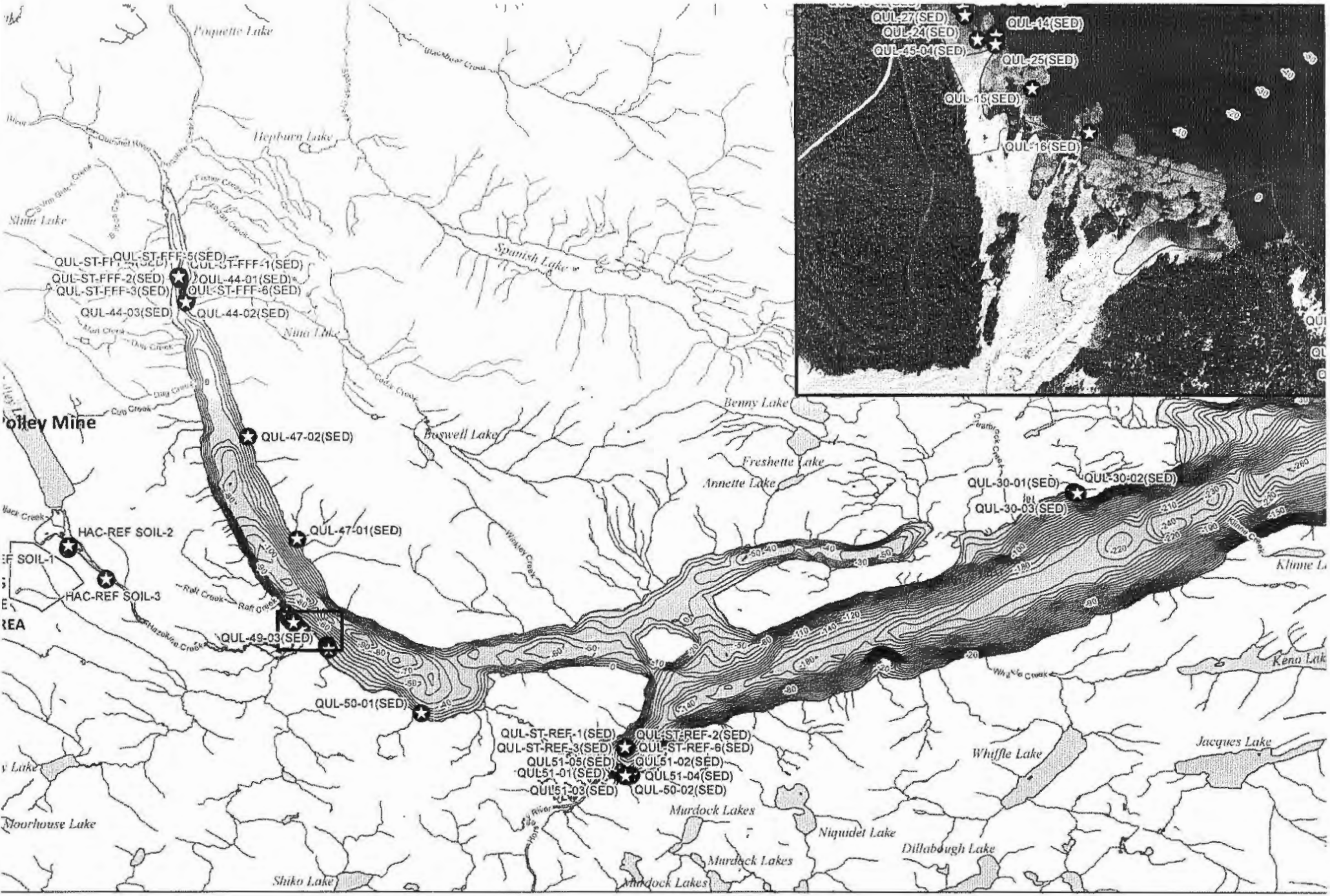

NOTES

1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

0 625 1,250 2,500 3,750 5,000 Meters

1. Toporama WMS service provided by NRCAN. http://data.gc.ca/eng/open-government-licence-canada

2. GPS Data Collected using an eTrex. Accuracy expected to be approximately +/- 3.5m.

CLIENT NAME:

TABLE 4a: Summary of Analytical Results for Mount Polley, Hazeltine Creek - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters: Hardness (mg/L)	pH (field) (pH)	pH (pH)	Temperature (field) (C)	Turbidity (NTU)	Conductivity (uS/cm)	TDS (mg/L)	TSS (mg/L)	DOC (mg/L)	Total Inorganics: Total Nitrogen (N) (mg/L)	Ammonia Nitrogen (µg/L)	Nitrate Nitrogen (µg/L)	Nitrite Nitrogen (µg/L)	Nitrate+Nitrite Nitrogen (µg/L)	Chloride (mg/L)	Fluoride (µg/L)	Sulphate (mg/L)	Total Alkalinity (as CaCO3) (mg/L)	Ortho-phosphate (mg/L)	Total Phosphorus (mg/L)
BC Standards																						
BCWQG Aquatic Life (AW)[b,c]			n/a	6.5-9.0	6.5-9.0	+/-1 Degree change from ambient[g]	Change of 8	n/a	n/a	Change of 25	n/a	n/a	700-24,500[d]	32,800	60 (Cl<2)	32,800[f]	600	1324-1592[d]	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[b,c,h]			n/a	n/a	n/a		Change of 2[k]	n/a	n/a	Change of 5[k]	+20% of median background	n/a	135-17,700[d]	3,000	20 (Cl<2)	3,000[f]	150	n/a	128-309[d]	n/a	n/a	n/a
BCWQG Drinking Water (DW)[b,c]			n/a	6.5-8.5	6.5-8.5	n/a[j]	Change of 1	n/a	n/a	n/a	n/a	n/a	n/a	10,000	1,000	10,000[f]	250	1,000	500	n/a	n/a	0.01
Canadian Drinking Water Quality (DW)[e]			n/a	6.5-8.5	6.5-8.5	n/a[j]	n/a[j]	n/a	500	n/a	n/a	n/a	n/a	10,000	1,000	n/a	250	1,500	500	n/a	n/a	n/a
HAD-1	HAD-1	2014 08 10	99	8.98	8.68	18.8	5.24	198	140	10.7	6.82	0.378	< 5	< 5	< 1	-	< 0.5	64	27.5	71.8	< 0.001	0.0066
	HAD-1	2014 08 10	100	9.08	8.86	21.3	2.75	183	138	< 3	6.58	0.361	< 5	< 5	< 1	-	< 0.5	65	27.4	74.7	< 0.001	0.0076
	HAD-1	2014 08 11	102	8.94	8.50	21.1	2.16	199	139	< 3	6.77	0.366	< 5	< 5	< 1	-	< 0.5	62	27.4	74.4	< 0.001	0.0056
	HAD-1	2014 08 12	99.9	8.99	8.66	20.5	2.64	198	148	< 3	6.12	0.348	< 5	< 5	< 1	-	< 0.5	63	27.2	74.7	< 0.001	0.0061
	HAD-1	2014 08 13	97.4	9.11	8.80	21.2	1.5	194	135	< 3	6.32	0.366	6.7	< 5	< 1	-	< 0.5	65	27.3	73.9	0.0011	0.0053
	HAD-1	2014 08 14	99	9.00	8.59	21.5	1.24	200	131	< 3	6.45	0.341	< 5	< 5	< 1	-	< 0.5	63	27.4	76.2	< 0.001	0.0048
	HAD-1	2014 08 15	99.1	8.72	8.43	22.3	1.25	201	136	< 3	6.39	0.37	< 5	< 5	< 1	< 5.1	< 0.5	81	27.3	75	< 0.001	0.0057
	HAD-1	2014 08 16	101	8.67	8.28	20.4	3.21	203	141	4.5	6.71	0.363	< 5	< 5	< 1	< 5.1	< 0.5	67	27.6	75.2	< 0.001	0.0058
	HAD-1X	2014 08 16	102	8.67	8.21	20.4	3.04	203	138	3.4	6.73	0.371	< 5	< 5	< 1	< 5.1	< 0.5	69	27.5	74.6	< 0.001	0.0061
	QA/QC RPD %		< 1	0	< 1	0	5	0	2	[illegible]	< 1	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	< 1	< 1	[illegible]	[illegible]
	HAD-1	2014 08 17	97.9	8.79	8.21	20.5	2.95	201	141	< 3	6.57	0.352	< 5	< 5	< 1	-	< 0.5	69	27.5	75	< 0.001	0.0068
	HAD-1	2014 08 18	100	8.65	8.37	21.0	1.51	201	135	< 3	7.37	0.425	5.7	< 5	< 1	-	< 0.5	67	27.4	76.1	< 0.001	0.0064
	HAD-1	2014 08 19	98	8.72	8.28	20.7	1.52	200	105	< 3	7.02	0.372	< 5	< 5	< 1	-	< 0.5	75	26.8	76.3	< 0.001	0.0059
	HAD-1	2014 08 20	102	8.72	8.21	20.7	7.79	201	139	8.5	6.45	0.364	< 5	< 5	< 1	-	< 0.5	63	26.8	76	< 0.001	0.0062
	HAD-1	2014 08 21	101	-	8.32	-	5.14	200	141	4	6.29	0.34	< 5	< 5	< 1	-	< 0.5	65	27.5	74.8	< 0.001	0.0046
	HAD-1	2014 08 22	103	8.58	8.29	-	4.33	200	131	4.2	6.61	0.349	< 5	< 5	< 1	-	< 0.5	66	27.5	75.2	< 0.001	0.0069
	HAD-1	2014 08 24	104	8.22	8.11	18.2	7.44	207	140	7.8	6.95	0.354	< 5	< 5	< 1	-	< 0.5	69	27.2	77.7	0.0012	0.0036
	HAD-1	2014 08 26	106	8.88	8.47	17.6	1.14	204	130	< 3	6.2	0.364	7.6	10.4	< 1	-	< 0.5	67	29.5	77	< 0.001	0.0044
	HAD-1	2014 08 28	108	8.78	8.33	18.2	1.08	209	132	< 3	6.68	0.335	5	< 5	< 1	-	< 0.5	67	28.9	76.8	0.001	0.0075
	HAD-1	2014 08 30	103	8.25	8.16	17.3	4.03	210	130	5.4	7.06	0.362	< 5	< 5	< 1	-	< 0.5	72	29.5	77.3	< 0.001	0.0058
	HAD-1	2014 08 31	104	8.67	8.29	16.0	1.3	209	137	3.3	6.52	0.35	9	6.6	< 1	-	< 0.5	69	29.5	77.3	0.0011	0.0047
	HAD-1	2014 09 01	105	8.28	8.14	16.8	2.36	208	131	4.3	6.52	0.37	5.6	5.9	< 1	-	< 0.5	66	29.5	77	< 0.001	0.0045
	HAD-1	2014 09 02	106	8.57	8.1	16.6	1.24	212	142	< 3	6.64	0.347	< 5	< 5	< 1	-	< 0.5	65	29.5	78.1	< 0.001	0.004
HAD-2	HAD-2	2014 08 30	104	8.14	8.15	17.3	4.41	211	137	3.9	6.73	0.359	< 5	< 5	< 1	-	< 0.5	71	29.4	78.6	< 0.001	0.0049
	HAD-2	2014 08 31	104	8.87	8.34	17.0	1.5	208	137	3.6	6.53	0.357	7.4	6.4	< 1	-	< 0.5	71	29.7	78.4	< 0.001	0.0046
	HAD-2	2014 09 01	106	8.37	8.25	16.2	2.56	208	136	< 3	6.62	0.348	5.1	< 5	< 1	-	< 0.5	66	29.4	77.6	< 0.001	0.0045
	HAD-2	2014 09 02	105	8.57	8.21	16.6	1.83	212	140	3.1	6.21	0.346	< 5	< 5	< 1	-	< 0.5	65	29.5	78.9	< 0.001	0.0041
	HAD-2	2014 09 03	107	8.2	8.38	21.6	1.91	208	144	< 3	6.79	0.345	< 5	< 5	< 1	-	< 0.5	65	29.8	77.9	< 0.001	0.0061
HAC01	HAC01	2014 08 24	161	8.22	8.17	18.2	> 4000	343	243	3,380	6.04	0.902	82.2	453	6.1	-	1.56	120	75.9	93.4	0.0056	0.009
	HAC01-24HRS	2014 08 24	159	-	8.24	-	62.1	345	256	38.7	6.71	0.691	72.9	461	6.4	-	1.58	119	77.7	95.5	0.0061	0.0077
	HAC01	2014 08 25	155	8.62	8.23	18.6	4,090	320	140	4,040	5.73	1.81	63.2	408	4.4	-	1.3	111	60	92.1	0.0032	0.0082
	HAC01	2014 08 26	151	8.76	8.3	18.0	> 4000	317	219	3,950	6.16	0.73	67.3	418	4.6	-	1.01	120	65.1	94.7	0.0066	0.0099
	HAC01	2014 08 27	166	8.83	8.17	18.8	> 4000	396	260	35,000	5.43	2.7	183	356	20.9	-	3.45	226	101	90.6	0.0024	0.0068
	HAC01-24HRS SETTLING	2014 08 26	153	-	8.21	-	21.4	319	216	3.8	5.61	0.643	77.1	416	5	-	1	103	65.2	96.1	0.0067	0.0118
	HAC1	2014 08 28	166	8.28	8.18	17.6	> 4000	411	282	28,900	5.59	2.3	174	403	16.7	-	3.96	248	114	91.4	0.0028	0.0081
	HAC1-24HRS SETTLING	2014 08 28	168	-	8.14	-	68.3	420	312	41.6	5.13	0.925	169	397	16.2	-	3.95	247	116	89.6	0.0027	0.0081
	HAC01	2014 08 29	189	8.3	8.17	14.6	> 4000	501	341	62,800	4.16	4.55	300	432	36.5	-	6.36	348	162	78.3	0.0024	0.009
	HAC01-24HRS SETTLING	2014 08 29	190	-	8.13	-	80.8	502	387	31.4	4.23	1.06	308	437	36.1	-	6.4	329	156	78.2	0.0029	0.008
	HAC-1	2014 08 31	164	-	8.23	-	100,000	384	266	46,400	5.64	3.26	201	365	17.7	-	3.35	222	89.9	92.4	0.0063	0.0136
	HAC-1	2014 09 03	137	-	8.34	-	> 4000	317	217	20,800	6.02	2.57	125	80	13.1	-	2.49	166	64.9	97.4	0.0008	0.027
HAC05	HAC-05	2014 08 28	162	8.39	8.24	18.2	> 4000	375	212	27,900	5.51	1.27	141	412	14.8	-	3.17	207	99.3	79.6	0.0027	0.0074
	HAC-05-24HRS SETTLING	2014 08 28	169	-	8.12	-	61.2	361	264	4.7	5.04	0.916	160	400	15	-	3.16	208	101	82.2	0.002	0.0074
HAC06	HAC-06	2014 08 28	165	8.25	8.22	17.5	> 4000	402	282	41,500	5.22	1.78	165	383	15.9	-	3.09	242	108	84.8	0.0035	0.0088
	HAC-06-24HRS SETTLING	2014 08 28	162	-	8.19	-	67.7	396	225	46.9	5.29	0.88	160	384	16.3	-	3.7	247	111	84.7	0.0026	0.0084

Associated ALS files: L1500205, L1500006, L1501501, L1501554, L1502400, L1503086, L1503826, L1503634, L1503943, L1504261, L1504297, L1505033, L1506592, L1506906, L1507958, L1507977, L1508848, L1509589, L1509671, L1510294, L1510298, L1510307, L1510744, L1511205, L1511213, L1511248, L1511774, L1511888, L1511905, L1512099, L1513376.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED — Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD — Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED — Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD — Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.
[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.
[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.
[d] Guideline varies with pH, and or Temperature or Hardness.
[e] Health Canada Drinking Water Guidelines, 2012.
[f] Guideline for Nitrate applied.
[g] Stream criteria applies to deviation from optimum fish species temperature range. In this case, a reference to ambient is made since the background range (Minnow, 2014) is <0-20.8°C (upper Hazeltine Creek).
[h] Calculated based on an individual sample basis, not average result basis.
[i] Secondary chronic or chronic value, not 30 day mean.
[j] Guideline not applicable for site situation.
[k] Based on a change from background at any one time. Prebreach range (Minnow, 2014) 0.34-8.98 NTU and <3-18 mg/L TSS.

TABLE 4a: Summary of Analytical Results for Mount Polley, Hazeltine Creek - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Dissolved Metals																												
			Dissolved Aluminum (µg/L)	Dissolved Calcium (mg/L)	Dissolved Iron (µg/L)	Dissolved Magnesium (mg/L)	Dissolved Manganese (µg/L)	Dissolved Potassium (mg/L)	Dissolved Sodium (mg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Lithium (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[b,c]			100[d]	n/a	350	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[b,c,h]			50[d]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Drinking Water (DW)[b,c]			200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canadian Drinking Water Quality (DW)[e]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HAD-1	HAD-1	2014 08 10	14.8	31.6	< 30	4.85	6.48	0.458	4.4	< 0.1	0.61	10.9	< 0.1	19	< 0.01	< 0.5	< 0.1	3.4	< 0.05	< 0.5	2.84	< 0.5	0.56	< 0.01	< 0.01	< 10	0.11	1.1	< 3
	HAD-1	2014 08 10	13.9	32.3	< 30	4.81	4.56	0.444	4.52	< 0.1	0.6	11	< 0.1	19	< 0.01	< 0.5	< 0.1	3.19	< 0.05	< 0.5	2.77	< 0.5	0.55	< 0.01	< 0.01	< 10	0.099	1.2	< 3
	HAD-1	2014 08 11	10.4	32.5	< 30	4.97	2.44	0.407	4.25	< 0.1	0.53	8.45	< 0.1	21	< 0.01	< 0.5	< 0.1	2.49	< 0.05	< 0.5	2.68	< 0.5	0.58	< 0.01	< 0.01	< 10	0.108	1.1	< 3
	HAD-1	2014 08 12	9.5	32	< 30	4.85	1.4	0.356	4.14	< 0.1	0.53	7.48	< 0.1	22	< 0.01	< 0.5	< 0.1	2.15	< 0.05	< 0.5	2.62	< 0.5	0.59	< 0.01	< 0.01	< 10	0.107	1.1	< 3
	HAD-1	2014 08 13	10	31.2	< 30	4.73	0.282	0.397	4.43	< 0.1	0.58	7.67	< 0.1	20	< 0.01	< 0.5	< 0.1	2.41	< 0.05	< 0.5	2.41	< 0.5	0.53	< 0.01	< 0.01	< 10	0.098	1.2	< 3
	HAD-1	2014 08 14	8.9	31.9	< 30	4.67	0.224	0.388	4.48	< 0.1	0.6	7.51	< 0.1	22	< 0.01	< 0.5	< 0.1	2.19	< 0.05	< 0.5	2.03	< 0.5	0.57	< 0.01	< 0.01	< 10	0.113	1.1	< 3
	HAD-1	2014 08 15	10.1	31.7	< 30	4.88	3.31	0.434	4.59	< 0.1	0.61	7.72	< 0.1	19	< 0.01	< 0.5	< 0.1	2.51	< 0.05	< 0.5	2.51	< 0.5	0.58	< 0.01	< 0.01	< 10	0.118	1.1	< 3
	HAD-1	2014 08 16	11.1	32.4	< 30	4.9	7.12	0.463	4.43	< 0.1	0.62	8.52	< 0.1	18	< 0.01	< 0.5	< 0.1	2.77	< 0.05	< 0.5	2.59	< 0.5	0.59	< 0.01	< 0.01	< 10	0.101	1.1	< 3
	HAD-1X	2014 08 16	10.9	32.6	< 30	4.92	7.97	0.477	4.47	< 0.1	0.6	8.45	< 0.1	18	< 0.01	< 0.5	< 0.1	2.67	< 0.05	< 0.5	2.52	< 0.5	0.57	< 0.01	< 0.01	< 10	0.102	1.1	< 3
	QA/QC RPD %		1	1	1	< 1	11	3	< 1	1	3	< 1	1	1	1	1	1	4	1	1	3	1	1	1	1	1	< 3	1	1	1	1
	HAD-1	2014 08 17	10.4	31.5	< 30	4.7	0.578	0.467	4.56	< 0.1	0.57	8.05	< 0.1	21	< 0.01	< 0.5	< 0.1	2.65	< 0.05	< 0.5	2.66	< 0.5	0.54	< 0.01	< 0.01	< 10	0.106	1.1	< 3
	HAD-1	2014 08 18	10	32.2	< 30	4.78	4.26	0.463	4.43	< 0.1	0.57	8.29	< 0.1	20	< 0.01	< 0.5	< 0.1	2.41	< 0.05	< 0.5	2.62	< 0.5	0.52	< 0.01	< 0.01	< 10	0.108	1.1	< 3
	HAD-1	2014 08 19	10.8	31.5	< 30	4.71	7.21	0.465	4.44	< 0.1	0.61	8.15	< 0.1	20	< 0.01	< 0.5	< 0.1	2.44	< 0.05	< 0.5	2.6	< 0.5	0.57	< 0.01	< 0.01	< 10	0.1	1.2	< 3
	HAD-1	2014 08 20	15.1	32.7	< 30	4.85	4.9	0.478	4.52	< 0.1	0.61	9.04	< 0.1	19	< 0.01	< 0.5	< 0.1	3.31	< 0.05	< 0.5	2.62	< 0.5	0.58	< 0.01	< 0.01	< 10	0.105	1.1	< 3
	HAD-1	2014 08 21	13.5	32.3	< 30	4.9	0.453	0.467	4.57	< 0.1	0.59	8.23	< 0.1	20	< 0.01	< 0.5	< 0.1	2.99	< 0.05	< 0.5	2.81	< 0.5	0.55	< 0.01	< 0.01	< 10	0.103	1	< 3
	HAD-1	2014 08 22	10.7	33.1	< 30	4.91	3.02	0.48	4.66	< 0.1	0.63	8.69	< 0.1	20	< 0.01	< 0.5	< 0.1	2.92	< 0.05	< 0.5	2.66	< 0.5	0.57	< 0.01	< 0.01	< 10	0.104	1.1	< 3
	HAD-1	2014 08 24	15.1	33.5	< 30	4.92	3.04	0.532	4.69	< 0.1	0.67	9.76	< 0.1	18	< 0.01	< 0.5	< 0.1	3.71	< 0.05	< 0.5	2.78	< 0.5	0.56	< 0.01	< 0.01	< 10	0.107	1.1	< 3
	HAD-1	2014 08 26	31.5	34.4	< 30	4.98	4.05	0.675	5	< 0.1	0.63	9.06	< 0.1	19	0.014	< 0.5	< 0.1	3.59	0.078	< 0.5	4.53	< 0.5	0.63	< 0.01	< 0.01	< 10	0.117	1.1	56.5
	HAD-1	2014 08 28	10.9	34.7	< 30	5.07	2.33	0.495	4.86	< 0.1	0.65	8.74	< 0.1	21	< 0.01	< 0.5	< 0.1	2.82	< 0.05	< 0.5	2.98	< 0.5	0.69	< 0.01	< 0.01	< 10	0.116	1.1	< 3
	HAD-1	2014 08 30	15.1	32.9	< 30	4.96	4.24	0.51	6.23	< 0.1	0.73	10.3	< 0.1	19	0.015	< 0.5	< 0.1	4.25	< 0.05	< 0.5	3.61	< 0.5	0.65	< 0.01	< 0.01	< 10	0.132	1.1	< 3
	HAD-1	2014 08 31	10.5	33.4	< 30	4.97	1.97	0.551	4.93	< 0.1	0.66	9.34	< 0.1	20	< 0.01	< 0.5	< 0.1	2.82	< 0.05	< 0.5	3.42	< 0.5	0.71	< 0.01	< 0.01	< 10	0.119	1.1	< 3
	HAD-1	2014 09 01	10	34	< 30	5.02	3.07	0.56	4.86	< 0.1	0.66	9.35	< 0.1	20	< 0.01	< 0.5	< 0.1	3.01	< 0.05	< 0.5	3.39	< 0.5	0.69	< 0.01	< 0.01	< 10	0.119	1.1	< 3
	HAD-1	2014 09 02	11.3	34	< 30	5.02	2.68	0.543	5.02	< 0.1	0.68	9.06	< 0.1	19	< 0.01	< 0.5	< 0.1	2.89	< 0.05	< 0.5	3.41	< 0.5	0.77	< 0.01	< 0.01	< 10	0.126	1.1	< 3
	HAD-2	2014 08 30	12.4	33.4	< 30	4.96	3.96	0.593	5.2	< 0.1	0.69	10.1	< 0.1	19	< 0.01	< 0.5	< 0.1	3.85	< 0.05	< 0.5	3.53	< 0.5	0.63	< 0.01	< 0.01	< 10	0.121	1.1	< 3
HAD-2	HAD-2	2014 08 31	10.9	33.5	< 30	5.02	2.71	0.553	4.9	< 0.1	0.67	9.4	< 0.1	20	< 0.01	< 0.5	< 0.1	2.93	< 0.05	< 0.5	3.5	< 0.5	0.7	< 0.01	< 0.01	< 10	0.117	1.1	< 3
	HAD-2	2014 09 01	11	34	< 30	5.04	3.42	0.558	4.87	< 0.1	0.68	9.45	< 0.1	20	< 0.01	< 0.5	< 0.1	3.05	< 0.05	< 0.5	3.42	< 0.5	0.7	< 0.01	< 0.01	< 10	0.119	1.1	< 3
	HAD-2	2014 09 02	10.5	34	< 30	4.99	3.28	0.554	4.98	< 0.1	0.68	9.15	< 0.1	19	< 0.01	< 0.5	< 0.1	2.93	< 0.05	< 0.5	3.43	< 0.5	0.76	< 0.01	< 0.01	< 10	0.118	1.1	< 3
	HAD-2	2014 09 03	11.6	34.6	< 30	4.96	2.37	0.533	4.82	< 0.1	0.65	9.49	< 0.1	20	< 0.01	< 0.5	< 0.1	3.09	< 0.05	< 0.5	3.56	< 0.5	0.7	< 0.01	< 0.01	< 10	0.133	1.1	< 3
HAC01	HAC01	2014 08 24	11.6	90	< 30	8.78	52.7	2.08	9.63	< 0.5	1.72	35.2	< 0.5	< 50	< 0.05	< 0.5	< 0.5	17.5	< 0.25	3.2	12.3	< 2.5	3.44	< 0.05	< 0.05	< 10	0.986	< 5	< 5
	HAC01-24HRS	2014 08 24	10.3	49.2	< 30	8.83	53.9	2.16	9.82	0.27	1.93	37.9	< 0.1	29	0.013	< 0.5	0.12	17.8	< 0.05	1.11	12.2	0.74	3.77	< 0.01	< 0.01	< 10	0.954	3.2	< 3
	HAC01	2014 08 25	9.6	48	< 30	8.45	51.6	1.78	8.23	0.23	1.65	38.6	< 0.2	24	< 0.02	< 0.5	< 0.2	15.8	< 0.1	< 1	10.1	< 1	3.35	< 0.02	< 0.02	< 10	0.85	2.5	< 3
	HAC01	2014 08 26	12.1	46.4	< 30	8.44	52.8	1.7	7.95	< 0.5	1.67	38.4	< 0.5	< 50	< 0.05	< 0.5	< 0.5	16	< 0.25	< 2.5	10.4	< 2.5	3.43	< 0.05	< 0.05	< 10	0.746	< 5	< 5
	HAC01	2014 08 27	27	53	< 30	8.28	48.2	4.2	18.5	< 2	2.5	44.6	< 2	< 200	< 0.2	< 2	< 2	19.6	< 1	< 10	35.9	< 10	3	< 0.2	< 0.2	< 10	1.51	< 20	< 20
	HAC01 24HRS SETTLED	2014 08 26	13.2	47.1	< 30	8.55	51.9	1.66	7.62	0.25	1.69	38.8	< 0.1	26	0.01	< 0.5	0.11	15.8	< 0.05	1.13	10.3	0.62	3.6	< 0.01	< 0.01	< 10	0.727	2.8	< 3
	HAC1	2014 08 28	44	53.2	< 30	8.07	45.8	4.6	18	< 2	2.5	37.6	< 2	< 200	< 0.2	< 2	< 2	15.3	< 1	< 10	38.5	< 10	3	< 0.2	< 0.2	< 10	1.52	< 20	< 20
	HAC1 24HRS SETTLED	2014 08 28	19.9	54.1	< 30	8.03	50.2	5.32	20.4	0.62	2.9	42.3	< 0.2	42	< 0.02	< 0.5	< 0.2	14.7	0.18	2.5	41.5	< 1	3.55	< 0.02	< 0.02	< 10	1.65	4.3	< 3
	HAC01	2014 08 29	231	61.1	< 60	8.74	62.9	5.7	29.1	< 5	< 5	42.9	< 5	< 500	< 0.5	< 5	< 5	19	< 2.5	< 25	68.3	< 25	< 5	< 0.5	< 0.5	< 20	2.18	< 50	< 50
	HAC01 24HRS SETTLED	2014 08 29	26	61.5	< 60	8.81	65.6	6	30.9	< 1	3.1	43.4	< 1	< 100	< 0.1	< 1	< 1	14.5	< 0.5	< 5	69.4	< 5	3.7	< 0.1	< 0.1	< 20	2.27	< 10	< 10
	HAC-1	2014 08 31	27	51.8	< 150	8.36	37	4.2	16.8	< 2	2.4	40.9	< 2	< 200	< 0.2	< 2	< 2	12.6	< 1	< 10	33.8	< 10	2.5	< 0.2	< 0.2	< 50	1.06	< 20	< 20
	HAC-1	2014 09 03	22	43	< 30	7.25	34.1	3.48	20.3	1.4	3.2	39.8	< 1	< 100	< 0.1	< 1	6.3	12.6	< 0.5	< 5	21.9	< 5	3.1	0.1	< 0.1	< 10	0.84	< 10	< 10
HAC05	HAC-05	2014 08 29	88	53.1	< 30	7.14	43.4	4.4	17.8	< 2	2.7	35.7	< 2	< 200	< 0.2	< 2	< 2	25.8	< 1	< 10	41.2	< 10	3.7	< 0.2	< 0.2	< 10	0.92	< 20	< 20
	HAC-05 24HRS SETTLED	2014 08 28	22	55.6	< 30	7.44	58.6	4.92	19	0.85	2.96	39.3	< 0.2	48	0.035	< 0.5	0.21	40.8	< 0.1	3.9	49.7	< 1	4.41	< 0.02	< 0.02	< 10	1.3	3.5	< 3
HAC06	HAC-06	2014 08 29	7,650	52.3	1,880	8.36	99.1	6.9	20.8	< 2	3.5	63	< 2	< 200	< 0.2	< 2	< 2	88.2	1.1	< 10	39.6	< 10	3.4	< 0.2	< 0.2	135	1.7	< 20	< 20
	HAC-06 24HRS SETTLED	2014 08 28	19.8	52.9	< 30	7.36	66.9	5.55	20.9	0.95	2.85	40	< 0.5	< 50	< 0.05	< 0.5	< 0.5	37.7	< 0.25	3.8	46.6	< 2.5	3.64	< 0.05	< 0.05	< 10	2.08	< 5	< 5

Associated ALS files: L1503203, L1503606, L1501501, L1501554, L1502400, L1503068, L1503028, L1503934, L1503943, L1504201, L1504997, L1505933, L1506592, L1506596, L1507058, L1507077, L1508649, L1508569, L1508671, L1510204, L1510206, L1510307, L1510744, L1511205, L1511213, L1511248, L1511774, L1511866, L1511905, L1512698, L1513275.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.

[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[d] Guideline varies with pH, and or Temperature or Hardness.

[e] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate applied.

[g] Stream criteria applies to deviation from optimum fish species temperature range. In this case, a reference in ambient is made since the background range (Minnow, 2014) is ~0-20.5°C (Upper Hazeltine Creek)

[h] Calculated based on an individual sample basis, not average result basis.

[i] Secondary chronic or chronic value not 30 day mean.

[j] Guideline not applicable for site situation.

[k] Based on a change from background of any one time, Probable LA range (Minnow 2014) 0.34-8.99 NTU and 4.3-18 mg/L TSS.

TABLE 4a: Summary of Analytical Results for Mount Polley, Hazeltine Creek - Surface Water DRAFT

Total Metals (Part 1: Aluminum – Iron)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Aluminum (ug/L)	Antimony (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Beryllium (ug/L)	Bismuth (ug/L)	Boron (ug/L)	Cadmium (ug/L)	Calcium (ug/L)	Chromium (ug/L)	Cobalt (ug/L)	Copper (ug/L)	Iron (ug/L)
BC Standards															
BCWQG Aquatic Life (AW)[b,c]			n/a	20	5	5,000	n/a	n/a	1,200	0.0325-0.0579[d]	n/a	1 (Cr(+6))	110	11.2-19.9[d]	1,000
BCWQG Aquatic Life (30day) (AW)[b,c,h]			n/a	n/a	n/a	1,000	5.3[i]	n/a	n/a	n/a	n/a	n/a	4	3.9-7.6[d]	n/a
BCWQG Drinking Water (DW)[b,c]			n/a	14	25	n/a	4	n/a	5,000	n/a	n/a	n/a	n/a	500	n/a
Canadian Drinking Water Quality (DW)[e]			100	6	10	1,000	n/a	n/a	5,000	5	n/a	50	n/a	1,000	300
HAD-1	HAD-1	2014 08 10	364	< 0.1	1.07	17	< 0.1	< 0.5	20	< 0.01	31,900	< 0.5	0.24	21.5	247
	HAD-1	2014 08 10	121	< 0.1	0.68	12.8	< 0.1	< 0.5	20	< 0.01	31,700	< 0.5	< 0.1	6.89	86
	HAD-1	2014 08 11	76.8	< 0.1	0.56	8.68	< 0.1	< 0.5	23	< 0.01	32,300	< 0.5	< 0.1	4.11	49
	HAD-1	2014 08 12	36.8	< 0.1	0.54	7.25	< 0.1	< 0.5	22	< 0.01	31,400	< 0.5	< 0.1	2.62	< 30
	HAD-1	2014 08 13	26.7	0.1	0.66	7.91	< 0.1	< 0.5	22	< 0.01	31,400	< 0.5	< 0.1	3.21	< 30
	HAD-1	2014 08 14	30.9	< 0.1	0.58	8.08	< 0.1	< 0.5	23	< 0.01	32,600	< 0.5	< 0.1	3.29	< 30
	HAD-1	2014 08 15	44.2	< 0.1	0.64	8.34	< 0.1	< 0.5	20	< 0.01	31,800	< 0.5	< 0.1	3.61	< 30
	HAD-1	2014 08 16	164	< 0.1	0.64	10.6	< 0.1	< 0.5	21	< 0.01	32,000	< 0.5	0.14	5.79	110
	HAD-1X	2014 08 16	128	< 0.1	0.63	9.87	< 0.1	< 0.5	21	< 0.01	32,300	< 0.5	0.11	6.15	99
	QA/QC RPD %		25	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	HAD-1	2014 08 17	121	< 0.1	0.64	9.62	< 0.1	< 0.5	21	< 0.01	32,800	< 0.5	0.11	6.51	93
	HAD-1	2014 08 18	54.7	< 0.1	0.65	9.22	< 0.1	< 0.5	22	< 0.01	32,100	< 0.5	< 0.1	4.34	59
	HAD-1	2014 08 19	52.8	< 0.1	0.65	9.03	< 0.1	< 0.5	23	< 0.01	32,300	< 0.5	< 0.1	3.8	49
	HAD-1	2014 08 20	282	< 0.1	0.75	13.8	< 0.1	< 0.5	22	< 0.01	32,500	< 0.5	0.28	13.9	273
	HAD-1	2014 08 21	288	< 0.1	0.72	12.3	< 0.1	< 0.5	21	< 0.01	33,600	< 0.5	0.21	11.8	206
	HAD-1	2014 08 22	227	< 0.1	0.72	11.9	< 0.1	< 0.5	21	< 0.01	33,500	< 0.5	0.17	9.07	189
	HAD-1	2014 08 24	392	< 0.1	0.79	15.3	< 0.1	< 0.5	21	< 0.01	34,400	< 0.5	0.3	15.1	285
	HAD-1	2014 08 26	52.3	< 0.1	0.86	9.05	< 0.1	< 0.5	19	< 0.01	32,700	< 0.5	< 0.1	4.1	40
	HAD-1	2014 08 28	46.9	< 0.1	0.63	9	< 0.1	< 0.5	23	< 0.01	33,100	< 0.5	< 0.1	3.87	< 30
	HAD-1	2014 08 30	245	< 0.1	0.74	13.3	< 0.1	< 0.5	20	< 0.01	33,500	< 0.5	0.18	11.2	171
	HAD-1	2014 08 31	62	< 0.1	0.69	10.2	< 0.1	< 0.5	25	< 0.01	33,600	< 0.5	< 0.1	4.45	37
	HAD-1	2014 09 01	121	< 0.1	0.73	11.5	< 0.1	< 0.5	23	< 0.01	34,500	< 0.5	0.11	6.17	67
	HAD-1	2014 09 02	64.7	< 0.1	0.69	9.87	< 0.1	< 0.5	21	< 0.01	33,900	< 0.5	< 0.1	4.27	46
	HAD-2	2014 08 30	252	< 0.1	0.77	13.6	< 0.1	< 0.5	23	< 0.01	33,000	< 0.6	0.19	11.8	182
HAD-2	HAD-2	2014 08 31	74.3	< 0.1	0.7	10.4	< 0.1	< 0.5	24	< 0.01	33,500	< 0.5	< 0.1	4.87	56
	HAD-2	2014 09 01	140	< 0.1	0.73	11.4	< 0.1	< 0.5	23	< 0.01	34,500	< 0.5	0.11	6.58	105
	HAD-2	2014 09 02	77.4	< 0.1	0.68	10.2	< 0.1	< 0.5	21	< 0.01	33,700	< 0.5	< 0.1	4.77	57
	HAD-2	2014 09 03	103	< 0.1	0.69	11	< 0.1	< 0.5	22	< 0.01	33,900	< 0.5	< 0.1	5.11	73
HAC01	HAC01	2014 08 24	76,200	0.67	47.4	786	2.4	< 2.5	54	1.02	178,000	114	66.2	7,280	117,000
	HAC01-24HRS	2014 08 24	14,400	0.18	18.4	311	1.01	< 0.5	38	0.328	156,000	18.3	20.9	1,760	20,800
	HAC01	2014 08 25	63,400	0.6	36.1	660	2.03	< 1	43	1.08	146,000	111	60.1	2,200	113,000
	HAC01	2014 08 26	73,300	0.72	42.1	736	2.25	< 2.8	53	1.04	145,000	132	67.5	2,400	117,000
	HAC01	2014 08 27	380,000	< 2	245	4,870	14.1	< 10	270	4.78	757,000	590	373	20,000	473,000
	HAC01-24HRS SETTLING	2014 08 26	15,400	0.2	11.7	346	1.06	< 0.5	40	0.927	134,000	26.5	25.5	7,120	22,300
	HAC1	2014 08 28	404,000	< 2	278	5,160	17.5	< 10	280	4.94	738,000	202	399	22,100	404,000
	HAC1-24HRS SETTLING	2014 08 28	5,240	0.47	10.5	463	1.56	< 1	75	2.16	523,000	3.06	20.8	4,100	13,800
	HAC01	2014 08 29	817,000	< 5	564	11,600	37	< 25	< 500	10.4	#######	640	694	44,000	852,000
	HAC01-24HRS SETTLING	2014 08 29	192,000	< 1	182	2,750	13.8	< 5	290	6.76	#######	169	165	22,000	172,000
	HAC-1	2014 08 31	388,000	< 2	261	5,780	17.4	< 10	270	6.27	#######	330	426	21,500	485,000
	HAC-1	2014 09 03	272,000	1.7	179	2,506	11	< 5	170	4.3	557,000	230	250	12,000	340,000
HAC05	HAC-05	2014 08 28	318,000	< 2	272	4,200	15	< 10	290	4.42	767,000	168	334	17,200	346,000
	HAC-05-24HRS SETTLING	2014 08 28	8,990	0.51	35.7	469	2.03	< 1	67	1.61	577,000	7.59	17.9	4,210	13,700
HAC06	HAC-06	2014 08 28	374,000	< 2	322	5,560	14.2	< 10	360	5.87	#######	222	309	25,920	440,000
	HAC-06-24HRS SETTLING	2014 08 28	1,660	0.69	2.7	391	0.8	< 2.5	57	2.02	659,000	1.14	17.8	1,880	7,760

Total Metals (Part 2: Lead – Zinc)

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Lead (ug/L)	Lithium (ug/L)	Magnesium (ug/L)	Manganese (ug/L)	Mercury (ug/L)	Molybdenum (ug/L)	Nickel (ug/L)	Potassium (ug/L)	Selenium (ug/L)	Silver (ug/L)	Sodium (ug/L)	Thallium (ug/L)	Titanium (ug/L)	Uranium (ug/L)	Vanadium (ug/L)	Zinc (ug/L)
BC Standards																		
BCWQG Aquatic Life (AW)[b,c]			79.5-184.6[d]	870	n/a	1619-2634[d]	Methyl mercury analysis in progress	2,000	25-150[d]	373,000-432,000	2	0.1-3.0[d]	n/a	0.3	2,000	300	6	34.9-106[d]
BCWQG Aquatic Life (30day) (AW)[b,c,h]			6.4-10.5[d]	14[f]	n/a	1036-1441[d]		1,000	n/a	n/a	n/a	0.05-1.5[d]	n/a	n/a	n/a	n/a	n/a	13.1-42.5[d]
BCWQG Drinking Water (DW)[b,c]			50	n/a	n/a	n/a	1	250	n/a	n/a	10	n/a	n/a	2	n/a	n/a	n/a	5,000
Canadian Drinking Water Quality (DW)[e]			10	n/a	n/a	50	1	n/a	n/a	n/a	10	n/a	200,000	n/a	n/a	20	n/a	5,000
HAD-1	HAD-1	2014 08 10	0.182	< 0.5	5,030	38.9	< 0.05	3.01	< 0.5	559	0.58	< 0.01	4,880	< 0.01	19	0.131	2.1	< 3
	HAD-1	2014 08 10	0.061	< 0.5	4,960	13.1	< 0.05	2.94	< 0.5	489	0.61	< 0.01	4,720	< 0.01	< 10	0.108	1.6	< 3
	HAD-1	2014 08 11	< 0.05	< 0.5	4,960	9.59	< 0.05	2.93	< 0.5	401	0.66	< 0.01	4,100	< 0.01	< 10	0.122	1.2	< 3
	HAD-1	2014 08 12	< 0.05	< 0.5	4,950	5.57	< 0.05	2.72	< 0.5	346	0.62	< 0.01	3,970	< 0.01	< 10	0.122	1.1	< 3
	HAD-1	2014 08 13	< 0.05	< 0.5	4,800	4.8	< 0.05	2.51	< 0.5	420	0.57	< 0.01	4,630	< 0.01	< 10	0.103	1.2	< 3
	HAD-1	2014 08 14	< 0.05	< 0.5	4,640	6.54	< 0.05	2.76	< 0.5	418	0.58	< 0.01	4,620	< 0.01	< 10	0.115	1.3	< 3
	HAD-1	2014 08 15	< 0.05	< 0.5	4,790	8.96	< 0.05	2.8	< 0.5	439	0.6	< 0.01	4,530	< 0.01	< 10	0.107	1.2	< 3
	HAD-1	2014 08 16	0.051	< 0.5	4,910	16.9	< 0.05	2.71	< 0.5	511	0.58	< 0.01	4,530	< 0.01	< 10	0.112	1.4	< 3
	HAD-1X	2014 08 16	< 0.05	< 0.5	4,900	16.7	< 0.05	2.68	< 0.5	518	0.57	< 0.01	4,450	< 0.01	< 10	0.106	1.4	< 3
	QA/QC RPD %		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	HAD-1	2014 08 17	< 0.05	< 0.5	4,910	12.5	< 0.05	2.67	< 0.5	510	0.57	< 0.01	4,750	< 0.01	< 10	0.107	1.4	< 3
	HAD-1	2014 08 18	< 0.05	< 0.5	4,800	14.2	< 0.01	2.63	< 0.5	485	0.58	< 0.01	4,500	< 0.01	< 10	0.107	1.3	< 3
	HAD-1	2014 08 19	< 0.05	< 0.5	4,910	10.9	< 0.05	2.78	< 0.5	482	0.6	< 0.01	4,680	< 0.01	< 10	0.108	1.2	< 3
	HAD-1	2014 08 20	0.103	0.57	4,880	19.2	< 0.05	2.87	< 0.5	596	< 0.5	< 0.01	4,710	< 0.01	19	0.118	2	< 3
	HAD-1	2014 08 21	0.069	0.51	5,290	13.7	< 0.05	2.75	< 0.5	672	0.59	< 0.01	4,850	< 0.01	17	0.119	1.8	< 3
	HAD-1	2014 08 22	0.066	< 0.5	5,040	12.5	< 0.05	2.92	< 0.5	646	0.61	< 0.01	4,700	< 0.01	13	0.121	1.8	< 3
	HAD-1	2014 08 24	0.107	0.6	5,260	15.8	< 0.05	3	< 0.5	652	0.6	< 0.01	4,820	< 0.01	16	0.124	2	< 3
	HAD-1	2014 08 26	< 0.05	< 0.5	4,950	7.67	< 0.05	3.34	< 0.5	511	0.65	< 0.01	4,880	< 0.01	< 10	0.123	1.2	< 3
	HAD-1	2014 08 28	< 0.05	< 0.5	4,690	5.53	< 0.01	3.13	< 0.5	504	0.65	< 0.01	4,940	< 0.01	< 10	0.12	1.3	< 3
	HAD-1	2014 08 30	0.068	< 0.5	5,060	14.5	< 0.01	3.64	< 0.5	683	0.64	< 0.01	5,240	< 0.01	13	0.135	1.7	< 3
	HAD-1	2014 08 31	< 0.05	< 0.5	5,040	7.61	< 0.01	3.78	< 0.5	581	0.72	< 0.01	5,130	< 0.01	< 10	0.135	1.3	< 3
	HAD-1	2014 09 01	< 0.05	< 0.5	5,190	12.4	< 0.01	3.68	< 0.5	603	0.68	< 0.01	4,990	< 0.01	10	0.128	1.4	< 3
	HAD-1	2014 09 02	< 0.05	< 0.5	5,040	8.45	< 0.01	3.63	< 0.5	563	0.65	< 0.01	4,980	< 0.01	< 10	0.135	1.3	< 3
	HAD-2	2014 08 30	0.074	< 0.5	5,020	14.6	< 0.01	3.68	< 0.5	681	0.63	< 0.01	5,290	< 0.01	14	0.136	1.7	< 3
HAD-2	HAD-2	2014 08 31	< 0.05	< 0.5	5,080	8.31	< 0.01	3.76	< 0.5	587	0.74	< 0.01	5,380	< 0.01	< 10	0.136	1.3	< 3
	HAD-2	2014 09 01	< 0.05	< 0.5	5,210	11.2	< 0.01	3.68	< 0.5	614	0.7	< 0.01	5,310	< 0.01	12	0.129	1.6	< 3
	HAD-2	2014 09 02	< 0.05	< 0.5	5,020	9.75	< 0.01	3.68	< 0.5	578	0.62	< 0.01	5,110	< 0.01	< 10	0.131	1.3	< 3
	HAD-2	2014 09 03	< 0.05	< 0.5	4,960	8.91	< 0.01	3.77	< 0.5	556	0.68	< 0.01	4,880	< 0.01	< 10	0.137	1.4	< 3
HAC01	HAC01	2014 08 24	42.4	30.5	55,400	2,880	0.183	13.3	136	10,900	5.8	1.02	12,600	0.063	4,290	4.91	166	204
	HAC01-24HRS	2014 08 24	26.3	12.1	19,200	1,440	0.193	2.81	42.3	4,210	3.38	0.023	11,300	0.066	52	2.8	51.6	64.7
	HAC01	2014 08 25	201	77.9	51,500	2,680	0.312	8.46	121	9,300	4.80	0.665	10,500	0.301	3,230	3.82	123	204
	HAC01	2014 08 26	41.8	81	57,500	2,070	0.285	9.18	146	8,710	5.31	0.954	10,700	0.428	3,010	4.41	260	300
	HAC01	2014 08 27	244	433	232,000	14,800	2.89	49.8	856	42,100	19.4	8.17	41,300	1.02	10,400	20.6	1,380	1,490
	HAC01-24HRS SETTLING	2014 08 26	24.9	18.5	21,400	1,450	< 0.01	1.27	57.1	3,770	5.2	0.028	9,040	0.077	50	2.64	81.2	103
	HAC1	2014 08 28	251	463	259,000	15,200	2.15	53.4	343	48,600	21.1	10.2	46,800	0.94	8,770	21.8	1,280	1,050
	HAC1-24HRS SETTLING	2014 08 28	1.5	11	22,700	4,610	0.371	8.2	34.4	10,500	4.38	< 0.02	28,300	0.021	92	0.552	16.1	68.2
	HAC01	2014 08 29	577	901	522,000	37,600	4.06	92	882	86,600	38.1	30.1	81,700	1.73	17,000	42.6	2,020	3,400
	HAC01-24HRS SETTLING	2014 08 29	278	100	107,000	14,000	0.237	17.6	196	34,100	7.7	< 0.1	72,700	0.24	477	22.5	573	768
	HAC-1	2014 08 31	270	440	336,000	16,600	2.62	37	474	45,700	17.1	13.2	42,700	1.17	6,850	27.6	1,230	1,690
	HAC-1	2014 09 03	276	321	221,000	12,300	1.79	30.8	288	32,200	24.2	6.46	37,000	1.04	7,180	14.0	916	1,140
HAC05	HAC-05	2014 08 28	229	380	206,000	25,700	2.9	61.4	177	38,000	22.1	1.26	41,000	0.51	6,340	17.8	1,170	1,310
	HAC-05-24HRS SETTLING	2014 08 28	8.2	7.9	17,500	5,010	0.444	15.1	19	9,600	4.72	< 0.02	23,300	< 0.02	42	2.16	12.8	90.7
HAC06	HAC-06	2014 08 28	318	435	299,000	18,700	2.5	54.6	264	80,700	22.4	12.7	54,500	0.78	6,040	24.6	1,130	1,540
	HAC-06-24HRS SETTLING	2014 08 28	0.47	8.1	18,300	5,640	0.407	21	23	10,200	4.19	< 0.05	23,600	< 0.05	58	1.13	8	46

Associated ALS files: L1500203, L1500606, L1501501, L1501554, L1502400, L1503086, L1503928, L1503934, L1503943, L1504201, L1504097, L1505033, L1506502, L1506896, L1507958, L1507977, L1508640, L1509580, L1509671, L1510294, L1510298, L1510307, L1510744, L1511205, L1511213, L1511248, L1511774, L1511890, L1511905, L1512690, L1513375.

