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ADMINISTRATIVE RECORD

LIBBY, MT OU3 RI/FS SAMPLING AND ANALYSES

Comparison of Parameters
EPA Requirements vs Energy Laboratories Capabilities

Mine Waste and Road Bed Samples

Method	Analyte	ELI MDL (mg/kg)	Target MDL (mg/kg)	ELI PQL (mg/kg)	Target PQL (mg/kg)
6010/6020	Antimony	0.01	0.06	0.5	0.27
3050 Prep	Arsenic	0.1	0.5	5	16
	Barium	0.1	0.5	5	330
	Beryllium	0.05	0.05	5	10
	Boron	1	1	5	
	Cadmium	0.01	0.05	0.4	0.38
	Chromium	0.1	0.05	0.3	0.4
	Cobalt	0.02	0.5	5	13
	Copper	0.5	0.5	5	28
	Iron	1	10	5	
	Lead	0.5	0.5	5	11
	Aluminum	1	10	5	
	Manganese	0.07	0.5	5	220
	Selenium	0.02	0.25	0.1	0.52
	Silver	0.02	0.5	2	2
	Thallium	0.1	0.5	1	1
	Nickel	0.02	5	5	38
	Phosphorus	2	0.05%	10	
	Vanadium	0.4	0.5	1	2
	Zinc	1	1	5	42
7471A	Mercury	0.01	0.01	0.1	0.1
4500-f/300.0	Fluoride	0.016	0.01	1	
USDA26	Percent Solids	0.02	0.10%	0.02	
MA-VPH	VPH	1	1	2	10
MA-EPH	EPH	2	2	10	20
8082	PCB Aroclors		0.015		0.035
	Aroclor 1016	0.00602		0.017	
	Aroclor 1221			0.033	
	Aroclor 1232			0.017	
	Aroclor 1242			0.017	
	Aroclor 1248			0.017	
	Aroclor 1254	0.00698		0.017	
	Aroclor 1260	0.00535		0.017	
	Aroclor 1262			0.017	
	Aroclor 1268			0.017	

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Surface Water

Method	Analyte	ELI MDL (mg/L)	Target MDL (mg/L)	ELI PQL (mg/L)	Target PQL (mg/L)
Dissolved	*Aluminum*	0.0002	0.02	0.087	0.087
200.7/200.8	*Antimony*	0.00005	0.004	0.005	0.03
	Arsenic	0.00002	0.004	0.005	0.15
	Barium	0.00002	0.003	0.1	5
	Beryllium	0.00002	0.0003	0.0005	0.00066
	Boron	0.005	0.0007	0.01	0.02
	Cadmium	0.000004	0.0005	0.00009	0.00009
	Calcium	0.1	0.005	1	0.025
	Chromium	0.001	0.004	0.01	0.011
	Cobalt	0.00009	0.002	0.01	0.023
	Copper	0.0005	0.0005	0.003	0.003
	Iron	0.005	0.03	0.03	1
	Lead	0.00002	0.0006	0.001	0.001
	Magnesium	0.1	0.005	0.025	0.025
	Manganese	0.00002	0.001	0.001	0.12
	Nickel	0.00002	0.005	0.005	0.016
	Potassium	0.1	0.0003	0.01	53
	Selenium	0.00002	0.002	0.005	0.005
	Silver	0.00005	0.0001	0.001	0.0001
	Sodium	0.1	0.03	0.005	880
	Thallium	0.0002	0.001	0.1	0.12
	Vanadium	0.001	0.003	0.01	0.02
	Zinc	0.001	0.002	0.01	0.036
200.8/245.1	*Mercury*	0.00002	0.007	0.001	0.001
Total	*Aluminum*	0.005	0.02	0.087	0.087
200.7/200.8	*Antimony*	0.00005	0.004	0.005	0.03
	Arsenic	0.0001	0.004	0.005	0.15
	Barium	0.0005	0.003	0.1	5
	Beryllium	0.00002	0.0003	0.0005	0.00066
	Boron	0.005	0.0007	0.01	0.02
	Cadmium	0.0001	0.0005	0.00009	0.00008
	Calcium	0.2	0.005	1	0.025
	Chromium	0.001	0.004	0.01	0.011
	Cobalt	0.0002	0.002	0.01	0.023
	Copper	0.0006	0.0005	0.003	0.003
	Iron	0.005	0.03	0.03	1
	Lead	0.0002	0.0006	0.001	0.001
	Magnesium	0.2	0.005	0.025	0.025
	Manganese	0.0003	0.001	0.001	0.12
	Nickel	0.001	0.005	0.005	0.016
	Potassium	0.2	0.0003	0.01	53
	Selenium	0.00002	0.002	0.005	0.005
	Silver	0.00005	0.0001	0.001	0.0001
	Sodium	0.2	0.03	0.005	880
	Thallium	0.0001	0.001	0.1	0.12
	Vanadium	0.001	0.003	0.01	0.02
	Zinc	0.001	0.002	0.01	0.036

