



Shake Flask Extraction Analyses

Parameter	Unit	Dir No. 019*	Average Grade Comp	Average Grade Comp DUP1	Average Grade Comp DUP2	Average Grade +270	Average Grade +270 DUP1	Average Grade +270 DUP2	Average Grade -270	Average Grade -270 DUP1	Average Grade -270 DUP2	Low Grade Residue Comp	Low Grade Residue Comp DUP1	Low Grade Residue Comp DUP2	Low Grade Residue Comp +270
LIMS			10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08
Sample weight	g		300	300	300	300	300	300	300	300	300	300	300	300	300
Volume D.I. H ₂ O	mL		900	900	900	900	900	900	900	900	900	900	900	900	900
Initial pH	units		9.32	9.22	9.32	9.08	9.09	9.12	9.49	9.41	9.46	9.04	9.09	9.00	8.99
Final pH	units		8.98	8.97	9.01	8.90	8.94	8.93	8.78	8.68	8.75	8.80	8.79	8.83	8.81
Acidity (as CaCO ₃)	mg/L		< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
pH	units	6.0 - 9.5	7.18	7.23	7.28	7.14	7.18	7.41	7.36	7.50	7.44	7.14	7.16	7.12	7.01
Alkalinity (as CaCO ₃)	mg/L		26	27	26	23	32	23	42	46	44	24	25	24	22
Conductivity	uS/cm		215	216	219	199	199	201	177	193	183	282	278	279	208
F	mg/L		0.24	0.25	0.27	0.25	0.24	0.27	0.36	0.35	0.35	0.25	0.24	0.23	0.24
SO ₄	mg/L		65	66	62	62	66	65	32	41	35	87	91	90	69
Cl	mg/L		0.7	0.7	0.7	1.2	1.1	1.2	2.4	1.1	1.1	1.2	1.2	1.2	1.4
NO ₂ (as N)	mg/L		< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
NO ₃ (as N)	mg/L		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NH ₃ +NH ₄ (as N)	mg/L		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hg	mg/L		< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Al	mg/L		0.0493	0.0463	0.0455	0.0652	0.0610	0.0669	0.0360	0.0328	0.0425	0.0360	0.0422	0.0319	0.0535
As	mg/L	0.400	0.0003	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0022	0.0017	0.0019	0.0007
Ag	mg/L		< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ba	mg/L		0.167	0.160	0.156	0.164	0.167	0.158	0.248	0.250	0.238	0.139	0.129	0.139	0.160
Be	mg/L		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
B	mg/L		0.0569	0.0497	0.0696	0.0553	0.0545	0.0648	0.0596	0.0721	0.0737	0.0563	0.0548	0.0623	0.0630
Bi	mg/L		< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00018	0.00003	< 0.00001	0.00005	< 0.00001	< 0.00001	< 0.00001
Ca	mg/L		21.3	21.4	21.5	22.1	22.1	21.8	16.1	18.6	16.6	33.5	33.5	33.5	25.6
Cd	mg/L		< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	< 0.000003	0.000008	< 0.000003	0.000008	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Co	mg/L		0.000458	0.000453	0.000464	0.000127	0.000120	0.000124	0.000127	0.000122	0.000121	0.000574	0.000609	0.000658	0.000140
Cr	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cu	mg/L	0.600	0.0006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Fe	mg/L	6.000	0.02	0.01	0.02	0.01	< 0.01	0.01	0.03	0.02	0.04	< 0.01	< 0.01	< 0.01	< 0.01
K	mg/L		9.19	9.31	9.04	5.89	5.65	5.74	9.49	8.64	8.52	9.28	9.53	8.95	4.41
Li	mg/L		0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.003	0.003	0.003	0.002
Mg	mg/L		1.22	1.22	1.24	2.72	2.71	2.71	0.825	1.02	0.857	1.42	1.49	1.42	1.98
Mn	mg/L		0.00403	0.00307	0.00323	0.00283	0.00265	0.00297	0.00283	0.00374	0.00313	0.00639	0.00716	0.00672	0.00475
Mo	mg/L		0.00686	0.00682	0.00624	0.00679	0.00658	0.00625	0.0178	0.0193	0.0205	0.0116	0.0112	0.0102	0.0144
Na	mg/L		10.0	9.95	9.92	5.50	5.43	5.66	10.4	10.9	10.7	9.96	9.97	9.97	5.47
Ni	mg/L	1.000	0.0002	0.0003	0.0002	< 0.0001	0.0001	0.0002	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
P	mg/L		0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pb	mg/L	0.400	0.00009	0.00002	0.00003	0.00008	0.00003	0.00005	0.00011	0.00006	0.00009	0.00005	0.00003	< 0.00002	0.00004
Sb	mg/L		0.00168	0.00141	0.00131	0.00158	0.00126	0.00105	0.00439	0.00358	0.00375	0.01146	0.0114	0.0103	0.01142
Se	mg/L		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Si	mg/L		2.40	2.24	2.31	1.96	1.89	1.94	2.32	2.29	2.39	2.10	2.15	2.04	1.62
Sn	mg/L		< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Sr	mg/L		2.06	2.06	2.07	1.53	1.51	1.50	1.31	1.36	1.30	1.15	1.15	1.13	0.915
Ti	mg/L		0.0003	0.0002	0.0004	0.0004	0.0003	0.0005	0.0008	0.0007	0.0009	0.0003	0.0003	0.0003	0.0003
Tl	mg/L		0.000008	0.000004	0.000004	0.000009	0.000003	0.000002	0.000024	0.000004	0.000003	0.000010	0.000010	0.000007	0.000005
U	mg/L		0.000349	0.000352	0.000345	0.00121	0.000916	0.000846	0.00251	0.00211	0.00173	0.000813	0.000659	0.000578	0.000846
V	mg/L		0.00046	0.00038	0.00041	0.00046	0.00043	0.00044	0.00050	0.00042	0.00049	0.00014	0.00018	0.00017	0.00026
W	mg/L		0.00162	0.00116	0.00132	0.00126	0.00122	0.00112	0.00363	0.00381	0.0049	0.00051	0.00058	0.00047	0.00058
Y	mg/L		0.000003	< 0.000001	< 0.000001	< 0.000001	< 0.000001	< 0.000001	0.000004	0.000005	0.000009	< 0.000001	< 0.000001	< 0.000001	< 0.000001
Zn	mg/L	1.000	0.005	0.002	0.003	0.003	0.003	0.003	0.003	0.004	0.003	0.004	0.004	0.003	0.003