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- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED — Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD — Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED — Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD — Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.
[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.
[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.
[d] Guideline varies with pH, and or Temperature or Hardness.
[e] Health Canada Drinking Water Guidelines, 2012.
[f] Guideline for Nitrate applied.
[g] Stream criteria applies to deviation from optimum fish species temperature range. In this case, a reference to ambient is made since the background range (Minnow, 2014) is ~0-20.5°C (upper Hazeltine Creek).
[h] Calculated based on an individual sample basis, not average result basis.
[i] Secondary chronic or chronic value, not 30 day mean.
[j] Guideline not applicable for site situation.
[k] Based on a change from background at any one time. Prebreach range (Minnow, 2014) 0.34-6.89 NTU and <3-18 mg/L TSS.

TABLE 4b: Summary of Analytical Results for Mount Polley, Hazeltine Creek - Blanks DRAFT

			Physical Parameters									Total Inorganics											
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness (mg/L)	pH (field) (pH)	pH (pH)	Temperature (field) (C)	Turbidity (NTU)	Conductivity (µS/cm)	TDS (mg/L)	TSS (mg/L)	DOC (mg/L)	Total Nitrogen (N) (mg/L)	Ammonia Nitrogen (µg/L)	Nitrate Nitrogen (µg/L)	Nitrite Nitrogen (µg/L)	Nitrate+Nitrite Nitrogen (µg/L)	Chloride (mg/L)	Fluoride (µg/L)	Sulphate (mg/L)	Total Alkalinity (as CaCO3) (mg/L)	Ortho-phosphate (mg/L)	Total Phosphorus (mg/L)
BC Standards																							
BCWQG Aquatic Life (AW)[B,C]			n/a	6.5-9.0	6.5-9.0		Change of 8	n/a	n/a	Change of 25	n/a	n/a	700-24,500[4]	32,800	60 (CI<2)	32,900[7]	600	1324-1582[4]	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[B,C,D]			n/a	n/a	n/a	+/-1 Degree change from ambient[H]	Change of 2[K]	n/a	n/a	Change of 5[K]	+20% of median background	n/a	135-17,700[4]	3,000	20 (CI<2)	3,000[7]	150	n/a	128-309[4]	n/a	n/a	n/a
BCWQG Drinking Water (DW)[B,E]			n/a	6.5-8.5	6.5-8.5	n/a[I]	Change of 1	n/a	n/a	n/a	n/a	n/a	n/a	10,000	1,000	10,000[7]	250	1,000	500	n/a	n/a	0.01
Canadian Drinking Water Quality (DW)[F]			n/a	6.5-8.5	6.5-8.5	n/a[I]	n/a[J]	n/a	500	n/a	n/a	n/a	n/a	10,000	1,000	n/a	250	1,500	500	n/a	n/a	n/a
HAD-FIELD BLANK	FIELD BLANK	2014 08 22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HAC01-FB	2014 08 27	< 0.5	-	6.69	-	< 0.1	< 2	< 10	< 3	-	< 0.05	< 5	< 5	< 1	-	< 0.5	< 20	< 0.5	< 1	< 0.001	< 0.002[A]
HAD-TRAVEL BLANK	TRIP BLANK	2014 08 27	< 0.5	-	6.65	-	< 0.1	< 2	< 10	< 3	-	< 0.05	< 5	< 5	< 1	-	< 0.5	< 20	< 0.5	< 1	< 0.001	< 0.002[A]

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- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

Concentration greater than SrDL.

[A] Laboratory detection limit out of range.

[B] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[C] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[D] Guideline varies with pH, and or Temperature or Hardness.

[E] Health Canada Drinking Water Guidelines, 2012.

[F] Guideline for Nitrate applied.

[H] Stream criteria applies to deviation from optimum fish species temperature range. In this case, a reference to ambient is made since the background range (Minnow, 2014) is ~0-30.8°C (upper Hazeltine Creek).

[I] Calculated based on an individual sample basis, not average result basis.

[J] Secondary chronic or chronic value, not 30 day mean.

[K] Guideline not applicable for site situation.

[7] Based on a change from background at any one time. Prebreach range (Minnow, 2014) 0.34-8.09 NTU and <3-18 mg/L TSS.

TABLE 4b: Summary of Analytical Results for Mount Polley, Hazeltine Creek - Blanks DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Dissolved Metals																												
			Dissolved Aluminum (µg/L)	Dissolved Calcium (mg/L)	Dissolved Iron (µg/L)	Dissolved Magnesium (mg/L)	Dissolved Manganese (µg/L)	Dissolved Potassium (mg/L)	Dissolved Sodium (mg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Lithium (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)			
BC Standards																															
BCWQG Aquatic Life (AW)[b,c]			100[d]	n/a	350	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[b,c,h]			50[d]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Drinking Water (DW)[b,c]			200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canadian Drinking Water Quality (DW)[e]			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
HAD-FIELD BLANK	FIELD BLANK	2014 06 22	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
	HAC01-FB	2014 06 27	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<
HAD-TRAVEL BLANK	TRIP BLANK	2014 06 27	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<	<

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* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

Concentration greater than 5xDL

[a] Laboratory detection limit out of range.

[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

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[d] Guideline varies with pH, and or Temperature or Hardness.

[e] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate applied.

[g] Stream enters applies to deviation from optimum fish species temperature range. In this case, a reference is omitted is made since the background range (Minnow, 2014) is ~0-20.5°C (upper Hazeltine Creek).

[h] Calculated based on an individual sample basis, not average result basis.

[i] Secondary chronic or chronic value, not 30 day mean

[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Prebreach range (Minnow, 2014) 0.34-8.69 NTU and <3-18 mg/L TSS

TABLE 4b: Summary of Analytical Results for Mount Polley, Hazeltine Creek - Blanks DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Total Metals																												
			Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Bismuth (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Calcium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Lithium (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[b,c]			n/a	20	5	5,000	n/a	n/a	1,200	0.0325-0.0575[d]	n/a	1 (Cr(+6))	110	11.2-19.9[d]	1,000	79.5-164.8[d]	870	n/a	1649-2634[d]	Methyl mercury analysis in progress	2,000	25-150[d]	373,000-432,000	2	0.1-2.0[d]	n/a	0.3	2,000	300	6	38.9-108[d]
BCWQG Aquatic Life (30day) (AW)[b,c,e]			n/a	n/a	n/a	1,000	5.3[f]	n/a	n/a	n/a	n/a	n/a	4	3.9-7.6[d]	n/a	6.4-10.5[d]	14[f]	n/a	1036-1441[d]		1,000	n/a	n/a	n/a	0.05-1.5[d]	n/a	n/a	n/a	n/a	n/a	13.1-82.5[d]
BCWQG Drinking Water (DW)[b,c]			n/a	14	25	n/a	4	n/a	5,000	n/a	n/a	n/a	n/a	600	n/a	50	n/a	n/a	n/a	1	250	n/a	n/a	10	n/a	n/a	2	n/a	n/a	n/a	5,000
Canadian Drinking Water Quality (DW)[a]			100	6	10	1,000	n/a	n/a	5,000	5	n/a	50	n/a	1,000	300	10	n/a	n/a	50	1	n/a	n/a	n/a	10	n/a	200,000	n/a	n/a	20	n/a	5,000
HAD-FIELD BLANK	FIELD BLANK	2014 08 22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	< 0.05	-	-	-	-	-	-	-	-	-	-	-
	HAD01-FB	2014 08 27	< 3	< 0.1	< 0.1	< 0.05	< 0.1	< 0.5	< 10	< 0.01[e]	< 50	< 0.5	< 0.1	< 0.5	< 30	< 0.05	< 0.5	< 100	< 0.05	< 0.01	< 0.05	< 0.5	< 50	< 0.5	< 0.01	< 50	< 0.01	< 10	< 0.01	< 1	< 3
HAD-TRAVEL BLANK	TRIP BLANK	2014 08 27	< 3	< 0.1	< 0.1	< 0.05	< 0.1	< 0.5	< 10	< 0.01[e]	< 50	< 0.5	< 0.1	< 0.5	< 30	< 0.05	< 0.5	< 100	< 0.05	< 0.01	< 0.05	< 0.5	< 50	< 0.5	< 0.01	< 50	< 0.01	< 10	< 0.01	< 1	< 3

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SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.
Concentration greater than 5xDL.

[e] Laboratory detection limit out of range.

[a] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[b] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[c] Guideline varies with pH, and or Temperature or Hardness.

[d] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for fitness applied.

[g] Stream criteria applies to deviation from optimum fish species temperature range. In this case, a reference to ambient is made since the background range (Minnow, 2014) is ~0-20.8°C (upper Hazeltine Creek).

[h] Calculated based on an individual sample basis, not average result basis.

[i] Secondary chronic or chronic value, not 30 day mean.

[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Prebreach range (Minnow, 2014) 0.34-6.88 NTU and 13-18 mg/L TSS.

TABLE 2a: Summary of Analytical Results for Mount Polley, Quesnel Lake - Sediment

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Grain Size			
			Gravel (%)	Sand (%)	Silt (%)	Clay (%)
QUL-14	QUL-14-S	2014 08 07	3.19	50.2	39.3	7.27
QUL-15	QUL-15-S	2014 08 07	1.43	68.7	28.4	1.52
QUL-16	QUL-16-S	2014 08 07	< 0.1	68.7	30.1	1.23
QUL-23	QUL23	2014 08 10	< 0.1	52.7	44.5	2.85
QUL-24	QUL24	2014 08 10	0.61	52	37.8	9.64
QUL-25	QUL25	2014 08 10	2.09	52.7	38.2	7.05
QUL-27	QUL27-140813	2014 08 13	< 0.1	66.5	31.6	1.89
	QUL27	2014 08 13	< 0.1	66.5	31.6	1.89
QUL-30-01	QUL30-01	2014 08 12	7.12	57.9	33.8	1.13
QUL-30-02	QUL30-02	2014 08 12	0.64	81.5	17.2	0.66
QUL-30-03	QUL30-03	2014 08 12	2.86	89.3	7.32	0.49
QUL-43	QUL43-140813	2014 08 13	5.54	45.9	39.3	9.31
	QUL43	2014 08 13	5.54	45.9	39.3	9.31
QUL-44-01	QUL44-01	2014 08 12	< 0.1	26	70	3.92
QUL-44-02	QUL44-02	2014 08 12	8.81	74.9	15.1	1.25
QUL-44-03	QUL44-03	2014 08 12	8.23	56.9	32.3	2.56
QUL-45-01	QUL-45-01	2014 08 13	< 0.1	50.2	41.7	8.07
QUL-45-02	QUL-45-02	2014 08 13	5.34	45.7	38.2	10.8

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

TABLE 2b: Summary of Analytical Results for Mount Polley, Quesnel Lake - Sediment

Sample Location	Sample ID	Sample Date (yyyy mm dd)	pH (pH)	Total Metals: Aluminum (µg/g)	Antimony (µg/g)	Arsenic (µg/g)	Barium (µg/g)	Beryllium (µg/g)	Cadmium (µg/g)	Calcium (µg/g)	Chromium (µg/g)	Cobalt (µg/g)	Copper (µg/g)	Iron (µg/g)	Lead (µg/g)	Lithium (µg/g)	Magnesium (µg/g)	Manganese (µg/g)	Mercury (µg/g)	Molybdenum (µg/g)	Nickel (µg/g)	Phosphorus (µg/g)	Potassium (µg/g)	Selenium (µg/g)	Silver (µg/g)	Sodium (µg/g)	Strontium (µg/g)	Tin (µg/g)	Thallium (µg/g)	Titanium (µg/g)	Uranium (µg/g)	Vanadium (µg/g)	Zinc (µg/g)
BC Standards																																	
CSR Fresh Water Sediment (FW Sediment)			n/a	n/a	n/a	11	n/a	n/a	2.2	n/a	56	n/a	120	21,200*	57	n/a	n/a	460*	0.3	n/a	16*	n/a	n/a	2*	0.6*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	200
QUL-14	QUL-14-S-1	2014 08 07	6.82	19,000	0.48	**14.4**	205	0.74	0.165	32,200	16.2	21.6	**721**	**71,200**	5.99	20	11,700	**755**	0.0793	4.31	12.5	1,840	1,670	1.16	0.375	1,050	192	2.05	< 0.05	2,040	1.35	268	70.3
	QUL-14-S-1<2MM	2014 08 07	-	15,800	0.39	**11.9**	160	0.6	0.136	25,500	11.7	16.4	**983**	**49,700**	4.74	15.4	9,450	**640**	0.082	4.41	9.25	1,270	1,340	0.98	0.37	980	158	< 2	< 0.05	1,370	1.02	192	58.2
	QUL-14-S-2	2014 08 07	8.5	16,400	0.45	**14**	199	0.71	0.149	31,200	15.2	20.6	**711**	**69,600**	6.69	18.8	11,400	**740**	0.0761	3.95	11.8	1,770	1,620	1.11	0.333	1,030	182	1.88	< 0.05	1,930	1.26	260	67.6
	QUL-14-S-2<2MM	2014 08 07	-	14,900	0.35	**12.1**	153	0.57	0.144	24,000	12	16.1	**820**	**49,100**	5.05	15	8,980	**691**	0.109	4.07	9.36	1,250	1,240	0.95	0.35	880	142	< 2	< 0.05	1,190	0.949	181	55.3
	QUL-14-S-3	2014 08 07	6.78	18,900	0.44	**14.5**	205	0.74	0.178	31,600	15.6	21.5	**736**	**71,100**	5.6	19.9	11,900	**760**	0.0764	4.07	12.4	1,640	1,660	1.17	0.329	1,040	184	1.88	< 0.05	1,850	1.24	266	70.5
	QUL-14-S-3<2MM	2014 08 07	-	14,800	0.38	**11.3**	154	0.56	0.136	24,400	11.5	16.2	**828**	**47,700**	4.78	14.9	9,340	**669**	0.0878	4.39	11.1	1,210	1,260	1	0.37	890	147	< 2	< 0.05	1,200	0.896	178	58
QUL-15	QUL-15-S-1	2014 08 07	8.82	11,800	0.35	**12.2**	125	0.51	0.129	23,800	21.7	18.1	**526**	**89,600**	5.06	12.6	7,200	**528**	0.0633	2.9	12.8	1,840	1,020	0.9	0.266	820	116	1.03	< 0.05	1,040	0.892	330	54.3
	QUL-15-S-1<2MM	2014 08 07	-	10,800	0.31	9.17	120	0.44	0.121	18,800	13.6	13.2	**620**	**49,700**	3.94	11.2	6,500	**487**	0.0771	3.27	9.66	1,190	980	0.76	0.25	700	112	< 2	< 0.05	866	0.673	183	44.1
	QUL-15-S-2	2014 08 07	8.75	11,800	0.36	**12.9**	116	0.49	0.136	24,600	21.3	18.8	**533**	**94,600**	4.87	11.5	6,890	**551**	0.0636	3.11	12.2	1,950	930	0.96	0.26	600	117	1.27	< 0.05	1,290	0.979	353	54.4
	QUL-15-S-2<2MM	2014 08 07	-	11,500	0.35	10.1	121	0.49	0.126	20,500	13.6	13.4	**641**	**53,300**	4.07	11	6,470	**485**	0.0719	3.25	8.97	1,240	960	0.83	0.28	740	119	< 2	< 0.05	1,000	0.789	202	44.9
	QUL-15-S-3	2014 08 07	8.74	11,600	0.4	**13.5**	116	0.48	0.366	22,600	29.8	21.7	**539**	**119,000**	5.86	12.1	6,510	**547**	0.0653	2.99	15.7	1,770	930	1.07	0.284	540	108	1.26	< 0.05	1,300	1.01	440	62.1
	QUL-15-S-3<2MM	2014 08 07	-	10,200	0.32	9.4	76.3	0.39	0.108	15,000	17.2	11.2	**528**	**37,700**	5.9	10.3	6,260	**483**	0.0791	2.06	11.4	909	730	0.57	0.27	550	83.7	< 2	< 0.05	870	0.597	134	44.2
QUL-16	QUL-16-S-1	2014 08 07	8.8	12,200	0.38	**11.6**	124	0.5	0.146	25,000	20.8	18	**504**	**95,200**	4.7	11.8	6,530	**545**	0.0562	2.78	12.1	1,740	990	0.86	0.266	640	127	1.42	< 0.05	1,450	0.894	355	55.6
	QUL-16-S-1<2MM	2014 08 07	-	12,000	0.31	8.25	129	0.47	0.193	20,700	13	12.6	**628**	**49,200**	3.94	11.1	6,370	**472**	0.0626	3.88	8.67	1,000	980	0.8	0.28	810	132	< 2	< 0.05	1,120	0.733	184	44
	QUL-16-S-2	2014 08 07	8.79	11,600	0.4	**11.5**	118	0.49	0.155	24,200	22	17.9	**496**	**92,100**	4.73	11.1	6,260	**537**	0.0551	3.56	11.8	1,700	910	0.94	0.266	630	121	1.27	< 0.05	1,300	0.958	343	55.9
	QUL-16-S-2<2MM	2014 08 07	-	11,500	0.33	9.11	116	0.47	0.122	20,500	14	12.5	**604**	**50,500**	4.1	10.7	6,120	**475**	0.0819	3.22	8.78	1,050	940	0.79	0.3	730	127	< 2	< 0.05	1,110	0.769	188	44
	QUL-16-S-3	2014 08 07	8.64	11,700	0.38	**11.6**	121	0.46	0.249	23,800	24.3	19.1	**532**	**102,000**	11.7	11.6	6,470	**547**	0.0619	3.22	13.4	1,760	920	0.96	0.283	630	118	1.77	< 0.05	1,340	0.974	378	63.3
	QUL-16-S-3<2MM	2014 08 07	-	11,800	0.32	8.53	125	0.44	0.112	19,400	11.7	11.4	**678**	**39,800**	3.77	10.8	6,220	**452**	0.0766	3.47	8.19	905	950	0.78	0.31	830	134	< 2	< 0.05	1,090	0.681	151	41.7
QUL-23	QUL23<2MM	2014 08 10	-	12,600	0.36	9.63	138	0.52	0.145	20,400	15.4	13.8	**577**	**53,200**	4.46	12.2	6,950	**513**	0.0766	3.48	10.3	1,080	1,120	0.76	0.28	810	137	< 2	< 0.05	1,130	0.781	197	48.7
	QUL23	2014 08 10	8.24	13,100	0.39	**11.6**	139	0.51	0.142	23,200	23.5	19	**518**	**93,400**	5.41	13.2	7,500	**578**	0.0822	3.02	13.5	1,770	1,160	0.87	0.273	720	125	1.29	< 0.05	1,260	0.948	348	55.5
QUL-24	QUL24<2MM	2014 08 10	-	15,600	0.37	**11.6**	144	0.59	0.126	24,600	12.5	16	**733**	**43,800**	4.57	15.3	9,620	**601**	0.0842	3.49	9.6	1,150	1,340	0.95	0.35	950	160	< 2	< 0.05	1,260	0.998	168	54.4
	QUL24	2014 08 10	8.67	19,600	0.47	**13.8**	195	0.74	0.129	29,300	15.2	21	**628**	**59,900**	5.44	18.6	12,400	**706**	0.0908	3.4	11.6	1,780	1,930	1.04	0.309	1,210	208	1.87	< 0.05	1,690	1.28	229	62.6
QUL-25	QUL25<2MM	2014 08 10	-	13,400	0.32	10.6	146	0.54	0.128	21,800	12	14.5	**732**	**44,800**	4.31	14.2	8,620	**532**	0.0649	3.58	9.97	1,110	1,170	0.94	0.33	890	143	< 2	< 0.05	956	0.765	167	51.6
	QUL25	2014 08 10	8.76	17,400	0.43	**13.3**	181	0.68	0.137	27,800	16.1	19.9	**627**	**66,900**	5	16.7	10,600	**662**	0.0801	3.72	11.6	1,750	1,580	0.99	0.296	1,030	177	1.8	< 0.05	1,570	1.13	262	60.6
QUL-27	QUL27-140813	2014 08 13	8.46	12,400	0.44	**12.4**	142	0.58	0.149	21,700	20.2	20.2	**804**	**92,300**	5.01	13	7,680	**572**	0.0704	3.56	12.4	1,820	1,150	0.95	0.414	780	118	1.03	0.136	1,060	0.976	349	58.5
	QUL27 <2MM	2014 08 13	-	12,100	0.36	10.2	124	0.5	0.134	20,000	12.6	13.3	**725**	**47,000**	4.15	11.8	6,970	**484**	-	5.25	8.93	1,010	1,040	0.87	0.32	840	127	< 2	< 0.05	1,060	0.725	178	46.2
	QUL27	2014 08 13	8.46	12,400	0.44	**12.4**	142	0.58	0.149	21,700	20.2	20.2	**804**	**92,300**	5.01	13	7,680	**572**	0.0704	3.56	12.4	1,820	1,150	0.95	0.414	780	118	1.03	0.136	1,060	0.976	349	58.5
	QUL27<2MM	2014 08 13	-	12,100	0.36	10.2	124	0.5	0.134	20,000	12.6	13.3	**725**	**47,000**	4.15	11.8	6,970	**484**	0.117	5.25	8.93	1,010	1,040	0.87	0.32	840	127	< 2	< 0.05	1,060	0.725	178	46.2
QUL-30-01	QUL30-01	2014 08 12	8.28	7,490	0.1	3.74	19	0.19	0.084	59,300	14.5	7.61	10.7	19,200	6.88	17.9	6,220	355	< 0.005	0.26	**18.7**	1,120	530	< 0.1	< 0.05	< 100	350	< 0.2	< 0.05	302	0.877	12.5	34.9
	QUL30-01<2MM	2014 08 12	-	8,990	0.12	3.62	25.3	< 0.2	< 0.05	41,800	19.1	10.7	12.2	**22,800**	6.85	22.1	6,940	377	< 0.005	< 0.5	**24.6**	458	1,160	< 0.2	< 0.1	< 100	234	< 2	0.081	415	0.49	16.5	42.2
QUL-30-02	QUL30-02	2014 08 12	8.44	7,680	0.11	3.66	21.1	0.22	0.077	45,400	16.2	8.27	11.5	20,300	7.42	17.5	5,860	369	0.0085	0.46	**20.9**	1,450	540	0.11	< 0.05	< 100	263	0.28	< 0.05	335	1.11	14.9	36.8
	QUL30-02<2MM	2014 08 12	-	6,920	< 0.1	3.54	18.4	< 0.2	< 0.05	26,500	14.4	7.55	9.12	17,600	5.24	15.8	5,020	347	< 0.005	< 0.5	**19.5**	724	730	< 0.2	< 0.1	< 100	157	< 2	0.052	321	0.605	13.4	30.3
QUL-30-03	QUL30-03	2014 08 12	8.47	8,050	0.21	4.4	24.7	0.22	0.129	38,400	19	9.05	13	**21,700**	7.84	17.5	5,930	429	0.0119	0.87	**24.4**	1,360	600	0.2	0.061	< 100	221	0.68	< 0.05	371	1.08	16.8	41
	QUL30-03<2MM	2014 08 12	-	5,300	< 0.1	1.53	14.5	< 0.2	0.056	17,100	10.3	5.13	5.63	12,800	3.89	11.8	3,600	231	0.0134	0.61	**16.1**	353	550	< 0.2	< 0.1	< 100	101	< 2	< 0.05	220	0.368	9.62	24.1
QUL-43	QUL43-140813	2014 08 13	8.64	20,000	0.44	**13.7**	205	0.73	0.136	29,100	14.8	21.5	**662**	**80,000**	5.84	19.5	12,300	**735**	0.0754	3.83	12.6	1,660	2,230	1.02	0.331	1,340	214	1.62	< 0.05	1,820	1.27	224	64.6
	QUL43 <2MM	2014 08 13	-	15,900	0.39	**11.9**	149	0.6	0.154	23,800	13.3	16.5	**760**	**43,900**	5.62	15.3	9,950	**613**	-	3.58	11	1,220	1,370	0.99	0.33	950	159	< 2	< 0.05	1,370	0.911	165	56.9
	QUL43	2014 08 13	8.64	20,000	0.44	**13.7**	208	0.73	0.136	29,100	14.8	21.5	**662**	**80,000**	5.84	19.5	12,300	**735**	0.0754	3.83	12.6	1,660	2,230	1.02	0.331	1,340	214	1.62	< 0.05	1,820	1.27	224	64.6
	QUL43<2MM	2014 08 13	-	15,900	0.39	**11.9**	149	0.6	0.154	23,800	13.3	16.5	**760**	**43,900**	5.62	15.3	9,950	**613**	0.0948	3.58	11	1,220	1,370	0.99	0.33	950	159	< 2	< 0.05	1,370	0.911	165	56.9
QUL-44-01	QUL44-01	2014 08 12	8.1	16,500	0.8	10.6	49.6	0.34	0.353	8,500	53.9	15.5	56.9	**28,600**	8.93	15.3	11,200	328	0.056	0.64	**32.1**	851	850	0.55	0.181	270	49.6	0.66	0.067	1,200	0.559	61.8	80.7
	QUL44-01<2MM	2014 08 12	-	17,100	0.95	**13.1**	50.9	0.41	0.386	8,140	**56.8**	17.4	74.6	**31,600**	9.94	17.5	11,900	353	0.069	0.81	**34.3**	778	900	0.61	0.2	240	46.8	< 2	0.09	1,100	0.556	83.3	83.3
QUL-44-02	QUL44-02	2014 08 12	7.41	18,000	1.65	**22.6**	84.8	0.38	0.508	9,310	**65.1**	20.7	90.8	**34,300**	8.61	16.7	12,100	**760**	0.072	1.24	**39**	802	830	0.54	0.237	210	52.3	0.52	0.075	1,300	0.601	95.4	83.4
	QUL44-02<2MM	2014 08 12	-	18,000	1.36	**35.5**	41.1	0.35	0.339	7,620	56.5	16.3	59.2	**39,200**	6.89	18	14,300	**790**	0.0483	1.08	**33**	871	520	0.41	0.2	110	31.1	< 2	0.055	1,020	0.489	105	70.9
QUL-44-03	QUL44-03	2014 08 12	7.58	17,700	1.44	**27.1**	60.2	0.35	0.379	9,560	**57.9**	15.2	74.2	**30,000**	7.48	14.7	10,700	**712**	0.0641	0.79	**32.2**	802	740	0.55	0.328	200	52	0.62	0.061	1,210	0.627	85.6	65.4
	QUL44-03<2MM	2014 08 12	-	16,800	1.04	**23.1**	189	0.31	0.198	7,280	50.3	14.1	48.9	**33,100**	5.49	16	12,400	**558**	0.0299	0.91	**30.1**	555	440	0.25	0.12	130	30	< 2	< 0.05	1,160	0.392	92.6	55.8
QUL-45-01	QUL-45-01	2014 08 13	8.72	17,600	0.4	**13.3**	186	0.65	0.135	27,100	16.7	20.9	**630**	**66,600**	6.09	16.8	10,900	**676**	0.0747	4	12.7	1,740	1,720	0.99	0.312	1,150	190	1.55	< 0.05	1,610	1.13	253	60.2
	QUL-45-01<2MM	2014 08 13	-	16,100	0.38	10.9	144	0.64	0.128	23,300	15.7	15.3	**677**	**44,500**	4.71	15.3	9,190	**574**	0.0844	4.01	10.7	1,180	1,340	0.84	0.32	920	157	< 2	< 0.05	1,270	0.924	169	52.8
QUL-45-02	QUL-45-02	2014 08 13	8.85	18,600	0.41	**12.4**	199	0.68	0.119	26,800	13	20.3	**707**	**51,000**	6.68	18.5	11,900	**691**	0.0745	3.6	11.7	1,430	1,850	1	0.321	1,220	206	1.52	< 0.05	1,640	1.14	193	60.3
	QUL-45-02<2MM	2014 08 13	-	15,800	0.41	**12**	147	0.64	0.145	23,400	20.6	16.4	**719**	**43,000**	4.98	16	9,790	**633**	0.0851	3.53	10.3	1,240	1,370	1.03	0.34	920	160	< 2	< 0.05	1,280	0.934	160	56.4

Associated ALS files: L1499703, L1500632, L1502319, L1503198, L1503207.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

BOLD Concentration greater than CSR Fresh Water Sediment (FW Sediment) standard.

* No CSR Sediment Criteria, BCWQG guideline shown.

TABLE 2: Summary of Analytical Results for Mount Polley, Quesnel Lake - Sediment

Sample Location	Sample ID	Sample Date (yyyy mm dd)	TOC (%)
QUL-14	QUL-14-S-1	2014 08 07	0.18
	QUL-14-S-163UM	2014 08 07	0.12
	QUL-14-S-2	2014 08 07	0.12
	QUL-14-S-263UM	2014 08 07	0.16
	QUL-14-S-3	2014 08 07	0.1
	QUL-14-S-363UM	2014 08 07	0.12
QUL-15	QUL-15-S-1	2014 08 07	< 0.1
	QUL-15-S-163UM	2014 08 07	0.1
	QUL-15-S-2	2014 08 07	0.11
	QUL-15-S-263UM	2014 08 07	< 0.1
	QUL-15-S-3	2014 08 07	0.12
	QUL-15-S-363UM	2014 08 07	0.15
QUL-16	QUL-16-S-1	2014 08 07	0.11
	QUL-16-S-163UM	2014 08 07	< 0.1
	QUL-16-S-2	2014 08 07	0.11
	QUL-16-S-263UM	2014 08 07	0.12
	QUL-16-S-3	2014 08 07	0.1
	QUL-16-S-363UM	2014 08 07	0.13
QUL-23	QUL23	2014 08 10	0.27
	QUL2363UM	2014 08 10	0.22
QUL-24	QUL24	2014 08 10	0.25
	QUL2463UM	2014 08 10	0.28
QUL-25	QUL25	2014 08 10	0.22
	QUL2563UM	2014 08 10	0.18
QUL-27	QUL27	2014 08 13	0.17
	QUL27 63UM TOC	2014 08 13	0.15
	QUL27	2014 08 13	0.17
	QUL2763UMTOC	2014 08 13	0.15
QUL-30-01	QUL30-01	2014 08 12	0.51
	QUL30-0163UMTOC	2014 08 12	0.61
QUL-30-02	QUL30-02	2014 08 12	0.37
	QUL30-0263UMTOC	2014 08 12	0.58
QUL-30-03	QUL30-03	2014 08 12	0.25
	QUL30-0363UMTOC	2014 08 12	0.63
QUL-43	QUL43	2014 08 13	0.24
	QUL43 63UM TOC	2014 08 13	0.12
	QUL43	2014 08 13	0.24
	QUL4363UMTOC	2014 08 13	0.12
QUL-44-01	QUL44-01	2014 08 12	3.59
	QUL44-0163UMTOC	2014 08 12	2.69
QUL-44-02	QUL44-02	2014 08 12	0.69
	QUL44-0263UMTOC	2014 08 12	1.39
QUL-44-03	QUL44-03	2014 08 12	1.79
	QUL44-0363UMTOC	2014 08 12	1.97
QUL-45-01	QUL-45-01	2014 08 13	0.25
	QUL-45-0163UMTOC	2014 08 13	0.23
QUL-45-02	QUL-45-02	2014 08 13	0.3
	QUL-45-0263UMTOC	2014 08 13	0.26

Associated ALS files: L1499703, L1500632, L1502319, L1503198, L1503207.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference

TABLE 2d: Summary of Analytical Results for Mount Polley, Quesnel Lake - Sediment Leachate

Sample Location	Sample ID	Sample Date (yyyy mm dd)	pH	Leachate Metals																																
				Aluminum Leachable	Antimony Leachable	Arsenic Leachable	Barium Leachable	Beryllium Leachable	Bismuth Leachable	Cadmium Leachable	Calcium Leachable	Chromium Leachable	Cobalt Leachable	Copper Leachable	Iron Leachable	Lead Leachable	Magnesium Leachable	Manganese Leachable	Mercury Leachable	Molybdenum Leachable	Nickel Leachable	Phosphorus Leachable	Potassium Leachable	Selenium Leachable	Silicon Leachable	Silver Leachable	Sodium Leachable	Strontium Leachable	Thallium Leachable	Tin Leachable	Titanium Leachable	Uranium Leachable	Vanadium Leachable	Zinc Leachable
			(pH)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
BC Standards																																				
HWR Leachate Quality (HWLQ)			n/a	n/a	n/a	2,500	100,000	n/a	n/a	500	n/a	5,000	n/a	100,000	n/a	5,000	n/a	n/a	100	n/a	n/a	n/a	n/a	1,000	n/a	5,000	n/a	n/a	n/a	n/a	n/a	10,000	n/a	500,000
QUL-45-01	QUL-45-01	2014 08 13	8.47	270	< 50	< 50	27	< 5	< 100	< 10	20,100	< 10	< 10	25	167	< 50	2,860	38	< 0.05	44	< 50	< 300	3,500	< 50	4,920	< 10	14,400	225	< 200	< 30	11	< 500	< 30	< 20
QUL-45-02	QUL-45-02	2014 08 13	8.46	270	< 50	< 50	31	< 5	< 100	< 10	23,900	< 10	< 10	14	189	< 50	3,470	37.7	< 0.05	51	< 50	< 300	4,500	< 50	5,670	< 10	20,600	269	< 200	< 30	11	< 500	< 30	< 20

Associated ALS file: L1503198.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

RPD Denotes relative percent difference.

BOLD Concentration greater than HWR Leachate Quality (HWLQ) standard.

TABLE 3a: Summary of Analytical Results for Mount Polley, Polley Lake - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters: Hardness (mg/L)	pH (field) (pH)	pH (pH)	Temperature (field) (C)	Turbidity (NTU)	Conductivity (µS/cm)	TDS (mg/L)	TSS (mg/L)	DOC (mg/L)	Microbiological Tests: Total Coliform (MPN/0.1L)	E. Coli (MPN/0.1L)	Total Nitrogen (N) (mg/L)	Ammonia Nitrogen (µg/L)	Nitrate Nitrogen (µg/L)	Nitrite Nitrogen (µg/L)	Nitrate+Nitrite Nitrogen (µg/L)	Chloride (mg/L)	Fluoride (µg/L)	Sulphate (mg/L)	Total Alkalinity (as CaCO3) (mg/L)	Ortho-phosphate (mg/L)	Total Phosphorus[g] (mg/L)
BC Standards																								
BCWQG Aquatic Life (AW)[b,c]			n/a	6.5-9.0	6.5-9.0		Change of 8[k]	n/a	n/a	Change of 25	n/a	n/a	n/a	n/a	700-5,680[d]	32,800	60 (Cl<2)	32,800[f]	600	1264-1361[d]	n/a	n/a	n/a	0.005-0.015
BCWQG Aquatic Life (30day) (AW)[b,c,h]			n/a	n/a	n/a	+/-1 Degree change from ambient	Change of 2[k]	n/a	n/a	Change of 5[k]	<20% of median background	n/a	n/a	n/a	135-1,090[i]	3,000	20 (Cl<2)	3,000[f]	150	n/a	309[d]	n/a	n/a	n/a
BCWQG Drinking Water (DW)[b,c]			n/a	6.5-8.5	6.5-8.5	n/a[j]	Change of 1	n/a	n/a	n/a	n/a	n/a	0/100ml	n/a	n/a	10,000	1,000	10,000[f]	250	1,500	500	n/a	n/a	0.01
Canadian Drinking Water Quality (DW)[e]			n/a	6.5-8.5	6.5-8.5	n/a[j]	n/a[j]	n/a	500	n/a	n/a	n/a[j]	0/100ml	n/a	n/a	10,000	1,000	n/a	250	1,500	500	n/a	n/a	n/a
POL-1	POL-1	2014 08 07	97.1	-	9.06	-	2.52	187	127	< 3	6.09	-	-	0.388	< 5	6.6	< 1	-	< 0.5	90	29.3	75.4	< 0.001	0.0044
POL-2	POL-2	2014 08 07	95.2	-	9.01	-	3.06	184	126	< 3	6.81	> 201	**> 201**	0.402	< 5	< 5	< 1	-	< 0.5	81	27.6	70.8	< 0.001	0.005
	POL-2(13:18)	2014 08 05	96.7	**9.02**	**8.86**	20.4	4.04	192	135	6	6.86	> 2,420	**365**	0.376	5.8	< 5	< 1	-	< 0.5	81	27.2	72.8	0.0011	0.0058
	POL-2(16:54)	2014 08 05	96.1	**8.87**	**8.68**	21	3.4	193	142	< 3	7.44	-	-	0.45	< 5	< 5	< 1	-	< 0.5	84	27.2	70.5	0.0017	0.0077
	POL-2	2014 08 09	96.7	-	**8.87**	-	4.62	194	145	4.3	7.01	-	-	0.381	< 5	< 5	< 1	-	< 0.5	91	27.8	71.2	< 0.001	0.0057
	POL-2X	2014 08 09	97.2	-	**8.88**	-	4.13	185	144	5.9	6.97	-	-	0.372	< 5	< 5	< 1	-	< 0.5	84	28	71.6	< 0.001	0.0053
	QA/QC RPD %		< 1	-	< 1	-	15	< 1	< 1	*	< 1	-	-	2	*	*	*	-	*	*	< 1	< 1	*	*
	POL-2	2014 08 11	99.6	**8.55**	8.16	23.0	3.59	203	143	< 3	7.57	-	-	0.56	< 5	< 5	< 1	-	< 0.5	68	27.6	75.3	0.0011	0.0079
	POL-2	2014 08 12	94.8	**8.99**	**8.58**	20.6	1.58	198	135	< 3	8.29	-	-	0.355	< 5	< 5	< 1	-	< 0.5	80	27.1	73.4	< 0.001	0.0061
	POL-2	2014 08 13	98.4	**8.98**	**8.65**	21.4	1.16	194	132	< 3	6.3	-	-	0.512	7.8	< 5	< 1	-	< 0.5	68	27.2	73.7	< 0.001	0.0053
	POL-2	2014 08 14	99.8	**8.87**	**8.53**	22.5	1.08	200	130	< 3	6.69	-	-	0.373	5	< 5	< 1	-	< 0.5	83	27.4	75.7	< 0.001	0.0049
	POL-2	2014 08 15	99.9	**8.76**	8.26	21.8	1.07	202	137	< 3	6.6	-	-	0.345	< 5	< 5	< 1	< 5.1	< 0.5	81	27.4	75.6	< 0.001	0.0064
	POL-2	2014 08 16	100	-	8.26	-	1.7	203	142	< 3	6.57	-	-	0.339	< 5	< 5	< 1	< 5.1	< 0.5	68	27.3	76	< 0.001	0.0056
	POL-2	2014 08 17	95.9	**8.83**	8.18	20.1	3.05	203	93	4.8	6.48	-	-	0.328	< 5	< 5	< 1	-	< 0.5	68	27.5	74.9	< 0.001	0.0061
	POL-2	2014 08 18	97.5	**8.66**	8.33	20.7	1.38	200	139	< 3	7.38	-	-	0.389	6.1	< 5	< 1	-	< 0.5	67	27.4	75.7	< 0.001	0.006
	POL-2	2014 08 19	102	8.24	8.09	20.4	3.02	198	133	5.2	6.94	-	-	0.505	5.4	< 5	< 1	-	< 0.5	74	26.7	74.9	< 0.001	0.0086
	POL-2	2014 08 20	102	8.39	8.17	20.4	4.8	201	110	5.6	6.43	-	-	0.345	< 5	< 5	< 1	-	< 0.5	67	27	76.7	0.0011	0.0063
	POL-2	2014 08 21	100	-	8.17	-	7.8	200	141	5.8	6.39	-	-	0.333	< 5	< 5	< 1	-	< 0.5	87	27.3	74	< 0.001	0.0052
POL-3	POL-3(12:15)	2014 08 08	99.8	**9.02**	**8.93**	19	1.66	194	134	3.1	6	> 2,420	**10**	0.352	5.2	< 5	< 1	-	< 0.5	81	26.5	76.5	0.0011	0.0048
	POL-3(12:34)	2014 08 08	100	**8.85**	**8.79**	18.8	3.03	198	131	7.5	6.06	-	-	0.333	< 5	< 5	< 1	-	< 0.5	80	26.3	77.1	0.001	0.0084
	POL-3	2014 08 09	97.9	-	**8.7**	-	2.98	195	139	5.5	6.49	-	-	0.404	< 5	< 5	< 1	-	< 0.5	80	26.5	73.6	0.0058	**0.0117**
	POL-3	2014 08 11	107	-	7.89	-	2.91	224	162	5.8	8.27	-	-	0.835	15	< 5	< 1	-	< 0.5	84	25.8	87.6	0.0476	**0.08**
	POL-3	2014 08 12	96.3	**8.86**	8.39	21.7	1.15	200	142	< 3	6.3	-	-	0.409	6.4	< 5	< 1	-	< 0.5	65	27.2	73.7	< 0.001	0.0066
	POL-3	2014 08 13	97.0	**8.94**	**8.56**	21.7	1.60	197	136	3.5	6.65	-	-	0.402	10.7	< 5	< 1	-	< 0.5	66	27	75.2	0.0021	0.0069
	POL-3	2014 08 14	98.3	**8.88**	**8.57**	22.5	3.36	200	130	< 3	6.77	-	-	0.383	7.2	5.5	< 1	-	< 0.5	64	27.2	74.9	< 0.001	0.005
	POL-3	2014 08 15	98.5	9.12	8.38	21.7	3.68	199	133	< 3	6.31	-	-	0.359	< 5	< 5	< 1	< 5.1	< 0.5	80	27.1	74.1	< 0.001	0.0056
	POL-3	2014 08 16	99.7	-	**5.84**	-	0.62	200	139	3.7	6.25	-	-	0.333	< 5	< 5	< 1	< 5.1	< 0.5	68	27.1	73.3	< 0.001	0.006
	POL-3	2014 08 17	99.6	**8.932**	8.27	19.7	1.04	202	135	3.5	6.38	-	-	0.365	< 5	< 5	< 1	-	< 0.5	68	27.4	74.7	< 0.001	0.0052
	POL-3	2014 08 18	99.6	**8.843**	**8.52**	19.8	0.89	200	117	< 3	7.15	-	-	0.395	7.3	< 5	< 1	-	< 0.5	70	27.6	74.5	< 0.001	0.0051
	POL-3X	2014 08 18	99.1	**8.843**	8.49	19.8	0.85	201	96	< 3	7.08	-	-	0.381	7	< 5	< 1	-	< 0.5	67	27.5	75.3	< 0.001	0.008
	QA/QC RPD %		< 1	0	< 1	0	6	< 1	20	*	1	-	-	1	*	*	*	-	*	*	0	1	*	*
	POL-3	2014 08 19	101	**8.53**	8.32	20.4	0.82	199	138	< 3	6.4	-	-	0.42	5.3	< 5	< 1	-	< 0.5	77	26.9	74.7	< 0.001	0.006
	POL-3	2014 08 20	102	**8.53**	8.23	20.5	0.75	201	110	< 3	6.38	-	-	0.351	8.3	< 5	< 1	-	< 0.5	66	27.3	75.9	0.0012	0.0067
	POL-3X	2014 08 20	100	**8.53**	8.23	20.5	0.88	204	145	< 3	6.28	-	-	0.347	9	< 5	< 1	-	< 0.5	64	27.1	77.2	0.0011	0.0069
	QA/QC RPD %		2	0	0	0	16	2	20	*	2	-	-	1	*	*	*	-	*	*	< 1	2	*	*
	POL-3	2014 08 21	100	-	8.43	-	0.85	202	135	< 3	5.99	-	-	0.384	8.2	< 5	< 1	-	< 0.5	66	27.9	78	< 0.001	0.0045
	POL-3	2014 08 27	105	**8.74**	8.3	19.4	0.93	209	135	< 3	6.92	-	-	0.376	< 5	< 5	< 1	-	< 0.5	70	28.5	77.2	0.0013	0.0059
	POL-3	2014 09 03	103	**8.76**	8.3	15.9	0.59	210	151	< 3	6.64	-	-	0.331	6.4	< 5	< 1	-	< 0.5	87	30.1	76.7	< 0.001	0.0052

Associated ALS files: L1460194, L1499709, L1496835, L1490939, L1501501, L1501541, L1502406, L1503046, L1503928, L1503934, L1503943, L1504261, L1504997, L1505033, L1506592, L1509579, L1513384

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

\- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED — Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD — Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED — Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD — Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

a Laboratory detection limit out of range.
b British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.
c A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.
d Guideline varies with pH, and or Temperature or Hardness.
e Health Canada Drinking Water Guidelines, 2012.
f Guideline for Nitrate applied.
g The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.
h Calculated based on an individual sample basis, not average of 30 day results.
i Secondary chronic or chronic value, not 30 day mean.
j Guideline not applicable for site situation.
k Based on a change from background at any one time. Prebreach range (Minnow 2014) 0.54-2.73 NTU and <3-5.5 mg/L TSS.

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TABLE 3a: Summary of Analytical Results for Mount Polley, Polley Lake - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Physical Parameters									Microbiological Tests		Total Nitrogen (N) (mg/L)	Ammonia Nitrogen (µg/L)	Nitrate Nitrogen (µg/L)	Nitrite Nitrogen (µg/L)	Nitrate+Nitrite Nitrogen (µg/L)	Chloride (mg/L)	Fluoride (µg/L)	Sulphate (mg/L)	Total Alkalinity (as CaCO3) (mg/L)	Ortho-phosphate (mg/L)	Total Phosphorus[9] (mg/L)
			Hardness (mg/L)	pH (field) (pH)	pH (pH)	Temperature (field) (C)	Turbidity (NTU)	Conductivity (µS/cm)	TDS (mg/L)	TSS (mg/L)	DOC (mg/L)	Total Coliform (MPN/0.1L)	E. Coli (MPN/0.1L)												
BC Standards																								
BCWQG Aquatic Life (AW)[2,4]			n/a	6.5-9.0	6.5-9.0	+/-1 Degree change from ambient	Change of 5[h]	n/a	n/a	Change of 25	n/a	n/a	n/a	n/a	700-6,680[a]	32,800	60 (Cl<2)	32,800[f]	600	1264-1361[d]	n/a	n/a	n/a	0.005-0.015
BCWQG Aquatic Life (30day) (AW)[2,4,5]			n/a	n/a	n/a		Change of 2[h]	n/a	n/a	Change of 5[h]	+20% of median background	n/a	n/a	n/a	135-1,090[a]	3,000	20 (Cl<2)	3,000[f]	150	n/a	300[d]	n/a	n/a	n/a
BCWQG Drinking Water (DW)[2,4]			n/a	6.5-8.5	6.5-8.5	n/a	Change of 1	n/a	n/a	n/a	n/a	n/a	0/100ml	n/a	n/a	10,000	1,000	10,000[f]	250	1,500	500	n/a	n/a	0.01
Canadian Drinking Water Quality (DW)[3]			n/a	6.5-8.5	6.5-8.5	n/a	n/a	n/a	500	n/a	n/a	n/a	0/100ml	n/a	n/a	10,000	1,000	n/a	250	1,500	500	n/a	n/a	n/a
POL-4	POL-4(11:03)	2014 08 08	100	**9.89**	**8.97**	18.2	2.39	194	136	4.6	6.56	-	-	0.337	< 5	< 5	< 1	-	< 0.5	61	26.4	75.6	0.001	0.0059
	POL-4(11:23)	2014 08 08	100	**9.06**	**8.89**	18.2	2.53	192	132	5.5	6.14	> 2,420	**28**	0.33	< 5	< 5	< 1	-	< 0.5	60	26.3	75.9	0.0021	0.0054
	POL-4	2014 08 08	99.2	-	**8.78**	-	2.7	199	139	3.1	7.29	-	-	0.44	< 5	< 5	< 1	-	< 0.5	60	26.6	75	< 0.001	0.0054
	POL-4	2014 08 11	83.9	-	**8.56**	-	2.25	168	116	< 3	6.46	-	-	0.404	< 5	6.1	< 1	-	< 0.5	72	28.9	73.6	< 0.001	0.0063
	POL-4	2014 08 12	94.6	**8.90**	**8.52**	22.0	1.4	199	140	< 3	6.24	-	-	0.397	< 5	< 5	< 1	-	< 0.5	67	27.1	73.4	< 0.001	0.0056
	POL-4X	2014 08 12	98.7	**8.90**	**8.52**	22.0	1.08	200	141	< 3	6.17	-	-	0.393	< 5	< 5	< 1	-	< 0.5	64	27.2	74.8	< 0.001	0.0056
	QA/QC RPD %		2	0	0	*	26	< 1	< 1	*	*	-	-	1	*	*	*	*	*	*	*	2	*	*
	POL-4	2014 08 13	98.1	**8.831**	**8.62**	21.1	1.09	196	137	< 3	6.4	-	-	0.373	5.4	6	< 1	-	< 0.5	72	27.2	75.5	< 0.001	0.006
	POL-4	2014 08 14	97.8	**8.993**	**8.69**	22.4	1.09	199	134	< 3	6.53	-	-	0.34	6	< 5	< 1	-	< 0.5	64	27.2	75	< 0.001	**0.0048**
	POL-4	2014 08 15	97.8	7.724	8.41	20.7	3.37	200	122	< 3	6.26	-	-	0.408	< 5	< 5	< 1	< 5.1	< 0.5	65	27.2	75.4	< 0.001	0.0059
	POL-4	2014 08 16	99.5	-	8.28	-	0.66	201	137	< 3	6.44	-	-	0.345	8.6	< 5	< 1	< 5.1	< 0.5	65	28.9	75.2	< 0.001	0.0058
	POL-4	2014 08 17	101	**8.847**	8.26	19.4	0.87	204	90	< 3	6.5	-	-	0.342	5.1	< 5	< 1	-	< 0.5	68	27.4	76.5	< 0.001	0.006
	POL-4	2014 08 19	99.6	**8.815**	**8.52**	19.5	1.02	200	139	< 3	6.77	-	-	0.404	< 5	15.4	< 1	-	< 0.5	76	27.6	76	< 0.001	**0.0049**
	POL-4	2014 08 19	103	8.4	8.23	20	1.11	201	134	< 3	6.83	-	-	0.472	10.3	5.9	< 1	-	< 0.5	76	27.1	78.1	< 0.001	0.0053
	POL-4	2014 08 20	103	**8.59**	8.26	20.4	0.66	204	140	< 3	6.44	-	-	0.338	5.2	< 5	< 1	-	< 0.5	67	27.3	77.5	0.0012	0.006
	POL-4	2014 08 21	101	-	8.5	-	0.71	204	161	< 3	6.05	-	-	0.335	6	7.8	< 1	-	< 0.5	67	28	78	< 0.001	**0.0041**
	POL-4	2014 08 27	106	**8.67**	8.21	19.2	1.01	209	131	< 3	6.94	-	-	0.348	< 5	< 5	< 1	-	< 0.5	73	29.4	76.4	0.0022	0.0071
	POL-4	2014 09 03	107	**8.67**	8.36	15.7	0.73	215	151	< 3	6.49	-	-	0.342	9.7	23.6	2.1		< 0.5	66	31.1	80.3	< 0.001	0.0053

Associated ALS files: L1499194, L1499739, L1499935, L1499938, L1501501, L1501541, L1502406, L1502046, L1502926, L1503934, L1503943, L1504201, L1504097, L1505033, L1505592, L1505578, L1513384.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.

