 PVC 8' to 15' Sand: 10/20 6' to 15'</p>	<p>Sand gravel basalt fractured basalt basalt</p>
	<p>Seal: Bentonite chips 1.5' to 6'</p>	<p>3 7 12 13 15</p>

RECEIVED
 SEP 16 2008
 DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

SCALE: 1"= 15' PAGE 1 OF 1

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E1

Sheet 1 of 1

Date(s) Drilled	6/23/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	13 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	484.00 feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Bentonite Chips	Location			

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type	Number	Blows/6in.	Recovery (%)					
0							SM	Buff silty fine SAND with organics (loose) (dry)		
480	5			16 32 16		0.0	GP	Gray fine to coarse sub-angular to angular GRAVEL (medium dense) (dry)		
475	10			50/1"				Basalt bedrock		
470	15							Boring was completed to 13' bgs. Groundwater was not encountered. Boring was backfilled with hydrated bentonite chips.		
465	20									
460	25									
455	30									

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ_URSSEA3B.GLB_URSSEA3.GDT 1/7/09

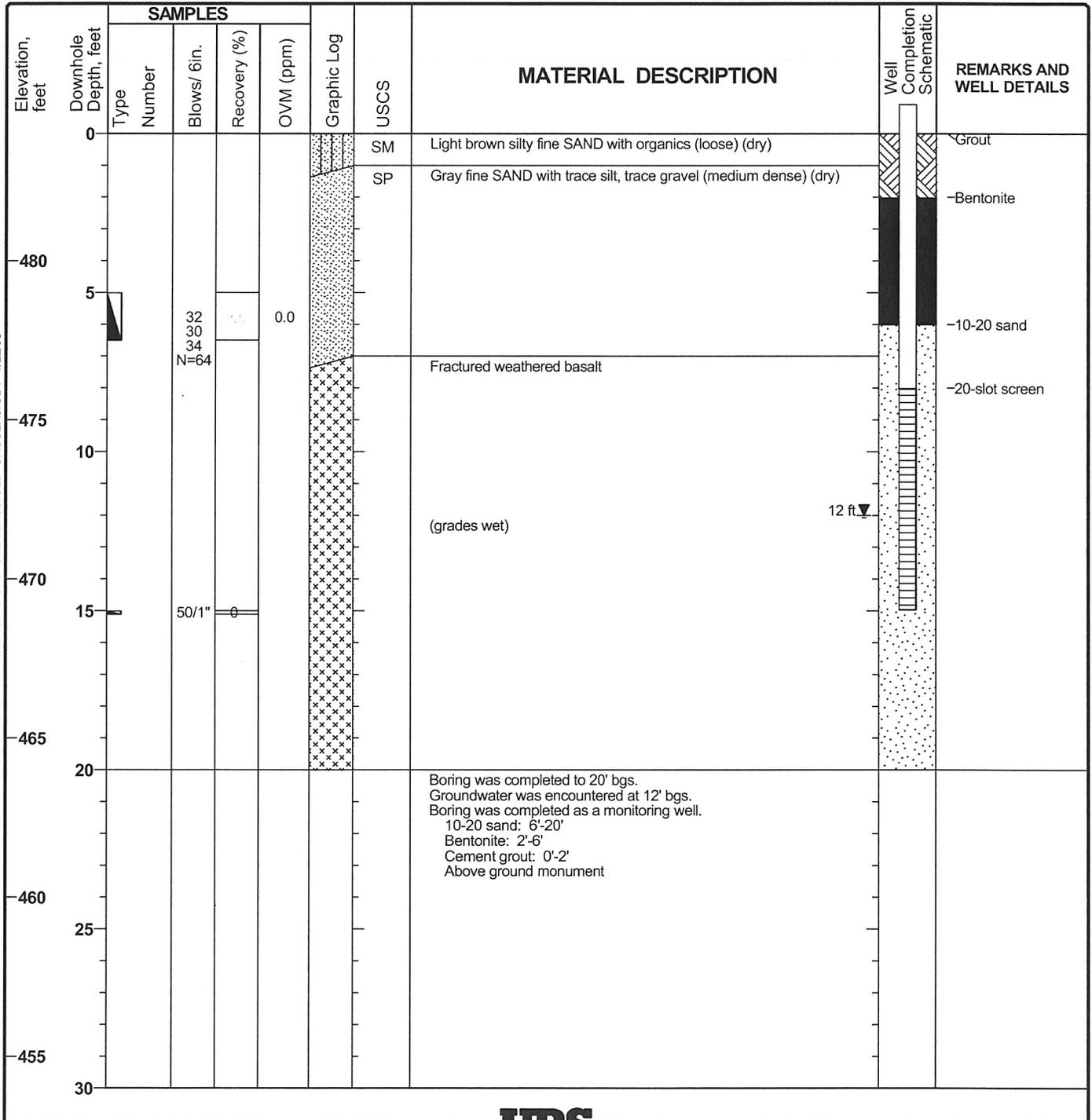


Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E1A

Sheet 1 of 1

Date(s) Drilled	6/23/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	20 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	484.00 feet MSL
Groundwater Level	12 ft bgs	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Location				



ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ_URSSEA3B.GLB_URSSEA3.GDT 1/22/09

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E2/MW-E2A

Sheet 1 of 1

Date(s) Drilled	6/23/08	Logged By	GDP	Checked By	GHG
Drilling Method	HSA	Drilling Contractor	EWE	Total Depth of Borehole	6.5 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	8"	Ground Surface Elevation	487.75 feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Bentonite Chips		Location		

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type Number	Blows/ 6in.	Recovery (%)	OVM (ppm)					
0						GM	Brown silty fine to coarse GRAVEL with sand, trace cobbles (loose) (dry) (fill)			
485						ML	Dark gray ashy SILT, trace cobbles (crushed drums, metal pieces, and wood) (dry) (fill)			
5			2 2	33	0.0	SM	Dark gray silty fine to coarse SAND with gravel (moist) (very loose)			
480	30/2"						Boring MW-E2 was terminated at 6.5 due to refusal on basalt bedrock. Boring ME-E2A was terminated at 6' due to refusal on basalt bedrock. Groundwater was not encountered. Borings were backfilled with hydrated bentonite chips.			
10										
475										
15										
470										
20										
465										
25										
460										
30										

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ URSSEA3B.GLB URSSEA3.GDT 1/7/09



The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60012

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction 318818
 Decommission

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number:

Property Owner Goldendale Aluminum Co.

Consulting Firm URS Corp.

Site Address 85 John Day Dam Rd.

Unique Ecology Well IDTag No. BAS413 MW-E3

City Goldendale County Klickitat

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Location NE 1/4-1/4 NW 1/4 Sec 21 Twn 3 R 17

EWM or WWM

C

Lat/Long (s, l, r) Lat Deg _____ Min _____ Sec _____
 still REQUIRED) Long Deg _____ Min _____ Sec _____

Driller Engineer Trainee
 Name (Print Last, First Name) Sink Ronald

Tax Parcel No. 0317210000200

Driller/Engineer /Trainee Signature [Signature]

Cased or Uncased Diameter 6" Static Level

Driller or Trainee License No. 2661

Work/Decommission Start Date 6/23/08

If trainee, licensed driller's Signature and License Number:

Work/Decommission Completed Date 6/23/08

Construction Design	Well Data	Formation Description
 <p>- concrete - bentonite - sand</p>	<p>Drill Method: Air Rotary Casings: 2" sch 40 PVC +2.5' to 20' Screen: 2" sch 40 PVC 20' to 25' Sand: 10/20 18' to 25'</p>	<p>silty sand w/ cobbles 3 cobbles 6 12" dia. debris 21 Basalt 25</p>
	<p>Seal: Bentonite 2' to 18'</p>	<p style="text-align: center;"> RECEIVED SEP 16 2008 DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE </p>

SCALE: 1" = 25' PAGE 1 OF 1

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E3

Sheet 1 of 1

Date(s) Drilled	6/23/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	25 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	487.12 feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Location				

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type	Number	Blows/6in.	Recovery (%)					
0							GM	Brown silty fine to coarse GRAVEL and COBBLES (dry) (fill)	Grout	
-485									Bentonite	
	5			18 34 31	4	0.0	SM/ GM	Dark gray ashy SILT with gravel (medium dense) (moist) (fill)		
-480										
	10			6 8 4	33	0.0		Same as above (loose) (moist)		
-475										
	15			23 31 14	28	0.0		Same as above with wood (medium dense) (moist)		
-470										
	20	P-E3-20.0	18 34 40	0	0.0		GP	Bottom of landfill material Brown sandy fine to coarse GRAVEL with trace silt (medium dense) (moist) (native)	-10-20 sand -20-slot screen CA	
-465								(Becomes very hard last 2") Competent basalt		
-460										
	25									
	30							Boring was completed to 25' bgs. Groundwater was not encountered. Boring was completed as a monitoring well. 10-20 sand: 18'-25' Bentonite: 2'-18' Cement grout: 0'-2' Above ground monument		

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ URSSEA3B.GLB URSSEA3.GDT 1/7/09

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60012

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction 318817
 Decommission

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number:

Property Owner Goldendale Aluminum Co.

Consulting Firm URS Corp.

Site Address 85 John Day Dam Rd.

Unique Ecology Well IDTag No. BAS412 MW-E4

City Goldendale County Klickitat

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Location NE 1/4-1/4 NW 1/4 Sec 21 Twn 3 R 17

EWM or WWM C

Driller Engineer Trainee
 Name (Print Last, First Name) Sink Ronald
 Driller/Engineer/Trainee Signature [Signature]
 Driller or Trainee License No. 2661

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____
 still REQUIRED) Long Deg _____ Min _____ Sec _____

Tax Parcel No. 03172100000200

Cased or Uncased Diameter 6" Static Level 32'

Work/Decommission Start Date 6/23/08

If trainee, licensed driller's Signature and License Number:

Work/Decommission Completed Date 6/24/08

Construction Design	Well Data	Formation Description
	Drill Method: Air Rotary Casings: 2" sch 40 PVC to Screen: 2" sch 40 PVC to Sand: 10/20 to Seal: Bentonite to	cobbles 2 sand 29 Fractured basalt 32 weathered basalt 36 Basalt 38

RECEIVED
 SEP 16 2008
 DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

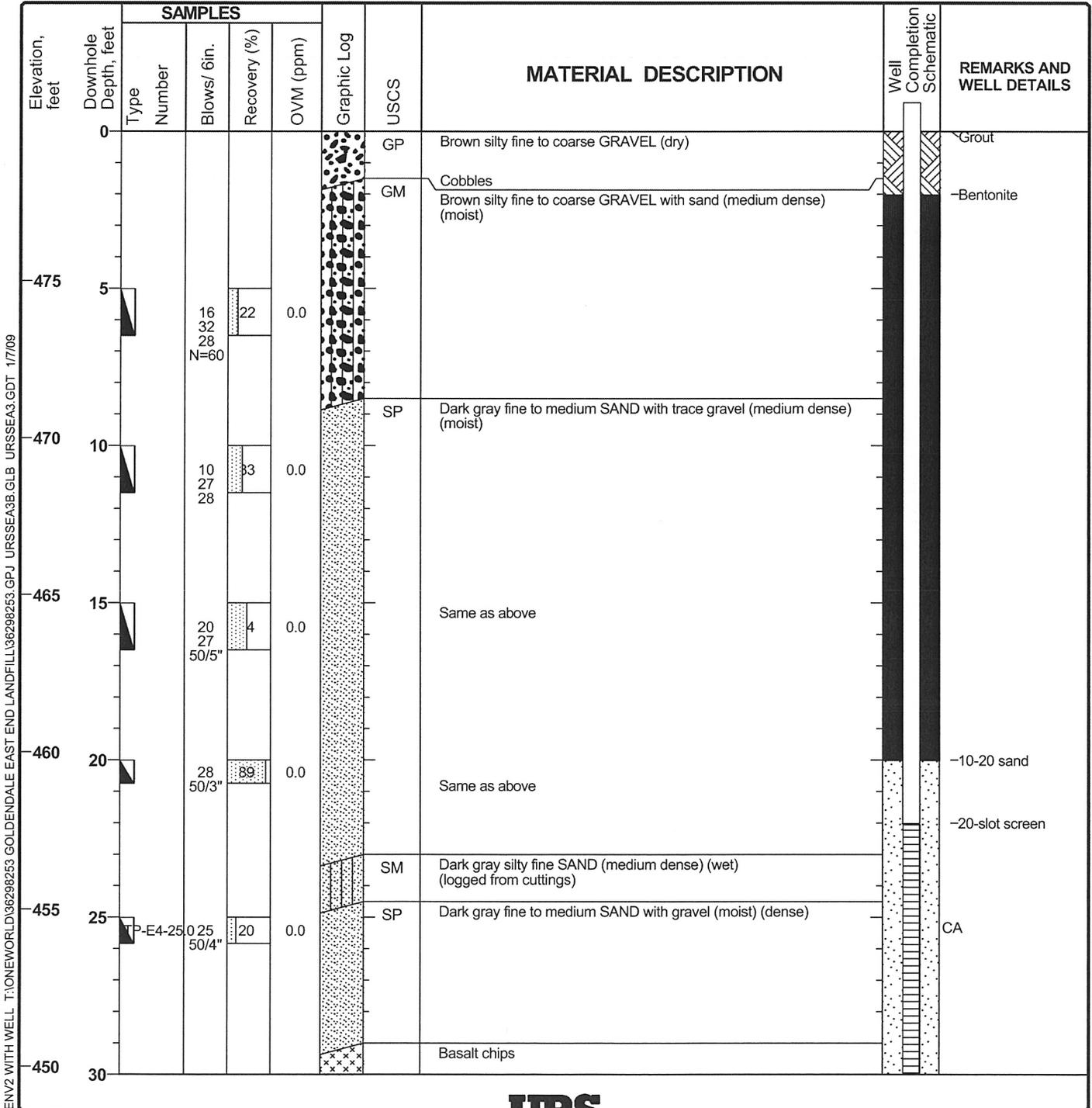
SCALE: 1"= 38' PAGE 1 OF 1

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E4

Sheet 1 of 2

Date(s) Drilled	6/23/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	37 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	479.75 feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Bentonite Chips	Location			



Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E4

Sheet 2 of 2

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
		Type Number	Blows/6in.	Recovery (%)	OVM (ppm)				
30			50/3"	0					
					0.0	GM	Green silty coarse GRAVEL (moist to wet) (sample from cuttings)		
445	35		50/3"	0			BASALT (very dense) (no recovery)		
440	40						Boring was completed to 37' bgs. Groundwater was not encountered. Boring was completed as a monitoring well. 10-20 sand: 20'-37' Bentonite: 2'-20' Cement grout: 0'-2' Above ground monument		
435	45								
430	50								
425	55								
420	60								
415	65								

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ_URSSEA3B.GLB_URSSEA3.GDT 1/7/09

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E5

Sheet 1 of 1

Date(s) Drilled	6/21/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	10 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	N/A feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Bentonite Chips		Location		

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type Number	Blows/ 6in.	Recovery (%)	OVM (ppm)					
0							GP	Gray medium to coarse GRAVEL (dry)		
							GP	Green-gray medium GRAVEL with trace silt (dry)		
5			50/2"	0	0.0			Boulders, no recovery BASALT (dry)		
10			50/1"	0						
								Boring was completed to 10' bgs. Groundwater was not encountered. Boring was backfilled with bentonite chips.		
15										
20										
25										
30										

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ URSSEA3B.GLB URSSEA3.GDT 1/22/09

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E6

Sheet 1 of 1

Date(s) Drilled	6/21/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	20 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	491.90 feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Bentonite Chips	Location			

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type Number	Blows/ 6in.	Recovery (%)	OVM (ppm)					
0							GP	Gray medium to coarse GRAVEL (dry)		
490							GM	Brown, silty fine to coarse GRAVEL with sand (medium dense) (moist)		
485	5		16 23 22 N=45		0.0					
480	10	MW-E6-10.5	1 2 1 N=3	100	0.0			Same as above (very loose) (moist)		
475	15		50/1"	0				BASALT No recovery		
470	20							Boring was completed to 20' bgs. Groundwater was not encountered. Boring was backfilled with bentonite chips.		
465	25									
460	30									

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ_URSSEA3B.GLB_URSSEA3.GDT_1/7/09

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E7

Sheet 1 of 1

Date(s) Drilled	6/21/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	27.5 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	498.22 feet MSL
Groundwater Level	19 ft bgs	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Location				

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type	Number	Blows/6in.	Recovery (%)					
0							GP	Gray medium to coarse GRAVEL (dry)		Grout
-495		MW-E7-3	32	50/4"	0.0		GP	Gray fine to coarse GRAVEL with trace silt (very dense) (dry) basalt fragments		Bentonite
-490	5		23 32 26				GM	Brownish yellow silty fine to coarse GRAVEL with sand (medium dense) (moist) weathered/fractured basalt		
-485	10		25 50/6"				GP	Grayish brown fine to coarse GRAVEL with sand, trace silt (very dense) (moist) weathered/fractured basalt		
-480	15	MW-E7-16.0						Same as above		-10-20 sand -20-slot screen
-475	20							Gray fractured BASALT (very dense)		
-470	25									
-470	30							Boring was completed to 27.5' bgs. Groundwater was encountered at 19.0' bgs. Boring was completed as a monitoring well.		

ENV2 WITH WELL T:\H\NEWORLD\86298253 GOLDENDALE EAST END LANDFILL\86298253.GPJ URSSEA3B.GLB URSSEA3.GDT 1/22/09

The Department of Ecology does NOT Warrant the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60012

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction
 Decommission 318816

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number:

Property Owner Goldendale Aluminum Co.

Site Address 85 John Day Dam Rd.

City Goldendale County Klickitat

Location NE 1/4-1/4 NW 1/4 Sec 21 Twn 3 R 17

EWM or WWM C

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____

still REQUIRED) Long Deg _____ Min _____ Sec _____

Tax Parcel No. 03172100000200

Cased or Uncased Diameter 6" Static Level 17'

Work/Decommission Start Date 6/24/08

Work/Decommission Completed Date 6/24/08

Consulting Firm URS Corp.

Unique Ecology Well IDTag No. BAS410 NW-E8

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee

Name (Print Last, First Name) Sink Ronald

Driller/Engineer/Trainee Signature [Signature]

Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
<p>- concrete - bentonite - sand</p>	<p>Drill Method: Air Rotary Casings: 2" sch 40 PVC 5' to 13' Screen: 2" sch 40 PVC 13' to 23' Sand: 10/20 11' to 23' Seal: Bentonite 1.5' to 11'</p>	<p>sandy gravel w/ cobbles 13 gravelly sand 18 basalt 23</p>

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 DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

SCALE: 1" = 23' PAGE 1 OF 1

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E8

Sheet 1 of 1

Date(s) Drilled	6/24/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	23 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	493.07 feet MSL
Groundwater Level	N/A	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Location				

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type Number	Blows/6in.	Recovery (%)	OVM (ppm)					
0						GP	Gray medium to coarse GRAVEL (dry)		-Grout	
490						GM	Brown silty fine to coarse GRAVEL with sand (loose) (wet)		-Bentonite	
5			10 19 9		0.0					
485										
10			29 50/3"		0.0	GP	Grayish brown sandy fine to coarse GRAVEL with trace silt (dense) (moist)			
480									-10-20 sand -20-slot screen	
15		W-E8-15.010	38 44		0.0		Same as above, gray			
475							BASALT bedrock			
20										
470										
25							Boring was completed to 23' bgs. Groundwater was not encountered. Boring was completed as a monitoring well.			
465										
30										

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ_URSS3B.GLB_URSS3A.GDT_1/7/09

APPENDIX B-2.1

EAST SPL STORAGE AREA (SWMU #12) VICINITY WELL LOGS

Project: Goldendale
 Project Location: East End Landfill
 Project Number: 36298253

Log of Boring MW-E7

Sheet 1 of 1

Date(s) Drilled	6/21/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	27.5 feet bgs
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	498.22 feet MSL
Groundwater Level	19 ft bgs	Sampling Method	2.25" SPT	Hammer Data	140 lb, 30" drop
Borehole Backfill	Location				

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type	Number	Blows/ 6in.	Recovery (%)					
0						GP	GRAVEL		Grout	
-495	3.5	MW-E7	32	50/4"	0.0	GP	Gray fine to coarse GRAVEL with trace silt (very dense) (dry) basalt fragments		Bentonite	
-490	5		23	32		GM	Brownish yellow silty fine to coarse GRAVEL with sand (medium dense) (moist) weathered/fractured basalt			
			32	26						
-485	10		25	50/6"		GP	Grayish brown fine to coarse GRAVEL with sand, trace silt (very dense) (moist) weathered/fractured basalt			
-480	15	MW-E7	16.0				Same as above		-10-20 sand	
									-20-slot screen	
-475	20						Gray fractured BASALT (very dense)			
-470	25									
-470	27.5						Boring was completed to 27.5' bgs. Groundwater was not encountered. Boring was completed as a monitoring well.			
30										

ENV2 WITH WELL T:\ONEWORLD\36298253 GOLDENDALE EAST END LANDFILL\36298253.GPJ_URSSEA3B.GLB_URSSEA3.GDT 10/13/08

The Department of Ecology does NOT Warrant the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60012

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction 318815
 Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm URS Corp.

Unique Ecology Well IDTag No. BA5406 MWE-7

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee
Name (Print Last, First Name) Sink Ronald
Driller/Engineer/Trainee Signature [Signature]
Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number:

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

Property Owner Goldendale Aluminium Co.

Site Address 85 John Day Dam Rd.

City Goldendale County Klickitat

Location NE 1/4-1/4 NW 1/4 Sec 21 Twn 3 R 17

EWM or WWM C

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____
still REQUIRED) Long Deg _____ Min _____ Sec _____

Tax Parcel No. 03172100600200

Cased or Uncased Diameter 6" Static Level 18.5

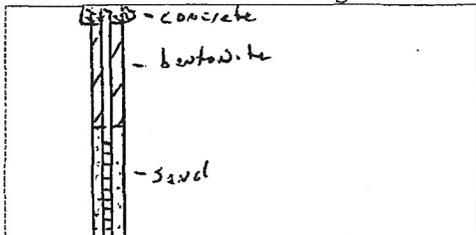
Work/Decommission Start Date 6/21/08

Work/Decommission Completed Date 6/21/08

Construction Design

Well Data

Formation Description



Drill Method: Air Rotary
Casing: 2" sch 40 PVC
5' to 18'
Screen: 2" sch 40 PVC
18' to 28'
Sand: 10/20
16' to 28'

Silty sandy gravel w/cobbles

Seal: Bentonite Chips
1.5' to 16'

28

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SEP 16 2008

DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

SCALE: 1"= 28' PAGE 1 OF 1

APPENDIX B-2.1

WEST END LANDFILL (SWMU #18) VICINITY WELL LOGS

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R 60013

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction 318812
 Decommission

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number: _____

Consulting Firm URS Corp.

Unique Ecology Well IDTag No. BAS411 MW-W1

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee
 Name (Print Last, First Name) Sink Ronald
 Driller/Engineer /Trainee Signature [Signature]
 Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number: _____

Property Owner Goldendale Aluminum Co.

Site Address 85 John Day Dam Rd.

City Goldendale County Klickitat

Location NW 1/4-1/4 SE 1/4 Sec 20 Twn 3 R 17

EWM or WWM K

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____
 still REQUIRED) Long Deg _____ Min _____ Sec _____

Tax Parcel No. 0317200000100

Cased or Uncased Diameter 6" Static Level 20'

Work/Decommission Start Date 6/22/08

Work/Decommission Completed Date 6/22/08

Construction Design	Well Data	Formation Description
 <p>concrete bentonite sand</p>	<p>Drill Method: Air Rotary Casings: 2" sch 40 PVC + 2.5' to 20' Screen: 2" sch 40 PVC 20' to 30' Sand: 10/20 18' to 30'</p>	<p>Silty sandy gravel w/ cobbles sand w/ some silt</p> <p>Silty sandy gravel w/ cobbles sand w/ some silt</p>
	<p>Seal: Bentonite Chips 2' to 18'</p>	<p>5 12 18 30</p> <p style="text-align: center;">RECEIVED SEP 16 2008 DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE</p>

SCALE: 1" = 30' PAGE 1 OF 1

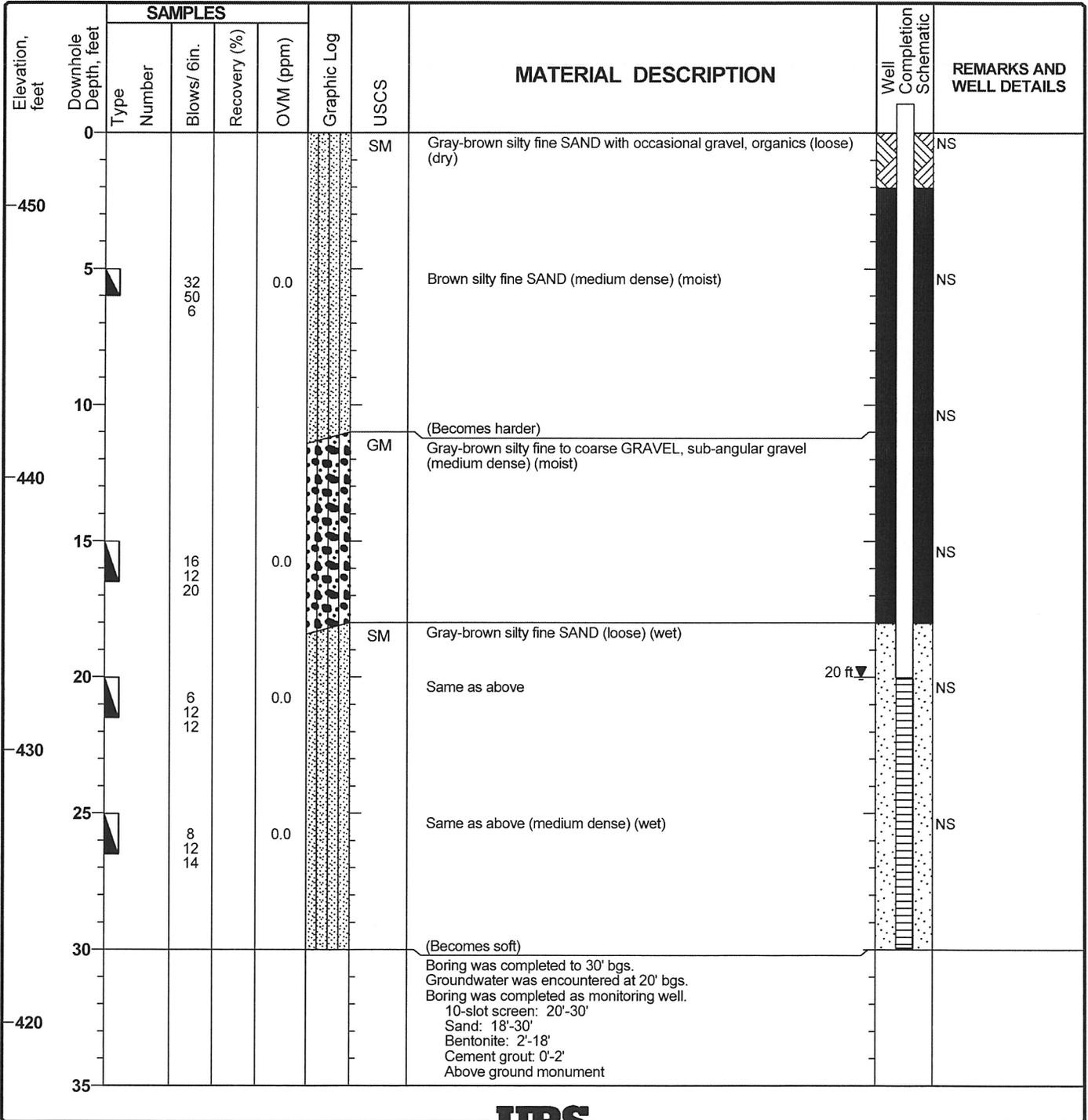
Project: Goldendale Aluminum, West End Landfill
 Project Location: Goldendale, Washington
 Project Number: 36298254

Log of Boring MW-W1

Sheet 1 of 1

Date(s) Drilled	6/22/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	30 feet
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	452.68
Groundwater Level	20' bgs	Sampling Method	2 1/2' SPT	Hammer Data	140 lb hammer, 30" drop
Borehole Backfill	Location				

ENV2 WITH WELL V:\M&R\LOCKHEED MARTIN\GOLDENDALE\WELL RI REVISION 1 - MAY 2010\APPENDICES\APPENDIX A - TEST PIT AND SOIL BORING LOGS\36298254.GPJ_URSSEA3.JA.GLB_URSSEA3.GDT_5/12/10



The Department of Ecology does NOT Warrant the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60013

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction
 Decommission 318811

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm URS Corp.

Unique Ecology Well IDTag No. BAS 409 MW-W2

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee
 Name (Print Last, First Name) Sink Ronald
 Driller/Engineer/Trainee Signature [Signature]
 Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number:

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

Property Owner Goldendale Aluminum Co.

Site Address 85 John Day Dam Rd.

City Goldendale County Klickitat

Location NW 1/4-1/4 SE 1/4 Sec 20 Twn 3 R 17

EWM or WWM K

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____
 still REQUIRED) Long Deg _____ Min _____ Sec _____

Tax Parcel No. 0317200000100

Cased or Uncased Diameter 6" Static Level 22'

Work/Decommission Start Date 6/22/08

Work/Decommission Completed Date 6/22/08

Construction Design	Well Data	Formation Description
 <p>concrete bentonite sand</p>	<p>Drill Method: Air Rotary Casing: 2" sch 40 PVC +2.5 to 20' Screen: 2" sch 40 PVC 20' to 30' Sand: 10/20 18' to 30'</p>	<p>silty sandy gravel w/cobbles sand w/ some silt silty sandy gravel sand w/ some silt</p>
	<p>Seal: Bentonite 2' to 18'</p>	<p style="text-align: center;"> RECEIVED SEP 16 2008 DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE </p>

SCALE: 1"= 30' PAGE 1 OF 1

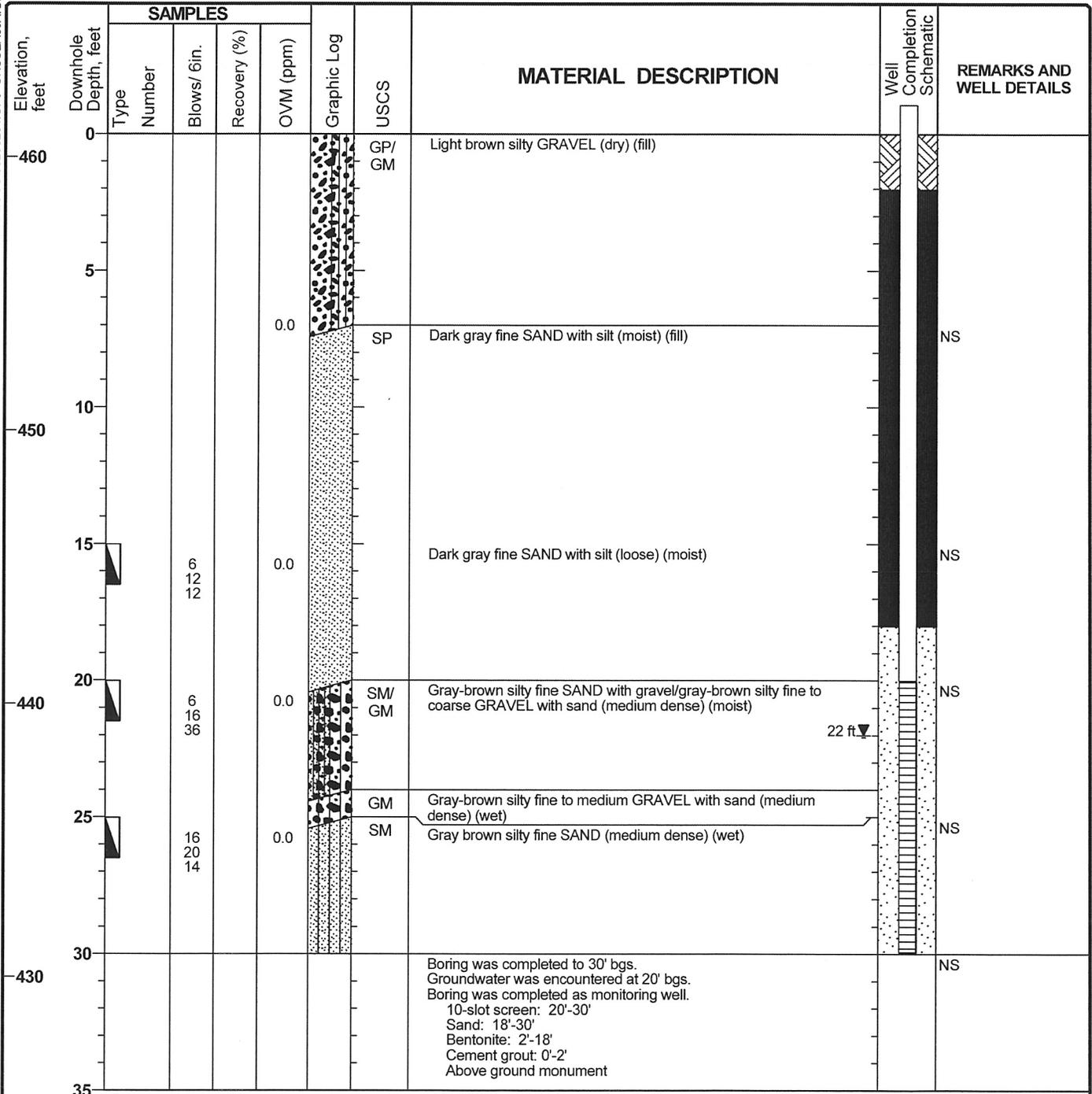
Project: Goldendale Aluminum, West End Landfill
 Project Location: Goldendale, Washington
 Project Number: 36298254

Log of Boring MW-W2

Sheet 1 of 1

Date(s) Drilled	6/22/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	30 feet
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	460.85
Groundwater Level	22' bgs	Sampling Method	2 1/2' SPT	Hammer Data	140 lb hammer, 30" drop
Borehole Backfill	Location				

ENV2 WITH WELL V:\WM&RD\LOCKHEED MARTIN\GOLDDENALEWELLF RI REVISION 1 - MAY 2010\APPENDICES\APPENDIX A - TEST PIT AND SOIL BORING LOGS\36298254.GPJ_URSSEA3.JA.GLB_URSSEA3.GDT_5/12/10



The Department of Ecology does NOT Warrant the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R60013

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction 319814
 Decommission

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

ORIGINAL INSTALLATION Notice of Intent Number:

Property Owner Goldensdale Aluminum Co.

Site Address 85 John Day Dam Rd.

City Goldensdale County Klickitat

Location NW 1/4-1/4 SE 1/4 Sec 20 Twn 3 R 17

EWM or WWM K

Lat/Long (s, t, r still REQUIRED) Lat Deg _____ Min _____ Sec _____
 Long Deg _____ Min _____ Sec _____

Tax Parcel No. 0317200000100

Cased or Uncased Diameter 6" Static Level 20'

Work/Decommission Start Date 6/22/08

Work/Decommission Completed Date 6/22/08

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee
 Name (Print Last, First Name) Sink Ronald
 Driller/Engineer/Trainee Signature [Signature]
 Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number:

Construction Design	Well Data	Formation Description
	Drill Method: Air Rotary Casings: 2" sch 40 PVC +2.5' to 18' Screens: 2" sch 40 PVC 18' to 30' Sand: 10/20 16' to 30' Seal: Bentonite Chgs 1.5' to 16'	silty sandy gravel w/ cobbles sand w/ some silt
		12 30 <div style="text-align: center;"> <p>RECEIVED</p> <p>SEP 16 2008</p> <p>DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE</p> </div>

SCALE: 1"= 30' PAGE 1 OF 1

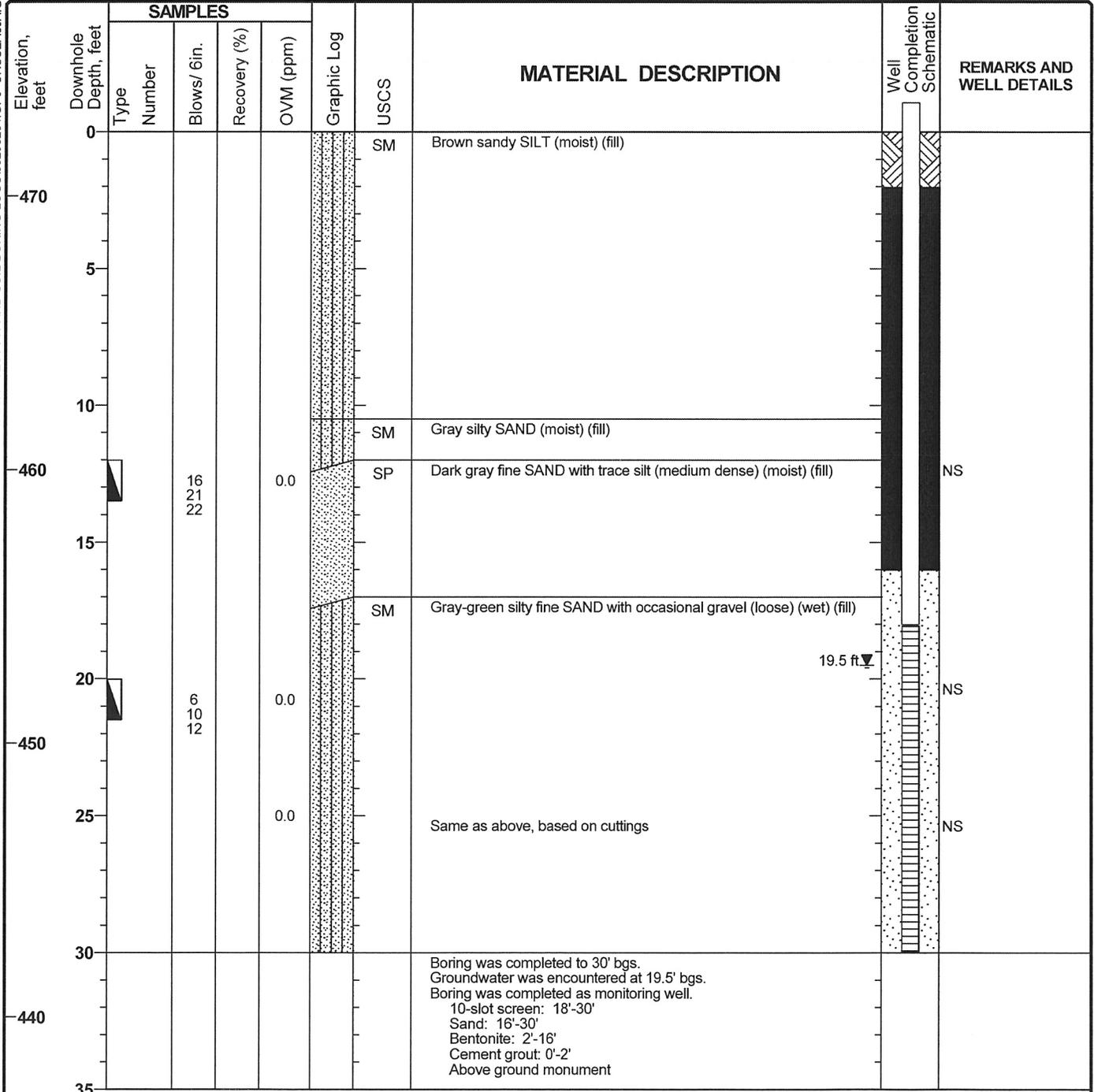
Project: Goldendale Aluminum, West End Landfill
 Project Location: Goldendale, Washington
 Project Number: 36298254

Log of Boring MW-W3

Sheet 1 of 1

Date(s) Drilled	6/22/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	30 feet
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	472.35
Groundwater Level	19.5' bgs	Sampling Method	2 1/2' SPT	Hammer Data	140 lb hammer, 30" drop
Borehole Backfill	Location				

ENV2 WITH WELL V:\WM&RD\LOCKHEED MARTIN\GOLDENDALE\WELL RI REVISION 1 - MAY 2010\APPENDICES\APPENDIX A - TEST PIT AND SOIL BORING LOGS\36298254.GPJ_URSSEA3JA.GLB_URSSEA3.GDT_5/12/10



The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. R 60013

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in box)

Construction 318813
 Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm URS Corp.

Unique Ecology Well IDTag No. BAS407 MW-W4

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Driller Engineer Trainee
 Name (Print Last, First Name) Sink Ronald
 Driller/Engineer/Trainee Signature [Signature]
 Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number:

Type of Well ("x" in box)

Resource Protection
 Geotech Soil Boring

Property Owner Goldendale Aluminium Co.

Site Address 85 John Day Rd. Dam Rd.

City Goldendale County Klickitat

Location NW 1/4-1/4 SE 1/4 Sec 20 Twn 3 R 17

EWM or WWM

Lat/Long (s, t, r) Lat Deg _____ Min _____ Sec _____
 still REQUIRED) Long Deg _____ Min _____ Sec _____

Tax Parcel No. 03172 00000100

Cased or Uncased Diameter 6" Static Level 53.5'

Work/Decommission Start Date 6/21/08

Work/Decommission Completed Date 6/22/08

Construction Design

Well Data

Formation Description

<p>- concrete - bentonite - sand</p>	<p>Drill Method: Air Rotary Casings: 2" sch 40 PVC 15' to 50' Screen: 2" sch 40 PVC 50' to 65' Sand: 10/20 48' to 65' Seal: Bentonite chgs 1.5 to 48'</p>	<p>(Fill) silty gravel 25 silty sandy gravel 49 sand w/ some silt 65</p>
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SEP 16 2008

DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

SCALE: 1"= 65' PAGE 1 OF 1

Project: Goldendale Aluminum, West End Landfill
 Project Location: Goldendale, Washington
 Project Number: 36298254

Log of Boring MW-W4

Sheet 1 of 2

Date(s) Drilled	6/21/08	Logged By	GDP	Checked By	GHG
Drilling Method	Tubex	Drilling Contractor	EWE	Total Depth of Borehole	65 feet
Drill Rig Type	T-300	Drill Bit Size/Type	6"	Ground Surface Elevation	491.59
Groundwater Level	55' bgs	Sampling Method	2 1/2' SPT	Hammer Data	140 lb hammer, 30" drop
Borehole Backfill	Location				

ENV2 WITH WELL V:\M&R\LOCKHEED MARTIN\GOLDENDALE\WELL RI REVISION 1 - MAY 2010\APPENDICES\APPENDIX A - TEST PIT AND SOIL BORING LOGS\36298254.GPJ_URSSEA3\JA.GLB_URSSEA3.GDT_5/12/10

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	Well Completion Schematic	REMARKS AND WELL DETAILS
		Type	Number	Blows/ 6in.	Recovery (%)					
0						GP/GM	Gray-brown silty fine to coarse GRAVEL with fine sand (very dense) (dry) (fill)			
-490						GP	Gray fine to coarse GRAVEL (very dense) (dry) (fill)		NS	
	5		12 28 31							
	10		50/4"				Same as above, no recovery			
-480										
	15		18 41 28		0.0		Gray fine to coarse GRAVEL (very dense) (dry)		NS	
	20		26 41 36		0.0		Gray fine to coarse GRAVEL (very dense) (dry)		NS	
-470						GM	Gray-brown silty fine to coarse GRAVEL with fine sand (very dense) (moist) (fill)		NS	
	25		25 50/4"		0.0				NS	
	30		35 50/5"		0.0		Same as above		NS	
-460										
	35									

Project: Goldendale Aluminum, West End Landfill
 Project Location: Goldendale, Washington
 Project Number: 36298254

Log of Boring MW-W4

Sheet 2 of 2

Elevation, feet	Downhole Depth, feet	SAMPLES				Graphic Log	USCS	MATERIAL DESCRIPTION	REMARKS AND WELL DETAILS
		Type	Number	Blows/6in.	Recovery (%)				
35				50/3"			No recovery		
40				50/5"		GP	Gray fine to coarse GRAVEL (very dense) (dry) (fill)		
450							(Becomes soft, end of fill material)		
45				16 22 26	0.0	SW	Gray-green fine to coarse SAND with occasional gravel with silt (medium dense) (moist)	NS	
50				14 20 22	0.0	SM	Grades to gray-orange silty fine SAND, mottled (medium dense) (moist)	NS	
55				15 17 22	0.0		Gray-orange-brown silty fine SAND, mottled (medium dense) (moist)	NS	
60					0.0		Brown silty fine SAND (moist)	NS	
65							Boring was completed to 65' bgs. Groundwater was encountered at 55' bgs. Boring was completed as monitoring well. 10-slot screen: 50'-65' Sand: 48'-65' Bentonite: 2'-48' Cement grout: 0'-2' Flush mount monument		
70									
75									

ENV2 WITH WELL - V:\WM&RD\LOCKHEED MARTIN\GOLDDENALEWELLF RI REVISION 1 - MAY 2010\APPENDICES\APPENDIX A - TEST PIT AND SOIL BORING LOGS\36298254.GPJ URSSEA3JA.GLB URSSEA3.GDT 5/12/10

APPENDIX B-2.1

WEST SURFACE IMPOUNDMENT (SWMU #4) AND WEST SPL STORAGE AREA (SWMU #13) VICINITY WELL LOGS

WATER WELL REPORT

STATE OF WASHINGTON

Application No. _____

Permit No. _____

(1) OWNER: Name MARTIN MARIETTA Address P.O. Box 711 THE DALES OR. 9705

(2) LOCATION OF WELL: County Klickitat - SE 1/4 NW 1/4 Sec 20 T. 3N. N. R. 17E W.M.

Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic Industrial Municipal
Monitoring Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well 2-A
(if more than one)
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 55 ft. Depth of completed well 55 ft.

(6) CONSTRUCTION DETAILS: P.V.C. SCH. 40
Casing installed: 2 " Diam. from 4 ft. to 50 ft.
Threaded " Diam. from _____ ft. to _____ ft.
Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No TIMED
Manufacturer's Name _____
Type P.V.C. Model No. _____
Diam. 2 Slot size 40 from 50 ft. to 55 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
Gravel placed from 24 ft. to 55 ft.

Surface seal: Yes No To what depth? 24 ft.
Material used in seal BEN-SEAL
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ HP _____

(8) WATER LEVELS: Land-surface elevation _____
above mean sea level _____
Static level 31 ft. below top of well Date 4-12-84
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
"NO YIELD" TEST WAS MADE

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Borehole test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Minimum flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
FINE LIGHT SOIL w/ } SOME LOOSE ROCKS }	1	19
LOOSE BROKEN BASALT	19	55

RECEIVED

MAY 29 1984

RECEIVED

MAY 29 1984

Work started 4-4 1984 Completed 4-ECOLGY 1984

DEPARTMENT OF ECOLOGY
NORTHWEST REGION
WELL DRILLER'S STATEMENT

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

West Coast Drilling Co., Inc.
223 Academy St.
NAME _____ (Person, title, organization, address, phone number) (Type or print)
Address _____
503-845-6824

[Signed] Steven M. Stadel
(Well Driller)

License No. 860 Date 5-18 1984

CH 14/12/84

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

(1) OWNER: Name MARTIN MARIETTA

Address P.O. Box 711 THE DALES OR. 97058

(2) LOCATION OF WELL: County CLATSOP

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal Irrigation Test Well Other MONITORING

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
SANDY SOIL	0	22
BASALT GREY BROKEN	22	23
BASALT GREY HRD	23	27

(4) TYPE OF WORK: Owner's number of well (if more than one) 3A
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 27 ft. Depth of completed well 24 1/2 ft.

(6) CONSTRUCTION DETAILS: P.V.C.

Casing installed: 4" Diam. from 71 ft. to 19 1/2 ft.

Threaded " Diam. from " ft. to " ft.
Welded " Diam. from " ft. to " ft.

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No
Manufacturer's Name TIMCO
Type P.V.C. Model No _____
Diam. 4 Slot size 40 from 19 1/2 ft. to 24 1/2 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
Gravel placed from 18 ft. to 27 1/8 ft.

Surface seal: Yes No To what depth? 18 ft.
Material used in seal BEN-SEAL
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
Static level 22 ft. below top of well Date _____
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
"NO YIELD TEST WAS MADE"

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Flow test _____ gal./min. with _____ ft. drawdown after _____ hrs.
_____ an flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

Work started 4-13, 1984 Completed 4-13, 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

226 Academy St.
Mt. Angel, OR 97132
NAME: _____ (Person, firm, or corporation) (Type or print)
503-845-6824
Address _____

[Signed] Steven W. Stadler
(Well Driller)

License No. 860 Date 5-18, 1984

10/13/84

MW-3B

Permit No.

(1) OWNER: Name Martin Marsetta Address P.O. Box 711 The Dallas, Or. 97058
(2) LOCATION OF WELL: County Clatsop SE 1/4 SW 1/4 Sec 20 T3N N. R. 2E
ing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic Industrial Municipal
Monitoring Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well (if more than one) G-38
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 150 ft. Depth of completed well 57 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 4" Diam. from 71 ft. to 46 ft.
Threaded " Diam. from _____ ft. to _____ ft.
Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No
Manufacturer's Name TIMCO
Type P.V.C. Model No _____
Diam. 4 Slot size 40 from 46 ft. to 57 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
Gravel placed from 32 ft. to 58 ft.

Surface seal: Yes No To what depth? 32 ft.
Material used in seal BEINSEAL
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P.

(8) WATER LEVELS: Land-surface elevation _____ ft.
Static level 22 ft. below top of well Date 4-9-87
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____
(Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" 3 G.P.M. W/ AIR TEST " " " " " " " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test 4-9-87
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
SANDY SOIL	0	22
BASALT GREY & BRN BROKEN	22	23
BASALT GREY HARD	23	32
BASALT GREY, BRN, RED, ?		
SEMI POROUS	32	36
BASALT GREY HARD	36	45
BASALT GREY & BRN FRACTURED	45	51
BASALT GREY HARD	51	131
BASALT GREY W/ BRN BROKEN		
SEAMS	131	136
BASALT GREY HRD	136	150

NOTE:
WELL WAS BACK PLUGGED
W/ BRN SEAL FROM 150'-58'

MAY 20 1984
JUN 18 1984

Work started 4-6 1987 Completed 4-7 1987

WELL DRILLER'S STATEMENT:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME West Coast Drilling Co., Inc.
(Person, firm, or corporation) (Type or print)

Address 220 Academy St. Mt. Angel, Or. 97362

[Signed] Steven M. Stadel
(Well Driller)

License No. 0860 Date 5-4

(USE ADDITIONAL SHEETS IF NECESSARY)

MW-4A

(1) OWNER: Name Martin Marietta Address P.O. Box 711 The Dallas, Or. 97058
 (2) LOCATION OF WELL: County Klickitat SE 1/4 SW 1/4 Sec 30 T3 N. R12E W.M.
 Bearing and distance from section or subdivision corner 29 P

PROPOSED USE: Domestic Industrial Municipal
 Monitoring Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well GAB
 New well Method: Dug Bored
 Deepened Cable Driven
 Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
 Drilled 22 ft. Depth of completed well 21 ft.

(6) CONSTRUCTION DETAILS:
 Casing installed: 4" Diam. from 71 ft. to 16 ft.
 Threaded " Diam. from _____ ft. to _____ ft.
 Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No
 Type of perforator used _____
 SIZE of perforations _____ in. by _____ in.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.
 _____ perforations from _____ ft. to _____ ft.

Screens: Yes No
 Manufacturer's Name TIMCO
 Type P.V.C. Model No. _____
 Diam. 4 Slot size 40 from 16 ft. to 21 ft.
 Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
 Gravel placed from 14 ft. to 22 ft.

Surface seal: Yes No To what depth? 14 ft.
 Material used in seal REN-SEAL
 Did any strata contain unusable water? Yes No
 Type of water? _____ Depth of strata _____
 Method of sealing strata off _____

(7) PUMP: Manufacturer's Name X HP _____
 Type: _____

(8) WATER LEVELS: Land-surface elevation ? ft.
 Static level 4 ft. below top of well Date _____
 Artesian pressure _____ lbs. per square inch Date _____
 Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
 Was a pump test made? Yes No If yes, by whom? _____
 Yield: gal./min. with _____ ft. drawdown after _____ hrs.
"NO YIELD" TEST WAS "MADE." " " " " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

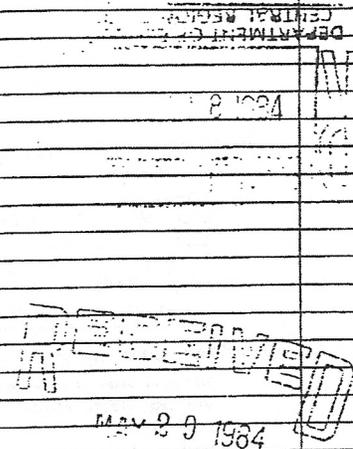
Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
 Baller test _____ gal./min. with _____ ft. drawdown after _____ hrs.
 an flow _____ g.p.m. Date _____
 Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
SAND BROWN	0	13
SAND GREY	13	21
BASALT GREY HARD	21	22



Work started 4-16, 1984 Completed 4-17, 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME West Coast Drilling Co. Inc.
 (Person, firm, or corporation) (Type or print)

Address 220 Academy St. Mt. Angel, Or. 97362

[Signed] Steven N. Stadel
 (Well Driller)

License No. 0860 Date 5-4, 1984

CA 10/2/84

(USE ADDITIONAL SHEETS IF NECESSARY)

WATER WELL REPORT

Start Card No. 024246

STATE OF WASHINGTON

Water Right Permit No. _____

(1) OWNER: Name COLUMBIA ALUMINUM CORP Address 85 JOHN DAY DAM RD GOLDENDALE WA

(2) LOCATION OF WELL: County Klickitat Sec 20 T. 3N N. R. 17EW.M.

(2a) STREET ADDRESS OF WELL (or nearest address) 85 JOHN DAY DAM RD, GOLDENDALE, WA 98620

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other
 DeWater

(4) TYPE OF WORK: Owner's number of well (if more than one) MN-9A
Abandoned New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 4 inches.
Drilled 39 feet. Depth of completed well 35.5 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 4 " Diam. from +2.5 ft. to 30.5 ft. to 35.5 ft.
Welded Liner installed Threaded
Perforations: Yes No
Type of perforator used _____
Size of perforations _____ in. by _____ in.
Screens: Yes No
Manufacturer's Name JOHNSON SCH. 40
Type PVC WIRE WRAP Model No. _____
Diam. 4 Slot size 0.10 from 30.5 ft. to 35.5 ft.

Gravel packed: Yes No Size of gravel SAND #8
Gravel placed from 28.5 ft. to 36.5 ft.
Surface seal: Yes No To what depth? 28.5 ft.
Material used in seal CEMENT GROUT
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation above mean sea level _____ ft.
Static level 32.5 ft. below top of well Date 4/24/89
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap. valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)
Time Water Level Time Water Level Time Water Level

Date of test _____
Bailer test 3 gal./min. with 2 ft. drawdown after 3 hrs.
Airtest _____ gal./min. with stem set at _____ ft. for _____ hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

MATERIAL	FROM	TO
SAND, GRAVEL WITH SOME COBBLES AND BOLDERS BROWN	0	27.5
SLAT FINE SAND	27.5	34.5
ROCK (BASALT) GRAYBLACK	34.5	39
BORE HOLE BELOW SCREEN FILLED WITH BENICONITE CHIPS		

Work started 4/17/89, 19. Completed 4/18/89, 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME PITNER DRILLING & PUMP (PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)
Address RT 2, BOX 20-B LaCENTER, WA 98629
(Signed) [Signature] License No. 0392
Contractor's Registration No. PITNERDP201PF Date MAY 22, 1989, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.