Comparison of Parameters
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			Surface Water		
200.8/245.1	*Mercury*	0.00002	0.007	0.001	0.001
2320B	*Alkalinity*	2	2	4	5
4500-F/300	*Fluoride*	0.016	0.01	0.05	0.2
353.2	*Nitrate*	0.0095	0.05	0.01	0.2
353.2	*Nitrite*	0.0075	0.05	0.01	0.2
350.1	*Ammonia*	0.028	0.05	0.1	0.2
351.2	*TKN*	0.1	0.05	0.5	0.2
365.1	*Ortho P*	0.002	0.05	0.01	0.2
415.1/9060	*DOC*	0.37	0.05	1	0.25
A2540 D	*TSS*	0	4	10	10
MA-VPH	*VPH*	Many Parameters at different Levels			
MA-EPH	*EPH*	0.07	0.02	0.3	0.1

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Comparison of Parameters
EPA Requirements vs Energy Laboratories Capabilities

Groundwater

Method	Analyte	ELI MDL (mg/L)	Target MDL (mg/L)	ELI PQL (mg/L)	Target PQL (mg/L)
Dissolved	*Calcium*	0.1	0.01	1	116
E200.7/200.8	*Copper*	0.0005	0.00005	0.003	0.003
	Iron	0.005	0.03	0.03	1
	Lead	0.00002	0.0005	0.001	0.001
	Magnesium	0.1	0.02	1	82
	Potassium	0.1	0.0003	1	53
	Sodium	0.1	0.03	1	680
E200.8/245.1	*Mercury*	0.00003	0.007	0.0002	0.001
Total	*Aluminum*	0.005	0.02	0.087	0.087
E200.7/200.8	*Antimony*	0.00005	0.004	0.005	0.03
	Arsenic	0.0001	0.004	0.005	0.15
	Barium	0.0005	0.003	0.1	5
	Beryllium	0.00002	0.0003	0.001	0.001
	Boron	0.005	0.0007	0.01	0.02
	Cadmium	0.0001	0.0005	0.0009	0.0009
	Chromium	0.001	0.004	0.01	0.011
	Cobalt	0.0002	0.002	0.01	0.023
	Copper	0.0006	0.0005	0.003	0.003
	Iron	0.005	0.03	0.03	1
	Lead	0.0002	0.0006	0.001	0.001
	Manganese	0.00005	0.001	0.001	0.12
	Nickel	0.001	0.005	0.005	0.016
	Selenium	0.00002	0.002	0.005	0.005
	Silver	0.00005	0.0001	0.0001	0.0001
	Thallium	0.0001	0.001	0.1	0.12
	Vanadium	0.001	0.003	0.01	0.02
	Zinc	0.001	0.002	0.01	0.036
SM4500-F/E300	*Fluoride*	0.016	0.01	0.05	0.2
E353.2	*Nitrate*	0.0095	0.05	0.01	0.2
E353.2	*Nitrite*	0.0075	0.05	0.01	0.2
E350.1	*Ammonia*	0.028	0.05	0.1	0.2
E351.2	*TKN*	0.1	0.05	0.5	0.2
E365.1	*Ortho P*	0.002	0.05	0.01	0.2
E300	*Sulfate*	0.07	0.02	0.05	0.1
Kelada mod	*Cyanide, Total*	0.001	0.02	0.005	0.1
A2540 D	*TSS*	0	4	10	10
A2540 C	*TDS*	1	10	10	50
MA-VPH	*VPH*	Many Parameters at different Levels			
MA-EPH	*EPH*	0.07	0.02	0.3	0.1
E900.0	*Gross Alpha*	1pCi/L	3pCi/L	1pCi/L	15pCi/L
E900.0	*Gross Beta*	2pCi/L	3pCi/L	2pCi/L	15pCi/L
RA-05	*Radium 228*	1pCi/L	1pCi/L	1pCi/L	5pCi/L

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			Groundwater		
E903	*Radium 226*	0.2pCi/L	5pCi/L	1pCi/L	30pCi/L
E200.8	*Uranium Total*	0.0004	0.005	0.001	0.03

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Comparison of Parameters
EPA Requirements vs Energy Laboratories Capabilities