[2] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[4] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[d] Guideline varies with pH, and or Temperature or Hardness.

[3] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate applied.

[9] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.

[h] Calculated based on an individual sample basis, not average of 30 day results.

[i] Secondary chronic or chronic value, not 30 day mean.

[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Preferred range (Wilkinson, 2014) 0.54-2.73 NTU and <3-5.5 mg/L TSS.

TABLE 3a: Summary of Analytical Results for Mount Polley, Polley Lake - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Dissolved Metals																												
			Dissolved Aluminum (µg/L)	Dissolved Calcium (mg/L)	Dissolved Iron (µg/L)	Dissolved Magnesium (mg/L)	Dissolved Manganese (µg/L)	Dissolved Potassium (mg/L)	Dissolved Sodium (mg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Lithium (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[1,3]			100[4]	n/a	350	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[3,4]			50[4]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Drinking Water (DW)			200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canadian Drinking Water Quality (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
POL-1	POL-1	2014 08 07	5.3	31.1	< 30	4.72	0.377	0.341	4.24	< 0.1	0.65	6.36	< 0.1	19	< 0.01	< 0.5	< 0.1	1.67	< 0.05	< 0.5	< 0.05	2.2	< 0.5	0.56	< 0.01	< 0.01	< 10	0.102	1.1	< 3
POL-2	POL-2	2014 08 07	12.5	30.2	< 30	4.78	3.86	0.483	4.44	< 0.1	0.61	7.72	< 0.1	20	< 0.01	< 0.5	< 0.1	2.77	< 0.05	< 0.5	< 0.05	2.58	< 0.5	0.55	< 0.01	< 0.01	< 10	0.101	1.1	< 3
	POL-2(13:19)	2014 08 08	13.8	30.7	< 30	4.87	11.7	0.527	4.77	< 0.1	0.65	9.11	< 0.1	20	< 0.01	< 0.5	< 0.1	3.08	< 0.05	< 0.5	-	2.45	< 0.5	0.59	< 0.01	< 0.01	< 10	0.1	1.1	< 3
	POL-2(16:54)	2014 08 08	11.4	31.3	< 30	4.83	7.95	0.531	4.83	< 0.1	0.63	9.29	< 0.1	18	< 0.01	< 0.5	< 0.1	2.86	< 0.05	< 0.5	-	2.46	< 0.5	0.57	< 0.01	< 0.01	< 10	0.115	1.2	< 3
	POL-2	2014 08 09	14.8	30.9	< 30	4.76	0.815	0.466	4.52	< 0.1	0.61	9.3	< 0.1	20	< 0.01	< 0.5	< 0.1	3.19	< 0.05	< 0.5	-	2.87	< 0.5	0.56	< 0.01	< 0.01	< 10	0.143	1.2	< 3
	POL-2X	2014 08 09	15.2	31	< 30	4.8	0.728	0.474	4.63	< 0.1	0.6	8.25	< 0.1	20	< 0.01	< 0.5	< 0.1	3.21	< 0.05	< 0.5	-	2.77	< 0.5	0.56	< 0.01	< 0.01	< 10	0.144	1.2	< 3
	QA/QC RPD %		1	1	< 1	11	2	2	1	*	2	< 1	*	*	*	*	*	*	*	*	*	4	*	*	*	*	*	< 1	*	*	*
	POL-2	2014 08 11	12.1	31.9	< 30	4.85	22.4	0.708	4.66	< 0.1	0.66	9.62	< 0.1	20	< 0.01	< 0.5	< 0.1	3.16	< 0.05	0.56	-	2.49	< 0.5	0.57	< 0.01	< 0.01	< 10	0.091	1.1	< 3
	POL-2	2014 08 12	10.5	30.4	< 30	4.51	0.361	0.422	4.54	< 0.1	0.58	7.9	< 0.1	19	< 0.01	< 0.5	< 0.1	2.16	< 0.05	< 0.5	-	2.36	< 0.5	0.55	< 0.01	< 0.01	< 10	0.096	1.2	< 3
	POL-2	2014 08 13	10.3	30.7	< 30	4.8	0.487	0.422	4.43	< 0.1	0.54	8.04	< 0.1	21	< 0.01	< 0.5	< 0.1	2.3	< 0.05	< 0.5	-	2.53	< 0.5	0.55	< 0.01	< 0.01	< 10	0.102	1.1	< 3
	POL-2	2014 08 14	9.5	32.1	< 30	4.8	0.501	0.41	4.48	< 0.1	0.61	7.48	< 0.1	21	< 0.01	< 0.5	< 0.1	2.25	< 0.05	< 0.5	-	2.57	< 0.5	0.53	< 0.01	< 0.01	< 10	0.109	1.1	< 3
	POL-2	2014 08 15	10.2	32	< 30	4.87	3.41	0.435	4.47	< 0.1	0.58	7.56	< 0.1	19	< 0.01	< 0.5	< 0.1	2.34	< 0.05	< 0.5	-	2.53	< 0.5	0.57	< 0.01	< 0.01	< 10	0.099	1.1	< 3
	POL-2	2014 08 16	8	32.2	< 30	4.8	2.87	0.45	4.51	< 0.1	0.61	7.56	< 0.1	18	< 0.01	< 0.5	< 0.1	2.3	< 0.05	< 0.5	-	2.51	< 0.5	0.6	< 0.01	< 0.01	< 10	0.097	1.1	< 3
	POL-2	2014 08 17	11.9	30.8	< 30	4.63	0.815	0.468	4.68	< 0.1	0.61	7.75	< 0.1	20	< 0.01	< 0.5	< 0.1	2.53	< 0.05	< 0.5	-	2.65	< 0.5	0.55	< 0.01	< 0.01	< 10	0.118	1.2	< 3
	POL-2	2014 08 18	11.7	31.3	< 30	4.69	4.93	0.48	4.48	< 0.1	0.55	8.1	< 0.1	19	< 0.01	< 0.5	< 0.1	2.33	< 0.05	< 0.5	-	2.56	< 0.5	0.54	< 0.01	< 0.01	< 10	0.105	1.1	< 3
	POL-2	2014 08 19	19	32.8	< 30	4.66	31.2	0.529	4.38	< 0.1	0.61	9.63	< 0.1	20	< 0.01	< 0.5	< 0.1	2.34	< 0.05	< 0.5	-	2.56	< 0.5	0.57	< 0.01	< 0.01	< 10	0.1	1.1	< 3
	POL-2	2014 08 20	12.5	32.7	< 30	4.92	8.18	0.502	4.6	< 0.1	0.62	8.68	< 0.1	21	< 0.01	< 0.5	< 0.1	2.69	< 0.05	< 0.5	-	2.72	< 0.5	0.62	< 0.01	< 0.01	< 10	0.105	1.1	< 3
	POL-2	2014 08 21	16.8	32.1	< 30	4.89	1.44	0.482	4.61	< 0.1	0.59	8.59	< 0.1	19	< 0.01	< 0.5	< 0.1	3.41	< 0.05	< 0.5	-	2.84	< 0.5	< 0.5	< 0.01	< 0.01	< 10	0.105	1.1	< 3
POL-3	POL-3(12:15)	2014 08 09	7.5	32	< 30	4.82	3.02	0.404	4.53	< 0.1	0.6	6.96	< 0.1	16	< 0.01	< 0.5	< 0.1	2.12	< 0.05	< 0.5	-	2.23	< 0.5	0.58	< 0.01	< 0.01	< 10	0.095	1.1	< 3
	POL-3(12:34)	2014 08 09	7.1	32.2	< 30	4.82	6.32	0.505	4.51	< 0.1	0.61	7.12	< 0.1	19	< 0.01	< 0.5	< 0.1	2.17	< 0.05	< 0.5	-	2.19	< 0.5	0.52	< 0.01	< 0.01	< 10	0.094	1.1	< 3
	POL-3	2014 08 09	7.4	31.4	< 30	4.71	0.583	0.419	4.37	< 0.1	0.65	6.84	< 0.1	20	< 0.01	< 0.5	< 0.1	1.82	< 0.05	< 0.5	-	2.36	< 0.5	0.51	< 0.01	< 0.01	< 10	0.087	1.1	< 3
	POL-3	2014 08 11	5.8	34.6	< 30	5.04	73	1.46	4.61	< 0.1	0.78	10.7	< 0.1	21	0.015	< 0.5	< 0.1	2.74	< 0.05	0.52	-	2.13	< 0.5	0.52	< 0.01	< 0.01	< 10	0.033	< 1	< 3
	POL-3	2014 08 12	8.8	30.9	< 30	4.57	0.327	0.481	4.58	< 0.1	0.65	7.03	< 0.1	19	< 0.01	< 0.5	< 0.1	2.15	< 0.05	0.51	-	2.4	< 0.5	0.53	< 0.01	< 0.01	< 10	0.096	1.1	< 3
	POL-3	2014 08 13	10.3	31.3	< 30	4.79	0.406	0.451	4.48	< 0.1	0.58	7.42	< 0.1	20	< 0.01	< 0.5	< 0.1	2.25	< 0.05	< 0.5	-	2.48	< 0.5	0.55	< 0.01	< 0.01	< 10	0.104	1.1	< 3
	POL-3	2014 08 14	8.3	31.5	< 30	4.78	0.448	0.428	4.45	< 0.1	0.65	7.2	< 0.1	21	< 0.01	< 0.5	< 0.1	2.16	< 0.05	< 0.5	-	2.5	< 0.5	0.57	< 0.01	< 0.01	< 10	0.107	1.2	< 3
	POL-3	2014 08 15	9.8	31.5	< 30	4.83	2.08	0.415	4.52	< 0.1	0.59	7.21	< 0.1	19	< 0.01	< 0.5	< 0.1	2.21	< 0.05	< 0.5	-	2.6	< 0.5	0.58	< 0.01	< 0.01	< 10	0.093	1.1	< 3
	POL-3	2014 08 16	8.4	31.9	< 30	4.85	1.77	0.419	4.27	< 0.1	0.61	7.08	< 0.1	18	< 0.01	< 0.5	< 0.1	2.15	< 0.05	< 0.5	-	2.44	< 0.5	0.57	< 0.01	< 0.01	< 10	0.094	1.1	< 3
	POL-3	2014 08 17	8.9	31.9	< 30	4.82	0.345	0.447	4.73	< 0.1	0.6	7.21	< 0.1	20	< 0.01	< 0.5	< 0.1	2.12	< 0.05	< 0.5	-	2.65	< 0.5	0.57	< 0.01	< 0.01	< 10	0.102	1.1	< 3
	POL-3	2014 08 18	9.2	32	< 30	4.78	0.527	0.443	4.52	< 0.1	0.61	7.46	< 0.1	20	< 0.01	< 0.5	< 0.1	2.06	< 0.05	< 0.5	-	2.65	< 0.5	0.55	< 0.01	< 0.01	< 10	0.111	1.1	< 3
	POL-3X	2014 08 18	9	31.8	< 30	4.71	0.79	0.441	4.44	< 0.1	0.57	7.37	< 0.1	21	< 0.01	< 0.5	< 0.1	2.06	< 0.05	< 0.5	-	2.6	< 0.5	0.57	< 0.01	< 0.01	< 10	0.107	1.1	< 3
	QA/QC RPD %		*	1	< 1	*	2	40	< 1	2	*	7	*	*	*	*	*	*	*	*	*	2	*	*	*	*	*	4	*	*	*
	POL-5	2014 08 19	10.8	32.4	< 30	4.85	2.62	0.452	4.43	< 0.1	0.58	7.49	< 0.1	21	< 0.01	< 0.5	< 0.1	2.25	< 0.05	< 0.5	-	2.57	< 0.5	0.61	< 0.01	< 0.01	< 10	0.099	1.1	< 3
	POL-3	2014 08 20	9.4	32.9	< 30	4.82	3.86	0.53	4.56	< 0.1	0.65	7.61	< 0.1	20	< 0.01	< 0.5	< 0.1	2.32	< 0.05	< 0.5	-	2.62	< 0.5	0.64	< 0.01	< 0.01	< 10	0.109	1.1	< 3
	POL-3X	2014 08 20	8.7	32.2	< 30	4.81	3.71	0.506	4.47	< 0.1	0.61	7.64	< 0.1	19	< 0.01	< 0.5	< 0.1	2.17	< 0.05	< 0.5	-	2.76	< 0.5	0.63	< 0.01	< 0.01	< 10	0.11	1.1	< 3
	QA/QC RPD %		2	1	< 1	< 1	7	6	3	*	8	< 1	*	*	*	*	*	*	*	*	*	2	*	*	*	*	*	< 1	*	*	*
	POL-3	2014 08 21	8.7	32.1	< 30	4.83	2.35	0.497	4.66	< 0.1	0.59	7.88	< 0.1	23	< 0.01	< 0.5	< 0.1	2.21	< 0.05	< 0.5	-	2.92	< 0.5	0.57	< 0.01	< 0.01	< 10	0.096	1.1	< 3
	POL-3	2014 08 27	9.6	33.8	< 30	5.02	8.29	0.567	4.84	< 0.1	0.59	8.35	< 0.1	16	< 0.01	< 0.5	< 0.1	2.49	< 0.05	< 0.5	-	2.96	< 0.5	0.61	< 0.01	< 0.01	< 10	0.112	1.1	< 3
	POL-3	2014 09 03	11	33.2	< 30	4.96	3.68	0.526	5.04	< 0.1	0.64	9.13	< 0.1	19	< 0.01	< 0.5	< 0.1	2.74	< 0.05	< 0.5	-	3.6	< 0.5	0.73	< 0.01	< 0.01	< 10	0.124	1.1	< 3

Associated ALS Ites: L1499184, L1499709, L1499955, L1499959, L1501591, L1501541, L1502496, L1503046, L1503826, L1503934, L1503943, L1504281, L1504997, L1505933, L1506502, L1506578, L1513394.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[1] Laboratory detection limit out of range.

[2] British Columbia Approved Water Quality Guidelines, 2006 Edition, updated 2014.

[3] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2008.

[4] Guideline varies with pH, and or Temperature or Hardness.

[5] Health Canada Drinking Water Guidelines, 2012.

[6] Guideline for Nitrate applied.

[7] This total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.

[8] Calculated based on an individual sample basis, not average of 30 day results.

[9] Secondary aspects of chronic value, not 30 day mean.

[10] Guideline not applicable for site situation

[11] Based on a change from background at any one time. Freshwater range (Wetzel, 2001) 0.58-2.73 NTU and <3-5.5 mg/L TSS.

TABLE 3a: Summary of Analytical Results for Mount Polley, Polley Lake - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Dissolved Metals																												
			Dissolved Aluminum (µg/L)	Dissolved Calcium (mg/L)	Dissolved Iron (µg/L)	Dissolved Magnesium (mg/L)	Dissolved Manganese (µg/L)	Dissolved Potassium (mg/L)	Dissolved Sodium (mg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Lithium (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[a,c]			100[f]	n/a	350	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[a,c]			50[g]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Drinking Water (DW)			200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canadian Drinking Water Quality (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
POL-4	POL-4(11:03)	2014 08 08	7.9	32.2	< 30	4.84	2.3	0.398	4.52	< 0.1	0.6	6.85	< 0.1	19	< 0.01	< 0.5	< 0.1	2.19	< 0.05	< 0.5	-	2.27	< 0.5	0.58	< 0.01	< 0.01	< 10	0.101	1.1	< 3
	POL-4(11:23)	2014 08 08	8.5	32.2	< 30	4.85	3.36	0.404	4.46	< 0.1	0.6	6.58	< 0.1	19	< 0.01	< 0.5	< 0.1	2.24	< 0.05	< 0.5	-	2.25	< 0.5	0.58	< 0.01	< 0.01	< 10	0.098	1.1	< 3
	POL-4	2014 08 08	8.4	31.9	< 30	4.72	0.481	0.413	4.31	< 0.1	0.57	6.88	< 0.1	20	< 0.01	< 0.5	< 0.1	1.77	< 0.05	< 0.5	-	2.34	< 0.5	0.54	< 0.01	< 0.01	< 10	0.112	1.1	< 3
	POL-4	2014 08 11	10.1	29.9	< 30	4.05	2.74	0.429	4.74	< 0.1	0.59	7.41	< 0.1	19	< 0.01	< 0.5	< 0.1	2.55	< 0.05	0.56	-	2.35	< 0.5	0.61	< 0.01	< 0.01	< 10	0.092	1.2	< 3
	POL-4	2014 08 12	10.2	30.3	< 30	4.56	0.324	0.446	4.78	< 0.1	0.7	7.84	< 0.1	19	< 0.01	< 0.5	< 0.1	2.28	< 0.05	0.51	-	2.34	< 0.5	0.65	< 0.01	< 0.01	< 10	0.099	1.3	< 3
	POL-4X	2014 08 12	9.7	30.9	< 30	4.71	0.329	0.393	4.54	< 0.1	0.58	7.06	< 0.1	21	< 0.01	< 0.5	< 0.1	2.27	< 0.05	< 0.5	-	2.52	< 0.5	0.57	< 0.01	< 0.01	< 10	0.106	1.1	< 3
	QA/QC RPD %		17	2	*	3	2	16	5	*	19	7	*	1	*	*	*	*	*	*	*	7	*	*	*	*	*	*	*	*	*
	POL-4	2014 08 13	12.4	31	< 30	4.99	2.76	0.44	4.41	< 0.1	0.6	7.58	< 0.1	22	< 0.01	< 0.5	< 0.1	2.19	< 0.05	< 0.5	-	2.51	< 0.5	0.59	< 0.01	< 0.01	< 10	0.105	1.1	< 3
	POL-4	2014 08 14	11	31.4	< 30	4.74	0.853	0.393	4.49	< 0.1	0.62	7.11	< 0.1	22	< 0.01	< 0.5	< 0.1	2.19	< 0.05	< 0.5	-	2.52	< 0.5	0.53	< 0.01	< 0.01	< 10	0.109	1.2	< 3
	POL-4	2014 08 15	9.8	31.3	< 30	4.77	2.03	0.413	4.48	< 0.1	0.6	6.85	< 0.1	19	< 0.01	< 0.5	< 0.1	2.2	< 0.05	< 0.5	-	2.53	< 0.5	0.62	< 0.01	< 0.01	< 10	0.097	1.1	< 3
	POL-4	2014 08 16	8.5	31.9	< 30	4.85	2.84	0.435	4.32	< 0.1	0.58	7.13	< 0.1	17	< 0.01	< 0.5	< 0.1	2.13	< 0.05	< 0.5	-	2.4	< 0.5	0.56	< 0.01	< 0.01	< 10	0.094	1.1	< 3
	POL-4	2014 08 17	9.9	32.5	< 30	4.84	2.59	0.453	4.56	< 0.1	0.61	7.2	< 0.1	21	< 0.01	< 0.5	< 0.1	2.78	< 0.05	< 0.5	-	2.87	< 0.5	0.57	< 0.01	< 0.01	< 10	0.102	1.1	< 3
	POL-4	2014 08 18	10.3	32	< 30	4.74	0.493	0.441	4.99	< 0.1	0.61	7.45	< 0.1	20	< 0.01	< 0.5	< 0.1	2.12	< 0.05	< 0.5	-	2.64	< 0.5	0.58	< 0.01	< 0.01	< 10	0.107	1.2	< 3
	POL-4	2014 08 19	8.7	33.2	< 30	4.94	22.4	0.576	4.57	< 0.1	0.63	7.78	< 0.1	21	< 0.01	< 0.5	< 0.1	2.19	< 0.05	< 0.5	-	2.87	< 0.5	0.62	< 0.01	< 0.01	< 10	0.104	1.1	< 3
	POL-4	2014 08 20	8.7	33.3	< 30	4.89	6.36	0.53	4.67	< 0.1	0.58	7.86	< 0.1	18	< 0.01	< 0.5	< 0.1	2.3	< 0.05	< 0.5	-	2.76	< 0.5	0.63	< 0.01	< 0.01	< 10	0.105	1.1	< 3
	POL-4	2014 08 21	8.8	32.4	< 30	4.82	1.84	0.439	4.67	< 0.1	0.62	7.38	< 0.1	20	< 0.01	< 0.5	< 0.1	2.18	< 0.05	< 0.5	-	2.87	< 0.5	0.56	< 0.01	< 0.01	< 10	0.098	1.1	< 3
	POL-4	2014 08 27	9.3	34	< 30	5.01	7.05	0.526	4.74	< 0.1	0.62	7.96	< 0.1	18	< 0.01	< 0.5	< 0.1	2.51	< 0.05	< 0.5	-	2.83	< 0.5	0.62	0.013	< 0.01	< 10	0.111	1.1	< 3
	POL-4	2014 09 03	10.4	34.5	< 30	5.08	5.75	0.581	5.34	< 0.1	0.67	9.01	< 0.1	20	< 0.01	< 0.5	< 0.1	2.82	< 0.05	< 0.5	-	4.16	< 0.5	0.77	< 0.01	< 0.01	< 10	0.144	1.2	< 3

Associated ALS files: L1499194, L1499709, L1499955, L1499930, L1501501, L1501541, L1502400, L1503048, L1503028, L1501934, L1503943, L1504261, L1504997, L1505953, L1506582, L1506578, L1513384

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.

[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2009.

[d] Guideline varies with pH, and or Temperature or Hardness.

[e] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate applied.

[g] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.

[h] Calculated based on an individual sample basis, not average of 30 day results.

[i] Secondary chronic or chronic value, not 30 day mean.

[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Fretreach range (Minnow, 2014) 0.54-2.73 NTU and <3-5.5 mg/L TSS.

TABLE 3a: Summary of Analytical Results for Mount Polley, Polley Lake - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Total Metals: Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Bismuth (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Calcium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Lithium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Tin (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[a,x]			n/a	20	5	5,000	n/a	n/a	1,200	0.0285-0.0351[d]	n/a	1 (Cr(+6))	110	9.9-12.1[e]	1,000	65.3-80[e]	870	1465-1710[e]	Methyl mercury analysis in progress	2,000	25-65[f]	373,000-432,000	2	0.1-3.0[d]	n/e	0.3	n/a	2,000	300	6	33-45.6[d]
BCWQG Aquatic Life (30day) (AW)[b,x]			n/a	n/a	n/a	1,000	5.3[i]	n/a	n/a	n/a	n/a	n/a	4	3.4-4.3[e]	n/a	9.9-8.6[f]	14[i]	974-1078[e]	n/a	1,000	n/a	n/a	n/a	0.05-1.5[d]	n/a	n/a	n/a	n/a	n/a	n/a	7.5-20.3[d]
BCWQG Drinking Water (DW)			n/a	14	25	n/a	4	n/a	5,000	n/a	n/a	n/a	n/a	500	n/a	50	n/a	n/a	1	250	n/a	n/a	10	n/a	n/a	2	n/a	n/a	n/a	n/a	5,000
Canadian Drinking Water Quality (DW)			100	6	10	1,000	n/a	n/a	5,000	5	n/a	50	n/a	1,000	300	10	n/a	50	1	n/a	n/a	n/a	10	n/a	200,000	n/a	n/a	n/a	20	n/a	5,000
POL-1	POL-1	2014 08 07	53.7	< 0.1	0.57	9.91	< 0.1	< 0.5	19	< 0.01	30,900	< 0.5	< 0.1	3.16	34	< 0.05	< 0.5	8.21	< 0.05	2.17	< 0.5	355	0.53	< 0.01	4,060	< 0.01	< 0.1	< 10	0.096	1.2	< 3
POL-2	POL-2	2014 08 07	**139**	< 0.1	0.63	9.62	< 0.1	< 0.5	19	< 0.01	29,900	< 0.5	0.1	**9.51**	88	0.054	< 0.5	11.7	< 0.05	2.51	< 0.5	519	0.58	< 0.01	4,360	< 0.01	< 0.1	< 10	0.107	1.5	< 3
	POL-2(13:18)	2014 08 08	**776**	< 0.1	0.72	11.5	< 0.1	< 0.5	23	< 0.01	31,500	< 0.5	0.14	**4.85**	127	0.063	< 0.5	19.6	< 0.05	2.89	< 0.5	570	0.64	< 0.01	4,770	< 0.01	< 0.1	11	0.114	1.6	< 3
	POL-2(16:54)	2014 08 08	**114**	< 0.1	0.65	11	< 0.1	< 0.5	20	< 0.01	29,600	< 0.5	< 0.1	**3.28**	88	< 0.05	< 0.5	15.3	< 0.05	2.5	< 0.5	582	0.65	< 0.01	4,350	< 0.01	< 0.1	< 10	0.124	1.4	< 3
	POL-2	2014 08 09	**227**	< 0.1	0.72	11.4	< 0.1	< 0.5	21	< 0.01	31,800	< 0.5	0.18	**9.5**	180	0.058	< 0.5	13.7	< 0.05	2.91	< 0.5	551	0.58	< 0.01	4,730	< 0.01	< 0.1	13	0.103	1.9	< 3
	POL-2X	2014 08 09	**241**	< 0.1	0.72	11.7	< 0.1	< 0.5	21	< 0.01	31,700	< 0.5	0.18	**9.24**	175	0.083	< 0.5	14.5	< 0.05	2.79	< 0.5	557	0.58	< 0.01	4,650	< 0.01	< 0.1	13	0.157	1.8	< 3
	QA/QC RPD %		2	*	0	2	*	*	*	*	< 1	*	*	9	*	*	*	*	*	5	*	1	*	*	2	*	*	*	4	*	*
	POL-2	2014 08 11	67.5	< 0.1	0.66	10	< 0.1	< 0.5	19	< 0.01	30,400	< 0.5	< 0.1	**4.8**	47	< 0.05	< 0.5	24.3	< 0.05	2.64	< 0.5	696	0.52	< 0.01	4,650	< 0.01	< 0.1	< 10	0.1	1.3	< 3
	POL-2	2014 08 12	38.7	< 0.1	0.69	7.73	< 0.1	< 0.5	19	< 0.01	31,000	< 0.5	< 0.1	3.15	< 30	< 0.05	< 0.5	7.98	< 0.05	2.57	< 0.5	440	0.58	< 0.01	4,610	< 0.01	< 0.1	< 10	0.104	1.5	< 3
	POL-2	2014 08 13	35.3	< 0.1	0.62	7.68	< 0.1	< 0.5	21	< 0.01	31,100	< 0.5	< 0.1	3.38	< 30	< 0.05	< 0.5	8.64	< 0.05	2.48	< 0.5	448	0.6	< 0.01	4,430	< 0.01	< 0.1	< 10	0.107	1.3	3.1
	POL-2	2014 08 14	35.4	< 0.1	0.66	7.97	< 0.1	< 0.5	22	< 0.01	32,400	< 0.5	< 0.1	3.28	< 30	< 0.05	< 0.5	6.84	< 0.05	2.8	< 0.5	458	0.58	< 0.01	4,590	< 0.01	< 0.1	< 10	0.112	1.4	< 3
	POL-2	2014 08 15	57.9	< 0.1	0.64	7.98	< 0.1	< 0.5	20	< 0.01	31,600	< 0.5	< 0.1	3.73	38	< 0.05	< 0.5	7.94	-	2.64	< 0.5	453	0.59	< 0.01	4,590	< 0.01	< 0.1	< 10	0.104	1.3	< 3
	POL-2	2014 08 16	50.6	< 0.1	0.63	8.32	< 0.1	< 0.5	21	< 0.01	32,000	< 0.5	< 0.1	3.57	37	< 0.05	< 0.5	9.47	-	2.57	< 0.5	470	0.57	< 0.01	4,550	< 0.01	< 0.1	< 10	0.106	1.2	< 3
	POL-2	2014 08 17	99.7	< 0.1	0.66	9.09	< 0.1	< 0.5	21	< 0.01	31,600	< 0.5	< 0.1	**5.28**	83	< 0.05	< 0.5	9.39	-	2.79	< 0.5	496	0.58	< 0.01	4,700	< 0.01	< 0.1	< 10	0.127	1.4	< 3
	POL-2	2014 08 18	58.3	< 0.1	0.61	8.87	< 0.1	< 0.5	20	< 0.01	31,700	< 0.5	< 0.1	3.87	54	< 0.05	< 0.5	11.8	-	2.63	< 0.5	462	0.58	< 0.01	4,560	< 0.01	< 0.1	< 10	0.108	1.2	< 3
	POL-2	2014 08 19	**168**	< 0.1	0.71	12.1	< 0.1	< 0.5	23	< 0.01	33,600	< 0.5	0.18	**6.99**	148	0.074	< 0.5	**50**	-	2.74	< 0.5	599	0.6	0.022	4,770	< 0.01	< 0.1	11	0.108	1.5	< 3
	POL-2	2014 08 20	**286**	< 0.1	0.72	13.5	< 0.1	< 0.5	21	< 0.01	33,800	< 0.5	0.2	**10.3**	187	0.079	< 0.5	18.2	-	2.88	< 0.5	615	0.57	< 0.01	4,930	< 0.01	< 0.1	15	0.122	1.8	< 3
	POL-2	2014 08 21	**435**	< 0.1	0.74	14.6	< 0.1	< 0.5	20	< 0.01	32,500	< 0.5	0.31	**16.5**	**302**	0.102	0.62	16.5	-	2.71	< 0.5	612	0.58	< 0.01	4,730	< 0.01	< 0.1	24	0.12	2.1	< 3
POL-3	POL-3(12:19)	2014 08 08	45.8	< 0.1	0.64	7.41	< 0.1	< 0.5	22	< 0.01	31,300	< 0.5	< 0.1	2.94	< 30	< 0.05	< 0.5	7.59	< 0.05	2.29	< 0.5	390	0.58	< 0.01	4,450	< 0.01	< 0.1	< 10	0.1	1.2	< 3
	POL-3(12:34)	2014 08 08	**120**	< 0.1	0.69	8.6	< 0.1	< 0.5	22	< 0.01	31,900	< 0.5	< 0.1	**5.01**	97	0.059	< 0.5	18.1	< 0.05	2.31	< 0.5	561	0.57	< 0.01	4,390	< 0.01	< 0.1	< 10	0.102	1.5	< 3
	POL-3	2014 08 09	48	< 0.1	0.71	7.57	< 0.1	< 0.5	20	< 0.01	31,200	< 0.5	< 0.1	3.18	30	< 0.05	< 0.5	11.3	< 0.05	2.31	< 0.5	437	0.52	< 0.01	4,240	0.01	< 0.1	< 10	0.096	1.3	< 3
	POL-3	2014 08 11	37	< 0.1	0.61	10.7	< 0.1	< 0.5	20	0.022	33,400	< 0.5	< 0.1	**4.8**	< 30	< 0.05	< 0.5	**82.5**	< 0.05	2.48	< 0.5	1,080	< 0.5	< 0.01	4,370	< 0.01	< 0.1	< 10	0.041	< 1	< 3
	POL-3	2014 08 12	41.9	< 0.1	0.67	8.02	< 0.1	< 0.5	18	< 0.01	31,100	< 0.5	< 0.1	3.35	< 30	< 0.05	0.58	8.03	< 0.05	2.25	< 0.5	507	0.59	< 0.01	4,650	< 0.01	< 0.1	< 10	0.095	1.3	< 3
	POL-3	2014 08 13	36	< 0.1	0.69	7.5	< 0.1	< 0.5	21	< 0.01	32,500	< 0.5	< 0.1	3.37	< 30	< 0.05	< 0.5	10.9	< 0.05	2.49	< 0.5	450	0.57	< 0.01	4,360	< 0.01	< 0.1	< 10	0.101	1.3	< 3
	POL-3	2014 08 14	34.6	< 0.1	0.67	7.85	< 0.1	< 0.5	23	< 0.01	32,700	< 0.5	< 0.1	3.23	< 30	< 0.05	< 0.5	8.56	< 0.05	2.63	< 0.5	465	0.58	< 0.01	4,740	< 0.01	< 0.1	< 10	0.109	1.5	< 3
	POL-3	2014 08 15	22.6	< 0.1	0.62	7.35	< 0.1	< 0.5	20	< 0.01	31,400	< 0.5	< 0.1	2.74	< 30	< 0.05	< 0.5	6.05	-	2.62	< 0.5	438	0.57	< 0.01	4,600	< 0.01	< 0.1	< 10	0.105	1.2	< 3
	POL-3	2014 08 16	20.3	< 0.1	0.59	7.35	< 0.1	< 0.5	20	< 0.01	31,700	< 0.5	< 0.1	2.59	< 30	< 0.05	< 0.5	7.47	-	2.55	< 0.5	428	0.56	< 0.01	4,340	< 0.01	< 0.1	< 10	0.105	1.2	< 3
	POL-3	2014 08 17	27.3	< 0.1	0.63	7.52	< 0.1	< 0.5	20	< 0.01	31,800	< 0.5	< 0.1	2.86	< 30	< 0.05	< 0.5	7.67	-	2.69	< 0.5	458	0.6	< 0.01	4,720	< 0.01	< 0.1	< 10	0.111	1.2	3
	POL-3	2014 08 18	22.8	< 0.1	0.59	7.44	< 0.1	< 0.5	20	< 0.01	31,000	< 0.5	< 0.1	2.61	< 30	< 0.05	< 0.5	8.86	-	2.58	< 0.5	435	0.59	< 0.01	4,360	< 0.01	< 0.1	< 10	0.109	1.1	< 3
	POL-3X	2014 08 18	22.9	< 0.1	0.6	7.54	< 0.1	< 0.5	21	< 0.01	31,400	< 0.5	< 0.1	2.61	< 30	< 0.05	< 0.5	9.46	-	2.61	< 0.5	440	0.58	< 0.01	4,440	< 0.01	< 0.1	< 10	0.108	1.1	< 3
	QA/QC RPD %		1.3	*	2	1	*	*	*	*	1	*	*	*	*	*	*	*	*	2	*	*	*	*	*	2	*	*	3	*	*
	POL-3	2014 08 19	22.2	< 0.1	0.63	7.96	< 0.1	< 0.5	23	< 0.01	32,800	< 0.5	< 0.1	2.81	< 30	< 0.05	< 0.5	8.23	-	2.78	< 0.5	482	0.62	< 0.01	4,670	< 0.01	< 0.1	< 10	0.108	1.2	< 3
	POL-3	2014 08 20	20.4	< 0.1	0.66	8.15	< 0.1	< 0.5	23	< 0.01	32,700	< 0.5	< 0.1	2.73	< 30	< 0.05	< 0.5	7.26	-	2.99	< 0.5	533	0.51	< 0.01	4,650	< 0.01	< 0.1	< 10	0.111	1.2	< 3
	POL-3X	2014 08 20	18.3	< 0.1	0.67	8.32	< 0.1	< 0.5	23	< 0.01	33,500	< 0.5	< 0.1	2.76	< 30	< 0.05	< 0.5	7.69	-	3.07	< 0.5	546	< 0.5	< 0.01	4,640	< 0.01	< 0.1	< 10	0.110	1.3	< 3
	QA/QC RPD %		11	*	2	2	*	*	*	*	3	*	*	*	*	*	*	*	*	3	*	*	*	2	*	*	4	*	*	2	*	*
	POL-3	2014 08 21	25.9	< 0.1	0.64	7.91	< 0.1	< 0.5	21	< 0.01	33,000	< 0.5	< 0.1	2.86	< 30	< 0.05	< 0.5	7.39	-	3	< 0.5	489	0.59	< 0.01	4,910	< 0.01	< 0.1	< 10	0.114	1.2	< 3
	POL-3	2014 08 27	32.9	< 0.1	0.66	8.78	< 0.1	< 0.5	20	< 0.01	33,900	< 0.5	< 0.1	3.45	< 30	< 0.05	< 0.5	9.5	-	3.24	< 0.5	581	0.62	< 0.01	4,680	< 0.01	< 0.1	< 10	0.119	1.3	< 3
	POL-3	2014 09 03	24.5	< 0.1	0.63	9.35	< 0.1	< 0.5	21	< 0.01	32,400	< 0.5	< 0.1	3.36	< 30	< 0.05	< 0.5	8.63	< 0.01	3.82	< 0.5	531	0.72	< 0.01	5,040	< 0.01	< 0.1	< 10	0.131	1.2	< 3

Associated ALS files: L1499194, L1499709, L1499535, L1499535, L1501501, L1501541, L1502406, L1503046, L1503928, L1503934, L1503943, L1504261, L1504907, L1505033, L1505592, L1505579, L1513384.

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.

[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[d] Guideline varies with pH, and or Temperature or Hardness.

[e] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate as NO3.

[g] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.

[h] Calculated based on an individual sample basis, not average of 30 day results.

[i] Secondary chronic or chronic value, not 30 day mean.

[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Protection range (Johnson, 2014) 0.54-2.73 NTU and <3-5.5 mg/L TSS.

TABLE 3a: Summary of Analytical Results for Mount Polley, Polley Lake - Surface Water DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Total Metals																												
			Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Bismuth (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Calcium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Lithium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Tin (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[b,c]			n/a	20	5	5,000	n/a	n/a	1,200	0.0265-0.0351[g]	n/a	1 (Cr(+6))	110	9.8-12.1[g]	1,000	65.3-89[g]	870	1465-1719[g]	Methyl mercury analysis in progress	2,000	25-65[g]	373,000-432,000	2	0.1-3.0[g]	n/a	0.3	n/a	2,000	300	6	33-45.8[g]
BCWQG Aquatic Life (30day) (AW)[b,c]			n/a	n/a	n/a	1,000	5.3[i]	n/a	n/a	n/a	n/a	n/a	4	3.4-4.3[g]	n/a	5.8-6.8[g]	14[i]	974-1076[g]		1,000	n/a	n/a	n/a	0.05-1.5[g]	n/a	n/a	n/a	n/a	n/a	n/a	7.5-20.3[g]
BCWQG Drinking Water (DW)			n/a	14	25	n/a	4	n/a	5,000	n/a	n/a	n/a	n/a	500	n/a	50	n/a	n/a	1	250	n/a	n/a	10	n/a	n/a	2	n/a	n/a	n/a	n/a	5,000
Canadian Drinking Water Quality (DW)			100	6	10	1,000	n/a	n/a	5,000	5	n/a	50	n/a	1,000	300	10	n/a	50	1	n/a	n/a	n/a	10	n/a	200,000	n/a	n/a	n/a	20	n/a	5,000
POL-4	POL-4(11:03)	2014 08 08	71.9	< 0.1	0.65	7.53	< 0.1	< 0.5	20	< 0.01	31,700	< 0.5	< 0.1	3.48	39	< 0.05	< 0.5	9.6	< 0.05	2.37	< 0.5	464	0.56	< 0.01	4,390	< 0.01	< 0.1	< 10	0.108	1.3	< 3
	POL-4(11:23)	2014 08 08	267	< 0.1	0.71	0.47	< 0.1	< 0.5	21	< 0.01	31,800	< 0.5	0.35	4.64	228	0.126	< 0.5	16.2	< 0.05	2.34	< 0.5	462	0.58	< 0.01	4,520	< 0.01	< 0.1	18	0.106	1.9	< 3
	POL-4	2014 08 09	59.7	< 0.1	0.62	7.66	< 0.1	< 0.5	20	< 0.01	31,800	< 0.5	< 0.1	3.21	37	< 0.05	< 0.5	15.1	< 0.05	2.37	< 0.5	434	0.55	< 0.01	4,390	< 0.01	< 0.1	< 10	0.112	1.2	< 3
	POL-4	2014 08 11	43.1	< 0.1	0.66	7.44	< 0.1	< 0.5	19	< 0.01	29,900	< 0.5	< 0.1	3.23	< 30	< 0.05	< 0.5	8.43	< 0.05	2.47	< 0.5	470	0.51	< 0.01	4,450	< 0.01	< 0.1	< 10	0.1	1.3	< 3
	POL-4	2014 08 12	35.8	< 0.1	0.68	7.59	< 0.1	< 0.5	19	< 0.01	30,800	< 0.5	< 0.1	3.06	< 30	< 0.05	< 0.5	6.62	< 0.05	2.43	< 0.5	453	0.54	< 0.01	4,650	< 0.01	< 0.1	< 10	0.101	1.3	< 3
	POL-4X	2014 08 12	41.6	< 0.1	0.67	7.63	< 0.1	< 0.5	19	< 0.01	31,300	< 0.5	< 0.1	3.02	< 30	< 0.05	< 0.5	8.02	< 0.05	2.52	< 0.5	450	0.54	< 0.01	4,520	< 0.01	< 0.1	< 10	0.105	1.3	< 3
	QA/QC RPD %		15	-	-	< 1	-	-	-	-	2	-	-	-	-	-	-	-	-	4	-	-	< 1	-	-	2	-	-	-	4	-	-
	POL-4	2014 08 13	30.3	< 0.1	0.62	7.73	< 0.1	< 0.5	21	< 0.01	31,000	< 0.5	< 0.1	2.88	< 30	< 0.05	< 0.5	17.8	< 0.05	2.51	< 0.5	458	0.58	< 0.01	4,540	< 0.01	< 0.1	< 10	0.109	1.3	< 3
	POL-4	2014 08 14	31.5	< 0.1	0.63	7.62	< 0.1	< 0.5	22	< 0.01	32,000	< 0.5	< 0.1	2.87	< 30	< 0.05	< 0.5	5.81	< 0.05	2.58	< 0.5	467	0.61	< 0.01	4,480	< 0.01	< 0.1	< 10	0.116	1.4	< 3
	POL-4	2014 08 15	22.3	< 0.1	0.65	7.22	< 0.1	< 0.5	20	< 0.01	31,100	< 0.5	< 0.1	2.63	< 30	< 0.05	< 0.5	6.56	-	2.62	< 0.5	439	0.57	< 0.01	4,550	< 0.01	< 0.1	< 10	0.101	1.3	< 3
	POL-4	2014 08 16	20.5	< 0.1	0.6	7.35	< 0.1	< 0.5	21	< 0.01	32,000	< 0.5	< 0.1	2.49	< 30	< 0.05	< 0.5	8.79	-	2.49	< 0.5	449	0.58	< 0.01	4,370	< 0.01	< 0.1	< 10	0.108	1.2	< 3
	POL-4	2014 08 17	23.2	< 0.1	0.62	7.56	< 0.1	< 0.5	21	< 0.01	32,900	< 0.5	< 0.1	2.62	< 30	< 0.05	< 0.5	13	-	2.65	< 0.5	458	0.58	< 0.01	4,620	< 0.01	< 0.1	< 10	0.111	1.1	< 3
	POL-4	2014 08 18	24.7	< 0.1	0.61	7.51	< 0.1	< 0.5	21	< 0.01	32,100	< 0.5	< 0.1	2.66	< 30	< 0.05	< 0.5	9.33	-	2.69	< 0.5	444	0.58	< 0.01	4,570	< 0.01	< 0.1	< 10	0.117	1.2	< 3
	POL-4	2014 08 19	81.4	< 0.1	0.65	8.89	< 0.1	< 0.5	24	< 0.01	33,300	< 0.5	< 0.1	3.19	72	< 0.05	< 0.5	26.7	-	3.09	< 0.5	509	0.62	< 0.01	4,760	< 0.01	< 0.1	< 10	0.117	1.3	< 3
	POL-4	2014 08 20	22.3	< 0.1	0.68	8.09	< 0.1	< 0.5	23	< 0.01	32,900	< 0.5	< 0.1	2.68	< 30	< 0.05	< 0.5	9.37	-	3.16	< 0.5	532	0.65	< 0.01	4,810	< 0.01	< 0.1	< 10	0.119	1.2	< 3
	POL-4	2014 08 21	26	< 0.1	0.64	8.1	< 0.1	< 0.5	22	< 0.01	33,700	< 0.5	< 0.1	2.95	< 30	< 0.05	< 0.5	7.27	-	3.17	< 0.5	471	0.67	< 0.01	4,810	< 0.01	< 0.1	< 10	0.115	1.3	< 3
	POL-4	2014 08 27	25.2	< 0.1	0.69	8.25	< 0.1	< 0.5	23	< 0.01	33,300	< 0.5	< 0.1	3.02	< 30	< 0.05	< 0.5	10.8	-	3.16	< 0.5	562	0.82	0.03	4,720	< 0.01	< 0.1	< 10	0.12	1.3	< 3
	POL-4	2014 09 03	23.7	< 0.1	0.67	10.1	< 0.1	< 0.5	23	< 0.01	34,000	< 0.5	< 0.1	3.47	< 30	< 0.05	< 0.5	12.2	< 0.01	4.47	< 0.5	605	0.76	< 0.01	5,470	< 0.01	< 0.1	< 10	0.149	1.2	< 3

Associated ALS files: L1486104, L1490709, L1496935, L1496938, L1501501, L1501541, L1502406, L1503046, L1503926, L1503934, L1503945, L1504261, L1504987, L1505933, L1506502, L1506576, L1513384.

All terms defined within the body of SNC-Lavalin's report (available upon request).

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- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

[a] Laboratory detection limit out of range.

[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[d] Guideline varies with pH, and or Temperature or Hardness.

[e] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate applied.

[g] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.

[h] Calculated based on an individual sample basis, not average of 30 day results.

[i] Secondary chronic or chronic value, not 30 day mean.

[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Freshwater range (Minnow, 2014) 0.54-2.73 NTU and <3-5.5 mg/L TSS.

TABLE 3b: Summary of Analytical Results for Mount Polley, Polley Lake - Blanks DRAFT

			Physical Parameters									Microbiological Tests												
Sample Location	Sample ID	Sample Date (yyyy mm dd)	Hardness (mg/L)	pH (field) (pH)	pH (pH)	Temperature (field) (C)	Turbidity (NTU)	Conductivity (µS/cm)	TDS (mg/L)	TSS (mg/L)	DOC (mg/L)	Total Coliform (MPN/0.1L)	E. Coli (MPN/0.1L)	Total Nitrogen (N) (mg/L)	Ammonia Nitrogen (µg/L)	Nitrate Nitrogen (µg/L)	Nitrite Nitrogen (µg/L)	Nitrate+Nitrite Nitrogen (µg/L)	Chloride (mg/L)	Fluoride (µg/L)	Sulphate (mg/L)	Total Alkalinity (as CaCO3) (mg/L)	Ortho-phosphate (mg/L)	Total Phosphorus[1] (mg/L)
BC Standards																								
BCWQG Aquatic Life (AW)[b,c]			n/a	6.5-9.0	6.5-9.0	+/-1 Degree change from ambient	Change of 8[k]	n/a	n/a	Change of 25	n/a	n/a	n/a	n/a	700-5,680[e]	32,800	60 (Cl<2)	32,800[f]	600	1264-1381[e]	n/a	n/a	n/a	0.005-0.015
BCWQG Aquatic Life (30day) (AW)[b,c,i]			n/a	n/a	n/a		Change of 2[k]	n/a	n/a	Change of 5[k]	+20% of median background	n/a	n/a	n/a	135-1,000[e]	3,000	20 (Cl<2)	3,000[f]	150	n/a	309[e]	n/a	n/a	n/a
BCWQG Drinking Water (DW)[b,c]			n/a	6.5-8.5	6.5-8.5	n/a[j]	Change of 1	n/a	n/a	n/a	n/a	n/a	0/100ml	n/a	n/a	10,000	1,000	10,000[f]	250	1,500	500	n/a	n/a	0.01
Canadian Drinking Water Quality (DW)[d]			n/a	6.5-8.5	6.5-8.5	n/a[j]	n/a[j]	n/a	500	n/a	n/a	n/a[j]	0/100ml	n/a	n/a	10,000	1,000	n/a	250	1,500	500	n/a	n/a	n/a
POL-FIELD BLANK	[illegible]	2014 08 20	< 0.5	-	5.96	-	< 0.1	< 2	< 10	< 3	-	-	-	< 0.05	< 5	< 5	< 1	-	< 0.5	< 20	< 0.5	< 1	< 0.001	< 0.002[a]
TRIP BLANK	TRIP BLANK	2014 08 13	-	-	6.1	-	< 0.1	< 2	< 10	< 3	-	-	-	< 0.05	< 5	< 5	< 1	-	< 0.5	< 20	< 0.5	< 1	< 0.001	< 0.002[a]

All terms defined within the body of SNC-Lavalin's report (available upon request).
< Denotes concentration less than indicated detection limit or RPD less than indicated value.
- Denotes analysis not conducted.
n/a Denotes no applicable standard.
* RPDs are not normally calculated where one or more concentrations are less than five times MDL.
SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.
BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.
SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.
BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.
Concentration greater than 5xDL.

[a] Laboratory detection limit out of range.
[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.
[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.
[e] Guideline varies with pH, and or Temperature or Hardness.
[d] Health Canada Drinking Water Guidelines, 2012.
[f] Guideline for Nitrate applied.
[g] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.
[h] Calculated based on an individual sample basis, not average of 30 day results.
[i] Secondary chronic or chronic value, not 30 day mean.
[j] Guideline not applicable for site situation.
[k] Based on a change from background at any one time. Preliminary range (Minnow, 2014) 0.54-2.73 NTU and <3-9.5 mg/L TSS.