RESOURCE PROTECTION WELL REPORT Notice of Intent No. RE01041

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission ("x" in circle)

- Construction
- Decommission *Original Construction Notice of Intent Number*

Type of Well ("x" in circle)

- Resource Protection
- Geotech Soil Boring

157768
 Property Owner Goldendale Aluminum Plant
 Unique Ecology Well ID Tag No. ~~AKH~~ AKH
 Consulting Firm Parametrix 569
 Driller or Trainee Name Jim Hansen
 Driller or Trainee Signature Jim Hansen
 Driller or Trainee License No. 0171

Site Address 85 John Day Dam Rd.
 City Goldendale County: Klickitat
 Location SW 1/4- 1/4 SE 1/4 Sec 20 Twn 3N R 17 WWM circle or one WWM
 Lat/Long (s, t, r. still REQUIRED) Lat Deg _____ Lat Min/Sec _____
 Long Deg _____ Long Min/Sec _____
 Tax Parcel No. _____
 Cased or Uncased Diameter 8" Static Level 23' 3"
 Work/Decommission Start Date 10-11-04
 Work/Decommission Completed Date 10-12-04

If trainee, licensed driller's Signature and License no. _____

Construction/Design

Well Data

Formation Description

<p>8" pipe 4" x 2' 12" hole to 10' 6" cement grout to surface 29' Dentrite chips 33' screen SAND 10x20 8" hole 51'</p>	<p>Well Tag <u>AKH 569</u> <u>well # MW-18</u></p>	<p>0 - 3' 6" rock 3' 6" - 5' 6" broken rock & clay 5' 6" - 15 Grey rock / broken Brown layers 15-21 and real broken Grey + Brown rock some clay mixed 21-27 Grey rock 27-29 Brown rock 29-37 Fractured Grey + Brown rock 37-40 Broken Brown red, Grey rock 40-47 Fractured Grey + Brown w.s.B. 47-51 Brown red Grey broken rock w.B.</p>
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RECEIVED

OCT 22 2004

DEPARTMENT OF ECOLOGY
 WELL DRILLING UNIT

DEPT. OF ECOLOGY
 FISCAL & BUDGET
 RECEIVED
 OCT 27 2004
 CENTRAL REGION OFFICE
 OCT 20 P 1:18

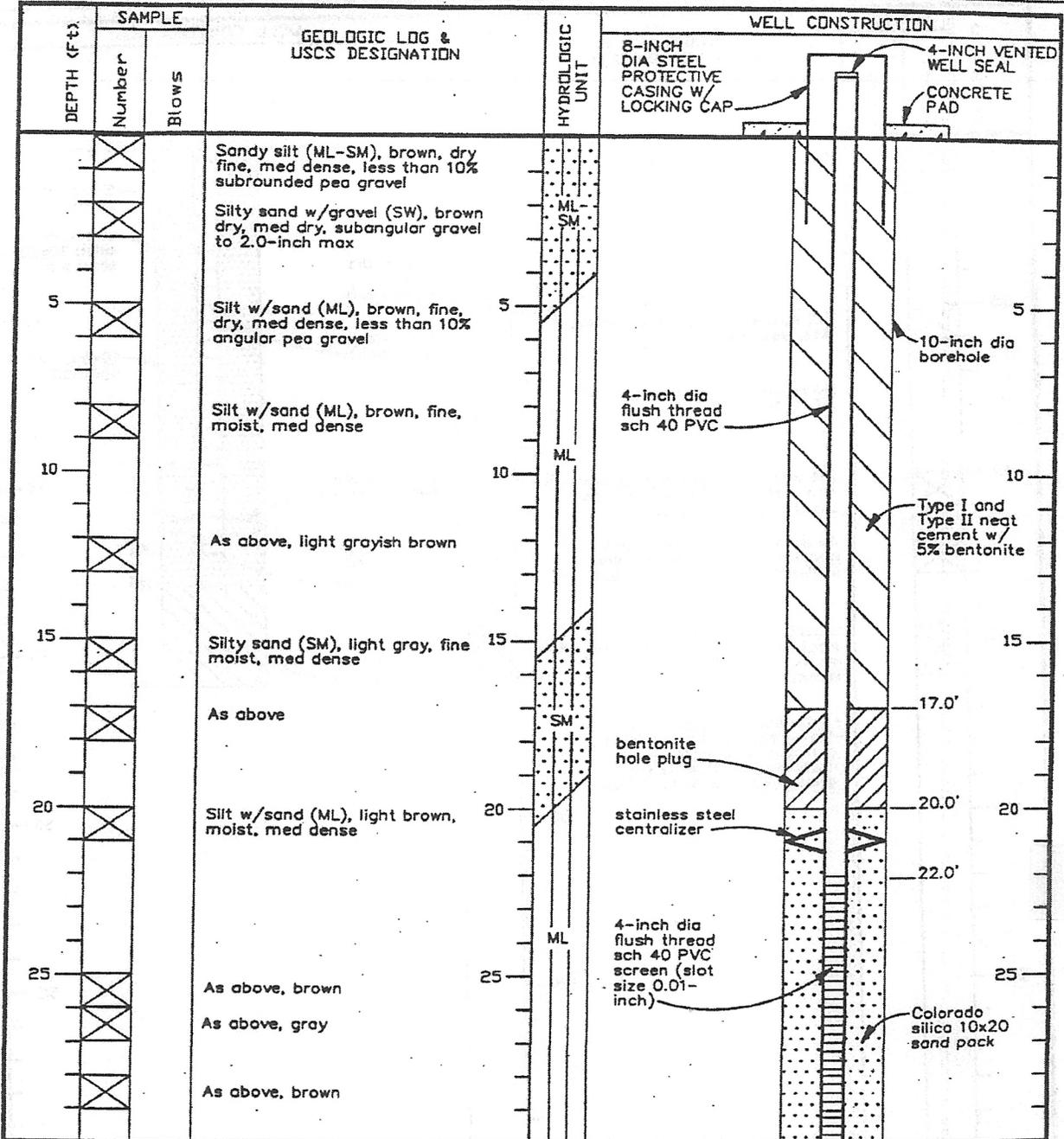
The Department of Ecology does NOT Warranty the Data and/or the Information on this Well Report.



MONITORING WELL GEOLOGIC & CONSTRUCTION LOG

PROJECT NUMBER PDX24907.CO	WELL NUMBER MW 16A
SHEET <u>1</u> OF <u>2</u>	

PROJECT COMMONWEALTH ALUMINUM LOCATION GOLDENDALE, WASHINGTON
 ELEVATION, NGVD (Top of Well Casing) 468.54 FT. SURFACE ELEVATION, NGVD 467.22 FT.
 WATER LEVEL ELEVATION, NGVD 436.73 FT. (1-12-90) START DATE 1/10/90
 DRILLING CONTRACTOR STACO WELL SERVICES, MT ANGEL, OR FINISH DATE 1/10/90
 DRILLING METHOD 8-INCH AIR ROTARY WITH CASING HAMMER

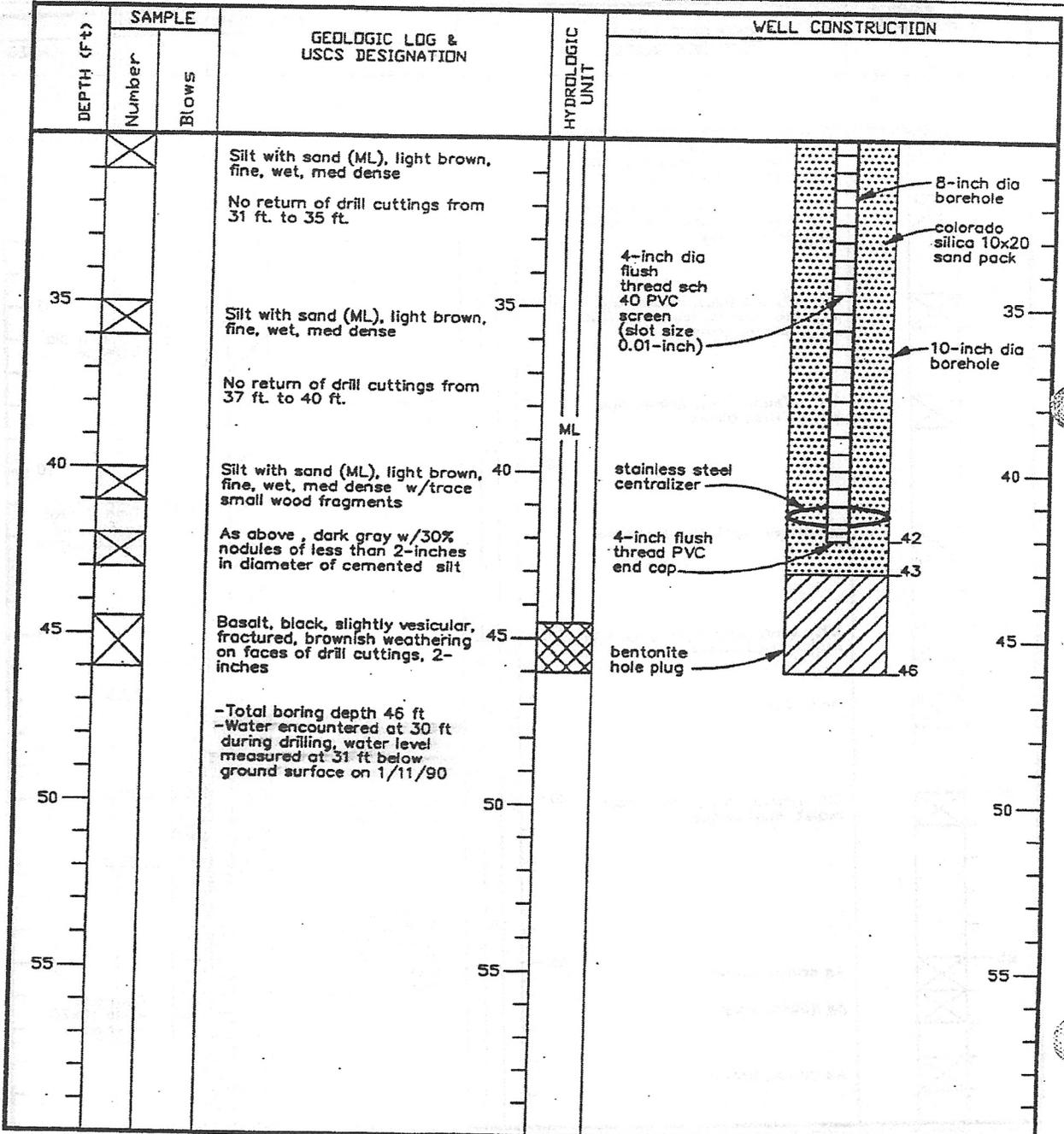




MONITORING WELL GEOLOGIC & CONSTRUCTION LOG

PROJECT NUMBER PDX24907.C0	WELL NUMBER MW 16A	SHEET <u>2</u> OF <u>2</u>
-------------------------------	------------------------------	----------------------------

PROJECT COMMONWEALTH ALUMINUM LOCATION GOLDENDALE, WASHINGTON
 ELEVATION, NGVD (Top of Well Casing) 468.54 FT. SURFACE ELEVATION, NGVD 467.22 FT.
 WATER LEVEL ELEVATION, NGVD 436.73 FT. (1/12/90) START DATE 1/10/89
 DRILLING CONTRACTOR STACO WELL SERVICES, MT. ANGEL, OR. FINISH DATE 1/10/89
 DRILLING METHOD 8-INCH AIR ROTARY WITH CASING HAMMER





MONITORING WELL GEOLOGIC & CONSTRUCTION LOG

PROJECT NUMBER

WELL NUMBER

PDX24907.CO

MW 17A

SHEET 1 OF 2

PROJECT COMMONWEALTH ALUMINUM

LOCATION GOLDENDALE, WASHINGTON

ELEVATION, NGVD (Top of Well Casing) 461.91 FT.

SURFACE ELEVATION, NGVD 459.93 FT.

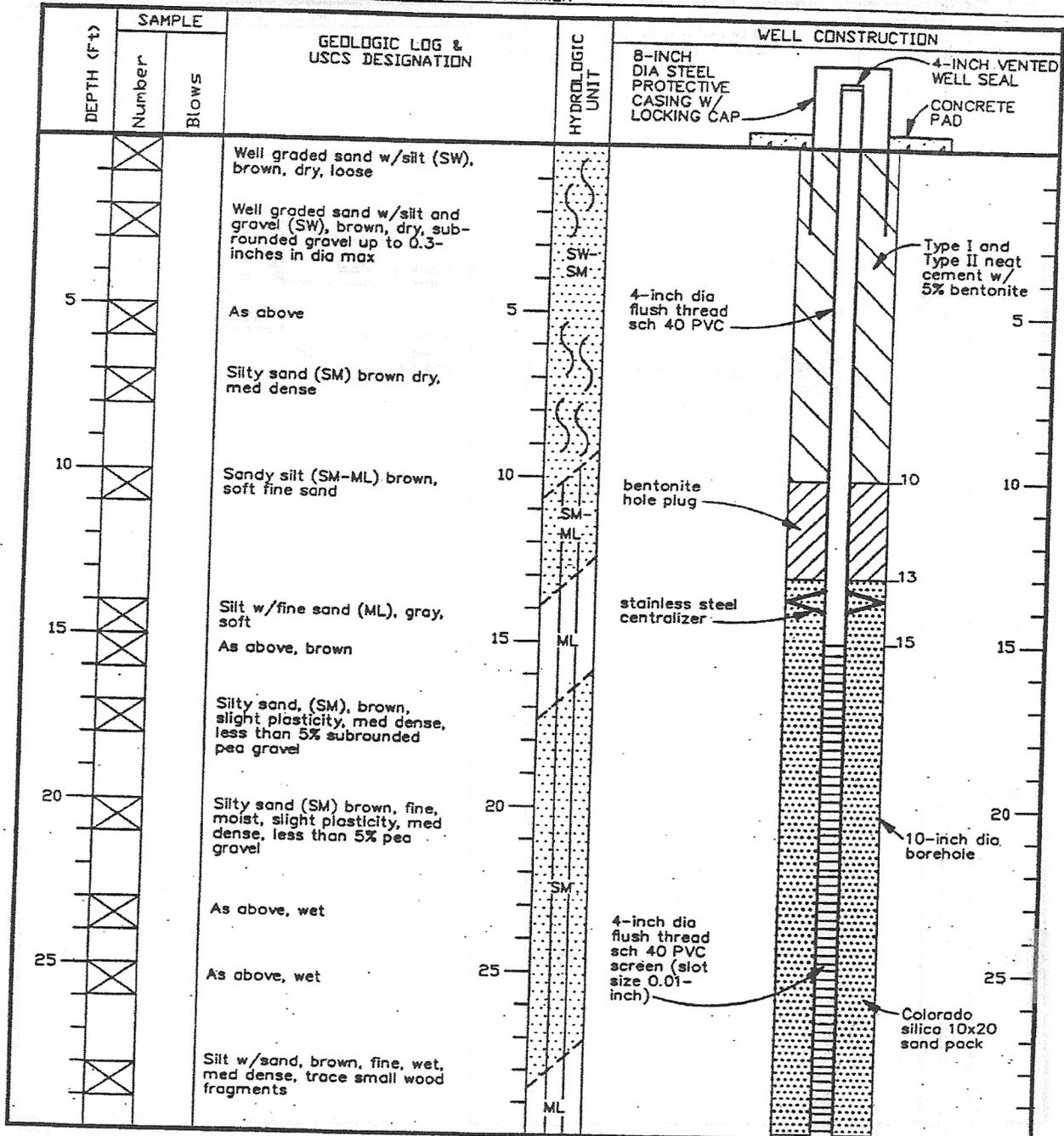
WATER LEVEL ELEVATION, NGVD 439.61 FT. (1-12-90)

START DATE 1/8/90

DRILLING CONTRACTOR STACO WELL SERVICES, MT ANGEL, OR

FINISH DATE 1/10/90

DRILLING METHOD 8-INCH AIR ROTARY WITH CASING HAMMER





MONITORING WELL GEOLOGIC & CONSTRUCTION LOG		
PROJECT NUMBER	WELL NUMBER	SHEET <u>2</u> OF <u>2</u>
PDX24907.CO	MW 17A	

PROJECT: COMMONWEALTH ALUMINUM LOCATION: GOLDENDALE, WASHINGTON
 ELEVATION, NGVD (Top of Well Casing) 461.91 FT. SURFACE ELEVATION, NGVD 459.93 FT.
 WATER LEVEL ELEVATION, NGVD 439.61 FT. (1/12/90) START DATE 1/8/89
 DRILLING CONTRACTOR STACO WELL SERVICES, MT. ANGEL, OR. FINISH DATE 1/10/89
 DRILLING METHOD 8-INCH AIR ROTARY WITH CASING HAMMER

DEPTH (ft)	SAMPLE		GEOLOGIC LOG & USCS DESIGNATION	HYDROLOGIC UNIT	WELL CONSTRUCTION		
	Number	Blows					
35	X		Silt w/sand, dark gray, fine, wet med dense, trace small wood fragments	ML			
	X		As above w/40% nodules of less than 2-inches in diameter of cemented silt				
	X		As above				
40			-Total boring depth 36 ft -Water encountered at 22 ft during drilling. Water measured at 21 ft below ground surface on 1/11/89				
45							
50							
55							

WATER WELL REPORT

STATE OF WASHINGTON

Application No. _____
Permit No. _____

MW-63

(1) OWNER: Name Martin Marietta Address P.O. Box 711 The Dallas, Or. 97058

(2) LOCATION OF WELL: County Klickitat NE 1/4 Sec 10 T. 3 N. R. 17E.

Bearing and distance from section or subdivision corner _____

(3) PROPOSED USE: Domestic Industrial Municipal
Monitoring Irrigation Test Well Other

(4) TYPE OF WORK: Owner's number of well G=6
(if more than one).....
New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

(5) DIMENSIONS: Diameter of well 8 inches.
Drilled 50 ft. Depth of completed well 50 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 4 " Diam. from 41 ft. to 35 ft.
Threaded 4 " Diam. from 40 ft. to 50 ft.
Welded " Diam. from _____ ft. to _____ ft.

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

Screens: Yes No
Manufacturer's Name Tinco
Type P.V.C. Model No. _____
Diam. 4 Slot size 40 from 35 ft. to 40 ft.
Diam. _____ Slot size _____ from _____ ft. to _____ ft.

Gravel packed: Yes No Size of gravel: 3/8 PEA
Gravel placed from 20 ft. to 50 ft.

Surface seal: Yes No To what depth? 20 ft.
Material used in seal BEN SEAL
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name _____
Type: _____ H.P. _____

(8) WATER LEVELS: Land-surface elevation _____ ft.
above mean sea level....
Static level 15 ft. below top of well Date 4-20-84
Artesian pressure _____ lbs. per square inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? _____
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
"NO YIELD" TEST WAS MADE

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

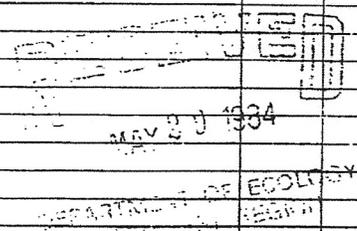
Time	Water Level	Time	Water Level	Time	Water Level

Date of test _____
Ballor test _____ gal./min. with _____ ft. drawdown after _____ hrs.
A _____ an flow _____ g.p.m. Date _____
T. _____ arature of water _____ Was a chemical analysis made? Yes No

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
SAND BRN	0	19
SAND GREY DIRTY	19	38
BASALT GREY + BRN BROKEN	38	41
BASALT GREY HRD	41	50



Work started 4-19, 1984 Completed 4-20, 1984

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME West Coast Drilling Co. Inc.
(Person, firm, or corporation) (Type or print)

Address 220 Academy St. Mt. Angel, Or. 97362

[Signed] Steven M. Studer
(Well Driller)

License No. 0860 Date 5-4, 1984

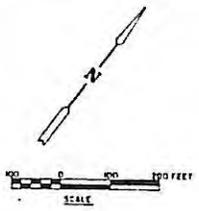
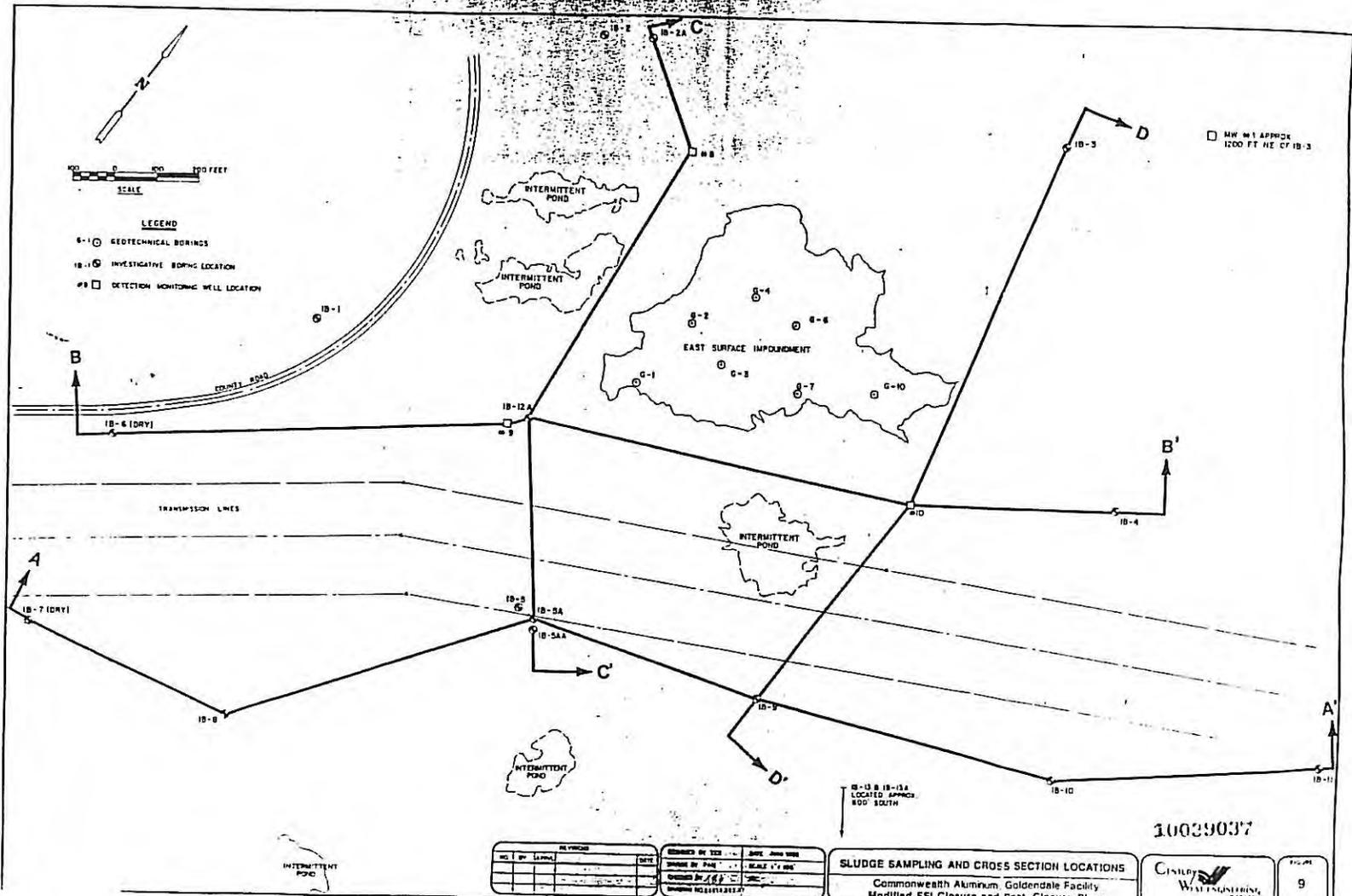
10/12/84

(USE ADDITIONAL SHEETS IF NECESSARY)

APPENDIX B-2.2

CROSS-SECTIONS

**Geraghty & Miller (1986)
East Surface Impoundment Vicinity**



- LEGEND**
- G-1 (○) GEOTECHNICAL BORINGS
 - IB-1 (○) INVESTIGATIVE BORING LOCATION
 - (□) DETECTION MONITORING WELL LOCATION

□ MW #1 APPROX
1200 FT. NE. OF IB-3

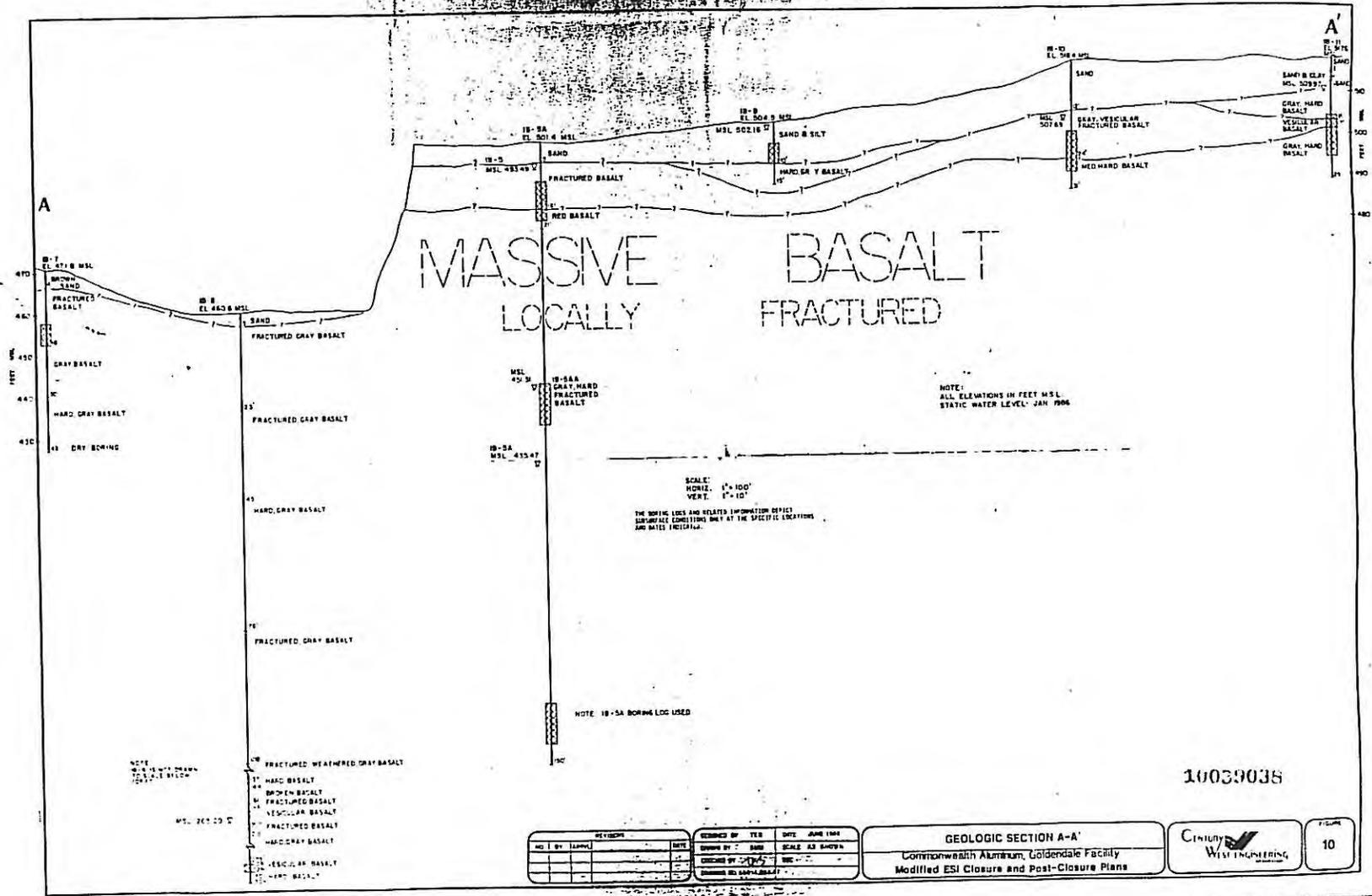
REVISION		DATE	BY	CHKD

DESIGNED BY	DATE	DATE
DRAWN BY	SCALE	
CHECKED BY		
APPROVED BY		

SLUDGE SAMPLING AND CROSS SECTION LOCATIONS
 Commonwealth Aluminum Goldendale Facility
 Modified ESI Closure and Post-Closure Plans

10029037





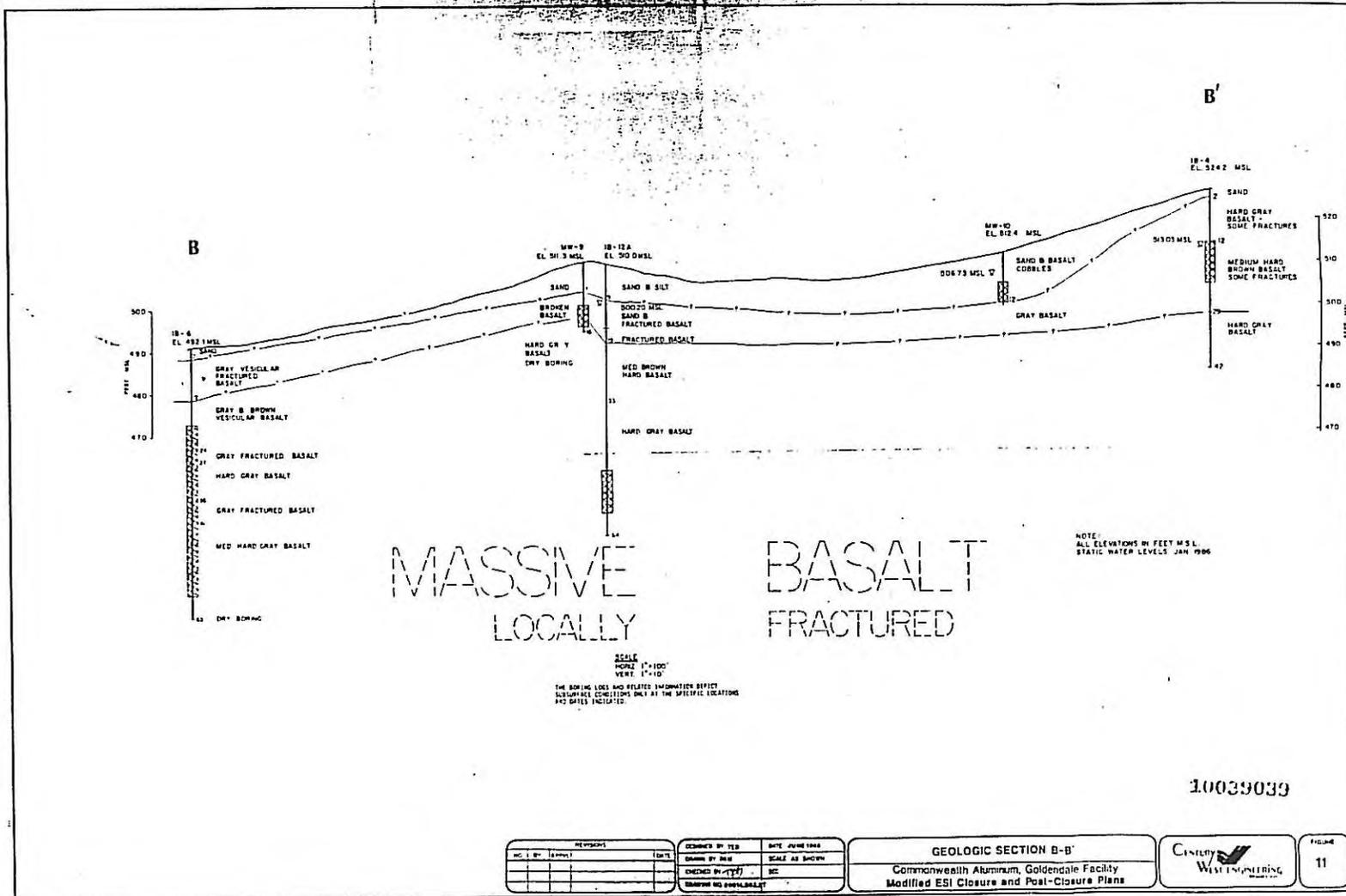
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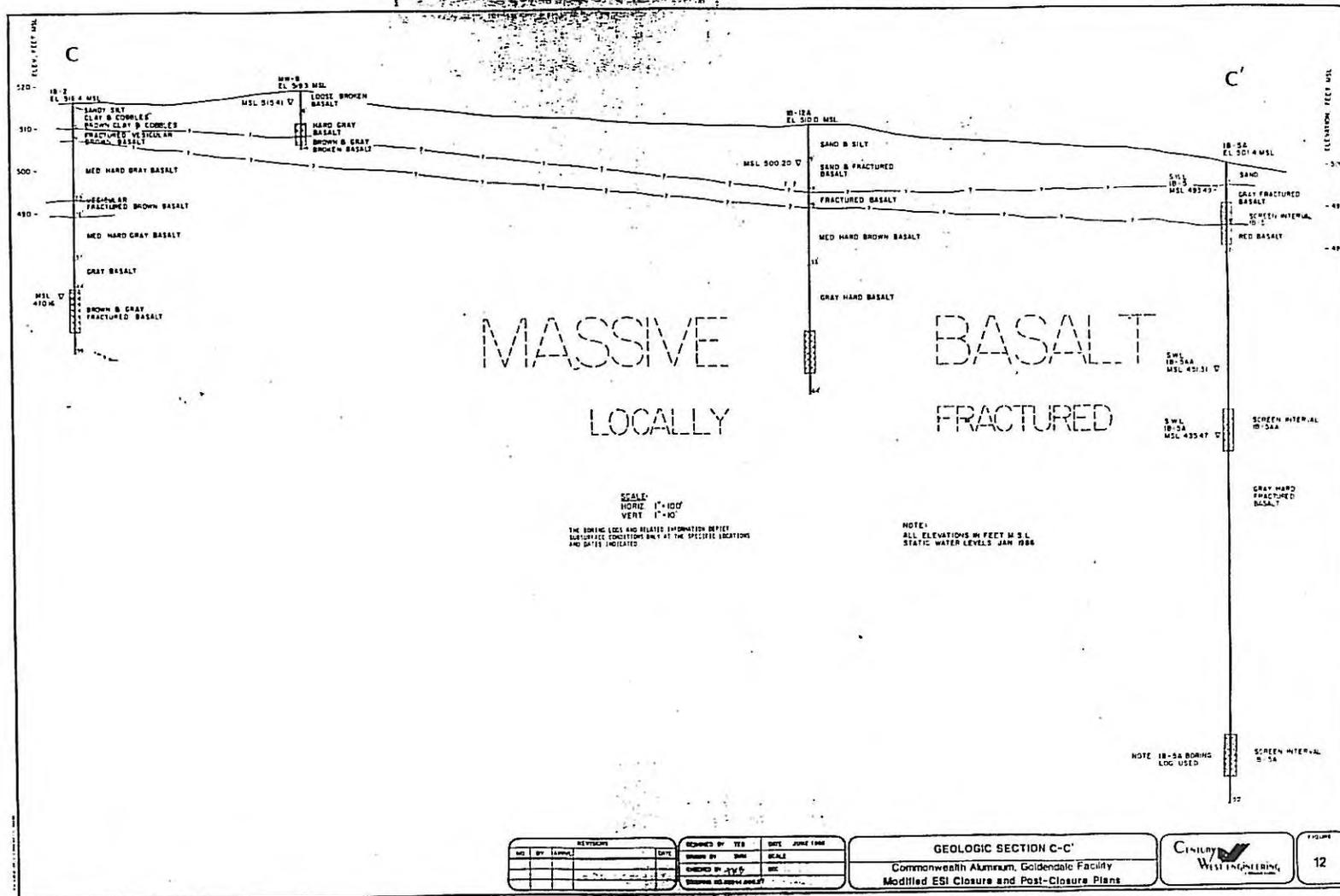
REVISED		DATE	
NO. 1	BY: [initials]	DATE: [blank]	DATE: [blank]
NO. 2	BY: [initials]	DATE: [blank]	DATE: [blank]
NO. 3	BY: [initials]	DATE: [blank]	DATE: [blank]
NO. 4	BY: [initials]	DATE: [blank]	DATE: [blank]

DESIGNED BY: TEB
 DRAWN BY: [initials]
 CHECKED BY: [initials]
 DATE: JUNE 1996
 SCALE: AS SHOWN

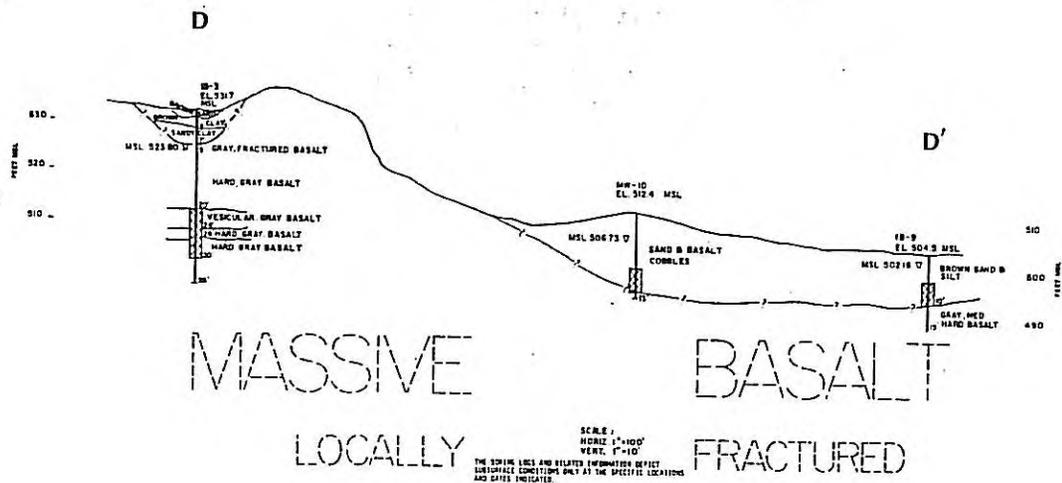
GEOLOGIC SECTION A-A'
 Commonwealth Aluminum, Goldendale Facility
 Modified ESI Closure and Post-Closure Plans







10034040



SCALE:
 HORIZ. 1"=100'
 VERT. 1"=10'
 THE SPINE LOGS AND RELATED INFORMATION REFLECT
 SURFACE CONDITIONS ONLY AT THE SPECIFIC LOCATIONS
 AND DATES INDICATED.

NOTE:
 ALL ELEVATIONS IN FEET M.S.L.
 STATIC WATER LEVELS: JAN. 1986

10029041

REVISIONS		DATE	DESIGNED BY	DATE	APPROVED BY
NO.	BY	DATE	DESIGNED BY	DATE	APPROVED BY

GEOLOGIC SECTION D-D'
 Commonwealth Aluminum, Goldendale Facility
 Modified ESI Closure and Post-Closure Plans

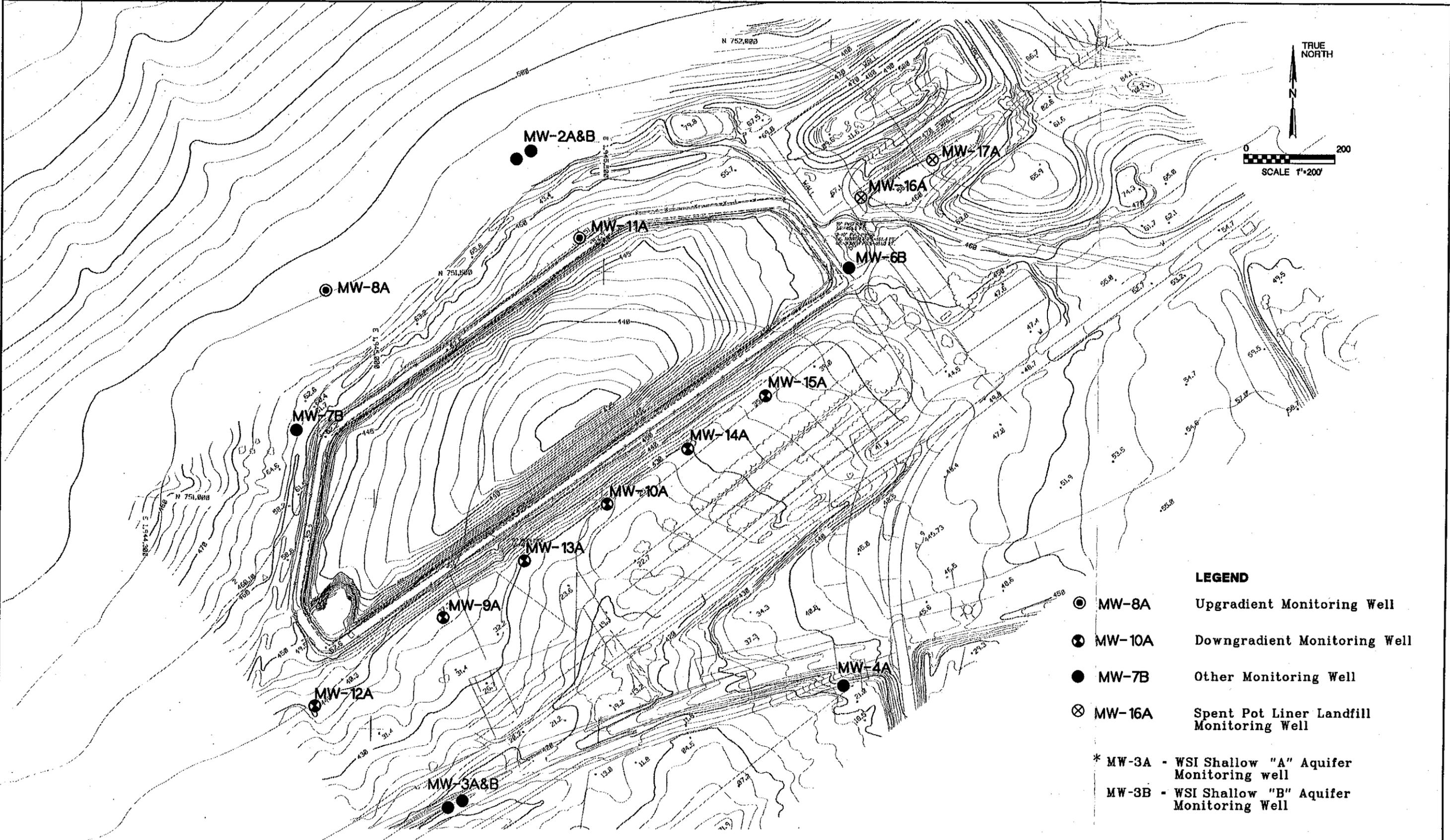


FIGURE
 13

APPENDIX B-2.2

CROSS-SECTIONS

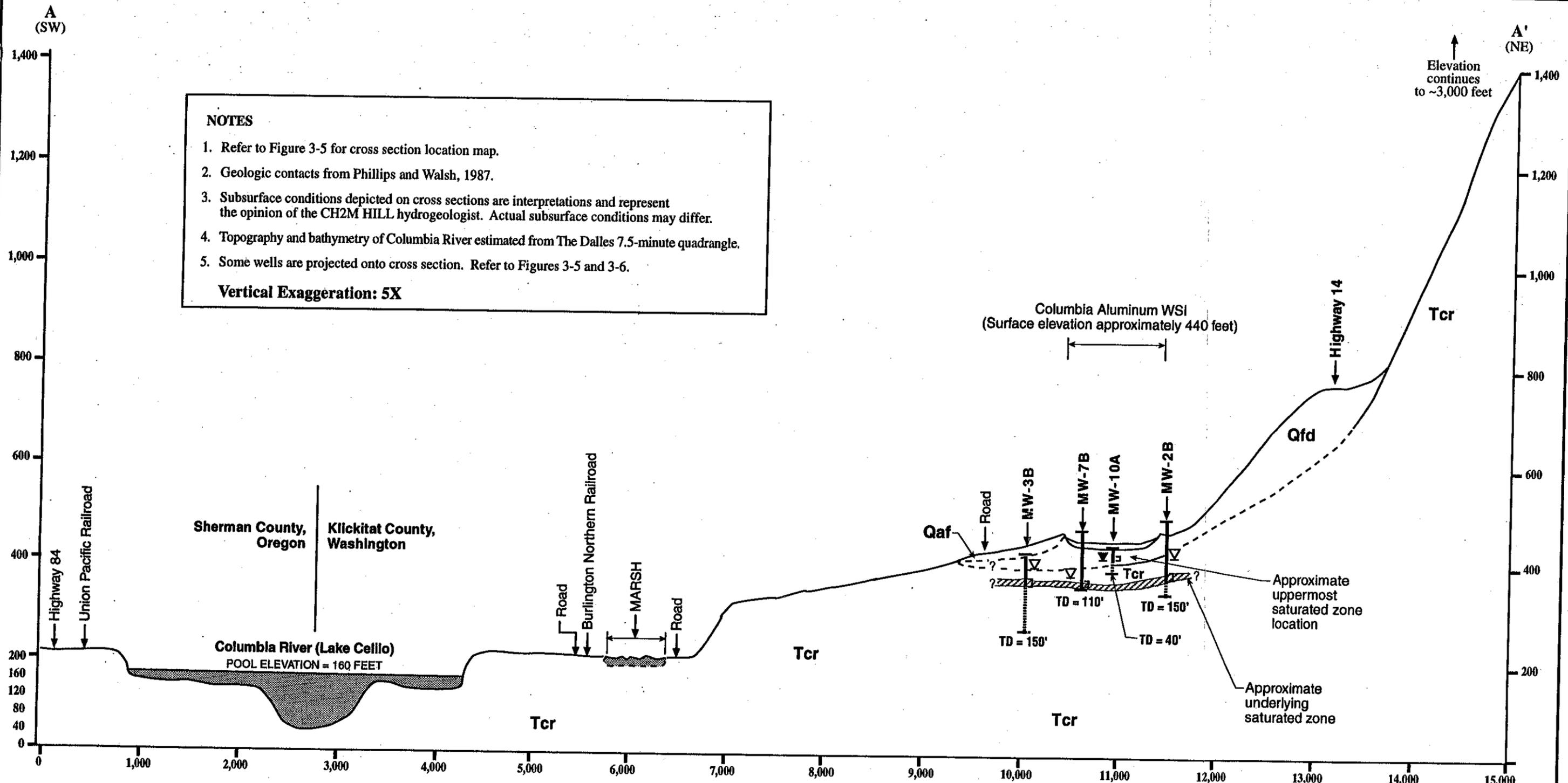
Parametrix (2004c) West Surface Impoundment Vicinity



- LEGEND**
- MW-8A Upgradient Monitoring Well
 - ⊗ MW-10A Downgradient Monitoring Well
 - MW-7B Other Monitoring Well
 - ⊗ MW-16A Spent Pot Liner Landfill Monitoring Well
- * MW-3A - WSI Shallow "A" Aquifer Monitoring well
 MW-3B - WSI Shallow "B" Aquifer Monitoring Well

Figure 3-1
Monitoring Well Locations
for the WSI

NOTE:
 THIS DRAWING IS FOR CONCEPTUAL USE ONLY. IT HAS BEEN COMPILED FROM SEVERAL SOURCES AND DOES NOT HAVE THE ACCURACY REQUIRED FOR ENGINEERING DESIGN DRAWINGS.



NOTES

1. Refer to Figure 3-5 for cross section location map.
2. Geologic contacts from Phillips and Walsh, 1987.
3. Subsurface conditions depicted on cross sections are interpretations and represent the opinion of the CH2M HILL hydrogeologist. Actual subsurface conditions may differ.
4. Topography and bathymetry of Columbia River estimated from The Dalles 7.5-minute quadrangle.
5. Some wells are projected onto cross section. Refer to Figures 3-5 and 3-6.

Vertical Exaggeration: 5X

LEGEND

<p>Deep well static water level (August 1994)</p> <p>Well number</p> <p>Screened interval</p> <p>Dashed interval = boring backfilled with bentonite</p> <p>Total well depth in feet below ground surface</p> <p>TD = 150'</p>	<p>Shallow well static water level (August 1994)</p>	<p>Qfd = Quaternary flood deposits</p> <p>Qaf = Alluvial fan deposits</p> <p>Tcr = Columbia River Basalt</p>
<p>Approximate geologic contact (dashed where inferred)</p>		

Figure 3-2
Regional Hydrogeologic Cross Section A-A'

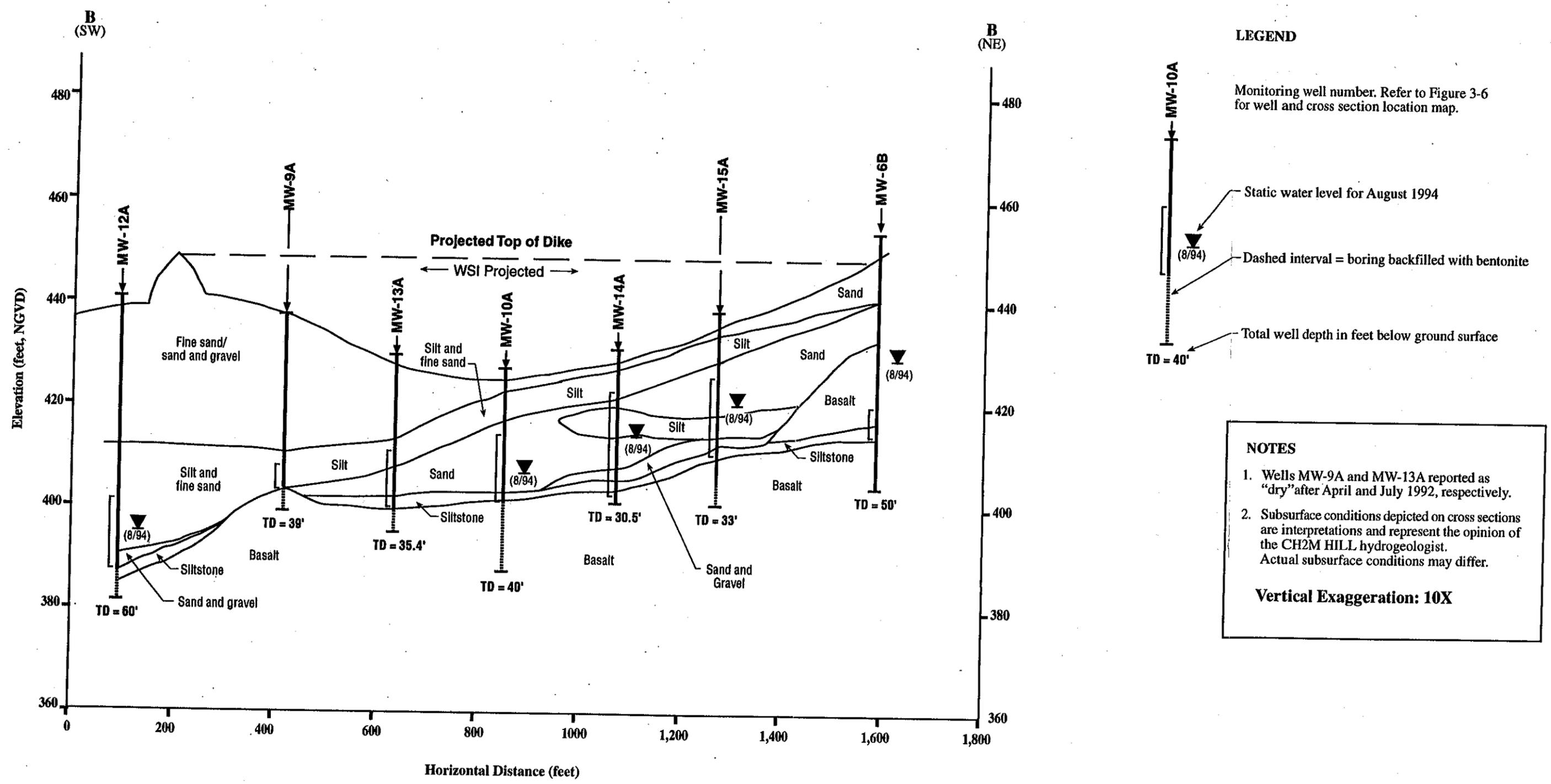
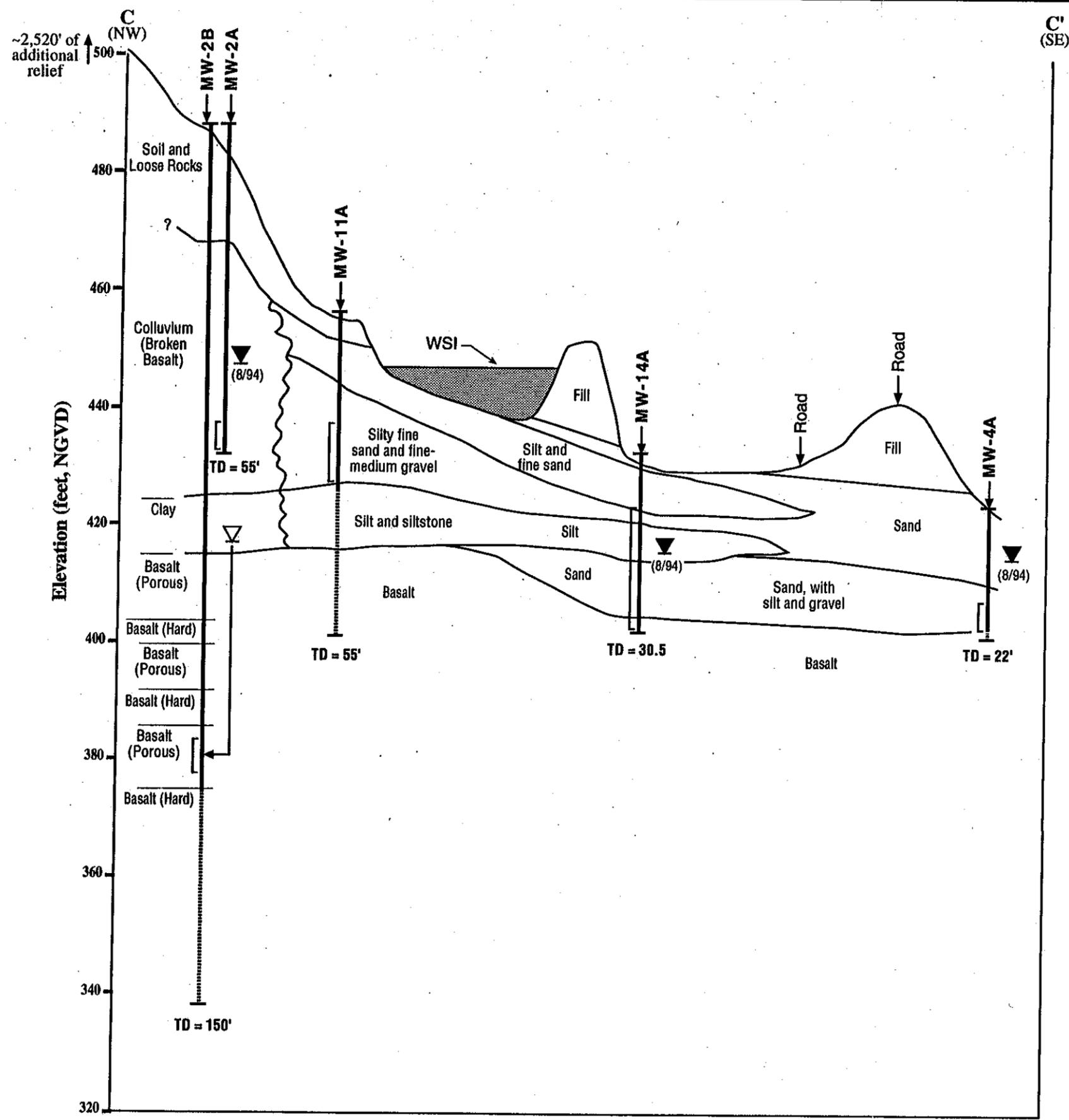
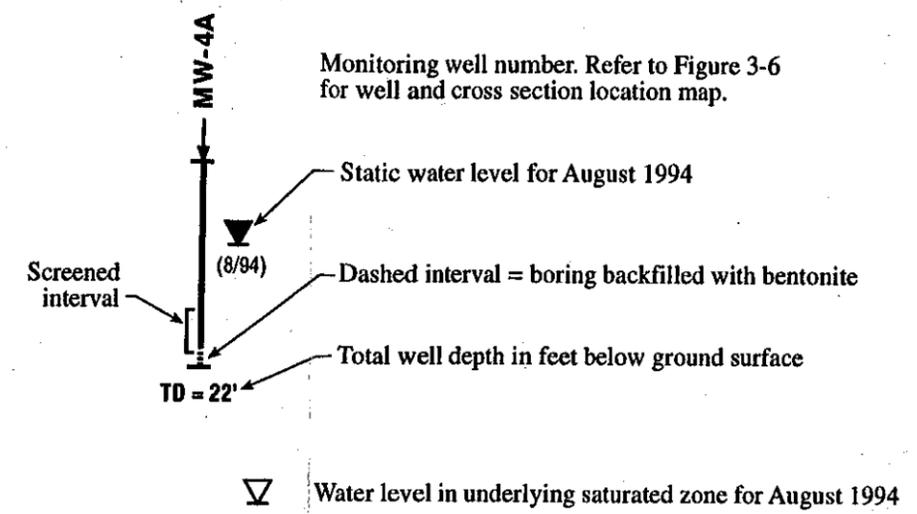


Figure 3-3
Hydrogeologic Cross Section B-B'



LEGEND

Monitoring well number. Refer to Figure 3-6 for well and cross section location map.