Additional Analysis Tailings

Method	Analyte	ELI MDL (mg/kg)	Target MDL (mg/kg)	ELI PQL (mg/kg)	Target PQL (mg/kg)
SW8082	*Aroclor 1016*	0.00602	0.015	0.017	0.035
	Aroclor 1221		0.015	0.033	0.035
	Aroclor 1232		0.015	0.017	0.035
	Aroclor 1242		0.015	0.017	0.035
	Aroclor 1248		0.015	0.017	0.035
	Aroclor 1254	0.00698	0.015	0.017	0.035
	Aroclor 1260	0.00535	0.015	0.017	0.035
	Aroclor 1262		0.015	0.017	0.035
	Aroclor 1268		0.015	0.017	0.035
SW8081	*4,4'-DDD*	0.00029	0.0005	0.0017	0.0033
	4,4'-DDE	0.00027	0.0004	0.0017	0.0033
	4,4'-DDT	0.00024	0.0004	0.0017	0.0033
	Aldrin	0.00028	0.0003	0.0017	0.0017
	alpha-BHC	0.00031	0.0003	0.0017	0.0017
	alpha-Chlordane	0.00024	0.0004	0.0017	0.0017
	beta-BHC	0.0002	0.0004	0.0017	0.0017
	Chlordane	0.00215	0.005	0.017	0.0017
	delta-BHC	0.0011	0.004	0.0017	0.0017
	Dieldrin	0.00023	0.0003	0.0017	0.0017
	Endosulfan I	0.00021	0.0003	0.0017	0.0033
	Endosulfan II	0.00029	0.0003	0.0017	0.0033
	Endosulfan sulfate	0.00041	0.0004	0.0017	0.0017
	Endrin	0.00029	0.0003	0.0017	0.0033
	Endrin aldehyde	0.0003	0.0003	0.0017	0.0017
	Endrin ketone	0.00028	0.0007	0.0017	0.0017
	gamma-BHC (Lindane)	0.00024	0.0003	0.0017	0.0017
	gamma-Chlordane	0.00032	0.0003	0.0017	0.0017
	Heptachlor	0.0005	0.0003	0.0017	0.0017
	Heptachlor epoxide	0.0025	0.0004	0.0017	0.0017
	Isodrin		0.0005	0.0017	0.0033
	Methoxychlor	0.0141	0.0005	0.0017	0.0033
	Toxaphene	0.03099	0.031	0.167	0.007
SW8151	*2,4,5-T*	0.00036	0.5	0.004	
	2,4,5-TP (Silvex)	0.0011	0.5	0.004	
	2,4-D	0.00088	0.5	0.02	
	Dalapon	0.027	0.5	0.05	
	Dicamba	0.00043	1	0.005	
	Dichlorprop	0.0074	0.5	0.02	
	MCPA	0.4	0.5	4	
	MCPP	0.57	0.5	4	
	Pentachlorophenol	0.001	0.5	0.002	

TCLP	Analyte	ELI MDL (ug/L)	Target MDL (ug/L)	ELI PQL (ug/L)	Target PQL (ug/L)
SW8270	*2,4,5-Trichlorophenol*	2.65		50	
	2,4,6-Trichlorophenol	2		50	
	2,4-Dinitrotoluene	2.13		50	

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		Additional Analysis Tailings	
	Hexachlorobenzene	1.97	50
	Hexachlorobutadiene	1.38	50
	Hexachloroethane	1.79	50
	m+p-Cresols	2.23	50
	Nitrobenzene	2.64	50
	o-Cresol	1.65	50
	Pentachlorophenol	3.35	250
	Pyridine	1.82	10
TCLP SW8260	*1,1-Dichloroethene*	0.05	1
	1,2-Dichloroethane	0.07	1
	1,4-Dichlorobenzene	0.06	1
	Benzene	0.07	1
	Carbon tetrachloride	0.055	1
	Chlorobenzene	0.06	1
	Chloroform	0.06	1
	Methyl ethyl ketone	0.42	20
	Tetrachloroethene	0.045	1
	Trichloroethene	0.066	1
	Vinyl chloride	0.09	1