TABLE 3b: Summary of Analytical Results for Mount Polley, Polley Lake - Blanks DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Dissolved Aluminum (µg/L)	Dissolved Calcium (mg/L)	Dissolved Iron (µg/L)	Dissolved Magnesium (mg/L)	Dissolved Manganese (µg/L)	Dissolved Potassium (mg/L)	Dissolved Sodium (mg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Lead (µg/L)	Lithium (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Silver (µg/L)	Thallium (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
			Dissolved Metals																											
BC Standards																														
BCWQG Aquatic Life (AW)[b,c]			100[d]	n/a	350	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Aquatic Life (30day) (AW)[b,c]			50[d]	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
BCWQG Drinking Water (DW)			200	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Canadian Drinking Water Quality (DW)			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
POL-FIELD BLANK	[illegible]	2014 08 20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TRIP BLANK	TRIP BLANK	2014 08 13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

All terms defined within the body of SNC-Lavalin's report (available upon request).

< Denotes concentration less than indicated detection limit or RPD less than indicated value.

- Denotes analysis not conducted.

n/a Denotes no applicable standard.

* RPDs are not normally calculated where one or more concentrations are less than five times MDL.

SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.

BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.

SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.

BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.

Concentration greater than 5xDL

[a] Laboratory detection limit out of range.

[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.

[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.

[d] Guideline varies with pH, and or Temperature or Hardness.

[e] Health Canada Drinking Water Guidelines, 2012.

[f] Guideline for Nitrate applied.

[g] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of summer samples and is not applicable to single sample results at this point in time.

[h] Calculated based on an individual sample basis, not average of 30 day results.

[i] Secondary chronic or chronic value, not 30 day mean.

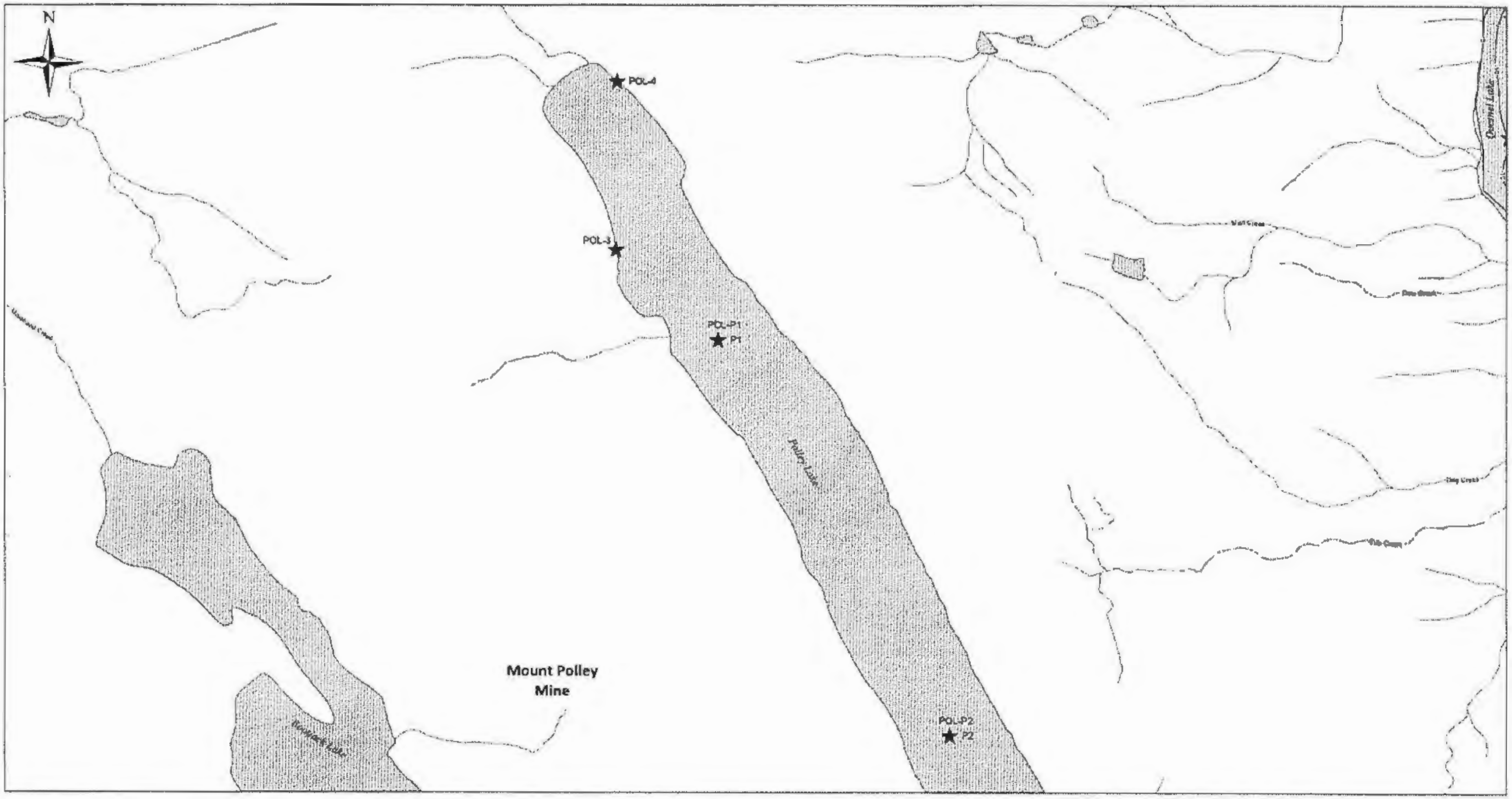
[j] Guideline not applicable for site situation.

[k] Based on a change from background at any one time. Prebreach range (Minnow, 2014) 0.54-2.73 NTU and <3-5.5 mg/L TSS.

TABLE 3b: Summary of Analytical Results for Mount Polley, Polley Lake - Blanks DRAFT

Sample Location	Sample ID	Sample Date (yyyy mm dd)	Total Metals Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Bismuth (µg/L)	Boron (µg/L)	Cadmium (µg/L)	Calcium (µg/L)	Chromium (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Lithium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Molybdenum (µg/L)	Nickel (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Tin (µg/L)	Titanium (µg/L)	Uranium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)
BC Standards																															
BCWQG Aquatic Life (AW)[b,c]			n/a	20	5	5,000	n/a	n/a	1,200	0.0285-0.0351[d]	n/a	1 (Cr(+6))	110	0.9-12.1[d]	1,000	65.3-80[d]	870	1465-1710[d]	Methyl mercury analysis in progress	2,000	25-65[d]	373,000-432,000	2	0.1-3.0[d]	n/a	0.3	n/a	2,000	300	6	33-45.6[d]
BCWQG Aquatic Life (30day) (AW)[b,c]			n/a	n/a	n/a	1,000	5.3	n/a	n/a	n/a	n/a	n/a	4	3.4-4.3[d]	n/a	5.9-6.8[d]	14	974-1076[d]		1,000	n/a	n/a	n/a	0.05-1.5[d]	n/a	n/a	n/a	n/a	n/a	n/a	7.5-20.3[d]
BCWQG Drinking Water (DW)			n/a	14	25	n/a	4	n/a	5,000	n/a	n/a	n/a	n/a	500	n/a	50	n/a	n/a	1	250	n/a	n/a	10	n/a	n/a	2	n/a	n/a	n/a	n/a	5,000
Canadian Drinking Water Quality (DW)			100	6	10	1,000	n/a	n/a	5,000	5	n/a	50	n/a	1,000	300	10	n/a	50	1	n/a	n/a	n/a	10	n/a	200,000	n/a	n/a	n/a	20	n/a	5,000
POL-FIELD BLANK	[illegible]	2014 08 20	< 3	< 0.1	< 0.1	< 0.05	< 0.1	< 0.5	< 10	< 0.01[e]	< 50	< 0.5	< 0.1	< 0.5	< 30	< 0.05	< 0.5	< 0.05	-	< 0.05	< 0.5	< 50	< 0.5	< 0.01	< 50	< 0.01	< 0.1	< 10	< 0.01	< 1	< 3
TRIP BLANK	TRIP BLANK	2014 08 13	< 3	< 0.1	< 0.1	< 0.05	< 0.1	< 0.5	< 10	< 0.01[e]	< 50	< 0.5	< 0.1	< 0.5	< 30	< 0.05	< 0.5	< 0.05	< 0.05	< 0.05	< 0.5	< 50	< 0.5	< 0.01	< 50	< 0.01	< 0.1	< 10	< 0.01	< 1	< 3

All terms defined within the body of SNC-Lavalin's report (available upon request).
< Denotes concentration less than indicated detection limit or RPD less than indicated value.
- Denotes analysis not conducted.
n/a Denotes no applicable standard.
* RPDs are not normally calculated where one or more concentrations are less than five times MDL.
SHADED Concentration greater than BCWQG Aquatic Life (AW) guideline.
BOLD Concentration greater than BCWQG Drinking Water (DW) guideline.
SHADED Concentration greater than BCWQG Aquatic Life (30day) (AW) guideline.
BOLD Concentration greater than or equal to Canadian Drinking Water Quality (DW) guideline.
Concentration greater than SeDL.
[a] Laboratory detection limit out of range.
[b] British Columbia Approved Water Quality Guidelines 2006 Edition, updated 2014.
[c] A Compendium of Working Water Quality Guidelines for British Columbia, updated August 2006.
[d] Guideline varies with pH, and or Temperature or Hardness.
[e] Health Canada Drinking Water Guidelines, 2012.
[f] Guideline for Nitrate applied.
[g] The total phosphorus guideline is a measure of lake productivity and is based on spring overturn or an average of seasonal samples and is not applicable to single sample results at this point in time.
[h] Calculated based on an individual sample basis, not average of 30 day results.
[i] Secondary chronic or chronic value, not 30 day mean.
[j] Guideline not applicable for site situation.
[k] Based on a change from background at any one time. Prior each range (Minnow, 2014) 0.54-3.73 NTU and <3-6.5 mg/L TSS

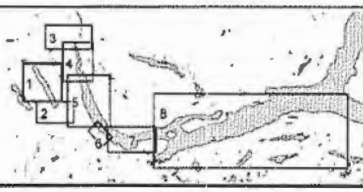


LEGEND

New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

- ☆ Hazeltine Creek (0)
- ★ Polley Lake (6)
- ☆ Quesnel Lake (2)



NOTES

1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort the scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

0 125 250 500 750 1,000 Meters

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data.Gov.BC.ca Data Distribution Service
3. Orthophoto collected by McElhanney on August 5th, 2014

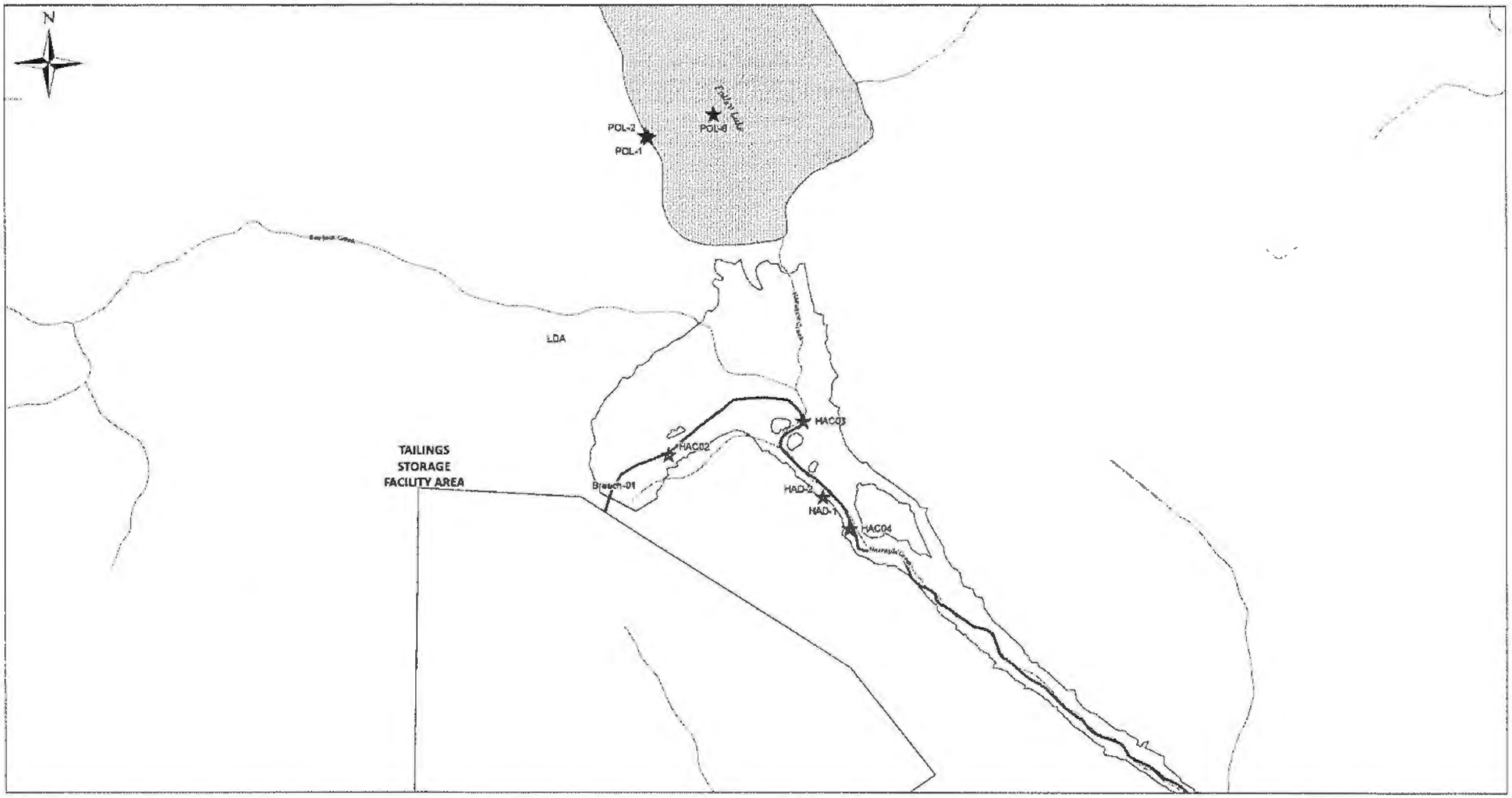
SNC·LAVALIN Environment

CLIENT NAME MPMC	PROJECT LOCATION Mount Polley Mine British Columbia

Figure 5: Current Monitoring Locations
Page 1 of 8

BY CJW	SCALE 1:24,500	DATE 2014/08/12	REF No. REV 0
CHK'D GJ	PROJ/COORD SYS NAD 1983 UTM Zone 10N		621717-005-P1

Project Path: P:\Current Projects\Mount Polley\621717\



LEGEND

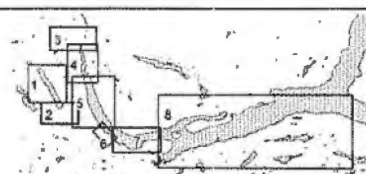
—— New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

☆ Hazeltine Creek (5)

★ Polley Lake (3)

☆ Quesnel Lake (0)



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REFERENCES

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data.Gov.BC.ca Data Distribution Service.
3. Orthophoto collected by McElhanney on August 5th, 2014

SNC·LAVALIN Environment

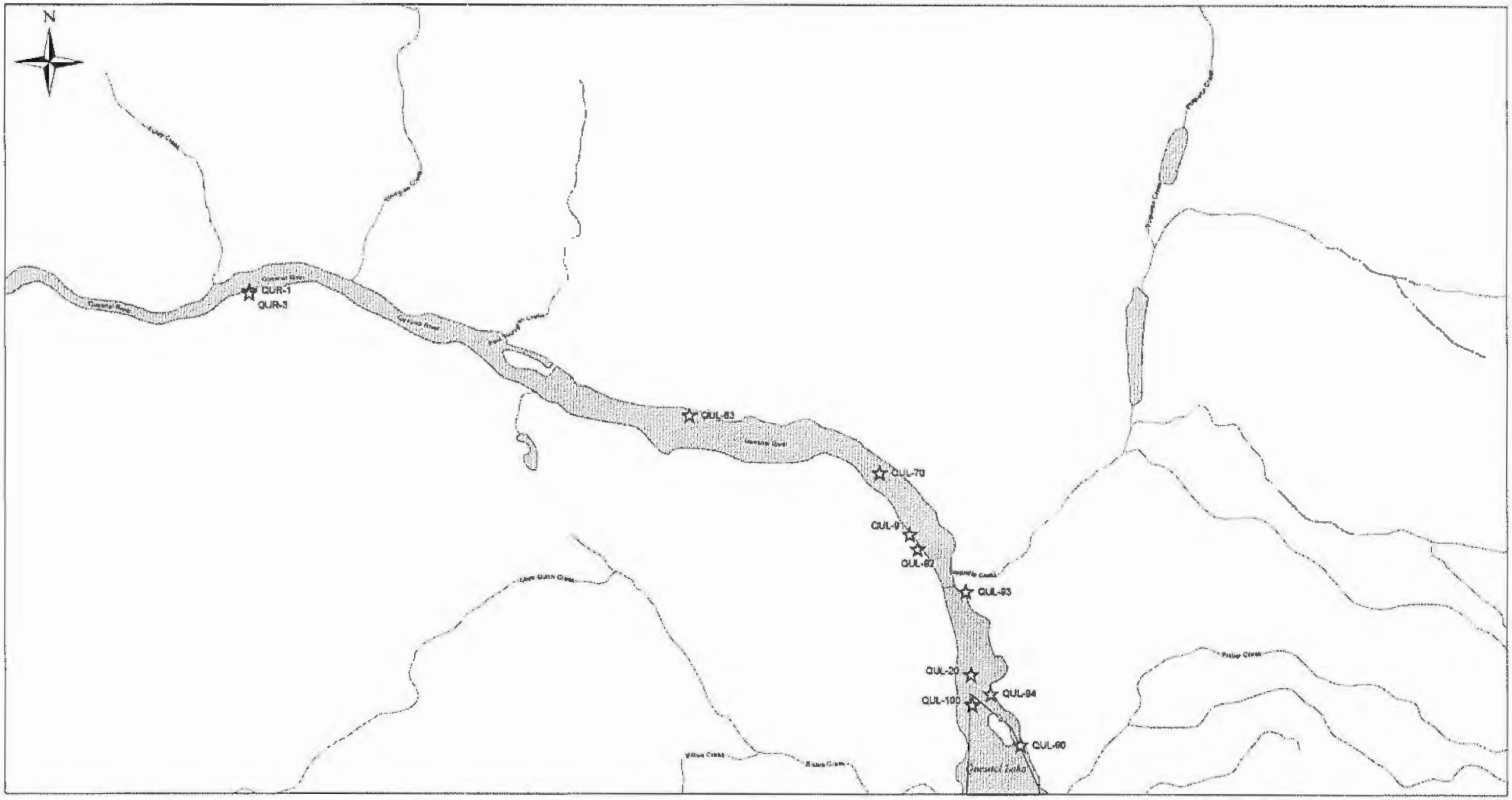
CLIENT NAME: MPMC

PROJECT LOCATION: Mount Polley Mine, British Columbia

Figure 5: Current Monitoring Locations
Page 2 of 8

BY: CJW	SCALE: 1:14,000	DATE: 2014/09/12	REF No. REV. 0
CHK'D: GJ	PROJ COORD SYS: NAD 1983 UTM Zone 10N		621717-005-P2

Project Path: P:\Current Projects\Mount Polley\621717\



LEGEND

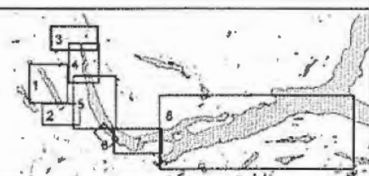
—— New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

☆ Hazeltine Creek (0)

★ Polley Lake (0)

☆ Quesnel Lake (11)



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2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data.Gov.BC.ca Data Distribution Service.
3. Orthophoto collected by McElhanney on August 5th, 2014

SNC·LAVALIN Environment

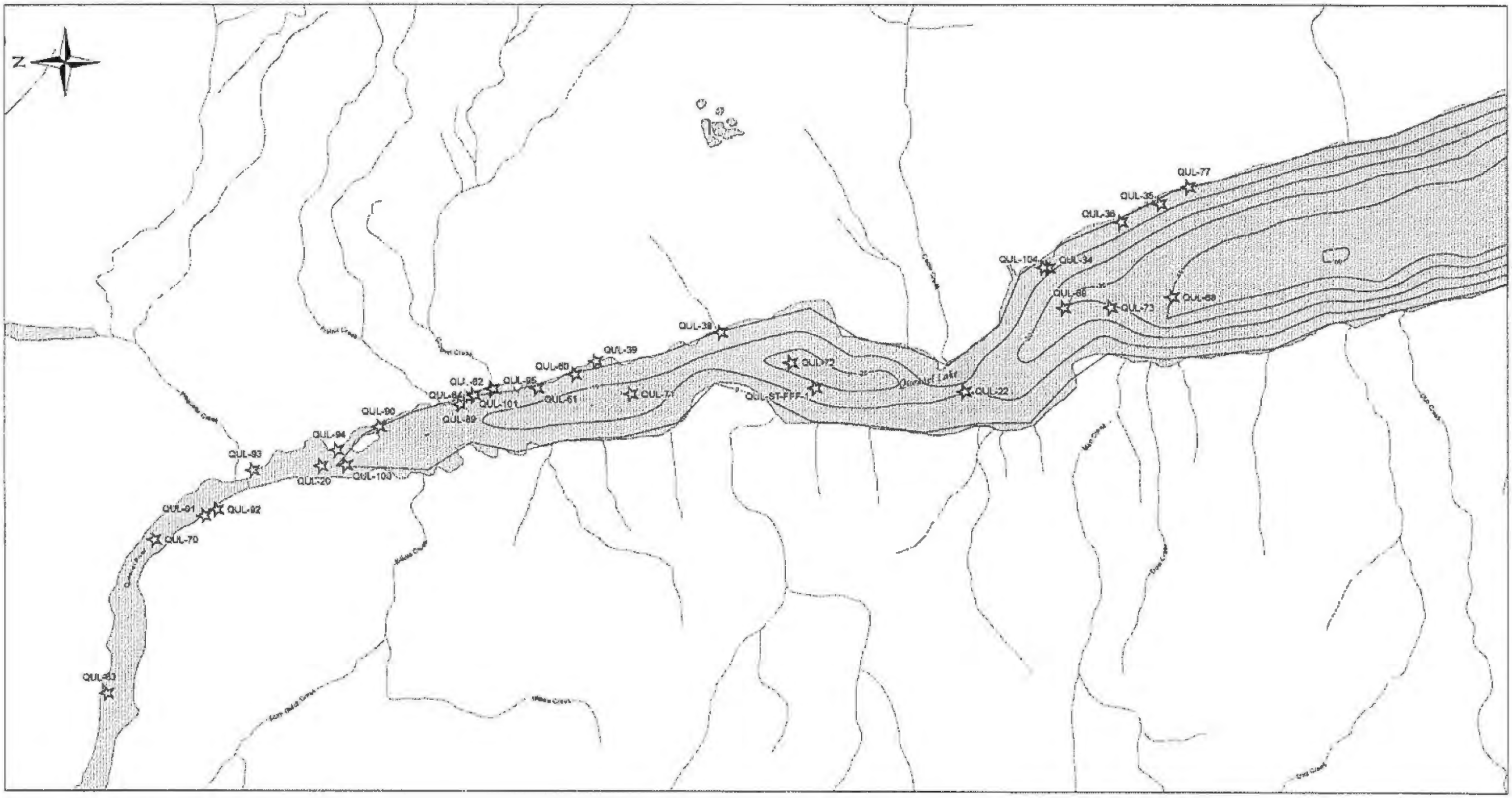
CLIENT NAME: MPMC

PROJECT LOCATION: Mount Polley Mine, British Columbia

Figure 5: Current Monitoring Locations
Page 3 of 8

BY: CJW	SCALE: 1:16,200	DATE: 2014/08/12	REF No. REV. D
CHKD: GJ	PROJ/COORD SYS: NAD 1983 UTM Zone 10N		621717-005-P3

Project Path: P:\Current Projects\Mount Polley\621717\

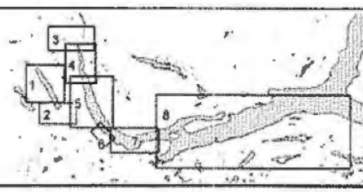


LEGEND

—— New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

- Hazeltine Creek (0)
- Polley Lake (0)
- Quesnel Lake (30)



NOTES

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3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data Gov.BC.ca Data Distribution Service.
3. Orthophoto collected by McElhanney on August 5th, 2014

SNC·LAVALIN Environment

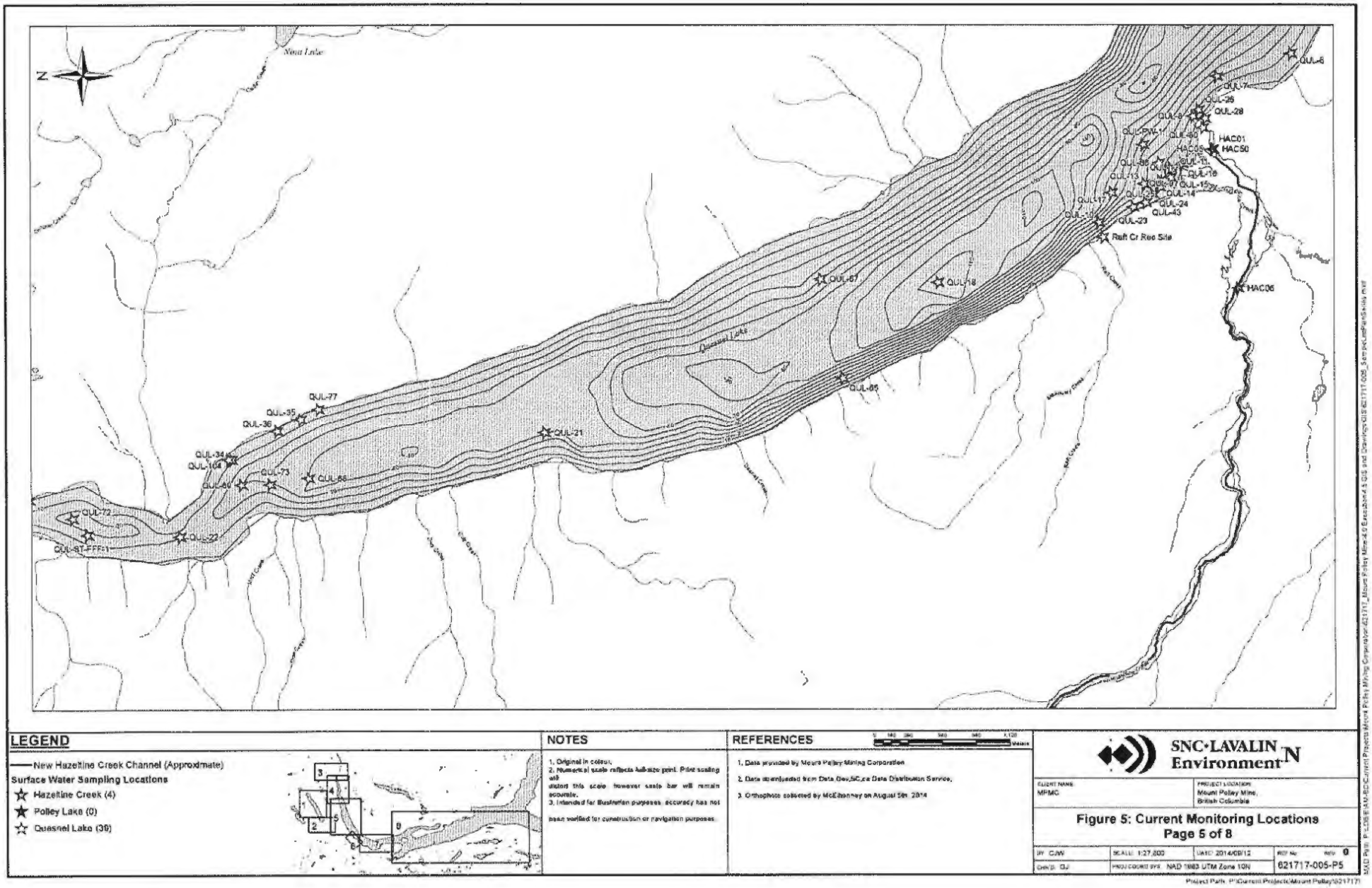
CLIENT NAME: MPMC

PROJECT LOCATION: Mount Polley Mine, British Columbia

Figure 5: Current Monitoring Locations
Page 4 of 8

BY: CJW	SCALE: 1:10,000	DATE: 2014/09/12	REF No: REV: 0
CHK'D: GJ	PROJ COORD SYS: NAD 1983 UTM Zone 10N		621717-005-P4

Project Path: P:\Current Projects\Mount Polley\621717\



LEGEND

New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

- Hazeltine Creek (4)
- Polley Lake (0)
- Quesnel Lake (30)

NOTES

1. Original in colour.
2. Numerical scale reflects A4-size print. Print scaling will distort this scale however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data.BC.ca Data Distribution Service.
3. Orthophoto collected by McElhanney on August 5th, 2014

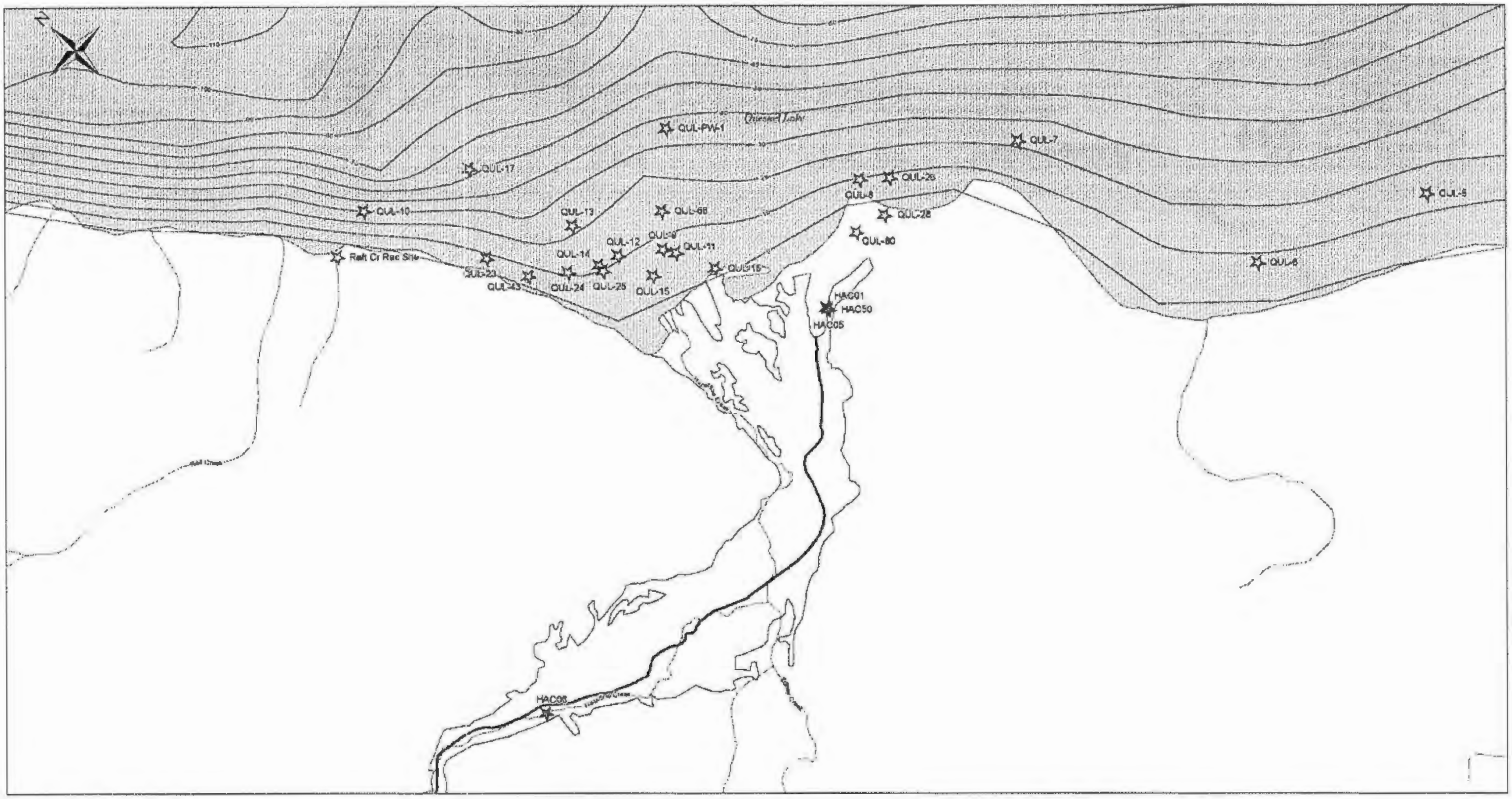
SNC·LAVALIN Environment

CLIENT NAME	PROJECT LOCATION
MPMC	Mount Polley Mine, British Columbia

Figure 5: Current Monitoring Locations
Page 5 of 8

BY: CJW	SCALE: 1:27,000	DATE: 2014/09/12	REF No: 621717-005-P5	REV: 0
CHK'D: GJ	PROJECTION SYS: NAD 1983 UTM Zone 10N			

Project Path: P:\Current Projects\Mount Polley\621717\

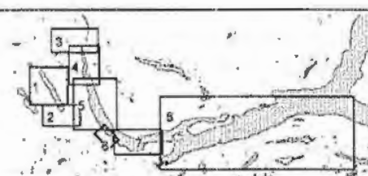


LEGEND

New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

- Hazeltine Creek (4)
- Polley Lake (0)
- Quesnel Lake (24)



NOTES

1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

0 40 80 160 240 320 Meters

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data DataBC's Data Distribution Service
3. Orthophoto collected by McElhanney on August 5th, 2014

SNC•LAVALIN Environment

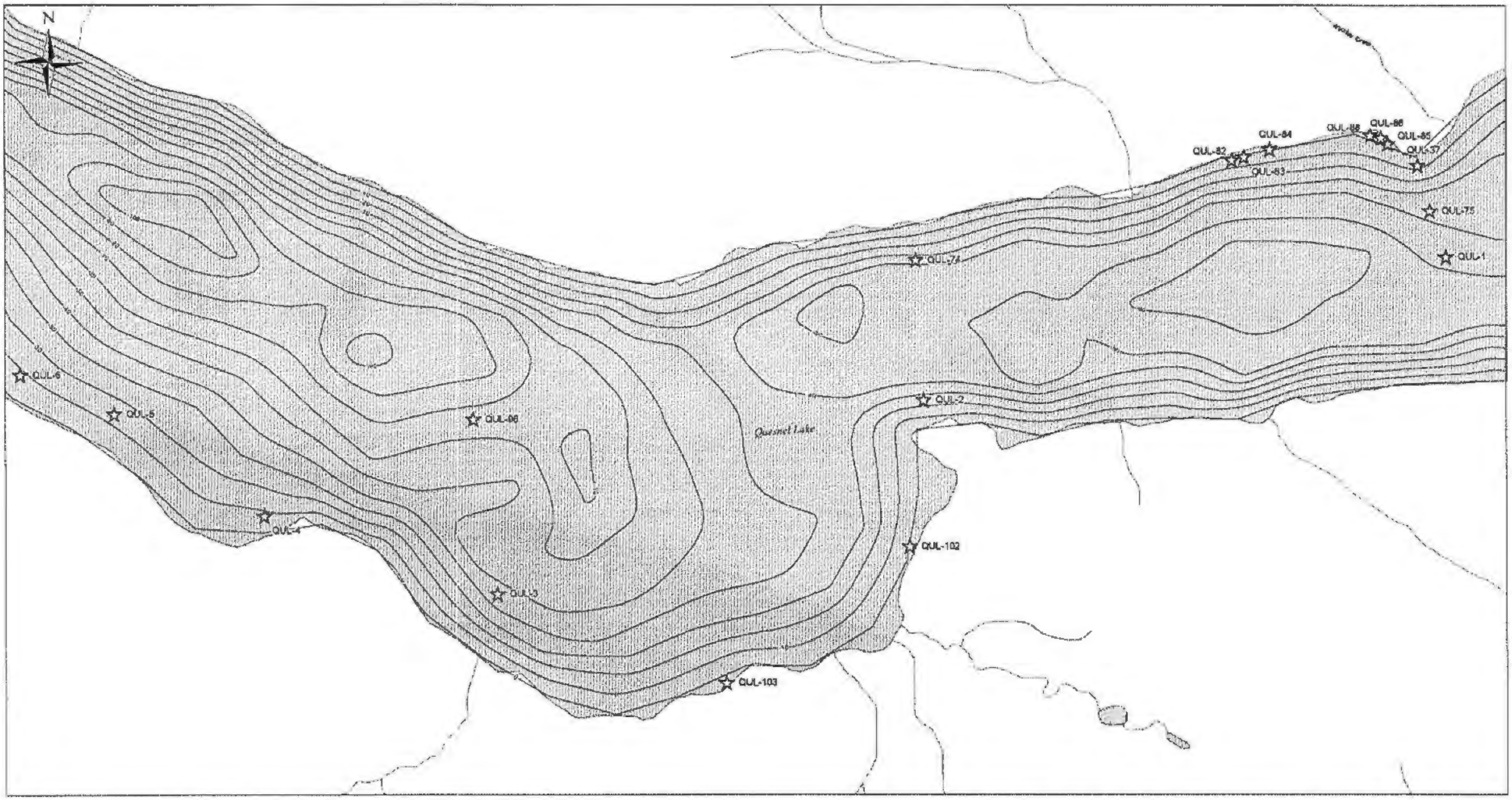
CLIENT NAME: MPMC

PROJECT LOCATION: Mount Polley Mine, British Columbia

Figure 5: Current Monitoring Locations
Page 6 of 8

BY: CJW	SCALE: 1:9,200	DATE: 2014/08/12	REF №: REV 0
CHKD: GJ	PROJ COORD SYS: NAD 1983 UTM Zone 10N		621717-005-P6

Project Path: P:\Current Projects\Mount Polley\621717\

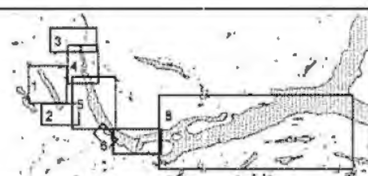


LEGEND

—— New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

- ☆ Hazeltine Creek (0)
- ★ Polley Lake (0)
- ☆ Quesnel Lake (18)



NOTES

1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort this scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

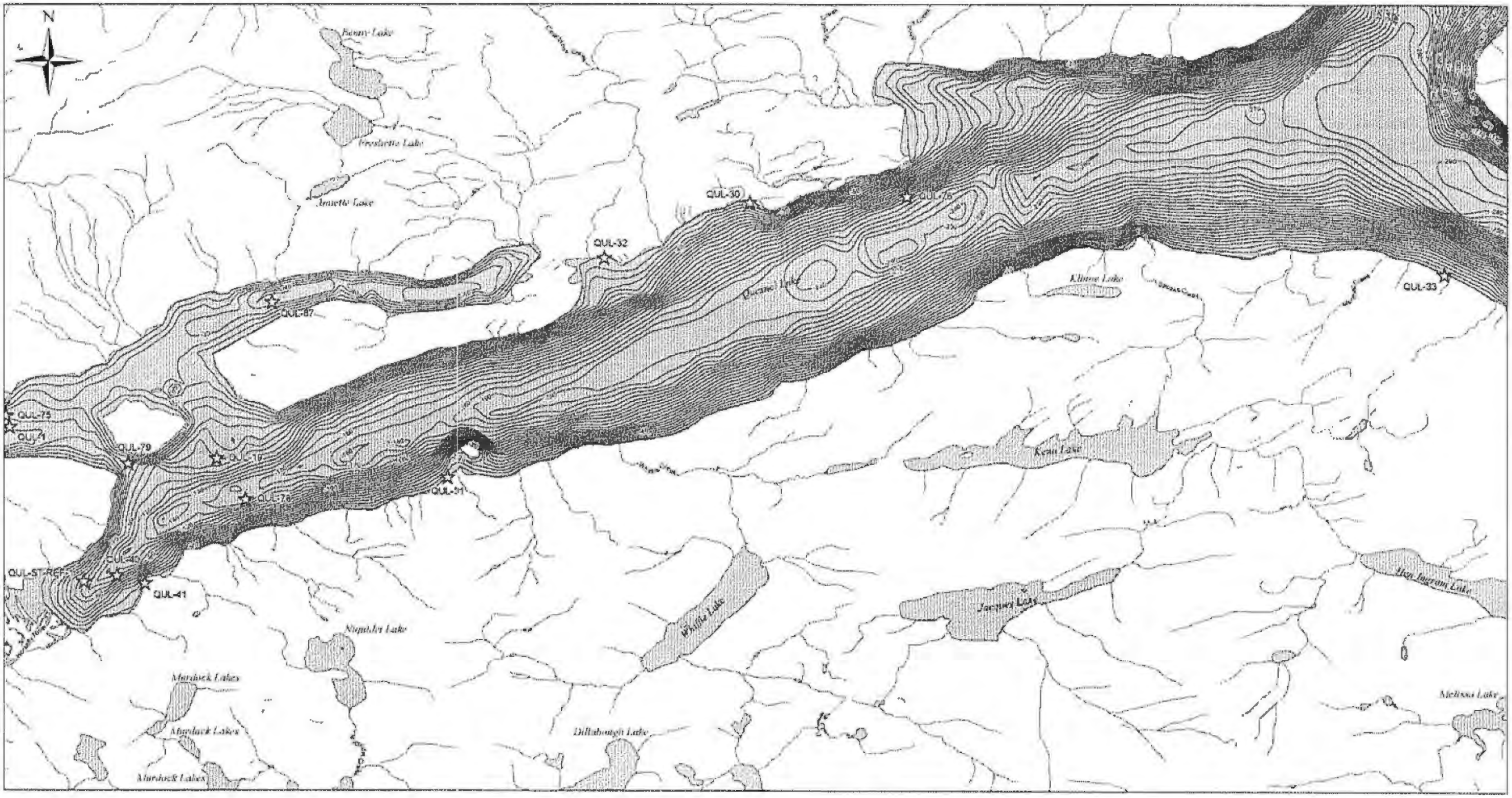
0 85 170 340 510 680 Meters

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data.Gov.BC.ca Data Distribution Service,
3. Orthophoto collected by McElhanney on August 5th, 2014

SNC·LAVALIN Environment

CLIENT NAME: MPMC	PROJECT LOCATION: Mount Polley Mine, British Columbia		
Figure 5: Current Monitoring Locations Page 7 of 8			
BY: CJW	SCALE: 1:10,000	DATE: 2014/09/12	REF No. REV. 0
CHK'D: DJ	PROJ COORD SYS: NAD 1983 UTM Zone 10N		821717-005-P7

Project Path: P:\Current Projects\Mount Polley\821717\

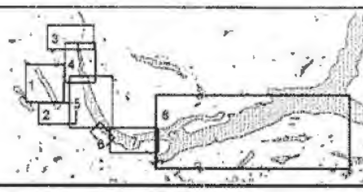


LEGEND

New Hazeltine Creek Channel (Approximate)

Surface Water Sampling Locations

- Hazeltine Creek (0)
- Polley Lake (0)
- Quesnel Lake (15)



NOTES

1. Original in colour.
2. Numerical scale reflects full-size print. Print scaling will distort the scale, however scale bar will remain accurate.
3. Intended for illustration purposes, accuracy has not been verified for construction or navigation purposes.

REFERENCES

0 340 680 1,360 2,040 2,720 Meters

1. Data provided by Mount Polley Mining Corporation
2. Data downloaded from Data Gov.BC via Data Distribution Service.
3. Orthophoto collected by McElhanney on August 5th 2014

SNC·LAVALIN Environment

CLIENT NAME: MPMC

PROJECT LOCATION: Mount Polley Mine, British Columbia

Figure 5: Current Monitoring Locations
Page 8 of 8

BY: CJW	SCALE: 1:66,500	DATE: 2014/09/12	REF No. REV. 0
CHK'D: GJ	PROJ/COORD SYS: NAD 1983 UTM Zone 10N		621717-005-P8

Project Path: P:\Current Projects\Mount Polley\621717\

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Monday, September 15, 2014 11:56 AM
To: Bunce, Hubert ENV:EX
Subject: RE: garbage that last email.

okay

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Monday, September 15, 2014 11:52 AM
To: Weir, David J FLNR:EX
Subject: garbage that last email.

You will get the formal version later today. thanks

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

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2080A Labieux Road
Nanaimo BC V9T 6J9

Weir, David J FLNR:EX

From: Sabur, Muhammed A FLNR:EX
Sent: Monday, September 15, 2014 11:01 AM
To: Weir, David J FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dave:

I am available.

Regards,
M. Sabur

From: Weir, David J FLNR:EX
Sent: Monday, September 15, 2014 10:44 AM
To: Hoffos, Robin FLNR:EX; Sabur, Muhammed A FLNR:EX; Moe, James W FLNR:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

I apologise for the short notice on this but would you be able to help me take a look at this plan this afternoon? We really don't have much input into this plan but I want to have a good look at it from the operational side as we have already made some significant contributions at that level in their operations and we may have valuable local knowledge to contribute here also.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Friday, September 12, 2014 5:06 PM
To: Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Douglas (Mobile) Watt'; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

In the email below you will find a link to Erosion and Sediment control plan developed by SNC for MPMC. If you can review this document and get your comments back to me as soon as possible that would be appreciated, but by Sept 17 at the latest, as we are keen to get information back to the company so that those acceptable works can be implemented

this information is provided in confidence and is for your consideration only and not for distribution at this time.

I look forward to your comments

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

On behalf of Mount Polley Mining Corporation, I am pleased to submit to you an erosion and sediment control plan for lower Hazeltine Creek, prepared by SNC Lavalin.

This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

To access the file, it can be downloaded from the link below. Please note that this link will work for anyone to whom you forward this email. I have done it that way to facilitate your distribution. However, please be sure that you have confidence that parties receiving this email from you will not forward past the intended audience if access security is to be maintained.

Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | **T:** +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com |
www.golder.com

Work Safe, Home Safe

Weir, David J FLNR:EX

From: Sabur, Muhammed A FLNR:EX
Sent: Monday, September 15, 2014 11:01 AM
To: Weir, David J FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dave:

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M. Sabur

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To: Hoffos, Robin FLNR:EX; Sabur, Muhammed A FLNR:EX; Moe, James W FLNR:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

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Cell 250 267-5925

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To: Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Douglas (Mobile) Watt'; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

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I look forward to your comments

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
Please consider the environment before printing this email
BC Pollution Free

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
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Lee Nikl

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Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | **T:** +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com | **www.golder.com**

Work Safe, Home Safe

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Monday, September 15, 2014 8:32 AM
To: Vanderburgh, Ken FLNR:EX
Subject: FW: Mt Polley permit

FYI

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Friday, September 12, 2014 1:05 PM
To: Forgeng, Eric E FLNR:EX; 'Remi Farvacque'; 'Wendy Slavica'
Cc: Metcalfe, Shelley ENV:EX; Fenwick, Leigh-Ann ENV:EX; Weir, David J FLNR:EX
Subject: RE: Mt Polley permit

Lightning speed, Thanks Eric

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Forgeng, Eric E FLNR:EX
Sent: Friday, September 12, 2014 12:00 PM
To: 'Remi Farvacque'; 'Wendy Slavica'
Cc: Bunce, Hubert ENV:EX; Metcalfe, Shelley ENV:EX; Fenwick, Leigh-Ann ENV:EX; Weir, David J FLNR:EX
Subject: RE: Mt Polley permit

Hello everyone,

The Mt Polley HCA Section 14 permit has been issued as **2014-0264**, documentation is being forwarded right now. You're clear to proceed whenever you're ready.

Please let me know if you have any questions

Best,

Eric Forgeng, MA | Archaeologist / Heritage Resource Specialist
Archaeology Branch | Ministry of Forests, Lands and Natural Resource Operations
Phone: 250-953-3362 | Fax: 250-953-3340 |e-mail: eric.forgeng@gov.bc.ca
Unit 3 - 1250 Quadra Street, Victoria BC V8W 2K7 | PO Box 9816 Stn Prov Govt, Victoria, BC V8W 9W3

Visit our website at: **http://www.for.gov.bc.ca/archaeology/index.htm**

From: Bunce, Hubert ENV:EX
Sent: Friday, September 12, 2014 09:33
To: Forgeng, Eric E FLNR:EX
Cc: Metcalfe, Shelley ENV:EX; Fenwick, Leigh-Ann FLNR:EX
Subject: RE: Mt Polley permit

Thanks for keeping me in the loop

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Forgeng, Eric E FLNR:EX
Sent: Friday, September 12, 2014 8:32 AM
To: Bunce, Hubert ENV:EX
Subject: RE: Mt Polley permit

Application is in hand, I'll keep you posted.

Best,
Eric

Eric Forgeng, MA | Archaeologist / Heritage Resource Specialist
Archaeology Branch | Ministry of Forests, Lands and Natural Resource Operations
Phone: 250-953-3362 | Fax: 250-953-3340 |e-mail: eric.forgeng@gov.bc.ca
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From: Bunce, Hubert ENV:EX
Sent: Thursday, September 11, 2014 16:34
To: Forgeng, Eric E FLNR:EX
Cc: Weir, David J FLNR:EX; Glaum, Doug FLNR:EX; 'Adam.kantakis@williamslakeband.ca'; Fenwick, Leigh-Ann FLNR:EX; 'Nikl, Lee'; Batten, Justine FLNR:EX
Subject: RE: Mt Polley permit

Hi Eric, thanks for taking this on

Whatever can be done to speed up this application process would be appreciated. Mount Polley Mine Corporation has received letters of agreement from the Williams Lake and Soda Creek Indian bands thus negating the consultation period for these bands as I understand it. The province, the mine, and the community are keen to see activity move forward on actions to protect against further degradation of the environment

The province has signed a Letter of Understanding with the WLIB and SCIB (attached) to work at a govt to govt level and
s.16

s.16

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
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2080A Labieux Road
Nanaimo BC V9T 6J9

From: Weir, David J FLNR:EX
Sent: Thursday, September 11, 2014 12:48 PM
To: Bunce, Hubert ENV:EX
Subject: FW: Mt Polley permit

FYI.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Glaum, Doug FLNR:EX
Sent: Thursday, September 11, 2014 12:20 PM
To: Weir, David J FLNR:EX; 'Adam.kantakis@williamslakeband.ca'; Forgeng, Eric E FLNR:EX
Cc: Fenwick, Leigh-Ann FLNR:EX
Subject: RE: Mt Polley permit

I've assigned Eric Forgeng to oversee this permit application. He will be your contact.