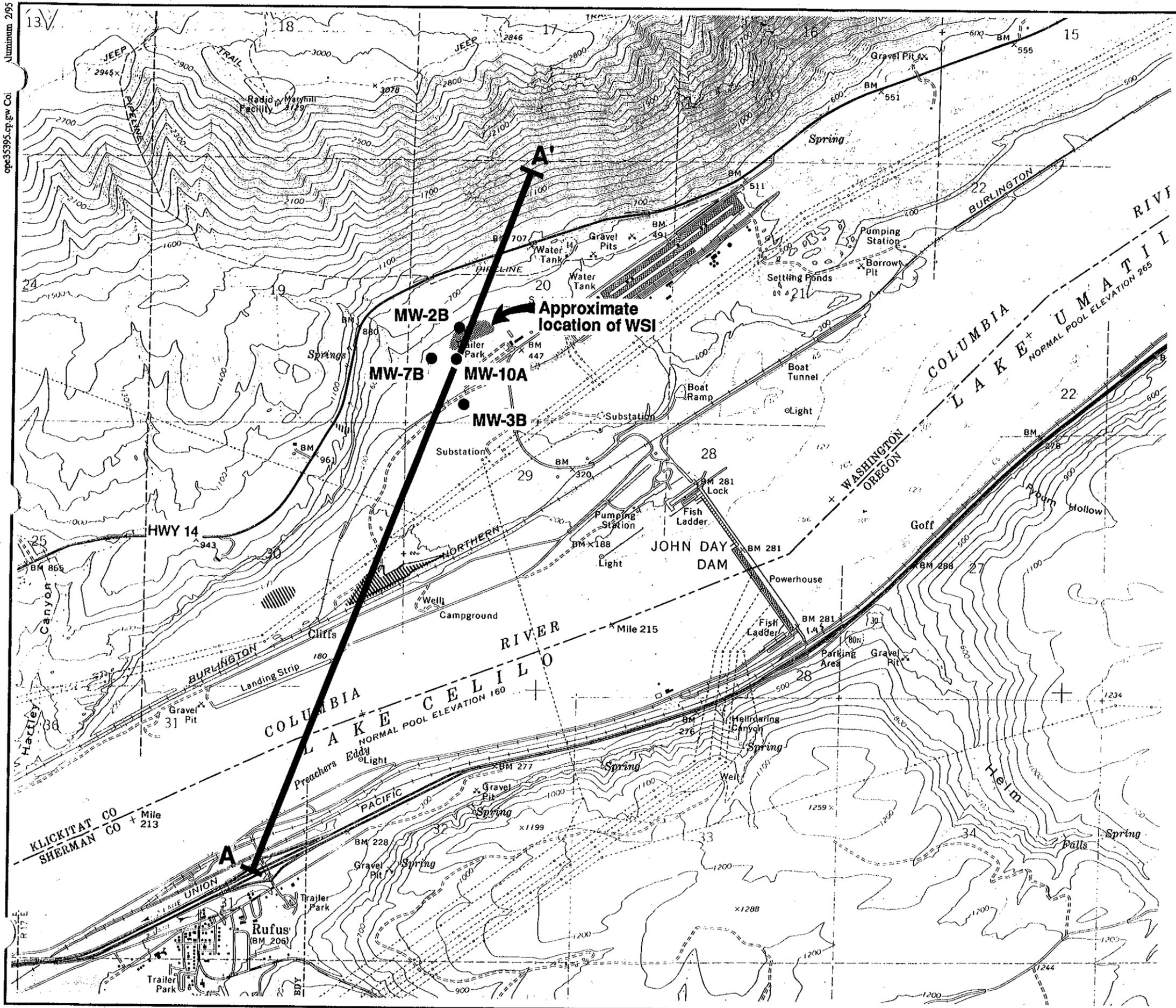


NOTES

1. Wells MW-9A and MW-13A reported as "dry" after April and July 1992, respectively.
2. Subsurface conditions depicted on cross sections are interpretations and represent the opinion of the CH2M HILL hydrogeologist. Actual subsurface conditions may differ.
3. WSI inserted for graphical purposes only; elevations are schematic and are not necessarily representative of this feature.

Vertical Exaggeration: 10X

Figure 3-4
Hydrogeologic Cross Section C-C'



LEGEND

MW-10A
● Approximate well locations

A—A'
— Cross section location

▨ Wetland areas

Refer to Figure 3-2 for A-A' cross section



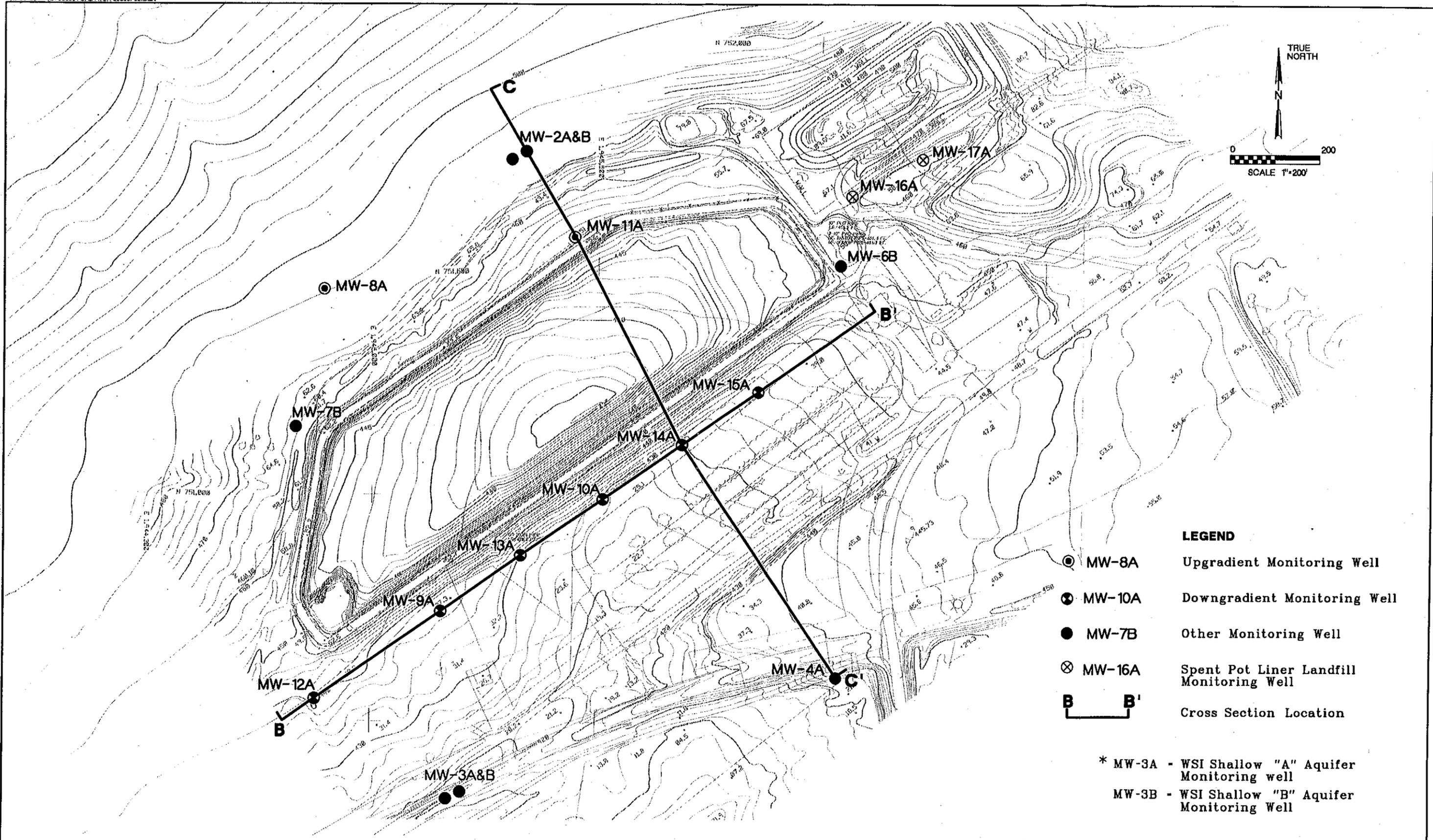
OREGON
QUADRANGLE LOCATION
Contour interval = 20 feet
Datum is mean sea level

Source: U.S. Geological Survey Rufus 7.5-Minute Quadrangle, Oregon-Washington, 1971.



0 1000 2000 Feet
Approximate Scale

Figure 3-5
**Regional Cross Section A-A' Map
for the WSI**



- LEGEND**
- MW-8A Upgradient Monitoring Well
 - ⊗ MW-10A Downgradient Monitoring Well
 - MW-7B Other Monitoring Well
 - ⊗ MW-16A Spent Pot Liner Landfill Monitoring Well
 - B B' Cross Section Location

* MW-3A - WSI Shallow "A" Aquifer Monitoring well
 MW-3B - WSI Shallow "B" Aquifer Monitoring Well

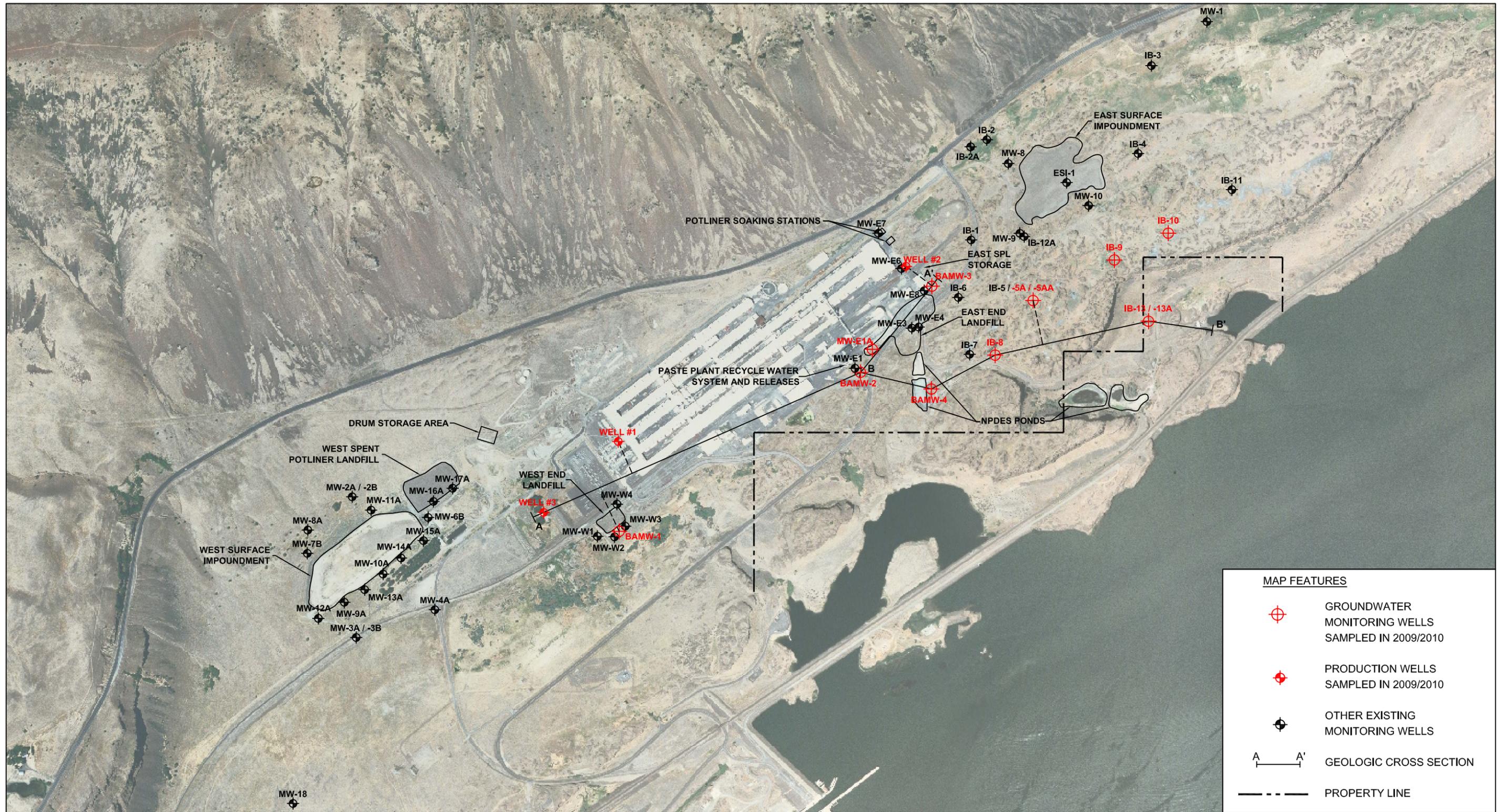
NOTE:
 THIS DRAWING IS FOR CONCEPTUAL USE ONLY. IT HAS BEEN COMPILED FROM SEVERAL SOURCES AND DOES NOT HAVE THE ACCURACY REQUIRED FOR ENGINEERING DESIGN DRAWINGS.

Figure 3-6
Cross Section Location Map
for B-B' and C-C'

APPENDIX B-2.2

CROSS-SECTIONS

**URS (2011)
Site-Wide Groundwater Investigation**



MAP FEATURES

-  GROUNDWATER MONITORING WELLS SAMPLED IN 2009/2010
-  PRODUCTION WELLS SAMPLED IN 2009/2010
-  OTHER EXISTING MONITORING WELLS
-  GEOLOGIC CROSS SECTION
-  PROPERTY LINE

GROUNDWATER MONITORING WELL NETWORK

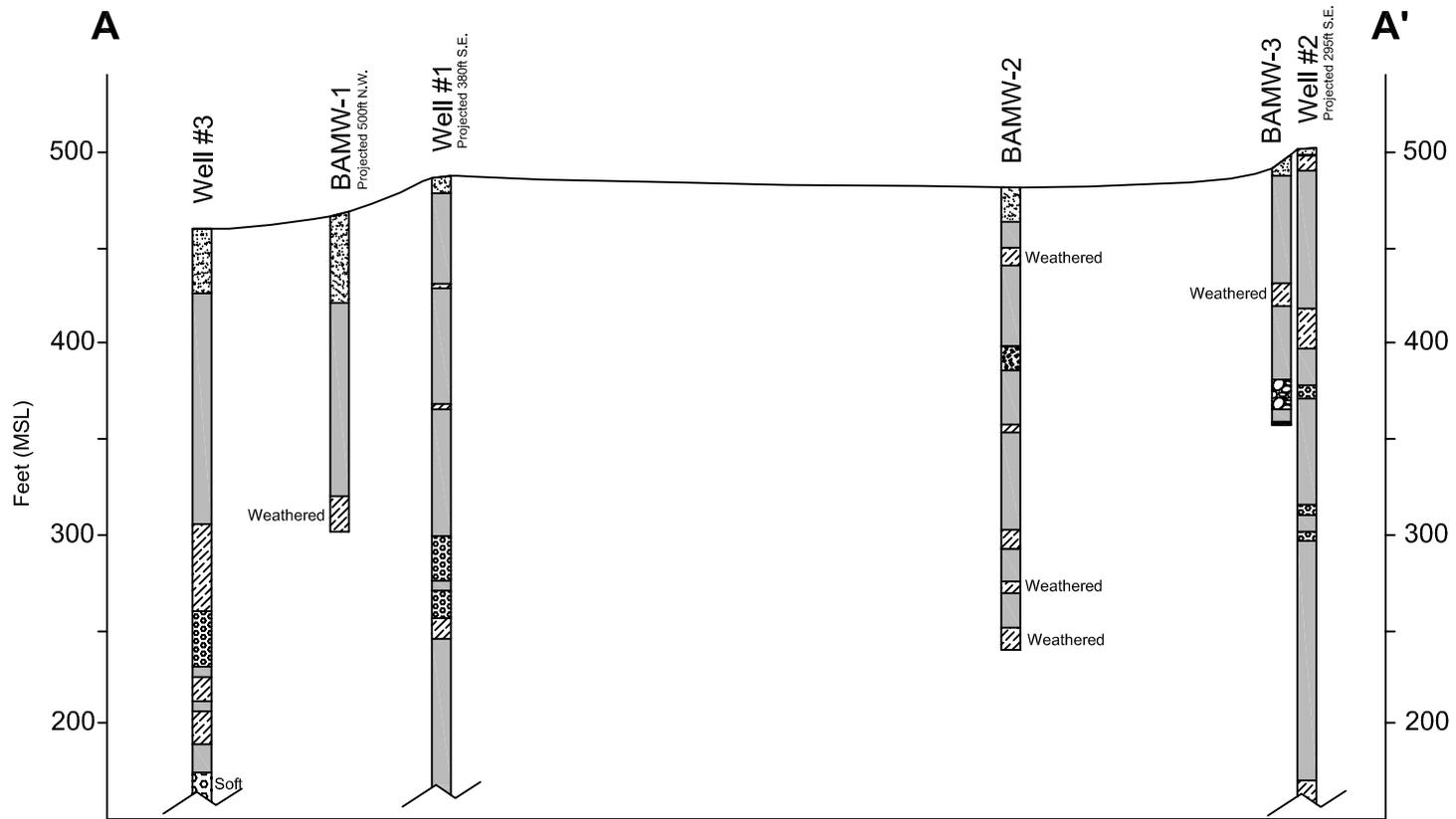
JANUARY 2011
25696946

LOCKHEED MARTIN
COLUMBIA GORGE ALUMINUM FACILITY
GOLDENDALE, WASHINGTON

FIGURE 2



C:\25696946 LMC Goldendale StairWells Off Inv\5000 Technical\Figures\Fig 2 Groundwater Monitoring Well Network.dwg Jan 26, 2011 - 11:07am



LEGEND

- | | | | |
|---|---------------------------|---|---------------|
|  | UNCONSOLIDATED
AQUIFER |  | POROUS BASALT |
|  | BASALT |  | ASH / TUFF |
|  | FRACTURED BASALT |  | GRAVEL |



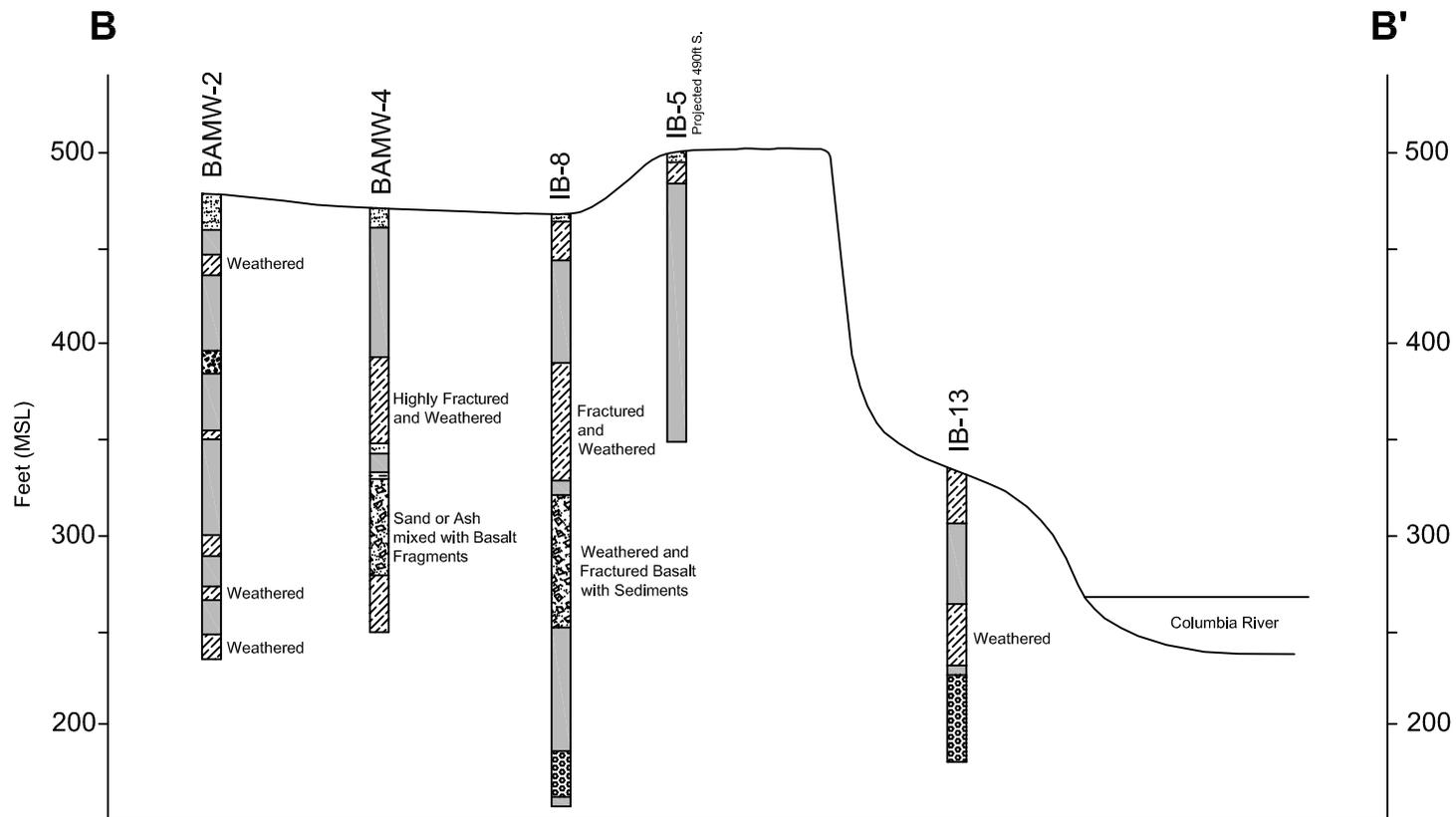
GEOLOGIC CROSS SECTION A - A'

NOVEMBER 2010
25696946

LOCKHEED MARTIN
GOLDENDALE ALUMINUM FACILITY
Klickitat County, WA



FIGURE 3



LEGEND

- | | | | |
|--|---------------------------|--|---|
| | UNCONSOLIDATED
AQUIFER | | GRAVEL |
| | BASALT | | SAND |
| | FRACTURED BASALT | | CLAY |
| | POROUS BASALT | | MIXED BASALT FRAGMENTS
WITH SEDIMENT |
| | ASH / TUFF | | |



GEOLOGIC CROSS SECTION B - B'

NOVEMBER 2010
25696946

LOCKHEED MARTIN
GOLDENDALE ALUMINUM FACILITY
Klickitat County, WA



FIGURE 4

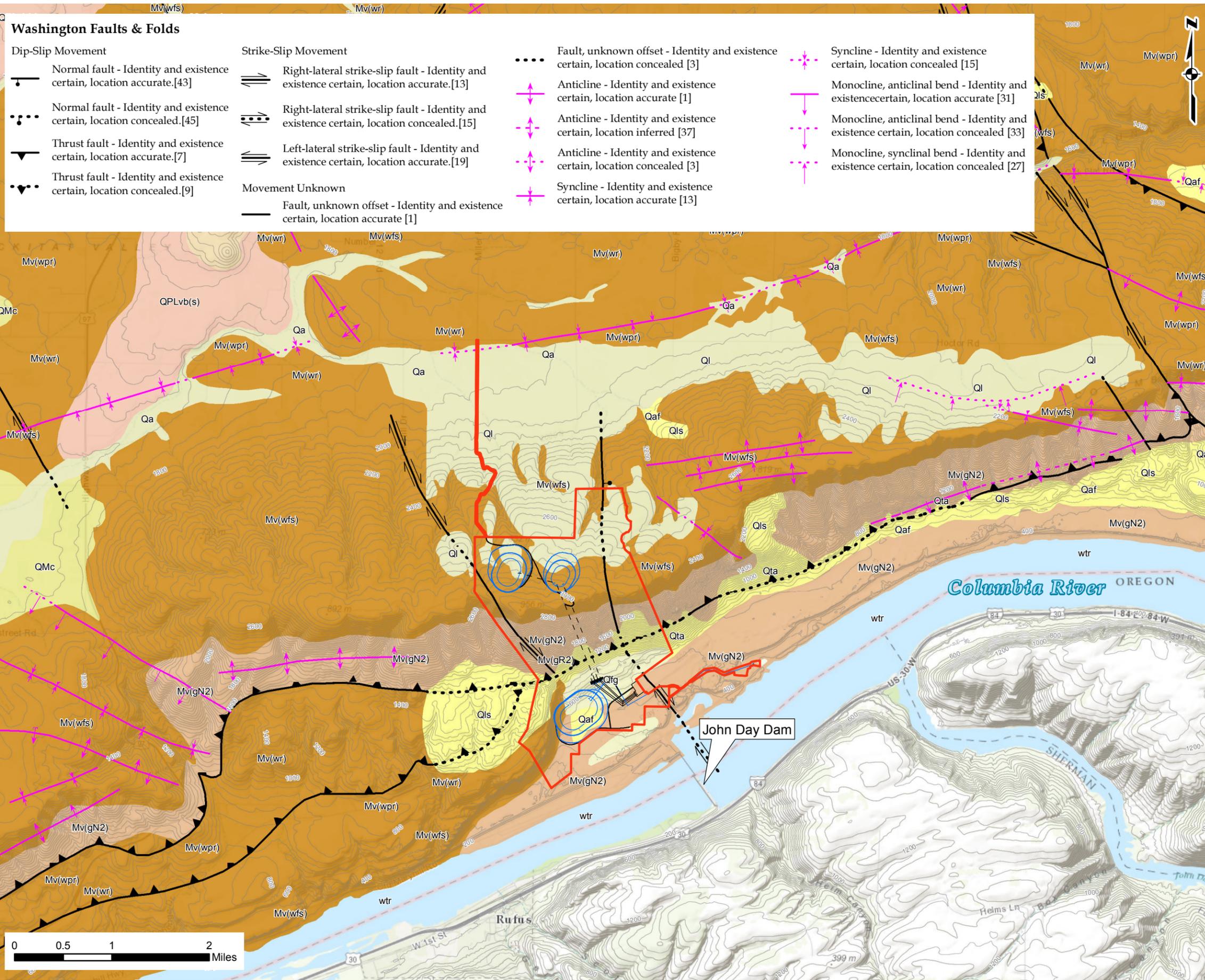
APPENDIX B-2.3

Geologic Map

KPUD (2014) John Day Pool Pumped Storage Hydroelectric Project Pre-Application Document Geologic Map

Created By: Alex Kirk Date: 10/23/2014 Project: 0267256

F:\Projects\0267256_MWH Global-Clickit\14\GIS\maps\Geology.mxd



Washington Faults & Folds

Dip-Slip Movement

- Normal fault - Identity and existence certain, location accurate.[43]
- Normal fault - Identity and existence certain, location concealed.[45]
- Thrust fault - Identity and existence certain, location accurate.[7]
- Thrust fault - Identity and existence certain, location concealed.[9]

Strike-Slip Movement

- Right-lateral strike-slip fault - Identity and existence certain, location accurate.[13]
- Right-lateral strike-slip fault - Identity and existence certain, location concealed.[15]
- Left-lateral strike-slip fault - Identity and existence certain, location accurate.[19]

Movement Unknown

- Fault, unknown offset - Identity and existence certain, location accurate [1]

Fault, unknown offset - Identity and existence certain, location concealed [3]

- Anticline - Identity and existence certain, location accurate [1]
- Anticline - Identity and existence certain, location inferred [37]
- Anticline - Identity and existence certain, location concealed [3]
- Syncline - Identity and existence certain, location accurate [13]

Syncline - Identity and existence certain, location concealed [15]

- Monocline, anticlinal bend - Identity and existence certain, location accurate [31]
- Monocline, anticlinal bend - Identity and existence certain, location concealed [33]
- Monocline, synclinal bend - Identity and existence certain, location concealed [27]



- ### Legend
- Study Area
 - 50 ft Contours (NED)
- Washington Geologic Units**
- Unconsolidated Sediments**
- Quaternary alluvial fans (Qaf), beach deposits, landslides (Qls), and talus (Qta)
 - Quaternary alluvium, dune sand, loess, and artificial fill (Q1)
 - Pleistocene continental glacial, glaciolacustrine, and outburst flood deposits, Fraser-age (Qfg)
- Sedimentary Rocks and Deposits**
- Quaternary-Miocene continental sedimentary rocks
- Volcanic Rocks and Deposits**
- Quaternary and Quaternary-Pliocene undifferentiated volcanic rocks
 - Quaternary-Tertiary volcanic rocks
 - Miocene Columbia River Basalt Group, Wanapum Basalt, MV(wpr) Priest Rapids Member, MV(wr) Roza Member, and MV(wfs) Frenchman Springs Member
 - Miocene Columbia River Basalt Group, Grande Ronde Basalt: MV(gN2) Flows of normal magnetic polarity and MV(gR2) Flows of reverse magnetic polarity

Figure 4.2.1-1
 Project Geology
 PAD Study Area
 John Day Pool Project
 Goldendale, Washington

F:\Projects\0267256_MWH_Global-Kickstart_PUD\GIS\maps\Stratigraphy.mxd
 Created By: Alex Kirk Date: 10/20/2014 Project: 0267256

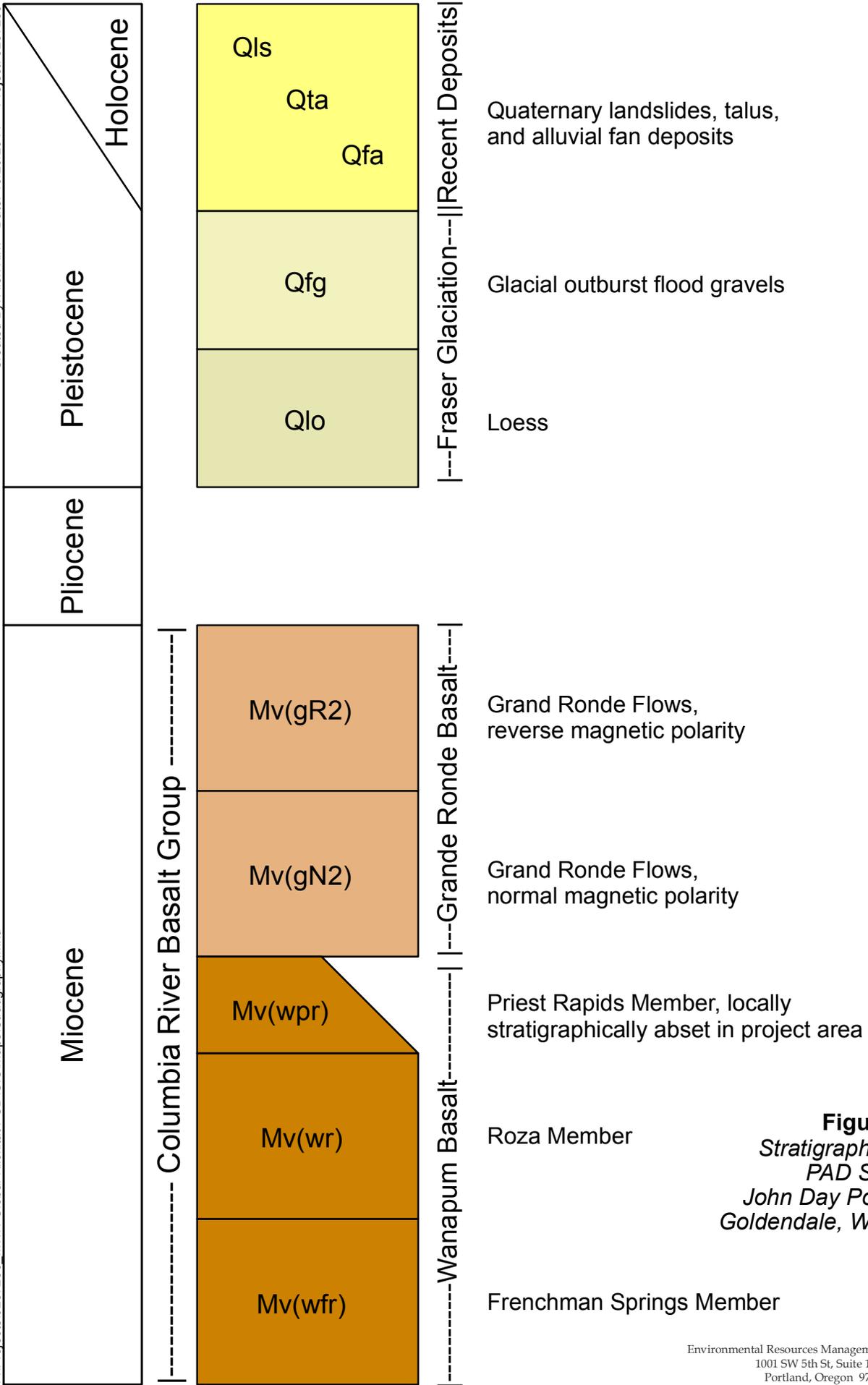


Figure 4.2.1-2
 Stratigraphic Section
 PAD Study Area
 John Day Pool Project
 Goldendale, Washington



APPENDIX B-3
WETLANDS AOC

APPENDIX B-3

WETLANDS AOC

**PGG (2013a)
Wetlands Survey**

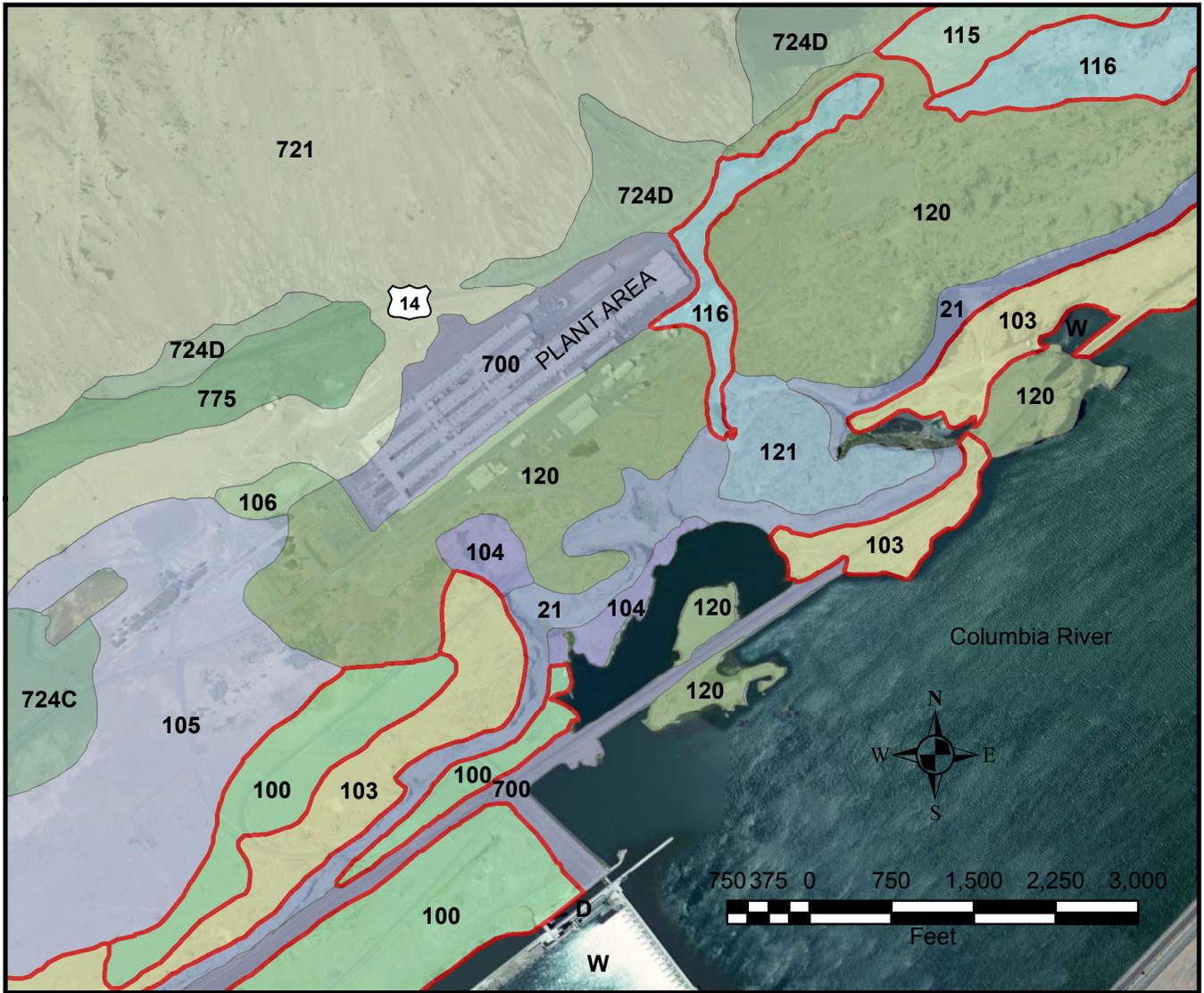
All of the wetlands except H, I, J and K have been used for livestock grazing. Wetlands D, E, F, J, L and M have all been disturbed by vehicle traffic, grading, fill, and/or clearing of power line rights-of-way. Wetland ratings and categorization reflect these impacts on the plant communities. Wetlands I and K are the least physically disturbed of all the wetlands. Site wetland results are summarized in Table 3.

Table 2 - Summary of Wetland Results

SUMMARY OF WETLAND RESULTS		
Wetland	Wetland Category	Status
A	IV Palustrine emergent and/or scrub/shrub	Used for livestock grazing
B	IV Palustrine emergent and/or scrub/shrub	Man-made ditch
C	III Palustrine emergent and/or scrub/shrub	Livestock grazing
D	III Palustrine emergent and/or scrub/shrub	Livestock grazing, disturbed by adjacent vehicular traffic, grading, and power line right-of-way
E	IV Palustrine emergent and/or scrub/shrub	Livestock grazing, grading, and power line right-of-way
F	IV Palustrine emergent and/or scrub/shrub	Livestock grazing, disturbed by adjacent vehicular traffic, grading, and power line right-of-way
G	III Palustrine emergent and/or scrub/shrub	Disturbed by adjacent vehicular traffic
H	III Palustrine emergent and/or scrub/shrub	Adjacent parking area, buildings and railroad bed
I	II Palustrine emergent and/or scrub/shrub	Least disturbed
J	III Palustrine emergent and/or scrub/shrub	Disturbed by adjacent vehicular traffic, grading, and power line right-of-way clearing
K	III Palustrine emergent and/or scrub/shrub	Least disturbed
L	III Palustrine emergent and/or scrub/shrub	Disturbed by adjacent vehicular traffic, grading, and power line right-of-way clearing
M	III Palustrine emergent and/or scrub/shrub	Disturbed by vehicular traffic, grading, and power line right-of-way clearing
See "Wetlands & Biologically Sensitive Areas Delineation", Sound Ecological Endeavors, Appendix C2.		

4.4 Evaluation of Surface Water Flow Paths Related to Identified Wetlands

Much of the water for the Site wetlands originates from groundwater seeps. This is not unexpected given the location of the Site at the base of the Columbia Hills to the north. Wetland A is created by a groundwater seep that has been piped to an overflowing livestock water trough. Snow melt and surface water runoff (from the plant area as well as surrounding undeveloped areas) also contribute to the wetland conditions.



LEGEND	
Soils	
Hydric	
	100 Dallesport very cobbly fine sandy loam, 0 to 8 percent slopes
	103 Dallesport-Rock outcrop compls, 0 to 15 percent slopes
	115 Aquolls, 0 to 3 percent slopes
	116 Aquolls-Rock outcrop complex, 0 to 3 percent slopes
Non-hydric	
	104 Dallesport-Rock outcrop complex, 15 to 30 percent slopes
	105 Ewall loamy sand, 0 to 8 percent slopes
	106 Ewall loamy sand, 8 to 15 percent slopes
	120 Rock outcrop-Haploxerolls complex, 0 to 30 percent slopes
	121 Rock outcrop-Haploxerolls complex, 30 to 50 percent slopes
	21 Rock outcrop-Rubble land complex, 65 to 90 percent slopes
	700 Urban land
	721 Rock outcrop-Rubble land-Haploxerolls complex, 30 to 90 percent slopes
	724C Haploxerolls-Rubble land complex, 30 to 50 percent slopes
	724D Haploxerolls-Rubble land complex, 50 to 70 percent slopes
	775 Horseflat cobbly silt loam, 2 to 15 percent slopes

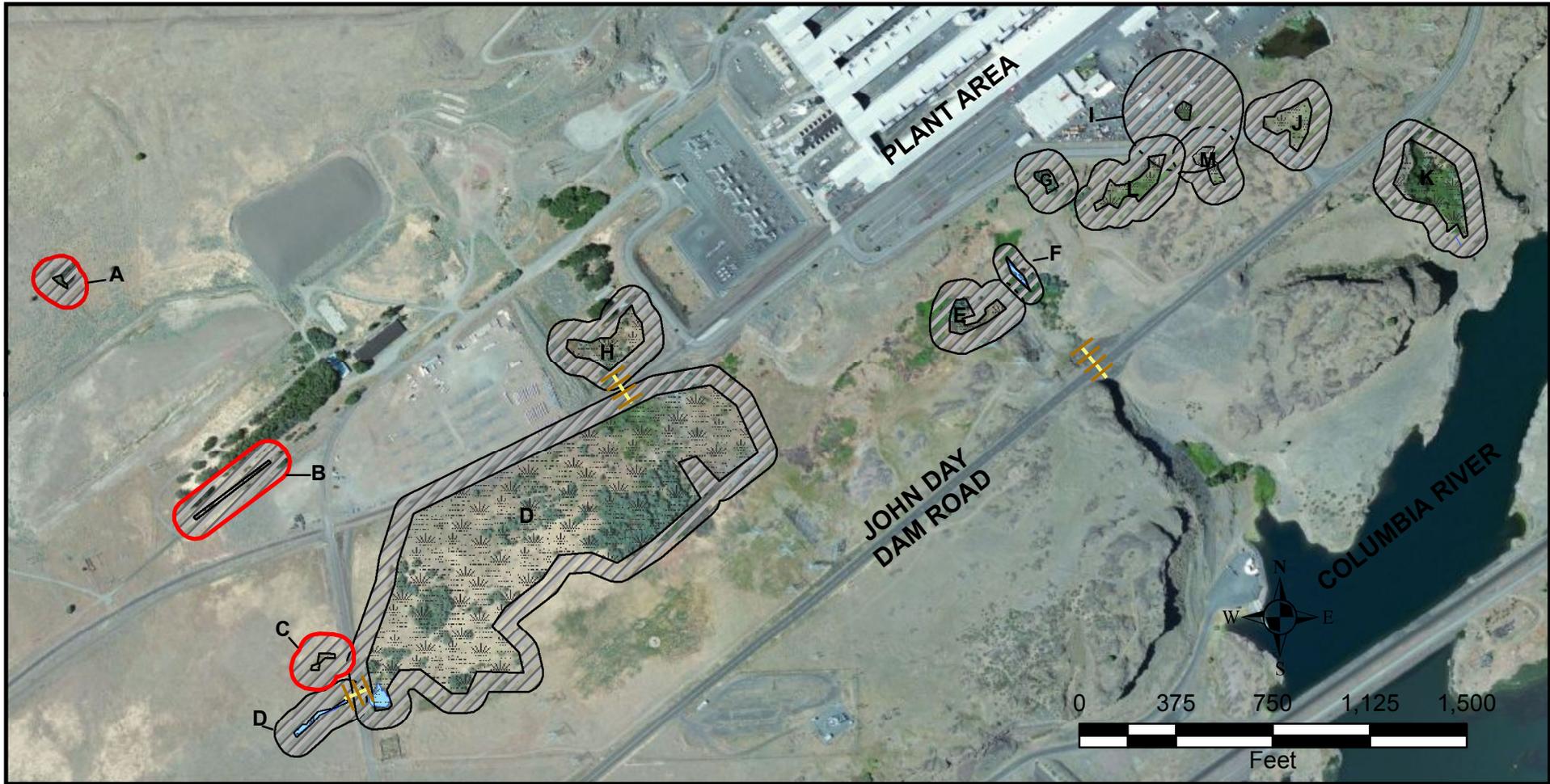
MARCH 2013	FIGURE 4 SITE SOIL UNIT MAP
 PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604	
COLUMBIA GORGE ALUMINUM COMPANY GOLDENDALE ALUMINUM SMELTER GOLDENDALE, WASHINGTON	



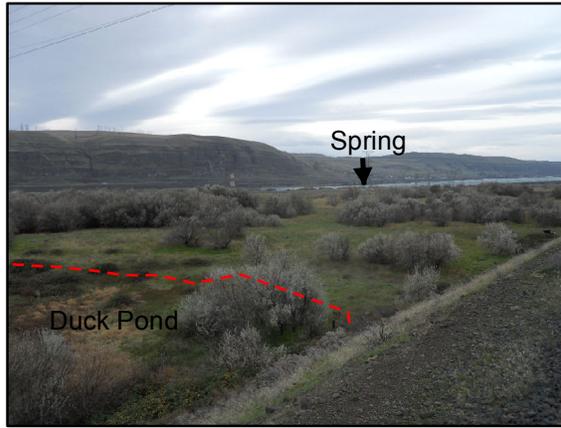
Source: U.S. Fish and Wildlife National Wetland Inventory

Wetland Type	General Description	Cowardin et al. 1979
Freshwater Emergent Wetland	Herbaceous march, fen, swale and wet meadow	Palustrine emergent
Freshwater Pond	Pond	Palustrine unconsolidated bottom, Palustrine aquatic bed
Other	Farmed wetland, saline seep and other miscellaneous wetland	Palustrine wetland

MARCH 2013	LEGEND	FIGURE 5
 PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604	NWI Wetland Types  Freshwater Emergent Wetland  Freshwater Pond  Other	SITE WETLANDS FROM NATIONAL WETLAND INVENTORY MAP
		COLUMBIA GORGE ALUMINUM COMPANY GOLDENDALE ALUMINUM SMELTER GOLDENDALE, WASHINGTON



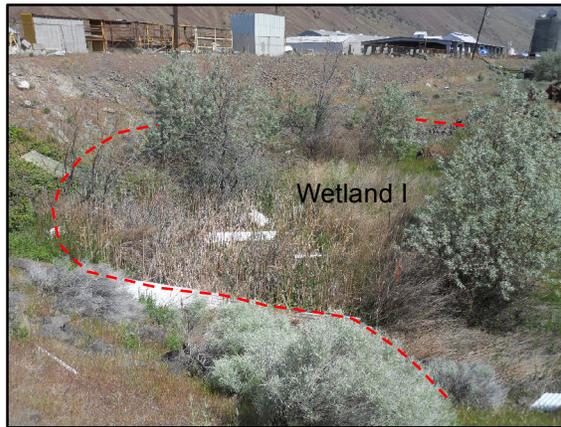
<p>MARCH 2013</p>	<p>LEGEND</p>	<p>FIGURE 6 WETLAND AND SURFACE WATER LOCATION MAP</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<p>  Wetland area  Wetlands Not Regulated  Buffer  Surface Water  Culvert </p>	



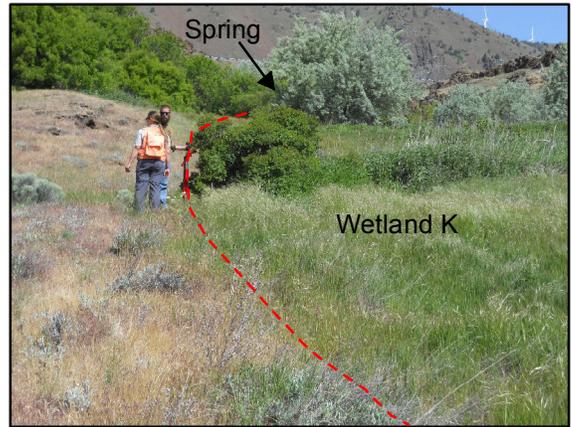
A. Overview of Wetland D view to SW with approximate location of spring, and Duck Pond in lower left photo.



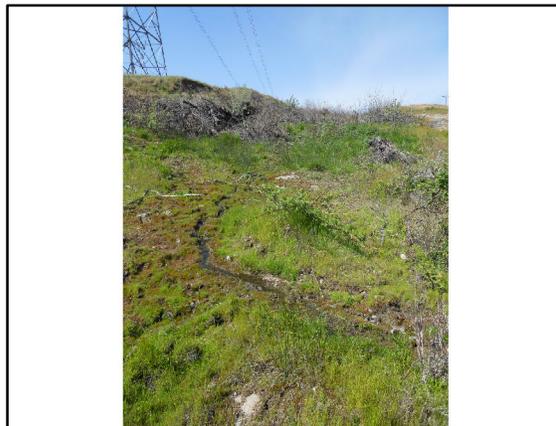
B. Surface water (infiltrates into the ground) on western side of Wetland D. View to E.



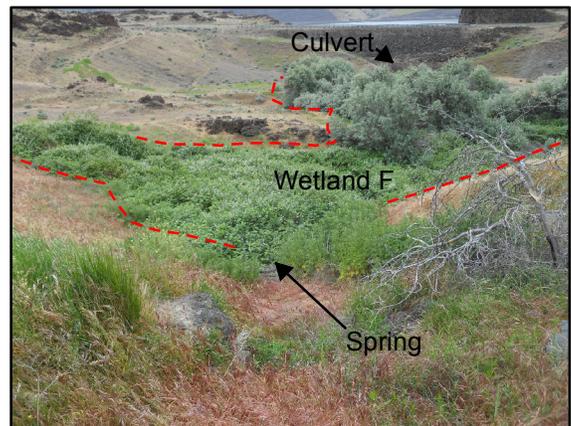
C. Wetland I, view to NW.