Comparison of Parameters
EPA Requirements vs Energy Laboratories Capabilities

Additional Analysis on Surface

Method	Analyte	ELI MDL (ug/L)	Target MDL (ug/L)	ELI PQL (ug/L)	Target PQL (ug/L)
SW8082	*Aroclor 1016*	0.18	0.1	0.5	1
	Aroclor 1221		0.1	0.5	1
	Aroclor 1232		0.1	0.5	1
	Aroclor 1242		0.1	0.5	1
	Aroclor 1248		0.1	0.5	1
	Aroclor 1254	0.17	0.1	0.5	1
	Aroclor 1260	0.09	0.1	0.5	1
	Aroclor 1262		0.1	0.5	1
	Aroclor 1268		0.1	0.5	1
SW8081	*4,4´-DDD*	0.0086	0.009	0.05	0.1
	4,4´-DDE	0.01	0.008	0.05	0.1
	4,4´-DDT	0.012	0.008	0.05	0.1
	Aldrin	0.0098	0.006	0.05	0.05
	alpha-BHC	0.0089	0.006	0.05	0.1
	alpha-Chlordane	0.015	0.007	0.05	0.1
	beta-BHC	0.015	0.006	0.05	0.1
	Chlordane	0.1	0.006	0.5	0.5
	delta-BHC	0.011	0.006	0.05	0.1
	Dieldrin	0.0073	0.007	0.05	0.1
	Endosulfan I	0.01	0.007	0.05	0.1
	Endosulfan II	0.0102	0.007	0.05	0.1
	Endosulfan sulfate	0.0088	0.008	0.05	0.1
	Endrin	0.0087	0.007	0.05	0.1
	Endrin aldehyde	0.0094	0.009	0.05	0.1
	Endrin ketone	0.0082	0.01	0.05	0.1
	gamma-BHC (Lindane)	0.0077	0.008	0.05	0.05
	gamma-Chlordane	0.0103	0.007	0.05	0.1
	Heptachlor	0.0104	0.006	0.05	0.05
	Heptachlor epoxide	0.0089	0.007	0.05	0.05
	Isodrin	0.0059	0.007	0.05	0.05
	Methoxychlor	0.0186	0.02	0.05	0.5
	Toxaphene	0.453	0.25	5	0.7
SW8151	*2,4,5-T*	0.015	0.08	0.2	
	2,4,5-TP (Silvex)	0.011	0.075	0.2	
	2,4-D	0.038	0.2	1	
	Dalapon	0.343	1.3	2.5	
	Dicamba	0.014	0.081	0.25	
	Dichlorprop	0.151	0.26	1	
	MCPA	31.82	0.08	200	
	MCPP	22.57	0.058	200	
	Pentachlorophenol	0.018	0.075	0.1	0.1
	Gross Alpha	1pCi/L	3pCi/L	1pCi/L	15pCi/L
	Gross Beta	2pCi/L	3pCi/L	2pCi/L	15pCi/L
	Cyanide, Total	0.001	0.02	0.005	0.1

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Additional Analysis on Surface

	Analyte	ELI MDL (ug/L)	Target MDL (ug/L)	ELI PQL (ug/L)	Target PQL (ug/L)
TCLP SW8270	*2,4,5-Trichlorophenol*	2.65		50	
	2,4,6-Trichlorophenol	2		50	
	2,4-Dinitrotoluene	2.13		50	
	Hexachlorobenzene	1.97		50	
	Hexachlorobutadiene	1.38		50	
	Hexachloroethane	1.79		50	
	m+p-Cresols	2.23		50	
	Nitrobenzene	2.64		50	
	o-Cresol	1.65		50	
	Pentachlorophenol	3.35		250	
	Pyridine	1.82		10	
TCLP SW8260	*1,1-Dichloroethene*	0.05		1	
	1,2-Dichloroethane	0.07		1	
	1,4-Dichlorobenzene	0.06		1	
	Benzene	0.07		1	
	Carbon tetrachloride	0.055		1	
	Chlorobenzene	0.06		1	
	Chloroform	0.06		1	
	Methyl ethyl ketone	0.42		20	
	Tetrachloroethene	0.045		1	
	Trichloroethene	0.066		1	
	Vinyl chloride	0.09		1	

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Comparison of Parameters
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Sediment

Method	Analyte	ELI MDL (mg/kg)	Target MDL (mg/kg)	ELI PQL (mg/kg)	Target PQL (mg/kg)
SW6010/6020	*Aluminum*	1	10	5	25
3050 Prep	*Antimony*	0.01	0.5	0.5	2
	Arsenic	0.1	0.5	5	9.8
	Barium	0.1	0.5	5	
	Beryllium	0.05	0.05	5	
	Boron	1	1	5	
	Cadmium	0.01	0.2	0.4	1
	Chromium	0.1	0.6	0.3	43
	Cobalt	0.02	0.5	5	
	Copper	0.5	0.5	5	32
	Iron	1	10	5	188
	Lead	0.5	0.5	5	36
	Manganese	0.07	0.5	5	631
	Nickel	0.02	5	5	23
	Phosphorus	2	0.05%	10	
	Selenium	0.02	0.5	0.1	1
	Silver	0.02	0.2	1	1
	Thallium	0.1	0.01	1	
	Vanadium	0.4	0.5	1	
	Zinc	1	1	5	121
SW7471A	*Mercury*	0.01	0.01	0.16	0.16
SM4500-F/E300.0	*Fluoride*	0.016	0.01	1	
USDA26	*Percent Solids*	0.02	0.10%	0.02	
MA-VPH	*VPH*	1	1	2	10
MA-EPH	*EPH*	2	2	10	20