Doug Glaum
Archaeology Branch
Ministry of Forests, Lands and Natural Resource Operations
1250 Quadra
(250) 953-3357
Visit our website

From: Weir, David J FLNR:EX
Sent: Thursday, September 11, 2014 11:51 AM
To: 'Adam.kantakis@williamslakeband.ca'
Cc: Glaum, Doug FLNR:EX; Fenwick, Leigh-Ann FLNR:EX
Subject: Mt Polley permit

I understand that the permit has not been applied for yet? Please submit the application immediately. If you are worried about its completness please call Doug and I believe he will help you out.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Monday, September 15, 2014 2:46 PM
To: Bunce, Hubert ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Hi Hubert,

I have had time to look these over quickly. I have the following comments, questions, and concerns:

1: A flow of 2.5m3 per second was recorded in Hazeltine creek in 1997; I suspect this year's peak flow exceeded this number.
s.13

I have no concerns with the concept proposed for the sediment control works but ask that the design be beefed up a little. If this will be moving to a habitat restoration project I would like to know when it would be appropriate for our habitat section to be engaged? Also, they mention working with MOF on access issues but it is not clear what is being done in this regard. The new channel is unlikely to allow for putting the old crossing structures back in their original places and may require road relocations and crossings closer to the new stream channel apex.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: *Bunce, Hubert ENV:EX*
Sent: Friday, September 12, 2014 5:06 PM
To: Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Douglas (Mobile) Watt'; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; *'kirk.dressler@williamslakeband.ca'*
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

In the email below you will find a link to Erosion and Sediment control plan developed by SNC for MPMC. If you can review this document and get your comments back to me as soon as possible that would be appreciated, but by Sept 17 at the latest, as we are keen to get information back to the company so that those acceptable works can be *implemented*

this information is provided in confidence and is for your consideration only and not for distribution at this time.

I look forward to your comments

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

On behalf of Mount Polley Mining Corporation, I am pleased to submit to you an erosion and sediment control plan for lower Hazeltine Creek, prepared by SNC Lavalin.

This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

To access the file, it can be downloaded from the link below. Please note that this link will work for anyone to whom you forward this email. I have done it that way to facilitate your distribution. However, please be sure that you have confidence that parties receiving this email from you will not forward past the intended audience if access security is to be maintained.

Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | **T:** +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com | **www.golder.com**

Work Safe, Home Safe

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Monday, September 15, 2014 2:54 PM
To: 'Jack Love'
Cc: 'Dale Reimer'; Hoffman, Al MEM:EX; 'Colleen Hughes'; 'Amy Crook'; 'Aaron.Higginbottom@williamslakeband.ca'; 'kirk.dressler@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; Weir, David J FLNR:EX
Subject: CEIA response for your review

2014-09-12 MOE feedback on MP...

here is the ministry review relative to the MPMC CEIA submitted Aug 29

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

BRITISH COLUMBIA

September 15, 2014 File: Order 107461

Via Email: JLove@imperialmetals.com

Mount Polley Mining Corporation
Suite 200 – 580 Hornby St
Vancouver BC V6C 3B6

Attention: Jack Love, Environmental Manager

Re: Review of Mount Polley Mining Corporation's Comprehensive Environmental Impact Assessment provided on August 29, 2014 under Order 107461

On August 29, 2014, the Ministry of Environment received Mount Polley Mining Corporation's *Mount Polley Comprehensive Environmental Impact Assessment Work Plan* (the Plan) which was prepared by SNC-Lavalin, dated August 29, 2014 and submitted under Pollution Abatement Order 107461.

The Plan was reviewed by many government staff with varying expertise and this letter is meant to provide Mount Polley Mining Corporation (MPMC) with feedback to assist with finalizing the Plan.

Additional comments from the Environmental Working Group, which includes the Soda Creek Indian Band and Williams Lake Indian Band, could be expected.

	Reviewers
Chapter 1	Kym Keogh, Impact Assessment Biologist, Ministry of Environment Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment
Chapter 2	Kym Keogh, Impact Assessment Biologist, Ministry of Environment Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment Scott Babakaiff, P.Geo., Fish Hyrdologist, Ministry of Forests, Lands and Natural Resource Operations
Chapter 3	Kym Keogh, Impact Assessment Biologist, Ministry of Environment Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment
Chapter 4	Remi Odense, Risk Assessment Officer, Ministry of Environment Peter Kickham, Risk Assessment Officer, Ministry of Environment Stephen Dankevy, Senior Contaminated Sites Officer, Ministry of Environment

Ministry of Environment Mining Operations Section
Environmental Protection Division
Mailing Address:
200 - 10470 152nd Street
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Facsimile: 604 584-9751
Website: www.gov.bc.ca/env

Chapter 5	Kym Keogh, Impact Assessment Biologist, Ministry of Environment Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment Remi Odense, Risk Assessment Officer, Ministry of Environment Peter Kickham, Risk Assessment Officer, Ministry of Environment Stephen Dankevy, Senior Contaminated Sites Officer, Ministry of Environment
Chapter 6	Joanne McLeod, Habitat Biologist, Ministry of Forests, Lands and Natural Resource Operations
Chapter 7	Kym Keogh, Impact Assessment Biologist, Ministry of Environment Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment Lee Williston, Fish Biologist, Ministry of Forests, Lands and Natural Resource Operations
Chapter 8	Jennifer Puhallo, R.P.Bio, Impact Assessment Biologist, Ministry of Environment Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment
Chapter 9	Gabriele Matscha, R.P.Bio, Impact Assessment Section Head – Mining, Ministry of Environment Deb Epps, R.P.Bio, Section Head, Provincial Water Quality, Ministry of Environment

Chapter I: Cultural and Heritage Impact Assessment

- The Forest Lands and Natural Resource Operation's (FLNRO) planning database has a number of archaeological site locations with GPS information that may not be in the database with the Archaeology Branch. These sites would consist of old mining structures such as ditches.
- There is nothing in this section that addresses what the process would be for any known archaeological sites that were impacted by the tailings storage facility (TSF) breach.

Chapter II: Hydrology Impact Assessment

- This chapter focuses solely on the Hazeltine Creek channel.

s.13

- It seems the information is largely collected to determine best stream channel options.

s.13

- Will there be any work to determine the porosity/permeability of the original creek bed and similarly of the current creek bed?
- Has there been any information collected on the groundwater contribution to Hazeltine Creek? If so, is it considered in the current hydrological evaluations?

The following review of the Work Plan includes the hydrologist's interpretation of onsite conditions viewed on August 16-17 2014, and represents his opinion provided to Statutory Decision Makers within the Ministry of Environment. It should not be interpreted as professional advice given to MPMC, nor as guidance that the independent professionals working on behalf of MPMC are obligated to follow.

The Work Plan makes reference to a Comprehensive EIA & Action Plan (dated August 15 2014), and a subsequent Ministry of Environment (MoE) response (dated August 21 2014). I provided review comments (dated August 17 2014) to MoE staff on the Comprehensive EIA & Action Plan, but I have not been provided a copy of the actual (August 21 2014) MoE response to the proponent. As such, I am not certain if any (or all) of my review comments were provided to the proponent & their consultants, but several of my August 17 2014 review comments do not seem to have been addressed in the Work Plan, and they are reiterated herein.

I have four general comments regarding the Work Plan:

1. Formatting adopted in the Work Plan does not allow for efficient reference & review. For instance, Tables in the various sections are not numbered, and the coding for Work Plan sections & pages (roman numerals, dashes & points, numerals) is awkward. For future reporting, the Work Plan authors should adopt more straightforward formatting style (e.g. standards used by the BC Environmental Assessment Office for Applications, or standards used in graduate theses submitted for University Library archiving).

2. Section II-3 of the Work Plan commits to generate three reports by the Hydrological Impact Assessment:

    1. "*A description of the Hazeltine channel prior to and following the breach, the location & description of the tailings, results of hydraulic modelling, and erosion & sedimentation of the tailings*";
    2. "*A description of the hydrology of Hazeltine Creek*";
    3. "*A design report describing the rehabilitation of the channel, supported by engineered drawings & technical specifications*".

    These three reports seem to correspond to three respective sections tabulated on p.II-3 and p.II-4: "Channel Assessment", "Hydrological Assessment" and "Channel Design & Construction". The three reports are logically sequenced, and the Tasks described on p.II-3 and p.II-4 are generally appropriate,

s.13

s.13

3. The eleven Tasks in the three sections tabulated on p.II-3 and p.II-4 (ie. six (H-CA-1 to 6) for the Channel Assessment; two (H-HA-1 to 2) for the Hydrological Assessment; three (T-CD-1 to 3)for the Channel Design & Construction) are logical & well-organized,

s.13

s.13

s.13

- I understand and agree with the desire to use historic information to assess the recent evolution of channel form (and to interpret channel process),

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s.13

- Details regarding the Hydrometric Gauges and Sediment Discharge (Task T-HA-2, which should presumably be named **H**-HA-2, not T-HA-2) are absent:
    i. Why is this monitoring being completed? Are there thresholds (e.g. discharge exceeding **x** m^3/s from tailings pond or turbidity exceeding **x** NTU in Lower Hazeltine Creek) linked to action items?
    ii. Where (ie. gauge locations) and how (ie. continuous data collection or spot measurements)?

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s.13
4.

Chapter III: Water Quality Impact Assessment

- This chapter remains relatively general. s.13

- A table of sample sites (referenced to a site map) showing sampling frequency, and analysed parameters, sampling periods is included in Appendix II for the current sampling program.

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- s.13
- The scope of the water quality impact assessment includes the Quesnel River to immediately downstream of Likely.

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Chapter IV: Soil Quality Impact Assessment

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- A key initial requirement of contaminated site assessment is to identify all of the Potential Contaminants of Concern (PCOC), and this entails a review of the history, use and preliminary chemistry data from the site.

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CSR Technical Guidance Document 1 – Site Characterization and Confirmation Testing provides guidance on sampling and typical sample collection spacing for investigating contaminated sites in BC.

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CSR Technical Guidance Document 12 – Statistics for Contaminated Sites provides guidance on using statistics to characterize soils.

s.13

- Site specific soil conditions, such as pH and organic carbon content, can greatly modify the bioavailability and mobility of the substances and these soil characteristics are included in the sampling plan.

s.13

- There are a variety of leachate tests which can be done for soil to estimate the availability of contaminants and leachate tests are proposed in the work plan. The work plan does not provide the test methodology for proposed leachate testing, however for contaminated site screening level risk assessment, the Land Remediation Section has determined that (for soils with a pH greater than 5.5) the USEPA's synthetic precipitation leaching procedure (SPLP), Method 1312, should be used with a weak acid (Fluid #3, with a pH of 5). Another question is how variable is the tailings composition, i.e. is the initial breach material different from the later breach material farther down gradient?

s.13

- Determining background soil concentrations of contaminants of concern can be useful in determining applicable clean-up standards at sites especially in mineralized areas and this is proposed as part of the sampling for the 18 soil transects. It is not completely clear where the background soil samples will be collected,

s.13

Chapter V: Sediment Quality Impact Assessment

- During the Monitoring Meeting on September 2, a gap was identified for the deep areas out from Hazeltine Creek. According to the September 2 meeting minutes, MPMC was going to collect this info, likely through three transects out from Hazeltine at various depths. s.13

- Another item from the September 2 meeting were sediment cores. It was discussed that they may be done at a later date for deep sites. s.13

- s.13

- The sediment quality triad is a standard approach for assessing contaminated sediment and it is essential that the three components are sampled together so that correlations can be made between the chemistry, biological assessment and toxicity.
- The Sediment Quality Triad will provide a "snapshot" regarding the condition of sediments at the time of the investigation. There are a number of issues that may manifest over a longer term. For example:
    - What investigations are planned to determine the potential for bioaccumulation and biomagnifications to occur with contaminants of concern deposited in the aquatic environment?
    - What is the potential for mercury deposited in sediments to methylate, and at what point in the future could this issue manifest? Will this be evaluated by the sediment assessment?
    - What is anticipated in terms of geochemical changes over time in lake and stream sediments? Could changes in pH, Eh result in changes to the bioavailability of sediment contaminants of concern?
- s.13

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- Weight of evidence (WOE) is proposed for the assessment of multiple lines of evidence. s.13

s.13

Chapter VI: Terrestrial Impact Assessment

- VI-1 Purpose and Scope: The terrestrial areas also affected by the TSF breach include wetland habitat along Hazeltine Creek, the lower reaches of Bootjack Creek, the confluence of Edney and Hazeltine Creeks, and sections of upland forest ecosystems (including CCLUP designated Old Growth Management Areas) adjacent to Hazeltine Creek.
- s.13

- VI-2.3 Analysis and Assessment:

s.13

- VI-3 Reporting: From the Terrestrial Impact Assessment, a Reclamation Plan is proposed for the terrestrial habitat impacted by the TSF breach.

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- s.13

- Task ID T-DR-3: The TSF breach impacted legal land use objectives under the Cariboo Chilcotin Land Use Plan, areas designated as Critical Fish Habitat and Old Growth Management Areas (OGMA).

s.13

- Task ID AQ-FP-4b: This task recommends assessing the potential effect of the TSF breach on fish communities.

s.13

Chapter VII: Aquatic Impact Assessment

- CRA refers to commercial, recreational and aboriginal fisheries. These three uses often have different objectives and rely on different species.

s.13

- Quesnel River (which is downstream of Likely) has not been included in this section. As the TSF breach was located near the lake outlet and the lake current moves to the Quesnel River, the impacts will potentially affect the river biota.
- Pg. VII-2, 2nd bullet a) includes the estimate of the magnitude loss of spawning fish and associated habitat in Hazeltine Creek, West Arm of Quesnel Lake and Polley Lake.

s.13

- Pg. VII-2, 2nd bullet b) identifies fish bioaccumulation as one component to be covered.

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- Reporting: This chapter states that information will be collected for a year (for 4 quarters) to then be integrated into a comprehensive impact assessment. When will the CEIA be submitted?

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- AQ-FP-2c Correction - sentences are repeated. How will increased predation be determined?
- AQ-FP-2d How is rainbow trout movement going to be monitored?

- AQ-FP-4b What is defined as direct mortality? Would that have extended past the initial TSF breach? How would the cause of mortality be established? How will increased predation due to impaired avoidance response be determined? Will this rely on laboratory testing?

s.13

- AQ-FP-5bThe first part of the work described does not match the title of Identifying Shoreline and Shallow Benthic Values and appears to be habitat compensation.
- In general, the activities related to fish collection are vague.

s.13

- s.13
- s.13

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- There are ongoing conservation concerns for Quesnel Lake rainbow trout and bull trout.

s.13

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Chapter VIII: Environmental Risk Assessment

- The plan itself appears to be comprehensive and generally sufficient to deal with the current and potential future risks for use of the area.

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- s.13

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- Under Task RA-DR-2 the consultant indicates that they will be evaluating data for inclusion in the risk assessment against data quality objectives that will be presented in the data review and gap analysis report.

s.13

- s.13

- Pg. VIII 7, RA-PF-2: In the Standards column BCMWLAP approved and working water quality guidelines are identified. We agree that BCMWLAP water quality guidelines should be used for screening.
- It is expected that the risk assessment problem formulation will be provided to MoE once it is available.

Chapter IX: Current Monitoring Program

- Pg. IX-1: It is indicated that the parameters exceeding BC Water Quality Guidelines (BCWQGs) in the monitoring results would be identified as COPCs.

s.13

- Pg. IX-3, Chapter IX-4 indicates that permits were obtained to sample a number of residential and migratory sport fish. However they are not mentioned in the detailed plans. What are the plans to sample the sport fish (e.g. timelines, methods).
- Pg. IX-4, Chapter IX-5, item 8) indicates that shipping over weekends and holidays should be generally avoided.

s.13

- Aquatic toxicity is listed in the table A, pg IX-6 but what is the frequency of these tests. There was also discussion that aquatic toxicity tests were being conducted within the suspended solids plume as well. This is not discussed in report.
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Will sediment sample sites be added based on results of the plume delineation and plume movement?

- There is no medium and long term plan indicated.

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- MPMC agreed to install three continuous turbidity monitors in Quesnel Lake for overwinter at key locations, one to the east, one out from Hazeltine and one down towards Likely.

s.13

- MPMC agreed to fund zooplankton metals analysis for plankton collected by UNBC. And to fund metals analysis and histology for juvenile sockeye that DFO collect in Late Sept. s.13

Appendix II: Project Schedule:

- I notice that the sediment sampling implementation ends in October. Does this mean there is no more sampling later in the year? Is this due to bad weather/sampling conditions? What is the rationale?

s.13

Generally, the impression of the Plan is that it is still a relatively high level document and while the topics covered look reasonably complete, actual adequacy will depend on how the specific details are fleshed out.

s.13

s.13

Yours truly,

Hubert Bunce
A/ Director, Mount Polley
Environmental Protection, Regional Operations

cc: Al Hoffman, Chief Inspector, Ministry of Energy and Mines, Al.Hoffman@gov.bc.ca
Dale Reimer, Mine Manager, MPMC, dreimer@mountpolley.com
Colleen Hughes, Environmental Coordinator, MPMC, chughes@mountpolley.com
Amy Crook, Fair Mining Collaborative, amy@fairmining.ca
Aaron Higginbottom, Williams Lake Indian Band,
Aaron.higginbottom@williamslakeband.ca
Kirk Dressler, Willisams Lake Indian Band, kirk.dressler@willisamslakeband.ca
Julia Banks, Xatsull First Nation, nrcoordinator@xatsull.com
David Weir, Water Stewardship, FLNRO, Williams Lake, David.J.Weir@gov.bc.ca

Weir, David J FLNR:EX

From: Moe, James W FLNR:EX
Sent: Tuesday, September 16, 2014 10:54 AM
To: Weir, David J FLNR:EX
Cc: Stolar, Harold B FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

As I was out of the office on Monday, I was unavailable for a joint Review, I have since had a quick look and I do have some concerns, we need to talk.

~~~~~~

James Moe, RFT
District Engineering Officer
Ministry Natural Resources Operations
Cariboo-Chilcotin Forest District
Field Services, Engineering Section
(250) 398-4782 phone
(250) 398-4790 fax
mailto:james.moe@gov.bc.ca

From: Weir, David J FLNR:EX
Sent: Monday, September 15, 2014 10:44 AM
To: Hoffos, Robin FLNR:EX; Sabur, Muhammed A FLNR:EX; Moe, James W FLNR:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

I apologise for the short notice on this but would you be able to help me take a look at this plan this afternoon? We really don't have much input into this plan but I want to have a good look at it from the operational side as we have already made some significant contributions at that level in their operations and we may have valuable local knowledge to contribute here also.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Friday, September 12, 2014 5:06 PM
To: Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Douglas (Mobile) Watt'; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

In the email below you will find a link to Erosion and Sediment control plan developed by SNC for MPMC. If you can review this document and get your comments back to me as soon as possible that would be appreciated, but by Sept 17 at the latest, as we are keen to get information back to the company so that those acceptable works can be implemented

this information is provided in confidence and is for your consideration only and not for distribution at this time.
~~~~~~

I look forward to your comments

Hubert Bunce
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From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

On behalf of Mount Polley Mining Corporation, I am pleased to submit to you an erosion and sediment control plan for lower Hazeltine Creek, prepared by SNC Lavalin.

This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

To access the file, it can be downloaded from the link below. Please note that this link will work for anyone to whom you forward this email. I have done it that way to facilitate your distribution. However, please be sure that you have confidence that parties receiving this email from you will not forward past the intended audience if access security is to be maintained.

Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | T: +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com | **www.golder.com**

Work Safe, Home Safe

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Tuesday, September 16, 2014 9:48 AM
To: Weir, David J FLNR:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

I would like to try to get up there for the boat trip. I plan on being in WL this Thursday and Friday so could meet up with you then. Will be in touch

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Weir, David J FLNR:EX
Sent: Tuesday, September 16, 2014 8:12 AM
To: Bunce, Hubert ENV:EX; Henley, Margaret TRAN:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Mt Polley September 29th Boat Trip Quesnel Lake

I would like to arrange a boat trip in order to confirm the state of the debris clean up, look at the Kokanee shore spawning areas, and address as many issues as we can prior to the 2015 spring freshet relating to the cleanup. I am proposing September 29th 2015. Please get back to me concerning this as soon as possible.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Henley, Margaret TRAN:EX
Sent: Tuesday, September 16, 2014 8:21 AM
To: Weir, David J FLNR:EX
Cc: Bunce, Hubert ENV:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos, Robin FLNR:EX; Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: Mt Polley September 29th Boat Trip Quesnel Lake

I am available that date.

Sent from Margie's iPhone

On Sep 16, 2014, at 8:11 AM, "Weir, David J FLNR:EX" <David.J.Weir@gov.bc.ca> wrote:

> I would like to arrange a boat trip in order to confirm the state of the debris clean up, look at the Kokanee shore spawning areas, and address as many issues as we can prior to the 2015 spring freshet relating to the cleanup. I am proposing September 29th 2015. Please get back to me concerning this as soon as possible.
>
> David Weir
> Water Section Head,
> Ministry of Forest Lands and Natural Resource Operations
> Williams Lake , BC
> David.J.Weir@gov.bc.ca
> (250) 398 4924
> Cell 250 267-5925

Weir, David J FLNR:EX

From: Hoffos, Robin FLNR:EX
Sent: Tuesday, September 16, 2014 8:19 AM
To: Weir, David J FLNR:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

Right now that works for me.

From: Weir, David J FLNR:EX
Sent: Tuesday, September 16, 2014 8:12 AM
To: Bunce, Hubert ENV:EX; Henley, Margaret TRAN:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Mt Polley September 29th Boat Trip Quesnel Lake

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David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Jack Love <JLove@imperialmetals.com>
Sent: Monday, September 15, 2014 9:48 PM
To: Bunce, Hubert ENV:EX
Cc: Dale Reimer; Hoffman, Al MEM:EX; Colleen Hughes; Amy Crook; Aaron.Higginbottom@williamslakeband.ca; kirk.dressler@williamslakeband.ca; nrcoordinator@xatsull.com; Weir, David J FLNR:EX
Subject: Re: CEIA response for your review

Hello Hubert

We have received the Ministry of Environments comments

Regards,

Jack Love
604-358-2699

On Sep 15, 2014, at 2:53 PM, "Bunce, Hubert ENV:EX" <Hubert.Bunce@gov.bc.ca> wrote:

> here is the ministry review relative to the MPMC CEIA submitted Aug 29
>
> Hubert Bunce
> A/Director, Mount Polley
> Environmental Protection, Regional Operations
> ph (250) 751-3254 fax (250) 751-3103
> 2080A Labieux Road
> Nanaimo BC V9T 6J9
>
>
> <2014-09-12 MOE feedback on MPMC CEIA.PDF>

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Monday, September 15, 2014 4:05 PM
To: Vanderburgh, Ken FLNR:EX
Subject: RE: Expenditures relating to Mt. Polley

I am currently managing Mt Polley off the edge of my desk and no significant after hours time has been committed to it. Although, it is beginning to impact productivity at my end with respect to water licences and approvals.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Vanderburgh, Ken FLNR:EX
Sent: Monday, September 15, 2014 3:46 PM
To: Stewart, Rodger W FLNR:EX; Pedersen, Mike FLNR:EX; Weir, David J FLNR:EX
Subject: FW: Expenditures relating to Mt. Polley

My understanding is this would include cases where we have contributed significant staff time beyond what normal duties or situation would require. Please forward your estimates, if any and I will respond to Mary. Thanks

From: Myers, Mary E CSNR:EX
Sent: Monday, September 15, 2014 3:02 PM
To: Vanderburgh, Ken FLNR:EX
Cc: Manwaring, Richard G FLNR:EX
Subject: Expenditures relating to Mt. Polley

Ken, the Chief Financial Officer (CFO) for MEM is coordinating costs associated with the Mt. Polley incident. Do we have any costs incurred or planned? Thanks.

Mary Myers
A/CFO, A/ED
Financial Services Branch, CSNR
Supporting the Ministry of FLNR
Phone: 250 952-0229

Weir, David J FLNR:EX

From: Penny Carpenter s.22
Sent: Tuesday, September 16, 2014 7:55 PM
To: Weir, David J FLNR:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

I can make it on that date.
Penny

From: Weir, David J FLNR:EX [mailto:David.J.Weir@gov.bc.ca]
Sent: September-16-14 8:12 AM
To: Bunce, Hubert ENV:EX; Henley, Margaret TRAN:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Mt Polley September 29th Boat Trip Quesnel Lake

I would like to arrange a boat trip in order to confirm the state of the debris clean up, look at the Kokanee shore spawning areas, and address as many issues as we can prior to the 2015 spring freshet relating to the cleanup. I am proposing September 29th 2015. Please get back to me concerning this as soon as possible.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 4:37 PM
To: Weir, David J FLNR:EX
Subject: INFO : Coordination of planning and practice for Mt. Polley restoration

For your reference.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: Bunce, Hubert ENV:EX
Sent: Tuesday, September 16, 2014 4:31 PM
To: Stewart, Rodger W FLNR:EX
Cc: Epps, Deb ENV:EX
Subject: RE: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Restoration of the terrestrial and aquatic areas of the spill impacted areas are still some way off and we are currently working on short term corrective and mitigation strategies as a priority. Ie seeding of impacted areas occurred late last week but plans for long term vegetation recovery have yet to be defined

Deb Epps is leading our response to the mines proposal on the environmental assessment and restoration biological mine and would be your best point of contact. Environmental Protection is very interested in getting input from other agencies regarding best potential courses of action for the mine impacted areas.

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:51 PM
To: Bunce, Hubert ENV:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Hubert, what say you respecting the circumstances FLNR regional operations finds itself in?

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street

Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: McGuire, Jennifer ENV:EX
Sent: Tuesday, September 16, 2014 1:11 PM
To: Stewart, Rodger W FLNR:EX; Bunce, Hubert ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Roger,

Hubert would be the best person to speak to. Hubert is the RD - responsible for Mount Polley.

Jennifer

Sent from my BlackBerry 10 smartphone on the TELUS network.

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:04 PM
To: McGuire, Jennifer ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Jennifer, could you please direct me to the correct contact responsible for coordinating inter-agency deliberations respecting planning and selection of practices for restoration of areas impacted by the My Polley event?

We are aware of the submission made by Imperial Metals in response to the Ministry of Environment pollution abatement order. We know that works undertaken consistent with the pollution abatement submission may serve for purposes of addressing specific pollution abatement matters. However, it would appear that restoration works are a substantively different matter. Or are they? We simply do not know enough at this point.

We at FLNR regional operations face substantive uncertainty as to the schedule of planning for works leading to restoration of terrestrial and aquatic ecosystems at the impact sites (where practicable). It is expected that such enterprise would require inter-agency deliberation, yet we (in a supporting role) have no specific information as to who has lead responsibility for various elements of this project.

Hope you might be able to point us in the correct direction.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

Weir, David J FLNR:EX

From: Dale Reimer <dreimer@mountpolley.com>
Sent: Tuesday, September 16, 2014 12:16 PM
To: Weir, David J FLNR:EX
Subject: FW: Mt Polley
Attachments: Mt Polley.pdf

From: Dale Reimer
Sent: September-16-14 9:32 AM
To: 'Alan.Day@gov.bc.ca'; Hoffman, Al MEM:EX; Steve Rothman; Demchuk, Tania MEM:EX
Cc: Stolar, Harold B FLNR:EX
Subject: FW: Mt Polley

Please find attached the engineered drawings for the Gavin Lake road bridge. The drawings for the Ditch Road bridge should ready by this afternoon. We plan to commence work on the approach to the Gavin Lake road bridge late tomorrow or Thursday morning. The site has been inspected by the First Nations Archeologists and has been cleared to proceed. Regards: Dale

Dale Reimer
General Manager
Mount Polley Mining Corporation
Box 12 Likely, B.C. V0L 1N0
Ph. 250-790-2600
Cell 250-305-8530

From: Daryl Taylor [mailto:d.taylor@celticengineering.ca]
Sent: September-16-14 9:16 AM
To: 'Russ Gibson'; Dale Reimer; Art Frye; Don Parsons
Cc: Christine Seinen; d.taylor@celticengineering.ca
Subject: FW: Mt Polley

Please see attached document for the upper crossing.

Daryl

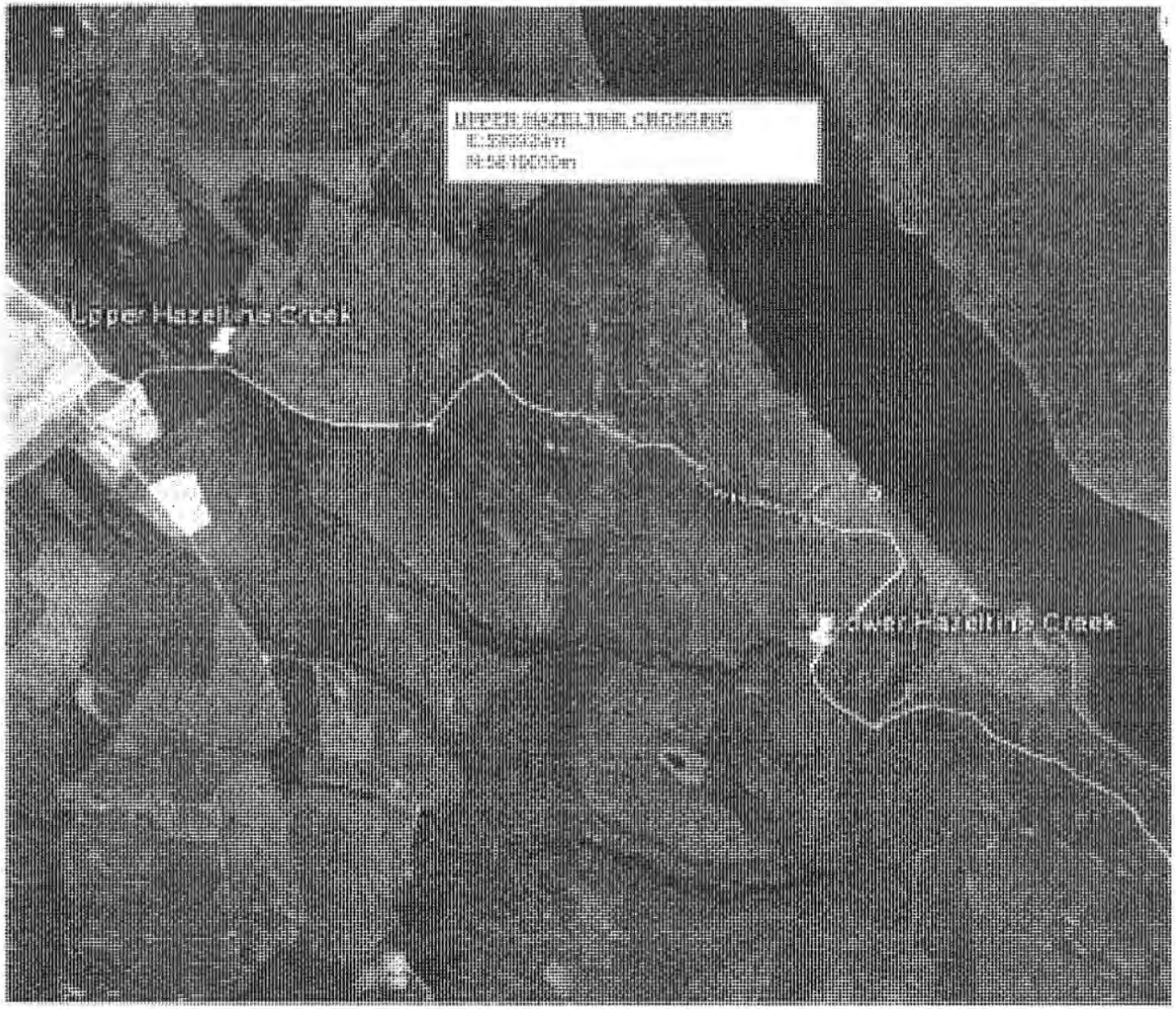
From: Christine Seinen [mailto:c.seinen@celticengineering.ca]
Sent: Tuesday, September 16, 2014 8:59 AM
To: Daryl Taylor
Subject: Mt Polley

Christine Seinen

Office Manager
Celtic Engineering Ltd
#304-383 Oliver Street
Williams Lake, BC V2G 1M4

P 250.392.5159
F 250.483.1907
c.seinen@celticengineering.ca
www.celticengineering.ca

 This email is free from viruses and malware because avast! Antivirus protection is active.



Imperial Metals

IMPERIAL METALS
MT. POLLEY
UPPER HAZELTINE

L-100
60ft BRIDGE DESIGN

PREPARED FOR:
Imperial Metals - Mt. Polley

PREPARED ON:
Sept 15, 2014

Sheet Number	Sheet Name
1	Cover Sheet
2	Site Pictures
3	Bridge Site
4	Bridge Cross Section, Road Profile
5	Town Abutment Detail
6	Woods Abutment Detail
7	Site Plan, Sediment and Erosion Control
8	Notes

PROJECT # P_460

Designing Engineer

Eng Tech

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

SHEET NUMBER 1

TOWN APPROACH

LOOKING TO BUSH

UPSTREAM FROM CROSSING

DOWNSTREAM FROM CROSSING

EXISTING ABUTMNET LOCATION

NEW ABUTMENT LOCATION

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304 383 Oliver St., Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

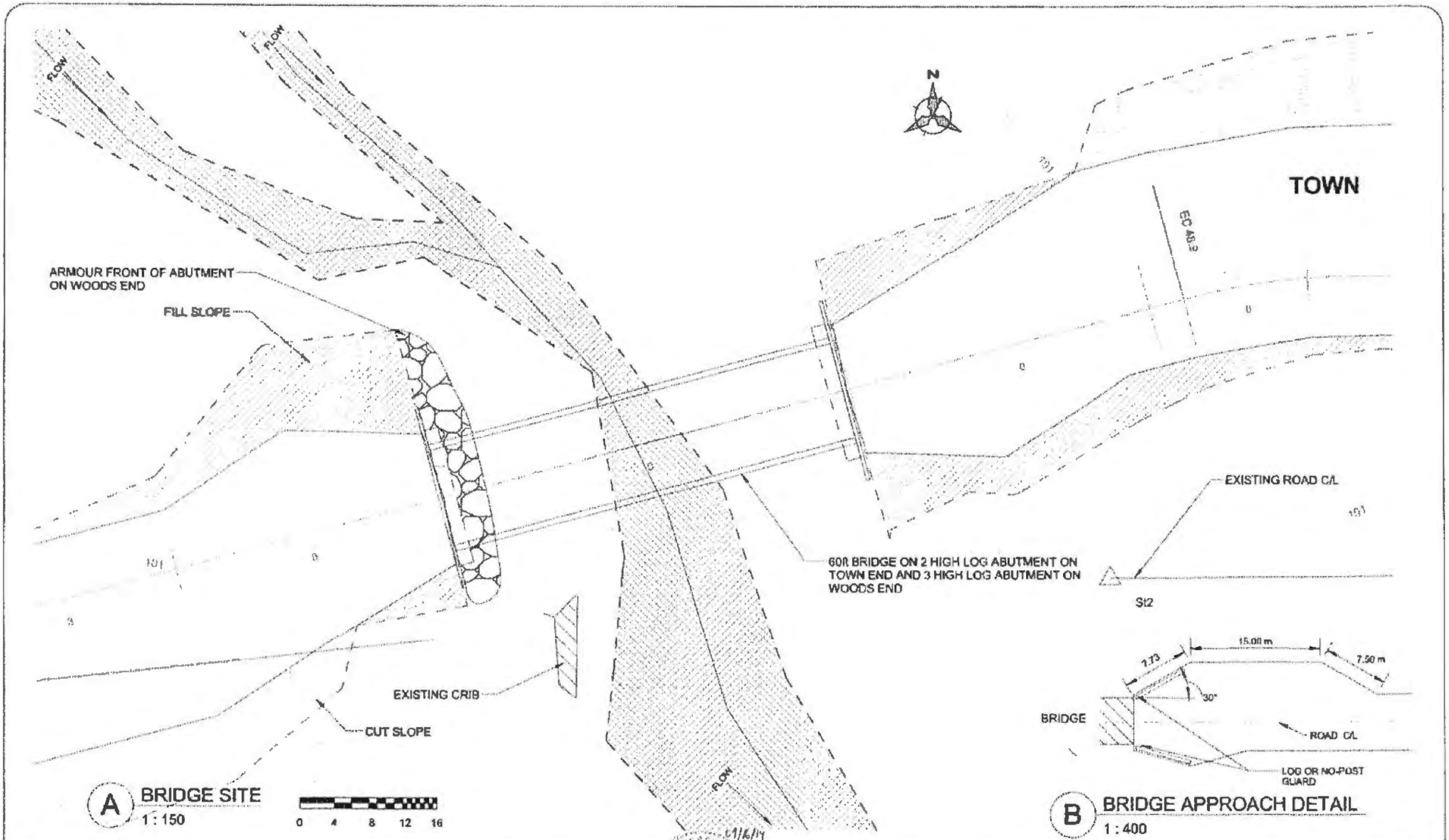
04/16/14

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN

SHEET: Site Pictures

SCALE:	SURVEY CREW: SW, KB
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_460

SHEET NUMBER: 2



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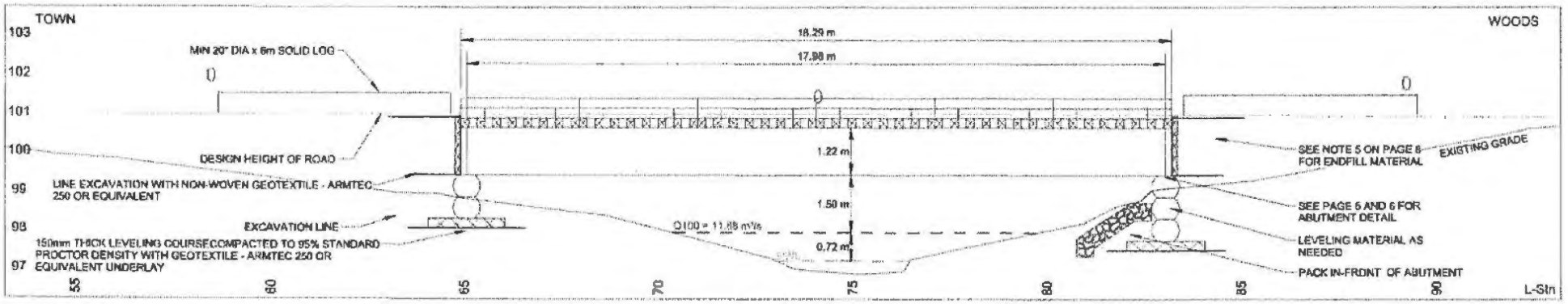
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

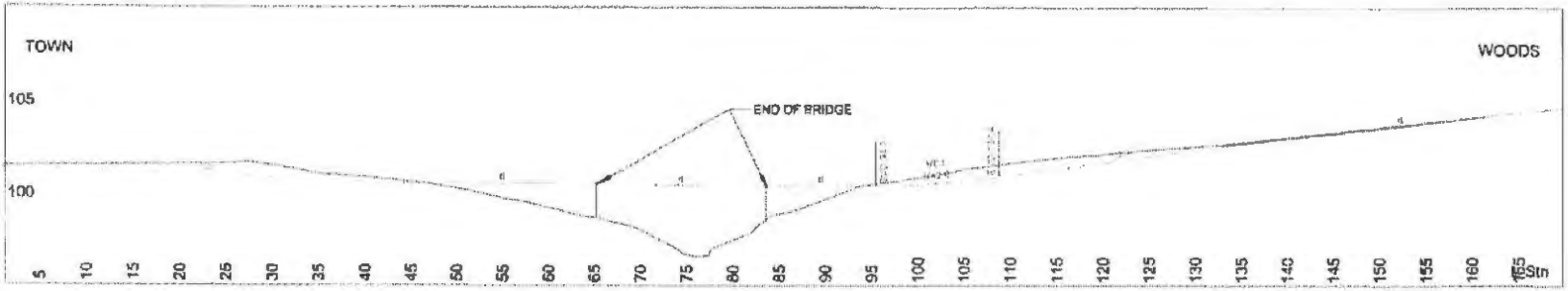
D. W. TAYLOR
ENGINEER
01/6/14

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	SCALE: As indicated	SURVEY CREW: SW, KB	SHEET NUMBER: 3
	DESIGNED BY: DT	DATE: Sept 15,2014	
SHEET: Bridge Site	DRAWN BY: JS, SW	REVISION NUMBER:	
	CHECKED: N/A	REVISION DATE:	
	SITE SURVEY: Sept 8, 2014	JOB #: P_460	



A XS - C/L
1 : 100

HYDROLOGY	
Q_{100}	11.88 m³/s
Velocity	2.2 m/s



B XS - ROAD PROFILE
1 : 500

RIPRAP TABLE							
CLASS OF RIPRAP (kg)	NOMINAL THICKNESS OF RIPRAP (mm)	ROCK GRADATION: PERCENT LARGER THAN GIVEN MASS (kg)					
		85%		50%		15%	
25	460	2.5 kg	50 mm	25 kg	300 mm	75 kg	400 mm

L-Stn m.	Cut Dp. m.	Grade %	V.Brk %	SG Cut V. Cu. m.	SG Fill V. Cu. m.	Mass H. Cu. m.
0.0	0.1	-2	0	200.4	15.3	0.0
43.4	0.1	0	2	22.2	188.4	185.1
63.9	-1.6	0	0	0.0	3.4	18.9
82.3	-1.8	0	1	23.8	133.2	17.1
94.1	0.1	0	0	96.3	7.2	-92.4
107.4	0.7	p 4	0	94.6	6.0	-3.4
133.8	0.0	7	-1	15.1	42.1	85.2
168.1	0.0	6	0			58.2
Cum. Tot.				452.4	395.7	

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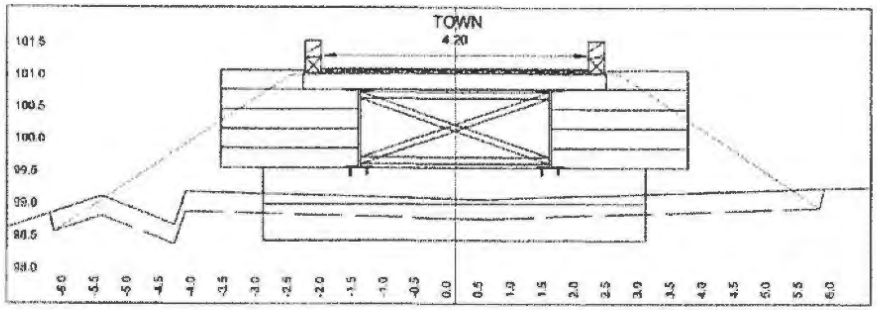
#304-383 Oliver St., Williams Lake, BC, V2G 1M4
250 392-5150 (ph) info@celticengineering.ca

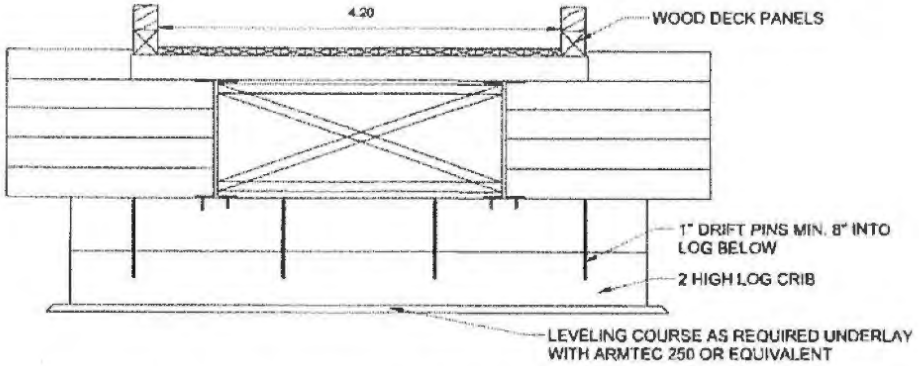
Imperial Metals

P. W. TAYLOR — PROFESSIONAL ENGINEER

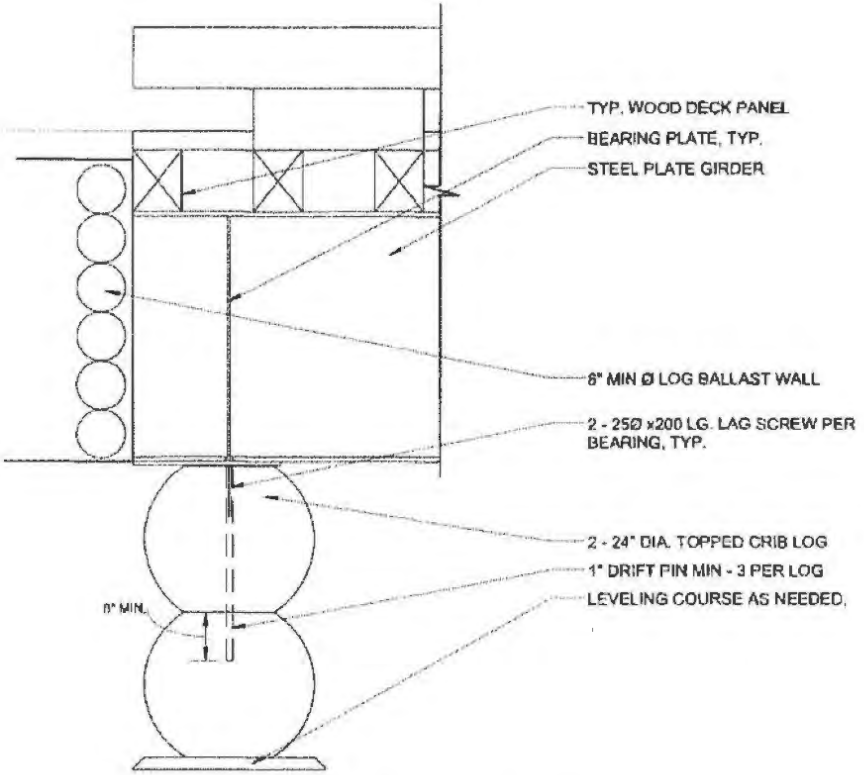
PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	SCALE: As indicated	SURVEY CREW: SW, KB	SHEET NUMBER: 4
	DESIGNED BY: DT	DATE: Sept 15,2014	
	DRAWN BY: JS, SW	REVISION NUMBER:	
SHEET: Bridge Cross Section, Road Profile	CHECKED: N/A	REVISION DATE:	
	SITE SURVEY: Sept 8, 2014	JOB #: P_460	



A ABUTMENT - TOWN
1 : 75

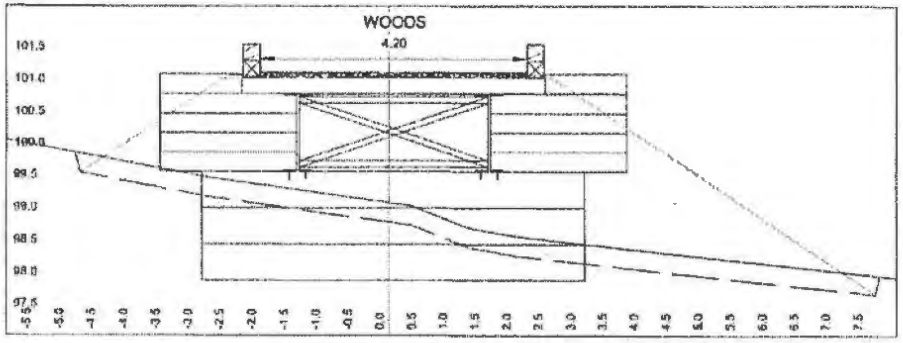


B 2 LOG CRIB ABUTMENT STEEL
1 : 50

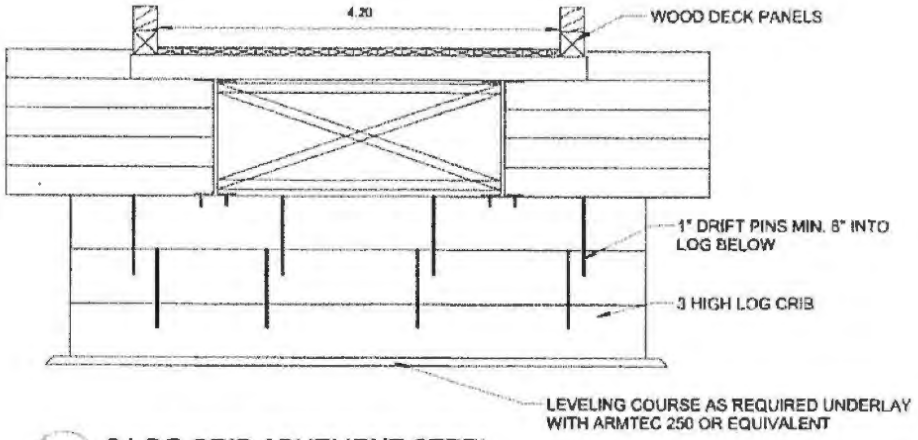


C 2 HIGH SILL LOG CRIB ABUTMENT SECTION
1 : 20

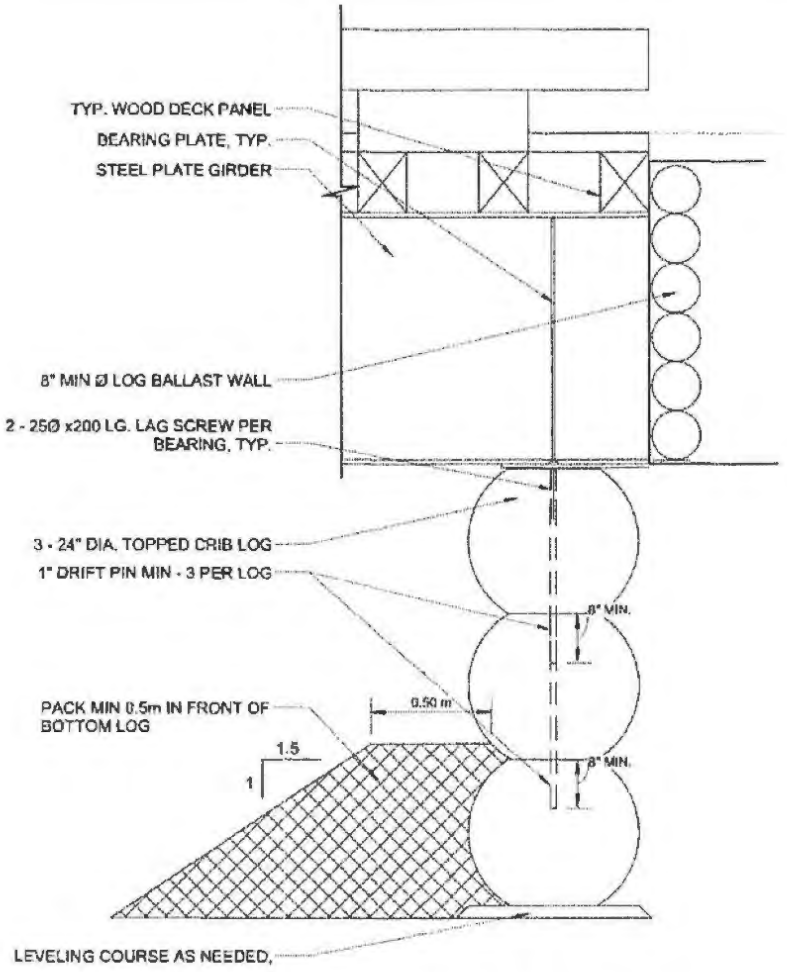
Celtic Engineering Ltd. DESIGN & CONSTRUCTION #304-383 Oliver St., Williams Lake, BC, V2G 1M4 250-392-5159 (ph) info@celticengineering.ca	Imperial Metals	D. W. TAYLOR 09/11/14	PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN SHEET: Town Abutment Detail	SCALE: As indicated DESIGNED BY: DT DRAWN BY: JS, SW CHECKED: N/A SITE SURVEY: Sept 8, 2014 SURVEY CREW: SW, KB DATE: Sept 15,2014 REVISION NUMBER: REVISION DATE: JOB #: P_460	SHEET NUMBER: 5



A ABUTMENT - WOODS
1 : 75



B 3 LOG CRIB ABUTMENT STEEL
1 : 50



C 3 HIGH SILL LOG CRIB ABUTMENT SECTION
1 : 20

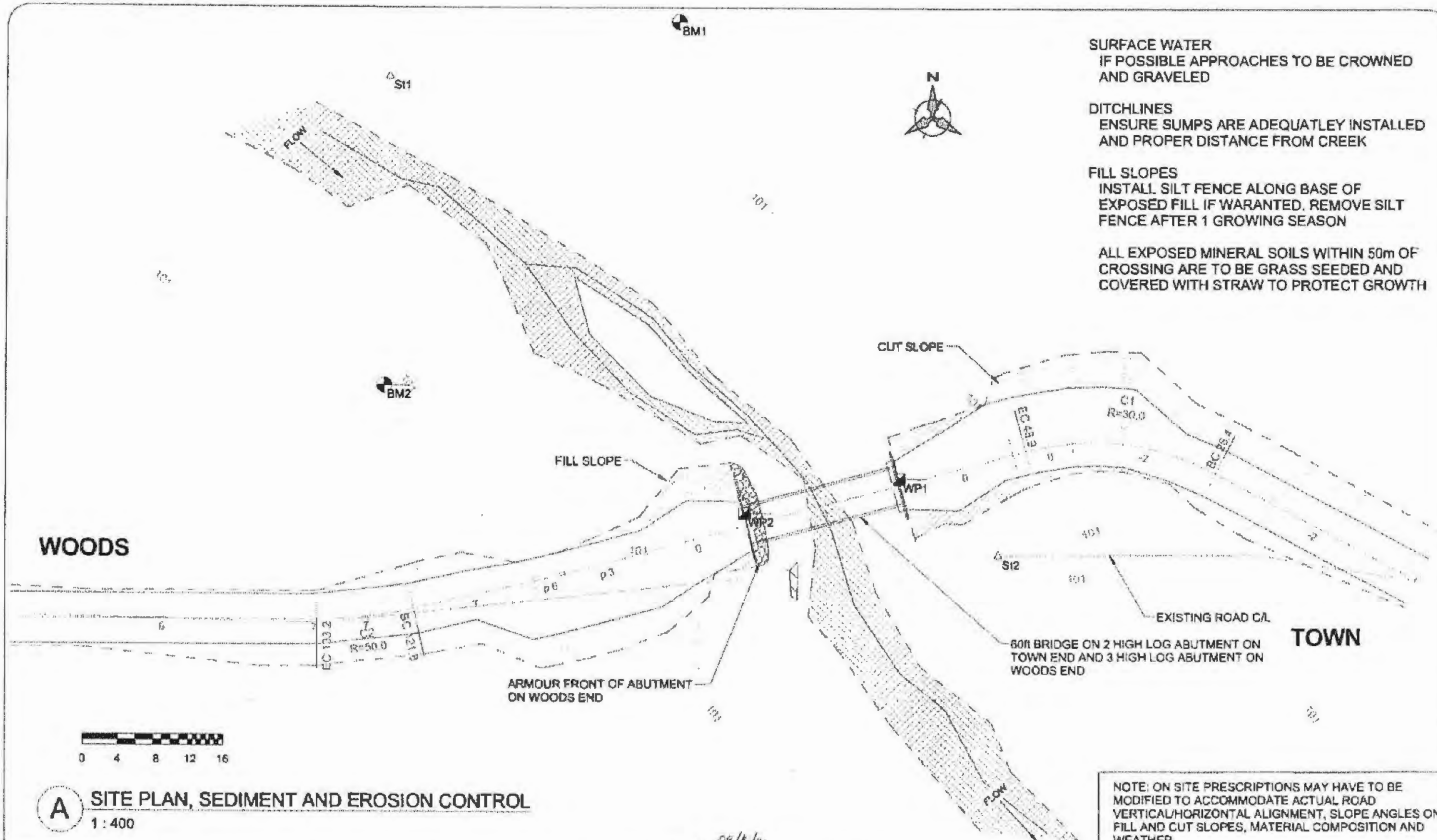
Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304-383 Oliver St, Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN
SHEET: Woods Abutment Detail

SCALE: As indicated	SURVEY CREW: SW, KB
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_460

SHEET NUMBER: 6



SURFACE WATER
IF POSSIBLE APPROACHES TO BE CROWNED AND GRAVELED

DITCHLINES
ENSURE SUMPS ARE ADEQUATLEY INSTALLED AND PROPER DISTANCE FROM CREEK

FILL SLOPES
INSTALL SILT FENCE ALONG BASE OF EXPOSED FILL IF WARANTED. REMOVE SILT FENCE AFTER 1 GROWING SEASON

ALL EXPOSED MINERAL SOILS WITHIN 50m OF CROSSING ARE TO BE GRASS SEEDED AND COVERED WITH STRAW TO PROTECT GROWTH

NOTE: ON SITE PRESCRIPTIONS MAY HAVE TO BE MODIFIED TO ACCOMMODATE ACTUAL ROAD VERTICAL/HORIZONTAL ALIGNMENT, SLOPE ANGLES ON FILL AND CUT SLOPES, MATERIAL COMPOSITION AND WEATHER.