D. Wetland K with approximate location of Spring. View to NE.



E. Wetland E showing surface flow.



F. Overview of Wetland F showing culvert location (top right photo) and spring location (bottom photo). View to S.

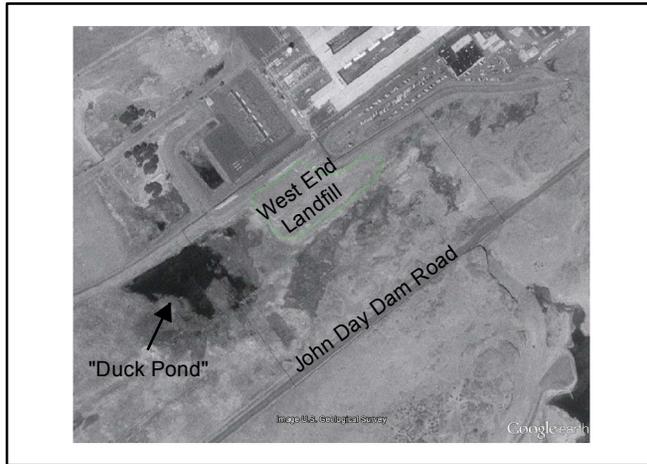
MARCH 2013



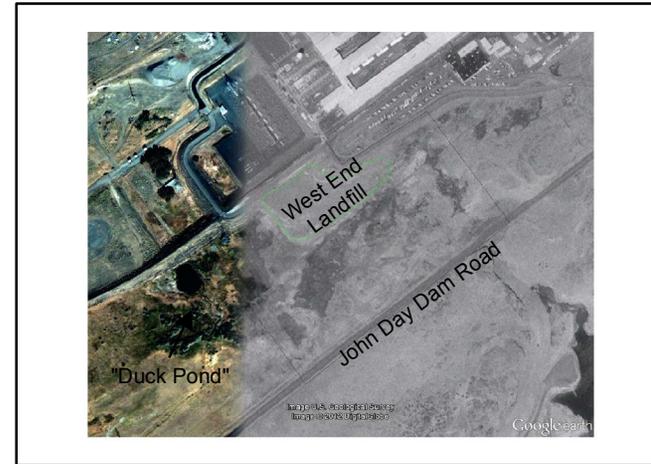
PLATEAU GEOSCIENCE GROUP LLC
PO BOX 1020
BATTLE GROUND, WA 98604

FIGURE 7
PHOTOGRAPHS OF WETLANDS

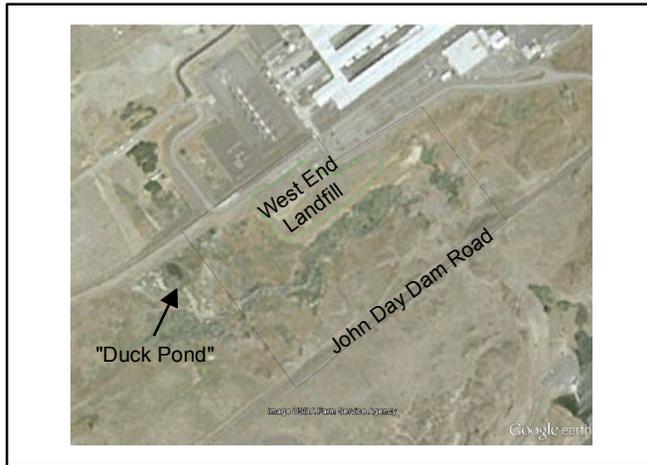
COLUMBIA GORGE ALUMINUM COMPANY
GOLDENDALE ALUMINUM SMELTER
GOLDENDALE, WASHINGTON



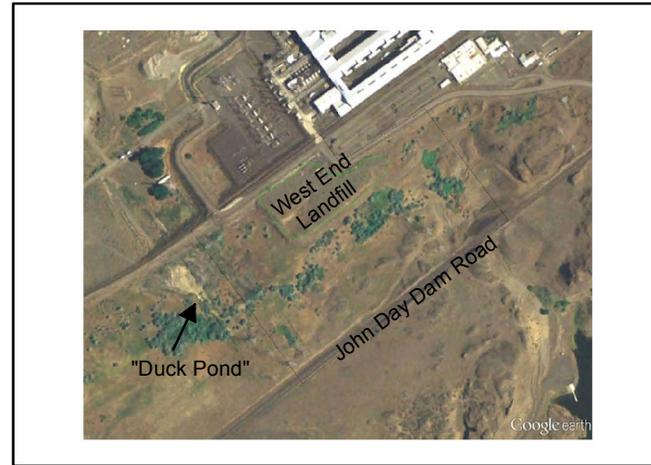
A. GOOGLE Earth Aerial Photo. Image date 7/15/1996



B. GOOGLE Earth Aerial Photo. Image date 10/24/2002



C. GOOGLE Earth Aerial Photot. Image date 6/25/2003



D. GOOGLE Earth Aerial Photo. Image data 7/31/2005

MARCH 2013

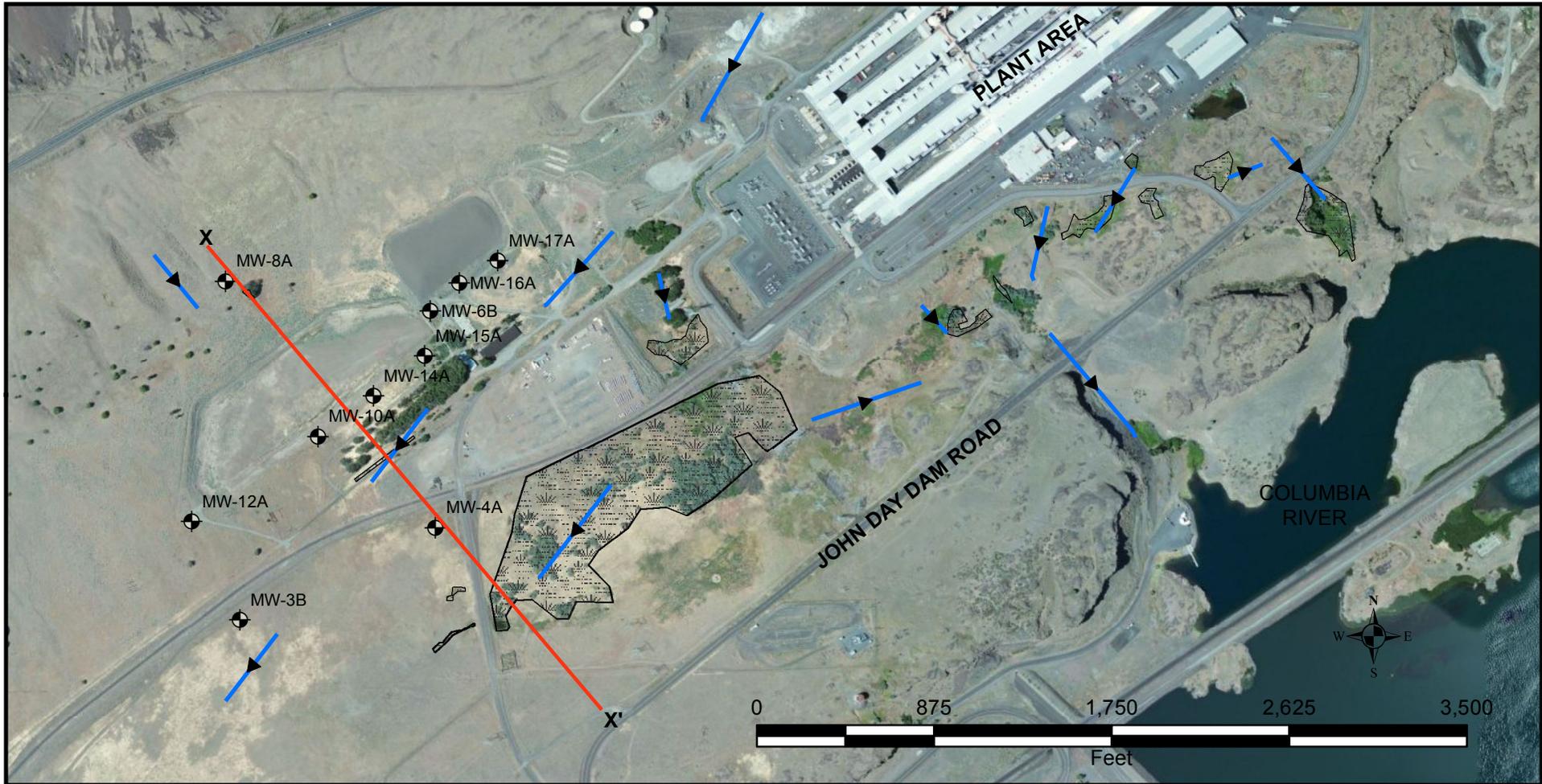


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PO BOX 1020
BATTLE GROUND, WA 98604

FIGURE 8

"DUCK POND" AERIAL PHOTOGRAPHS

COLUMBIA GORGE ALUMINUM COMPANY
GOLDENDALE ALUMINUM SMELTER
GOLDENDALE, WASHINGTON



<p>MARCH 2013</p>	<p>LEGEND</p>	<p>FIGURE 9A GROUNDWATER FLOW DIRECTION MAP</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<ul style="list-style-type: none">  Interpreted Groundwater Flow Direction  Groundwater Monitor Wells  Wetlands  Cross Section X-X' (Fig. 9B) 	

APPENDIX B-3

WETLANDS AOC

**PGG (2013b)
Wetlands D Investigation**

Table 2 - Surface Water Sample Analytical Results

CHEMICALS	Wetland D ¹			Wetland E	Wetland F		Wetland K	Pond A Discharge ²				
	SW-D1	SW-D2	SWD-1	SW-E	WR-SW1	WR-SW2	SW-K	DW-1	DW-1D	DP1-1	DP1-2	UP2-24
	5/30/2012	5/30/2012	3/23/2013	5/11/2012	3/8/2012	4/18/2012	5/24/2012	3/17/2011	3/17/2011	12/1/2011	12/7/2011	2/24/2012
Total Metals (EPA 6010B/7471A) ug/L												
Aluminum	100 U	8400	170	140	na	na	2700	150	150	na	na	150
Antimony	5.6 U	5.6 U	5.6 U	5.6 U	na	na	5.6 U	na	na	na	na	5.6 U
Arsenic	4.5	7.9	3.3 U	3.3 U	3 U	3 U	3.3 U	3.3 U	3.3 U	3.3 U	na	3.3 U
Barium	23	110	28 U	28	30	29	32	28 U	28 U	28 U	na	28 U
Beryllium	10 U	10 U	11 U	11 U	na	na	11 U	na	na	na	na	11 U
Cadmium	4 U	4 U	4.4 U	4.4 U	4 U	4 U	4.4 U	4.4 U	4.4 U	4.4 U	na	4.4 U
Chromium	10 U	10	11 U	11 U	10 U	10 U	11 U	11 U	11 U	11 U	na	11 U
Lead	1 U	8.1	1.1 U	1.1 U	1 U	1 U	1.4	1.1 U	1.1 U	1.1 U	na	1.1 U
Mercury	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	na	0.5 U
Selenium	5 U	5 U	5.6 U	5.6 U	5 U	5 U	5.6 U	5.6 U	5.6 U	5.6 U	na	5.6 U
Silver	10 U	10 U	11 U	11 U	10 U	10 U	11 U	11 U	11 U	11 U	na	11 U
Zinc	28	51	na	na	na	na	28 U	56 U	56 U	na	na	28 U
Chromium (hexavalent)	na	na	na	na	na	10 U	na	na	na	na	na	na
Fluoride (SM 4500-F C) mg F-/L	0.49	0.46	0.44	6.3	3.3	8.7	4.6	23	23	12	na	7.4
Cyanide (SW846 9010/9012) mg/L												
Total Cyanide	0.005 U	0.005 U	0.005 U	na	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	na	0.005 U	0.005 U
Free Cyanide	0.005 U	0.005 U	0.005 U	na	0.005 U	0.005 U	0.005 U	na	na	na	0.005 U	0.005 U
PAHs (EPA 8270D/SIM) ug/L												
Naphthalene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.097 U	0.094 U	0.094 U	0.5 U	na	0.094 U
2-Methylnaphthalene	0.1 U	0.1 U	0.1 U	0.1 U	0.33	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
<i>1-Methylnaphthalene</i>	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
Acenaphthylene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
Acenaphthene	0.1 U	0.1 U	0.1 U	0.1 U	0.19	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
Fluorene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
Phenanthrene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
Anthracene	0.1 U	0.1 U	0.1 U	0.19	0.1 U	0.23	0.097 U	0.094 U	0.094 U	0.13	na	0.094 U
Fluoranthene	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
Pyrene	0.1 U	0.1 U	0.1 U	0.1 U	0.34	0.1 U	0.097 U	0.094 U	0.094 U	0.1 U	na	0.094 U
<i>Benzo(a)anthracene</i>	0.01 U	0.01 U	0.01 U	0.037	0.021	0.048	0.06	0.016	0.016	0.03	na	0.0094 U
<i>Chrysene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.014	0.025	0.065	0.025	0.027	0.01 U	na	0.0094 U
<i>Benzo(b)fluoranthene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.021	0.029	0.12	0.024	0.026	0.01 U	na	0.0094 U
<i>Benzo(k)fluoranthene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.013	0.03	0.0099	0.012	0.01 U	na	0.0094 U
<i>Benzo(a)pyrene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.011	0.01	0.081	0.0094 U	0.0094 U	0.01 U	na	0.0094 U
<i>Ideno(1,2,3-c,d)pyrene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.014	0.051	0.0094 U	0.0094 U	0.01 U	na	0.0094 U
<i>Dibenz(a,h)anthracene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01	0.014	0.0094 U	0.0094 U	0.01 U	na	0.0094 U
<i>Benzo(g,h,i)perylene</i>	0.01 U	0.01 U	0.01 U	0.01 U	0.01	0.014	0.054	0.011	0.012	0.01 U	na	0.0094 U
PCBs (EPA 8082) ug/L												
Aroclor 1016	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Aroclor 1221	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Aroclor 1232	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Aroclor 1242	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Aroclor 1248	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Aroclor 1254	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Aroclor 1260	0.048 U	0.048 U	0.047 U	na	0.1 U	0.1 U	na	0.047 U	0.047 U	0.05 U	na	na
Volatiles (EPA 8260B) ug/l	na	na	na	na	na	na	na	ND ³	ND ³	ND ³	na	na
PETROLEUM HYDROCARBONS (NWTPH) mg/L												
Gasoline Range												0.1 U
Diesel Range	na	na	na	na	0.25 U	0.28 U	na	0.26 U	0.26 U	na	na	0.26 U
Lube Oil Range	na	na	na	na	0.41 U	0.44 U	na	0.41 U	0.41 U	na	na	0.41 U

Notes: ¹ Grab samples collected from springs at previously identified wetlands during the time period that springs were actively flowing. ² Discharge from open pipe at northern end of NPDES Pond A believed to be from the shallow groundwater collection system installed along the northern margin of the plant area. ³ Analysis for volatile organic chemicals for one Pond A discharge sample collected on 3/17/2011. ND means no detections at a practical quantitation limits of 0.2 for most analytes, and 0.4, 1.0, 2.0 and 5.0 for other analytes. "na" means not analyzed. "U" means not detected above the practical quantitation limit shown. Concentrations shown in bold are detected at concentrations that exceed the practical quantitation limit.

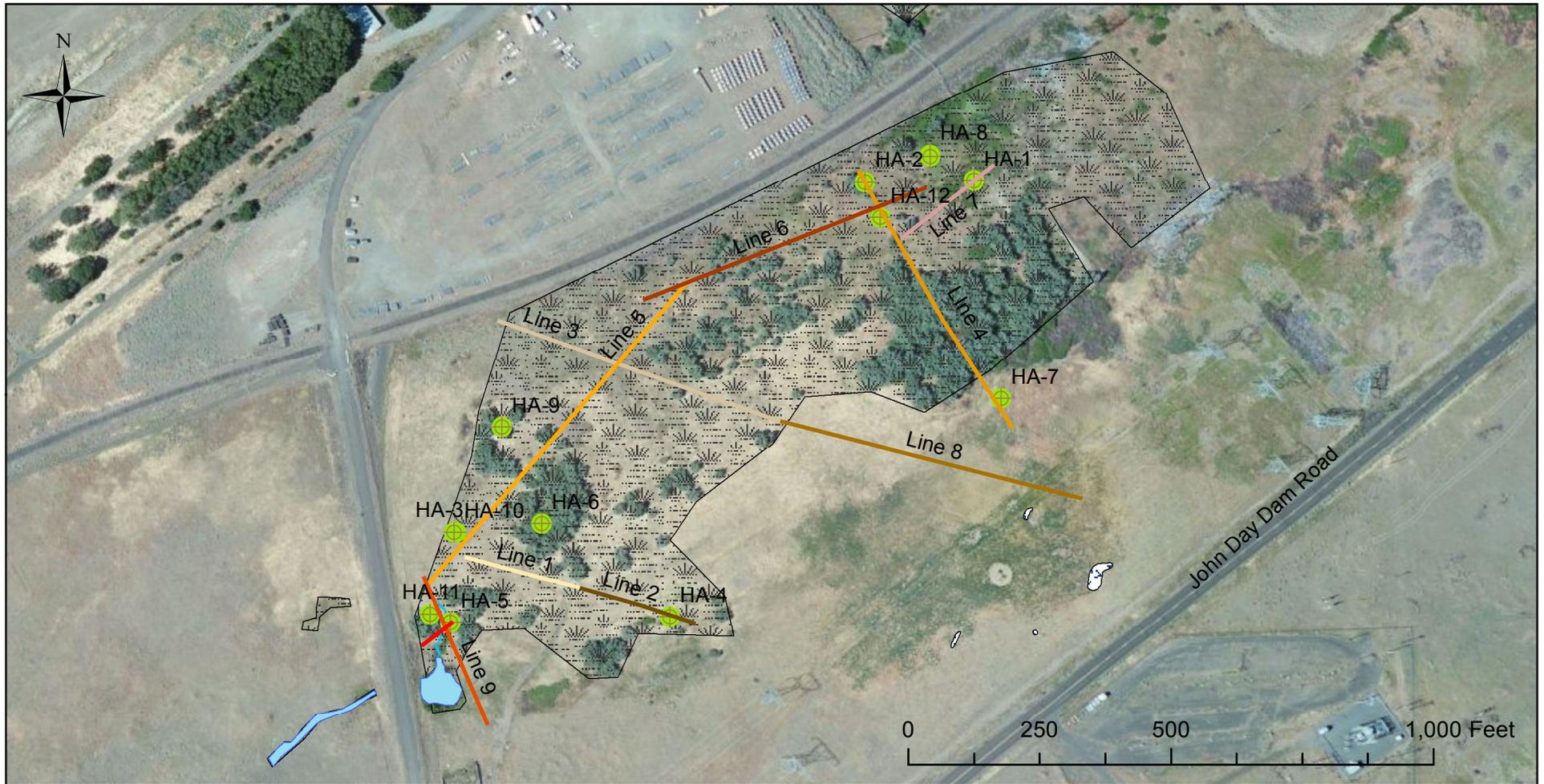
Table 6 - Groundwater Level Measurements at Wetland D

Well ID ¹	Well Location ²	ELEVATIONS				WATER LEVELS					
		Reference		Screened Interval ⁵		2/23/2013		3/8/2013		3/23/2013	
		TOC ³	Ground ⁴	Top	Bottom	Depth ⁶	Elevation	Depth ⁶	Elevation	Depth ⁶	Elevation
P-1	Upgradient	438.7	438.7	433.8	432.8	4.55	434.15	4.22	434.48	4.14	434.56
P-2	Sidegradient	425.9	425.7	418.6	417.6	3	422.9	2.84	423.06	2.7	423.2
P-3	Sidegradient	413.1	413	409.1	407.7	3.42	409.68	3.39	409.71	3.45	409.65
P-4	Downgradient	414.3	414.3	407.1	406	6.96	407.34	6.94	407.36	7	407.3
MW-W1	Upgradient	455.18	452.68	432.7	422.7	22.82	432.36	22.78	432.4	22.8	432.38
MW-W2	Upgradient	463.35	460.85	440.8	430.8	29.61	433.74	29.68	433.67	29.68	433.67
B-11	Sidegradient	455.1	455.1	421.1	411.1	30.36	424.74	30.19	424.91	30	425.1
MW-18	Downgradient	347.4	345.8	310.8	295.8	24.18	323.22	24.27	323.13	24.3	323.1

Notes: ¹ Piezometers P-1 through P-4 were installed by Plateau Geoscience Group as part of the geophysical investigation of Wetland D; other monitor wells installed by others during previous investigations. ² Locations are with respect to the general area of Wetland D. Horizontal location of wells determined by Plateau with GPS at <1 foot accuracy. ³ TOC means top of casing used as reference point for depth to groundwater measuring point. ⁴ Relative ground surface elevations for piezometers P-1 through P-4 were measured by Plateau relative to MW-18 using a transit and stadia; surveyed ground surface elevations for monitor wells and piezometer B-11 were obtained from existing investigation reports (MW-W1 and W2, Tetra Tech, 2010; B-7, Fujitani Hilt, 2001; MW-18, GeoPro, 2012). ⁵ Screened interval elevations in feet above mean sea level. ⁶ Depth in feet to static groundwater level measured from the TOC point of measurement. See Figure X for location of wells and interpreted contours.



<p>OCTOBER 2013</p>	<p>LEGEND</p>	<p>FIGURE 3 WETLAND LOCATION MAP</p>						
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<table border="0"> <tr> <td> Wetland area</td> <td> Surface Water</td> </tr> <tr> <td> Wetlands Not Regulated</td> <td> Culvert</td> </tr> <tr> <td> Buffer</td> <td> Spring</td> </tr> </table>		 Wetland area	 Surface Water	 Wetlands Not Regulated	 Culvert	 Buffer	 Spring
 Wetland area	 Surface Water							
 Wetlands Not Regulated	 Culvert							
 Buffer	 Spring							



<p>OCTOBER 2013</p>	<p>LEGEND</p>	<p>FIGURE 4</p> <p>RESISTIVITY PROFILE LOCATIONS</p>																												
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<p>Geophysical Lines</p> <table border="0"> <tr> <td></td> <td>10</td> <td></td> <td>5</td> </tr> <tr> <td></td> <td>9</td> <td></td> <td>4</td> </tr> <tr> <td></td> <td>8</td> <td></td> <td>3</td> </tr> <tr> <td></td> <td>7</td> <td></td> <td>2</td> </tr> <tr> <td></td> <td>6</td> <td></td> <td>1</td> </tr> </table> <table border="0"> <tr> <td></td> <td>Hand Auger Boring</td> </tr> <tr> <td></td> <td>Basalt Outcrop</td> </tr> <tr> <td></td> <td>Surface Water</td> </tr> <tr> <td></td> <td>Spring</td> </tr> </table>			10		5		9		4		8		3		7		2		6		1		Hand Auger Boring		Basalt Outcrop		Surface Water		Spring
	10		5																											
	9		4																											
	8		3																											
	7		2																											
	6		1																											
	Hand Auger Boring																													
	Basalt Outcrop																													
	Surface Water																													
	Spring																													



A



B



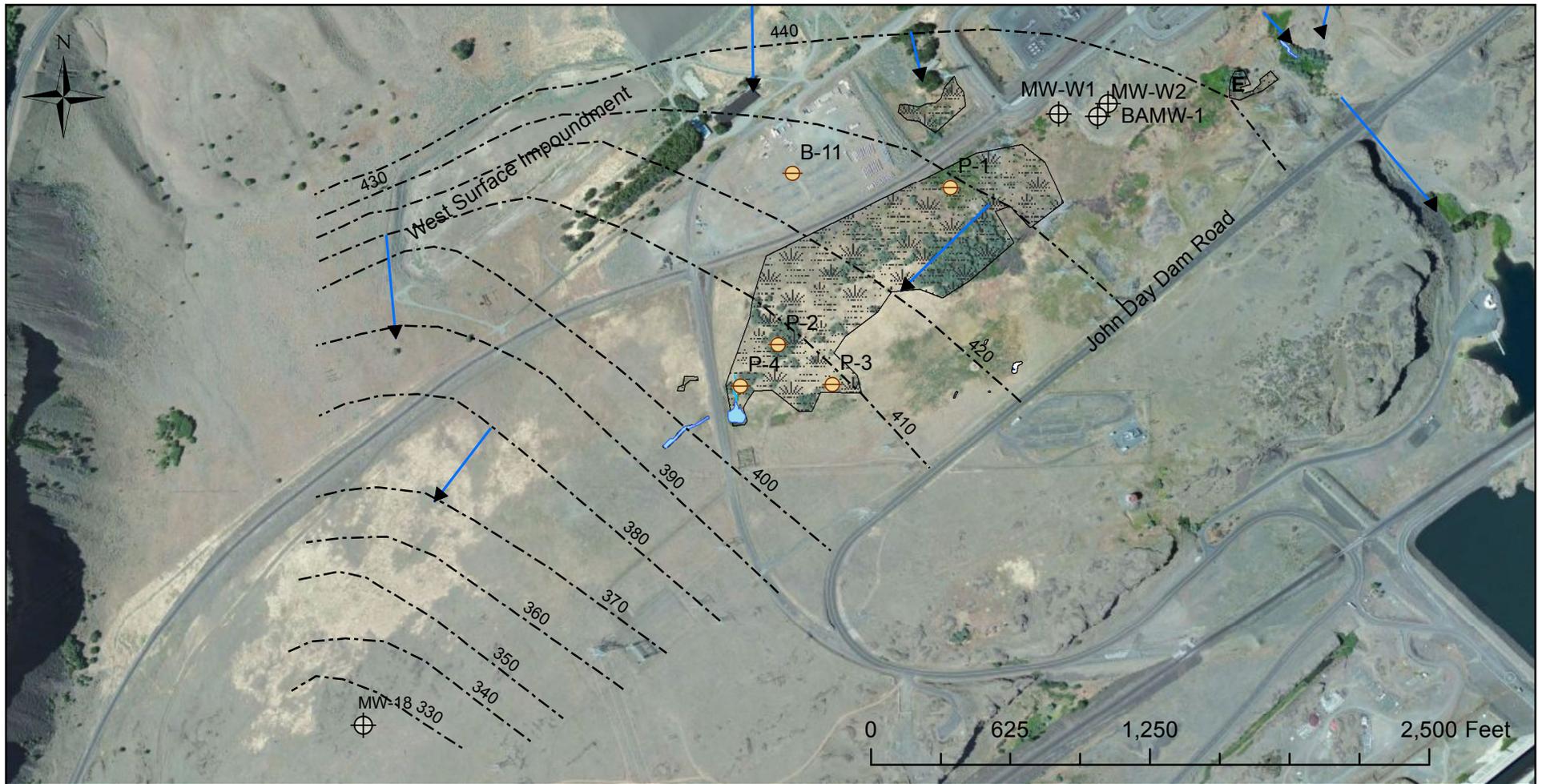
C

A. Geophysical survey set up at Line 2. Resistivity meter (blue top) and battery with range finder on tripod. View to northwest.

B. Measuring relative elevation along survey Line 6 near HA-12. View to southeast.

C. Sighting to measure relative elevations along survey Line 8. View of transmission lines that resulted in cultural noise in Line 8 profil. View to southeast.

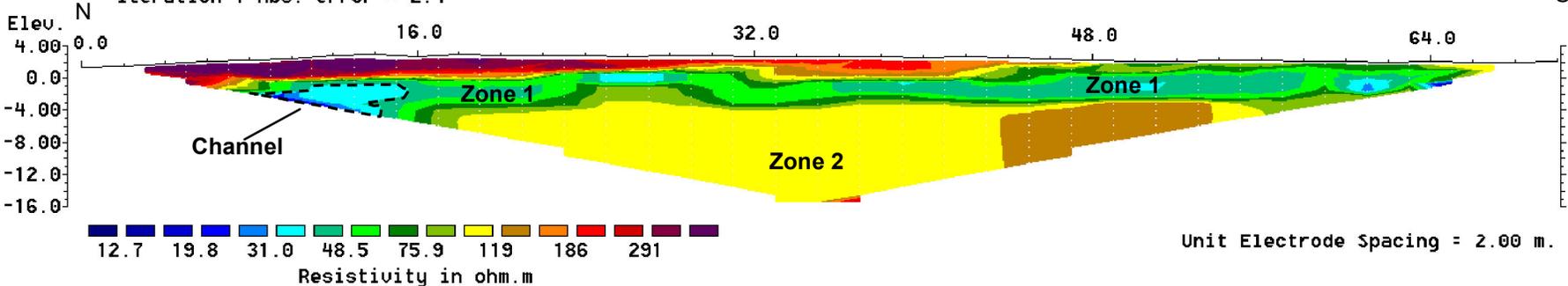
<p>OCTOBER 2013</p>	<p align="center">FIGURE 5 PHOTOGRAPHS OF GEOPHYSICAL SURVEY EQUIPMENT</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	



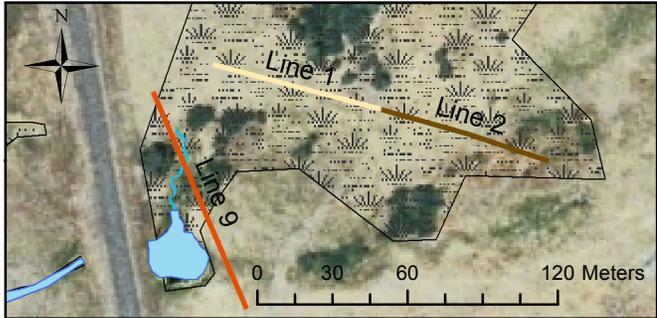
<p>OCTOBER 2013</p>	<p>LEGEND</p>	<p>FIGURE 6 SHALLOW GROUNDWATER GRADIENT MAP</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<ul style="list-style-type: none">  Monitor Well  Piezometer  Groundwater Gradient  Groundwater Flow Direction  Basalt Outcrop  Surface Water  Spring 	

LINE 1

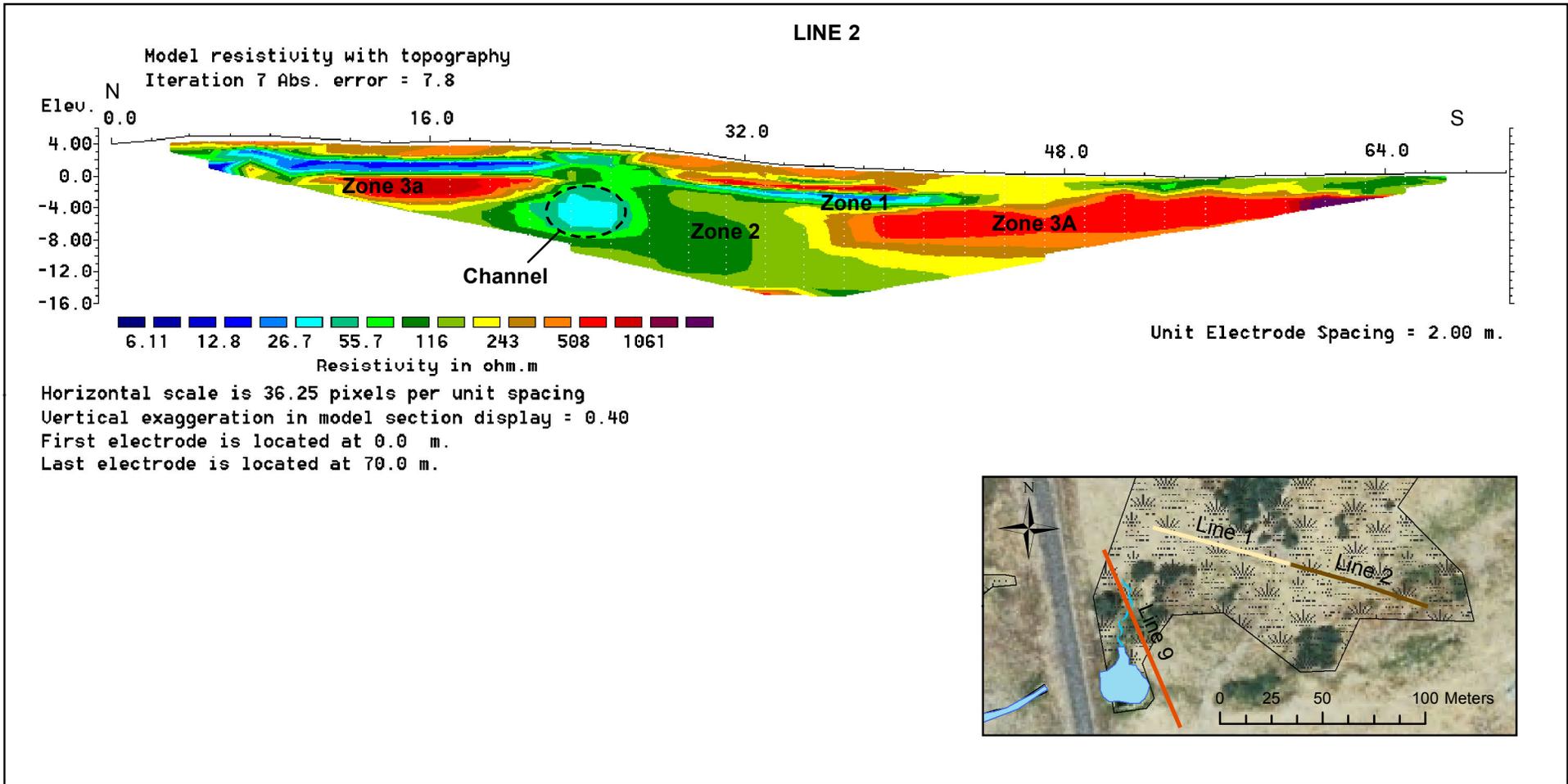
Model resistivity with topography
Iteration 7 Abs. error = 2.4

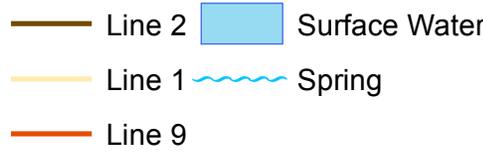


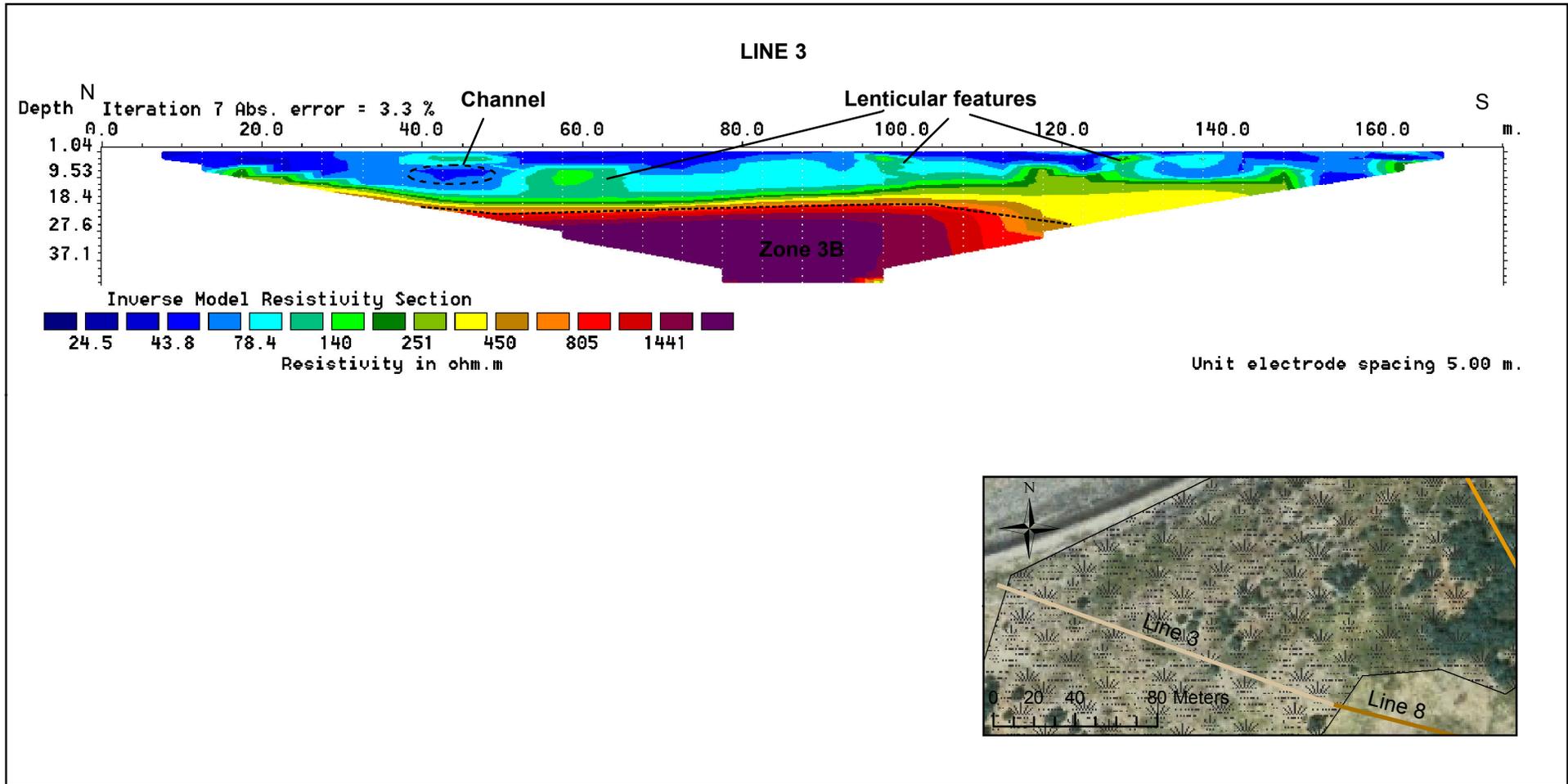
Horizontal scale is 36.01 pixels per unit spacing
Vertical exaggeration in model section display = 0.38
First electrode is located at 0.0 m.
Last electrode is located at 70.0 m.



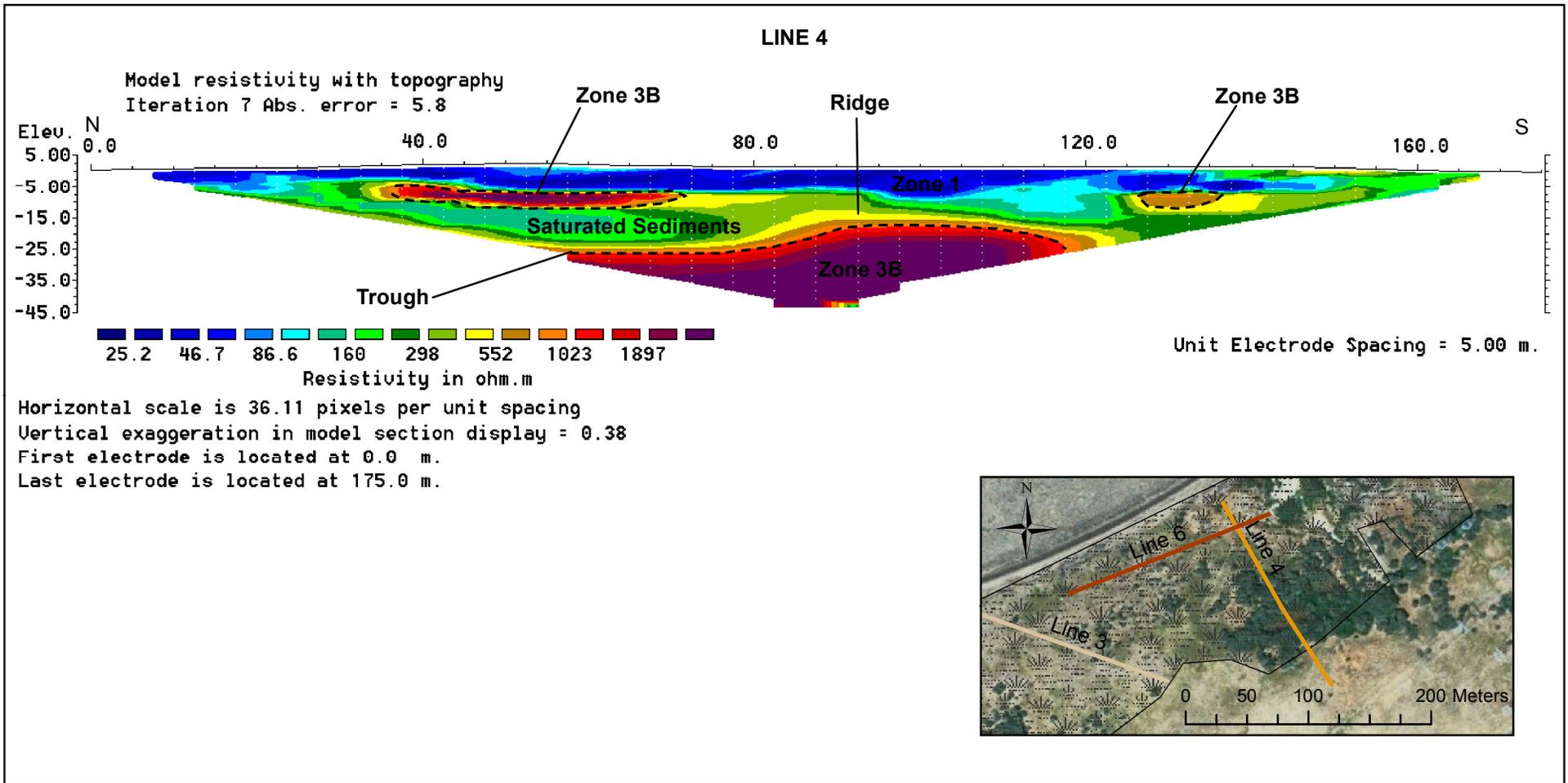
<p>OCTOBER 2013</p>	<p>LEGEND</p>	<p>FIGURE 7 RESISTIVITY PROFILE AT LINE 1</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<ul style="list-style-type: none"> Line 1  Wetland Line 2  Surface Water Line 9  Spring 	



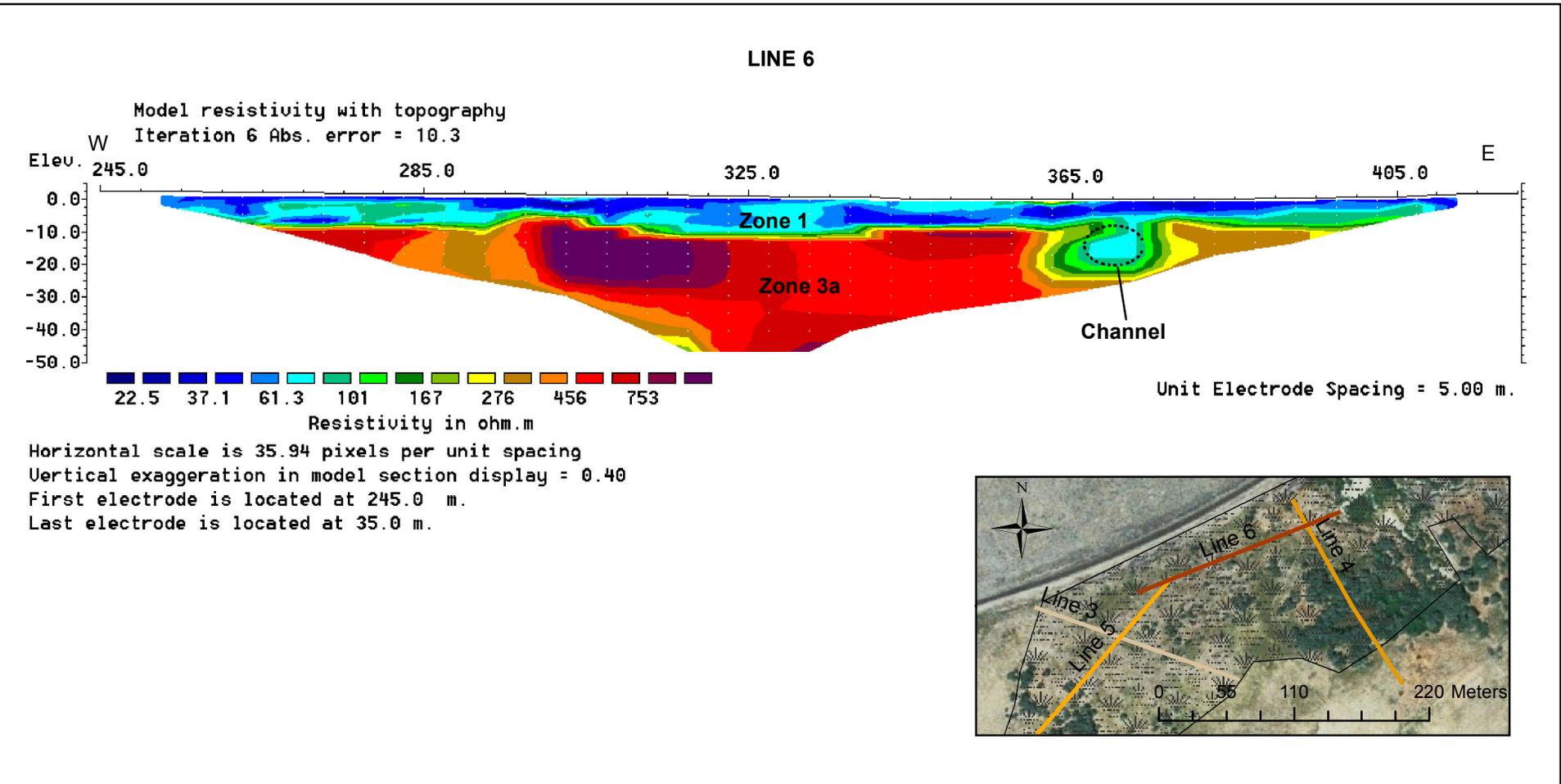
OCTOBER 2013	LEGEND	FIGURE 8 RESISTIVITY SURVEY AT LINE 2
 PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604		



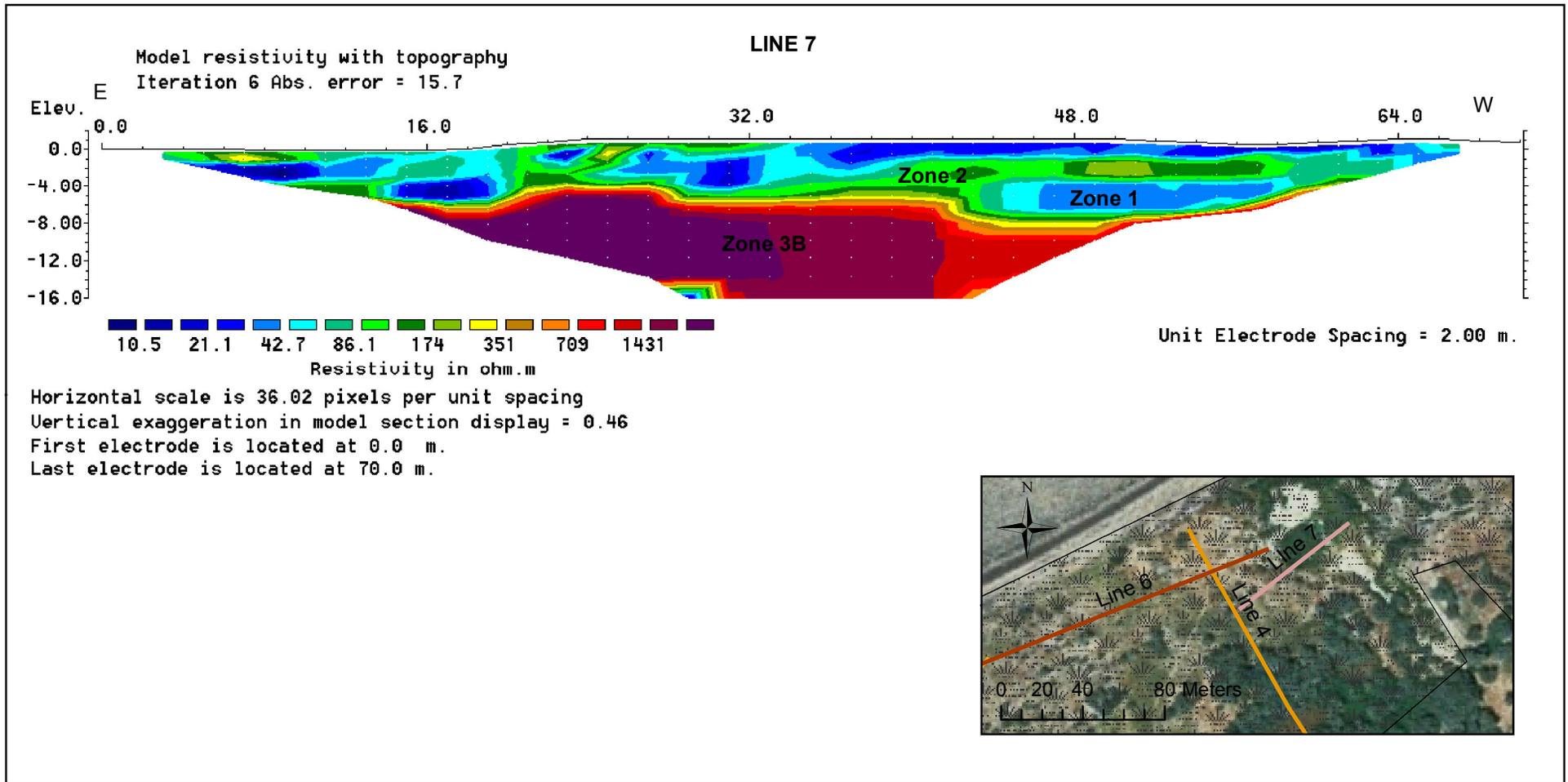
OCTOBER 2013	LEGEND	<p align="center">FIGURE 9</p> <p align="center">RESISTIVITY PROFILE AT LINE 3</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<p>— Line 3  Wetland</p> <p>— Line 4</p> <p>— Line 8</p>	

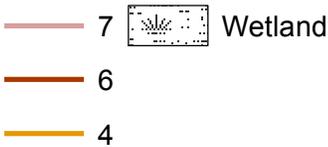


OCTOBER 2013	LEGEND	FIGURE 10 RESISTIVITY PROFILE AT LINE 4
 PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604	<p>— Line 3  Wetland</p> <p>— Line 4</p> <p>— Line 6</p>	

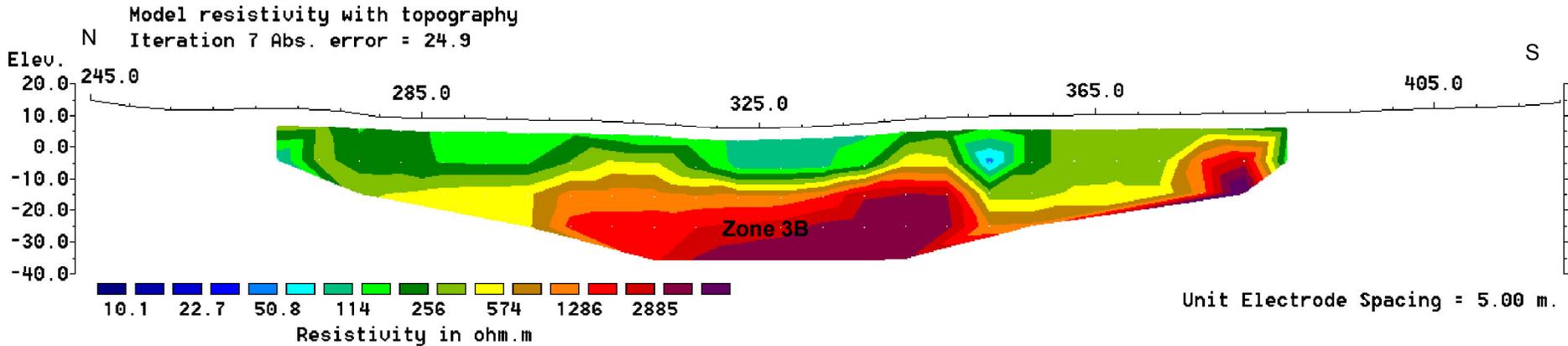


OCTOBER 2013	LEGEND	FIGURE 12
PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604	Line 3 Wetland Line 4 Line 5 Line 6	RESISTIVITY PROFILE AT LINE 6
	COLUMBIA GORGE ALUMINUM COMPANY FORMER GOLDENDALE ALUMINUM SMELTER GOLDENDALE, WASHINGTON	

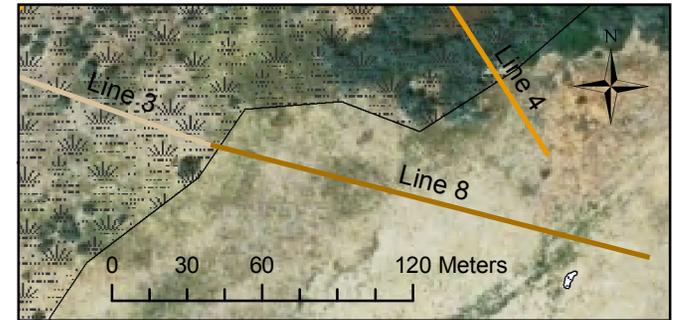


OCTOBER 2013	LEGEND	FIGURE 13 RESISTIVITY PROFILE AT LINE 7
 PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604		

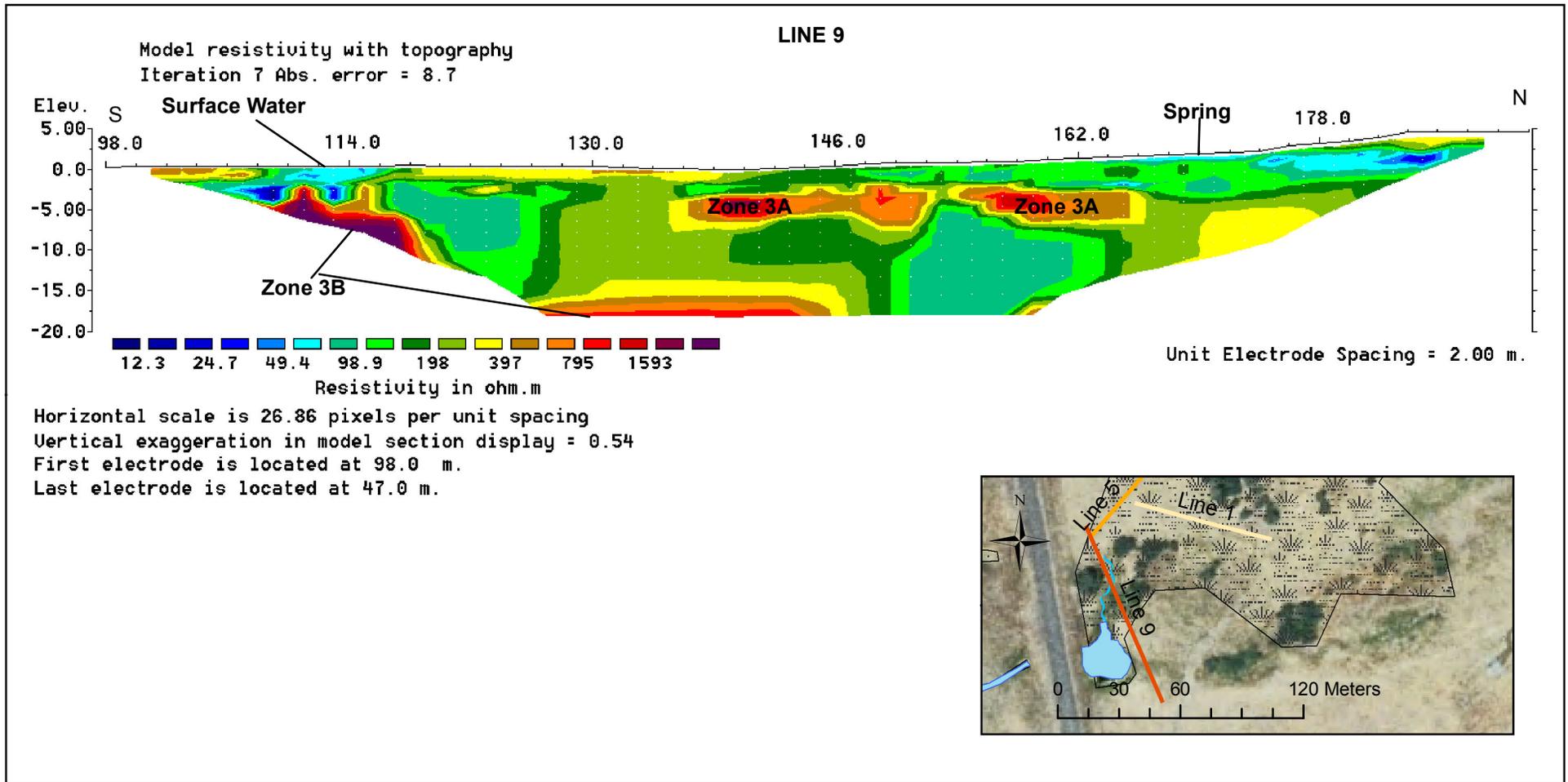
LINE 8



Horizontal scale is 35.99 pixels per unit spacing
Vertical exaggeration in model section display = 0.37
First electrode is located at 245.0 m.
Last electrode is located at 35.0 m.