* Acceptable maximum concentration of an instantaneous, non-dilute final effluent sample.

Shake Flask Extraction Analyses

Parameter	Unit	Dir No. 019*	Low Grade	Low Grade	Low Grade	Low Grade	Low Grade
			Residue Comp +270 DUP1	Residue Comp +270 DUP2	Residue Comp -270	Residue Comp -270 DUP1	Residue Comp -270 DUP2
LIMS			10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08	10316-AUG08
Sample weight	g		300	300	300	300	300
Volume D.I. H ₂ O	mL		900	900	900	900	900
Initial pH	units		9.03	8.99	9.68	9.64	9.55
Final pH	units		8.83	8.84	9.08	9.14	9.08
Acidity (as CaCO ₃)	mg/L		< 2	< 2	< 2	< 2	< 2
pH	units	6.0 - 9.5	7.09	7.10	7.29	7.39	7.45
Alkalinity (as CaCO ₃)	mg/L		22	22	38	38	39
Conductivity	uS/cm		209	211	150	147	153
F	mg/L		0.24	0.21	0.37	0.38	0.36
SO ₄	mg/L		65	68	23	22	24
Cl	mg/L		1.4	1.3	1.2	1.2	1.2
NO ₂ (as N)	mg/L		< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
NO ₃ (as N)	mg/L		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
NH ₃ +NH ₄ (as N)	mg/L		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hg	mg/L		< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Al	mg/L		0.0586	0.0570	0.0471	0.0521	0.0459
As	mg/L	0.400	0.0005	0.0003	0.0023	0.0023	0.0018
Ag	mg/L		< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Ba	mg/L		0.151	0.141	0.301	0.293	0.285
Be	mg/L		< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
B	mg/L		0.0610	0.0587	0.0787	0.0757	0.0817
Bi	mg/L		< 0.00001	< 0.00001	0.00022	0.00010	0.00004
Ca	mg/L		25.5	25.8	9.52	8.97	9.83
Cd	mg/L		0.000004	< 0.000003	0.000013	< 0.000003	< 0.000003
Co	mg/L		0.000130	0.000135	0.000117	0.000118	0.000118
Cr	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cu	mg/L	0.600	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Fe	mg/L	6.000	< 0.01	< 0.01	0.06	0.07	0.05
K	mg/L		4.47	4.51	8.26	8.07	8.12
Li	mg/L		0.002	0.002	0.001	0.001	0.001
Mg	mg/L		1.96	2.00	0.185	0.164	0.190
Mn	mg/L		0.00483	0.00563	0.00165	0.00159	0.00143
Mo	mg/L		0.0147	0.0154	0.0337	0.0339	0.0334
Na	mg/L		5.35	5.08	13.9	13.9	13.8
Ni	mg/L	1.000	< 0.0001	0.0001	0.0004	0.0004	0.0003
P	mg/L		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pb	mg/L	0.400	0.00003	0.00005	0.00017	0.00016	0.00014
Sb	mg/L		0.0110	0.0101	0.0395	0.0392	0.0342
Se	mg/L		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Si	mg/L		1.57	1.52	2.05	1.96	1.88
Sn	mg/L		< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Sr	mg/L		0.910	0.914	0.449	0.432	0.464
Ti	mg/L		0.0002	0.0003	0.0009	0.0011	0.0008
Tl	mg/L		0.000003	0.000003	0.000013	0.000004	< 0.000002
U	mg/L		0.000820	0.000890	0.000441	0.000401	0.000396
V	mg/L		0.00026	0.00022	0.00033	0.00031	0.00029
W	mg/L		0.00057	0.00065	0.00438	0.00584	0.00489
Y	mg/L		< 0.000001	< 0.000001	0.000006	0.000004	0.000001
Zn	mg/L	1.000	0.003	0.003	0.003	0.002	0.002

* Acceptable maximum concentration of an instantaneous, non-dilute final effluent