(A) SITE PLAN, SEDIMENT AND EROSION CONTROL

1 : 400

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304-383 Oliver St., Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

D.W. TAYLOR

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	SCALE: 1:400	SURVEY CREW: SW, KB	SHEET NUMBER: 7
	DESIGNED BY: DT	DATE: Sept 15,2014	
SHEET: Site Plan, Sediment and Erosion Control	DRAWN BY: JS, SW	REVISION NUMBER:	
	CHECKED: N/A	REVISION DATE:	
	SITE SURVEY: Sept 8, 2014	JOB #: P_460	

1 - GEOTECHNICAL

NO SUBSURFACE GEOTECHNICAL INVESTIGATION WAS PERFORMED AT THE SITE. GROUND CONDITIONS MAY VARY, AND AS SUCH, FOUNDATION REQUIREMENTS MAY RESULT IN THE MODIFICATION OF THE CONCEPT BY AN ENGINEER TO ACCOUNT FOR ON SITE CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. IT WILL BE THE RESPONSIBILITY OF THE FIELD ENGINEER TO DETERMINE THE SUITABILITY OF THE SOIL CONDITIONS FOR THE FOUNDATION OF THE BRIDGE.

2 - HYDROLOGY AND HYDRAULIC ASSESSMENT

- HYDRAULIC ANALYSIS BASED ON CHANNEL CONDITIONS COULD VARY OVER TIME.
- FREE BOARD HEIGHT REQUIREMENT SHOWN REFERS TO UPSTREAM FACE OF BRIDGE.
- THE EXTENT OF THE RIPRAP IS BASED ON AVAILABLE INFORMATION. THE EXTENTS SHOULD BE ADJUSTED IN THE FIELD TO ENSURE ADEQUATE SCOUR PROTECTION IS PROVIDED TO THE BRIDGE SUBSTRUCTURE AND ABUTMENTS.

3 - BRIDGE DESIGN

- CONFORM TO CAN/CSA-S6-36(MODIFIED) AND THE MINISTRY OF FORESTS AND RANGE, "FOREST SERVICE BRIDGE DESIGN AND CONSTRUCTION MANUAL", 1999.
- ALL BRIDGE COMPONENTS SHALL CONFORM TO THE MINISTRY OF FORESTS AND RANGE STANDARD DRAWINGS UNLESS APPROVED BY OWNER.
- LOADING: BCL-625(63 730 KG G.V.W.) ECCENTRICITY IN ACCORDANCE WITH S6-06
- FATIGUE; DESIGN TO BE COMPLETED IN ACCORDANCE WITH CAN/CSA-S6-06 - 500,000 CYCLES.

4 - CONSTRUCTION NOTES:

ALTERATION TO STREAM BANKS AND IN-STREAM WORK MUST BE SUPERVISED BY QUALIFIED PERSON. SEDIMENT MANAGEMENT TO REDUCE SILTATION IS REQUIRED. IN-STREAM MACHINE CROSSINGS ARE NOT PERMITTED WITHOUT PROPER APPROVAL.

REMOVE THE MINIMUM AMOUNT OF RIPARIAN VEGETATION NECESSARY TO INSTALL A SAFE STRUCTURE, DIRECT SURFACE WATER AWAY FROM WORK SITE. ENSURE MACHINERY IS CLEAN PRIOR TO ENTERING WATERCOURSE. SILT FENCING, GEOTEXTILE CLOTH FABRIC AND A ROLL OF PLASTIC SHOULD BE ONSITE. STOP WORK DURING EXTREME ADVERSE WEATHER CONDITIONS. SEED AND STRAW DISTURBED SLOPES AS SOON AS POSSIBLE.

ENSURE DITCH WATER AND SURFACE RUNOFF FROM THE ROAD DOES NOT FLOW DIRECTLY INTO STREAM. CONSTRUCT SUMPS AS REQUIRED.

* SUPERSTRUCTURE SUPPLIED BY OTHERS CONFIRM ALL DIMENSIONS PRIOR TO FIELD LAYOUT

5 - MATERIALS

- BASE MATERIAL - EXISTING MATERIAL EXPECTED TO BE MINIMUM 200kPa BEARING CAPACITY. TO BE CONFIRMED IN FIELD. NO FILLS EXPECTED FOR ABUTMENTS. LEVELING COURSE AS REQUIRED
- ENDFILL MATERIAL - ENDFILL SHALL CONSIST OF WELL GRADED, SELECT, GRANULAR MATERIAL (<75mm), PACKED TO 98% PROCTOR DENSITY IN LIFTS OF 300mm MAX

6 - ABUTMENTS

- ENSURE ALL WORKS COMPLY WITH MINISTRY OF FORESTS AND RANGE STANDARDS

8 - SAFETY

- NONE

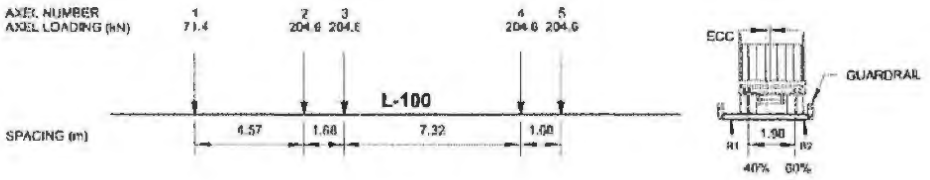
9 - ENVIRONMENT

- TEMP CROSSING
  LOCATED AT CROSSING LOCATION

ON SITE PRESCRIPTIONS MAY HAVE TO BE MODIFIED TO ACCOMMODATE ACTUAL ROAD VERTICAL/HORIZONTAL ALIGNMENT, SLOPE ANGLES ON FILL AND CUT SLOPES, MATERIAL COMPOSITION AND WEATHER.

10 - SITE CONDITIONS

- FIELD INFORMATION GATHERED DURING SUMMER CONDITIONS



09/16/14

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304-383 Oliver St, Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN

SHEET: Notes

SCALE: As indicated	SURVEY CREW: SW, KB
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_460

SHEET NUMBER: 8

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 8:22 AM
To: Epps, Deb ENV:EX; Hoffos, Robin FLNR:EX
Cc: Stewart, Rodger W FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Hello Deb,

My specific role is mostly related to the stability and public safety aspects around Mt Polley, Hazeltine Creek and Quesnel Lake. To that affect I issued orders to the company regarding management of the lake level on Polley Lake and debris removal from the water bodies. However, as you are probably aware there is a habitat component in the water act and as part of my due diligence I wish to confirm that this component is addressed. I see that one of our biologists is on the working group. I am concerned in reading the sediment and control plan for Hazeltine Creek that the conversation about habitat compensation might move past the point of meaningful input from our habitat group due to the real need for operational expediency. Can you assure me that you will engage Robin at the appropriate time?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 4:37 PM
To: Weir, David J FLNR:EX
Subject: INFO : Coordination of planning and practice for Mt. Polley restoration

For your reference.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: Bunce, Hubert ENV:EX
Sent: Tuesday, September 16, 2014 4:31 PM
To: Stewart, Rodger W FLNR:EX
Cc: Epps, Deb ENV:EX
Subject: RE: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Restoration of the terrestrial and aquatic areas of the spill impacted areas are still some way off and we are currently working on short term corrective and mitigation strategies as a priority. Ie seeding of impacted areas occurred late last week but plans for long term vegetation recovery have yet to be defined

Deb Epps is leading our response to the mines proposal on the environmental assessment and restoration biological mine and would be your best point of contact. Environmental Protection is very interested in getting input from other agencies regarding best potential courses of action for the mine impacted areas.

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
Please consider the environment before printing this email
BC Pollution Free

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:51 PM
To: Bunce, Hubert ENV:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Hubert, what say you respecting the circumstances FLNR regional operations finds itself in?

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: McGuire, Jennifer ENV:EX
Sent: Tuesday, September 16, 2014 1:11 PM
To: Stewart, Rodger W FLNR:EX; Bunce, Hubert ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Roger,

Hubert would be the best person to speak to. Hubert is the RD - responsible for Mount Polley.

Jennifer

Sent from my BlackBerry 10 smartphone on the TELUS network.

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:04 PM
To: McGuire, Jennifer ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Jennifer, could you please direct me to the correct contact responsible for coordinating inter-agency deliberations respecting planning and selection of practices for restoration of areas impacted by the My Polley event?

We are aware of the submission made by Imperial Metals in response to the Ministry of Environment pollution abatement order. We know that works undertaken consistent with the pollution abatement submission may serve for purposes of addressing specific pollution abatement matters. However, it would appear that restoration works are a substantively different matter. Or are they? We simply do not know enough at this point.

We at FLNR regional operations face substantive uncertainty as to the schedule of planning for works leading to restoration of terrestrial and aquatic ecosystems at the impact sites (where practicable). It is expected that such enterprise would require inter-agency deliberation, yet we (in a supporting role) have no specific information as to who has lead responsibility for various elements of this project.

Hope you might be able to point us in the correct direction.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 9:28 AM
To: Weir, David J FLNR:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

I'll see if I can make something work Thursday

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
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From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 8:32 AM
To: Bunce, Hubert ENV:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

I am in all day Thursday but have an urgent Dam Audit on Friday.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Tuesday, September 16, 2014 9:48 AM
To: Weir, David J FLNR:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

I would like to try to get up there for the boat trip. I plan on being in WL this Thursday and Friday so could meet up with you then. Will be in touch

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
Please consider the environment before printing this email
BC Pollution Free

From: Weir, David J FLNR:EX
Sent: Tuesday, September 16, 2014 8:12 AM
To: Bunce, Hubert ENV:EX; Henley, Margaret TRAN:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos,

Robin FLNR:EX
Cc: Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Mt Polley September 29th Boat Trip Quesnel Lake

I would like to arrange a boat trip in order to confirm the state of the debris clean up, look at the Kokanee shore spawning areas, and address as many issues as we can prior to the 2015 spring freshet relating to the cleanup. I am proposing September 29th 2015. Please get back to me concerning this as soon as possible.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Moe, James W FLNR:EX
Sent: Wednesday, September 17, 2014 8:40 AM
To: Weir, David J FLNR:EX
Subject: RE: Mt Polley

yes

James Moe, RFT
District Engineering Officer
Ministry Natural Resources Operations
Cariboo-Chilcotin Forest District
Field Services, Engineering Section
(250) 398-4782 phone
(250) 398-4790 fax
mailto:james.moe@gov.bc.ca

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 8:38 AM
To: Moe, James W FLNR:EX
Subject: FW: Mt Polley

Can I catch you today or tomorrow?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Dale Reimer [mailto:dreimer@mountpolley.com]
Sent: Tuesday, September 16, 2014 12:16 PM
To: Weir, David J FLNR:EX
Subject: FW: Mt Polley

From: Dale Reimer
Sent: September-16-14 9:32 AM
To: 'Alan.Day@gov.bc.ca'; Hoffman, Al MEM:EX; Steve Rothman; Demchuk, Tania MEM:EX
Cc: Stolar, Harold B FLNR:EX
Subject: FW: Mt Polley

Please find attached the engineered drawings for the Gavin Lake road bridge. The drawings for the Ditch Road bridge should ready by this afternoon. We plan to commence work on the approach to the Gavin Lake road bridge late tomorrow or Thursday morning. The site has been inspected by the First Nations Archeologists and has been cleared to proceed. Regards: Dale

Dale Reimer
General Manager
Mount Polley Mining Corporation
Box 12 Likely, B.C. V0L 1N0
Ph. 250-790-2600
Cell 250-305-8530

From: Daryl Taylor [mailto:d.taylor@celticengineering.ca]
Sent: September-16-14 9:16 AM
To: 'Russ Gibson'; Dale Reimer; Art Frye; Don Parsons
Cc: Christine Seinen; d.taylor@celticengineering.ca
Subject: FW: Mt Polley

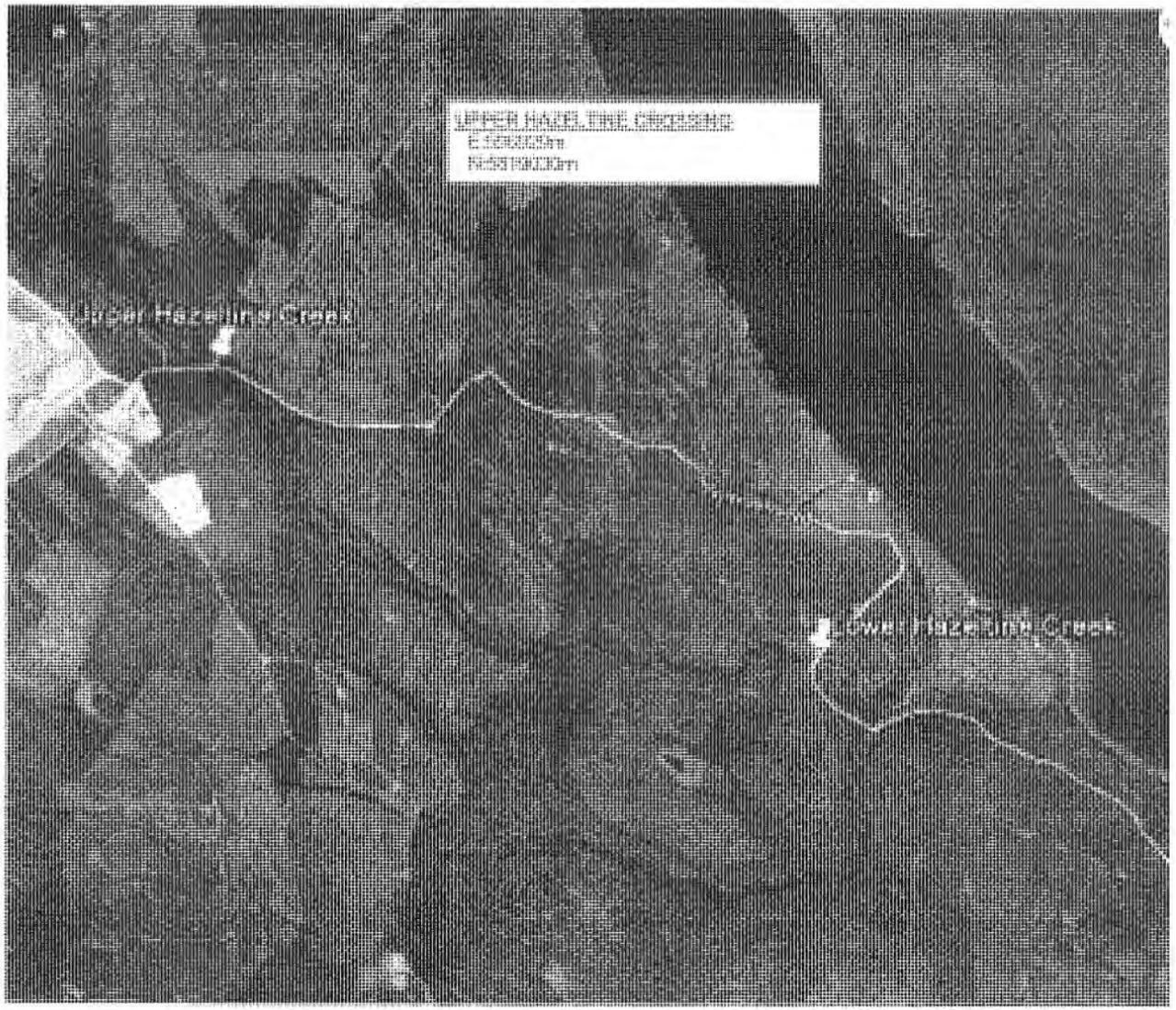
Please see attached document for the upper crossing.

Daryl

From: Christine Seinen [mailto:c.seinen@celticengineering.ca]
Sent: Tuesday, September 16, 2014 8:59 AM
To: Daryl Taylor
Subject: Mt Polley

Christine Seinen
Office Manager
Celtic Engineering Ltd
#304-383 Oliver Street
Williams Lake, BC V2G 1M4
P 250.392.5159
F 250.483.1907
c.seinen@celticengineering.ca
www.celticengineering.ca

avast! be free This email is free from viruses and malware because avast! Antivirus protection is active.



Imperial Metals

IMPERIAL METALS
MT. POLLEY
UPPER HAZELTINE

L-100
60ft BRIDGE DESIGN

PREPARED FOR:
Imperial Metals - Mt. Polley

B.W. TAYLOR
PROFESSIONAL ENGINEER

PREPARED ON:
Sept 15, 2014

Sheet Number	Sheet Name
1	Cover Sheet
2	Site Pictures
3	Bridge Site
4	Bridge Cross Section, Road Profile
5	Town Abutment Detail
6	Woods Abutment Detail
7	Site Plan, Sediment and Erosion Control
8	Notes

PROJECT # P_460

Designing Engineer Date Sept 16/14

Eng Tech Date Sept 16/14

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION

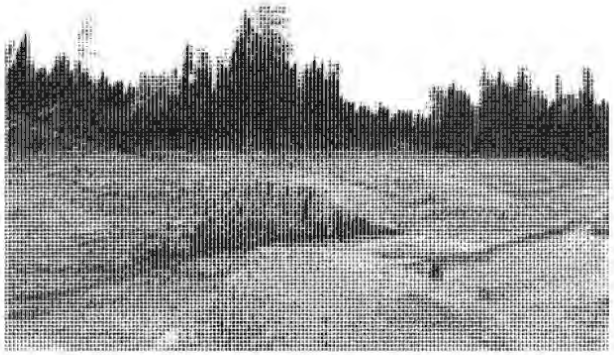
SHEET NUMBER: 1

TOWN APPROACH

LOOKING TO BUSH

UPSTREAM FROM CROSSING

DOWNSTREAM FROM CROSSING



EXISTING ABUTMNET LOCATION

NEW ABUTMENT LOCATION

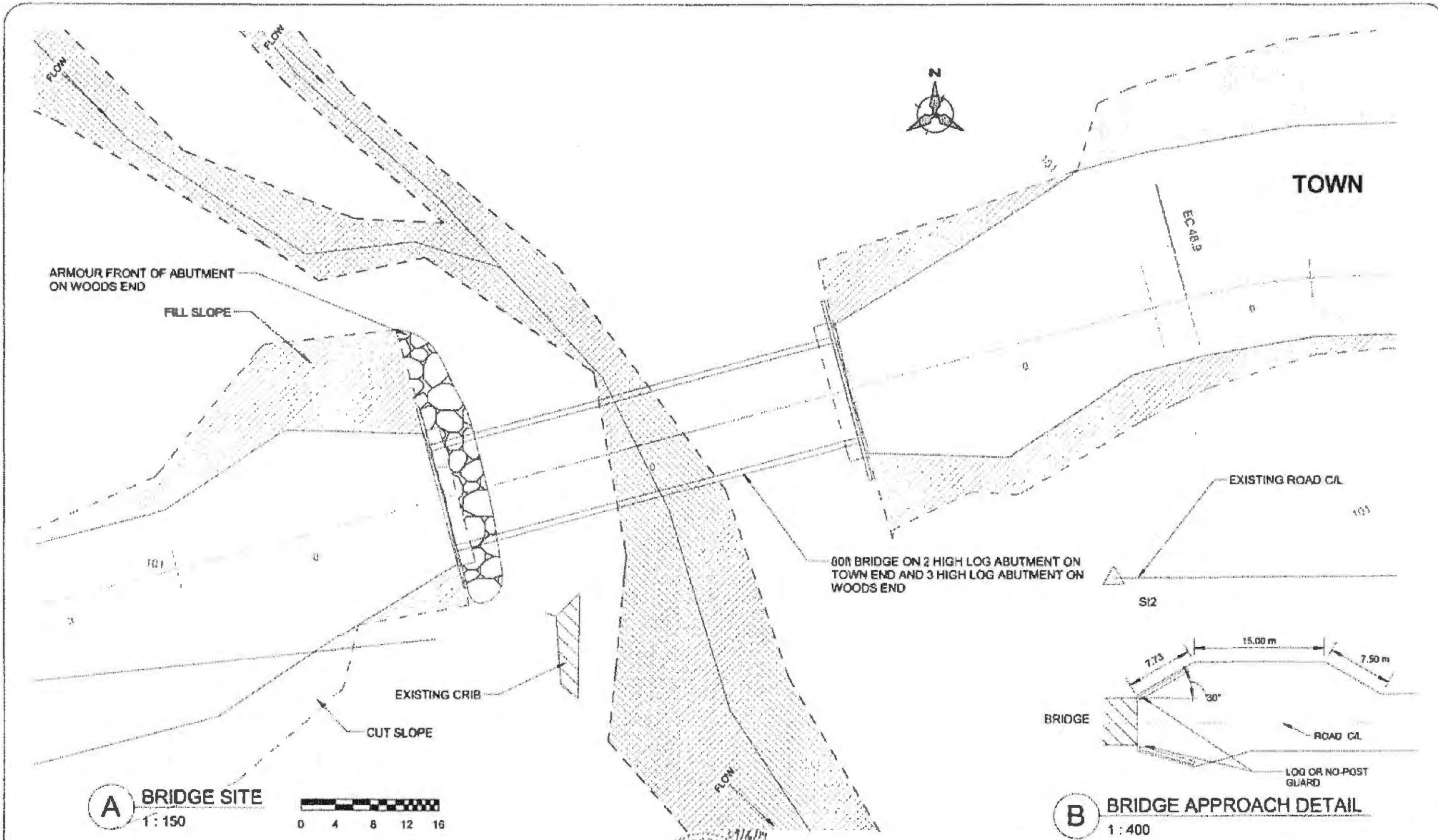
Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304-381 Oliver St., Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

D.W. TAYLOR

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	
SHEET: Site Pictures	
SCALE:	SURVEY CREW: SW, KD
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_460

SHEET NUMBER: 2

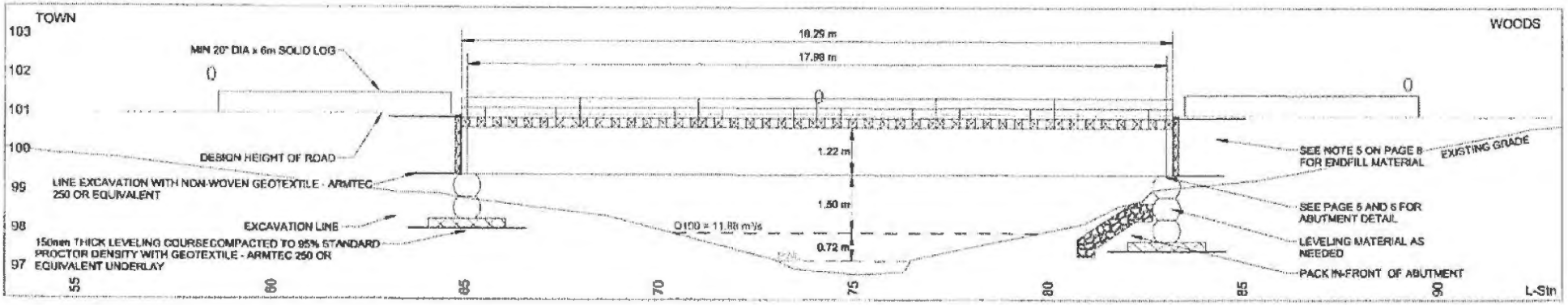


Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304-383 Oliver St., Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

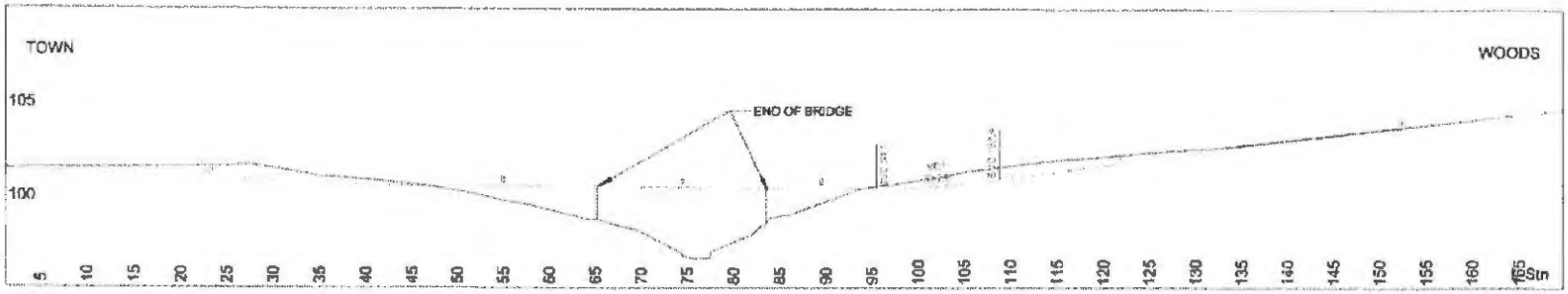
PROFESSIONAL ENGINEER D. W. TAYLOR # 29559

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	SCALE: As indicated	SURVEY CREW: SW, KB	SHEET NUMBER:
	DESIGNED BY: DT	DATE: Sept 15,2014	3
SHEET: Bridge Site	DRAWN BY: JS, SW	REVISION NUMBER:	
	CHECKED: N/A	REVISION DATE:	
	SITE SURVEY: Sept 8, 2014	JOB #: P_460	



A XS - C/L
1 : 100

HYDROLOGY	
Q_{100}	11.88 m³/s
Velocity	2.2 m/s



B XS - ROAD PROFILE
1 : 500

RIPRAP TABLE							
CLASS OF RIPRAP (kg)	NOMINAL THICKNESS OF RIPRAP (mm)	ROCK GRADATION: PERCENT LARGER THAN GIVEN MASS (kg)					
		85%		50%		15%	
25	460	2.5 kg	50 mm	25 kg	300 mm	75 kg	400 mm

L-Stn m.	Cut Dp. m.	Grade %	V Brk %	SG Cut V. Cu. m.	SG Fill V. Cu. m.	Mass H. Cu. m.
0.0	0.1	-2	0	200.4	15.3	0.0
43.4	0.1	0	2	22.2	188.4	185.1
53.9	-1.8	0	0	0.0	3.4	18.9
82.3	-1.6	0	1	23.8	133.2	17.1
94.1	0.1	0	0	96.3	7.2	-92.4
107.4	0.7	p 4	0	94.6	6.0	-3.4
133.8	0.0	7	-1	15.1	42.1	85.2
158.1	0.0	6	0			58.2
Cum. Tot.				452.4	395.7	

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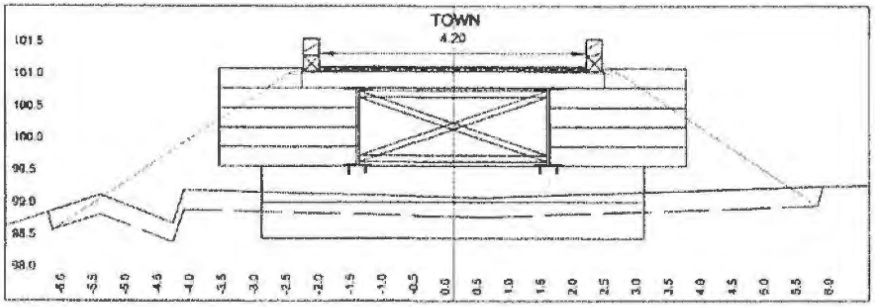
Imperial Metals

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN

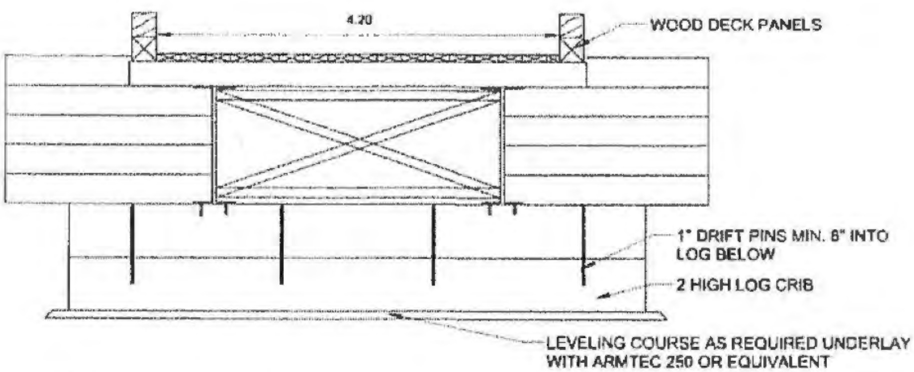
SHEET: Bridge Cross Section, Road Profile

SCALE: As indicated	SURVEY CREW: SW, KB
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_480

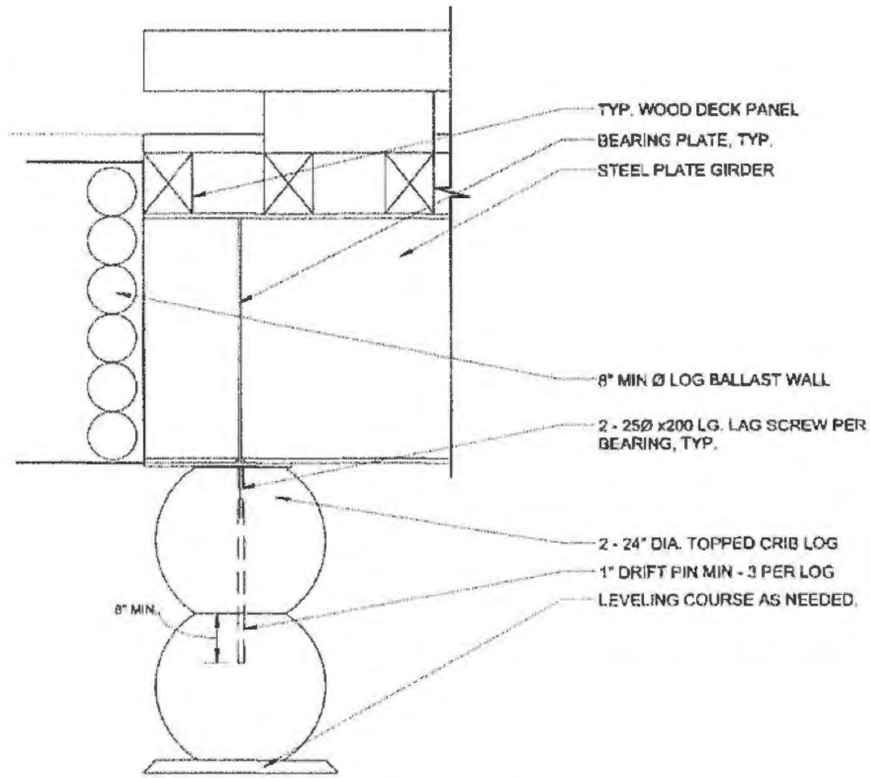
SHEET NUMBER: 4



A ABUTMENT - TOWN
1 : 75



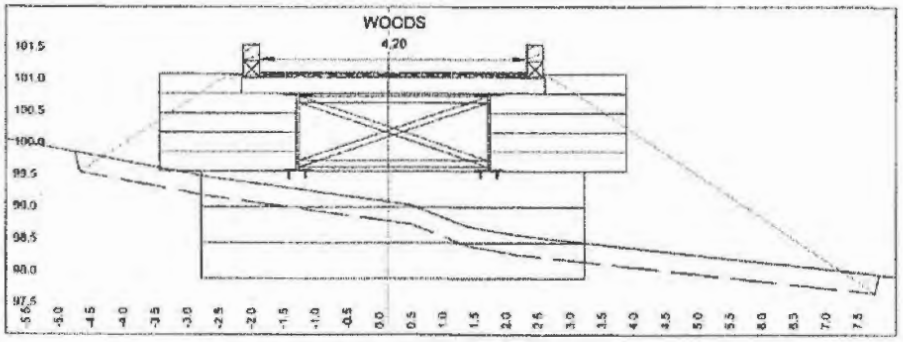
B 2 LOG CRIB ABUTMENT STEEL
1 : 50



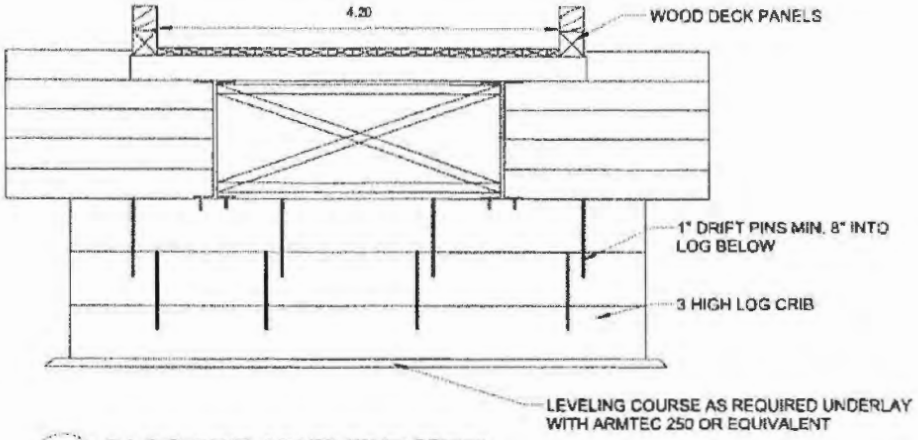
C 2 HIGH SILL LOG CRIB ABUTMENT SECTION
1 : 20

Celtic Engineering Ltd. DESIGN & CONSTRUCTION #304-383 Oliver St., Williams Lake, BC, V2G 1M4 250-392-5159 (ph) info@celticengineering.ca	Imperial Metals	PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	SHEET NUMBER: 5
		SHEET: Town Abutment Detail	
SCALE: As Indicated	SURVEY CREW: SW, KB		
DESIGNED BY: DT	DATE: Sept 15,2014		
DRAWN BY: JS, SW	REVISION NUMBER:		
CHECKED: N/A	REVISION DATE:		
SITE SURVEY: Sept 8, 2014	JOB #: P_460		

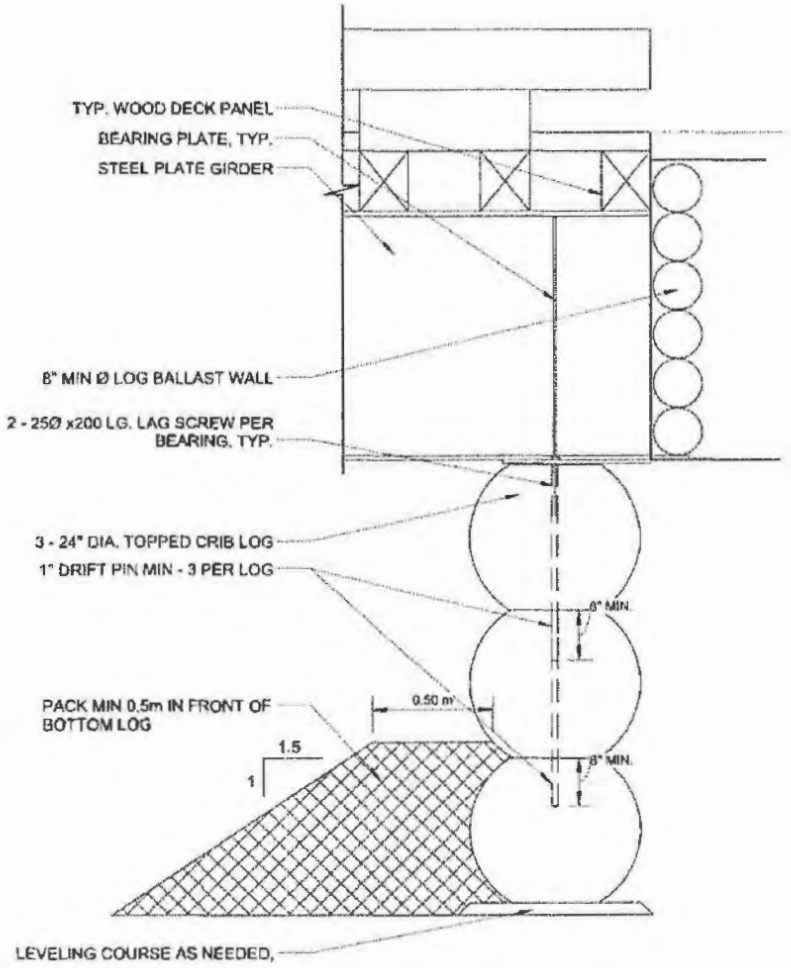
PROFESSIONAL ENGINEER D. W. TAYLOR 09/16/14



A ABUTMENT - WOODS
1 : 75



B 3 LOG CRIB ABUTMENT STEEL
1 : 50



C 3 HIGH SILL LOG CRIB ABUTMENT SECTION
1 : 20

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
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250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

PROJECT:
MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN

SHEET:
Woods Abutment Detail

SCALE: As indicated	SURVEY CREW: SW, KB
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_460

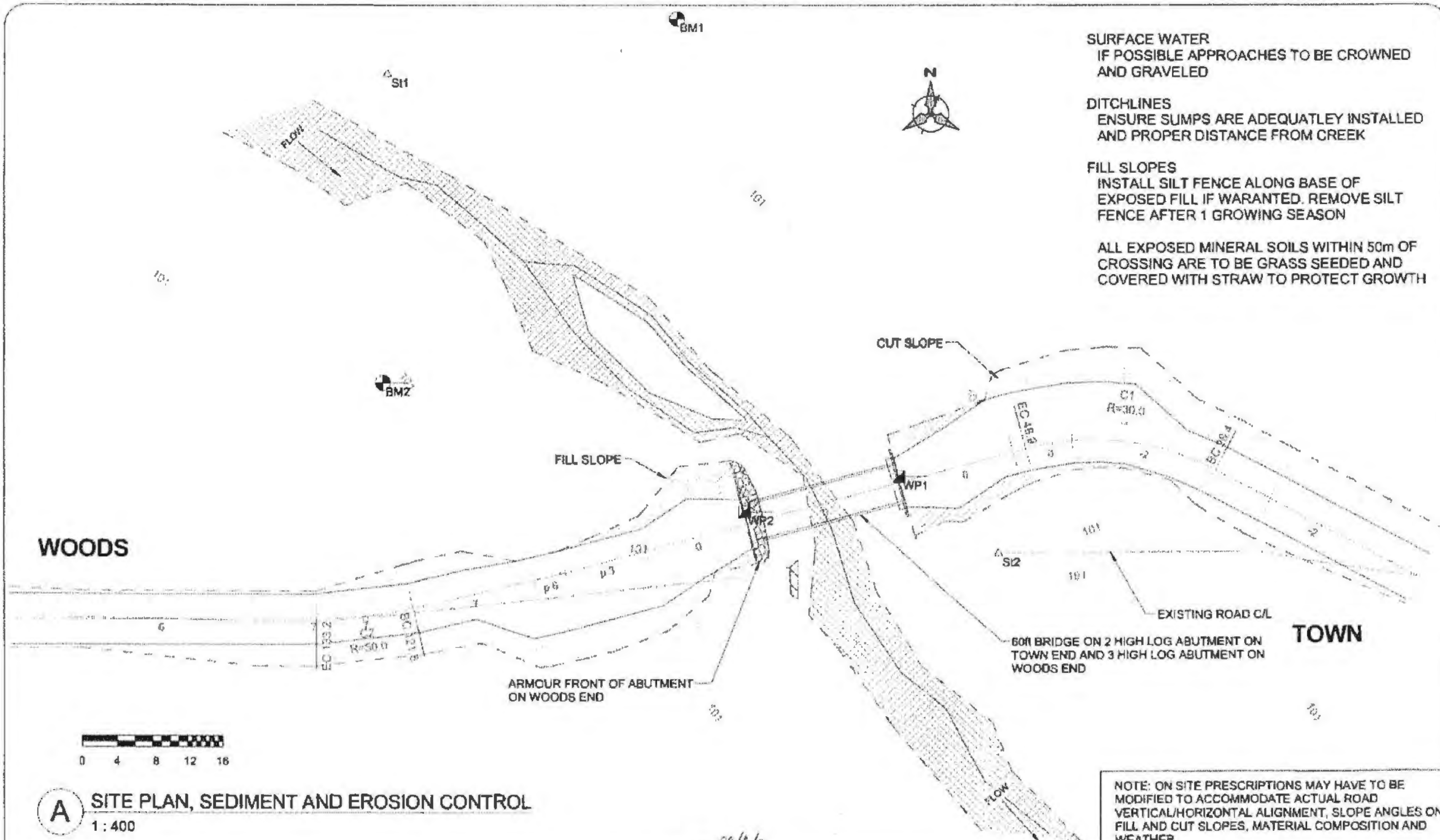
SHEET NUMBER: 6

SURFACE WATER
IF POSSIBLE APPROACHES TO BE CROWNED AND GRAVELED

DITCHLINES
ENSURE SUMPS ARE ADEQUATLEY INSTALLED AND PROPER DISTANCE FROM CREEK

FILL SLOPES
INSTALL SILT FENCE ALONG BASE OF EXPOSED FILL IF WARANTED. REMOVE SILT FENCE AFTER 1 GROWING SEASON

ALL EXPOSED MINERAL SOILS WITHIN 50m OF CROSSING ARE TO BE GRASS SEEDED AND COVERED WITH STRAW TO PROTECT GROWTH



(A) SITE PLAN, SEDIMENT AND EROSION CONTROL
1 : 400

NOTE: ON SITE PRESCRIPTIONS MAY HAVE TO BE MODIFIED TO ACCOMMODATE ACTUAL ROAD VERTICAL/HORIZONTAL ALIGNMENT, SLOPE ANGLES ON FILL AND CUT SLOPES, MATERIAL COMPOSITION AND WEATHER.

Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304-383 Oliver St., Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN	SCALE: 1 : 400	SURVEY CREW: SW, KB	SHEET NUMBER: 7
	DESIGNED BY: DT	DATE: Sept 15,2014	
SHEET: Site Plan, Sediment and Erosion Control	DRAWN BY: JS, SW	REVISION NUMBER:	
	CHECKED: N/A	REVISION DATE:	
	SITE SURVEY: Sept 8, 2014	JOB #: P_460	

1 - GEOTECHNICAL

NO SUBSURFACE GEOTECHNICAL INVESTIGATION WAS PERFORMED AT THE SITE. GROUND CONDITIONS MAY VARY, AND AS SUCH, FOUNDATION REQUIREMENTS MAY RESULT IN THE MODIFICATION OF THE CONCEPT BY AN ENGINEER TO ACCOUNT FOR ON SITE CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. IT WILL BE THE RESPONSIBILITY OF THE FIELD ENGINEER TO DETERMINE THE SUITABILITY OF THE SOIL CONDITIONS FOR THE FOUNDATION OF THE BRIDGE.

2 - HYDROLOGY AND HYDRAULIC ASSESSMENT

- HYDRAULIC ANALYSIS BASED ON CHANNEL CONDITIONS COULD VARY OVER TIME.
- FREE BOARD HEIGHT REQUIREMENT SHOWN REFERS TO UPSTREAM FACE OF BRIDGE.
- THE EXTENT OF THE RIPRAP IS BASED ON AVAILABLE INFORMATION. THE EXTENTS SHOULD BE ADJUSTED IN THE FIELD TO ENSURE ADEQUATE SCOUR PROTECTION IS PROVIDED TO THE BRIDGE SUBSTRUCTURE AND ABUTMENTS.