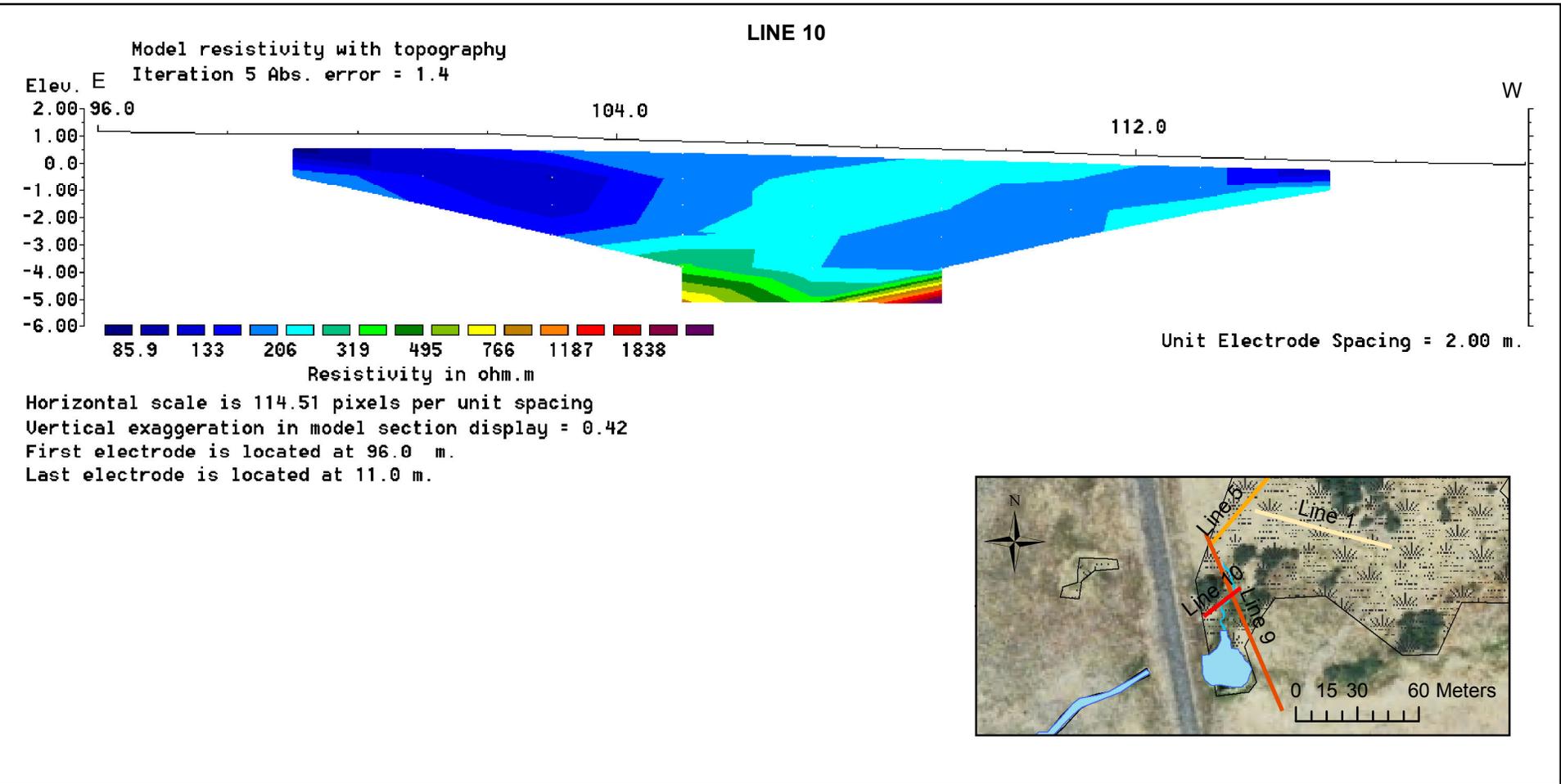


<p>OCTOBER 2013</p>	<p>LEGEND</p>	<p>FIGURE 14 RESISTIVITY PROFILE AT LINE 8</p>
 <p>PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604</p>	<p>— Line 8  Wetland</p> <p>— Line 4</p> <p>— Line 3</p>	



OCTOBER 2013	LEGEND	FIGURE 15 RESISTIVITY PROFILE AT LINE 9
 PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604	<ul style="list-style-type: none"> — Line 9  Wetland — Line 5  Surface Water — Line 1  Spring 	

COLUMBIA GORGE ALUMINUM COMPANY
FORMER GOLDENDALE ALUMINUM SMELTER
GOLDENDALE, WASHINGTON



OCTOBER 2013	LEGEND	FIGURE 16 RESISTIVITY PROFILE AT LINE 10
PLATEAU GEOSCIENCE GROUP LLC PO BOX 1020 BATTLE GROUND, WA 98604	<ul style="list-style-type: none"> — Line 10 Wetland — Line 9 Surface Water — Line 5 Spring — Line 1 	COLUMBIA GORGE ALUMINUM COMPANY FORMER GOLDENDALE ALUMINUM SMELTER GOLDENDALE, WASHINGTON



A. Silty fine sand in the upper portion of soil column at borehole HA-1. Note yellowish to reddish brown mottling.



B. Fine to coarse basaltic sand at base of soil column at piezometer P-4. Semi rounded basalt gravel.



C. Black to greenish black (gley) very fine sand at piezometer P-1. Note yellowish to reddish brown mottling at root holes.



D. Very fine gley sand at piezometer P-1. Note mica grains and carbonized organic particles. Gley soil indicates perennial soil saturation.

OCTOBER 2013



PLATEAU GEOSCIENCE GROUP LLC
PO BOX 1020
BATTLE GROUND, WA 98604

FIGURE 17
PHOTOGRAPHS OF SOIL
IN WETLAND D

COLUMBIA GORGE ALUMINUM COMPANY
FORMER GOLDENDALE ALUMINUM SMELTER
GOLDENDALE, WASHINGTON

APPENDIX B-4

RECTIFIER YARD AOC

**PGG (2012b)
Rectifier Yard and Interior Transformer Soil Results**

FIGURE 2

RECTIFIER YARD SAMPLE LOCATION MAP

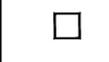
COLUMBIA GORGE ALUMINUM COMPANY
 Goldendale Aluminum Smelter
 Goldendale, Washington

LEGEND

SOIL SAMPLE TYPES

-  COMPOSITE SAMPLE SUBSAMPLES
TAB-1
-  DISCRETE SOIL SAMPLES
SL1-1
-  SOIL REMOVAL CONFIRMATION SAMPLES
SL4-05

PADS

-  TRANSFORMER PADS
-  OIL CIRCUIT BREAKER PADS
A-112

SITE STRUCTURES

- MAIN A, MAIN B, MAIN C TRANSFORMERS ADJACENT TO BONNEVILLE POWER ADMINISTRATION (BPA) SUBSTATION
- AUX-AA, AUX-BB, AUX-CC AUXILIARY TRANSFORMERS FOR POWER PHASE ADJUSTMENT
- A1 to A6 TRANSFORMERS SERVICING PRODUCTION BUILDING A
- B1 to B6 TRANSFORMERS SERVICING PRODUCTION BUILDING B
- CD1 to CD4 TRANSFORMERS SERVICING PRODUCTION BUILDINGS C & D
- A-102 or B-202 OIL CIRCUIT BREAKER PAD NUMBERS

SAMPLE LABELS

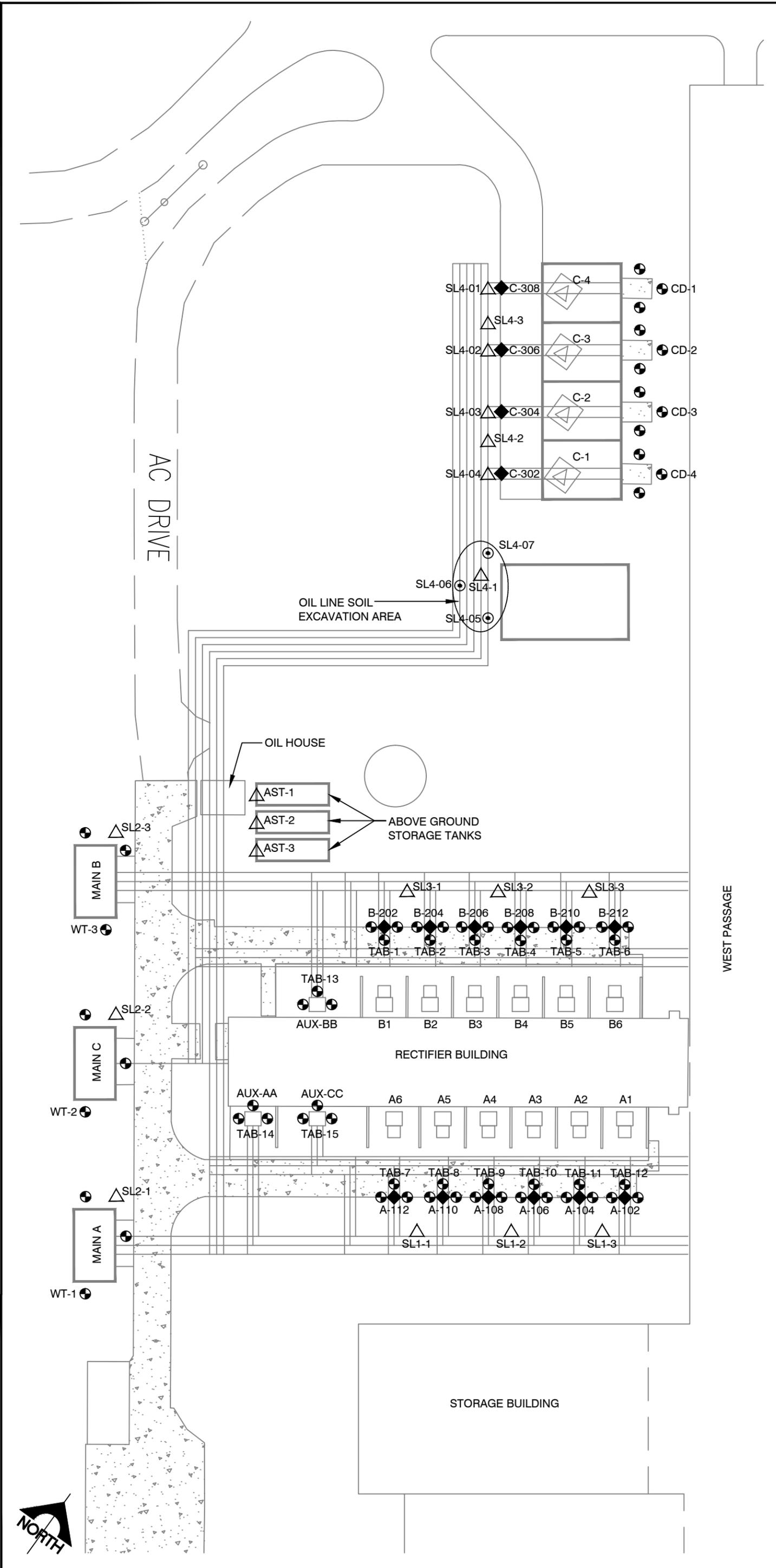
- WT-1 to WT-3 SOIL SAMPLES AT MAIN TRANSFORMERS
- TAB-1 to TAB-12 SOIL SAMPLES AT RECTIFIER BUILDING OIL CIRCUIT BREAKERS
- TAB-13 to TAB-15 SOIL SAMPLES AT AUXILIARY TRANSFORMER PADS
- CD-1 to CD-4 SOIL SAMPLES AT BUILDING C/D TRANSFORMER PADS
- SL1-1 to SL4-3 SOIL SAMPLES AT OIL CIRCUIT BREAKER OIL LINES
- AST-1 to AST-3 SOIL SAMPLES AT ABOVE GROUND STORAGE TANKS (ASTs)
- SL4-01 to SL4-04 SOIL SAMPLES AT BUILDING C/D TRANSFORMER PADS
- SL4-05 to SL4-07 SOIL SAMPLES AT OIL LINE SOIL EXCAVATION AREA

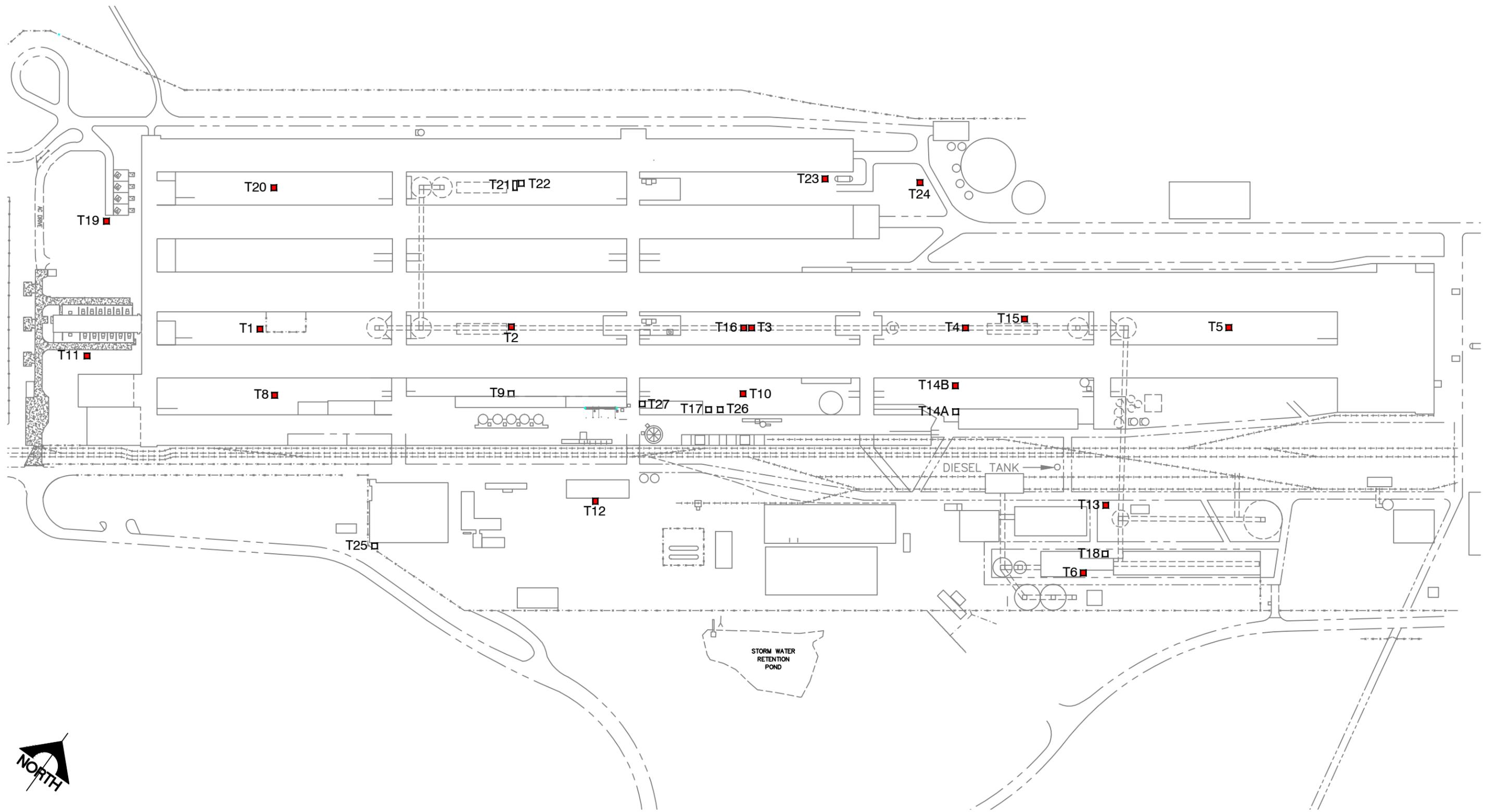
SAMPLE LOGS ARE IN APPENDIX A.

DATE: JUNE 2012



PLATEAU GEOSCIENCE GROUP LLC
 Po Box 1020
 Battle Ground, WA 98604





DATE: JUNE 2012

LEGEND

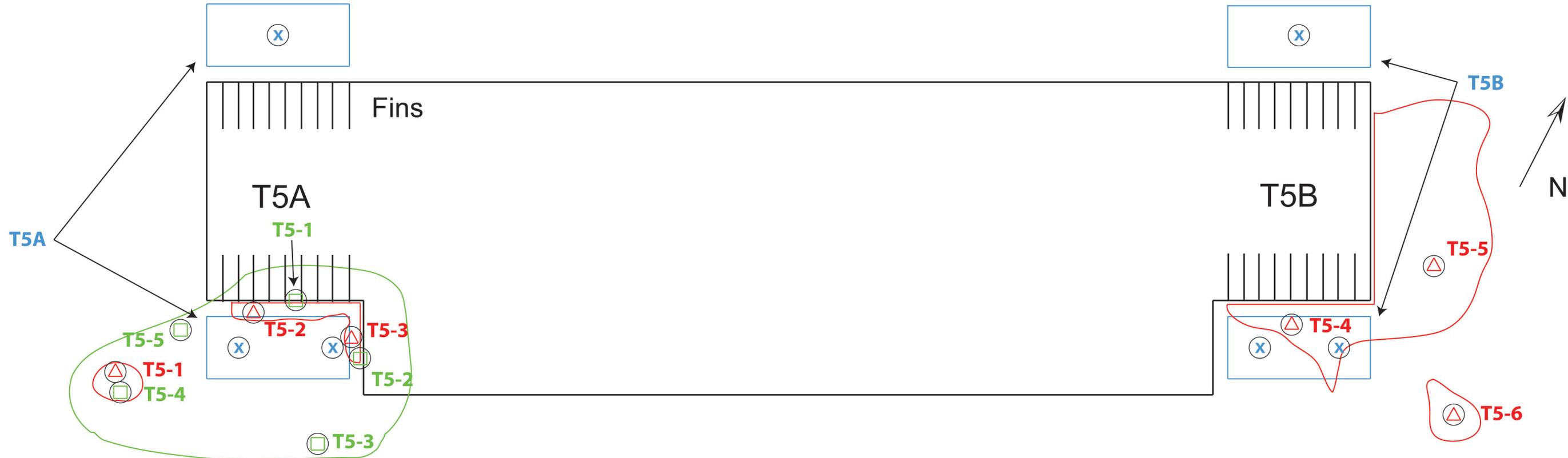
- T1** TRANSFORMER SUBSTATION SAMPLED. EACH SUBSTATION CONTAINS SIDES A AND B, EXCEPT FOR T14 WHERE A AND B ARE ON SEPARATE PADS, AND T24 WITH SIDES A, B AND C. SAMPLE LOGS ARE IN APPENDIX A.
- T21** TRANSFORMER SUBSTATION NOT SAMPLED (INACCESSIBLE OR NO SOIL).



PLATEAU GEOSCIENCE GROUP LLC
 Po Box 1020
 Battle Ground, WA 98604

FIGURE 4
 TRANSFORMER SUBSTATION
 SAMPLE LOCATION MAP

COLUMBIA GORGE ALUMINUM COMPANY
 Goldendale Aluminum Smelter
 Goldendale, Washington



View to south of "A" side of transformer T5 pad. Note oil stained soil on pad.

View to south of "B" side of transformer T5 pad. Note oil staining on pad and adjacent soil.



View to northwest of transformer T5 controls structure. Transformers are removed. "B" side is to right of controls and "A" side is to left. Note oil staining on "B" side pad and adjacent soil.



LEGEND

- Composite sample collected on 2/11/2011. Composite sample consists of 3 subsamples. See Table 4.
- Soil samples collected on 4/14/2011 after spill. See Table 6.
- Confirmation soil samples collected on 5/25/2011 after soil removal. See Table 6.
- T5A/T5B subsample area
- Areas of transformer oil spillage on 4/12/2011
- Area of soil removal on 5/25/2011

FIGURE 5 TRANSFORMER SUBSTATION T5 SPILL SOIL SAMPLE AND REMOVAL MAP

COLUMBIA GORGE ALUMINUM CORPORATION
GOLDENDALE ALUMINUM SMELTER
WASHINGTON

PGG^{LLC}
PLATEAU GEOSCIENCES GROUP LLC
BATTLE GROUND, WA
June 2012

Figure 6 – Photographs of Rectifier Yard Transformer and OCB Pads



TABLE 1
CHEMICALS DETECTED IN RECTIFIER YARD SAMPLES

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	RECTIFIER YARD COMPOSITE SOIL SAMPLES ²											
		TAB-1	TAB-2	TAB-3	TAB-4	TAB-5	TAB-6	TAB-7	TAB-8	TAB-9	TAB-10	TAB-11	TAB-12
PAHs (EPA 8270D/SIM) mg/kg													
Naphthalene	5	< 0.0075	< 0.0074	< 0.0077	< 0.0074	< 0.0073	0.013	< 0.0076	< 0.0077	< 0.0076	< 0.0074	0.014	0.0077
2-Methylnaphthalene	5	< 0.0075	< 0.0074	< 0.0077	< 0.0074	< 0.0073	< 0.0073	< 0.0076	< 0.0077	< 0.0076	< 0.0074	0.0084	< 0.0077
<i>1-Methylnaphthalene</i> ³	5	< 0.0075	< 0.0074	< 0.0077	< 0.0074	< 0.0073	< 0.0073	< 0.0076	< 0.0077	< 0.0076	< 0.0074	< 0.0074	< 0.0077
Acenaphthylene	2400	< 0.0075	< 0.0074	< 0.0077	< 0.0074	< 0.0073	< 0.0073	< 0.0076	< 0.0077	< 0.0076	< 0.0074	< 0.0074	< 0.0077
Acenaphthene	4800	0.017	0.011	0.0095	0.015	0.021	0.055	0.033	0.01	0.036	0.016	0.09	0.049
Fluorene	3200	< 0.0075	< 0.0074	< 0.0077	< 0.0074	0.0084	0.024	0.14	< 0.0077	0.015	< 0.0074	0.034	0.019
Phenanthrene	2400	0.11	0.083	0.069	0.11	0.14	0.4	0.2	0.064	0.23	0.11	0.6	0.3
Anthracene	24000	0.019	0.015	0.011	0.018	0.024	0.06	0.032	0.0094	0.035	0.017	0.093	0.047
Fluoranthene	3200	0.3	0.27	0.2	0.33	0.44	0.89	0.5	0.15	0.58	0.29	1.5	0.86
Pyrene	2400	0.28	0.25	0.17	0.3	0.38	0.89	0.42	0.13	0.48	0.24	1.3	0.75
<i>Benzo(a)anthracene</i>	1.4	0.19	0.18	0.14	0.21	0.27	0.66	0.31	0.098	0.38	0.18	0.96	0.52
<i>Chrysene</i>	140	0.27	0.26	0.21	0.31	0.4	1.1	0.44	0.15	0.56	0.27	1.6	0.82
<i>Benzo(b)fluoranthene</i>	1.4	0.36	0.34	0.3	0.45	0.59	1.6	0.6	0.23	0.8	0.42	2.7	2.7
<i>Benzo(k)fluoranthene</i>	14	0.25	0.27	0.24	0.29	0.37	0.89	0.41	0.14	0.46	0.28	1.5	0.68
<i>Benzo(a)pyrene</i>	0.1	0.27	0.27	0.21	0.33	0.39	0.87	0.46	0.14	0.54	0.27	1.5	0.76
<i>Ideno(1,2,3-c,d)pyrene</i>	1.4	0.21	0.22	0.18	0.24	0.27	0.82	0.3	0.13	0.48	0.24	1.3	0.45
<i>Dibenz(a,h)anthracene</i>	0.14	0.073	0.64	0.05	0.081	0.094	0.34	0.11	0.042	0.18	0.082	0.22	0.16
<i>Benzo(g,h,i)perylene</i>	2400	0.3	0.32	0.26	0.33	0.4	1.1	0.45	0.19	0.72	0.33	1.5	0.67
PCBs (EPA 8082) mg/kg													
Aroclor 1016	5.6	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Aroclor 1221	14	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Aroclor 1232	14	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Aroclor 1242	14	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Aroclor 1248	14	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Aroclor 1254	0.5	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Aroclor 1260	0.5	<0.057	<0.056	<0.058	<0.055	<0.055	<0.055	<0.057	<0.057	<0.057	<0.055	<0.055	<0.057
Petroleum Hydrocarbons (NWTPH) mg/kg													
Mineral Oil	2000	190	220	170	73	66	930	140	140	150	61	120	< 29
Lube Oil Range	2000	< 60	< 67	< 58	< 56	< 55	< 340	< 61	< 57	< 64	< 55	130	< 57

Notes: ¹ Screening criteria based on DOE Model Toxics Control Act (MTCA) lowest value of Methods A and B. ² See Figure 2 for location of composite samples and composite sub-samples. Samples are three sub-sample composites combined during sampling and submitted to Onsite Environmental Inc. laboratory in Redmond, WA. All screening levels and analytical results are in milligrams per kilogram (mg/kg or ug/g). Results in **bold** are detected concentrations and results highlighted in yellow exceed the human health screening levels at normalized concentrations (three times the reported concentration). Chemicals that are not detected are shown as less than ("<") the practical quantitation limit (PQL). ³ PAHs shown in italic are carcinogenic.

TABLE 1
CHEMICALS DETECTED IN RECTIFIER YARD SAMPLES

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	RECTIFIER YARD COMPOSITE SOIL SAMPLES ²									
		TAB-13	TAB-14	TAB-15	WT-1	WT-2	WT-3	CD-1	CD-2	CD-3	CD-4
PAHs (EPA 8270D/SIM) mg/kg											
Naphthalene	5	< 0.0075	< 0.0080	< 0.0077	< 0.0076	< 0.0077	< 0.0078	< 0.0072	< 0.0074	< 0.0074	< 0.0073
2-Methylnaphthalene	5	< 0.0075	< 0.0080	< 0.0077	< 0.0076	< 0.0077	< 0.0078	< 0.0072	< 0.0074	< 0.0074	< 0.0073
<i>1-Methylnaphthalene</i> ³	5	< 0.0075	< 0.0080	< 0.0077	< 0.0076	< 0.0077	< 0.0078	< 0.0072	< 0.0074	< 0.0074	< 0.0073
Acenaphthylene	2400	< 0.0075	< 0.0080	< 0.0077	< 0.0076	< 0.0077	< 0.0078	< 0.0072	< 0.0074	< 0.0074	< 0.0073
Acenaphthene	4800	0.011	< 0.0080	0.021	< 0.0076	0.027	< 0.0078	0.0087	< 0.0074	0.017	< 0.0073
Fluorene	3200	< 0.0075	< 0.0080	0.0093	< 0.0076	0.011	< 0.0078	< 0.0072	< 0.0074	0.0074	< 0.0073
Phenanthrene	2400	0.068	< 0.0080	0.13	0.05	0.15	< 0.0078	0.071	0.021	0.1	0.027
Anthracene	24000	0.011	< 0.0080	0.021	0.008	0.025	< 0.0078	0.01	< 0.0074	0.014	< 0.0073
Fluoranthene	3200	0.18	0.01	0.37	0.13	0.34	< 0.0078	0.18	0.054	0.26	0.069
Pyrene	2400	0.15	< 0.0080	0.31	0.11	0.28	< 0.0078	0.15	0.046	0.22	0.061
<i>Benzo(a)anthracene</i>	1.4	0.11	< 0.0080	0.2	0.079	0.21	< 0.0078	0.097	0.032	0.14	0.038
<i>Chrysene</i>	140	0.17	0.0091	0.27	0.11	0.31	< 0.0078	0.14	0.045	0.22	0.055
<i>Benzo(b)fluoranthene</i>	1.4	0.22	0.011	0.33	0.15	0.4	0.016	0.17	0.055	0.29	0.071
<i>Benzo(k)fluoranthene</i>	14	0.13	0.008	0.24	0.1	0.3	0.01	0.12	0.042	0.2	0.053
<i>Benzo(a)pyrene</i>	0.14	0.15	< 0.0080	0.27	0.12	0.32	< 0.0078	0.13	0.042	0.22	0.054
<i>Ideno(1,2,3-c,d)pyrene</i>	1.4	0.11	< 0.0080	0.19	0.085	0.24	0.011	0.097	0.028	0.16	0.04
<i>Dibenz(a,h)anthracene</i>	0.14	0.039	< 0.0080	0.066	0.03	0.086	< 0.0078	0.034	0.01	0.053	0.013
<i>Benzo(g,h,i)perylene</i>	2400	0.16	0.0085	0.27	0.13	0.37	< 0.0078	0.15	0.034	0.25	0.059
PCBs (EPA 8082) mg/kg											
Aroclor 1016	5.6	<0.056	<0.060	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Aroclor 1221	14	<0.056	<0.060	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Aroclor 1232	14	<0.056	<0.060	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Aroclor 1242	14	<0.056	<0.060	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Aroclor 1248	14	<0.056	<0.060	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Aroclor 1254	0.5	<0.056	<0.060	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Aroclor 1260	0.5	<0.056	0.87	<0.058	<0.057	<0.058	<0.059	<0.054	<0.055	<0.055	<0.055
Petroleum Hydrocarbons (NWTPH) mg/kg											
Mineral Oil	2000	46	740	< 29	36	170	770	< 27	< 28	< 28	< 27
Lube Oil Range	2000	< 56	<110	< 58	< 57	< 67	< 76	< 54	< 56	< 55	< 55

Table 3 - Chemicals Detected in Oil Pipeline Discrete Samples

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	CIRCUIT BREAKER OIL LINE SAMPLES ²											
		SL1-1	SL1-2	SL1-3	SL2-1	SL2-2	SL2-3	SL3-1	SL3-2	SL3-3	SL4-1	SL4-2	SL4-3
PAHs (EPA 8270D/SIM) mg/kg													
Naphthalene	5	0.0077	0.019	0.022	0.012	< 0.74	< 0.75	< 0.039	<0.0081	< 0.4	< 0.0073	< 0.036	< 0.037
2-Methylnaphthalene	5	< 0.0072	0.012	0.012	0.008	< 0.74	< 0.75	< 0.039	<0.0081	< 0.4	< 0.0073	0.086	< 0.037
<i>1-Methylnaphthalene</i> ³	5	< 0.0072	0.01	0.0095	< 0.007	< 0.74	< 0.75	< 0.039	<0.0081	< 0.4	< 0.0073	0.083	< 0.037
Acenaphthylene	2400	< 0.0072	< 0.0070	< 0.0074	<0.007	< 0.74	< 0.75	< 0.039	<0.0081	< 0.4	< 0.0073	< 0.036	< 0.037
Acenaphthene	4800	0.056	0.13	0.1	0.08	0.91	1.6	0.047	<0.0081	< 0.4	< 0.0073	0.29	0.068
Fluorene	3200	0.016	0.044	0.035	0.036	< 0.74	0.88	< 0.039	<0.0081	< 0.4	< 0.0073	0.14	0.059
Phenanthrene	2400	0.34	0.76	0.67	0.49	5.4	9.5	0.34	0.023	1.1	0.019	0.36	0.43
Anthracene	24000	0.048	0.11	0.096	0.066	1.1	1.8	0.063	<0.0081	< 0.4	< 0.0073	1.1	0.065
Fluoranthene	3200	0.89	2.1	2	1.3	10	20	0.87	0.036	2.8	0.018	0.12	0.31
Pyrene	2400	0.73	1.9	1.9	1.1	9.3	16	0.73	0.027	2.3	0.014	0.078	0.23
<i>Benzo(a)anthracene</i>	1.4	0.6	1.4	1.3	0.76	6.3	14	0.61	0.011	1.9	0.01	0.07	0.2
<i>Chrysene</i>	140	1	2.3	3	1.1	8	17	1.2	0.042	3.4	0.016	0.11	0.38
<i>Benzo(b)fluoranthene</i>	1.4	1.3	3.5	3.8	1.4	8.2	20	1.7	0.065	7.2	0.027	0.13	0.5
<i>Benzo(k)fluoranthene</i>	14	0.8	2.1	2.3	1	6.5	14	0.93	0.037	3.8	0.014	0.088	0.27
<i>Benzo(a)pyrene</i>	0.14	0.88	1.9	1.8	1.1	8.4	19	0.81	<0.0081	2.6	0.014	0.92	0.26
<i>Ideno(1,2,3-c,d)pyrene</i>	1.4	0.75	1.5	1.6	0.85	4.6	14	0.78	0.022	2.7	0.017	0.074	0.25
<i>Dibenz(a,h)anthracene</i>	0.14	0.28	0.51	0.54	0.31	1.7	4.4	0.23	0.0096	0.83	< 0.0073	< 0.036	0.054
Benzo(g,h,i)perylene	2400	0.87	2.1	2.2	0.91	6	18	1.1	0.033	3.4	0.019	0.057	0.33
Petroleum Hydrocarbons (NWTPH) mg/kg													
Mineral Oil	2000	1300	2100	2500	120	< 100	2900	3300	630	3300	1000	25000	18000
Lube Oil Range	2000	< 270	< 620	< 920	83	570	2900	< 670	< 130	< 1100	< 180	< 2000	< 1700

Notes: ¹ Screening levels based on DOE Model Toxics Control Act (MTCA) lowest value of Methods A and B. ² See Figure 2 for location of soil samples. Samples are discrete samples submitted to Onsite Environmental Inc. laboratory in Redmond, WA. All screening levels and analytical results are in milligrams per kilogram (mg/kg). Chemicals that are not detected are shown as less than ("<") the practical quantitation limit (PQL). Results in **bold** are detected concentrations, and results highlighted in yellow exceed the human health screening levels. ³ PAHs shown in italic are carcinogenic.

Table 4 - Chemicals Detected in Oil Pipeline and AST Discrete Samples

Rectifier Yard, Stormwater Catch basin, and Interior Transformer Soil Sampling Data Report

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	Oil Line Soil Follow-up Sampling ²				Oil Line Soil Removal Confirmation Samples ²			AST Soil Samples ²		
		SL4-01	SL4-02	SL4-03	SL4-04	SL4-05	SL4-06	SL4-07	AST-1	AST-2	AST-3
PCBs (EPA 8082) mg/kg											
Aroclor 1016	5.6								<0.053	<0.054	<0.055
Aroclor 1221	14								<0.053	<0.054	<0.055
Aroclor 1232	14								<0.053	<0.054	<0.055
Aroclor 1242	14								<0.053	<0.054	<0.055
Aroclor 1248	14								<0.053	<0.054	<0.055
Aroclor 1254	0.5								<0.053	<0.054	<0.055
Aroclor 1260	0.5								0.12	0.31	0.43
Petroleum Hydrocarbons (NWTPH) mg/kg											
Mineral Oil	2000	<28	<29	<29	<27	<27	<28	<28			
Notes: ¹ Screening levels based on DOE Model Toxics Control Act (MTCA) lowest value of Methods A and B. ² See Figure 2 for location of soil samples. Samples are discrete soil samples submitted to Onsite Environmental Inc. laboratory in Redmond, WA. AST is above ground storage tanks for storage of mineral oil used in rectifier yard rectifiers. All screening levels and analytical results are in milligrams per kilogram (mg/kg). Chemicals that are not detected are shown as less than ("<") the practical quantitation limits (PQL). Results in bold are detected concentrations.											

Table 7 - Chemicals Detected in Interior Transformer Substation Soil Samples

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	Ecological Screening Levels (mg/kg) ²	TRANSFORMER SUBSTATION COMPOSITE SOIL SAMPLES ³									
			T1A	T1B	T2A	T2B	T3A	T3B	T4A	T4B	T5A	T5B
			Number of Composite Sample Sub-Samples ⁵									
			3	3	3	3	3	3	3	3	3	3
PAHs (EPA 8270D/SIM) mg/kg												
Naphthalene	5	10	< 0.084	< 0.085	< 1.7	< 0.087	< 4.8	< 9.4	< 10	< 2.0	< 18	< 9.3
2-Methylnaphthalene	5		< 0.084	< 0.085	< 1.7	< 0.087	< 4.8	< 9.4	< 10	< 2.0	< 18	< 9.3
<i>1-Methylnaphthalene</i> ⁴	5		< 0.084	< 0.085	< 1.7	< 0.087	< 4.8	< 9.4	< 10	< 2.0	< 18	< 9.3
Acenaphthylene	2400	20	< 0.084	< 0.085	< 1.7	< 0.087	< 4.8	< 9.4	< 10	< 2.0	< 18	< 9.3
Acenaphthene	4800	20	< 0.084	0.48	5.9	< 0.087	8.3	11	18	8.9	38	35
Fluorene	3200	30	< 0.084	0.21	3.5	< 0.087	4.9	< 9.4	< 10	4.7	< 18	12
Phenanthrene	2400		0.19	3.3	60	0.28	75	110	140	71	220	150
Anthracene	24000		< 0.084	0.59	14	< 0.087	12	19	25	15	44	29
Fluoranthene	3200		0.37	9.7	160	1	220	330	410	200	550	370
Pyrene	2400		0.28	9	140	0.96	200	300	380	180	500	330
<i>Benzo(a)anthracene</i>	1.4	2.5	0.27	6.1	93	0.65	140	230	270	120	350	240
<i>Chrysene</i>	140	35	1.6	9.2	110	0.81	180	320	350	160	430	300
<i>Benzo(b)fluoranthene</i>	1.4		2.6	17	120	1.1	250	470	470	190	560	420
<i>Benzo(k)fluoranthene</i>	14	38	1.2	8.3	100	0.71	180	330	350	150	490	290
<i>Benzo(a)pyrene</i>	0.14	7	0.43	9.9	130	1	230	410	440	200	580	440
<i>Ideno(1,2,3-c,d)pyrene</i>	1.4	1.9	2.5	9.1	97	0.72	160	300	300	150	380	300
<i>Dibenz(a,h)anthracene</i>	0.14		0.68	3.2	33	0.21	49	89	90	54	110	110
Benzo(g,h,i)perylene	2400		2.8	10	100	0.8	180	340	350	160	430	330
PCBs (EPA 8082) mg/kg												
Aroclor 1016	5.6	100	< 0.21	< 0.21	< 0.22	< 0.22	< 0.24	< 0.23	< 0.25	< 0.25	< 0.23	< 0.23
Aroclor 1221	14		< 0.21	< 0.21	< 0.22	< 0.22	< 0.24	< 0.23	< 0.25	< 0.25	< 0.23	< 0.23
Aroclor 1232	14		< 0.21	< 0.21	< 0.22	< 0.22	< 0.24	< 0.23	< 0.25	< 0.25	< 0.23	< 0.23
Aroclor 1242	14	1.5	< 0.21	< 0.21	< 0.22	< 0.22	< 0.24	< 0.23	< 0.25	< 0.25	< 0.23	< 0.23
Aroclor 1248	14		< 0.21	< 0.21	< 0.22	< 0.22	< 0.24	< 0.23	< 0.25	< 0.25	< 0.23	< 0.23
Aroclor 1254	0.5	0.7	< 0.21	< 0.21	< 0.22	< 0.22	< 0.24	< 0.23	< 0.25	< 0.25	< 0.23	< 0.23
Aroclor 1260	0.5	0.7	1.4	0.21	< 0.22	< 0.22	< 0.24	< 0.23	0.46	< 0.25	1.7	< 0.23
Petroleum Hydrocarbons (NWTPH) mg/kg												
Lube Oil Range	2000	200	980	630	6500	< 220	14000	15000	15000	19000	28000	18000
Diesel Range	2000	200	2200	130	1300	< 110	2200	5900	3200	3200	5300	2500

Notes: ¹ Human health screening levels based on DOE Model Toxics Control Act (MTCA) lowest value of Methods A and B. ² Ecological screening levels based on DOE MTCA lowest values for soil for plants, invertebrates, birds or mammals. ³ See Figure 4 for location of transformer substation composite samples. Samples are two, three or four sub-sample composites combined during sampling and submitted to Onsite Environmental Inc. laboratory in Redmond, WA. All screening levels and analytical results are in milligrams per kilogram (mg/kg). Chemicals that are not detected are shown as less than ("<") the practical quantitation limit (PQL). Results in bold are detected concentrations, results highlighted in yellow exceed human health screening levels, highlighted gray exceed ecological screening levels, and highlighted dark yellow exceed both human health and ecological screening levels. ⁴ PAHs shown in italic are carcinogenic. ⁵ Number of sub-samples in each composite sample. Location of sub-samples shown on transformer sample logs in Appendix A. Samples T14B and T14B-1 were mislabeled on the chain of custody form as T14A and T14A-1; transformer substation T14A was not sampled because the concrete pad was clean without exposed adjacent soil.

Table 7 - Chemicals Detected in Interior Transformer Substation Soil Samples

CHEMICALS	MTCA Methoc B Screening Values (mg/kg) ¹	Ecological Screening Levels (mg/kg) ²	TRANSFORMER SUBSTATION COMPOSITE SOIL SAMPLES ³									
			T6A	T6B	T8A	T8B	T10A	T10B	T11A	T11B	T12A	T12B
			Number of Composite Sample Sub-Samples ⁵									
			3	3	3	3	3	3	3	3	3	3
PAHs (EPA 8270D/SIM) mg/kg												
Naphthalene	5	10	< 0.046	< 1.8	< 1.9	< 1.8	< 2.1	< 4.9	< 0.092	< 0.091	2.6	< 1.7
2-Methylnaphthalene	5		< 0.046	< 1.8	< 1.9	< 1.8	< 2.1	< 4.9	< 0.092	< 0.091	1.3	< 1.7
1-Methylnaphthalene ⁴	5		< 0.046	< 1.8	< 1.9	< 1.8	< 2.1	< 4.9	< 0.092	< 0.091	< 0.95	< 1.7
Acenaphthylene	2400	20	< 0.046	< 1.8	< 1.9	< 1.8	< 2.1	< 4.9	< 0.092	< 0.091	< 0.95	< 1.7
Acenaphthene	4800	20	< 0.046	< 1.8	< 1.9	< 1.8	5.1	< 4.9	< 0.092	< 0.091	13	2
Fluorene	3200	30	< 0.046	< 1.8	< 1.9	< 1.8	2.6	< 4.9	< 0.092	< 0.091	5.4	< 1.7
Phenanthrene	2400		< 0.046	6.9	5.9	5	37	17	0.44	0.26	62	10
Anthracene	24000		< 0.046	< 1.8	2	< 1.8	7	< 4.9	< 0.092	< 0.091	10	< 1.7
Fluoranthene	3200		0.2	29	27	16	110	52	1.1	0.63	160	28
Pyrene	2400		0.15	29	27	15	98	47	0.93	0.55	140	25
Benzo(a)anthracene	1.4	2.5	0.063	10	17	9.7	62	30	0.63	0.36	99	17
Chrysene	140	35	0.12	19	60	19	91	47	0.86	0.52	130	24
Benzo(b)fluoranthene	1.4		0.11	24	86	37	150	71	1	0.65	180	33
Benzo(k)fluoranthene	14	38	0.071	12	37	20	69	41	0.74	0.41	98	23
Benzo(a)pyrene	0.14	7	0.053	15	22	15	100	47	0.91	0.51	160	27
Ideno(1,2,3-c,d)pyrene	1.4	1.9	0.047	11	40	16	87	40	0.58	0.34	110	20
Dibenz(a,h)anthracene	0.14		< 0.046	3.4	12	4.7	26	12	0.19	0.13	32	7.4
Benzo(g,h,i)perylene	2400		0.055	13	47	18	100	46	0.67	0.4	120	23
PCBs (EPA 8082) mg/kg												
Aroclor 1016	5.6	100	< 0.23	< 0.22	< 0.23	< 0.22	< 0.26	< 0.24	< 0.23	< 0.23	< 0.24	< 0.22
Aroclor 1221	14		< 0.23	< 0.22	< 0.23	< 0.22	< 0.26	< 0.24	< 0.23	< 0.23	< 0.24	< 0.22
Aroclor 1232	14		< 0.23	< 0.22	< 0.23	< 0.22	< 0.26	< 0.24	< 0.23	< 0.23	< 0.24	< 0.22
Aroclor 1242	14	1.5	< 0.23	< 0.22	< 0.23	< 0.22	< 0.26	< 0.24	< 0.23	< 0.23	< 0.24	< 0.22
Aroclor 1248	14		< 0.23	< 0.22	< 0.23	< 0.22	< 0.26	< 0.24	< 0.23	< 0.23	< 0.24	< 0.22
Aroclor 1254	0.5	0.7	< 0.23	< 0.22	< 0.23	< 0.22	< 0.26	< 0.24	< 0.23	< 0.23	< 0.24	< 0.22
Aroclor 1260	0.5	0.7	< 0.23	< 0.22	4.8	2	0.27	< 0.24	< 0.23	< 0.23	1.7	0.54
Petroleum Hydrocarbons (NWTPH) mg/kg												
Lube Oil Range	2000	200	< 230	4900	5400	2200	7800	3600	< 230	< 230	11000	2700
Diesel Range	2000	200	< 110	2300	1500	400	1300	480	< 120	< 110	2200	990

Table 7 - Chemicals Detected in Interior Transformer Substation Soil Samples

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	Ecological Screening Levels (mg/kg) ²	TRANSFORMER SUBSTATION COMPOSITE SOIL SAMPLES ³									
			T13A	T13B	T14B	T14B-1	T15A	T15B	T16A	T16B	T19A	T19B
			Number of Composite Sample Sub-Samples ⁵									
			3	3	3	3	3	3	3	3	4	4
PAHs (EPA 8270D/SIM) mg/kg												
Naphthalene	5	10	< 18	17	< 2.4	< 1.6	< 2.0	< 5.4	< 1.7	< 1.7	< 0.089	< 0.089
2-Methylnaphthalene	5		< 18	9.4	< 2.4	< 1.6	< 2.0	< 5.4	< 1.7	< 1.7	< 0.089	< 0.089
1-Methylnaphthalene ⁴	5		< 18	5.8	< 2.4	< 1.6	< 2.0	< 5.4	< 1.7	< 1.7	< 0.089	< 0.089
Acenaphthylene	2400	20	< 18	< 4.5	< 2.4	< 1.6	< 2.0	< 5.4	< 1.7	< 1.7	< 0.089	< 0.089
Acenaphthene	4800	20	73	71	3.3	< 1.6	7.8	< 5.4	2.1	< 1.7	0.36	0.21
Fluorene	3200	30	37	36		< 1.6	4.3	< 5.4	< 1.7	< 1.7	0.16	0.093
Phenanthrene	2400		530	370	36	12	68	56	27	14	2.3	1.4
Anthracene	24000		91	69	6.4	< 1.6	12	9.5	4.4	2	0.3	0.17
Fluoranthene	3200		1500	1100	140	49	220	200	92	51	6.4	3.7
Pyrene	2400		1400	690	130	42	190	170	82	48	5.3	3.1
Benzo(a)anthracene	1.4	2.5	950	650	76	26	130	120	58	33	3.3	2
Chrysene	140	35	1200	830	140	50	180	180	79	46	5.2	3
Benzo(b)fluoranthene	1.4		1500	1100	210	67	220	260	100	69	7.1	3.9
Benzo(k)fluoranthene	14	38	1100	680	97	36	160	160	72	43	4.3	2.4
Benzo(a)pyrene	0.14	7	1500	940	120	40	210	210	100	58	5.2	2.8
Indeno(1,2,3-c,d)pyrene	1.4	1.9	940	600	96	32	170	170	75	42	4	2.1
Dibenz(a,h)anthracene	0.14		290	230	35	9.5	61	60	27	12	1.4	0.66
Benzo(g,h,i)perylene	2400		1100	670	120	38	190	190	84	48	4.8	2.5
PCBs (EPA 8082) mg/kg												
Aroclor 1016	5.6	100	< 0.22	< 0.22	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1221	14		< 0.22	< 0.22	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1232	14		< 0.22	< 0.22	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1242	14	1.5	< 0.22	< 0.22	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1248	14		< 0.22	< 0.22	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1254	0.5	0.7	< 0.22	< 0.22	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1260	0.5	0.7	< 0.22	1.7	< 0.29	< 0.50	< 0.25	< 0.27	< 0.22	< 0.22	< 0.22	< 0.22
Petroleum Hydrocarbons (NWTPH) mg/kg												
Lube Oil Range	2000	200	50000	55000	8800	3000	9900	10000	3200	2000	390	290
Diesel Range	2000	200	8600	13000	1400	440	3100	3100	420	300	< 110	< 110

Table 7 - Chemicals Detected in Interior Transformer Substation Soil Samples

Rectifier Yard, Stormwater Catch Basin, and Interior Transformer Soil Sampling Data Report

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	Ecological Screening Levels (mg/kg) ²	TRANSFORMER SUBSTATION COMPOSITE SOIL SAMPLES ³						
			T20A	T20B	T23A	T23B	T24A	T24B	T24C
			Number of Composite Sample Sub-Samples ⁵						
			3	3	3	3	2	2	3
PAHs (EPA 8270D/SIM) mg/kg									
Naphthalene	5	10	< 0.089	< 0.089	< 0.089	0.17	< 0.089	< 0.088	< 0.087
2-Methylnaphthalene	5		< 0.089	< 0.089	< 0.089	0.14	< 0.089	< 0.088	< 0.087
1-Methylnaphthalene ⁴	5		< 0.089	< 0.089	< 0.089	0.095	< 0.089	< 0.088	< 0.087
Acenaphthylene	2400	20	< 0.089	< 0.089	< 0.089	< 0.089	< 0.089	< 0.088	< 0.087
Acenaphthene	4800	20	< 0.089	< 0.089	0.13	0.87	0.33	< 0.088	< 0.087
Fluorene	3200	30	< 0.089	< 0.089	< 0.089	0.56	0.17	< 0.088	< 0.087
Phenanthrene	2400		0.49	0.34	0.76	6	2.1	< 0.088	0.26
Anthracene	24000		0.096	< 0.089	0.11	0.73	0.26	< 0.088	< 0.087
Fluoranthene	3200		1.3	0.92	1.6	14	5.5	0.13	0.62
Pyrene	2400		1.2	0.77	1.3	11	4.5	0.11	0.53
Benzo(a)anthracene	1.4	2.5	1.1	0.5	0.78	7.9	3.1	< 0.088	0.35
Chrysene	140	35	5.1	1.1	1.1	11	4.4	0.11	0.49
Benzo(b)fluoranthene	1.4		2.4	1.4	1.4	13	5.3	0.14	0.58
Benzo(k)fluoranthene	14	38	1.6	0.82	0.9	8.4	3.8	< 0.088	0.42
Benzo(a)pyrene	0.14	7	1.4	0.77	1.1	10	4.2	0.11	0.49
Indeno(1,2,3-c,d)pyrene	1.4	1.9	1.3	0.71	0.75	6.4	2.7	< 0.088	0.38
Dibenz(a,h)anthracene	0.14		0.4	0.22	0.23	2.1	0.86	< 0.088	0.14
Benzo(g,h,i)perylene	2400		1.7	0.92	0.95	7.7	3.2	0.097	0.49
PCBs (EPA 8082) mg/kg									
Aroclor 1016	5.6	100	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1221	14		< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1232	14		< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1242	14	1.5	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1248	14		< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1254	0.5	0.7	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Aroclor 1260	0.5	0.7	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22	< 0.22
Petroleum Hydrocarbons (NWTPH) mg/kg									
Lube Oil Range	2000	200	< 220	< 220	< 220	450	390	< 220	< 220
Diesel Range	2000	200	< 110	< 110	< 110	< 110	< 110	< 110	< 110

Table 9 Chemicals Detected in Transformer T5 Spill Soil Samples

CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	Ecological Screening Levels (mg/kg) ²	Transformer Substation T5 Spill Soil Samples ³ Samples Collected on April 14, 2011						Transformer Substation T5 Spill Soil Confirmation Samples ³ Samples Collected on May 25, 2011				
			T5-1	T5-2	T5-3	T5-4	T5-5	T5-6	T5-1	T5-2	T5-3	T5-4	T5-5
			Transformer side "A"			Transformer side "B"			Sample Depth (Feet)				
PCBs (EPA 8082) mg/kg									2.5	2.5	3	3	3
Aroclor 1016	5.6	100	<0.054	<0.055	<1.2	<0.055	<0.057	<0.054	<0.058	<0.055	<0.058	<0.058	<0.056
Aroclor 1221	14		<0.054	<0.055	<1.2	<0.055	<0.057	<0.054	<0.058	<0.055	<0.058	<0.058	<0.056
Aroclor 1232	14		<0.054	<0.055	<1.2	<0.055	<0.057	<0.054	<0.058	<0.055	<0.058	<0.058	<0.056
Aroclor 1242	14	1.5	<0.054	<0.055	<1.2	<0.055	<0.057	<0.054	<0.058	<0.055	<0.058	<0.058	<0.056
Aroclor 1248	14		<0.054	<0.055	<1.2	<0.055	<0.057	<0.054	<0.058	<0.055	<0.058	<0.058	<0.056
Aroclor 1254	0.5	0.7	<0.054	<0.055	<1.2	<0.055	<0.057	<0.054	<0.058	<0.055	<0.058	<0.058	<0.056
Aroclor 1260	0.5	0.7	1.2	1.5	27	0.87	1.8	0.63	<0.058	0.11	<0.058	<0.058	<0.056
Petroleum Hydrocarbons (NWTPH) mg/kg													
Mineral Oil	2000	200	100000	30000	260000	55000	110000	63000					
Lube Oil	2000	200							<29	<28	<29	<29	<28
Diesel Range	2000	200							<58	<56	<58	<58	<56

Notes: ¹ Human health screening levels based on DOE Model Toxics Control Act (MTCA) lowest value of Methods A and B. ² Ecological screening levels based on DOE MTCA lowest values for soil for plants, invertebrates, birds or mammals. ³ See Figure 4 for the location of transformer substation T5 and Figure 5 for the location of T5 spill soil samples. Samples are discrete samples submitted to Onsite Environmental Inc. laboratory in Redmond, WA. All screening levels are in milligrams per kilogram (mg/kg). Chemicals that are not detected are shown as less than ("<") the practical quantitation limits (PQL). Results in **bold** are detected concentrations, results highlighted in yellow exceed human health screening levels and highlighted gray exceed ecological screening levels.

APPENDIX B-5
PLANT AREA AOC

APPENDIX B-5

PLANT AREA AOC

**BMEC (2014)
Waste Inventory Map and Table**



**Columbia Gorge Aluminum Smelter, Goldendale, Washington
Caste House and Production Building Waste Inventory
(see attached numbered list of identified wastes)**

SUMMARY OF WASTES REMOVED DURING CGA PLANT DEMOLITION

Inventory conducted by BMEC. Summary prepared 10/30/2014

Unit	Description	Material Identified	Status
1	Store Areas	Nuisance Chemicals, Aerosol cans, batteries, A/C units, etc.	Moved to S. Shipping Canopy for profiling and disposal
2	Bulk Tank	Motor Oil	Oil Disposed
3	Bulk Tank	Hydraulic Fluid	Liquid Disposed
4	Bulk Tank	Waste Oil	Oil Disposed
5	Oil Water Separator	Sludge/Water	Sludge water disposed
6	Hydraulic Power Unit	Hydraulic Fluid	Overhead lines drained manually, liquid disposed
7	Hydraulic Power Unit	Hydraulic Fluid	Overhead lines drained manually, liquid disposed
8	Hydraulic Ram	Hydraulic Fluid	Piping drained below floor, liquid removed and disposed
9	Hydraulic Ram	Hydraulic Fluid	Piping drained below floor, liquid removed and disposed
10	Hydraulic Ram	Hydraulic Fluid	Piping drained below floor, liquid removed and disposed
11	Hydraulic Power Unit	Hydraulic Fluid	Overhead lines drained manually, liquid disposed
12	Hydraulic Power Unit	Hydraulic Fluid	Overhead lines drained manually, liquid disposed
13	Hydraulic Power Unit	Hydraulic Fluid	Overhead lines drained manually, liquid disposed
14	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Liquid Disposed
15	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Liquid Disposed
16	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
17	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
18	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
19	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Liquid Disposed
20	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
21	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
22	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
23	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
24	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
25	Friction Welder	Hydraulic Fluid	Liquid Disposed
26	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
27	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Liquid Disposed
28	Hydraulic Press	Hydraulic Fluid	Liquid Disposed
29	Hydraulic Power Unit	Hydraulic Fluid	Liquid Disposed
30	Cast House/Production Buildings	Dust	Dust was sampled and disposed
31	Cast House/Production Buildings	Asbestos bearing floor tile, sheet vinyl, & mastic	Buildings have been removed

NOTES: See attached map for locations of Items 1 through 29. Asbestos reports posted to Plant AOC folder on Share Point project site.

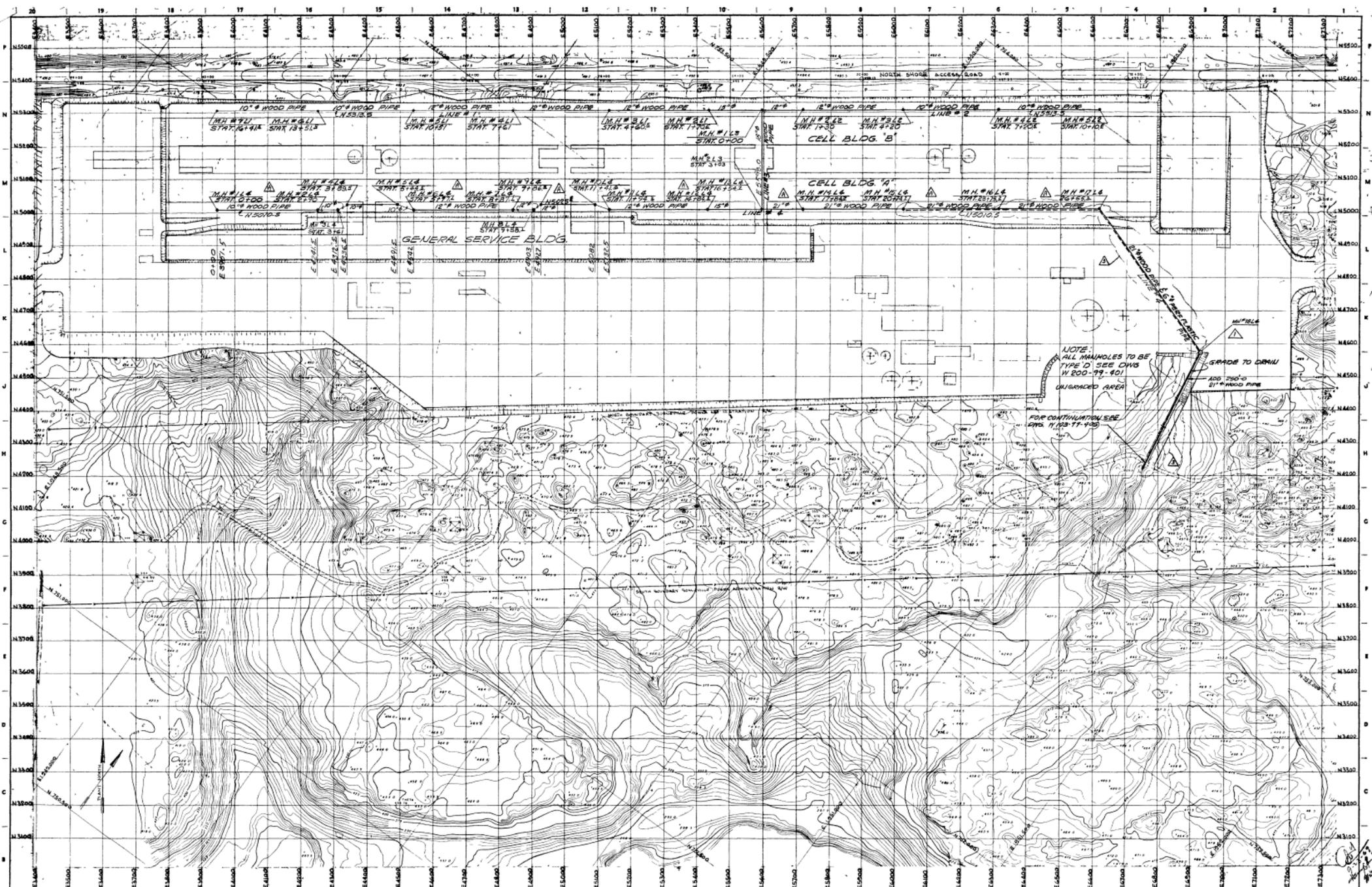
SUMMARY OF FLUIDS AND OTHER SUBSTANCES REMOVED FROM CAST HOUSE AND OTHER PLANT AREAS

Unit	Description	Material Removed	Method	Approximate Capacity
1	Store Areas	Nuisance Chemicals, Aerosol cans, batteries, A/C units, etc.	Physical removal, moved to S. Shipping Canopy for profiling and disposal	10 pallets
2	Bulk Tank	Motor Oil	Vacuum truck	1000 gallons
3	Bulk Tank	Hydraulic Fluid	Vacuum truck	1000 gallons
4	Bulk Tank	Waste Oil	Vacuum truck	1500 gallons
5	Oil Water Separator	Sludge/Water	Vacuum truck	100 gallons
6	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck, overhead lines drained manually	50 gallons
7	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck, overhead lines drained manually	50 gallons
8	Hydraulic Ram	Hydraulic Fluid	Physical removal, piping drained below floor	100 gallons
9	Hydraulic Ram	Hydraulic Fluid	Physical removal, piping drained below floor	100 gallons
10	Hydraulic Ram	Hydraulic Fluid	Physical removal, piping drained below floor	100 gallons
11	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck, overhead lines drained manually	250 gallons
12	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck, overhead lines drained manually	250 gallons
13	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck, overhead lines drained manually	250 gallons
14	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Vacuum truck	75 gallons
15	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Vacuum truck	50 gallons
16	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	40 gallons
17	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	40 gallons
18	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	75 gallons
19	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Vacuum truck	75 gallons
20	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	75 gallons
21	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	75 gallons
22	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	250 gallons
23	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	75 gallons
24	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	150 gallons
25	Friction Welder	Hydraulic Fluid	Vacuum truck	500 gallons
26	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	40 gallons
27	Hydraulic Power Unit/Equipment Specific	Hydraulic Fluid	Vacuum truck	75 gallons
28	Hydraulic Press	Hydraulic Fluid	Vacuum truck	75 gallons
29	Hydraulic Power Unit	Hydraulic Fluid	Vacuum truck	100 gallons

APPENDIX B-5

PLANT AREA AOC

Harvey Aluminum (1971b) Scrubber Effluent Drawing



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REFERENCE DWGS
 W201-05-402
 W200-77-401
 W103-77-405

NO.	REVISION	DATE	BY	APP'D
1	APPROVED FOR CONSTRUCTION			
2	REVISED FOR REVIEW			
3	REVISED FOR REVIEW			
4	REVISED FOR REVIEW			
5	REVISED FOR REVIEW			
6	REVISED FOR REVIEW			
7	REVISED FOR REVIEW			
8	REVISED FOR REVIEW			
9	REVISED FOR REVIEW			
10	REVISED FOR REVIEW			
11	REVISED FOR REVIEW			
12	REVISED FOR REVIEW			
13	REVISED FOR REVIEW			
14	REVISED FOR REVIEW			
15	REVISED FOR REVIEW			
16	REVISED FOR REVIEW			
17	REVISED FOR REVIEW			
18	REVISED FOR REVIEW			
19	REVISED FOR REVIEW			
20	REVISED FOR REVIEW			

APPROVED FOR CONSTRUCTION
 ENGINEERING STAFF
 DESIGN ENGINEER
 CHIEF ELECTRICAL ENGINEER
 CHIEF PROJECT ENGINEER
 CHIEF DESIGN ENGINEER
 CHIEF PROJECT ENGINEER

HARVEY ALUMINUM
 (INCORPORATED)
 TORRANCE, CALIFORNIA
 PLANT LOCATION JOHN DAY WASHINGTON
 FACILITY - REDUCTION PLANT
 SUB FACILITY - PLANT & SITE UTILITIES

SCRUBBER EFFLUENT PLAN
 SCALE 1" = 100'-0"
 DATE 12/28/87
 DRAWN BY J. J. GIBSON
 CHECKED BY J. J. GIBSON
 DATE 12/28/87
 DRAWN BY J. J. GIBSON
 CHECKED BY J. J. GIBSON
 DATE 12/28/87

NOTE:
 ALL MANHOLES TO BE
 TYPE D - SEE DWG
 W 200-77-401
 DISTURBED AREA
 GRADE TO DRAIN
 ADD 750'-0"
 24" WOOD PIPE

FOR CONTINUATION SEE
 DWG. W 201-77-405

APPENDIX B-5

PLANT AREA AOC

**PGG (Personal Communication, November 2014)
Correspondence Regarding Plant Area AOC Features and Data**

PGG (personal communication, November 2014) location information, notes, photographs, and data summary tables regarding Plant Area AOC features



A Equipment wash station, large square area in concrete floor sloped to middle drain. No samples collected.

B Oil Change Pit connected to sump at edge of cast house foundation immediately south. One sludge and one water sample collected; data tables provided.

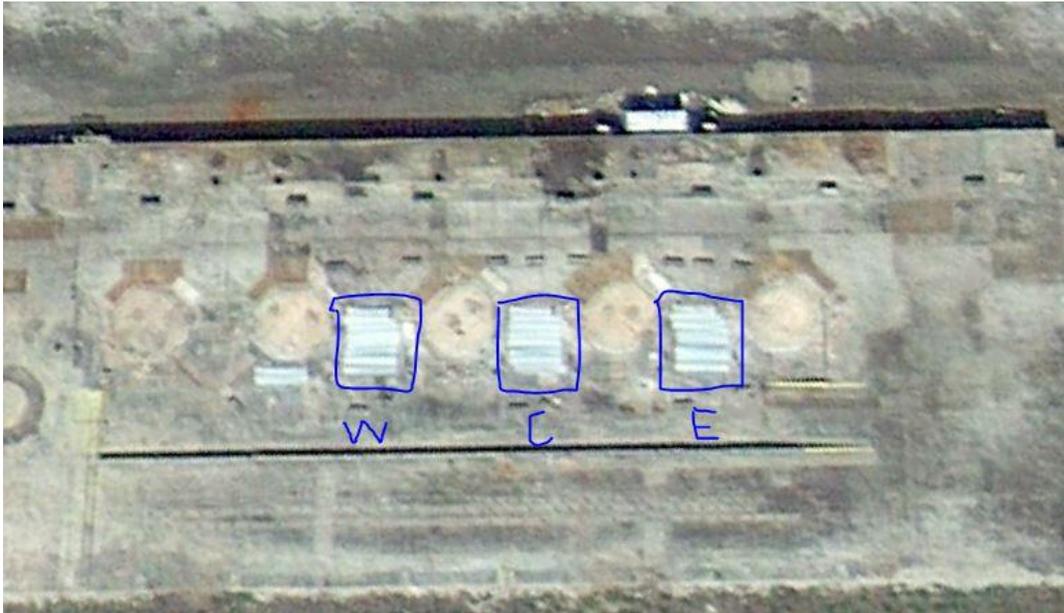
C Oil room where bulk hydraulic oil was stored. Four samples of bulk oil were collected to determine whether the hydraulic cylinders may have contained PCBs. No PCBs were detected.

D Five furnaces (pinkish circles) with three hydraulic cylinder (chill pits) between (silver squares). Samples of water from each of the three cylinder pits were collected and one follow-up sample collected from the eastern pit. Four water samples collected; data table and photos provided.

E Separate building at the east end of the cast house contained the press vault also known as the friction weld. The press pit is about 2 feet deep and contained oily water after the building was removed and the pit was exposed to rainfall. One water sample collected; data table and one photo provided.



Closeup of the press vault pit outlined in blue. This is located in a separate building at the east end of the cast house.



Three cylinder pits with corrugated metal covers. PCBs detected in water in the east pit. Dark area at edge of concrete cast house foundation above the center pit is oil storage room.



Oil Change pit outlined in blue. The black outline is approximate location of the sump to which the oil change pit is connected.

The Red outline is the location of the equipment washing area. The dark line in the center is a shallow trench.

Casting Pit Description

"Five holding furnaces, one tilting furnace and three casting pits were located in the Cast House (PGG, personal communication, 2014). The casting pits are each located adjacent to a casting furnace. The pits are about 40 feet deep and each contains a hydraulic cylinder and platform. During Cast House demolition activities between January and April of 2012, removal of all hydraulic fluids, associated hydraulic equipment, piping, auxiliary attachments, petroleum products, and batch chemicals was completed. Approximately 5,200 gallons of hydraulic fluids and petroleum products were removed. The pumping and cleaning of all water and sludge from various sumps and the removal of three large hydraulic cylinders was also completed at this time.

After the removal of the hydraulic cylinders, water remained in the pits. Water samples were collected from each of the three pits and analyzed for petroleum hydrocarbons and PCBs. Initial sampling results indicate the following: Aroclor 1242 was detected in the east pit at a concentration of 0.59 ug/L; diesel was detected in the west pit at a concentration of 7.1 ug/L; lube oil was detected below a concentration of 10 ug/L in the central and west pits, and at a concentration of 850 ug/L in the east pit. After water was pumped from all of the pits one follow-up sample was collected from accessible water in the east pit; lube oil was detected in the water at a concentration of 1.4 ug/L.

Due to limited access, the sub-floor area below the cast house floor could not be investigated. This area still contains pipe runs, electrical wiring, and utility lines. For safety, the open cylinder pits were covered with plywood and heavy gauge corrugated metal sheets that are bolted to the concrete.



Cast House hydraulic cylinder pits in September 2012



Waste removed from Cast House

Poor photos but shows the oil change pit.

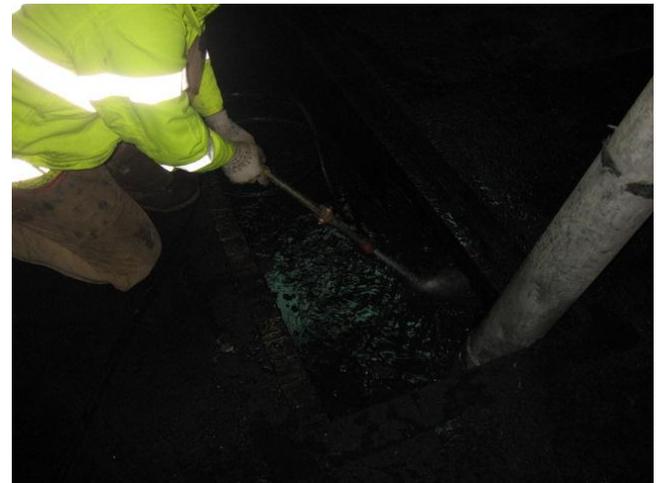




40 foot deep hydraulic cylinder pit (left and right photos)



Waste removed from Cast House staged under south annex canopy (left and right photos)



Left photo is friction weld pit (aka press pit) located in narrow building at east end of cast house. Oily water in pit was sampled after building removed. Right photo is cleaning of oil change sump located in the maintenance area at the west end of the cast house.

Summary of Water Samples from Cast House Hydraulic Cylinder Pits After Removal of the Hydraulic Cylinders (March 1, 2012)

Chemical	MTCA Method A Screening Level	Number of Samples Exceeding Screening Level	Maximum Detected Concentration	Sample with Maximum Concentration
Aroclor 1242	0.1	1/3	0.59	3-1-EP-03
TPH-Dx	500	1/3	850	3-1-EP-03
3-1-EP-03 sample collected from eastern of three deep hydraulic cylinders in the Cast House. Concentrations in ug/l. Bold values denote positive detection that exceeds screening level.				

Summary of Water Sample from Eastern Cast House Hydraulic Cylinder Pit After Water was Pumped Out of the Hydraulic Cylinder Pits (April 4, 2012)

Chemical	MTCA Method A Screening Level	Number of Samples Exceeding Screening Level	Maximum Detected Concentration	Sample with Maximum Concentration
TPH-Dx	500	0/1	1.4	CH-EP-W1
Sample from east cylinder pit only analyzed for TPH-Dx. Concentrations in ug/l.				

Summary of Water Sample from Industrial Sump (June 25, 2012)

Chemical	MTCA Method A Screening Level	Number of Samples Exceeding Screening Level	Maximum Detected Concentration	Sample with Maximum Concentration
Aluminum	16,000 ¹	0/1	660	IS-1
Zinc	4,800 ¹	0/1	87	IS-1
Fluoride	640 ¹	1/1	7,700	IS-1
Anthracene	4,830 ¹	0/1	0.27	IS-1
Fluoranthene	640 ¹	0/1	0.13	IS-1
Benzo(a)anthracene	0.12 ¹	0/1	0.093	IS-1
Chrysene	12 ¹	0/1	0.14	IS-1
Benzo(b)fluoranthene	0.12 ¹	1/1	0.18	IS-1
Benzo(j,k)fluoranthene	NE		0.045	IS-1
Benzo(a)pyrene	0.1	0/1	0.053	IS-1
Ideno(1,2,3-cd)pyrene	0.12 ¹	0/1	0.095	IS-1
Dibenz(a,h)anthracene	0.012 ¹	1/1	0.03	IS-1
Benzo(g,h,i)perylene	NE		0.08	IS-1
Concentrations in ug/l. ¹ MTCA Method B; no established value in look up table for Method A. NE = Not established in look up tables. Bold values denote positive detection that exceeds screening level. TPH, VOCs and PCBs not detected at concentrations above practical quantitation limit.				

Summary of Oil Change Sump Sludge Sample 12-13-CH-CB-1

Chemical	MTCA Method A Screening Level for Soil	Number of Samples Exceeding Screening Level	Maximum Detected Concentration
Antimony	32 ²	0/1	12
Arsenic	20	1/1	27
Barium	16,000 ²	0/1	79
Cadmium	2	1/1	18
Chromium	2,000	0/1	86
Lead	250	0/1	240
Mercury	2	0/1	0.4
Silver	400 ¹	0/1	0.99
Fluoride	3,200 ¹	0/1	2,000
Acenaphthene	4,800 ¹	0/1	1.3
Fluorene	3,200 ¹	0/1	1.5
Phenanthrene	NE	0/1	22
Anthracene	NE	0/1	4.5
Fluoranthene	3,200 ¹	0/1	190
Pyrene	2,400 ¹	0/1	100
Benzo(a)anthracene	1.37 ¹	1/1	48
Chrysene	137 ¹	1/1	130
Benzo(b)fluoranthene	1.37 ¹	1/1	140
Benzo(j,k)fluoranthene	NE	0/1	30
Benzo(a)pyrene	0.1	1/1	42
Ideno(1,2,3-cd)pyrene	1.37 ¹	1/1	48
Dibenz(a,h)anthracene	0.137 ¹	1/1	11
Benzo(g,h,i)perylene	NE	0/1	45
TPH-Gx(Xylene)	9	0/1	0.17
TPH-Dx	2,000	1/1	155,000
<p>Concentrations in mg/kg. ¹ MTCA Method B; no established value in look up table for Method A. ² MTCA Method B; no established value in look up table for Method A, chemical not a facility COPC NE = Not established in look up tables. Bold values denote positive detection that exceeds screening level.</p>			

Summary of Oil Change Sump Water Sample 12-13-CH-CB-1A

Chemical	MTCA Method A Screening Level	Number of Samples Exceeding Screening Level	Maximum Detected Concentration
Antimony	6 ²	1/1	34
Arsenic	5	1/1	69
Barium	2 ²	1/1	400
Cadmium	5	1/1	120
Chromium	50	1/1	610
Lead	15	1/1	1100
Fluoride	640 ¹	0/1	44
Phenanthrene	NE	0/1	3.7
Anthracene	4,830 ¹	0/1	3.2
Fluoranthene	640 ¹	0/1	25
Pyrene	480 ¹	0/1	15
Benzo(a)anthracene	0.12 ¹	1/1	5.9
Chrysene	12 ¹	1/1	19
Benzo(b)fluoranthene	0.12 ¹	1/1	19
Benzo(j,k)fluoranthene	NE	0/1	3.6
Benzo(a)pyrene	0.1	1/1	3.5
Ideno(1,2,3-cd)pyrene	0.12 ¹	1/1	4.8
Dibenz(a,h)anthracene	0.012 ¹	1/1	1.1
Benzo(g,h,i)perylene	NE	0/1	4.3
TPH-Gx	100	0/1	0.17
TPH-Dx	500	0/1	85
Concentrations in ug/l. ¹ MTCA Method B; no established value in look up table for Method A. ² MTCA Method B; no established value in look up table for Method A, chemical not a facility COPC NE = Not established in look up tables. Bold values denote positive detection that exceeds screening level.			

No table prepared for four hydraulic cylinder oil samples. Four samples collected from bulk oil and analyzed for VOCs and PCBs. Only 1,2-dichlorobenzene detected at 10 mg/kg in sample 3-9-OD-04; no other chemicals detected.

Summary of Press Vault (Friction Weld) Pit Water Sample 01-13-CHVault-01

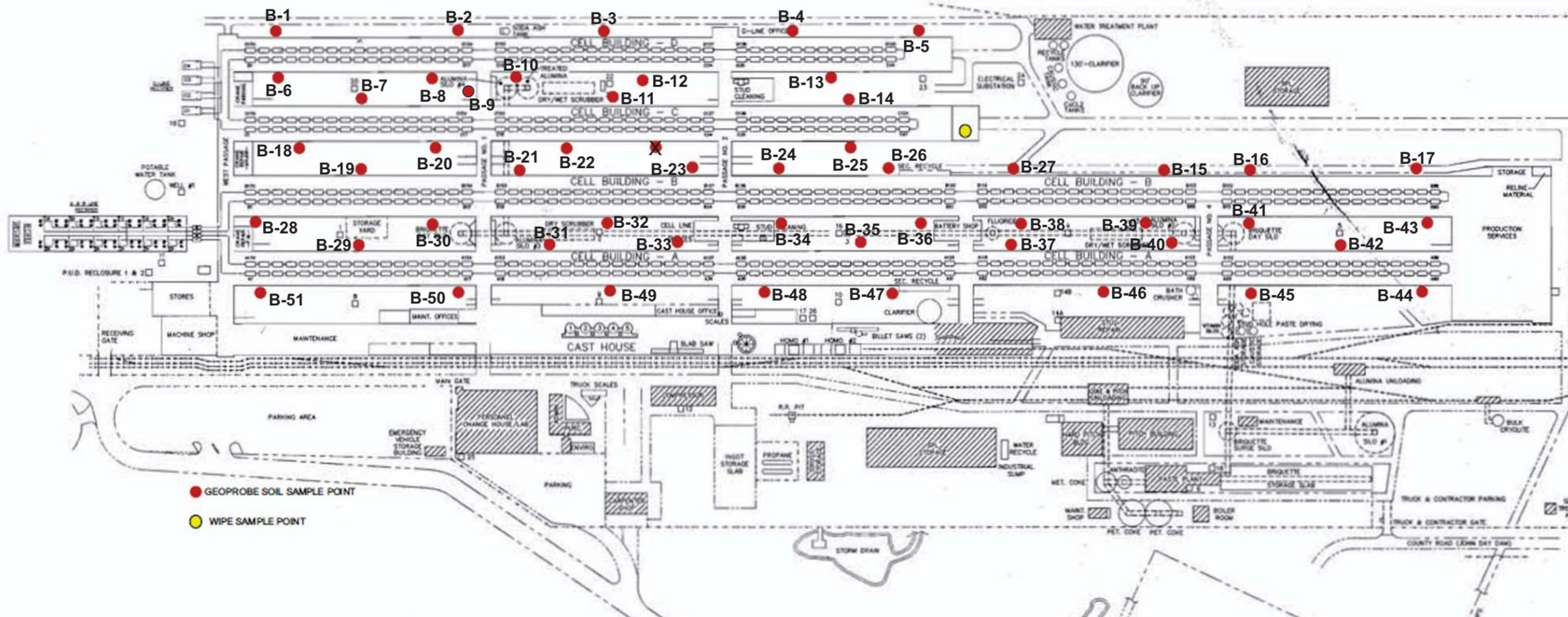
Chemical	MTCA Method A Screening Level	Number of Samples Exceeding Screening Level	Maximum Detected Concentration
Lead	15	0/1	1.8
Fluoride	640 ¹	0/1	9.7
Phenanthrene	NE	0/1	0.13
Fluoranthene	640 ¹	0/1	1.0
Pyrene	480 ¹	0/1	0.62
Benzo(a)anthracene	0.12 ¹	1/1	0.31
Chrysene	12 ¹	0/1	0.83
Benzo(b)fluoranthene	0.12 ¹	1/1	0.73
Benzo(j,k)fluoranthene	NE	0/1	0.16
Benzo(a)pyrene	0.1	1/1	0.2
Ideno(1,2,3-cd)pyrene	0.12 ¹	1/1	0.24
Dibenz(a,h)anthracene	0.012 ¹	1/1	0.052
Benzo(g,h,i)perylene	NE	0/1	0.22
Concentrations in ug/l. ¹ MTCA Method B; no established value in look up table for Method A. NE = Not established in look up tables. Bold values denote positive detection that exceeds screening level.			

APPENDIX B-5

PLANT AREA AOC

PGG (2010)

Preliminary Site Investigation Report, Plant Area



● GEOPROBE SOIL SAMPLE POINT
● WIPE SAMPLE POINT

FIGURE 1
SOIL SAMPLE LOCATIONS
FORMER COLUMBIA GORGE
ALUMINUM PLANT

Goldendale NW Aluminum Company Inc.
 3313 West 2nd Street
 The Dalles, Oregon

GGP GeoPro LLC
 Battle Ground, WA August 2010

Note:
 Base map provided by Goldendale NW Aluminum Company Inc.
 Soil sample locations are selected by Blue Mountain Environmental Consulting Inc.

REFERENCE DRAWING	NUMBER	REVISION	DATE	BY

TITLE BLOCK REVISION		C
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GOLDENDALE ALUMINUM COMPANY		GOLDENDALE ALUMINUM COMPANY SUBSTATION LOCATION LAYOUT	
GOLDENDALE REDUCTION PLANT		SCALE: 1" = 150'	
FACILITY: 50 HARVALUM		DRN	REV
SUB FACILITY: 5001 GEN. ARR'G		9/14/89	DWG NO
			A1/2082

Table B1 - PAHs in Soil

Sample Number	Units	Benzo(a)pyrene		Benzo(a)anthracene		Benzo(b)fluoranthene		Benzo(k)fluoranthene		Chrysene		Dibenz(a,h)anthracene		Indeno(1,2,3cd)pyrene		TEF			
		Concen		Concen		Concen		Concen		Concen		Concen		Concen					
B-1-1	mg/kg		13		1		1.9		1.1		0.18		0.41		1.2	18.8			
B-1-3	mg/kg	<	0.0068	U	<	0.00068	U	<	0.00068	U	<	0.00007	U	<	0.00068	U	na		
B-1-6	mg/kg		0.0058		0.0053		0.0078		0.0059		0.0008		0.0016		0.0042	0.0313			
B-2-1	mg/kg		6.8		0.52		1.5		0.92		0.12		0.31		0.93	11.1			
B-2-3	mg/kg	<	0.0066	U	<	0.00066	U	<	0.00066	U	<	0.00007	U	<	0.00066	U	na		
B-2-5	mg/kg		0.049		0.0043		0.016		0.0075		0.0012		0.002		0.0063	0.0863			
B-3-1	mg/kg		5.2		0.46		0.8		0.54		0.072		0.18		0.52	7.772			
B-3-3	mg/kg	<	0.0091	U	<	0.00091	U	<	0.00091	U	<	0.00009	U	<	0.00091	U	na		
B-4-1	mg/kg		69		6.5		8.8		6.7		1.1		2		5.4	99.5			
B-4-3	mg/kg	<	0.0078	U	<	0.00078	U	<	0.00078	U	<	0.00078	U	<	0.00078	U	na		
B-5-1	mg/kg		61		5.6		7.1		6.7		1.2		1.6		3.9	87.1			
B-6-1	mg/kg		0.018		0.0013		0.0035		0.0017		0.00028	<	0.00067	U	0.0017	0.0265			
B-6-3	mg/kg		0.054		0.0044		0.006		0.0045		0.00062		0.00015		0.0037	0.0747			
B-6-6	mg/kg		0.036		0.0025		0.0039		0.0029		0.00036		0.00097		0.0025	0.0491			
B-7-1	mg/kg		0.16		0.094		0.27		0.089		0.063		0.011		0.025	0.712			
B-7-3	mg/kg	<	0.0066	U	<	0.00066	U	<	0.00066	U	<	0.00007	U	<	0.00066	U	na		
B-7-6	mg/kg	<	0.007	U	<	0.0007	U	<	0.0007	U	<	0.00007	U	<	0.0007	U	na		
B-8-1	mg/kg		0.16		0.025		0.096		0.031		0.013		0.0091		0.026	0.3601			
B-9-3	mg/kg	<	0.008	U	<	0.0008	U	<	0.0008	U	<	0.00008	U	<	0.0008	U	na		
B-10-1	mg/kg		1.1		0.046		0.043		0.4		0.018		0.11		0.28	1.997			
B-10-3	mg/kg	<	0.0068	U	<	0.00068	U	<	0.00068	U	<	0.00007	U	<	0.00068	U	na		
B-10-6	mg/kg	<	0.0074	U	<	0.0074	U	<	0.0074	U	<	0.0074	U	<	0.0074	U	na		
B-11-1	mg/kg		0.22		0.013		0.075		0.029		0.0034		0.011		0.039	0.3904			
B-11-3	mg/kg	<	0.0066	U	<	0.00066	U		0.0009	<	0.00066	U	<	0.00066	U	0.0009			
B-11-5	mg/kg		0.37		0.026		0.16		0.067		0.0075		0.023		0.068	0.7215			
B-12-1	mg/kg		0.98		0.023		1		0.29		0.12		0.072		0.19	2.675			
B-12-3	mg/kg	<	0.0067	U	<	0.00067	U	<	0.0027		0.0013		0.00019	<	0.00067	U	0.00077	0.00496	
B-13-1	mg/kg		0.97		0.2		0.46		0.19		0.083		0.039		0.11	2.052			
B-13-2	mg/kg	<	0.0068	U		0.00089		0.0015		0.0009		0.00022	<	0.00068	U	<	0.00068	U	0.0035
B-14-1	mg/kg		1.4		0.11		0.19		0.13		0.018		0.042		0.11	2			
B-14-3	mg/kg		0.015		0.0012		0.0018		0.0013		0.00019	<	0.00067	U	0.0011	0.0206			
B-14-5	mg/kg		0.56		0.048		0.066		0.043		0.0064		0.016		0.04	0.7794			
B-15-1	mg/kg		2.9		0.26		1		0.45		0.074		0.12		0.33	5.134			
B-15-3	mg/kg	<	0.0066	U	<	0.00066	U		0.00068	<	0.00066	U	<	0.00066	U	<	0.00066	0.00068	
B-16-1	mg/kg		13		1.3		3.8		1.6		0.39		0.38		1.2	21.67			
B-16-3	mg/kg		0.14		0.015		0.038		0.021		0.0036		0.0038		0.013	0.2344			
B-16-6	mg/kg		0.23		0.026		0.062		0.033		0.0064		0.0058		0.019	0.3822			
B-17-1	mg/kg		1.5		0.11		0.22		0.15		0.02		0.047		0.13	2.177			
B-17-3	mg/kg		0.013		0.001		0.0027		0.0017		0.00024	<	0.00089	U	0.0016	0.0202			

Table B1 - PAHs in Soil

Sample Number	Units	Benzo(a)pyrene		Benzo(a)anthracene		Benzo(b)fluoranthene		Benzo(k)fluoranthene		Chrysene		Dibenz(a,h)anthracene		I(deno(1,2,3cd))pyrene		TEF				
		Concen		Concen		Concen		Concen		Concen		Concen		Concen						
B-17-5	mg/kg		4		0.35		0.65		0.5		0.077		0.12		0.34	6.037				
B-18-1	mg/kg		56		4.8		11		6		0.95		1.7		5.1	85.55				
B-18-3	mg/kg		1.3		0.094		0.29		0.11		0.023		0.037		0.13	1.984				
B-18-6	mg/kg	<	0.0065	U	<	0.00065	U		0.00071		0.0001	<	0.00065	U	<	0.00065	U	0.0021		
B-19-1	mg/kg		69		6.4		22		9.9		2.4		2.2		6.3	118.2				
B-19-3	mg/kg		0.45		0.042		0.039		0.038		0.0051		0.0098		0.028	0.6119				
B-20-1	mg/kg		8.5		0.96		0.84		0.68		0.11		0.21		0.56	11.86				
B-20-3	mg/kg		0.21		0.015		0.027		0.02		0.0026		0.0055		0.018	0.2981				
B-20-5	mg/kg		1.5		0.18		0.16		0.14		0.023		0.039		0.099	2.141				
B-21-1	mg/kg		24		3.1		7.2		3.3		0.92		1		2.7	42.22				
B-21-3	mg/kg	<	0.0067	U	<	0.00067	U		<	0.00067	u	<	0.00067	u	<	0.00067	u	0.00088		
B-21-5	mg/kg		0.053		0.0044		0.012		0.0062		0.001		0.0019		0.0051	0.0836				
B-22-1	mg/kg		7		0.53		1.1		0.59		0.097		0.23		0.71	10.257				
B-22-3	mg/kg	<	0.0082	U	<	0.00082	U		0.0009		0.00011	<	0.00082	U		0.00086	0.0033			
B-23-1	mg/kg		35		4		6.5		3.8		0.87		0.93		2.7	53.8				
B-23-3	mg/kg		0.022		0.0015		0.0063		0.0031		0.00039		0.0015		0.0062	0.041				
B-24-1	mg/kg		27		2		3.7		2.4		0.34		0.86		2.7	0.9				
B-24-3	mg/kg		0.15		0.011		0.23		0.015		0.0021		0.0043		0.014	0.2194				
B-24-6	mg/kg		0.28		0.021		0.045		0.025		0.0041		0.01		0.03	0.4151				
B-25-1	mg/kg		19		1.7		2.6		1.8		0.33		0.51		1.5	27.44				
B-25-3	mg/kg		0.021		0.0023		0.0037		0.0021		0.00042	<	0.00066	U		0.0016	0.311			
B-25-5	mg/kg		12		1.3		1.3		1		0.17		0.27		0.73	16.77				
B-26-1	mg/kg		37		2.5		4.3		3		0.44		0.72		0.25	48.21				
B-26-3	mg/kg		0.055		0.0043		0.012		0.0066		0.00097		0.0017		0.0056	0.0862				
B-26-5	mg/kg		3.6		0.31		0.37		0.31		0.05		0.077		0.22	4.937				
B-27-1	mg/kg		82		9.6		19		8.3		2.3		2.2		6.7	130.1				
B-27-3	mg/kg		10		1.1		2.3		1		0.28		0.28		0.91	15.87				
B-27-5	mg/kg		34		3.9		8.6		9.1		1		1.1		3.1	60.8				
B-28-1	mg/kg		1.8		0.14		0.43		0.24		0.031		0.056		0.18	2.877				
B-28-3	mg/kg		0.21		0.002		0.0079		0.0037		0.00054		0.0009		0.0028	0.0388				
B-28-6	mg/kg	<	0.0067	U	<	0.00067	U		0.0019		0.00014	<	0.00067	U		0.00078	0.0039			
B-29-1	mg/kg		1.2		0.098		0.15		0.1		0.015		0.036		0.11	1.709				
B-29-3	mg/kg	<	0.0066	U	<	0.00066	U	<	0.00066	U	<	0.00007	U	<	0.00066	U	<	0.00066	U	na
B-29-6	mg/kg	<	0.0066	U	<	0.00066	U	<	0.00066	U	<	0.00007	U	<	0.00066	U	<	0.00066	U	na
B-30-1	mg/kg		6.4		0.49		0.64		0.51		0.067		0.16		0.43	8.697				
B-30-3	mg/kg		0.48		0.036		0.062		0.043		0.0054	<	0.011	U		0.031	0.6574			
B-30-6	mg/kg		0.0075		0.00067		0.00088		0.0009		0.00008	<	0.00066	U	<	0.00066	U	0.01		
B-31-1	mg/kg		45		3.4		3.2		3		0.36		0.93		2.6	58.49				
B-31-3	mg/kg	<	0.0067	U	<	0.00067	U	<	0.00067	U	<	0.00007	U	<	0.00067	U	<	0.00067	U	na

Table B1 - PAHs in Soil

Sample Number	Units	Benzo(a)pyrene		Benzo(a)anthracene		Benzo(b)fluoranthene		Benzo(k)fluoranthene		Chrysene		Dibenzo(a,h)anthracene		Indeno(1,2,3cd)pyrene		TEF							
		Concen		Concen		Concen		Concen		Concen		Concen		Concen									
B-31-6	mg/kg	<	0.0069	U	<	0.00069	U		0.0011		<	0.00069	U		0.00012		<	0.00069	U		0.0012		
B-32-1	mg/kg		4.6			0.28			0.46			0.33			0.038			0.12			0.32	6.148	
B-32-3	mg/kg		2.2			0.14			0.24			0.2			0.019			0.083			0.17	3.052	
B-32-6	mg/kg		0.63			0.042			0.074			0.05			0.0054			0.015			0.041	8.574	
B-33-1	mg/kg		0.57		<	0.055	U		0.058		<	0.055	U		0.0061		<	0.055	U	<	0.055	U	0.6341
B-33-3	mg/kg	<	0.0068	U	<	0.00068	U	<	0.00068	U	<	0.00068	U	<	0.00007	U	<	0.00068	U	<	0.00068	U	na
B-33-5	mg/kg		0.21			0.14			0.024			0.018			0.0021		<	0.011	U		0.015	U	0.2831
B-34-1	mg/kg		6.3			0.4			0.62			0.46			0.051			0.16			0.44	U	8.431
B-34-3	mg/kg		2.7			0.15			0.23			0.18			0.019		<	0.058	U		0.17	U	3.449
B-34-6	mg/kg		4.3			0.28			0.48			0.34			0.037			0.094			0.3	U	5.831
B-35-1	mg/kg		1.1			0.076			0.13			0.098			0.011		<	0.036	U		0.089	U	1.504
B-35-3	mg/kg		0.04			0.0028			0.0054			0.0033			0.00041			0.0011			0.0031	U	0.0561
B-35-5	mg/kg		0.4			0.028			0.054			0.029			0.0038			0.012			0.029	U	3.052
B-36-1	mg/kg		10			0.72			1.5			0.89			0.1			0.29			0.8	U	14.3
B-36-3	mg/kg		0.32			0.022			0.044			0.031			0.0032			0.0093			0.025	U	0.4545
B-36-6	mg/kg		0.47			0.031			0.062			0.035			0.0044			0.013			0.035	U	0.6504
B-37-1	mg/kg		19			1.5			1.7			1.5			0.17			0.43			1.1	U	25.4
B-37-3	mg/kg		0.04			0.0029			0.0043			0.0033			0.00036			0.00099			0.0027	U	0.0545
B-37-6	mg/kg		0.079			0.0062			0.0086			0.0054			0.00072			0.0016			0.0054	U	0.1069
B-38-1	mg/kg		0.14			0.01			0.017			0.012			0.0014			0.0035			0.0096	U	0.1935
B-38-3	mg/kg		16			1			1.6			1.2			0.14			0.39			1.1	U	21.43
B-38-6	mg/kg	<	0.0067	U	<	0.00067	U		0.0054		<	0.00067	U		0.00007		<	0.00067	U	<	0.00067	U	0.0055
B-39-1	mg/kg		3.2			0.2			0.5			0.28			0.032			0.089			0.26	U	4.561
B-39-3	mg/kg		1.1			0.077			0.014			0.0088			0.01		<	0.053	U		0.077	U	1.492
B-39-6	mg/kg		0.058			0.0046			0.0079			0.0049			0.00062		<	0.0035	U		0.0798	U	na
B-40-1	mg/kg		1.3			0.094			0.13			0.1			0.012		<	0.053	U		0.083	U	1.719
B-40-3	mg/kg	<	0.0068	U	<	0.00068	U	<	0.00068	U	<	0.00068	U	<	0.00007	U	<	0.00068	U	<	0.00068	U	na
B-40-6	mg/kg		2.6			0.19			0.22			0.18			0.022		<	0.055	U		0.13	U	3.242
B-41-1	mg/kg		7.1			0.5			0.64			0.51			0.059			0.15			0.41	U	9.369
B-41-3	mg/kg		0.0072		<	0.00065	U		0.001			0.00066			0.00009		<	0.00065	U	<	0.00065	U	0.0089
B-41-6	mg/kg		0.29			0.021			0.028			0.023			0.0028			0.0066			0.017	U	0.3884
B-42-1	mg/kg		0.29			0.022			0.03			0.022			0.0029		<	0.011	U		0.02	U	0.3869
B-42-3	mg/kg		0.027			0.0022			0.0024			0.0022			0.00026		<	0.00066	U		0.0015	U	0.0356
B-42-6	mg/kg	<	0.0067	U	<	0.00067	U	<	0.00067	U	<	0.00067	U	<	0.00007	U	<	0.00067	U	<	0.00067	U	na
B-43-1	mg/kg		0.096		<	0.0068	U		0.011			0.0072			0.00091		<	0.0068	U	<	0.00068	U	0.1151
B-43-3	mg/kg		0.092			0.0062			0.01			0.0078			0.00087			0.0024			0.0068	U	0.1261
B-43-6	mg/kg		0.19			0.013			0.024			0.015			0.002		<	0.0067	U		0.016	U	0.26
B-44-1	mg/kg		11			0.5			1.1			0.81			0.094			0.3			0.93	U	14.734
B-44-3	mg/kg		27			1.5			2.6			2.1			0.22		<	0.69			2	U	36.11

Table B1 - PAHs in Soil

Sample Number	Units	Benzo(a)pyrene		Benzo(a)anthracene		Benzo(b)fluoranthene		Benzo(k)fluoranthene		Chrysene		Dibenz(a,h)anthracene		Indeno(1,2,3cd)pyrene		TEF	
		Concen		Concen		Concen		Concen		Concen		Concen		Concen			
B-44-6	mg/kg	0.027		0.0012		0.0029		0.0021		0.00021		<	0.0007 U		0.0021		0.0355
B-45-1	mg/kg	510		31		54		34		4.1		11		34		678.1	
B-45-3	mg/kg	95		6.5		8		6.5		0.69		2		5.7		124.4	
B-45-6	mg/kg	1.3		0.082		0.12		0.097		0.01		0.028		0.078		1.715	
B-46-1	mg/kg	32		2.3		4.8		3.2		0.45		0.75		2.2		45.7	
B-46-3	mg/kg	0.086		0.0078		0.007		0.0072		0.00088		0.0017		0.0047		0.1153	
B-46-6	mg/kg	0.44		0.031		0.061		0.039		0.0051		0.012		0.035		0.6231	
B-47-1	mg/kg	38		2.8		5.2		3.5		0.43		1.2		3.6		54.73	
B-47-3	mg/kg	13		1		2.2		1.2		0.22		0.38		1.1		19.1	
B-47-6	mg/kg	13		1		2.2		1.2		0.2		0.39		1.2		19.19	
B-48-1	mg/kg	2.6		0.19		0.46		0.28		0.031		0.079		0.23		3.87	
B-48-3	mg/kg	0.0012		0.0008		0.0019		0.0012		0.00013		<	0.00062 U		0.0013		0.0173
B-48-5	mg/kg	0.37		0.027		0.06		0.037		0.0045		0.0099		0.031		0.5394	
B-49-1	mg/kg	150		11		29		17		2.1		4.7		13		226.8	
B-49-1D	mg/kg	110		8.7		23		13		1.7		0.36		11		167.76	
B-49-3	mg/kg	0.44		0.036		0.078		0.049		0.0061		0.013		0.037		0.6591	
B-49-3D	mg/kg	3.1		0.17		0.41		0.22		0.027		0.075		0.23		4.232	
B-49-6	mg/kg	0.22		0.018		0.029		0.018		0.0027		0.0058		0.016		6.3095	
B-49-6D	mg/kg	0.12		0.0094		0.017		0.011		0.0015		0.0032		0.009		0.1711	
B-50-1	mg/kg	6.8		0.55		2.3		1.1		0.15		0.28		0.84		12.02	
B-50-3	mg/kg	0.8		0.074		0.23		0.092		0.018		0.029		0.084		1.327	
B-50-6	mg/kg	0.16		0.018		0.054		0.025		0.0055		0.0057		0.016		0.2842	
B-51-1	mg/kg	1.9		0.14		0.7		0.23		0.047		0.085		0.28		3.382	
B-51-3	mg/kg	0.019		0.0014		0.0067		0.003		0.00053		<	0.0011 U		0.0026		0.0332
B-51-6	mg/kg	<	0.011 U	<	0.0011 U	<	0.0011 U	<	0.0011 U	<	0.00011 U	<	0.0011 U	<	0.0011 U		na

Notes: (1) Sample depth in feet is last number in sample number (B-1-1 is sample at 1 foot depth in boring B-1), (2) PAH = polyaromatic hydrocarbons, (3) < = less than practical quantitation limit, (4) Concen = concentration of chemical detected, (5) U = not detected, (6) na = not applicable because PAHs not detected above practical quantitation limits, (7) TEF = Toxicity Equivalency Factor, (8) cells shaded light red exceed MTCA Method A Industrial soil cleanup level for Benzo(a)pyrene using toxicity equivalency methodology in WAC 173-340-708(8).

Goldendale Aluminum Company
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Table B2 - Metals and Inorganics in Soil

Sample Number	Units	Arsenic		Barium		Cadmium		Chromium		Lead		Mercury		Selenium		Silver		Fluoride		Cyanide		Cyanide (free)								
		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen								
B-1-1	mg/kg	<	10	U		91		4.4		180		19	<	0.26	U	<	10	U	<	0.51	U		1400		0.0003			0.0015		
B-1-3	mg/kg	<	11	U		45		0.57	U	3	<	5.7	U	<	0.28	U	<	11	U	<	0.57	U		480	<	0.00025	U	<	0.00025	U
B-1-6	mg/kg	<	12	U		61		0.59	U	5.5	<	5.9	U	<	0.29	U	<	12	U	<	0.59	U		120	<	0.00025	U	<	0.00025	U
B-2-1	mg/kg	<	11	U		77		4.6		24		14	<	0.26	U	<	11	U	<	0.53	U		800		0.0004		<	0.00025	U	
B-2-3	mg/kg	<	11	U		50		0.55	U	3.9	<	5.5	U	<	0.28	U	<	11	U	<	0.55	U		110	<	0.00025	U	<	0.00025	U
B-2-5	mg/kg	<	11	U		41		0.57	U	5.3	<	5.7	U	<	0.28	U	<	11	U	<	0.57	U		120	<	0.00025	U	<	0.00025	U
B-3-1	mg/kg	<	10	U		39		3.4		38		7.6	<	0.26	U	<	10	U	<	0.52	U		1700	<	0.00025	U	<	0.00025	U	
B-3-3	mg/kg	<	15	U		100		0.76	U	4.1	<	7.6	U	<	0.28	U	<	15	U	<	0.76	U		320		0.0004		<	0.00025	U
B-4-1	mg/kg	<	10	U		200		11		230		13	<	0.25	U	<	10	U	<	0.51	U		1300		0.0006		<	0.00025	U	
B-4-3	mg/kg	<	13	U		45		0.65	U	2.5	<	6.5	U	<	0.33	U	<	13	U	<	0.65	U		100	<	0.00025	U		0.0007	
B-5-1	mg/kg	<	11	U		68		0.56	U	4.3	<	5.6	U	<	0.28	U	<	11	U	<	0.58	U		1700	<	0.00025	U		0.0006	
B-6-1	mg/kg	<	11	U		68		0.56	U	4.3	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		410	<	0.00025	U		0.0003	
B-6-3	mg/kg	<	11	U		38		0.54	U	24	<	5.4	U	<	0.27	U	<	11	U	<	0.54	U		65	<	0.00025	U	<	0.00025	U
B-6-6	mg/kg	<	11	U		50		0.55	U	3.2	<	5.5	U	<	0.28	U	<	11	U	<	0.55	U		33	<	0.00025	U	<	0.00025	U
B-7-1	mg/kg	<	10	U		27		0.52	U	9.1	<	5.2	U	<	0.26	U	<	10	U	<	0.52	U		37	<	0.00025	U	<	0.00025	U
B-7-3	mg/kg	<	11	U		39		0.55	U	4.6	<	5.5	U	<	0.27	U	<	11	U	<	0.55	U		27	<	0.00025	U	<	0.00025	U
B-7-6	mg/kg	<	12	U		53		0.58	U	20	<	5.8	U	<	0.29	U	<	12	U	<	0.58	U		23	<	0.00025	U	<	0.00025	U
B-8-1	mg/kg	<	10	U		75		0.52	U	11		5.3	<	0.26	U	<	10	U	<	0.52	U		190	<	0.00025	U		0.0008		
B-9-3	mg/kg	<	13	U		42		0.66	U	7.2		7.4	<	0.33	U	<	13	U	<	0.66	U		81	<	0.00025	U		0.0004		
B-10-1	mg/kg	<	11	U		56		2.4		31		27	<	0.27	U	<	11	U	<	0.53	U		120		0.0003			0.0064		
B-10-3	mg/kg	<	11	U		62		0.57	U	8.2	<	5.7	U	<	0.28	U	<	11	U	<	0.57	U		380	<	0.00025	U		0.0004	
B-10-6	mg/kg	<	12	U		50		0.62	U	23	<	6.2	U	<	0.31	U	<	12	U	<	0.62	U		74	<	0.00025	U		0.0005	
B-11-1	mg/kg	<	10	U		34		6		20		15	<	0.62	U	<	10	U	<	0.52	U		32	<	0.00025	U		0.0013		
B-11-3	mg/kg	<	11	U		48		1.7		11		8.3	<	0.27	U	<	11	U	<	0.55	U		36	<	0.00025	U		0.0007		
B-11-5	mg/kg		12			68		2.5		27		32	<	0.27	U	<	11	U	<	0.54	U		41	<	0.00025	U		0.0008		
B-12-1	mg/kg	<	10	U		49		0.5	U	4.6	<	5	U	<	0.25	U	<	10	U	<	0.5	U		440	<	0.00025	U		0.016	
B-12-3	mg/kg	<	11	U		60		0.56	U	6	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		5.5	<	0.00025	U		0.0006	
B-13-1	mg/kg	<	10	U		68		1.2		26		13	<	0.25	U	<	10	U	<	0.5	U		530	<	0.00025	U		0.0005		
B-13-2	mg/kg	<	11	U		66		0.57	U	3.2	<	5.7	U	<	0.28	U	<	11	U	<	0.57	U		43	<	0.00025	U	<	0.0005	U
B-14-1	mg/kg	<	11	U		37		6		13		6.3	<	0.27	U	<	11	U	<	0.54	U		37	<	0.00025	U		0.0006		
B-14-3	mg/kg	<	11	U		51		0.56	U	7	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		36	<	0.00025	U		0.0024	
B-14-5	mg/kg	<	11	U		43		0.56	U	4.5	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		30	<	0.00025	U		0.0006	
B-15-1	mg/kg	<	10	U		34		2.2		41		11	<	0.26	U	<	10	U	<	0.52	U		1800	<	0.00025	U		0.0006		
B-15-3	mg/kg	<	11	U		55		0.55	U	1.8	<	5.5	U	<	0.28	U	<	11	U	<	0.54	U		51	<	0.00025	U		0.0006	
B-16-1	mg/kg	<	11	U		56		2.7		29		86	<	0.27	U	<	11	U	<	0.54	U		1300	<	0.00025	U		0.0014		
B-16-3	mg/kg	<	12	U		45		0.6	U	4	<	6	U	<	0.3	U	<	12	U	<	0.6	U		450	<	0.00025	U		0.0007	
B-16-6	mg/kg	<	14	U		47		0.69	U	1.9	<	6.9	U	<	0.34	U	<	14	U	<	0.69	U		540	<	0.00025	U		0.0005	
B-17-1	mg/kg	<	11	U		45		1.1		8.7		7	<	0.26	U	<	11	U	<	0.53	U		840	<	0.00025	U	<	0.00025	U	
B-17-3	mg/kg	<	15	U		75		0.74	U	6.5	<	7.4	U	<	0.37	U	<	15	U	<	0.74	U		1600	<	0.00025	U		0.0009	
B-17-5	mg/kg	<	17	U		67		1.1		14	<	8.4	U	<	0.42	U	<	17	U	<	0.84	U		1900		0.0004			0.013	
B-18-1	mg/kg		14			310		4.3		310		33	<	0.25	U	<	10	U	<	0.5	U		1800		0.0004			0.008		
B-18-3	mg/kg	<	11	U		62		0.53	U	13		5.4	<	0.27	U	<	11	U	<	0.53	U		1000		0.0003			0.0025		
B-18-6	mg/kg	<	11	U		53		0.54	U	3.7	<	5.4	U	<	0.27	U	<	11	U	<	0.54	U		520		0.0003	<	0.00025	U	
B-19-1	mg/kg		41			230		7		73		110	<	0.26	U	<	10	U	<	0.52	U		700		0.0004			0.02		

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Table B2 - Metals and Inorganics in Soil

Sample Number	Units	Arsenic		Barium		Cadmium		Chromium		Lead		Mercury		Selenium		Silver		Fluoride		Cyanide		Cyanide (free)									
		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen									
B-19-3	mg/kg	<	12	U		50	<	0.59	U		4.2	<	5.9	U	<	0.27	U	<	11	U	<	0.54	U		580		0.0004		0.0008		
B-20-1	mg/kg	<	11	U		41	<	0.56	U		11	<	5.4	U	<	0.27	U	<	11	U	<	0.54	U		900		0.0003		0.0004		
B-20-3	mg/kg	<	11	U		68	<	0.56	U		4.3	<	5.6	U	<	0.28	U	<	11	U	<	0.58	U		580	<	0.00025	U	0.019		
B-20-5	mg/kg	<	11	U		71	<	0.55	U		2.3	<	5.5	U	<	0.27	U	<	11	U	<	0.55	U		390	<	0.00025	U	0.0005		
B-21-1	mg/kg	<	12	U		69		18			38		18			0.26	U	<	10	U	<	0.52	U		230		0.0005		0.012		
B-21-3	mg/kg	<	11	U		49	<	0.56	U		3.3	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		100		0.0003		0.0005		
B-21-5	mg/kg	<	12	U		80	<	0.58	U		3.2	<	5.8	U	<	0.29	U	<	12	U	<	0.58	U		120		0.0003	<	0.00025	U	
B-22-1	mg/kg	<	11	U		78		1.7			99		12			0.28	U	<	11	U	<	0.55	U		980		0.0003		0.0005		
B-22-3	mg/kg	<	14	U		84	<	0.69	U		1.7	<	6.9	U	<	0.34	U	<	14	U	<	0.69	U		880		0.0003	<	0.00025	U	
B-23-1	mg/kg		22			340		1.8			51		19			0.25	U	<	10	U	<	0.76	U		1400		0.0004		0.001		
B-23-3	mg/kg	<	12	U		70		1.3			8.3		5.9			0.29	U	<	12	U	<	0.58	U		2200		0.0003		0.0013		
B-24-1	mg/kg		13			120		6.3			31		19			0.27	U	<	11	U	<	0.54	U		2900	<	0.00025	U	0.0014		
B-24-3	mg/kg	<	12	U		55	<	0.59	U		4.5	<	5.9	U	<	0.3	U	<	12	U	<	0.59	U		710	<	0.00025	U	0.0011		
B-24-6	mg/kg	<	15	U		52	<	0.73	U		5.8	<	7.3	U	<	0.37	U	<	15	U	<	0.73	U		660		0.0003		0.0004		
B-25-1	mg/kg		15			140		2.2			27		20			0.25	U	<	10	U	<	0.5	U		430		0.0003		0.0005		
B-25-3	mg/kg	<	11	U		29	<	0.55	U		1.6	<	5.5	U	<	0.27	U	<	11	U	<	0.55	U		160	<	0.00025	U	0.0005		
B-25-5	mg/kg	<	12	U		83		0.76			17		11			0.29	U	<	12	U	<	0.59	U		1800	<	0.00025	U	0.0025		
B-26-1	mg/kg		29			500		1.5			49		49			0.25	U	<	10	U	<	1	U		1200	<	0.00025	U	0.0044		
B-26-3	mg/kg	<	13	U		69	<	0.64	U		6	<	6.4	U	<	0.32	U	<	13	U	<	0.64	U		1200	<	0.00025	U	0.0017		
B-26-5	mg/kg	<	11	U		210	<	0.55	U		19		11			0.27	U	<	11	U	<	0.55	U		460	<	0.00025		0.0011		
B-27-1	mg/kg		19			85		4.2			45		68			0.28	U	<	11	U	<	0.56	U		1500	<	0.00025	U	0.0074		
B-27-3	mg/kg	<	12	U		63		1			15		12			0.29	U	<	12	U	<	0.59	U		460		0.0003		0.0046		
B-27-5	mg/kg	<	11	U		64		1.7			25		21			0.28	U	<	11	U	<	0.55	U		440	<	0.00025	U	0.0075		
B-28-1	mg/kg	<	11	U		46	<	0.53	U		8.4		6.8			0.27	U	<	11	U	<	0.53	U		130	<	0.00025	U	0.008		
B-28-3	mg/kg	<	11	U		48	<	0.55	U		3.1	<	5.5	U	<	0.27	U	<	11	U	<	0.55	U		87	<	0.00025	U	0.0007		
B-28-6	mg/kg	<	11	U		51	<	0.56	U		2.6	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		110	<	0.00025	U	0.0014		
B-29-1	mg/kg	<	10	U		38	<	0.52	U		3.3	<	5.2	U	<	0.26	U	<	10	U	<	0.52	U		97	<	0.00025	U	0.0014		
B-29-3	mg/kg	<	11	U		41	<	0.55	U		1.7	<	5.5	U	<	0.28	U	<	11	U	<	0.55	U		59	<	0.00025	U	0.0012		
B-29-6	mg/kg	<	11	U		45	<	0.53	U		6.2	<	5.3	U	<	0.27	U	<	11	U	<	0.53	U		16	<	0.00025	U	0.0047		
B-30-1	mg/kg	<	11	U		37	<	0.53	U		4.1	<	5.3	U	<	0.27	U	<	11	U	<	0.53	U		220	<	0.00025	U	<	0.00025	U
B-30-3	mg/kg	<	11	U		35	<	0.54	U		2.5	<	5.4	U	<	0.27	U	<	11	U	<	0.54	U		67	<	0.00025	U	<	0.00025	U
B-30-6	mg/kg	<	11	U		54	<	0.55	U		4.6	<	5.5	U	<	0.28	U	<	11	U	<	0.55	U		4.4	<	0.00025	U		0.0012	
B-31-1	mg/kg	<	11	U		35	<	0.53	U		4.7	<	5.3	U	<	0.26	U	<	11	U	<	0.53	U		110	<	0.00025	U		0.0012	
B-31-3	mg/kg	<	11	U		44	<	0.56	U		3.2	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		84	<	0.00025	U		0.0027	
B-31-6	mg/kg	<	11	U		58	<	0.57	U		5.2	<	5.7	U	<	0.29	U	<	11	U	<	0.57	U		4.8	<	0.00025	U		0.0014	
B-32-1	mg/kg	<	11	U		53		3.3			10		6.7			0.27	U	<	11	U	<	0.54	U		160	<	0.00025	U		0.0047	
B-32-3	mg/kg	<	11	U		46		0.87			4.8	<	5.4	U	<	0.27	U	<	11	U	<	0.54	U		170	<	0.00025	U		0.0004	
B-32-6	mg/kg	<	11	U		46	<	0.56	U		3.4	<	5.6	U	<	0.28	U	<	11	U	<	0.56	U		94	<	0.00025	U	<	0.00025	U
B-33-1	mg/kg	<	11	U		47		1.1			4.8	<	5.5	U	<	0.27	U	<	11	U	<	0.55	U		96	<	0.00025	U	<	0.00025	U
B-33-3	mg/kg	<	11	U		41	<	0.57	U		3	<	5.7	U	<	0.28	U	<	11	U	<	0.57	U		140	<	0.00025	U		0.0006	
B-33-5	mg/kg	<	11	U		48	<	0.54	U		7	<	5.4	U	<	0.27	U	<	11	U	<	0.54	U		46	<	0.00025	U		0.0011	
B-34-1	mg/kg	<	11	U		47	<	0.54	U		13		10			0.27	U	<	11	U	<	0.54	U		68	<	0.00025	U		0.0031	
B-34-3	mg/kg	<	12	U		44	<	0.58	U		3.2	<		U	<	0.29	U	<	12	U	<	0.58	U		48	<	0.00025	U		0.0005	
B-34-6	mg/kg	<	11	U		55	<	0.55	U		21		9.3			0.28	U	<	11	U	<	0.55	U		76	<	0.00025	U	<	0.00025	U