3 - BRIDGE DESIGN

- CONFORM TO CAN/CSA-S6-06(MODIFIED) AND THE MINISTRY OF FORESTS AND RANGE, "FOREST SERVICE BRIDGE DESIGN AND CONSTRUCTION MANUAL", 1999.
- ALL BRIDGE COMPONENTS SHALL CONFORM TO THE MINISTRY OF FORESTS AND RANGE STANDARD DRAWINGS UNLESS APPROVED BY OWNER.
- LOADING: BCL-625(63 730 KG G.V.W.) ECCENTRICITY IN ACCORDANCE WITH S6-06
- FATIGUE; DESIGN TO BE COMPLETED IN ACCORDANCE WITH CAN/CSA-S6-06 - 500,000 CYCLES.

4 - CONSTRUCTION NOTES:

ALTERATION TO STREAM BANKS AND IN-STREAM WORK MUST BE SUPERVISED BY QUALIFIED PERSON. SEDIMENT MANAGEMENT TO REDUCE SILTATION IS REQUIRED. IN-STREAM MACHINE CROSSINGS ARE NOT PERMITTED WITHOUT PROPER APPROVAL.

REMOVE THE MINIMUM AMOUNT OF RIPARIAN VEGETATION NECESSARY TO INSTALL A SAFE STRUCTURE, DIRECT SURFACE WATER AWAY FROM WORK SITE. ENSURE MACHINERY IS CLEAN PRIOR TO ENTERING WATERCOURSE. SILT FENCING, GEOTEXTILE CLOTH FABRIC AND A ROLL OF PLASTIC SHOULD BE ONSITE. STOP WORK DURING EXTREME ADVERSE WEATHER CONDITIONS. SEED AND STRAW DISTURBED SLOPES AS SOON AS POSSIBLE.

ENSURE DITCH WATER AND SURFACE RUNOFF FROM THE ROAD DOES NOT FLOW DIRECTLY INTO STREAM. CONSTRUCT SUMPS AS REQUIRED.

* SUPERSTRUCTURE SUPPLIED BY OTHERS CONFIRM ALL DIMENSIONS PRIOR TO FIELD LAYOUT

5 - MATERIALS

- BASE MATERIAL - EXISTING MATERIAL EXPECTED TO BE MINIMUM 200kPa BEARING CAPACITY. TO BE CONFIRMED IN FIELD. NO FILLS EXPECTED FOR ABUTMENTS. LEVELING COURSE AS REQUIRED
- ENDFILL MATERIAL - ENDFILL SHALL CONSIST OF WELL GRADED, SELECT, GRANULAR MATERIAL (<75mm), PACKED TO 98% PROCTOR DENSITY IN LIFTS OF 300mm MAX

6 - ABUTMENTS

- ENSURE ALL WORKS COMPLY WITH MINISTRY OF FORESTS AND RANGE STANDARDS

8 - SAFETY

- NONE

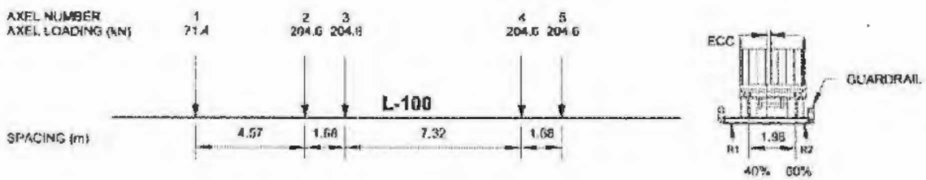
9 - ENVIRONMENT

- TEMP CROSSING
  LOCATED AT CROSSING LOCATION

ON SITE PRESCRIPTIONS MAY HAVE TO BE MODIFIED TO ACCOMMODATE ACTUAL ROAD VERTICAL/HORIZONTAL ALIGNMENT, SLOPE ANGLES ON FILL AND CUT SLOPES, MATERIAL COMPOSITION AND WEATHER.

10 - SITE CONDITIONS

- FIELD INFORMATION GATHERED DURING SUMMER CONDITIONS



Celtic Engineering Ltd.
DESIGN & CONSTRUCTION
#304 383 Oliver St., Williams Lake, BC, V2G 1M4
250-392-5159 (ph) info@celticengineering.ca

Imperial Metals

PROJECT: MT. POLLEY UPPER HAZELTINE CROSSING 60ft BRIDGE DESIGN
SHEET: Notes

SCALE: As indicated	SURVEY CREW: SW, KB
DESIGNED BY: DT	DATE: Sept 15,2014
DRAWN BY: JS, SW	REVISION NUMBER:
CHECKED: N/A	REVISION DATE:
SITE SURVEY: Sept 8, 2014	JOB #: P_480

SHEET NUMBER: 8

Sent from my BlackBerry 10 smartphone on the TELUS network.

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:04 PM
To: McGuire, Jennifer ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Jennifer, could you please direct me to the correct contact responsible for coordinating inter-agency deliberations respecting planning and selection of practices for restoration of areas impacted by the My Polley event?

We are aware of the submission made by Imperial Metals in response to the Ministry of Environment pollution abatement order. We know that works undertaken consistent with the pollution abatement submission may serve for purposes of addressing specific pollution abatement matters. However, it would appear that restoration works are a substantively different matter. Or are they? We simply do not know enough at this point.

We at FLNR regional operations face substantive uncertainty as to the schedule of planning for works leading to restoration of terrestrial and aquatic ecosystems at the impact sites (where practicable). It is expected that such enterprise would require inter-agency deliberation, yet we (in a supporting role) have no specific information as to who has lead responsibility for various elements of this project.

Hope you might be able to point us in the correct direction.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: Bunce, Hubert ENV:EX
Sent: Tuesday, September 16, 2014 4:31 PM
To: Stewart, Rodger W FLNR:EX
Cc: Epps, Deb ENV:EX
Subject: RE: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Restoration of the terrestrial and aquatic areas of the spill impacted areas are still some way off and we are currently working on short term corrective and mitigation strategies as a priority. Ie seeding of impacted areas occurred late last week but plans for long term vegetation recovery have yet to be defined

Deb Epps is leading our response to the mines proposal on the environmental assessment and restoration biological mine and would be your best point of contact. Environmental Protection is very interested in getting input from other agencies regarding best potential courses of action for the mine impacted areas.

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:51 PM
To: Bunce, Hubert ENV:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Hubert, what say you respecting the circumstances FLNR regional operations finds itself in?

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: McGuire, Jennifer ENV:EX
Sent: Tuesday, September 16, 2014 1:11 PM
To: Stewart, Rodger W FLNR:EX; Bunce, Hubert ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Roger,

Hubert would be the best person to speak to. Hubert is the RD - responsible for Mount Polley.

Jennifer

Hi Dave,

Thanks for the note and I understand your concerns. Things are moving fast. If you or Robin have any specific comments from the sediment and erosion control document itself, please pass them on to me so we can include them in our response to MPMC. They are on a really tight timeframe with our comments due today by end of day. I will also endeavour to keep you and other FLNRO staff in the loop when reports come in and when discussions are occurring regarding compensation and/or habitat mitigation. I believe FLNRO habitat staff reviewed the comprehensive EIA and provided comments as well.

If you wish to discuss anything please don't hesitate to call or send me an email. I will be in WL on Friday.

Deb

Sent from my BlackBerry Wireless Handheld

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 08:22 AM
To: Epps, Deb ENV:EX; Hoffos, Robin FLNR:EX
Cc: Stewart, Rodger W FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Hello Deb,

My specific role is mostly related to the stability and public safety aspects around Mt Polley, Hazeltine Creek and Quesnel Lake. To that affect I issued orders to the company regarding management of the lake level on Polley Lake and debris removal from the water bodies. However, as you are probably aware there is a habitat component in the water act and as part of my due diligence I wish to confirm that this component is addressed. I see that one of our biologists is on the working group. I am concerned in reading the sediment and control plan for Hazeltine Creek that the conversation about habitat compensation might move past the point of meaningful input from our habitat group due to the real need for operational expediency. Can you assure me that you will engage Robin at the appropriate time?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 4:37 PM
To: Weir, David J FLNR:EX
Subject: INFO : Coordination of planning and practice for Mt. Polley restoration

For your reference.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1

Weir, David J FLNR:EX

From: Epps, Deb ENV:EX
Sent: Wednesday, September 17, 2014 9:29 AM
To: Hoffos, Robin FLNR:EX
Cc: Stewart, Rodger W FLNR:EX; Weir, David J FLNR:EX; McLeod, Joanne FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Hi Robin,

Yes I believe that compensation is still on the table, however there is an immediately need to stop further sediment discharge into Quesnel Lake, causing further pollution and potential effects on aquatic life in the lake, now and during rainstorm event and spring melt. We are working to get short term measures in place to deal with this issue and the long term plan will look at compensation and rehabilitation. A lot of those discussions will also have to wait until they can get the impact assessment under way and have a more thorough understanding of the extent and degree of destruction in hazeltine Creek.

I will definitely keep you guys in the loop. The local knowledge you can provide will definitely be needed as we move forward.

Deb

Deborah Epps, M.Sc., RPBio.
Section Head, Provincial Water Quality
Ministry of Environment
2080A Labieux Road
Nanaimo, BC V9T 6J9
Phone: (250) 751-3146
Email: Deb.Epps@gov.bc.ca

From: Hoffos, Robin FLNR:EX
Sent: Wednesday, September 17, 2014 9:09 AM
To: Epps, Deb ENV:EX
Cc: Stewart, Rodger W FLNR:EX; Weir, David J FLNR:EX; McLeod, Joanne FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Thanks. Joanne McLeod provided some initial comments on the EIA. There were some notable land use designations that the EIA fails to mention and it remains unclear whether a choice has been made in regards to the future of Hazeltine creek. The term "rehabilitation" is used. Depending upon the conditions and costs, it may be far more reasonable to compensate for habitat losses at Hazeltine Ck if provided there are ways of preventing continued sedimentation input to Quesnel Lake. I hope those options are still on the table and we can provide input as appropriate.

Cheers.

From: Epps, Deb ENV:EX
Sent: Wednesday, September 17, 2014 8:43 AM
To: Weir, David J FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Stewart, Rodger W FLNR:EX
Subject: Re: INFO : Coordination of planning and practice for Mt. Polley restoration

This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

To access the file, it can be downloaded from the link below. Please note that this link will work for anyone to whom you forward this email. I have done it that way to facilitate your distribution. However, please be sure that you have confidence that parties receiving this email from you will not forward past the intended audience if access security is to be maintained.

Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl **(M.Sc., R.P.Bio.)** | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | T: +1.604.296.4200 | F: +1.604.298.5253 | C: +1.778.231.6636 | E: Lee_Nikl@golder.com | **www.golder.com**

Work Safe, Home Safe

The Gavin Lake Road bridge installation over Hazeltine Creek will begin tomorrow and is planned for completion Friday the 19th. The bridge will allow access to Quesnel Lake and the proposed sediment and erosion control works at the Hazeltine Creek discharge. A local first nation contractor joint venture, Lake Excavating Ltd., has been selected for the work. FLNRO has issued Mount Polley a road use permit authorizing off highway loading of the Gavin Lake Road. On Friday, construction materials will be able to move freely between the mine and Ditch Road. SNC is prepared to supply the supervisors familiar with work of a similar nature as early as Saturday, at which time work can begin.

I would like to start construction of access to the work area as soon as possible. Our intention would be to start the sediment and erosion control works on Saturday.
Please advise.

Regards
Don Parsons

From: Bunce, Hubert ENV:EX [mailto:Hubert.Bunce@gov.bc.ca]
Sent: Friday, September 12, 2014 4:46 PM
To: 'Nikl, Lee'
Cc: 'Johnson, Gordon'; Don Parsons; 'Colleen Hughes'; Steve Robertson
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Thanks Lee

I understand from Eric Forgeng of The Archeology Branch that the permit has been issued

I will be distributing the plan to MEM and FLNRO staff for their review and to members of the Env Working Group who have signed confidentiality agreements. I will ask them to provide comments as quickly as possible but no later than Wed Sept 17.

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

On behalf of Mount Polley Mining Corporation, I am pleased to submit to you an erosion and sediment control plan for lower Hazeltine Creek, prepared by SNC Lavalin.

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 11:26 AM
To: 'Don Parsons'; 'Nikl, Lee'
Cc: 'Johnson, Gordon'; 'Colleen Hughes'; 'Steve Robertson'; 'Dale Reimer (dreimer@mountpolley.com)'; Fenwick, Leigh-Ann ENV:EX; Epps, Deb ENV:EX; Metcalfe, Shelley ENV:EX; Weir, David J FLNR:EX; 'nrcoordinator@xatsull.com'; 'Aaron.Higginbottom@williamslakeband.ca'; 'Amy Crook'; 'kirk.dressler@williamslakeband.ca'; Demchuk, Tania MEM:EX; Howe, Diane J MEM:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

As noted previously the expectation of the ministry is that every possible action will be taken to mitigate the potential for this bridge installation to impact Hazeltine Creek. This could include, but not be limited to, reducing pumped flows, diverting water around areas, installation of hay bales and silt fences and other temporary treatment features. I trust that the bridge design is appropriately sized to pass the expected flows in Hazeltine Creek in its new configuration.

"Control" and downstream sampling should be undertaken to determine the effectiveness of the temporary mitigation works relative to the installation of the bridge and any other works undertaken within the spill impacted areas. This will allow for improvement of techniques relative to the specifc site conditions if necessary

It is helpful that the silt curtain at the mouth of Hazeltine Creek is now in place and the development of additional mitigation and treatment works will be of further assistance in protecting the environment.

As much prior notice of specific "works" development is appreciated.

We expect to have additional comments back on the latest version of the Erosion and Sediment Control plan to MPMC by tomorrow. We are interested in receiving as much detail as possible on the temporary and more permanent treatment and mitigation works and the related monitoring and how these works integrate with the CEIA and the level of treatment achieved at particular locations in the receiving environment

I plan to be in WL Thursday and Friday and will try to be in contact

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Don Parsons [mailto:dparsons@imperialmetals.com]
Sent: Tuesday, September 16, 2014 1:43 PM
To: Bunce, Hubert ENV:EX; 'Nikl, Lee'
Cc: 'Johnson, Gordon'; 'Colleen Hughes'; Steve Robertson; Dale Reimer (dreimer@mountpolley.com)
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Hubert

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 11:29 AM
To: Moe, James W FLNR:EX
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

FYI, sorry I had to submit the comments on the sediment control yesterday (I will explain in person) I just sent you the bridge design this morning as mentioned below.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 11:26 AM
To: 'Don Parsons'; 'Nikl, Lee'
Cc: 'Johnson, Gordon'; 'Colleen Hughes'; 'Steve Robertson'; 'Dale Reimer (dreimer@mountpolley.com)'; Fenwick, Leigh-Ann ENV:EX; Epps, Deb ENV:EX; Metcalfe, Shelley ENV:EX; Weir, David J FLNR:EX; 'nrcoordinator@xatsull.com'; 'Aaron.Higginbottom@williamslakeband.ca'; 'Amy Crook'; 'kirk.dressler@williamslakeband.ca'; Demchuk, Tania MEM:EX; Howe, Diane J MEM:EX
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Hubert Bunce

A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
Please consider the environment before printing this email
BC Pollution Free

From: Don Parsons [mailto:dparsons@imperialmetals.com]
Sent: Tuesday, September 16, 2014 1:43 PM
To: Bunce, Hubert ENV:EX; 'Nikl, Lee'
Cc: 'Johnson, Gordon'; 'Colleen Hughes'; Steve Robertson; Dale Reimer (dreimer@mountpolley.com)
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Don Parsons

From: Bunce, Hubert ENV:EX [mailto:Hubert.Bunce@gov.bc.ca]
Sent: Friday, September 12, 2014 4:46 PM
To: 'Nikl, Lee'
Cc: 'Johnson, Gordon'; Don Parsons; 'Colleen Hughes'; Steve Robertson
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

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Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road

Nanaimo BC V9T 6J9
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BC Pollution Free

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

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Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | **T:** +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com | **www.golder.com**

Work Safe, Home Safe

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 11:36 AM
To: 'Douglas (Mobile) Watt'; Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN
Attachments: Mount Polley CEIA & Monitoring Work Plan_140829.pdf

Thanks for these comments Doug

now that the confidentiality agreement is in place attached is the company's CEIA

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Douglas (Mobile) Watt s.22
Sent: Wednesday, September 17, 2014 12:50 AM
To: Bunce, Hubert ENV:EX; Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; Rick Holmes; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Hi Hubert,
I have reviewed the MPMC (SNC Lavalin) Lower Hazeltine Creek Erosion and Sediment Control Plan, with the comments listed below:

1) There are numerous references and referrals to the Comprehensive Environmental Impact Assessment and Action Plan (Aug 15, 2014), the Comprehensive Environmental Impact Assessment Work Plan (Aug 15, 2014) and the Conceptual Interim Erosion and Sediment Control Plan (Aug 21, 2014), none of which I have seen, nor have they been released publicly to the best of my knowledge.

2) I find it difficult to fit this plan into the overall strategy and plan being deployed at MPMC without the overall plan and concepts being available for review as well, not only to the EWG but to the public as well.

3) In section 2.4.2, average hydraulic residence time for Polley Lake is estimated at about 16 years, but section 2.4.3 does not mention what it is for Quesnel Lake. Another source I read suggested in the range of 10 – 11 years for Quesnel Lake, though I don't know if this is true.

4) In section 2.5.2 there is a statement comparing a couple of WQ parameters (pH & dissolved solids) to water in Hazeltine Creek and Polley Lake, but no comparison to Quesnel Lake.

5) In section 3.3 it mentions that the sedimentation ponds will reduce Hazeltine Creek sediment levels by 80% from current levels, but does not provide information on the present levels, nor what the target sediment level will be for discharge into Quesnel Lake, either during the construction period or after with the new permanent channel is operational.

6) Section 5.5.4 mentions constructing fish barriers at the mouth of Edney Creek. What are the plans for the mouth of Hazeltine Creek, both now during salmon spawning, and during the Hazeltine construction period?

7) In section 6.2, can the 10 m interval sediment sampling in Hazeltine Creek be conducted safely before Polley Lake is lowered and the plug stabilized? The timing of this is critical to determining and implementing the CEIA management criteria limits.

8) Other than in a line in figure 10.1 (Project Schedule), there is little detail of the monitoring plans and how they will be executed and used to control the effects on the environment, in particular the sediment levels discharging into Quesnel Lake.

9) Reporting and engineering controls appear to be fairly well covered for the construction by the engineers and contractors with continuous controls and weekly reporting internally, but how is this process going to be monitored by the regulators? Occasional visits by inspectors is unlikely to provide sufficient oversight for the project to ensure that the work is completed in compliance with the CEIA and Work Plan. Is there a plan to continuous on-sight monitoring during construction?

Based on my past experience, it appears that the engineering design and controls appear adequate, but I do expect that this will be a somewhat difficult project to complete based on the terrain and the fact that much of it will need to be completed during the winter months. There will be a very large field fit component during this process, which will make it a challenge to remain within the specifications of the construction plan and the CEIA.

Thanks,
Doug Watt, Likely Chamber Liaison
Likely, BC
Ph 250 790 2446
Cell s.22 (remember, no cell service in Likely)
Email s.22

From: "Bunce, Hubert ENV:EX" <Hubert.Bunce@gov.bc.ca>
Date: Fri, 12 Sep 2014 17:05:33 -0700
To: "Demchuk, Tania MEM:EX" <Tania.Demchuk@gov.bc.ca>, "McConnachie, Jennifer MEM:EX" <Jennifer.McConnachie@gov.bc.ca>, "Weir, David J FLNR:EX" <David.J.Weir@gov.bc.ca>, "Metcalfe, Shelley ENV:EX" <Shelley.Metcalfe@gov.bc.ca>, "Babakaiff, Scott C FLNR:EX" <Scott.Babakaiff@gov.bc.ca>, Douglas Watt s.22 Rick Holmes <carenvir@wlake.com>, "'Aaron.Higginbottom@williamslakeband.ca'" <Aaron.Higginbottom@williamslakeband.ca>, "'nrcoordinator@xatsull.com'" <nrcoordinator@xatsull.com>, "'kirk.dressler@williamslakeband.ca'" <kirk.dressler@williamslakeband.ca>
Cc: "Hill, Douglas J ENV:EX" <Doug.Hill@gov.bc.ca>, "McGuire, Jennifer ENV:EX" <Jennifer.Mcguire@gov.bc.ca>, "Fenwick, Leigh-Ann ENV:EX" <LeighAnn.Fenwick@gov.bc.ca>
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

In the email below you will find a link to Erosion and Sediment control plan developed by SNC for MPMC. If you can review this document and get your comments back to me as soon as possible that would be appreciated, but by Sept 17 at the latest, as we are keen to get information back to the company so that those acceptable works can be implemented

this information is provided in confidence and is for your consideration only and not for distribution at this time.

I look forward to your comments

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX

Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

On behalf of Mount Polley Mining Corporation, I am pleased to submit to you an erosion and sediment control plan for lower Hazeltine Creek, prepared by SNC Lavalin.

This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

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Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | **T:** +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com | **www.golder.com**

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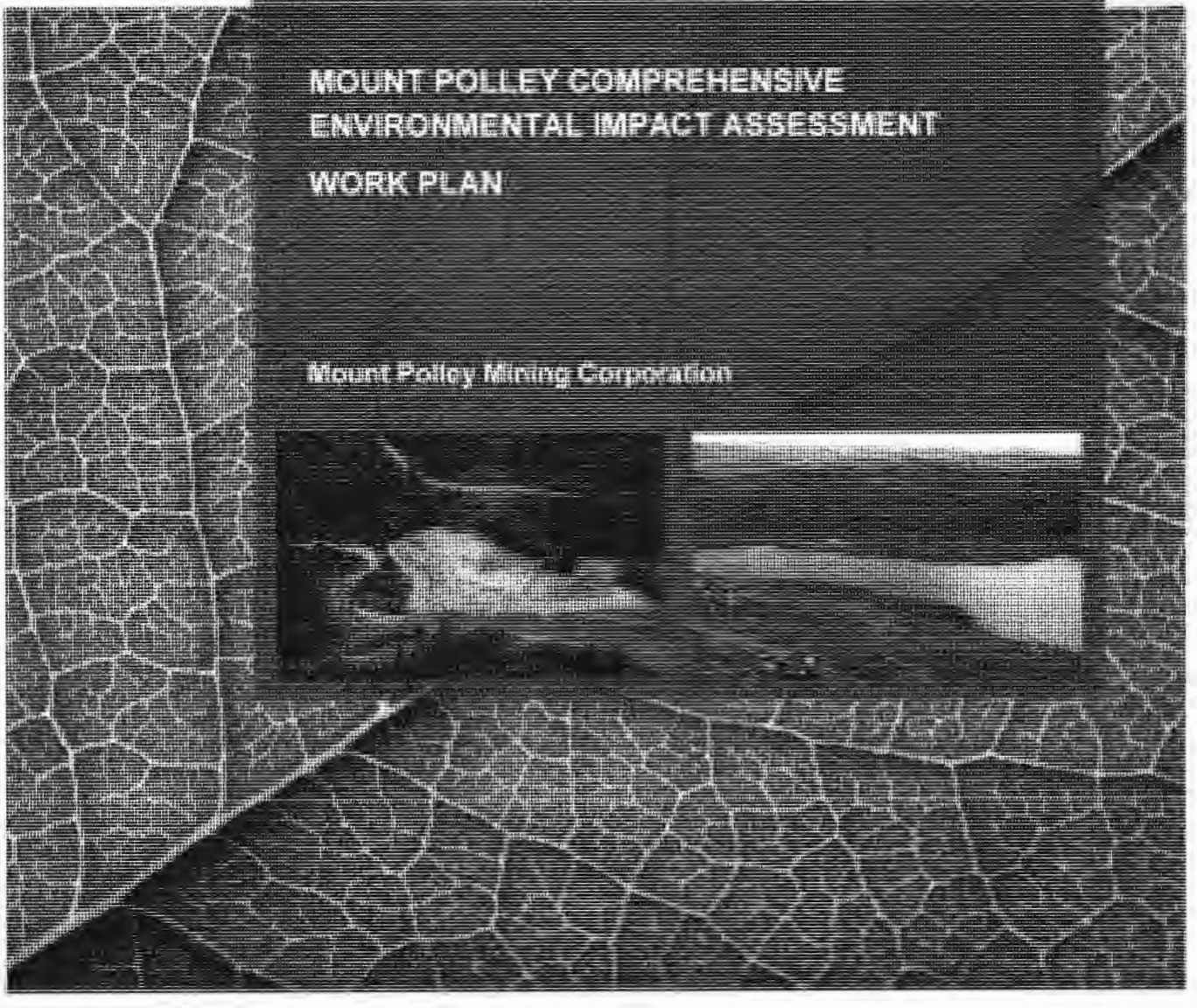
Subject to Solicitor-Client Privilege and
Prepared in Contemplation of Litigation

MOUNT POLLEY COMPREHENSIVE ENVIRONMENTAL IMPACT ASSESSMENT WORK PLAN

Mount Polley Mining Corporation



SNC-LAVALIN INC.

August 29, 2014

621717


SNC·LAVALIN

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 12:14 PM
To: Bunce, Hubert ENV:EX
Cc: Moe, James W FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Comments for the bridge: I spoke with the District Engineering officer and reviewed the temporary bridge design. I have no concerns with the proposal and it is consistent with the Water Act order. My understanding is that the company is committed to resestablishing the permanent access at a different location to be determined with FLNRO. The temporary crossing will now provide access to both sides of the stream channel so the company should probably revisit the Sediment Control structure designs remove the culverts in them and replace them with Rock Weirs?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 11:26 AM
To: 'Don Parsons'; 'Niki, Lee'
Cc: 'Johnson, Gordon'; 'Colleen Hughes'; 'Steve Robertson'; 'Dale Reimer (dreimer@mountpolley.com)'; Fenwick, Leigh-Ann ENV:EX; Epps, Deb ENV:EX; Metcalfe, Shelley ENV:EX; Weir, David J FLNR:EX; 'nrcoordinator@xatsull.com'; 'Aaron.Higginbottom@williamslakeband.ca'; 'Amy Crook'; 'kirk.dressler@williamslakeband.ca'; Demchuk, Tania MEM:EX; Howe, Diane J MEM:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

As noted previously the expectation of the ministry is that every possible action will be taken to mitigate the potential for this bridge installation to impact Hazeltine Creek. This could include, but not be limited to, reducing pumped flows, diverting water around areas, installation of hay bales and silt fences and other temporary treatment features. I trust that the bridge design is appropriately sized to pass the expected flows in Hazeltine Creek in its new configuration.

"Control" and downstream sampling should be undertaken to determine the effectiveness of the temporary mitigation works relative to the installation of the bridge and any other works undertaken within the spill impacted areas. This will allow for improvement of techniques relative to the specifc site conditions if necessary

It is helpful that the silt curtain at the mouth of Hazeltine Creek is now in place and the development of additional mitigation and treatment works will be of further assistance in protecting the environment.

As much prior notice of specific "works" development is appreciated.

We expect to have additional comments back on the latest version of the Erosion and Sediment Control plan to MPMC by tomorrow. We are interested in receiving as much detail as possible on the temporary and more permanent treatment and mitigation works and the related monitoring and how these works integrate with the CEIA and the level of treatment achieved at particular locations in the receiving environment

I plan to be in WL Thursday and Friday and will try to be in contact

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
Please consider the environment before printing this email
BC Pollution Free

From: Don Parsons [mailto:dparsons@imperialmetals.com]
Sent: Tuesday, September 16, 2014 1:43 PM
To: Bunce, Hubert ENV:EX; 'Nikl, Lee'
Cc: 'Johnson, Gordon'; 'Colleen Hughes'; Steve Robertson; Dale Reimer (dreimer@mountpolley.com)
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Hubert
The Gavin Lake Road bridge installation over Hazeltine Creek will begin tomorrow and is planned for completion Friday the 19th. The bridge will allow access to Quesnel Lake and the proposed sediment and erosion control works at the Hazeltine Creek discharge. A local first nation contractor joint venture, Lake Excavating Ltd., has been selected for the work. FLNRO has issued Mount Polley a road use permit authorizing off highway loading of the Gavin Lake Road. On Friday, construction materials will be able to move freely between the mine and Ditch Road. SNC is prepared to supply the supervisors familiar with work of a similar nature as early as Saturday, at which time work can begin.

I would like to start construction of access to the work area as soon as possible. Our intention would be to start the sediment and erosion control works on Saturday.
Please advise.

Regards
Don Parsons

From: Bunce, Hubert ENV:EX [mailto:Hubert.Bunce@gov.bc.ca]
Sent: Friday, September 12, 2014 4:46 PM
To: 'Nikl, Lee'
Cc: 'Johnson, Gordon'; Don Parsons; 'Colleen Hughes'; Steve Robertson
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Thanks Lee

I understand from Eric Forgeng of The Archeology Branch that the permit has been issued

I will be distributing the plan to MEM and FLNRO staff for their review and to members of the Env Working Group who have signed confidentiality agreements. I will ask them to provide comments as quickly as possible but no later than Wed Sept 17.

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9
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From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

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This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

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Lee Nikl

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Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
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Work Safe, Home Safe

Weir, David J FLNR:EX

From: Wells, Duane TRAN:EX
Sent: Wednesday, September 17, 2014 1:04 PM
To: Weir, David J FLNR:EX
Cc: Wiebe, Wes J TRAN:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

s.22

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 12:23 PM
To: Wells, Duane TRAN:EX
Cc: Wiebe, Wes J TRAN:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

Actually, I sent this to you by error. I meant to send you the meeting request for Pierce Creek for Oct 8th relating to Gibraltor Mines.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Wells, Duane TRAN:EX
Sent: Wednesday, September 17, 2014 11:42 AM
To: Weir, David J FLNR:EX; Henley, Margaret TRAN:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

If you want me there I could drive up but Margie should be able to answer any questions you might have.

Cheers
Duane

From: Weir, David J FLNR:EX
Sent: Tuesday, September 16, 2014 8:12 AM
To: Bunce, Hubert ENV:EX; Henley, Margaret TRAN:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Mt Polley September 29th Boat Trip Quesnel Lake

I would like to arrange a boat trip in order to confirm the state of the debris clean up, look at the Kokanee shore spawning areas, and address as many issues as we can prior to the 2015 spring freshet relating to the cleanup. I am proposing September 29th 2015. Please get back to me concerning this as soon as possible.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations

Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 12:26 PM
To: Weir, David J FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Don't think that is necessary as he is not directly involved with the Mt Polley file any longer

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
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2080A Labieux Road
Nanaimo BC V9T 6J9

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 12:16 PM
To: Bunce, Hubert ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Do you want to invite Doug along on the boat trip?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake . BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 11:36 AM
To: 'Douglas (Mobile) Watt'; Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Thanks for these comments Doug

now that the confidentiality agreement is in place attached is the company's CEIA

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Douglas (Mobile) Watt s.22
Sent: Wednesday, September 17, 2014 12:50 AM
To: Bunce, Hubert ENV:EX; Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; Rick Holmes; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Hi Hubert,
I have reviewed the MPMC (SNC Lavalin) Lower Hazeltine Creek Erosion and Sediment Control Plan, with the comments listed below:

1) There are numerous references and referrals to the Comprehensive Environmental Impact Assessment and Action Plan (Aug 15, 2014), the Comprehensive Environmental Impact Assessment Work Plan (Aug 15, 2014) and the Conceptual Interim Erosion and Sediment Control Plan (Aug 21, 2014), none of which I have seen, nor have they been released publicly to the best of my knowledge.

2) I find it difficult to fit this plan into the overall strategy and plan being deployed at MPMC without the overall plan and concepts being available for review as well, not only to the EWG but to the public as well.

3) In section 2.4.2, average hydraulic residence time for Polley Lake is estimated at about 16 years, but section 2.4.3 does not mention what it is for Quesnel Lake. Another source I read suggested in the range of 10 – 11 years for Quesnel Lake, though I don't know if this is true.

4) In section 2.5.2 there is a statement comparing a couple of WQ parameters (pH & dissolved solids) to water in Hazeltine Creek and Polley Lake, but no comparison to Quesnel Lake.

5) In section 3.3 it mentions that the sedimentation ponds will reduce Hazeltine Creek sediment levels by 80% from current levels, but does not provide information on the present levels, nor what the target sediment level will be for discharge into Quesnel Lake, either during the construction period or after with the new permanent channel is operational.

6) Section 5.5.4 mentions constructing fish barriers at the mouth of Edney Creek. What are the plans for the mouth of Hazeltine Creek, both now during salmon spawning, and during the Hazeltine construction period?

7) In section 6.2, can the 10 m interval sediment sampling in Hazeltine Creek be conducted safely before Polley Lake is lowered and the plug stabilized? The timing of this is critical to determining and implementing the CEIA management criteria limits.

8) Other than in a line in figure 10.1 (Project Schedule), there is little detail of the monitoring plans and how they will be executed and used to control the effects on the environment, in particular the sediment levels discharging into Quesnel Lake.

9) Reporting and engineering controls appear to be fairly well covered for the construction by the engineers and contractors with continuous controls and weekly reporting internally, but how is this process going to be monitored by the regulators? Occasional visits by inspectors is unlikely to provide sufficient oversight for the project to ensure that the work is completed in compliance with the CEIA and Work Plan. Is there a plan to continuous on-sight monitoring during construction?

Based on my past experience, it appears that the engineering design and controls appear adequate, but I do expect that this will be a somewhat difficult project to complete based on the terrain and the fact that much of it will need to be completed during the winter months. There will be a very large field fit component during this process, which will make it a challenge to remain within the specifications of the construction plan and the CEIA.

Thanks,
Doug Watt, Likely Chamber Liaison
Likely, BC
Ph 250 790 2446
Cell s.22 (remember, no cell service in Likely)
Email s.22

From: "Bunce, Hubert ENV:EX" <Hubert.Bunce@gov.bc.ca>
Date: Fri, 12 Sep 2014 17:05:33 -0700
To: "Demchuk, Tania MEM:EX" <Tania.Demchuk@gov.bc.ca>, "McConnachie, Jennifer MEM:EX" <Jennifer.McConnachie@gov.bc.ca>, "Weir, David J FLNR:EX" <David.J.Weir@gov.bc.ca>, "Metcalfe, Shelley ENV:EX" <Shelley.Metcalfe@gov.bc.ca>, "Babakaiff, Scott C FLNR:EX" <Scott.Babakaiff@gov.bc.ca>, Douglas Watt s.22 Rick Holmes <carenvir@wlake.com>, "'Aaron.Higginbottom@williamslakeband.ca'" <Aaron.Higginbottom@williamslakeband.ca>, "'nrcoordinator@xatsull.com'" <nrcoordinator@xatsull.com>, "'kirk.dressler@williamslakeband.ca'" <kirk.dressler@williamslakeband.ca>

Cc: "Hill, Douglas J ENV:EX" <Doug.Hill@gov.bc.ca>, "McGuire, Jennifer ENV:EX" <Jennifer.Mcguire@gov.bc.ca>, "Fenwick, Leigh-Ann ENV:EX" <LeighAnn.Fenwick@gov.bc.ca>
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

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I look forward to your comments

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A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751 3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM
To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

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Work Safe, Home Safe

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 1:24 PM
To: Wiebe, Wes J TRAN:EX
Cc: Wells, Duane TRAN:EX
Subject: RE: Mt Polley September 29th Boat Trip Quesnel Lake

Cheryl is trying to contact you with the meeting details. cwilliston@gibraltarmine.com

As this e-mail string relates to a different mine I won't copy her here.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Wiebe, Wes J TRAN:EX
Sent: Wednesday, September 17, 2014 1:05 PM
To: Weir, David J FLNR:EX
Cc: Wells, Duane TRAN:EX
Subject: Re: Mt Polley September 29th Boat Trip Quesnel Lake

Hi David do you have a time an location

Thanks

Wes

Sent from my iPhone

On Sep 17, 2014, at 12:23 PM, "Weir, David J FLNR:EX" <David.J.Weir@gov.bc.ca> wrote:

> Actually, I sent this to you by error. I meant to send you the meeting request for Pierce Creek for Oct 8th relating to Gibraltor Mines.
>
> David Weir
> Water Section Head,
> Ministry of Forest Lands and Natural Resource Operations
> Williams Lake , BC
> David.J.Weir@gov.bc.ca
> (250) 398 4924
> Cell 250 267-5925
>
> **From:** Wells, Duane TRAN:EX
> **Sent:** Wednesday, September 17, 2014 11:42 AM
> **To:** Weir, David J FLNR:EX; Henley, Margaret TRAN:EX
> **Subject:** RE: Mt Polley September 29th Boat Trip Quesnel Lake

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Cheers
Duane

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Sent: Tuesday, September 16, 2014 8:12 AM
To: Bunce, Hubert ENV:EX; Henley, Margaret TRAN:EX; XT:Carpenter, Penny FLNR:IN; Williston, Lee X FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Wells, Duane TRAN:EX; Wiebe, Wes J TRAN:EX; Fenwick, Leigh-Ann ENV:EX
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(250) 398 4924
Cell 250 267-5925

Weir, David J FLNR:EX

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 1:34 PM
To: Hoffos, Robin FLNR:EX; Epps, Deb ENV:EX
Cc: Stewart, Rodger W FLNR:EX; McLeod, Joanne FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Now that I am confident communication lines are open I no longer need to be cc'd on these.

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Hoffos, Robin FLNR:EX
Sent: Wednesday, September 17, 2014 9:09 AM
To: Epps, Deb ENV:EX
Cc: Stewart, Rodger W FLNR:EX; Weir, David J FLNR:EX; McLeod, Joanne FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Thanks. Joanne McLeod provided some initial comments on the EIA. There were some notable land use designations that the EIA fails to mention and it remains unclear whether a choice has been made in regards to the future of Hazeltine creek. The term "rehabilitation" is used. Depending upon the conditions and costs, it may be far more reasonable to compensate for habitat losses at Hazeltine Ck if provided there are ways of preventing continued sedimentation input to Quesnel Lake. I hope those options are still on the table and we can provide input as appropriate.

Cheers.

From: Epps, Deb ENV:EX
Sent: Wednesday, September 17, 2014 8:43 AM
To: Weir, David J FLNR:EX; Hoffos, Robin FLNR:EX
Cc: Stewart, Rodger W FLNR:EX
Subject: Re: INFO : Coordination of planning and practice for Mt. Polley restoration

Hi Dave,

Thanks for the note and I understand your concerns. Things are moving fast. If you or Robin have any specific comments from the sediment and erosion control document itself, please pass them on to me so we can include them in our response to MPMC. They are on a really tight timeframe with our comments due today by end of day. I will also endeavour to keep you and other FLNRO staff in the loop when reports come in and when discussions are occurring regarding compensation and/or habitat mitigation. I believe FLNRO habitat staff reviewed the comprehensive EIA and provided comments as well.

If you wish to discuss anything please don't hesitate to call or send me an email. I will be in WL on Friday.

Deb

Sent from my BlackBerry Wireless Handheld

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 08:22 AM
To: Epps, Deb ENV:EX; Hoffos, Robin FLNR:EX
Cc: Stewart, Rodger W FLNR:EX
Subject: RE: INFO : Coordination of planning and practice for Mt. Polley restoration

Hello Deb,

My specific role is mostly related to the stability and public safety aspects around Mt Polley, Hazeltine Creek and Quesnel Lake. To that affect I issued orders to the company regarding management of the lake level on Polley Lake and debris removal from the water bodies. However, as you are probably aware there is a habitat component in the water act and as part of my due diligence I wish to confirm that this component is addressed. I see that one of our biologists is on the working group. I am concerned in reading the sediment and control plan for Hazeltine Creek that the conversation about habitat compensation might move past the point of meaningful input from our habitat group due to the real need for operational expediency. Can you assure me that you will engage Robin at the appropriate time?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 4:37 PM
To: Weir, David J FLNR:EX
Subject: INFO : Coordination of planning and practice for Mt. Polley restoration

For your reference.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
Williams Lake, BC
V2G 4T1
cell (250) 305 8536, desk (250) 398 4549
fax (250) 398 4214

From: Bunce, Hubert ENV:EX
Sent: Tuesday, September 16, 2014 4:31 PM
To: Stewart, Rodger W FLNR:EX
Cc: Epps, Deb ENV:EX
Subject: RE: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Restoration of the terrestrial and aquatic areas of the spill impacted areas are still some way off and we are currently working on short term corrective and mitigation strategies as a priority. Ie seeding of impacted areas occurred late last week but plans for long term vegetation recovery have yet to be defined

Deb Epps is leading our response to the mines proposal on the environmental assessment and restoration biological mine and would be your best point of contact. Environmental Protection is very interested in getting input from other agencies regarding best potential courses of action for the mine impacted areas.

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:51 PM
To: Bunce, Hubert ENV:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Hubert, what say you respecting the circumstances FLNR regional operations finds itself in?

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
400 - 640 Borland Street
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fax (250) 398 4214

From: McGuire, Jennifer ENV:EX
Sent: Tuesday, September 16, 2014 1:11 PM
To: Stewart, Rodger W FLNR:EX; Bunce, Hubert ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Roger,

Hubert would be the best person to speak to. Hubert is the RD - responsible for Mount Polley.

Jennifer

Sent from my BlackBerry 10 smartphone on the TELUS network.

From: Stewart, Rodger W FLNR:EX
Sent: Tuesday, September 16, 2014 1:04 PM
To: McGuire, Jennifer ENV:EX
Cc: Hoffos, Robin FLNR:EX; Vanderburgh, Ken FLNR:EX
Subject: QUESTION : Coordination of planning and practice for Mt. Polley restoration

Jennifer, could you please direct me to the correct contact responsible for coordinating inter-agency deliberations respecting planning and selection of practices for restoration of areas impacted by the My Polley event?

We are aware of the submission made by Imperial Metals in response to the Ministry of Environment pollution abatement order. We know that works undertaken consistent with the pollution abatement submission may serve for

purposes of addressing specific pollution abatement matters. However, it would appear that restoration works are a substantively different matter. Or are they? We simply do not know enough at this point.

We at FLNR regional operations face substantive uncertainty as to the schedule of planning for works leading to restoration of terrestrial and aquatic ecosystems at the impact sites (where practicable). It is expected that such enterprise would require inter-agency deliberation, yet we (in a supporting role) have no specific information as to who has lead responsibility for various elements of this project.

Hope you might be able to point us in the correct direction.

Rodger Stewart
Director, Resource Management
Ministry of Forests, Lands and Natural Resource Operations
Cariboo Region
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Williams Lake, BC
V2G 4T1
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fax (250) 398 4214

Weir, David J FLNR:EX

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 1:36 PM
To: Weir, David J FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Sorry I thought you meant Doug Hill, feel free to invite Doug Watt

Hubert Bunce
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BC Pollution Free

From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 1:33 PM
To: Bunce, Hubert ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Doug Watt?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 12:26 PM
To: Weir, David J FLNR:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Don't think that is necessary as he is not directly involved with the Mt Polley file any longer

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From: Weir, David J FLNR:EX
Sent: Wednesday, September 17, 2014 12:16 PM
To: Bunce, Hubert ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Do you want to invite Doug along on the boat trip?

David Weir
Water Section Head,
Ministry of Forest Lands and Natural Resource Operations
Williams Lake , BC
David.J.Weir@gov.bc.ca
(250) 398 4924
Cell 250 267-5925

From: Bunce, Hubert ENV:EX
Sent: Wednesday, September 17, 2014 11:36 AM
To: 'Douglas (Mobile) Watt'; Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; 'Rick Holmes'; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: RE: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Thanks for these comments Doug

now that the confidentiality agreement is in place attached is the company's CEIA

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

From: Douglas (Mobile) Watt s.22
Sent: Wednesday, September 17, 2014 12:50 AM
To: Bunce, Hubert ENV:EX; Demchuk, Tania MEM:EX; McConnachie, Jennifer MEM:EX; Weir, David J FLNR:EX; Metcalfe, Shelley ENV:EX; Babakaiff, Scott C FLNR:EX; Rick Holmes; 'Aaron.Higginbottom@williamslakeband.ca'; 'nrcoordinator@xatsull.com'; 'kirk.dressler@williamslakeband.ca'
Cc: Hill, Douglas J ENV:EX; McGuire, Jennifer ENV:EX; Fenwick, Leigh-Ann ENV:EX
Subject: Re: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Hi Hubert,
I have reviewed the MPMC (SNC Lavalin) Lower Hazeltine Creek Erosion and Sediment Control Plan, with the comments listed below:

1) There are numerous references and referrals to the Comprehensive Environmental Impact Assessment and Action Plan (Aug 15, 2014), the Comprehensive Environmental Impact Assessment Work Plan (Aug 15, 2014) and the Conceptual Interim Erosion and Sediment Control Plan (Aug 21, 2014), none of which I have seen, nor have they been released publicly to the best of my knowledge.

2) I find it difficult to fit this plan into the overall strategy and plan being deployed at MPMC without the overall plan and concepts being available for review as well, not only to the EWG but to the public as well.

3) In section 2.4.2, average hydraulic residence time for Polley Lake is estimated at about 16 years, but section 2.4.3 does not mention what it is for Quesnel Lake. Another source I read suggested in the range of 10 – 11 years for Quesnel Lake, though I don't know if this is true.

4) In section 2.5.2 there is a statement comparing a couple of WQ parameters (pH & dissolved solids) to water in Hazeltine Creek and Polley Lake, but no comparison to Quesnel Lake.

5) In section 3.3 it mentions that the sedimentation ponds will reduce Hazeltine Creek sediment levels by 80% from current levels, but does not provide information on the present levels, nor what the target sediment level will be for discharge into Quesnel Lake, either during the construction period or after with the new permanent channel is operational.

6) Section 5.5.4 mentions constructing fish barriers at the mouth of Edney Creek. What are the plans for the mouth of Hazeltine Creek, both now during salmon spawning, and during the Hazeltine construction period?

7) In section 6.2, can the 10 m interval sediment sampling in Hazeltine Creek be conducted safely before Polley Lake is lowered and the plug stabilized? The timing of this is critical to determining and implementing the CEIA management criteria limits.

8) Other than in a line in figure 10.1 (Project Schedule), there is little detail of the monitoring plans and how they will be executed and used to control the effects on the environment, in particular the sediment levels discharging into Quesnel Lake.

9) Reporting and engineering controls appear to be fairly well covered for the construction by the engineers and contractors with continuous controls and weekly reporting internally, but how is this process going to be monitored by the regulators? Occasional visits by inspectors is unlikely to provide sufficient oversight for the project to ensure that the work is completed in compliance with the CEIA and Work Plan. Is there a plan to continuous on-sight monitoring during construction?

Based on my past experience, it appears that the engineering design and controls appear adequate, but I do expect that this will be a somewhat difficult project to complete based on the terrain and the fact that much of it will need to be completed during the winter months. There will be a very large field fit component during this process, which will make it a challenge to remain within the specifications of the construction plan and the CEIA.

Thanks,
Doug Watt, Likely Chamber Liaison
Likely, BC
Ph 250 790 2446
Cell s.22 (remember, no cell service in Likely)
Email s.22

From: "Bunce, Hubert ENV:EX" <Hubert.Bunce@gov.bc.ca>
Date: Fri, 12 Sep 2014 17:05:33 -0700
To: "Demchuk, Tania MEM:EX" <Tania.Demchuk@gov.bc.ca>, "McConnachie, Jennifer MEM:EX" <Jennifer.McConnachie@gov.bc.ca>, "Weir, David J FLNR:EX" <David.J.Weir@gov.bc.ca>, "Metcalfe, Shelley ENV:EX" <Shelley.Metcalfe@gov.bc.ca>, "Babakaiff, Scott C FLNR:EX" <Scott.Babakaiff@gov.bc.ca>, Douglas Watt s.22 Rick Holmes <carenvir@wlake.com>, "'Aaron.Higginbottom@williamslakeband.ca'" <Aaron.Higginbottom@williamslakeband.ca>, "'nrcoordinator@xatsull.com'" <nrcoordinator@xatsull.com>, "'kirk.dressler@williamslakeband.ca'" <kirk.dressler@williamslakeband.ca>
Cc: "Hill, Douglas J ENV:EX" <Doug.Hill@gov.bc.ca>, "McGuire, Jennifer ENV:EX" <Jennifer.Mcguire@gov.bc.ca>, "Fenwick, Leigh-Ann ENV:EX" <LeighAnn.Fenwick@gov.bc.ca>
Subject: FW: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

In the email below you will find a link to Erosion and Sediment control plan developed by SNC for MPMC. If you can review this document and get your comments back to me as soon as possible that would be appreciated, but by Sept 17 at the latest, as we are keen to get information back to the company so that those acceptable works can be implemented

this information is provided in confidence and is for your consideration only and not for distribution at this time.

I look forward to your comments

Hubert Bunce
A/Mining Director, Environmental Protection
Regional Operations
ph (250) 751-3254 fax (250) 751-3103
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Nanaimo BC V9T 6J9

From: Nikl, Lee [mailto:Lee_Nikl@golder.com]
Sent: Friday, September 12, 2014 2:54 PM

To: Bunce, Hubert ENV:EX
Cc: Johnson, Gordon; Don Parsons (dparsons@imperialmetals.com); Colleen Hughes; Steve Robertson
Subject: LOWER HAZELTINE EROSION AND SEDIMENT CONTROL PLAN

Dear Mr. Bunce,

On behalf of Mount Polley Mining Corporation, I am pleased to submit to you an erosion and sediment control plan for lower Hazeltine Creek, prepared by SNC Lavalin.

This plan is part of Mount Polley's efforts to limit the release of turbid waters to Quesnel Lake. The work proposed is part of our continuing incident response and was presented in summary form to the community of Likely on the evening of September 10th. Ministry staff were also present at that meeting.

We are providing this detailed plan to the Ministry for their review and we would ask that you provide us with prompt and specific feedback as we are planning to proceed with this work without delay. We are concurrently addressing matters such as the Archaeological permit and logisitics with respect to undertaking the physical works described in the plan. In the interest of expediency, we are submitting this to you in electronic form. If you require this in hard copy, please advise.

We look forward to your comments.

To access the file, it can be downloaded from the link below. Please note that this link will work for anyone to whom you forward this email. I have done it that way to facilitate your distribution. However, please be sure that you have confidence that parties receiving this email from you will not forward past the intended audience if access security is to be maintained.