Goldendale Aluminum Company
Smelter, Goldendale WA

Table B2 - Metals and Inorganics in Soil

Sample Number	Units	Arsenic		Barium		Cadmium		Chromium		Lead		Mercury		Selenium		Silver		Fluoride		Cyanide		Cyanide (free)		
		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		
B-35-1	mg/kg	<	11 U		41		1.5		8.2		7.4	<	0.27 U	<	11 U	<	0.54 U		310	<	0.00025 U		0.0009	
B-35-3	mg/kg	<	11 U		34	<	0.56 U		2.5	<		U	<	0.28 U	<	11 U	<	0.56 U		64	<	0.00025 U	<	0.00025 U
B-35-5	mg/kg	<	11 U		39	<	0.57 U		2.8	<	5.7 U	<	0.28 U	<	11 U	<	0.57 U		71	<	0.025 U		0.0006	
B-36-1	mg/kg	<	11 U		37		0.61		10		17	<	0.27 U	<	11 U	<	0.54 U		160	<	0.00025 U		0.0007	
B-36-3	mg/kg	<	11 U		46	<	0.56 U		2.8	<	5.6 U	<	0.28 U	<	11 U	<	0.56 U		73	<	0.00025 U	<	0.00025 U	
B-36-6	mg/kg	<	12 U		62	<	0.61 U		3.9	<	6.1 U	<	0.3 U	<	12 U	<	0.61 U		76	<	0.00025 U	<	0.00025 U	
B-37-1	mg/kg	<	11 U		31		0.8		5		5.6	<	0.26 U	<	11 U	<	0.53 U		260	<	0.00025 U		0.0003	
B-37-3	mg/kg	<	11 U		61	<	0.56 U		3.9	<	5.6 U	<	0.28 U	<	11 U	<	0.56 U		44	<	0.00025 U	<	0.00025 U	
B-37-6	mg/kg	<	11 U		60	<	0.57 U		3.2	<	5.7 U	<	0.29 U	<	11 U	<	0.57 U		35	<	0.025 U		0.0009	
B-38-1	mg/kg	<	11 U		61		0.61		31		7.2	<	0.27 U	<	11 U	<	0.55 U		150	<	0.00025 U		0.0006	
B-38-3	mg/kg	<	11 U		43	<	0.53 U		2.9	<	5.3 U	<	0.26 U	<	11 U	<	0.53 U		14	<	0.00025 U	<	0.00025 U	
B-38-6	mg/kg	<	11 U		35	<	0.56 U		2.3	<	5.6 U	<	0.28 U	<	11 U	<	0.56 U		14	<	0.00025 U	<	0.00025 U	
B-39-1	mg/kg	<	12 U		64	<	0.58 U		6	<	5.8 U	<	0.29 U	<	12 U	<	0.58 U		790	<	0.00025 U	<	0.00025 U	
B-39-3	mg/kg	<	12 U		73	<	0.59 U		6.4	<	5.9 U	<	0.3 U	<	12 U	<	0.59 U		100	<	0.00025 U		0.49	
B-39-6	mg/kg	<	12 U		77	<	0.59 U		5.8		6.7	<	0.3 U	<	12 U	<	0.59 U		84		0.0003		0.0005	
B-40-1	mg/kg	<	11 U		33		0.97		3.9		5.3 U	<	0.27 U	<	11 U	<	0.53 U		540	<	0.00025 U		0.0009	
B-40-3	mg/kg	<	11 U		74	<	0.56 U		5.8		6.1	<	0.28 U	<	11 U	<	0.56 U		46	<	0.00025 U		0.0009	
B-40-6	mg/kg	<	11 U		58	<	0.55 U		4.6	<	5.5 U	<	0.27 U	<	11 U	<	0.55 U		35		0.0003		0.0008	
B-41-1	mg/kg	<	11 U		44	<	0.54 U		3.5	<	5.4 U	<	0.27 U	<	11 U	<	0.54 U		220	<	0.00025 U	<	0.00025 U	
B-41-3	mg/kg	<	11 U		51	<	0.55 U		2.8	<	5.5 U	<	0.27 U	<	11 U	<	0.55 U		53	<	0.00025 U		0.001	
B-41-6	mg/kg	<	11 U		49	<	0.53 U		26	<	5.3 U	<	0.27 U	<	11 U	<	0.53 U		40	<	0.00025 U		0.0005	
B-42-1	mg/kg	<	11 U		42	<	0.54 U		3.9	<	5.4 U	<	0.27 U	<	12 U	<	0.54 U		47	<	0.00025 U		0.0004	
B-42-3	mg/kg	<	11 U		39	<	0.55 U		2.7	<	5.5 U	<	0.27 U	<	11 U	<	0.55 U		20	<	0.00025 U	<	0.00025 U	
B-42-6	mg/kg	<	11 U		61	<	0.56 U		3.7	<	5.6 U	<	0.28 U	<	11 U	<	0.56 U		52	<	0.00025 U		0.0004	
B-43-1	mg/kg	<	11 U		68	<	0.57 U		4.5	<	5.7 U	<	0.28 U	<	11 U	<	0.57 U		97	<	0.00025 U	<	0.00025 U	
B-43-3	mg/kg	<	11 U		45	<	0.55 U		1.4	<	5.5 U	<	0.28 U	<	11 U	<	0.55 U		38	<	0.00025 U		0.0023	
B-43-6	mg/kg	<	11 U		47	<	0.56 U		4.3	<	5.6 U	<	0.28 U	<	11 U	<	0.56 U		36	<	0.00025 U		0.0007	
B-44-1	mg/kg		12		54		2.8		21		16	<	0.27 U	<	11 U	<	0.54 U		990	<	0.00025 U		0.0033	
B-44-3	mg/kg	<	10 U		49		1.8		16		13	<	0.26 U	<	10 U	<	0.52 U		1200	<	0.0025 U		0.0054	
B-44-6	mg/kg	<	12 U		61	<	0.58 U		5.3	<	5.8 U	<	0.29 U	<	12 U	<	0.58 U		88	<	0.00025 U	<	0.00025 U	
B-45-1	mg/kg	<	11 U		23		2.2		7.6		6.8	<	0.26 U	<	11 U	<	0.53 U		66	<	0.00025 U		0.004	
B-45-3	mg/kg	<	11 U		47		0.65		4.7		6.9	<	0.27 U	<	11 U	<	0.54 U		500	<	0.00025 U	<	0.00025 U	
B-45-6	mg/kg	<	11 U		56	<	0.57 U		4.3	<	5.7 U	<	0.29 U	<	11 U	<	0.57 U		220	<	0.00025 U	<	0.00025 U	
B-46-1	mg/kg	<	11 U		53		1.2		5.3	<	5.3 U	<	0.27 U	<	11 U	<	0.53 U		760	<	0.00025 U	<	0.00025 U	
B-46-3	mg/kg	<	11 U		73	<	0.57 U		2.9	<	5.7 U	<	0.28 U	<	11 U	<	0.57 U		71	<	0.00025 U	<	0.00025 U	
B-46-6	mg/kg	<	11 U		63	<	0.57 U		5.2	<	5.7 U	<	0.29 U	<	11 U	<	0.57 U		40	<	0.00025 U	<	0.00025 U	
B-47-1	mg/kg	<	10 U		62		4.1		43		26	<	0.25 U	<	10 U	<	0.5 U		1500	<	0.00025 U		0.008	
B-47-3	mg/kg	<	11 U		68		0.99		13		17	<	0.27 U	<	11 U	<	0.54 U		340	<	0.00025 U		0.0045	
B-47-6	mg/kg	<	11 U		59	<	0.53 U		6.7		8.3	<	0.27 U	<	11 U	<	0.53 U		100	<	0.00025 U		0.005	
B-48-1	mg/kg	<	11 U		54	<	0.54 U		6.3	<	5.4 U	<	0.27 U	<	11 U	<	0.54 U		1200	<	0.00025 U		0.001	
B-48-3	mg/kg	<	12 U		49	<	0.58 U		3.7	<	5.8 U	<	0.29 U	<	12 U	<	0.58 U		750	<	0.00025 U		0.0012	
B-48-5	mg/kg	<	12 U		80	<	0.59 U		6.3		5.9	<	0.29 U	<	12 U	<	0.59 U		480	<	0.00025 U		0.0015	
B-49-1	mg/kg		40		30		11		110		42	<	0.25 U	<	10 U	<	0.51 U		1500	<	0.00025 U		0.0094	
B-49-3	mg/kg	<	12 U		54	<	0.58 U		3.9	<	5.8 U	<	0.29 U	<	12 U	<	0.58 U		890	<	0.00025 U		0.0005	

Goldendale Aluminum Company
Smelter, Goldendale WA

Table B2 - Metals and Inorganics in Soil

Sample Number	Units	Arsenic		Barium		Cadmium		Chromium		Lead		Mercury		Selenium		Silver		Fluoride		Cyanide		Cyanide (free)	
		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen		Concen	
B-49-6	mg/kg	<	13 U		74	<	0.65 U		7.1	<	6.5 U	<	0.32 U	<	13 U	<	0.65 U		150	<	0.00025 U		0.0003
B-50-1	mg/kg	<	11 U		57	<	0.57 U		6.5		13	<	0.27 U	<	11 U	<	0.55 U		420	<	0.00025 U		0.0013
B-50-3	mg/kg	<	11 U		60	<	0.55 U		8.2		8.4	<	0.27 U	<	11 U	<	0.55 U		1400	<	0.00025 U	<	0.00025 U
B-50-6	mg/kg	<	11 U		56	<	0.56 U		4.6	<	5.6 U	<	0.28 U	<	11 U	<	0.56 U		120	<	0.00025 U	<	0.00025 U
B-51-1	mg/kg		19		70		7.9		31		56	<	0.27 U	<	11 U	<	0.54 U		2000	<	0.00025 U		0.0011
B-51-3	mg/kg	<	11 U		47	<	0.57 U		2.1	<	5.7 U	<	0.29 U	<	11 U	<	0.57 U		62	<	0.00025 U	<	0.00025 U
B-51-6	mg/kg	<	11 U		59	<	0.57 U		5.1	<	5.7 U	<	0.29 U	<	11 U	<	0.57 U		40	<	0.025 U	<	0.00025 U
MTCA Method A Industrial Levels			20		na		2		na		1000		2		na		na		210,000		na		70,000

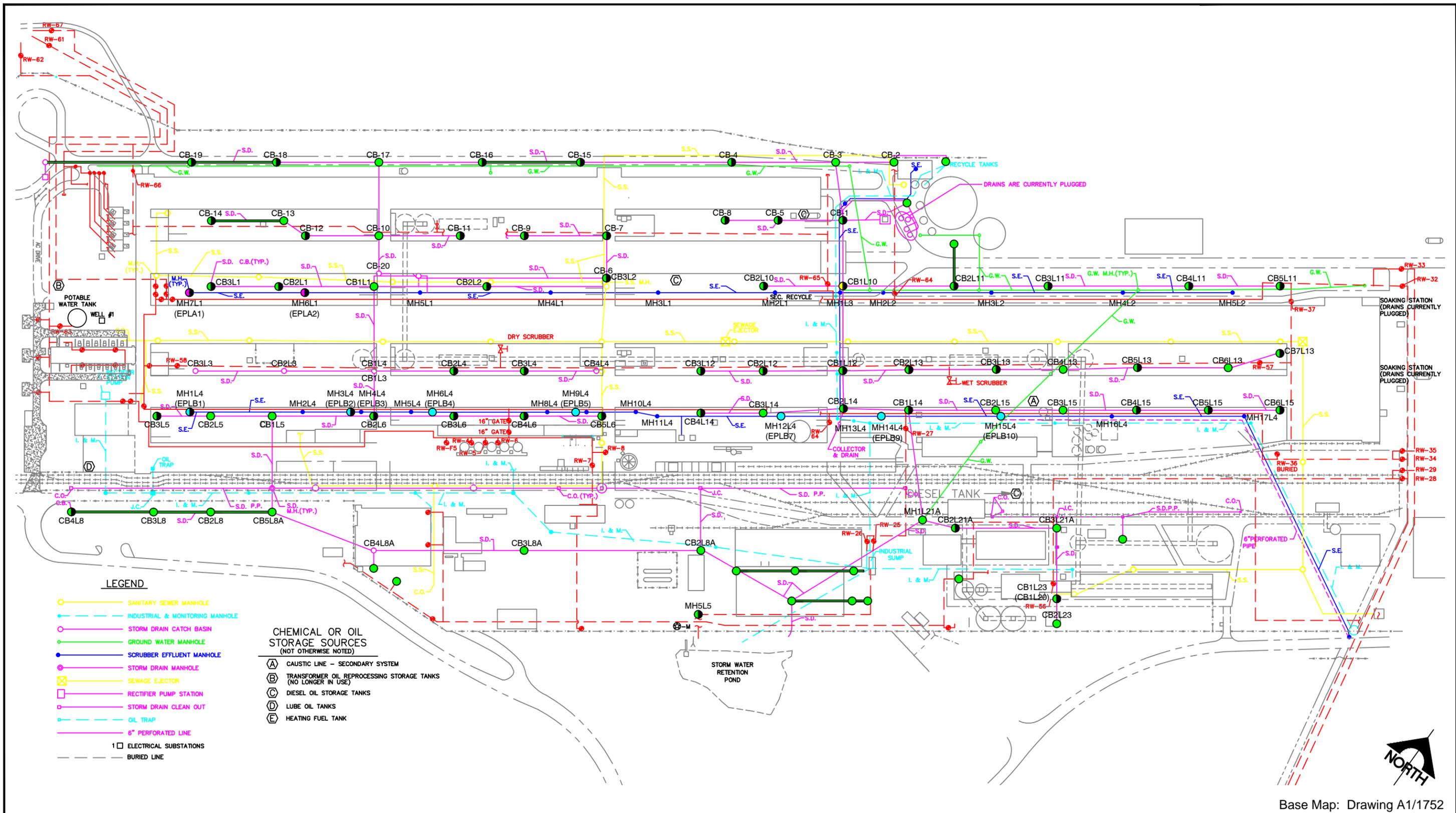
Notes: (1) Sample depth in feet is last number in sample number (B-1-1 is sample at 1 foot depth in boring B-1), (2) < = less than practical quantitation limit, (3) Concen = concentration of chemical detected, (4) U = not detected, (5) na = no industrial level available on MTCA Table 745-1, (6) cells shaded light red exceed MTCA Method A Industrial soil cleanup levels for metals and inorganics.

APPENDIX B-5

PLANT AREA AOC

PGG (2012b)

EP Line Catch Basin Results and Map



Base Map: Drawing A1/1752

DATE: JUNE 2012

PLATEAU GEOSCIENCE GROUP LLC
Po Box 1020
Battle Ground, WA 98604

LEGEND

ELECTROSTATIC PRECIPITATOR REDWOOD LINES

- MH7L1 (EPLA1) MANHOLE WOOD SAMPLE
- MH4L4 (EPLB3) MANHOLE SEDIMENT SAMPLE
- MH1L4 (EPLB1) MANHOLE WOOD AND SEDIMENT SAMPLE

SAMPLE LOGS ARE IN APPENDIX A

STORM DRAIN LINES

- CATCH BASIN SEDIMENT SAMPLE
- CATCH BASIN SEDIMENT SAMPLE AND CATCH BASIN CLEANED
- CATCH BASIN CLEANED, NO SEDIMENT SAMPLE

○ — ○ STORM LINE CLEANED

FIGURE 3

STORM DRAIN LINE AND ELECTROSTATIC PRECIPITATOR EFFLUENT LINE SAMPLE LOCATION MAP

COLUMBIA GORGE ALUMINUM COMPANY
Goldendale Aluminum Smelter
Goldendale, Washington

Table 5 - Chemicals Detected in Catch Basin Sediment Samples

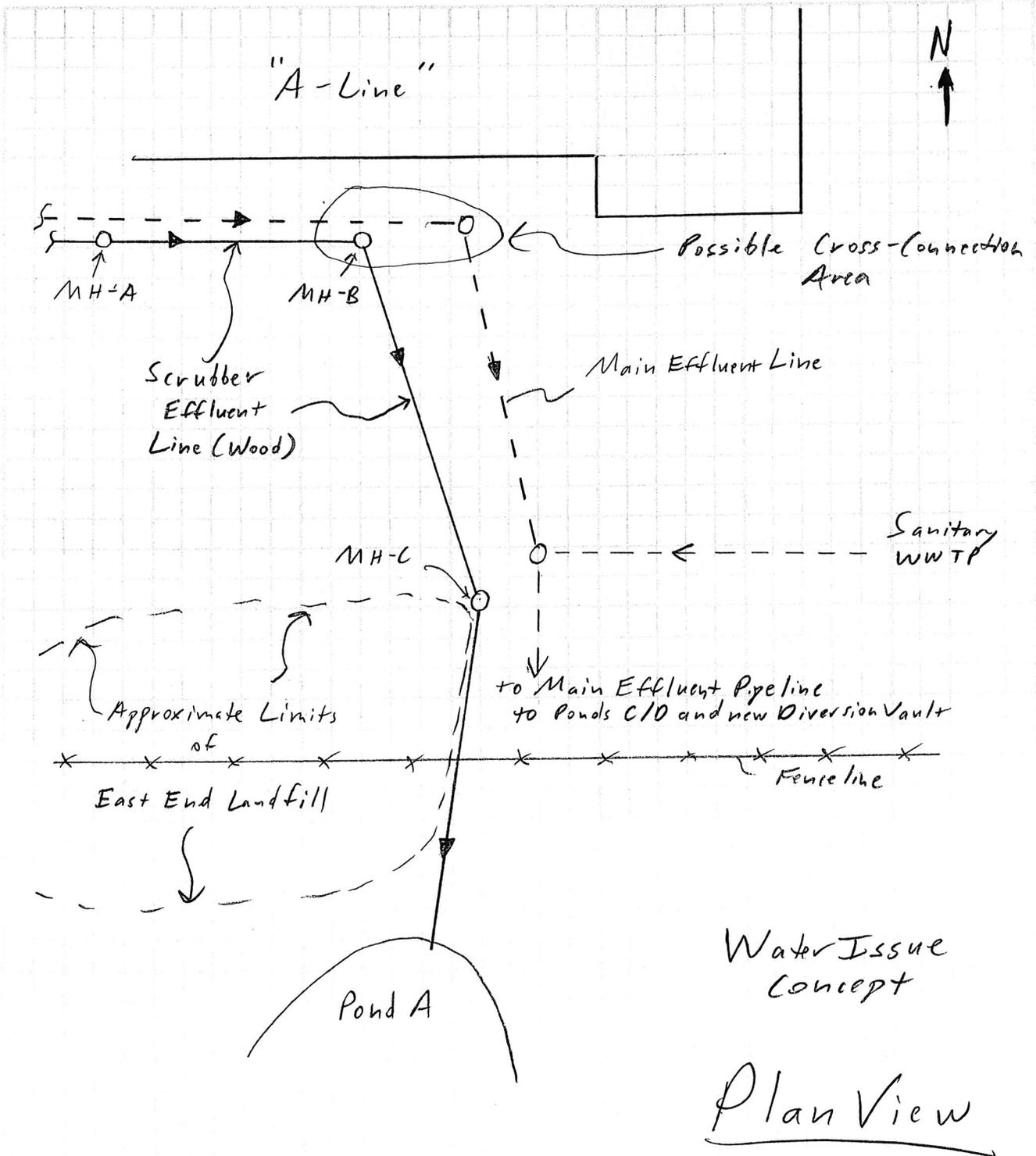
CHEMICALS	MTCA Method B Screening Values (mg/kg) ¹	Ecological Screening Levels (mg/kg) ²	STORMWATER CATCH BASIN SEDIMENT SAMPLES ³										
			CB1L23 (CB1L20)	CB2L21A	MH5L5	EPLB1 (MH1L4)	EPLB2 (MH3L4)	EPLB3 (MH4L4)	EPLB4 (MH6L4)	EPLB5 (MH9L4)	EPLB7 (MH12L4)	EPLB9 (MH14L4)	EPLB10 (MH15L4)
Total Metals (EPA 6010B/7471A) mg/kg													
Aluminum	80000	50	32000	4600	35000	29000	16000	27000	20000	26000	49000	30000	78000
Arsenic	7.6	7	< 17	< 11	58	39	66	53	24	67	32	42	45
Barium	16000	100	76	52	210	71	70	47	83	60	500	1700	190
Cadmium	2	14	4.4	< 0.57	3.1	6.4	10	4.3	5.1	4.3	2.7	4.8	12
Chromium	19	420	48	3.7	55	100	110	340	140	330	250	100	110
Lead	250	120	33	< 5.7	46	150	320	54	61	45	60	130	92
Mercury	2	0.1	< 0.42	< 0.29	< 0.32	< 0.3	1	< 0.3	< 0.28	< 0.33	3.2	< 0.35	< 0.33
Selenium	400	0.3	< 17	< 11	< 13	< 12	< 13	< 12	< 11	< 13	< 14	< 14	< 13
Silver	400	50	< 0.84	< 0.57	< 0.64	< 0.59	< 0.65	< 0.6	< 0.56	< 0.66	< 0.7	< 0.70	< 0.65
Fluoride (SM 4500-F C) mg/kg	3200		760	66	130	730	650	520	450	270	260	1800	2000
Cyanide (SW846 9010/9012) ug/g													
Total Cyanide	1600		0.091	< 0.05	0.72	0.1	< 0.05	0.26	< 0.05	< 0.05	0.071	< 0.05	< 0.05
Free Cyanide			< 0.05	< 0.05	0.45	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
PAHs (EPA 8270D/SIM) mg/kg													
Naphthalene	5	10	< 27	< 0.92	< 1	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
2-Methylnaphthalene	5		< 27	< 0.92	< 1	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
1-Methylnaphthalene ⁴	5		< 27	< 0.92	< 1	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
Acenaphthylene	2400	20	< 27	< 0.92	< 1	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
Acenaphthene	4800	20	230	< 0.92	< 1	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
Fluorene	3200	30	230	< 0.92	< 1	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
Phenanthrene	2400		1900	5	8.5	45	52	35	54	39	< 23	24	41
Anthracene	24000		280	< 0.92	1.2	< 19	< 21	< 19	< 18	< 21	< 23	< 22	< 21
Fluoranthene	3200		2800	15	28	700	380	160	250	90	53	80	140
Pyrene	2400		2100	12	22	490	290	130	180	72	45	71	110
Benzo(a)anthracene	1.4	2.5	730	8.1	12	190	200	77	90	32	31	51	73
Chrysene	140	35	880	13	24	860	860	260	300	68	79	150	130
Benzo(b)fluoranthene	1.4		890	15	26	420	750	230	190	63	89	150	170
Benzo(k)fluoranthene	14	38	510	11	13	120	170	110	94	37	41	70	89
Benzo(a)pyrene	0.14	7	640	12	14	41	53	74	77	35	39	67	100
Indeno(1,2,3-c,d)pyrene	1.4	1.9	360	7.8	11	56	100	72	64	29	35	64	88
Dibenz(a,h)anthracene	0.14		120	2.5	3.9	22	44	24	22	< 21	< 23	< 22	26
Benzo(g,h,i)perylene	2400		410	9.2	13	60	120	90	82	38	43	79	110
PCBs (EPA 8082) mg/kg													
Aroclor 1016	5.6	100	< 0.34	< 0.23	< 0.26	< 0.24	< 0.26	< 0.24	< 0.22	< 0.26	< 0.28	< 0.28	< 0.26
Aroclor 1221	14		< 0.34	< 0.23	< 0.26	< 0.24	< 0.26	< 0.24	< 0.22	< 0.26	< 0.28	< 0.28	< 0.26
Aroclor 1232	14		< 0.34	< 0.23	< 0.26	< 0.24	< 0.26	< 0.24	< 0.22	< 0.26	< 0.28	< 0.28	< 0.26
Aroclor 1242	14	1.5	< 0.34	< 0.23	< 0.26	< 0.24	< 0.26	< 0.24	< 0.22	< 0.26	< 0.28	< 0.28	< 0.26
Aroclor 1248	14		< 0.34	< 0.23	< 0.26	< 0.24	< 0.26	< 0.24	< 0.22	< 0.26	< 0.28	< 0.28	< 0.26
Aroclor 1254	0.5	0.7	0.36	< 0.23	< 0.26	0.25	3.2	< 0.24	< 0.22	1.4	0.37	8.1	< 0.26
Aroclor 1260	0.5	0.7	< 0.34	< 0.23	< 0.26	< 0.24	< 0.26	< 0.24	< 0.22	< 0.26	< 0.28	< 0.28	< 0.26
Petroleum Hydrocarbons (NWTPH) mg/kg													
Lube Oil Range	2000	200	37000	650	6600	12000	17000	8000	8800	2600	3100	11000	4100
Diesel Range	2000	200	83000	< 120	860	4300	3300	950	1900	< 660	< 700	2700	< 650

APPENDIX B-5

PLANT AREA AOC

CDM (2010)

**Water Issue Concept, Plan View and Profile Notes,
NPDES Ponds Soil Removal Project**

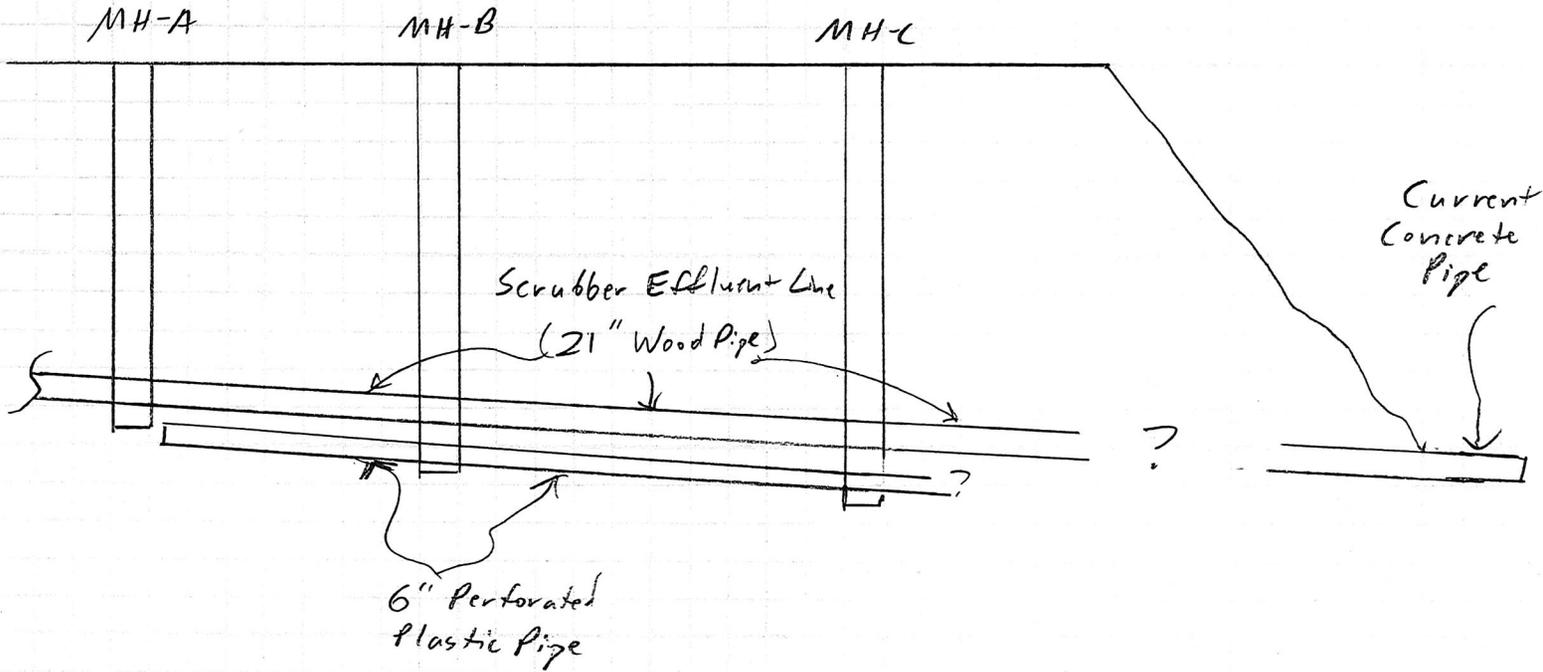


Water Issue Concept

Profile

N

S



APPENDIX B-5

PLANT AREA AOC

ARI (2010)

2010 Analytical Data Report Pond A Discharge Pipe Water Sample



Analytical Resources, Incorporated
Analytical Chemists and Consultants

June 4, 2010

Scott Adamek
CDM
14432 SE Eastgate Way, Suite 100
Bellevue, WA 98007

RE: Project ID: Goldendale, 74803
ARI Job No: QW99

Dear Mr. Adamek:

Please find enclosed the Chain-of-Custody (COC) record, sample receipt documentation, and the final results for samples from the project referenced above. Analytical Resources Inc. (ARI) accepted one water sample on May 19, 2010. For details regarding sample receipt, please refer to the enclosed Cooler Receipt Form.

The sample was analyzed for Total Cyanide, Anions, VOCs, Total Metals, SVOCs, TSS, and Free Cyanide. Note the Free Cyanide analysis was subcontracted to Columbia Analytical Services in Kelso, WA.

There were no matrix spike and matrix spike duplicate percent recoveries of 2-Chloroethylvinylether for sample **B-Outfall**. No corrective action is required for matrix QC.

The initial calibration percent RSD of Diethylphthalate was outside the control limits high. All detected results for this compound have been flagged with a "Q" qualifier. No further corrective action was required.

The continuing calibrations of 2,4-Dichlorophenol, 4-Chloro-3-methylphenol, and 4,6-Dinitro-2-Methylphenol were outside the 20% control limit high. All detected results for these compounds have been flagged with a "Q" qualifier. No further corrective action was required.

The continuing calibration of Benzo(g,h,i)perylene fell outside the 20% control limit low. All detected results for this compound have been flagged with a "Q" qualifier. No further corrective action was required.

The LCS percent recoveries of Benzyl Alcohol and 4-Chloro-2-methylphenol were outside the control limits high for **LCS-051910**. The associated sample results were undetected for these compounds. No corrective action was required.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

The matrix spike duplicate percent recoveries of Benzyl Alcohol and 4-Chloro-3-methylphenol were outside the advisory control limits high for sample **B-Outfall**. No corrective action is required for matrix QC.

An electronic copy of this report as well as all supporting raw data will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,
ANALYTICAL RESOURCES, INC.

A handwritten signature in black ink, appearing to read 'Cheronne Oreiro', written over the printed name.

Cheronne Oreiro
Project Manager
(206) 695-6214
cheronneo@arilabs.com
www.arilabs.com

Enclosures

cc: eFile: QW99

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)

ARI Assigned Number: <i>00099</i>	Turn-around Requested:	Page: <i>1</i> of <i>1</i>
ARI Client Company: <i>CDM</i>	Phone: <i>425-519-8300</i>	Date: _____ Ice Present? <i>Y</i>
Client Contact: <i>Scott Adamek</i>	No. of Coolers: <i>1</i>	Cooler Temps: <i>23</i>

Client Project Name: <i>Goldendale</i>	Analysis Requested							Notes/Comments			
Client Project #: <i>74803</i>	Samplers: <i>SHA</i>	<i>Cyanide</i>	<i>Total</i>	<i>Free Cyanide</i>	<i>(F/C, S04)</i>	<i>Anions</i>	<i>VOL</i>	<i>Metals</i>	<i>SVOL</i>	<i>TSS</i>	

Sample ID	Date	Time	Matrix	No. Containers	<i>Cyanide</i>	<i>Total</i>	<i>Free Cyanide</i>	<i>(F/C, S04)</i>	<i>Anions</i>	<i>VOL</i>	<i>Metals</i>	<i>SVOL</i>	<i>TSS</i>	
<i>B-outfall</i>	<i>18 May 10</i>	<i>1200</i>	<i>Water</i>		<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	<i>X</i>	

Comments/Special Instructions	Relinquished by: <i>[Signature]</i>	Received by: <i>[Signature]</i>	Relinquished by: _____	Received by: _____
	(Signature)	(Signature)	(Signature)	(Signature)
	Printed Name: <i>Scott H. Adamek</i>	Printed Name: <i>Jonathan Walker</i>	Printed Name:	Printed Name:
	Company: <i>CDM</i>	Company: <i>ARI</i>	Company:	Company:
Date & Time: <i>18 May 10 1230</i>	Date & Time: <i>5/19/10 0900</i>	Date & Time:	Date & Time:	

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

2000-2009



Cooler Receipt Form

ARI Client: CDM
 COC No(s): _____ (NA)
 Assigned ARI Job No: QW99

Project Name: Goldenale
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 Tracking No: 86563169300 NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
 Were custody papers included with the cooler? YES NO
 Were custody papers properly filled out (ink, signed, etc.) YES NO
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)..... 2.3
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 9041617

Cooler Accepted by: JW Date: 5/19/10 Time: 0900

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 Were all bottles sealed in individual plastic bags? YES NO
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI..... (NA) _____
 Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JW Date: 5/19/10 Time: 1121

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

No labels on the vials and no number of containers on COC.

By: JW Date: 5/19/10

			Small -> "sm"
			Peabubbles -> "pb"
			Large -> "lg"
			Headspace -> "hs"

PRESERVATION VERIFICATION 05/19/10

Page 1 of 1



ARI Job No: QW99

PC: Cheronne
VTSR: 05/19/10

Inquiry Number: NONE
Analysis Requested: 05/19/10
Contact: Adamek, Scott
Client: CDM
Logged by: JW
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

Project #: 74803
Project: Goldendale
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
10-12032 QW99A	B-Outfall	fail					TOT pass												712	2nd NACH GW		5-19-10 W

50000:66MD

Checked By JW Date 5/19/10

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: B-Outfall

Page 1 of 2

SAMPLE

Lab Sample ID: QW99A

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Data Release Authorized: 

Date Sampled: 05/18/10

Reported: 05/20/10

Date Received: 05/19/10

Instrument/Analyst: NT5/PKC

Sample Amount: 10.0 mL

Date Analyzed: 05/19/10 13:26

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.5	< 0.5	U
74-83-9	Bromomethane	0.5	< 0.5	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	< 0.2	U
179601-23-1	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: B-Outfall

Page 2 of 2

SAMPLE

Lab Sample ID: QW99A

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Date Analyzed: 05/19/10 13:26

CAS Number	Analyte	RL	Result	Q
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	97.9%
d8-Toluene	101%
Bromofluorobenzene	86.3%
d4-1,2-Dichlorobenzene	104%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: QW99-CDM
Project: Goldendale
74803

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-051910	Method Blank	10	99.3%	97.2%	88.9%	105%	0
LCS-051910	Lab Control	10	93.6%	102%	94.7%	98.6%	0
LCSD-051910	Lab Control Dup	10	96.1%	99.3%	97.2%	102%	0
QW99A	B-Outfall	10	97.9%	101%	86.3%	104%	0
QW99AMS	B-Outfall	10	94.8%	98.6%	99.5%	97.8%	0
QW99AMSD	B-Outfall	10	95.4%	99.8%	97.8%	99.3%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane
(TOL) = d8-Toluene
(BFB) = Bromofluorobenzene
(DCB) = d4-1,2-Dichlorobenzene

70-132
80-120
80-120
80-120

80-143
80-120
80-120
80-120

Prep Method: SW5030B
Log Number Range: 10-12032 to 10-12032

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: B-Outfall

Page 1 of 2

MATRIX SPIKE

Lab Sample ID: QW99A

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Data Release Authorized: *AS*

Date Sampled: 05/18/10

Reported: 05/20/10

Date Received: 05/19/10

Instrument/Analyst MS: NT5/PKC

Sample Amount MS: 10.0 mL

MSD: NT5/PKC

MSD: 10.0 mL

Date Analyzed MS: 05/19/10 13:51

Purge Volume MS: 10.0 mL

MSD: 05/19/10 14:17

MSD: 10.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Chloromethane	< 0.5 U	8.3	10.0	83.0%	8.5	10.0	85.0%	2.4%
Bromomethane	< 0.5 U	9.1	10.0	91.0%	9.9	10.0	99.0%	8.4%
Vinyl Chloride	< 0.2 U	8.6	10.0	86.0%	8.8	10.0	88.0%	2.3%
Chloroethane	< 0.2 U	9.4	10.0	94.0%	9.4	10.0	94.0%	0.0%
Methylene Chloride	< 0.5 U	9.0	10.0	90.0%	9.2	10.0	92.0%	2.2%
Acetone	< 5.0 U	43.2	50.0	86.4%	44.1	50.0	88.2%	2.1%
Carbon Disulfide	< 0.2 U	8.7	10.0	87.0%	8.8	10.0	88.0%	1.1%
1,1-Dichloroethene	< 0.2 U	9.6	10.0	96.0%	9.8	10.0	98.0%	2.1%
1,1-Dichloroethane	< 0.2 U	9.1	10.0	91.0%	9.1	10.0	91.0%	0.0%
trans-1,2-Dichloroethene	< 0.2 U	9.3	10.0	93.0%	9.5	10.0	95.0%	2.1%
cis-1,2-Dichloroethene	< 0.2 U	9.2	10.0	92.0%	9.5	10.0	95.0%	3.2%
Chloroform	< 0.2 U	9.4	10.0	94.0%	9.7	10.0	97.0%	3.1%
1,2-Dichloroethane	< 0.2 U	9.6	10.0	96.0%	9.8	10.0	98.0%	2.1%
2-Butanone	< 5.0 U	45.6	50.0	91.2%	49.0	50.0	98.0%	7.2%
1,1,1-Trichloroethane	< 0.2 U	9.6	10.0	96.0%	9.7	10.0	97.0%	1.0%
Carbon Tetrachloride	< 0.2 U	10.4	10.0	104%	10.2	10.0	102%	1.9%
Vinyl Acetate	< 1.0 U	8.3	10.0	83.0%	8.7	10.0	87.0%	4.7%
Bromodichloromethane	< 0.2 U	9.8	10.0	98.0%	10.0	10.0	100%	2.0%
1,2-Dichloropropane	< 0.2 U	9.9	10.0	99.0%	10.1	10.0	101%	2.0%
cis-1,3-Dichloropropene	< 0.2 U	9.6	10.0	96.0%	9.9	10.0	99.0%	3.1%
Trichloroethene	< 0.2 U	10.5	10.0	105%	10.4	10.0	104%	1.0%
Dibromochloromethane	< 0.2 U	10.2	10.0	102%	10.6	10.0	106%	3.8%
1,1,2-Trichloroethane	< 0.2 U	10.5	10.0	105%	10.6	10.0	106%	0.9%
Benzene	< 0.2 U	10.2	10.0	102%	10.3	10.0	103%	1.0%
trans-1,3-Dichloropropene	< 0.2 U	10.3	10.0	103%	10.1	10.0	101%	2.0%
2-Chloroethylvinylether	< 1.0 U	< 1.0 U	10.0	NA	< 1.0 U	10.0	NA	NA
Bromoform	< 0.2 U	10.2	10.0	102%	10.7	10.0	107%	4.8%
4-Methyl-2-Pentanone (MIBK)	< 5.0 U	50.6	50.0	101%	52.6	50.0	105%	3.9%
2-Hexanone	< 5.0 U	47.1	50.0	94.2%	48.5	50.0	97.0%	2.9%
Tetrachloroethene	< 0.2 U	10.1	10.0	101%	10.5	10.0	105%	3.9%
1,1,2,2-Tetrachloroethane	< 0.2 U	9.0	10.0	90.0%	9.5	10.0	95.0%	5.4%
Toluene	< 0.2 U	10.3	10.0	103%	10.7	10.0	107%	3.8%
Chlorobenzene	< 0.2 U	10.3	10.0	103%	10.3	10.0	103%	0.0%
Ethylbenzene	< 0.2 U	10.5	10.0	105%	10.6	10.0	106%	0.9%
Styrene	< 0.2 U	10.8	10.0	108%	10.9	10.0	109%	0.9%
Trichlorofluoromethane	< 0.2 U	9.8	10.0	98.0%	9.9	10.0	99.0%	1.0%
1,1,2-Trichloro-1,2,2-trifl	< 0.2 U	9.7	10.0	97.0%	9.6	10.0	96.0%	1.0%
m,p-Xylene	< 0.4 U	22.2	20.0	111%	22.2	20.0	111%	0.0%
o-Xylene	< 0.2 U	10.6	10.0	106%	10.6	10.0	106%	0.0%
1,2-Dichlorobenzene	< 0.2 U	9.7	10.0	97.0%	9.8	10.0	98.0%	1.0%
1,3-Dichlorobenzene	< 0.2 U	10.0	10.0	100%	10.0	10.0	100%	0.0%
1,4-Dichlorobenzene	< 0.2 U	9.9	10.0	99.0%	9.9	10.0	99.0%	0.0%
Acrolein	< 5.0 U	43.5	50.0	87.0%	43.9	50.0	87.8%	0.9%
Methyl Iodide	< 1.0 U	9.7	10.0	97.0%	9.8	10.0	98.0%	1.0%
Bromoethane	< 0.2 U	9.6	10.0	96.0%	9.6	10.0	96.0%	0.0%
Acrylonitrile	< 1.0 U	8.5	10.0	85.0%	8.8	10.0	88.0%	3.5%
1,1-Dichloropropene	< 0.2 U	9.7	10.0	97.0%	9.8	10.0	98.0%	1.0%

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: B-Outfall

Page 2 of 2

MATRIX SPIKE

Lab Sample ID: QW99A

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Dibromomethane	< 0.2 U	10.2	10.0	102%	10.4	10.0	104%	1.9%
1,1,1,2-Tetrachloroethane	< 0.2 U	10.4	10.0	104%	10.4	10.0	104%	0.0%
1,2-Dibromo-3-chloropropane	< 0.5 U	8.4	10.0	84.0%	8.4	10.0	84.0%	0.0%
1,2,3-Trichloropropane	< 0.5 U	9.9	10.0	99.0%	9.8	10.0	98.0%	1.0%
trans-1,4-Dichloro-2-butene	< 1.0 U	8.2	10.0	82.0%	9.3	10.0	93.0%	12.6%
1,3,5-Trimethylbenzene	< 0.2 U	9.8	10.0	98.0%	9.8	10.0	98.0%	0.0%
1,2,4-Trimethylbenzene	< 0.2 U	10.1	10.0	101%	10.0	10.0	100%	1.0%
Hexachlorobutadiene	< 0.5 U	8.9	10.0	89.0%	8.7	10.0	87.0%	2.3%
Ethylene Dibromide	< 0.2 U	10.4	10.0	104%	10.7	10.0	107%	2.8%
Bromochloromethane	< 0.2 U	10.0	10.0	100%	10.3	10.0	103%	3.0%
2,2-Dichloropropane	< 0.2 U	9.5	10.0	95.0%	9.8	10.0	98.0%	3.1%
1,3-Dichloropropane	< 0.2 U	9.7	10.0	97.0%	10.0	10.0	100%	3.0%
Isopropylbenzene	< 0.2 U	10.0	10.0	100%	10.2	10.0	102%	2.0%
n-Propylbenzene	< 0.2 U	10.1	10.0	101%	10.2	10.0	102%	1.0%
Bromobenzene	< 0.2 U	9.7	10.0	97.0%	10.0	10.0	100%	3.0%
2-Chlorotoluene	< 0.2 U	9.6	10.0	96.0%	9.9	10.0	99.0%	3.1%
4-Chlorotoluene	< 0.2 U	9.7	10.0	97.0%	9.7	10.0	97.0%	0.0%
tert-Butylbenzene	< 0.2 U	10.0	10.0	100%	10.1	10.0	101%	1.0%
sec-Butylbenzene	< 0.2 U	10.1	10.0	101%	10.1	10.0	101%	0.0%
4-Isopropyltoluene	< 0.2 U	10.0	10.0	100%	10.0	10.0	100%	0.0%
n-Butylbenzene	< 0.2 U	9.5	10.0	95.0%	9.5	10.0	95.0%	0.0%
1,2,4-Trichlorobenzene	< 0.5 U	9.0	10.0	90.0%	9.1	10.0	91.0%	1.1%
Naphthalene	< 0.5 U	9.0	10.0	90.0%	9.2	10.0	92.0%	2.2%
1,2,3-Trichlorobenzene	< 0.5 U	9.2	10.0	92.0%	9.2	10.0	92.0%	0.0%

Reported in µg/L (ppb)

NA-No recovery due to high concentration of analyte in original sample, calculated negative recovery, or undetected spike.

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C
Page 1 of 2

Sample ID: B-Outfall
MATRIX SPIKE

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/20/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Instrument/Analyst: NT5/PKC
Date Analyzed: 05/19/10 13:51

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.5	---	
74-83-9	Bromomethane	0.5	---	
75-01-4	Vinyl Chloride	0.2	---	
75-00-3	Chloroethane	0.2	---	
75-09-2	Methylene Chloride	0.5	---	
67-64-1	Acetone	5.0	---	
75-15-0	Carbon Disulfide	0.2	---	
75-35-4	1,1-Dichloroethene	0.2	---	
75-34-3	1,1-Dichloroethane	0.2	---	
156-60-5	trans-1,2-Dichloroethene	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
67-66-3	Chloroform	0.2	---	
107-06-2	1,2-Dichloroethane	0.2	---	
78-93-3	2-Butanone	5.0	---	
71-55-6	1,1,1-Trichloroethane	0.2	---	
56-23-5	Carbon Tetrachloride	0.2	---	
108-05-4	Vinyl Acetate	1.0	---	
75-27-4	Bromodichloromethane	0.2	---	
78-87-5	1,2-Dichloropropane	0.2	---	
10061-01-5	cis-1,3-Dichloropropene	0.2	---	
79-01-6	Trichloroethene	0.2	---	
124-48-1	Dibromochloromethane	0.2	---	
79-00-5	1,1,2-Trichloroethane	0.2	---	
71-43-2	Benzene	0.2	---	
10061-02-6	trans-1,3-Dichloropropene	0.2	---	
110-75-8	2-Chloroethylvinylether	1.0	---	
75-25-2	Bromoform	0.2	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	---	
591-78-6	2-Hexanone	5.0	---	
127-18-4	Tetrachloroethene	0.2	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	---	
108-88-3	Toluene	0.2	---	
108-90-7	Chlorobenzene	0.2	---	
100-41-4	Ethylbenzene	0.2	---	
100-42-5	Styrene	0.2	---	
75-69-4	Trichlorofluoromethane	0.2	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	---	
179601-23-1	m,p-Xylene	0.4	---	
95-47-6	o-Xylene	0.2	---	
95-50-1	1,2-Dichlorobenzene	0.2	---	
541-73-1	1,3-Dichlorobenzene	0.2	---	
106-46-7	1,4-Dichlorobenzene	0.2	---	
107-02-8	Acrolein	5.0	---	
74-88-4	Methyl Iodide	1.0	---	
74-96-4	Bromoethane	0.2	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.2	---	

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C
Page 2 of 2

Sample ID: B-Outfall
MATRIX SPIKE

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/19/10 13:51

QC Report No: QW99-CDM
Project: Goldendale
74803

CAS Number	Analyte	RL	Result	Q
74-95-3	Dibromomethane	0.2	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.2	---	
96-12-8	1,2-Dibromo-3-chloropropane	0.5	---	
96-18-4	1,2,3-Trichloropropane	0.5	---	
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.2	---	
95-63-6	1,2,4-Trimethylbenzene	0.2	---	
87-68-3	Hexachlorobutadiene	0.5	---	
106-93-4	Ethylene Dibromide	0.2	---	
74-97-5	Bromochloromethane	0.2	---	
594-20-7	2,2-Dichloropropane	0.2	---	
142-28-9	1,3-Dichloropropane	0.2	---	
98-82-8	Isopropylbenzene	0.2	---	
103-65-1	n-Propylbenzene	0.2	---	
108-86-1	Bromobenzene	0.2	---	
95-49-8	2-Chlorotoluene	0.2	---	
106-43-4	4-Chlorotoluene	0.2	---	
98-06-6	tert-Butylbenzene	0.2	---	
135-98-8	sec-Butylbenzene	0.2	---	
99-87-6	4-Isopropyltoluene	0.2	---	
104-51-8	n-Butylbenzene	0.2	---	
120-82-1	1,2,4-Trichlorobenzene	0.5	---	
91-20-3	Naphthalene	0.5	---	
87-61-6	1,2,3-Trichlorobenzene	0.5	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	94.8%
d8-Toluene	98.6%
Bromofluorobenzene	99.5%
d4-1,2-Dichlorobenzene	97.8%

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: B-Outfall

Page 1 of 2

MATRIX SPIKE DUP

Lab Sample ID: QW99A

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Data Release Authorized: *AB*

Date Sampled: 05/18/10

Reported: 05/20/10

Date Received: 05/19/10

Instrument/Analyst: NT5/PKC

Sample Amount: 10.0 mL

Date Analyzed: 05/19/10 14:17

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.5	---	
74-83-9	Bromomethane	0.5	---	
75-01-4	Vinyl Chloride	0.2	---	
75-00-3	Chloroethane	0.2	---	
75-09-2	Methylene Chloride	0.5	---	
67-64-1	Acetone	5.0	---	
75-15-0	Carbon Disulfide	0.2	---	
75-35-4	1,1-Dichloroethene	0.2	---	
75-34-3	1,1-Dichloroethane	0.2	---	
156-60-5	trans-1,2-Dichloroethene	0.2	---	
156-59-2	cis-1,2-Dichloroethene	0.2	---	
67-66-3	Chloroform	0.2	---	
107-06-2	1,2-Dichloroethane	0.2	---	
78-93-3	2-Butanone	5.0	---	
71-55-6	1,1,1-Trichloroethane	0.2	---	
56-23-5	Carbon Tetrachloride	0.2	---	
108-05-4	Vinyl Acetate	1.0	---	
75-27-4	Bromodichloromethane	0.2	---	
78-87-5	1,2-Dichloropropane	0.2	---	
10061-01-5	cis-1,3-Dichloropropene	0.2	---	
79-01-6	Trichloroethene	0.2	---	
124-48-1	Dibromochloromethane	0.2	---	
79-00-5	1,1,2-Trichloroethane	0.2	---	
71-43-2	Benzene	0.2	---	
10061-02-6	trans-1,3-Dichloropropene	0.2	---	
110-75-8	2-Chloroethylvinylether	1.0	---	
75-25-2	Bromoform	0.2	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	---	
591-78-6	2-Hexanone	5.0	---	
127-18-4	Tetrachloroethene	0.2	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	---	
108-88-3	Toluene	0.2	---	
108-90-7	Chlorobenzene	0.2	---	
100-41-4	Ethylbenzene	0.2	---	
100-42-5	Styrene	0.2	---	
75-69-4	Trichlorofluoromethane	0.2	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	---	
179601-23-1	m,p-Xylene	0.4	---	
95-47-6	o-Xylene	0.2	---	
95-50-1	1,2-Dichlorobenzene	0.2	---	
541-73-1	1,3-Dichlorobenzene	0.2	---	
106-46-7	1,4-Dichlorobenzene	0.2	---	
107-02-8	Acrolein	5.0	---	
74-88-4	Methyl Iodide	1.0	---	
74-96-4	Bromoethane	0.2	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.2	---	

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C
Page 2 of 2

Sample ID: B-Outfall
MATRIX SPIKE DUP

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/19/10 14:17

QC Report No: QW99-CDM
Project: Goldendale
74803

CAS Number	Analyte	RL	Result	Q
74-95-3	Dibromomethane	0.2	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.2	---	
96-12-8	1,2-Dibromo-3-chloropropane	0.5	---	
96-18-4	1,2,3-Trichloropropane	0.5	---	
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.2	---	
95-63-6	1,2,4-Trimethylbenzene	0.2	---	
87-68-3	Hexachlorobutadiene	0.5	---	
106-93-4	Ethylene Dibromide	0.2	---	
74-97-5	Bromochloromethane	0.2	---	
594-20-7	2,2-Dichloropropane	0.2	---	
142-28-9	1,3-Dichloropropane	0.2	---	
98-82-8	Isopropylbenzene	0.2	---	
103-65-1	n-Propylbenzene	0.2	---	
108-86-1	Bromobenzene	0.2	---	
95-49-8	2-Chlorotoluene	0.2	---	
106-43-4	4-Chlorotoluene	0.2	---	
98-06-6	tert-Butylbenzene	0.2	---	
135-98-8	sec-Butylbenzene	0.2	---	
99-87-6	4-Isopropyltoluene	0.2	---	
104-51-8	n-Butylbenzene	0.2	---	
120-82-1	1,2,4-Trichlorobenzene	0.5	---	
91-20-3	Naphthalene	0.5	---	
87-61-6	1,2,3-Trichlorobenzene	0.5	---	

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	95.4%
d8-Toluene	99.8%
Bromofluorobenzene	97.8%
d4-1,2-Dichlorobenzene	99.3%

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: LCS-051910

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LAB CONTROL SAMPLE

Lab Sample ID: LCS-051910

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Data Release Authorized: 

Date Sampled: NA

Reported: 05/20/10

Date Received: NA

Instrument/Analyst LCS: NT5/PKC

Sample Amount LCS: 10.0 mL

LCSD: NT5/PKC

LCSD: 10.0 mL

Date Analyzed LCS: 05/19/10 11:31

Purge Volume LCS: 10.0 mL

LCSD: 05/19/10 11:57

LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	8.4	10.0	84.0%	8.6	10.0	86.0%	2.4%
Bromomethane	10.0	10.0	100%	10.4	10.0	104%	3.9%
Vinyl Chloride	8.7	10.0	87.0%	8.8	10.0	88.0%	1.1%
Chloroethane	9.2	10.0	92.0%	9.6	10.0	96.0%	4.3%
Methylene Chloride	9.1	10.0	91.0%	9.1	10.0	91.0%	0.0%
Acetone	44.3	50.0	88.6%	46.7	50.0	93.4%	5.3%
Carbon Disulfide	9.5	10.0	95.0%	9.7	10.0	97.0%	2.1%
1,1-Dichloroethene	9.6	10.0	96.0%	9.8	10.0	98.0%	2.1%
1,1-Dichloroethane	9.1	10.0	91.0%	9.0	10.0	90.0%	1.1%
trans-1,2-Dichloroethene	9.5	10.0	95.0%	9.6	10.0	96.0%	1.0%
cis-1,2-Dichloroethene	9.3	10.0	93.0%	9.5	10.0	95.0%	2.1%
Chloroform	9.6	10.0	96.0%	9.6	10.0	96.0%	0.0%
1,2-Dichloroethane	9.8	10.0	98.0%	9.9	10.0	99.0%	1.0%
2-Butanone	46.6	50.0	93.2%	49.3	50.0	98.6%	5.6%
1,1,1-Trichloroethane	9.6	10.0	96.0%	9.8	10.0	98.0%	2.1%
Carbon Tetrachloride	10.4	10.0	104%	10.5	10.0	105%	1.0%
Vinyl Acetate	8.4	10.0	84.0%	8.8	10.0	88.0%	4.7%
Bromodichloromethane	10.2	10.0	102%	10.2	10.0	102%	0.0%
1,2-Dichloropropane	10.0	10.0	100%	10.0	10.0	100%	0.0%
cis-1,3-Dichloropropene	10.2	10.0	102%	10.4	10.0	104%	1.9%
Trichloroethene	10.2	10.0	102%	10.4	10.0	104%	1.9%
Dibromochloromethane	10.8	10.0	108%	10.8	10.0	108%	0.0%
1,1,2-Trichloroethane	10.9	10.0	109%	11.0	10.0	110%	0.9%
Benzene	10.1	10.0	101%	10.1	10.0	101%	0.0%
trans-1,3-Dichloropropene	10.7	10.0	107%	10.6	10.0	106%	0.9%
2-Chloroethylvinylether	9.9	10.0	99.0%	10.0	10.0	100%	1.0%
Bromoform	11.1	10.0	111%	11.3	10.0	113%	1.8%
4-Methyl-2-Pentanone (MIBK)	52.2	50.0	104%	53.3	50.0	107%	2.1%
2-Hexanone	48.4	50.0	96.8%	49.7	50.0	99.4%	2.7%
Tetrachloroethene	10.5	10.0	105%	10.4	10.0	104%	1.0%
1,1,2,2-Tetrachloroethane	9.4	10.0	94.0%	9.8	10.0	98.0%	4.2%
Toluene	10.7	10.0	107%	10.6	10.0	106%	0.9%
Chlorobenzene	10.4	10.0	104%	10.4	10.0	104%	0.0%
Ethylbenzene	10.6	10.0	106%	10.7	10.0	107%	0.9%
Styrene	11.0	10.0	110%	11.1	10.0	111%	0.9%
Trichlorofluoromethane	9.7	10.0	97.0%	9.9	10.0	99.0%	2.0%
1,1,2-Trichloro-1,2,2-trifluoroethane	9.5	10.0	95.0%	9.7	10.0	97.0%	2.1%
m,p-Xylene	21.8	20.0	109%	22.2	20.0	111%	1.8%
o-Xylene	10.4	10.0	104%	10.5	10.0	105%	1.0%
1,2-Dichlorobenzene	9.9	10.0	99.0%	10.4	10.0	104%	4.9%
1,3-Dichlorobenzene	10.2	10.0	102%	10.5	10.0	105%	2.9%
1,4-Dichlorobenzene	9.9	10.0	99.0%	10.3	10.0	103%	4.0%
Acrolein	45.6	50.0	91.2%	45.9	50.0	91.8%	0.7%
Methyl Iodide	9.9	10.0	99.0%	9.9	10.0	99.0%	0.0%
Bromoethane	9.5	10.0	95.0%	9.9	10.0	99.0%	4.1%

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: LCS-051910

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LAB CONTROL SAMPLE

Lab Sample ID: LCS-051910

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Analyte	LCS	Spike	LCS	LCSD	Spike	LCS	RPD
		Added-LCS	Recovery		Added-LCSD	Recovery	
Acrylonitrile	8.9	10.0	89.0%	8.9	10.0	89.0%	0.0%
1,1-Dichloropropene	9.7	10.0	97.0%	9.8	10.0	98.0%	1.0%
Dibromomethane	10.3	10.0	103%	10.6	10.0	106%	2.9%
1,1,1,2-Tetrachloroethane	10.6	10.0	106%	10.5	10.0	105%	0.9%
1,2-Dibromo-3-chloropropane	8.6	10.0	86.0%	9.1	10.0	91.0%	5.6%
1,2,3-Trichloropropane	9.9	10.0	99.0%	10.5	10.0	105%	5.9%
trans-1,4-Dichloro-2-butene	9.9	10.0	99.0%	10.4	10.0	104%	4.9%
1,3,5-Trimethylbenzene	10.1	10.0	101%	10.3	10.0	103%	2.0%
1,2,4-Trimethylbenzene	10.2	10.0	102%	10.5	10.0	105%	2.9%
Hexachlorobutadiene	8.6	10.0	86.0%	9.3	10.0	93.0%	7.8%
Ethylene Dibromide	11.0	10.0	110%	10.8	10.0	108%	1.8%
Bromochloromethane	10.1	10.0	101%	10.4	10.0	104%	2.9%
2,2-Dichloropropane	9.5	10.0	95.0%	9.7	10.0	97.0%	2.1%
1,3-Dichloropropane	10.2	10.0	102%	10.1	10.0	101%	1.0%
Isopropylbenzene	10.2	10.0	102%	10.4	10.0	104%	1.9%
n-Propylbenzene	10.2	10.0	102%	10.3	10.0	103%	1.0%
Bromobenzene	10.1	10.0	101%	10.3	10.0	103%	2.0%
2-Chlorotoluene	9.8	10.0	98.0%	10.1	10.0	101%	3.0%
4-Chlorotoluene	9.8	10.0	98.0%	10.0	10.0	100%	2.0%
tert-Butylbenzene	10.1	10.0	101%	10.2	10.0	102%	1.0%
sec-Butylbenzene	10.1	10.0	101%	10.5	10.0	105%	3.9%
4-Isopropyltoluene	10.1	10.0	101%	10.5	10.0	105%	3.9%
n-Butylbenzene	9.4	10.0	94.0%	10.0	10.0	100%	6.2%
1,2,4-Trichlorobenzene	9.4	10.0	94.0%	10.2	10.0	102%	8.2%
Naphthalene	9.5	10.0	95.0%	10.3	10.0	103%	8.1%
1,2,3-Trichlorobenzene	9.5	10.0	95.0%	10.1	10.0	101%	6.1%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	93.6%	96.1%
d8-Toluene	102%	99.3%
Bromofluorobenzene	94.7%	97.2%
d4-1,2-Dichlorobenzene	98.6%	102%

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C
Page 1 of 2

Sample ID: MB-051910
METHOD BLANK

Lab Sample ID: MB-051910
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/20/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT5/PKC
Date Analyzed: 05/19/10 12:22

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.5	< 0.5	U
74-83-9	Bromomethane	0.5	< 0.5	U
75-01-4	Vinyl Chloride	0.2	< 0.2	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	0.5	< 0.5	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	1.0	< 1.0	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	< 0.2	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	< 0.2	U
179601-23-1	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Methyl Iodide	1.0	< 1.0	U
74-96-4	Bromoethane	0.2	< 0.2	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.2	< 0.2	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-051910

Page 2 of 2

METHOD BLANK

Lab Sample ID: MB-051910

QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Date Analyzed: 05/19/10 12:22

CAS Number	Analyte	RL	Result	Q
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.5	< 0.5	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.5	< 0.5	U
106-93-4	Ethylene Dibromide	0.2	< 0.2	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.2	< 0.2	U
142-28-9	1,3-Dichloropropane	0.2	< 0.2	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.2	< 0.2	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.2	< 0.2	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.5	< 0.5	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	99.3%
d8-Toluene	97.2%
Bromofluorobenzene	88.9%
d4-1,2-Dichlorobenzene	105%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: B-Outfall
SAMPLE

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/21/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Date Extracted: 05/19/10
Date Analyzed: 05/20/10 13:00
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	Phenol	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	1.0	< 1.0 U
95-57-8	2-Chlorophenol	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	5.0	< 5.0 U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0 U
95-48-7	2-Methylphenol	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	1.0	< 1.0 U
106-44-5	4-Methylphenol	1.0	< 1.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	1.0	< 1.0 U
67-72-1	Hexachloroethane	1.0	< 1.0 U
98-95-3	Nitrobenzene	1.0	< 1.0 U
78-59-1	Isophorone	1.0	< 1.0 U
88-75-5	2-Nitrophenol	5.0	< 5.0 U
105-67-9	2,4-Dimethylphenol	1.0	< 1.0 U
65-85-0	Benzoic Acid	10	< 10 U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	5.0	< 5.0 U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0 U
91-20-3	Naphthalene	1.0	< 1.0 U
106-47-8	4-Chloroaniline	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	1.0	< 1.0 U
59-50-7	4-Chloro-3-methylphenol	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	5.0	< 5.0 U
95-95-4	2,4,5-Trichlorophenol	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	1.0	< 1.0 U
88-74-4	2-Nitroaniline	5.0	< 5.0 U
131-11-3	Dimethylphthalate	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
99-09-2	3-Nitroaniline	5.0	< 5.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	10	< 10 U
100-02-7	4-Nitrophenol	5.0	< 5.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	5.0	< 5.0 U
121-14-2	2,4-Dinitrotoluene	5.0	< 5.0 U
84-66-2	Diethylphthalate	1.0	< 1.0 U

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: B-Outfall
SAMPLE

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/20/10 13:00

QC Report No: QW99-CDM
Project: Goldendale
74803

CAS Number	Analyte	RL	Result
7005-72-3	4-Chlorophenyl-phenylether	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
100-01-6	4-Nitroaniline	5.0	< 5.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	5.0	< 5.0 U
101-55-3	4-Bromophenyl-phenylether	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	65.6%	2-Fluorobiphenyl	67.2%
d14-p-Terphenyl	78.8%	d4-1,2-Dichlorobenzene	60.0%
d5-Phenol	62.7%	2-Fluorophenol	60.8%
2,4,6-Tribromophenol	83.7%	d4-2-Chlorophenol	65.9%

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: QW99-CDM
Project: Goldendale
74803

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
MB-051910	74.0%	73.6%	89.2%	66.0%	71.5%	66.9%	89.9%	73.9%	0	
LCS-051910	79.2%	67.6%	71.2%	81.2%	76.8%	73.9%	85.3%	79.5%	0	
B-Outfall	65.6%	67.2%	78.8%	60.0%	62.7%	60.8%	83.7%	65.9%	0	
B-Outfall MS	71.6%	62.8%	70.8%	76.4%	67.2%	65.1%	81.3%	71.7%	0	
B-Outfall MSD	78.4%	68.4%	74.8%	84.8%	76.3%	73.9%	85.1%	79.7%	0	

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(46-100)	(39-100)
(FBP) = 2-Fluorobiphenyl	(49-100)	(42-100)
(TPH) = d14-p-Terphenyl	(53-119)	(26-114)
(DCB) = d4-1,2-Dichlorobenzene	(38-100)	(32-100)
(PHL) = d5-Phenol	(50-100)	(41-100)
(2FP) = 2-Fluorophenol	(46-100)	(38-100)
(TBP) = 2,4,6-Tribromophenol	(52-123)	(48-118)
(2CP) = d4-2-Chlorophenol	(53-100)	(44-100)

Prep Method: SW3520C
Log Number Range: 10-12032 to 10-12032

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: B-Outfall
MS/MSD

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/28/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Date Extracted MS/MSD: 05/19/10
Date Analyzed MS: 05/20/10 13:32
MSD: 05/20/10 14:04
Instrument/Analyst MS: NT6/JZ
MSD: NT6/JZ

Sample Amount MS: 475 mL
MSD: 475 mL
Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL
Dilution Factor MS: 1.00
MSD: 1.00

GPC Cleanup: NO

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	< 1.0 U	18.3	26.3	69.6%	20.8	26.3	79.1%	12.8%
Bis-(2-Chloroethyl) Ether	< 1.0 U	18.6	26.3	70.7%	20.5	26.3	77.9%	9.7%
2-Chlorophenol	< 1.0 U	20.3	26.3	77.2%	22.4	26.3	85.2%	9.8%
1,3-Dichlorobenzene	< 1.0 U	12.6	26.3	47.9%	14.8	26.3	56.3%	16.1%
1,4-Dichlorobenzene	< 1.0 U	13.2	26.3	50.2%	15.3	26.3	58.2%	14.7%
Benzyl Alcohol	< 5.0 U	51.2	52.6	97.3%	57.2	52.6	109%	11.1%
1,2-Dichlorobenzene	< 1.0 U	14.6	26.3	55.5%	17.1	26.3	65.0%	15.8%
2-Methylphenol	< 1.0 U	21.4	26.3	81.4%	23.6	26.3	89.7%	9.8%
2,2'-Oxybis(1-Chloropropane)	< 1.0 U	19.0	26.3	72.2%	21.0	26.3	79.8%	10.0%
4-Methylphenol	< 1.0 U	46.0	52.6	87.5%	51.4	52.6	97.7%	11.1%
N-Nitroso-Di-N-Propylamine	< 1.0 U	22.7	26.3	86.3%	24.4	26.3	92.8%	7.2%
Hexachloroethane	< 1.0 U	10.9	26.3	41.4%	13.2	26.3	50.2%	19.1%
Nitrobenzene	< 1.0 U	20.4	26.3	77.6%	22.2	26.3	84.4%	8.5%
Isophorone	< 1.0 U	23.0	26.3	87.5%	24.9	26.3	94.7%	7.9%
2-Nitrophenol	< 5.0 U	21.2	26.3	80.6%	23.6	26.3	89.7%	10.7%
2,4-Dimethylphenol	< 1.0 U	20.7	26.3	78.7%	22.8	26.3	86.7%	9.7%
Benzoic Acid	< 10.0 U	55.3	78.9	70.1%	65.8	78.9	83.4%	17.3%
bis(2-Chloroethoxy) Methane	< 1.0 U	19.4	26.3	73.8%	21.4	26.3	81.4%	9.8%
2,4-Dichlorophenol	< 5.0 U	23.3 Q	26.3	88.6%	25.8 Q	26.3	98.1%	10.2%
1,2,4-Trichlorobenzene	< 1.0 U	14.2	26.3	54.0%	16.4	26.3	62.4%	14.4%
Naphthalene	< 1.0 U	18.7	26.3	71.1%	21.0	26.3	79.8%	11.6%
4-Chloroaniline	< 5.0 U	61.0	63.2	96.5%	73.5	63.2	116%	18.6%
Hexachlorobutadiene	< 1.0 U	11.5	26.3	43.7%	14.0	26.3	53.2%	19.6%
4-Chloro-3-methylphenol	< 5.0 U	26.7 Q	26.3	102%	29.1 Q	26.3	111%	8.6%
2-Methylnaphthalene	< 1.0 U	21.0	26.3	79.8%	23.5	26.3	89.4%	11.2%
Hexachlorocyclopentadiene	< 5.0 U	39.6	78.9	50.2%	44.8	78.9	56.8%	12.3%
2,4,6-Trichlorophenol	< 5.0 U	20.2	26.3	76.8%	21.8	26.3	82.9%	7.6%
2,4,5-Trichlorophenol	< 5.0 U	20.2	26.3	76.8%	21.9	26.3	83.3%	8.1%
2-Chloronaphthalene	< 1.0 U	15.5	26.3	58.9%	17.1	26.3	65.0%	9.8%
2-Nitroaniline	< 5.0 U	22.5	26.3	85.6%	23.7	26.3	90.1%	5.2%
Dimethylphthalate	< 1.0 U	21.0	26.3	79.8%	22.1	26.3	84.0%	5.1%
Acenaphthylene	< 1.0 U	17.7	26.3	67.3%	19.1	26.3	72.6%	7.6%
3-Nitroaniline	< 5.0 U	76.8	67.4	114%	79.2	67.4	118%	3.1%
Acenaphthene	< 1.0 U	17.9	26.3	68.1%	19.4	26.3	73.8%	8.0%
2,4-Dinitrophenol	< 10.0 U	78.4	78.9	99.4%	83.0	78.9	105%	5.7%
4-Nitrophenol	< 5.0 U	24.1	26.3	91.6%	26.3	26.3	100%	8.7%
Dibenzofuran	< 1.0 U	20.7	26.3	78.7%	22.4	26.3	85.2%	7.9%
2,6-Dinitrotoluene	< 5.0 U	20.1	26.3	76.4%	21.0	26.3	79.8%	4.4%
2,4-Dinitrotoluene	< 5.0 U	21.7	26.3	82.5%	22.6	26.3	85.9%	4.1%
Diethylphthalate	< 1.0 U	15.5 Q	26.3	58.9%	16.3 Q	26.3	62.0%	5.0%
4-Chlorophenyl-phenylether	< 1.0 U	18.5	26.3	70.3%	19.7	26.3	74.9%	6.3%
Fluorene	< 1.0 U	20.0	26.3	76.0%	21.4	26.3	81.4%	6.8%
4-Nitroaniline	< 5.0 U	15.7	26.3	59.7%	16.6	26.3	63.1%	5.6%
4,6-Dinitro-2-Methylphenol	< 10.0 U	84.8 Q	78.9	107%	88.0 Q	78.9	112%	3.7%
N-Nitrosodiphenylamine	< 5.0 U	19.3	26.3	73.4%	20.7	26.3	78.7%	7.0%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: B-Outfall
MS/MSD

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/20/10 13:32

QC Report No: QW99-CDM
Project: Goldendale
74803

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
4-Bromophenyl-phenylether	< 1.0 U	20.9	26.3	79.5%	22.5	26.3	85.6%	7.4%
Hexachlorobenzene	< 1.0 U	21.4	26.3	81.4%	22.5	26.3	85.6%	5.0%
Pentachlorophenol	< 5.0 U	19.6	26.3	74.5%	20.8	26.3	79.1%	5.9%
Phenanthrene	< 1.0 U	21.8	26.3	82.9%	22.8	26.3	86.7%	4.5%
Carbazole	< 1.0 U	19.9	26.3	75.7%	20.9	26.3	79.5%	4.9%
Anthracene	< 1.0 U	20.9	26.3	79.5%	21.7	26.3	82.5%	3.8%
Di-n-Butylphthalate	< 1.0 U	22.0	26.3	83.7%	22.4	26.3	85.2%	1.8%
Fluoranthene	< 1.0 U	23.5	26.3	89.4%	24.1	26.3	91.6%	2.5%
Pyrene	< 1.0 U	19.6	26.3	74.5%	20.4	26.3	77.6%	4.0%
Butylbenzylphthalate	< 1.0 U	19.2	26.3	73.0%	19.8	26.3	75.3%	3.1%
3,3'-Dichlorobenzidine	< 5.0 U	35.0	67.4	51.9%	34.2	67.4	50.7%	2.3%
Benzo(a)anthracene	< 1.0 U	22.4	26.3	85.2%	23.3	26.3	88.6%	3.9%
bis(2-Ethylhexyl)phthalate	< 1.0 U	20.9	26.3	79.5%	22.0	26.3	83.7%	5.1%
Chrysene	< 1.0 U	20.0	26.3	76.0%	21.0	26.3	79.8%	4.9%
Di-n-Octyl phthalate	< 1.0 U	21.3	26.3	81.0%	22.3	26.3	84.8%	4.6%
Benzo(b)fluoranthene	< 1.0 U	24.1	26.3	91.6%	26.7	26.3	102%	10.2%
Benzo(k)fluoranthene	< 1.0 U	25.5	26.3	97.0%	25.3	26.3	96.2%	0.8%
Benzo(a)pyrene	< 1.0 U	20.4	26.3	77.6%	21.1	26.3	80.2%	3.4%
Indeno(1,2,3-cd)pyrene	< 1.0 U	21.1	26.3	80.2%	21.9	26.3	83.3%	3.7%
Dibenz(a,h)anthracene	< 1.0 U	21.4	26.3	81.4%	22.2	26.3	84.4%	3.7%
Benzo(g,h,i)perylene	< 1.0 U	17.5 Q	26.3	66.5%	17.8 Q	26.3	67.7%	1.7%
1-Methylnaphthalene	< 1.0 U	20.8	26.3	79.1%	22.9	26.3	87.1%	9.6%

Results reported in µg/L
RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: B-Outfall
MATRIX SPIKE

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/21/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Date Extracted: 05/19/10
Date Analyzed: 05/20/10 13:32
Instrument/Analyst: NT6/JZ

Sample Amount: 475 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	Phenol	1.0	---
111-44-4	Bis-(2-Chloroethyl) Ether	1.0	---
95-57-8	2-Chlorophenol	1.0	---
541-73-1	1,3-Dichlorobenzene	1.0	---
106-46-7	1,4-Dichlorobenzene	1.0	---
100-51-6	Benzyl Alcohol	5.3	---
95-50-1	1,2-Dichlorobenzene	1.0	---
95-48-7	2-Methylphenol	1.0	---
108-60-1	2,2'-Oxybis(1-Chloropropane)	1.0	---
106-44-5	4-Methylphenol	1.0	---
621-64-7	N-Nitroso-Di-N-Propylamine	1.0	---
67-72-1	Hexachloroethane	1.0	---
98-95-3	Nitrobenzene	1.0	---
78-59-1	Isophorone	1.0	---
88-75-5	2-Nitrophenol	5.3	---
105-67-9	2,4-Dimethylphenol	1.0	---
65-85-0	Benzoic Acid	10	---
111-91-1	bis(2-Chloroethoxy) Methane	1.0	---
120-83-2	2,4-Dichlorophenol	5.3	---
120-82-1	1,2,4-Trichlorobenzene	1.0	---
91-20-3	Naphthalene	1.0	---
106-47-8	4-Chloroaniline	5.3	---
87-68-3	Hexachlorobutadiene	1.0	---
59-50-7	4-Chloro-3-methylphenol	5.3	---
91-57-6	2-Methylnaphthalene	1.0	---
77-47-4	Hexachlorocyclopentadiene	5.3	---
88-06-2	2,4,6-Trichlorophenol	5.3	---
95-95-4	2,4,5-Trichlorophenol	5.3	---
91-58-7	2-Chloronaphthalene	1.0	---
88-74-4	2-Nitroaniline	5.3	---
131-11-3	Dimethylphthalate	1.0	---
208-96-8	Acenaphthylene	1.0	---
99-09-2	3-Nitroaniline	5.3	---
83-32-9	Acenaphthene	1.0	---
51-28-5	2,4-Dinitrophenol	10	---
100-02-7	4-Nitrophenol	5.3	---
132-64-9	Dibenzofuran	1.0	---
606-20-2	2,6-Dinitrotoluene	5.3	---
121-14-2	2,4-Dinitrotoluene	5.3	---
84-66-2	Diethylphthalate	1.0	---

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: B-Outfall
MATRIX SPIKE

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/20/10 13:32

QC Report No: QW99-CDM
Project: Goldendale
74803

CAS Number	Analyte	RL	Result
7005-72-3	4-Chlorophenyl-phenylether	1.0	---
86-73-7	Fluorene	1.0	---
100-01-6	4-Nitroaniline	5.3	---
534-52-1	4,6-Dinitro-2-Methylphenol	10	---
86-30-6	N-Nitrosodiphenylamine	5.3	---
101-55-3	4-Bromophenyl-phenylether	1.0	---
118-74-1	Hexachlorobenzene	1.0	---
87-86-5	Pentachlorophenol	5.3	---
85-01-8	Phenanthrene	1.0	---
86-74-8	Carbazole	1.0	---
120-12-7	Anthracene	1.0	---
84-74-2	Di-n-Butylphthalate	1.0	---
206-44-0	Fluoranthene	1.0	---
129-00-0	Pyrene	1.0	---
85-68-7	Butylbenzylphthalate	1.0	---
91-94-1	3,3'-Dichlorobenzidine	5.3	---
56-55-3	Benzo(a)anthracene	1.0	---
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	---
218-01-9	Chrysene	1.0	---
117-84-0	Di-n-Octyl phthalate	1.0	---
205-99-2	Benzo(b)fluoranthene	1.0	---
207-08-9	Benzo(k)fluoranthene	1.0	---
50-32-8	Benzo(a)pyrene	1.0	---
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	---
53-70-3	Dibenz(a,h)anthracene	1.0	---
191-24-2	Benzo(g,h,i)perylene	1.0	---
90-12-0	1-Methylnaphthalene	1.0	---

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.6%	2-Fluorobiphenyl	62.8%
d14-p-Terphenyl	70.8%	d4-1,2-Dichlorobenzene	76.4%
d5-Phenol	67.2%	2-Fluorophenol	65.1%
2,4,6-Tribromophenol	81.3%	d4-2-Chlorophenol	71.7%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: B-Outfall
MATRIX SPIKE DUP

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/21/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Date Extracted: 05/19/10
Date Analyzed: 05/20/10 14:04
Instrument/Analyst: NT6/JZ

Sample Amount: 475 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	Phenol	1.0	---
111-44-4	Bis-(2-Chloroethyl) Ether	1.0	---
95-57-8	2-Chlorophenol	1.0	---
541-73-1	1,3-Dichlorobenzene	1.0	---
106-46-7	1,4-Dichlorobenzene	1.0	---
100-51-6	Benzyl Alcohol	5.3	---
95-50-1	1,2-Dichlorobenzene	1.0	---
95-48-7	2-Methylphenol	1.0	---
108-60-1	2,2'-Oxybis(1-Chloropropane)	1.0	---
106-44-5	4-Methylphenol	1.0	---
621-64-7	N-Nitroso-Di-N-Propylamine	1.0	---
67-72-1	Hexachloroethane	1.0	---
98-95-3	Nitrobenzene	1.0	---
78-59-1	Isophorone	1.0	---
88-75-5	2-Nitrophenol	5.3	---
105-67-9	2,4-Dimethylphenol	1.0	---
65-85-0	Benzoic Acid	10	---
111-91-1	bis(2-Chloroethoxy) Methane	1.0	---
120-83-2	2,4-Dichlorophenol	5.3	---
120-82-1	1,2,4-Trichlorobenzene	1.0	---
91-20-3	Naphthalene	1.0	---
106-47-8	4-Chloroaniline	5.3	---
87-68-3	Hexachlorobutadiene	1.0	---
59-50-7	4-Chloro-3-methylphenol	5.3	---
91-57-6	2-Methylnaphthalene	1.0	---
77-47-4	Hexachlorocyclopentadiene	5.3	---
88-06-2	2,4,6-Trichlorophenol	5.3	---
95-95-4	2,4,5-Trichlorophenol	5.3	---
91-58-7	2-Chloronaphthalene	1.0	---
88-74-4	2-Nitroaniline	5.3	---
131-11-3	Dimethylphthalate	1.0	---
208-96-8	Acenaphthylene	1.0	---
99-09-2	3-Nitroaniline	5.3	---
83-32-9	Acenaphthene	1.0	---
51-28-5	2,4-Dinitrophenol	10	---
100-02-7	4-Nitrophenol	5.3	---
132-64-9	Dibenzofuran	1.0	---
606-20-2	2,6-Dinitrotoluene	5.3	---
121-14-2	2,4-Dinitrotoluene	5.3	---
84-66-2	Diethylphthalate	1.0	---

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
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Sample ID: B-Outfall
MATRIX SPIKE DUP

Lab Sample ID: QW99A
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/20/10 14:04

QC Report No: QW99-CDM
Project: Goldendale
74803

CAS Number	Analyte	RL	Result
7005-72-3	4-Chlorophenyl-phenylether	1.0	---
86-73-7	Fluorene	1.0	---
100-01-6	4-Nitroaniline	5.3	---
534-52-1	4,6-Dinitro-2-Methylphenol	10	---
86-30-6	N-Nitrosodiphenylamine	5.3	---
101-55-3	4-Bromophenyl-phenylether	1.0	---
118-74-1	Hexachlorobenzene	1.0	---
87-86-5	Pentachlorophenol	5.3	---
85-01-8	Phenanthrene	1.0	---
86-74-8	Carbazole	1.0	---
120-12-7	Anthracene	1.0	---
84-74-2	Di-n-Butylphthalate	1.0	---
206-44-0	Fluoranthene	1.0	---
129-00-0	Pyrene	1.0	---
85-68-7	Butylbenzylphthalate	1.0	---
91-94-1	3,3'-Dichlorobenzidine	5.3	---
56-55-3	Benzo(a)anthracene	1.0	---
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	---
218-01-9	Chrysene	1.0	---
117-84-0	Di-n-Octyl phthalate	1.0	---
205-99-2	Benzo(b)fluoranthene	1.0	---
207-08-9	Benzo(k)fluoranthene	1.0	---
50-32-8	Benzo(a)pyrene	1.0	---
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	---
53-70-3	Dibenz(a,h)anthracene	1.0	---
191-24-2	Benzo(g,h,i)perylene	1.0	---
90-12-0	1-Methylnaphthalene	1.0	---

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	78.4%	2-Fluorobiphenyl	68.4%
d14-p-Terphenyl	74.8%	d4-1,2-Dichlorobenzene	84.8%
d5-Phenol	76.3%	2-Fluorophenol	73.9%
2,4,6-Tribromophenol	85.1%	d4-2-Chlorophenol	79.7%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: LCS-051910
LAB CONTROL

Lab Sample ID: LCS-051910
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/21/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Date Extracted: 05/19/10
Date Analyzed: 05/20/10 12:27
Instrument/Analyst: NT6/JZ
GPC Cleanup: NO

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

Analyte	Lab Control	Spike Added	Recovery
Phenol	19.9	25.0	79.6%
Bis-(2-Chloroethyl) Ether	19.6	25.0	78.4%
2-Chlorophenol	21.3	25.0	85.2%
1,3-Dichlorobenzene	12.5	25.0	50.0%
1,4-Dichlorobenzene	13.0	25.0	52.0%
Benzyl Alcohol	53.9	50.0	108%
1,2-Dichlorobenzene	14.7	25.0	58.8%
2-Methylphenol	22.5	25.0	90.0%
2,2'-Oxybis(1-Chloropropane)	19.7	25.0	78.8%
4-Methylphenol	48.9	50.0	97.8%
N-Nitroso-Di-N-Propylamine	23.8	25.0	95.2%
Hexachloroethane	10.5	25.0	42.0%
Nitrobenzene	20.7	25.0	82.8%
Isophorone	23.9	25.0	95.6%
2-Nitrophenol	21.7	25.0	86.8%
2,4-Dimethylphenol	20.6	25.0	82.4%
Benzoic Acid	55.5	75.0	74.0%
bis(2-Chloroethoxy) Methane	20.3	25.0	81.2%
2,4-Dichlorophenol	24.2 Q	25.0	96.8%
1,2,4-Trichlorobenzene	13.8	25.0	55.2%
Naphthalene	19.3	25.0	77.2%
4-Chloroaniline	80.8	60.0	135%
Hexachlorobutadiene	10.6	25.0	42.4%
4-Chloro-3-methylphenol	27.8 Q	25.0	111%
2-Methylnaphthalene	20.9	25.0	83.6%
Hexachlorocyclopentadiene	37.1	75.0	49.5%
2,4,6-Trichlorophenol	20.5	25.0	82.0%
2,4,5-Trichlorophenol	20.4	25.0	81.6%
2-Chloronaphthalene	15.5	25.0	62.0%
2-Nitroaniline	22.9	25.0	91.6%
Dimethylphthalate	21.1	25.0	84.4%
Acenaphthylene	17.8	25.0	71.2%
3-Nitroaniline	81.9	64.0	128%
Acenaphthene	18.1	25.0	72.4%
2,4-Dinitrophenol	71.7	75.0	95.6%
4-Nitrophenol	24.4	25.0	97.6%
Dibenzofuran	20.6	25.0	82.4%
2,6-Dinitrotoluene	20.0	25.0	80.0%
2,4-Dinitrotoluene	21.7	25.0	86.8%
Diethylphthalate	15.5 Q	25.0	62.0%
4-Chlorophenyl-phenylether	18.6	25.0	74.4%
Fluorene	20.0	25.0	80.0%
4-Nitroaniline	15.7	25.0	62.8%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: LCS-051910
LAB CONTROL

Lab Sample ID: LCS-051910
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/20/10 12:27

QC Report No: QW99-CDM
Project: Goldendale
74803

Analyte	Lab Control	Spike Added	Recovery
4,6-Dinitro-2-Methylphenol	80.9 Q	75.0	108%
N-Nitrosodiphenylamine	19.6	25.0	78.4%
4-Bromophenyl-phenylether	20.8	25.0	83.2%
Hexachlorobenzene	21.2	25.0	84.8%
Pentachlorophenol	18.6	25.0	74.4%
Phenanthrene	21.5	25.0	86.0%
Carbazole	18.1	25.0	72.4%
Anthracene	20.8	25.0	83.2%
Di-n-Butylphthalate	21.6	25.0	86.4%
Fluoranthene	22.8	25.0	91.2%
Pyrene	17.6	25.0	70.4%
Butylbenzylphthalate	17.4	25.0	69.6%
3,3'-Dichlorobenzidine	56.6	64.0	88.4%
Benzo(a)anthracene	21.1	25.0	84.4%
bis(2-Ethylhexyl)phthalate	20.9	25.0	83.6%
Chrysene	18.0	25.0	72.0%
Di-n-Octyl phthalate	21.0	25.0	84.0%
Benzo(b)fluoranthene	24.5	25.0	98.0%
Benzo(k)fluoranthene	23.9	25.0	95.6%
Benzo(a)pyrene	20.2	25.0	80.8%
Indeno(1,2,3-cd)pyrene	20.7	25.0	82.8%
Dibenz(a,h)anthracene	21.0	25.0	84.0%
Benzo(g,h,i)perylene	17.3 Q	25.0	69.2%
1-Methylnaphthalene	21.0	25.0	84.0%

Semivolatile Surrogate Recovery

d5-Nitrobenzene	79.2%
2-Fluorobiphenyl	67.6%
d14-p-Terphenyl	71.2%
d4-1,2-Dichlorobenzene	81.2%
d5-Phenol	76.8%
2-Fluorophenol	73.9%
2,4,6-Tribromophenol	85.3%
d4-2-Chlorophenol	79.5%

Results reported in µg/L

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: MB-051910
METHOD BLANK

Lab Sample ID: MB-051910
LIMS ID: 10-12032
Matrix: Water
Data Release Authorized: 
Reported: 05/21/10

QC Report No: QW99-CDM
Project: Goldendale
74803
Date Sampled: NA
Date Received: NA

Date Extracted: 05/19/10
Date Analyzed: 05/20/10 11:56
Instrument/Analyst: NT6/JZ

Sample Amount: 500 mL
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	Phenol	1.0	< 1.0 U
111-44-4	Bis-(2-Chloroethyl) Ether	1.0	< 1.0 U
95-57-8	2-Chlorophenol	1.0	< 1.0 U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0 U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0 U
100-51-6	Benzyl Alcohol	5.0	< 5.0 U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0 U
95-48-7	2-Methylphenol	1.0	< 1.0 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	1.0	< 1.0 U
106-44-5	4-Methylphenol	1.0	< 1.0 U
621-64-7	N-Nitroso-Di-N-Propylamine	1.0	< 1.0 U
67-72-1	Hexachloroethane	1.0	< 1.0 U
98-95-3	Nitrobenzene	1.0	< 1.0 U
78-59-1	Isophorone	1.0	< 1.0 U
88-75-5	2-Nitrophenol	5.0	< 5.0 U
105-67-9	2,4-Dimethylphenol	1.0	< 1.0 U
65-85-0	Benzoic Acid	10	< 10 U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	< 1.0 U
120-83-2	2,4-Dichlorophenol	5.0	< 5.0 U
120-82-1	1,2,4-Trichlorobenzene	1.0	< 1.0 U
91-20-3	Naphthalene	1.0	< 1.0 U
106-47-8	4-Chloroaniline	5.0	< 5.0 U
87-68-3	Hexachlorobutadiene	1.0	< 1.0 U
59-50-7	4-Chloro-3-methylphenol	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	1.0	< 1.0 U
77-47-4	Hexachlorocyclopentadiene	5.0	< 5.0 U
88-06-2	2,4,6-Trichlorophenol	5.0	< 5.0 U
95-95-4	2,4,5-Trichlorophenol	5.0	< 5.0 U
91-58-7	2-Chloronaphthalene	1.0	< 1.0 U
88-74-4	2-Nitroaniline	5.0	< 5.0 U
131-11-3	Dimethylphthalate	1.0	< 1.0 U
208-96-8	Acenaphthylene	1.0	< 1.0 U
99-09-2	3-Nitroaniline	5.0	< 5.0 U
83-32-9	Acenaphthene	1.0	< 1.0 U
51-28-5	2,4-Dinitrophenol	10	< 10 U
100-02-7	4-Nitrophenol	5.0	< 5.0 U
132-64-9	Dibenzofuran	1.0	< 1.0 U
606-20-2	2,6-Dinitrotoluene	5.0	< 5.0 U
121-14-2	2,4-Dinitrotoluene	5.0	< 5.0 U
84-66-2	Diethylphthalate	1.0	< 1.0 U

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: MB-051910
METHOD BLANK

Lab Sample ID: MB-051910
LIMS ID: 10-12032
Matrix: Water
Date Analyzed: 05/20/10 11:56

QC Report No: QW99-CDM
Project: Goldendale
74803

CAS Number	Analyte	RL	Result
7005-72-3	4-Chlorophenyl-phenylether	1.0	< 1.0 U
86-73-7	Fluorene	1.0	< 1.0 U
100-01-6	4-Nitroaniline	5.0	< 5.0 U
534-52-1	4,6-Dinitro-2-Methylphenol	10	< 10 U
86-30-6	N-Nitrosodiphenylamine	5.0	< 5.0 U
101-55-3	4-Bromophenyl-phenylether	1.0	< 1.0 U
118-74-1	Hexachlorobenzene	1.0	< 1.0 U
87-86-5	Pentachlorophenol	5.0	< 5.0 U
85-01-8	Phenanthrene	1.0	< 1.0 U
86-74-8	Carbazole	1.0	< 1.0 U
120-12-7	Anthracene	1.0	< 1.0 U
84-74-2	Di-n-Butylphthalate	1.0	< 1.0 U
206-44-0	Fluoranthene	1.0	< 1.0 U
129-00-0	Pyrene	1.0	< 1.0 U
85-68-7	Butylbenzylphthalate	1.0	< 1.0 U
91-94-1	3,3'-Dichlorobenzidine	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	1.0	< 1.0 U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	< 1.0 U
218-01-9	Chrysene	1.0	< 1.0 U
117-84-0	Di-n-Octyl phthalate	1.0	< 1.0 U
205-99-2	Benzo(b)fluoranthene	1.0	< 1.0 U
207-08-9	Benzo(k)fluoranthene	1.0	< 1.0 U
50-32-8	Benzo(a)pyrene	1.0	< 1.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	1.0	< 1.0 U
53-70-3	Dibenz(a,h)anthracene	1.0	< 1.0 U
191-24-2	Benzo(g,h,i)perylene	1.0	< 1.0 U
90-12-0	1-Methylnaphthalene	1.0	< 1.0 U

Reported in µg/L (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.0%	2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	89.2%	d4-1,2-Dichlorobenzene	66.0%
d5-Phenol	71.5%	2-Fluorophenol	66.9%
2,4,6-Tribromophenol	89.9%	d4-2-Chlorophenol	73.9%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: B-Outfall
SAMPLE

Lab Sample ID: QW99A

LIMS ID: 10-12032

Matrix: Water

Data Release Authorized: 

Reported: 05/21/10

QC Report No: QW99-CDM

Project: Goldendale

74803

Date Sampled: 05/18/10

Date Received: 05/19/10

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	05/19/10	6010B	05/20/10	7429-90-5	Aluminum	0.05	1.22	
3010A	05/19/10	6010B	05/20/10	7440-36-0	Antimony	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-38-2	Arsenic	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-39-3	Barium	0.003	0.029	
3010A	05/19/10	6010B	05/20/10	7440-43-9	Cadmium	0.002	0.002	U
3010A	05/19/10	6010B	05/20/10	7440-47-3	Chromium	0.005	0.005	U
3010A	05/19/10	6010B	05/20/10	7439-92-1	Lead	0.02	0.02	U
7470A	05/19/10	7470A	05/19/10	7439-97-6	Mercury	0.0001	0.0001	U
3010A	05/19/10	6010B	05/20/10	7440-02-0	Nickel	0.01	0.01	
3010A	05/19/10	6010B	05/20/10	7782-49-2	Selenium	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-22-4	Silver	0.003	0.003	U

U-Analyte undetected at given RL

RL-Reporting Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

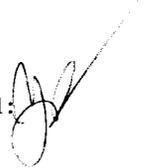
Sample ID: B-Outfall

MATRIX SPIKE

Lab Sample ID: QW99A

LIMS ID: 10-12032

Matrix: Water

Data Release Authorized: 

Reported: 05/21/10

QC Report No: QW99-CDM

Project: Goldendale

74803

Date Sampled: 05/18/10

Date Received: 05/19/10

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010B	1.22	3.16	2.00	97.0%	
Antimony	6010B	0.05 U	2.08	2.00	104%	
Arsenic	6010B	0.05 U	2.06	2.00	103%	
Barium	6010B	0.029	2.02	2.00	99.6%	
Cadmium	6010B	0.002 U	0.513	0.500	103%	
Chromium	6010B	0.005 U	0.511	0.500	102%	
Lead	6010B	0.02 U	1.97	2.00	98.5%	
Mercury	7470A	0.0001 U	0.0011	0.0010	110%	
Nickel	6010B	0.012	0.472	0.500	92.0%	
Selenium	6010B	0.05 U	1.86	2.00	93.0%	
Silver	6010B	0.003 U	0.465	0.500	93.0%	

Reported in mg/L

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: B-Outfall
DUPLICATE

Lab Sample ID: QW99A

LIMS ID: 10-12032

Matrix: Water

Data Release Authorized: 

Reported: 05/21/10

QC Report No: QW99-CDM

Project: Goldendale

74803

Date Sampled: 05/18/10

Date Received: 05/19/10

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010B	1.22	1.21	0.8%	+/- 20%	
Antimony	6010B	0.05 U	0.05 U	0.0%	+/- 0.05	L
Arsenic	6010B	0.05 U	0.05 U	0.0%	+/- 0.05	L
Barium	6010B	0.029	0.029	0.0%	+/- 20%	
Cadmium	6010B	0.002 U	0.002 U	0.0%	+/- 0.002	L
Chromium	6010B	0.005 U	0.005 U	0.0%	+/- 0.005	L
Lead	6010B	0.02 U	0.02 U	0.0%	+/- 0.02	L
Mercury	7470A	0.0001 U	0.0001 U	0.0%	+/- 0.0001	L
Nickel	6010B	0.01	0.01	0.0%	+/- 0.01	L
Selenium	6010B	0.05 U	0.05 U	0.0%	+/- 0.05	L
Silver	6010B	0.003 U	0.003 U	0.0%	+/- 0.003	L

Reported in mg/L

*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: QW99LCS

LIMS ID: 10-12032

Matrix: Water

Data Release Authorized: 

Reported: 05/21/10

QC Report No: QW99-CDM

Project: Goldendale

74803

Date Sampled: NA

Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010B	2.03	2.00	102%	
Antimony	6010B	2.12	2.00	106%	
Arsenic	6010B	2.04	2.00	102%	
Barium	6010B	1.98	2.00	99.0%	
Cadmium	6010B	0.515	0.500	103%	
Chromium	6010B	0.512	0.500	102%	
Lead	6010B	1.97	2.00	98.5%	
Mercury	7470A	0.0020	0.0020	100%	
Nickel	6010B	0.47	0.50	94.0%	
Selenium	6010B	1.86	2.00	93.0%	
Silver	6010B	0.515	0.500	103%	

Reported in mg/L

N-Control limit not met

Control Limits: 80-120%

INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: QW99MB

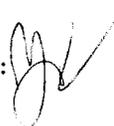
QC Report No: QW99-CDM

LIMS ID: 10-12032

Project: Goldendale

Matrix: Water

74803

Data Release Authorized: 

Date Sampled: NA

Reported: 05/21/10

Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/L	Q
3010A	05/19/10	6010B	05/20/10	7429-90-5	Aluminum	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-36-0	Antimony	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-38-2	Arsenic	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-39-3	Barium	0.003	0.003	U
3010A	05/19/10	6010B	05/20/10	7440-43-9	Cadmium	0.002	0.002	U
3010A	05/19/10	6010B	05/20/10	7440-47-3	Chromium	0.005	0.005	U
3010A	05/19/10	6010B	05/20/10	7439-92-1	Lead	0.02	0.02	U
7470A	05/19/10	7470A	05/19/10	7439-97-6	Mercury	0.0001	0.0001	U
3010A	05/19/10	6010B	05/20/10	7440-02-0	Nickel	0.01	0.01	U
3010A	05/19/10	6010B	05/20/10	7782-49-2	Selenium	0.05	0.05	U
3010A	05/19/10	6010B	05/20/10	7440-22-4	Silver	0.003	0.003	U

U-Analyte undetected at given RL

RL-Reporting Limit

SAMPLE RESULTS-CONVENTIONALS
QW99-CDM



Matrix: Water
Data Release Authorized:
Reported: 05/24/10

A handwritten signature or initials in black ink, appearing to be 'G' or 'J' with a flourish.

Project: Goldendale
Event: 74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Client ID: B-Outfall
ARI ID: 10-12032 QW99A

Analyte	Date Batch	Method	Units	RL	Sample
Total Suspended Solids	05/19/10 051910#1	EPA 160.2	mg/L	1.1	2.3
Chloride	05/20/10 052010#1	EPA 300.0	mg/L	1.0	17.4
Fluoride	05/20/10 052010#1	EPA 300.0	mg/L	1.0	13.8
Total Cyanide	05/19/10 051910#1	EPA 335.4	mg/L	0.005	< 0.005 U
Sulfate	05/20/10 052010#1	EPA 300.0	mg/L	10.0	205

RL Analytical reporting limit
U Undetected at reported detection limit

MS/MSD RESULTS-CONVENTIONALS
QW99-CDM



Matrix: Water
Data Release Authorized:
Reported: 05/24/10

A handwritten signature in black ink, appearing to be a stylized 'B' or similar character, positioned over the 'Data Release Authorized' text.

Project: Goldendale
Event: 74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Analyte	Method	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: QW99A		Client ID: B-Outfall					
Chloride	EPA 300.0	05/20/10	mg/L	17.4	34.6	20.0	86.0%
Fluoride	EPA 300.0	05/20/10	mg/L	13.8	31.4	20.0	88.0%
Total Cyanide	EPA 335.4	05/19/10	mg/L	< 0.005	0.131	0.147	89.1%

REPLICATE RESULTS-CONVENTIONALS
QW99-CDM



Matrix: Water
Data Release Authorized:
Reported: 05/24/10

A handwritten signature in black ink, appearing to be 'M. J.', written over the 'Data Release Authorized:' text.

Project: Goldendale
Event: 74803
Date Sampled: 05/18/10
Date Received: 05/19/10

Analyte	Method	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: QW99A Client ID: B-Outfall						
Total Suspended Solids	EPA 160.2	05/19/10	mg/L	2.3	2.0	14.0%
Chloride	EPA 300.0	05/20/10	mg/L	17.4	17.1	1.7%
Fluoride	EPA 300.0	05/20/10	mg/L	13.8	13.8	0.0%
Total Cyanide	EPA 335.4	05/19/10	mg/L	< 0.005	< 0.005	NA
Sulfate	EPA 300.0	05/20/10	mg/L	205	204	0.5%

LAB CONTROL RESULTS-CONVENTIONALS
QW99-CDM



Matrix: Water
Data Release Authorized: 
Reported: 05/24/10

Project: Goldendale
Event: 74803
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Total Suspended Solids EPA 160.2	ICVL	05/19/10	mg/L	50.1	50.0	100.2%

METHOD BLANK RESULTS-CONVENTIONALS
QW99-CDM



Matrix: Water
Data Release Authorized: 
Reported: 05/24/10

Project: Goldendale
Event: 74803
Date Sampled: NA
Date Received: NA

Analyte	Method	Date	Units	Blank	ID
Total Suspended Solids	EPA 160.2	05/19/10	mg/L	< 1.0 U	
Chloride	EPA 300.0	05/20/10	mg/L	< 0.1 U	
Fluoride	EPA 300.0	05/20/10	mg/L	< 0.1 U	
Total Cyanide	EPA 335.4	05/19/10	mg/L	< 0.005 U	
Sulfate	EPA 300.0	05/20/10	mg/L	< 0.1 U	

STANDARD REFERENCE RESULTS-CONVENTIONALS
QW99-CDM



Matrix: Water
Data Release Authorized: 
Reported: 05/24/10

Project: Goldendale
Event: 74803
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Method	Date	Units	SRM	True Value	Recovery
Chloride ERA #230109	EPA 300.0	05/20/10	mg/L	2.9	3.0	96.7%
Fluoride ERA #02098	EPA 300.0	05/20/10	mg/L	2.8	3.0	93.3%
Total Cyanide ERA 11107	EPA 335.4	05/19/10	mg/L	0.142	0.150	94.7%
Sulfate ERA #220109	EPA 300.0	05/20/10	mg/L	2.8	3.0	93.3%

June 1, 2010

Analytical Report for Service Request No: K1005202

Cheronne Oreiro
Analytical Resources, Incorporated
4611 So. 134th Place
Suite 100
Tukwila, WA 98168

RE: Goldendale

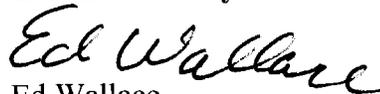
Dear Cheronne:

Enclosed are the results of the rush sample submitted to our laboratory on May 21, 2010. For your reference, these analyses have been assigned our service request number K1005202.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is 3291. You may also contact me via Email at EWallace@caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Ed Wallace
Project Chemist

EW/lb

Page 1 of 7

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value that was detected outside the quantitation range.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value that was detected outside the quantitation range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.1 definition: Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

Columbia Analytical Services, Inc.
Kelso, WA
State Certifications, Accreditations, and Licenses

Program	Number
Alaska DEC UST	UST-040
Arizona DHS	AZ0339
Arkansas - DEQ	88-0637
California DHS	2286
Colorado DPHE	-
Florida DOH	E87412
Hawaii DOH	-
Idaho DHW	-
Indiana DOH	C-WA-01
Louisiana DEQ	3016
Louisiana DHH	LA050010
Maine DHS	WA0035
Michigan DEQ	9949
Minnesota DOH	053-999-368
Montana DPHHS	CERT0047
Nevada DEP	WA35
New Jersey DEP	WA005
New Mexico ED	-
North Carolina DWQ	605
Oklahoma DEQ	9801
Oregon - DHS	WA200001
South Carolina DHEC	61002
Utah DOH	COLU
Washington DOE	C1203
Wisconsin DNR	998386840
Wyoming (EPA Region 8)	-



COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Analytical Resources, Incorporated
Project Name : Goldendale
Project Number : NA
Sample Matrix : WATER

Service Request : K1005202
Date Collected : 05/18/10
Date Received : 05/21/10

Cyanide, Free

Prep Method : Method
Analysis Method : ASTM D4282-02
Test Notes :

Units : ug/L
Basis : NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
B-Outfall	K1005202-001	10	1	5/28/2010	05/28/10	ND	
Method Blank	K1005202-MB	10	1	5/28/2010	05/28/10	ND	

SUBCONTRACTOR ANALYSIS REQUEST
 CUSTODY TRANSFER 05/19/10



ARI Project: QW99

K1005202

Laboratory: Columbia Analytical Services Inc.
 Lab Contact: Ed Wallace
 Lab Address: 1317 South 13th Street
 Kelso, WA 98626
 Phone: 360-577-7222
 Fax: 360-636-1068

ARI Client: CDM
 Project ID: Goldendale
 ARI PM: Cheronne Oreiro
 Phone: 206-695-6214
 Fax: 206-695-6201

Analytical Protocol: In-house
 Special Instructions:

Requested Turn Around: 06/03/10
 Email Results (Y/N): **email**

Limits of Liability. Subcontractor is expected to perform all requested services in accordance with appropriate methodology following Standard Operating Procedures that meet standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the negotiated amount for said services. The agreement by the Subcontractor to perform services requested by ARI releases ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Subcontractor.

ARI ID	Client ID/ Add'l ID	Sampled	Matrix	Bottles	Analyses
10-12032-QW99A	B-Outfall	05/18/10 12:00	Water	1	Free Cyanide

Special Instructions: None

Carrier	<i>UPS</i>	Airbill	<i>78932695 034985 6370</i>	Date	<i>5/20/10</i>
Relinquished by	<i>Nirva Mumbur</i>	Company	<i>ARI</i>	Date	<i>5/20/10</i>
Received by	<i>John Jones</i>	Company	<i>CAS</i>	Date	<i>5/21/10</i>
				Time	<i>1510</i>
				Time	<i>0930</i>

**Columbia Analytical Services, Inc.
Cooler Receipt and Preservation Form**

PC ed

Client / Project: ARI Service Request K10 5202

Received: 5/21/10 Opened: 5/21/10 By: Joh

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other _____ NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Cooler Temp °C	Temp Blank °C	Thermometer ID	Cooler/COC ID	NA	Tracking Number	NA	Filed
-0.5		291			178326950349856378		

7. Packing material used. Inserts Baggies Bubble Wrap Gel Packs Wet Ice Sleeves Other _____
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
11. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below. NA Y N
14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

RUSH

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Analytical Resources, Incorporated
Project Name : Goldendale
Project Number : NA
Sample Matrix : WATER

Service Request : K1005202
Date Collected : 05/18/10
Date Received : 05/21/10

Cyanide, Free

Prep Method : Method
Analysis Method : ASTM D4282-02
Test Notes :

Units : ug/L

Basis : NA

Sample Name	Lab Code	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
B-Outfall	K1005202-001	10	1	5/28/2010	05/28/10	ND	
Method Blank	K1005202-MB	10	1	5/28/2010	05/28/10	ND	