Lee Nikl

File(s) will be available for download until **12 October 2014**: File: Erosion Sed Combined Plan_MPMC_signed_Sept112014.pdf, 15,142.90 KB

Lee Nikl (M.Sc., R.P.Bio.) | Principal / Senior Environmental Scientist | **Golder Associates Ltd.** | 500 - 4260 Still Creek Drive, Burnaby, British Columbia, Canada V5C 6C6
D: +1.604.297.2016 | **T:** +1.604.296.4200 | **F:** +1.604.298.5253 | **C:** +1.778.231.6636 | **E:** Lee_Nikl@golder.com | **www.golder.com**

Work Safe, Home Safe

APPENDIX B

Construction Specifications

SNC·LAVALIN	Construction/Installation Specification Erosion and Sediment Control	Page 1 of 14	
		Revision	
	621717-LH-GS-001	No.	Date
		PA	2014-09-11

CLIENT: Mount Polley Mining Corporation

PROJECT: Lower Hazeltine Creek Erosion and Sediment Control Plan

		SIGNATURE	DATE
PREPARED BY (Geotechnical Engineer):	J. Zandbergen		
REVIEWED BY (Fluvial Geomorphologist):	L. Burge		
APPROVED BY (Project Manager):	G. Johnson		

ISSUE/REVISION INDEX

Issue Code	Revision Details					
	Rev. No.	Prep. By	Rev. By	App. By	Date	
RR	PA	J.Z.	A.K.	G.J	2014-09-11	Released for Review and Comments

Issue Codes: RC = Released for Construction, RD = Released for Design, RF = Released for Fabrication, RI = Released for Information, RP = Released for Purchase, RQ = Released for Quotation, RR = Released for Review and Comments, RU = Released for use.

TABLE OF CONTENTS

1.0 INTRODUCTION

This specification complements the technical requirements for construction of the Lower Hazeltine Creek Erosion and Sediment Control Plan Works.

2.0 RELEVANT CODES & STANDARDS

2.1 Codes, Standards & Regulations

Works to be performed in response to Pollution Abatement Order No 107461. Where a conflict exists between the following regulatory documents and the Order, Notify the Engineer for clarification.

Canada	*Fisheries Act.*
Canada	*Canada Seed Act.*
Canada	*Fertilizers Act* and Fertilizer Regulations
British Columbia	Health, Safety and Reclamation Code for Mines in British Columbia.
British Columbia	WorksafeBC Health and Safety Regulations.
British Columbia	*Environmental Management Act.*
British Columbia	*Mines Act.*
British Columbia	*Water Act*
British Columbia	*Forest and Range Practices Act.*
British Columbia	*Forest Act*
British Columbia	Guidelines by the Native Plant Society of British Columbia, and BC *Weed Control Act* and Regulations.

2.2 Drawings

Review these Drawings and report in conjunction with the following project specifications:

LOWER HAZELTINE CREEK EROSION AND SEDIMENT CONTROL PLAN	
621717-LH-001	COVERSHEET
621717-LH-002	EXISTING CONDITIONS
621717-LH-003	PLAN VIEW OF WORKS
621717-LH-004	CHANNEL PLAN VIEW ABOVE SEDIMENTATION PONDS
621717-LH-005	SEDIMENTATION BASINS PLAN VIEW
621717-LH-006	RIVER SECTIONS AND CHANNEL REACH PROFILE
621717-LH-007	SEDIMENTATION BASIN SECTIONS
621717-LH-008	SEDIMENTATION BASINS AND CREEK REACH PROFILES
621717-LH-009	TEMPORARY ACCESS ROADS PLAN VIEW AND CROSS SECTION
621717-LH-010	BANK STABILIZATION – PLAN VIEW AND DETAILS

3.0 WORKSITE DESIGN CRITERIA

In accordance with the report entitled *Lower Hazeltine Creek Erosion and Sediment Control Plan.*

4.0 TECHNICAL REQUIREMENTS

4.1 Interface & Coordination

Inspect existing facilities and work previously completed by others. Take all necessary field measurements to ensure new work ties in to and matches existing installations.

Provide written notification to the Engineer of all discrepancies including between drawings and field conditions and propose any rectification, remedial works, or adjustments and obtain the Engineer's written approval prior to proceeding with the work.

Coordinate and schedule the Works with the work of others or as directed by the Engineer.

Check that clearing, grubbing and other site preparation, if any, are satisfactory for the Works of this specification to proceed.

4.2 Environmental

During execution of the Works, protect the general environment from damage by complying with environmental guidelines and regulations.

Notify the Engineer and appropriate agencies and parties immediately in the event of any environmental spills or potential incidents.

Maintain silt fences and any protective measures installed by others to prevent silt run-off from work areas to the environment. If necessary, install additional silt fences or other measures as directed by the Engineer.

4.3 Delivery, Handling & Storage

Receive at site all equipment and materials necessary to complete the work. Handle equipment and materials to prevent damage and store in designated areas.

Store aggregates and granular materials separately from other materials. Stockpile and protect all materials from contamination and prevent segregation prior to their usage. Deliver, stockpile and handle materials using proper equipment.

Remove from site or relocate on site all the materials that become segregated or contaminated with foreign matter as directed by the Engineer. Alternatively, any segregated material can be remixed to provide uniform gradation.

4.4 Protection

Protect the work and the work of others from damage during construction/installation. Make good all damage caused at no cost to the Owner. Immediately notify the Owner of any contact or damage to buried utilities or structures.

Support, brace, and protect utilities, structures and properties adjacent to and within all excavations.

Protect the excavations from the inflow of water from natural surface drainage. Obtain approval of the Engineer for the construction of temporary berms and/or ditches to divert water away from excavations.

4.5 Tolerances

Work complying with the following horizontal location tolerances will be accepted.

Stripping and bulk excavations:

- Perimeter location +/- 1 m

Placement of embankments, berms and mass fill:

- Perimeter location +/- 1 m

Excavation of ponds, drainage ditches and diversion channels

- Centre line location +/- 1 m

4.6 Equipment & Materials

The Contractor is responsible for providing and maintaining all equipment and for taking all measures to ensure the safety of operations and equipment is free of leaks and contamination.

Contractor is responsible for advance testing of all materials proposed to be incorporated at the site by the Contractor. Engineer to approve of all fill materials prior to placement.

4.6.1 Definitions

Earthworks

Include stripping and stockpiling, rough grading, common excavation, disposal of unsuitable ground material and excess material, placing and compacting of fill, borrowing of suitable fill material as required to complete the works.

Common Excavation

Excavation of all materials such as earth, muck, clay, hardpan, soft shale, sand, gravel and any material that can be removed without drilling and blasting, except those materials classified under stripping and rock excavation.

Authorized Over-excavation

Additional excavation defined and required as a result of unsuitable natural soil conditions. Replacement fill shall be placed and compacted in accordance with this specification.

Unauthorized Over-excavation

Additional excavation obtained by the result of the Contractor's operation or over-excavation by Contractor's error. Replacement fill shall be placed and compacted in accordance with this specification, but at no additional cost to the Owner.

Unstable or Unsuitable Ground

As applied to existing ground, means either materials in a loose state, materials which are too wet, frozen, materials containing organic or other deleterious matter, materials having poor characteristics of grading and compaction, materials having other characteristics which would result in undesirable ground movement under loading from foundations, fills or other superimposed loads, or materials which do not meet the requirements of the specifications provided. However, this definition permits compacting, drying, dewatering and any other remedial work, improvements or processing where such action is required or permitted by the specifications or the Engineer.

Unstable or Unsuitable Fill

As applied to fill material, means either too wet, too dry, containing organic or other deleterious matter, having poor characteristics of grading and compaction, having other characteristics which result in undesirable settlement or other movement of the fill or within the fill, or otherwise not meeting the requirements of the specifications. However, this definition permits soil-conditioning (drying, dewatering, watering), compaction, and any other processing or reprocessing to make the material stable and suitable prior to incorporating it into the fill as permitted by the specifications or the Engineer.

Sound or Suitable Ground

As applied to existing ground, means undisturbed materials, being compact and having the required bearing capacity, stability and other required characteristics as determined by the Engineer.

Sound or Suitable Fill

Meaning material free of deleterious matter, suitably graded and can be compacted to a stable mass after any handling or re-handling and have the required bearing capacity and stability characteristics as determined by the specifications or the Engineer.

4.6.2 Construction Excavation, Fill, In-Situ Materials, Geosynthetics

The majority of the granular materials will be obtained by excavating and screening materials from the sedimentation basins, cutting the creek embankments or from Mount Polley Mine.

Mine waste rock will be screened, graded and separated into stockpiles.

Mine waste rock for use in the Works shall consist of material cleared as not having potential to generate acid or metal leaching.

River gravel will be graded and separated into stockpiles with grain sizes > 200 mm, 75 to 200 mm, 20 to 75 mm and < 20 mm.

Rip rap: 10 kg Class, angular shaped rock conforming with BC Ministry of Transportation and Infrastructure, Standard Specifications for Highway Construction, Tables 205-A and 205-B.

Organic materials and debris will consist of logs, tree limbs, shrubs and organic mulch.

Geogrid - Layfield RX1200 geogrid or equivalent.

Woven geotextile – Propex 2000 or equivalent.

Non-woven geotextile – Propex 4510 or equivalent.

Erosion control blankets – North American Green Bionet SC150BN or equivalent.

4.7 Preparation

In addition to Section 4.1 Interface and Coordination, prior to commencing the works, thoroughly examine existing facilities and work previously completed by others upon which these works are dependent. Provide written notification to the Engineer of all discrepancies that affect the works, and propose any rectification, remedial works, or adjustments, and obtain the Engineer's written approval prior to proceeding. Check that clearing, grubbing, and other site preparation works, if any, are satisfactory for the works under excavation and fill-general to proceed.

Set out the works and maintain all control points and bench marks to ensure accuracy of the works.

The locations of existing buried pipelines, cables, conduits and structures, shall be located before commencing the Works and clearly marked to prevent disturbance during the work. Record the site verified location of all existing, abandoned or re-routed utilities on the applicable as-built drawings.

Any trial excavations deemed necessary for locating the position of underground services shall be excavated by hand, by hydrovac, or by other appropriate measures in accordance with Worksafe BC regulations and/or Mount Polley Mining Corporation (MPMC) policy and/or the Health, Safety and Reclamation Code for Mines in BC.

If damages to existing facilities or structures occurred during earthworks operations; repair all damages at no additional cost to the Owner.

Unless otherwise directed, perform no permanent structural fill placement when the ground is frozen, during periods of snow, rain, or other unsuitable conditions.

4.8 Access Roads (Existing, Temporary, Permanent)

Work with MPMC to obtain approval from the Minister of Forests, Lands and Natural Resource Operations for use of and construction on an adjacent to the Ditch Road/Horsefly Likely Forest Service Road.

Any existing access roads used by the Contractor shall be maintained by the Contractor.

Maintain all existing, temporary and permanent access roads for the duration of performance of contract.

Maintenance consists of making good any wear, tear and damage arising out of construction operations. It also includes the removal of snow and ice, dust control and the provision of all signs, fences, barricades, gatemen, flagpersons, flares, lights, and other required measures.

Construct and maintain any additional temporary access roads as may be required to perform excavation and fill activities. The location of temporary access roads, not shown on the drawings, will be approved in writing by the Engineer.

Construction of additional access roads includes improvement of existing roads which the Contractor may require to perform the work.

4.9 Execution

4.9.1 Clearing and Grubbing

Clearing is to consist of

- Collection of organic debris as a result of the TSF breach;
- Cutting and slashing trees (except merchantable timber);
- Cutting and slashing brush;
- Cutting and decking merchantable timber within the designated area.

Before starting work, conduct with the Engineer a condition survey of existing First Nations, cultural and heritage resources, bench marks and monuments, buried utilities, service poles, wires, structures, buildings, trees, wetlands, active nests or other species and other plants or structures which need to be preserved that may be affected by work.

Delineate the area to be cleared by use of flagging or other survey marks. Obtain approval from the Engineer prior to clearing.

Clear the area within the limits of all vegetation, both living and dead, all minor man-made structures, all rubbish and other materials which, in the opinion of the Engineer, are unsuitable for use in the works.

Cut off trees, brush and vegetation to within 150 mm above the natural grade. Process and set aside trees as required for root wads and other habitat structures in Hazeltine Creek as shown on the drawings. Remaining trees shall be de-limbed and segregated where larger than 150 mm average diameter. Cut remaining tree trunks to lengths between (3) three to (4) four meters or as directed by the MPMC or the Engineer. Neatly stockpile de-limbed tree trunks. Pile up and remove to disposal area the balance of cut trees, tree limbs, brush and vegetation as approved by the Engineer.

Ensure that that there is no damage to any trees outside the limits of clearing specified or directed by the Engineer. Cleared material is not to be cut or buildozed into areas not specified to be cleared.

Grubbing is to consist of the removal and stockpiling of wood or root matter including stumps, roots and root systems on and below the ground surface.

Clear all undergrowth, brush and debris remaining from tree clearing operations.

The grubbing operations include the stripping of topsoil material and stockpiling for re-use in reclamation.

Collect all material and stockpile near the edge of the worksite or as directed by the Engineer. Remove all surface boulders and stockpile them for re-use in creek rehabilitation works (rock riffles etc).

Do not bury any materials resulting from clearing and grubbing operations. Dispose of all materials, except merchantable wood, as directed by the Engineer. Disposal of materials in areas other than those designated by the Engineer is not permitted.

4.9.2 Mulching

A woodchip mulch shall be developed and stockpiled from the woody debris that was collected during clearing and grubbing, for re-use in reclamation.

4.9.3 Temporary Access Roads

Roads will be constructed on the fluvial delta that was affected by the TSF breach along the alignment proposed in the drawings.

Field fit temporary access road alignment to relatively high firm ground. Remove weak material and fill with adequate fill as directed by the Engineer.

Place non-woven geotextile in accordance with Manufacturer's Instructions on the subgrade surface in lower, soft and/or wet areas that may be prone to subgrade failure during trafficking. Place geogrid on the compacted first lift, in two parallel rolls parallel to the road centerline along the alignments proposed in the drawings, side by side, with a 300 mm overlap spanning 7.5 m. Place temporary road gravel in a single, continuous lift, grade and compact to develop a smooth trafficable surface. Cover the geogrid with at least 250 mm of the imported 75 mm minus granular fill and compact it to the satisfaction of the Engineer.

Proof roll with a loaded haul truck to ensure deflection does not exceed 100 mm. Where soft spots and excess deflection are observed during proof rolling or afterward during construction of the Works, repair the areas as directed by the Engineer. Repair may comprise subexcavation to the subgrade in areas without non-woven geotextile, followed by placement of non-woven geotextile and granular fill and geogrid. Thicker granular fill may be locally required. As well, subsurface drainage or lead-off ditches or other subgrade improvement techniques may be employed in collaboration with the Engineer.

Place corrugated steel pipe culverts under the segment of the access road between the two proposed sedimentation basins as shown on the drawings.

4.9.4 Bank Stabilization

The method for bank stabilization will be selected in the field by the Engineer during implementation to account for the conditions that are encountered. The drawings provide typical sections and locations of bank stabilization methodology.

Cut and fill all embankments to a slope no greater than 2H:1V.

Place materials as directed by the Engineer for the chosen method for bank stabilization.

In the case of construction adjacent to the creek channel, do not free drop materials into water.

Ensure embankments are smooth and free of debris from potentially rolling down slope.

4.9.5 Creek Channel Works

1. All in-stream work shall be undertaken with written consent from the appropriate agencies which may be during an approved fisheries construction window or other time.
2. All equipment used near the stream shall be clean, free of leaks and in good operating condition. Spill kits must be carried at all times, and workers must be trained in their use.
3. Riffle to be constructed of angular, well-graded competent rock and/or riprap as specified. Riprap shall be competent and resistant to physical breakage and abrasion as well as degradation and dissolution in water. Shale, sandstone, thinly bedded rock, volcanic rock shall not be utilized.

4. Larger boulders used to anchor the riffle face dissipate energy and create low flow channels. V-shape the crest and face it inwards down to the centre-line of the riffle to concentrate low flow. Ensure a gentle transition into existing substrates at the downstream edge of the riffle.
5. Begin construction at riffle crest using large keystones (80 cm diameter or larger). Key riffle crest into existing large keystones or bedrock or into a shallow trench approximately 30 cm deep in sediment. Build riffle crest across the stream with large diameter keystone boulders; place a second row of next largest stones downstream.
6. Construct riffle crest slightly higher (10 to 15 cm) than design grades to allow for settling in and adjustment of the rocks in the first few post-construction, high flow events.
7. Cable keystones to bedrock where bedrock is competent on the banks or bed. Large riffle rocks to be cabled together to increase riffle structure resistance. Drill holes through keystones and pull cable through like the string of a necklace and anchor on channel banks to bedrock. String large second row keystones same as above. Additional row keystones (5-8) to be cabled to upstream keystones using rock bolts in a line or V.
8. A resin or grout-anchored rock bolt, at least 300 mm embedment depth into the rock and/or riprap particles is to be used for bedrock. The bolts may be installed untensioned, and fully grouted along their length. Use Dywidag Threadbar Reinforcing Steel or equivalent, Grade 60 or better, 19 mm diameter or greater. Use 152mm long and 13mm diameter anchor eye bolts for keystones. Drill hole diameters and lengths for the anchors and perform resin or grout anchoring according to the manufacturer's instructions based on the grade and diameter of the rock bolt. Competent riprap or bedrock is important to hold anchors in place and retain the large diameter. Use minimum 10mm galvanized cable (MIL-DTL-83420M or similar).
9. Materials: Riffle contains a range of rock sizes, gravels and sands to ensure that interstices between large rocks are infilled and compacted. Riffle riprap to be a range of size from 10cm to 80cm. The volume of materials required is 30% greater than the riffle volume to allow for in-filling and packing around large rocks and cobbles. Sand and gravel - 30% of volume.
10. Infill the volume with the whole range of rip rap rock sizes. Infill the spaces between rocks with cobbles and gravels so that there are no voids in riffle structure. Finish the upper surfaces of the downstream face with large (round if available) emergent rocks to create 3 or 4 paths through the riffle at different stages.
11. For tie-ins of riprap at upstream and downstream of construction limits and riffle crest: anchor/embed each rock as required into the existing streambed, with custom holes for each rock or trenches of rocks, and bucket-tamped into place, and backfilled with excavated material.
12. Randomly place rocks on the downstream face to dissipate energy and create low flow fish passage channels. Place rocks in contact with large rocks downstream to increase structure resistance.
13. On the banks: rip-rap both banks with embedded boulders and cobbles to at least 2 m elevation above the riffle crest elevation. Size of riprap to be 33cm (D_{50}). For keying riprap into channel banks: remove by sub-excavating locally unsuitable materials then place riprap onto channel banks. Riprap minimum thickness 50 cm.
14. Tree root wads will be added into the rip rap so that the trunk of the tree faces downstream at an angle of approximately 15 to 30° away from the river flow direction. Tree trunks will be at least 6 meters long and preferably 8 meters long and a minimum diameter of 30 cm and

preferably 40 cm. The trunk will be buried in a trench the depth of the average future creek water level and backfilled with hand tamping using excavated soil.

15. Each trunk will be anchored in place with large (>80 cm) boulders placed upstream and downstream of the tree trunk at the root wad-trunk interface.
16. Tree trunks with root wads will be held in place with chains/wire rope anchored into the large boulders using a rock bolt. Install rock bolts according to the manufacturer's instructions. Competent rock in boulders is important to hold anchors in place and retain the large diameter. Use galvanized spikes to attach cables to tree trunks.
17. 6 meter to 8 meter long longs with minimum diameter of 30 cm that include branches will be chained/cabled onto the upstream and downstream sides of the tree trunks with root wads.

4.9.6 Sedimentation Basins

Two large sedimentation basins will be excavated into the alluvial fan of the creek, with construction of berms, at the locations illustrated in the drawings.

The basins shall be constructed by excavating or filling to the embankment base elevations on the drawings, and field adjusted appropriately in collaboration with the Engineer.

These sedimentation basins will be excavated to a depth of approximately 2 m below the ultimate water level of the creek, or to the maximum practical depth, whichever is less. The excavated materials will be sorted into sizes (e.g. > 200 mm, 75 to 200 mm, 20 to 75 mm and < 20 mm). The coarser materials will then be used to construct the in-stream embankments as described

The embankments shall be placed by placing coarse material cores (>200 mm particles) in horizontal lifts with maximum thickness of 400 mm and compacted with several passes of a vibrating roller compactor.

The upstream/inboard sections of the embankments shall be placed using maximum 400 mm thick horizontal lifts of the 75 to 200 mm material and 20 to 75 mm material, at approximately 40 % each of the horizontal width of the filter layers as shown on the drawings. The lifts shall be compacted with several passes of a vibrating roller compactor.

The top lift embankment layer on the basin side, and on the face of cut slopes forming the basins' walls, shall consist of a minimum 300 mm thickness of 20 mm minus well graded fill material compacted on the 2H:1V sideslope using thorough bucket tamping and/or track-packing methods to the satisfaction of the Engineer.

Culverts shall be placed as shown on the drawings on a compacted and prepared, smooth, well graded, compacted bedding material. Embedment material shall be placed under the haunches and over the pipe with thorough hand-tamping and small walk-behind mechanical compactors. The fill overlying the culverts shall be placed and compacted in one lift of minimum 400 mm thickness. Where thicker overlying material is placed, a second lift shall be placed such that the first lift is no thicker than 400 mm.

Culvert inlet and outlet areas shall be prepared by placement of geosynthetic products and rip rap as shown on the drawings. Geotextiles shall be placed in accordance with the manufacturers' instructions.

Spillways shall be constructed as shown on the drawings. Geotextiles shall be placed as shown such that they line the full footprint of the spillway surface on the crest and downstream face, and at least 1 m vertically down the upstream face.

Rip rap shall be carefully placed so as to protect underlying geotextiles from damage and in a manner such that voids are minimized and to make use of the well graded nature of the material. Rip rap shall be placed on the inlet channel segments of the sedimentation basins, the spillway upstream faces and crests and downstream faces, and on the segment of channel connecting the sedimentation basins and crossed over by the temporary access road. On the downstream basin embankment faces and in the channel connecting the two basins, the lateral edges of the rip rap shall be bermed up at least 3 m wide and 1 m high. The lateral channel containment berms shall comprise low soil berms covered with geotextile and in turn covered with at least 0.35 m thick layer of the rip rap.

Following commissioning of the sedimentation basins, trapping efficiency and deposition rates shall be monitored. Upon direction of the Engineer, modifications to the embankments, construction of in-basin baffles, or other measures may be required to optimize sedimentation processes.

Sediment cleanout/removal access and planning shall be undertaken and constructed prior to commissioning in collaboration with the Engineer.

4.9.7 Mulch and Debris Application

Mulch will be applied to disturbed areas along the riparian area of the creek to decrease surface erosion by reducing impact from rainfall, and to act as a long term carbon source for soil development, as described in the Erosion and Sediment Control Plan.

In addition to woodchips, a portion of the coarse woody debris deposited in the area due to the tailings breach will be spread in the Riparian Habitat Reclamation areas. In addition to providing vertical structure and creating the associated habitats, this woody debris will retain moisture and provide shade, creating enhanced microsites for vegetation growth and acting as a long-term soil carbon source.

4.9.8 Trees and Plants

Imported plant material shall be accompanied by all necessary permits and import licences, and shall conform to federal and provincial regulations.

It shall be the Contractor's responsibility to ensure that all regulations pertaining to the import of plant materials or their movement to or from a particular region of the province are adhered to, and all inspection certificates required by the Ministry of Agriculture are completed to the satisfaction of the Engineer.

Transportation of trees and plants to site, unloading and handling procedures, storage on site, procurement of plant and tree specimens, preplanting operations, locations of planting, area preparation, planting procedures, timing of planting and maintenance of plants shall conform to the procedures described in the Ministry of Transportation and Infrastructure's Standard Specifications for Highway Construction (2012), Section 754. Specific requirements of Section 754 may be adjusted or reduced at the discretion of the Engineer.

All trees, shrubs, groundcovers, vines, and designated grass areas, shall be watered immediately after planting, and regular watering shall continue as required for plant health until final acceptance of the work. Water used for planting and maintenance shall be clean and potable.

When required, various other materials such as soil amendments, erosion control products, hydraulic mulches, etc. shall be supplied in accordance with latest version of the Erosion and Sediment Control Plan and drawings.

4.9.9 Seeding

Seed quality and type and application rates shall conform to that specified in the Erosion and Sediment Control Plan. All seed, fertilizers and other dry materials shall be stored in a dry, weather proof storage place and shall be protected from damage by heat, moisture, rodents or other causes until the time of seeding.

All seed supplied either as individual species, or as a seed mix, shall comply with the requirements of the *Canada Seed Act* and Regulations, and the grade standards for that particular crop kind. Grass and legume seed shall meet or exceed Common No.1 grade prior to mixing with other species. Seed shall be free of propagules of plant species designated as noxious under the BC *Weed Control Act* & Regulations.

Water used for seeding shall be clean and potable.

Fertilizer, if used, shall comply with the provisions of the Canada *Fertilizers Act* and Fertilizer Regulations.

When required, various other materials such as soil amendments, erosion control products, hydraulic mulches, etc. shall be supplied in accordance with latest version of the Erosion and Sediment Control Plan and drawings.

Seed mixes used shall be as described in the Erosion and Sediment Control Plan.

Hydraulic mulch, if and where utilized, shall be a wood fibre type, specifically designed for hydraulic seeding, and having demonstrated satisfactory past performance for this purpose. The product shall be dyed green for appearance and ease of monitoring application.

The use of tackifiers, water, other materials, as well as seeding and construction scheduling, procedures and methods shall conform to the Ministry of Transportation and Infrastructure's Standard Specifications for Highway Construction (2012), Section 757. Specific requirements of Section 757 may be adjusted or reduced at the discretion of the Engineer.

4.10 Clean-Up

During the course of the work keep the work area clean and remove all waste and surplus materials no longer required.

At the completion of the works, leave the work areas clean, free of debris and remove all equipment, waste and surplus materials from the whole site and leave the Site in a clean and safe condition to the satisfaction of the Engineer.

Ensure all surfaces are sloped to prevent standing water and ponding. Roll and compact all depressions to the required density.

The Contractor is to prevent spillage of oil, fuel or other contaminants. If any spillage occurs, promptly clean up the spillage, and disposal to be at controlled dumpsite. The Contractor is liable for all spillages.

Remove and replace contaminated soil to the satisfaction of the Engineer.

Dispose of used oil, used filters and other contaminants to designated areas and in a manner satisfactory to the Engineering Consultant.

5.0 QUALITY CONTROL AND QUALITY ASSURANCE

5.1 Samples

Samples

Submit a sample not less than 45 kg, typical of each type of fill material from each proposed source. With each sample, submit test results confirming that the material complies with the gradation and physical requirements specified.

The Engineer's review and acceptance of any sample will not mean approval of the entire source. All materials supplied from any source are subject to further sampling, testing and approval/rejection, whether incorporated into the work or not.

Test Reports and Certificates

Submit test reports showing the results of gradation, moisture content, compaction, physical requirements and other tests.

5.2 Workmanship

Perform all work using only trained and experienced personnel who hold certificates valid for the Work.

Review by the Owner or Engineer of Contractors drawings or other documents, or release of material for shipment by the Owner's inspector, shall not relieve the Contractor of responsibility for compliance with the contract.

5.3 Inspection & Testing

Submit an Inspection and Test Plan in accordance with this specification.

The Engineer is responsible for Quality Assurance and the Contractor is responsible for Quality Control.

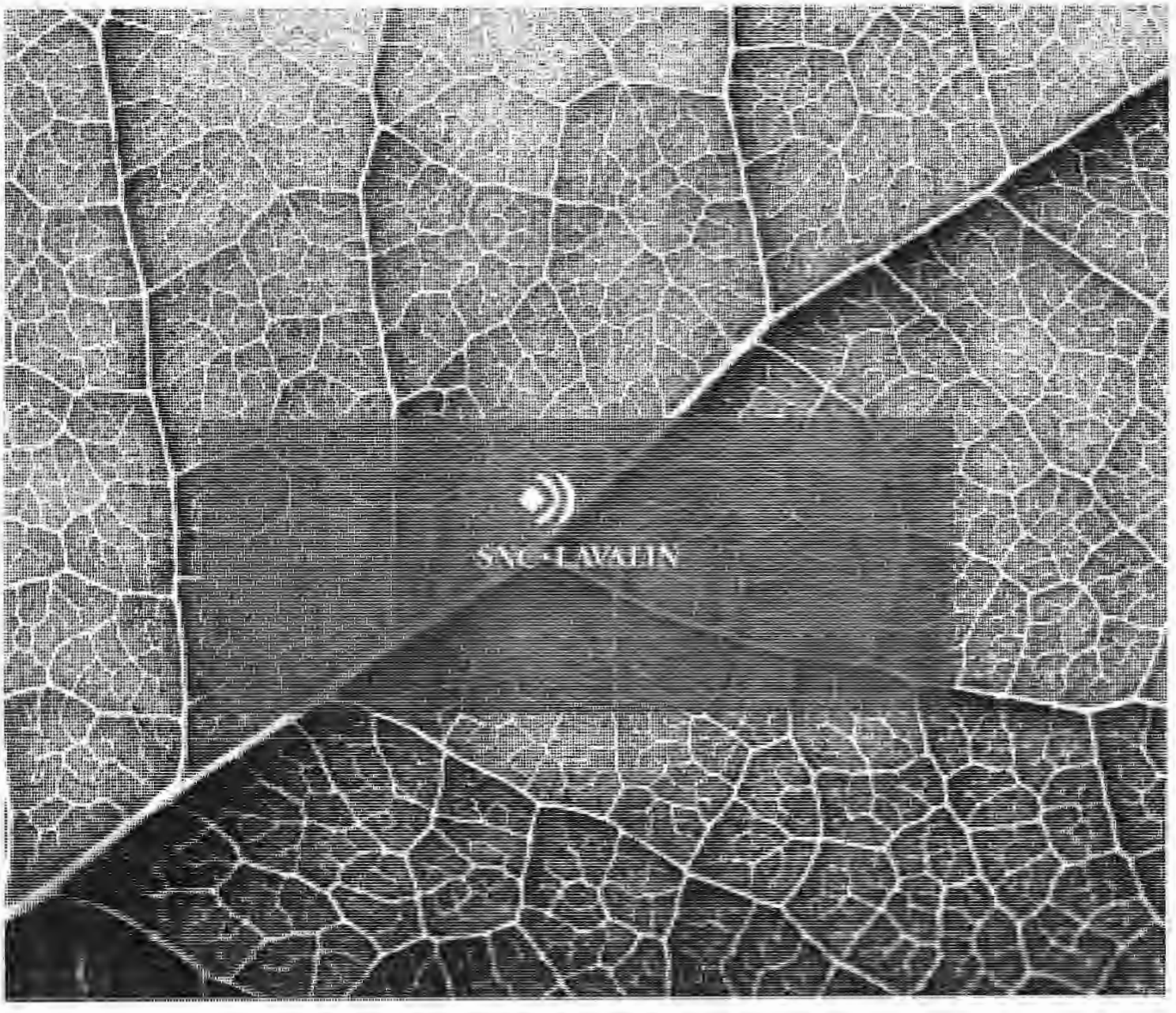
The Engineer's acceptance may be withheld subject to final testing or inspection.

No additional compensation or extension of time for completion is permitted due to time required to make tests and to interpret results.

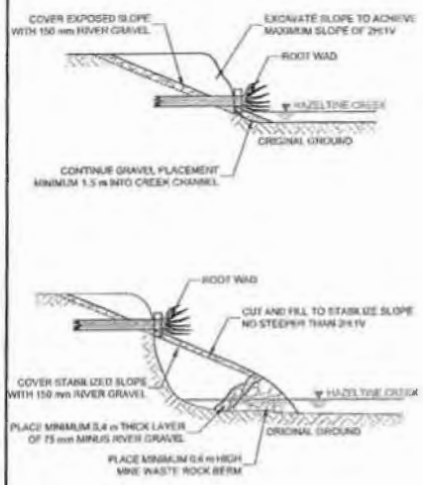
Inform the Engineer in advance when the Work is ready for inspection, Quality Assurance and Proof-Roll testing. Provide adequate and safe access for the Engineer, QA and QC testing and inspection personnel to all parts and areas of the Work.

Where the Work fails to meet the test requirements of this specification, the Contractor is to undertake appropriate corrective action and adjustments at its own cost and to the satisfaction of the Engineer.

END OF DOCUMENT


SNC-LAVALIN

SMALL EMBANKMENTS (<2.5 m) ADJACENT TO FLOWING CREEK CHANNEL



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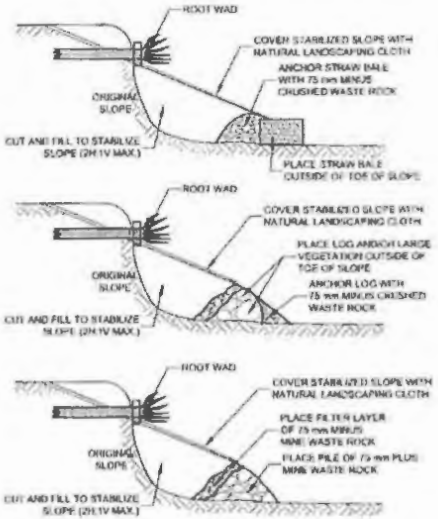
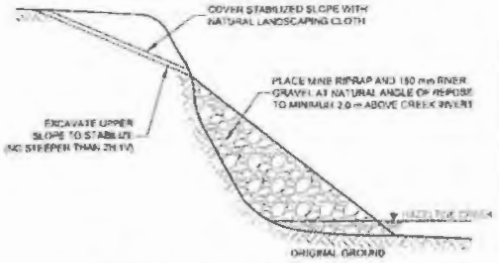


LARGE EMBANKMENTS (>2.5 m) ADJACENT TO FLOWING CREEK CHANNEL



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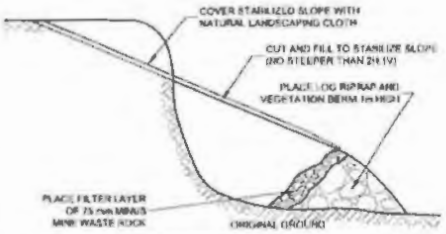


LEGEND

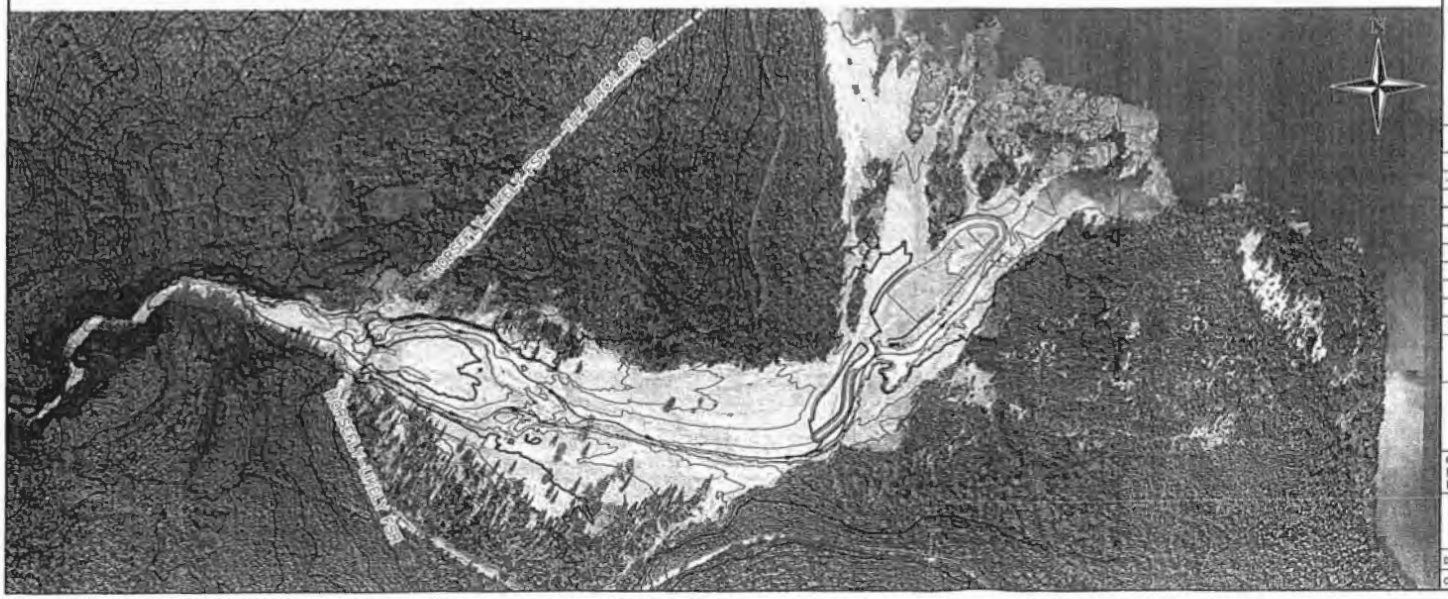
- APPROXIMATE EXISTING CHANNEL CENTER WITH FLOW DIRECTION
- CREEK BANK STABILIZATION
- MAJOR CONTOUR (10 m)
- MINOR CONTOUR (2 m)

ISSUED FOR REGULATORY SUBMISSION

NOT FOR CONSTRUCTION

NOTES

1. CONTOURS ARE IN METRES ABOVE SEA LEVEL (masl)



REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	2014 08 04	GOOGLE EARTH PRO SATELLITE IMAGERY

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	–	–	–	–

SNC·LAVALIN

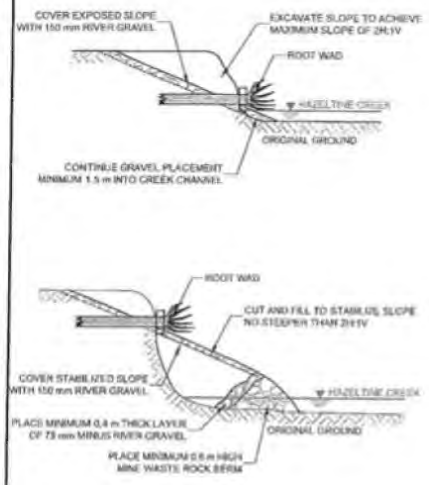
CLIENT NAME: MOUNT POLLEY MINING CORPORATION

PROJECT LOCATION: LOWER HAZELTINE CREEK, QUESNEL LAKE, BC

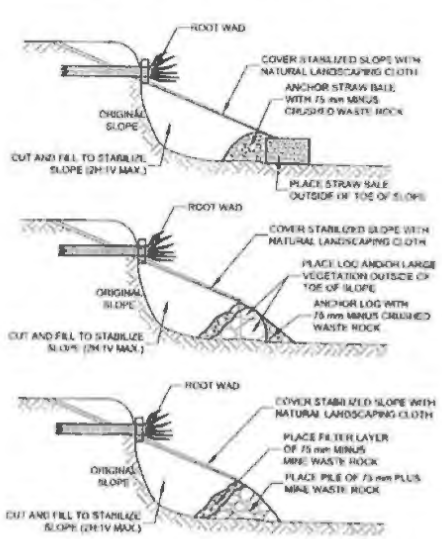
BANK STABILIZATION - PLAN VIEW AND DETAILS

DWN. BY: CDM	SCALE: 1:7,500	DATE: 2014 09 05	SERIES No:	REV.: 0
CHK'D:	PLOT: 20140911.1.358	CADFILE: 621717R08	621717-LH-010	

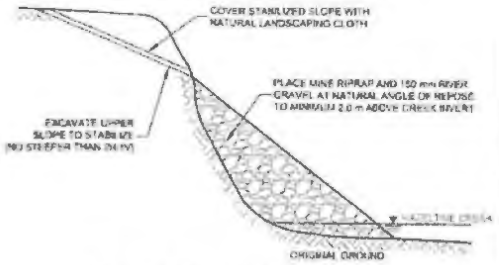
SMALL EMBANKMENTS (<2.5 m) ADJACENT TO FLOWING CREEK CHANNEL



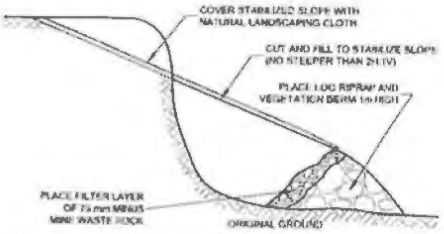
SMALL EMBANKMENTS (<2.5 m) OUTSIDE OF FLOWING CREEK CHANNEL



LARGE EMBANKMENTS (>2.5 m) ADJACENT TO FLOWING CREEK CHANNEL



LARGE EMBANKMENTS (>2.5 m) OUTSIDE OF FLOWING CREEK CHANNEL



LEGEND

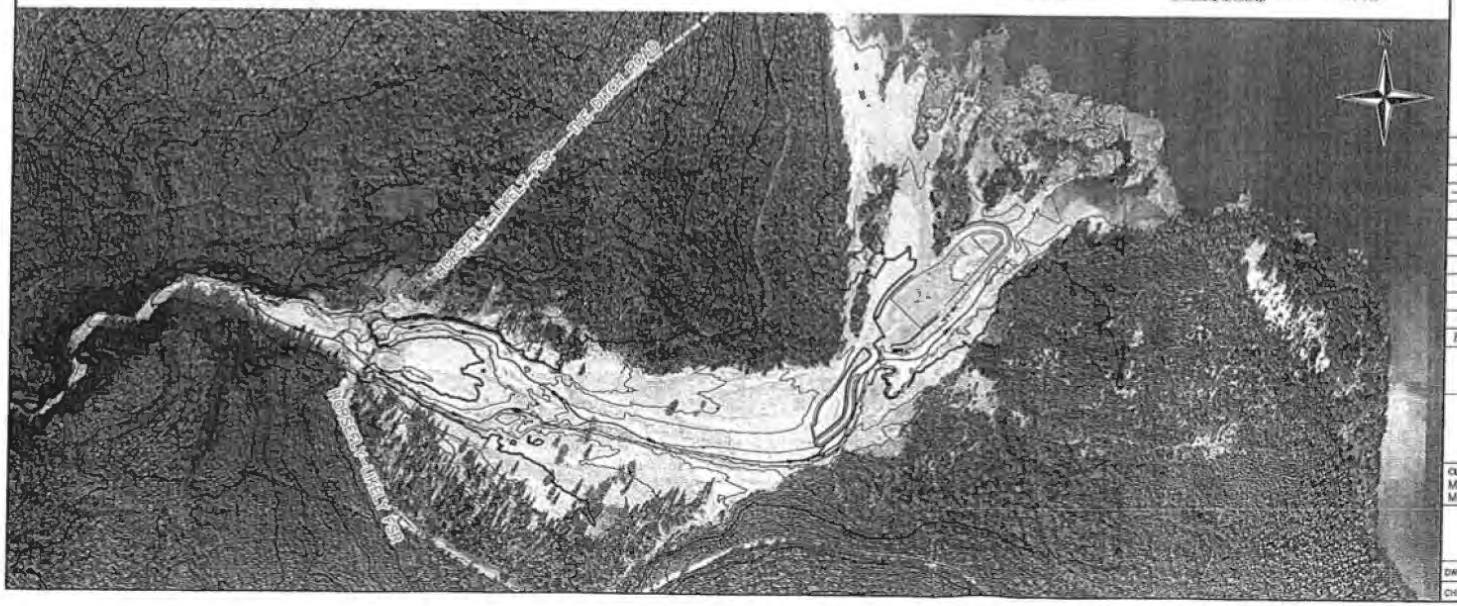
- APPROXIMATE EXISTING CHANNEL CENTER WITH FLOW DIRECTION
- CREEK BANK STABILIZATION
- MAJOR CONTOUR (10 m)
- MINOR CONTOUR (2 m)

ISSUED FOR REGULATORY SUBMISSION

NOT FOR CONSTRUCTION

NOTES

1. CONTOURS ARE IN METRES ABOVE SEA LEVEL (masl).



REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–	2014 08 04	GOOGLE EARTH PRO SATELLITE IMAGERY

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
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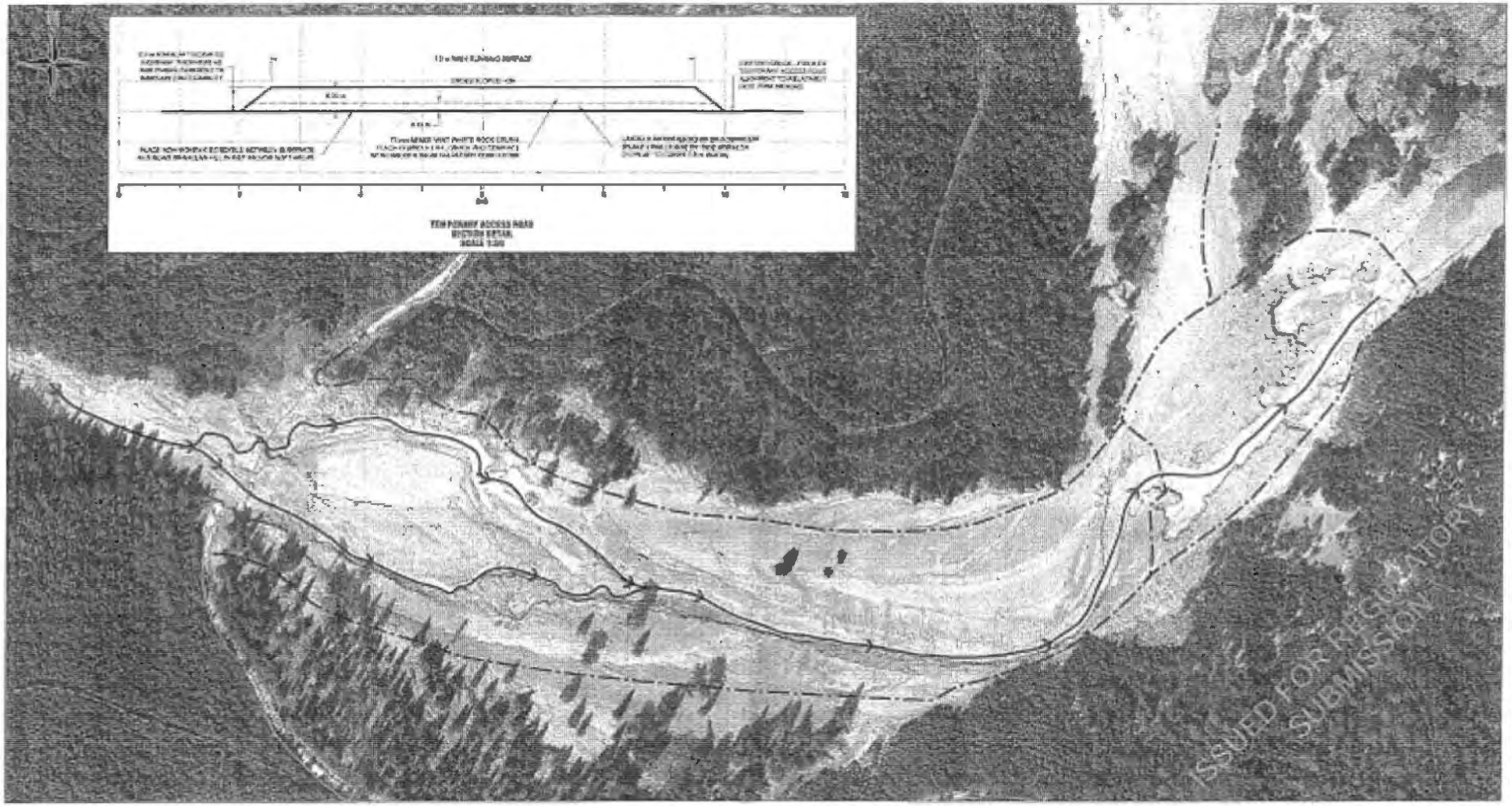
SNC·LAVALIN

CLIENT NAME:	PROJECT LOCATION:
MOUNT POLLEY MINING CORPORATION	LOWER HAZELTINE CREEK, QUESNEL LAKE, BC

BANK STABILIZATION - PLAN VIEW AND DETAILS

DWN BY: CDM	SCALE: 1:7,500	DATE: 2014 09 05	SERIES No:	REV.: 0
CHK'D:	PLOT: 20140911.1358	CADFILE: 621717R08	621717-LH-010	



LEGEND	NOTES	REFERENCES
APPROXIMATE EXISTING CHANNEL CENTER WITH FLOW DIRECTION TEMPORARY ACCESS ROAD TRIM GRAVEL ROADS TRIM ROUGH ROADS	1. ORIGINAL IN COLOUR. 2. NUMERICAL SCALE REFLECTS FULL-SIZE PRINT. PRINT SCALING WILL DISTORT THIS SCALE, HOWEVER SCALE BAR WILL REMAIN ACCURATE. 3. INTENDED FOR ILLUSTRATION PURPOSES, ACCURACY HAS NOT BEEN VERIFIED FOR CONSTRUCTION OR NAVIGATION PURPOSES.	WMS-TOPORAMA ON WMS.ESS-WS.NRCAN.GC.CA CONTOURS AND ORTHOPHOTO DERIVED FROM AERIAL SURVEY CONDUCTED BY MCELHANNEY.

SNC·LAVALIN

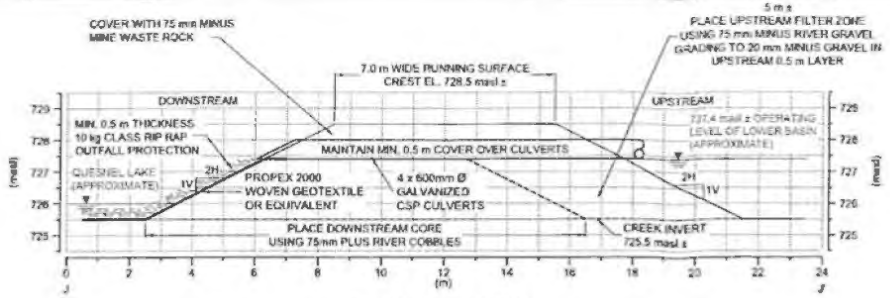
CLIENT NAME: MPMC	PROJECT LOCATION: MOUNT POLLEY MINE, BRITISH COLUMBIA

TEMPORARY ACCESS ROADS - PLAN VIEW AND CROSS SECTION

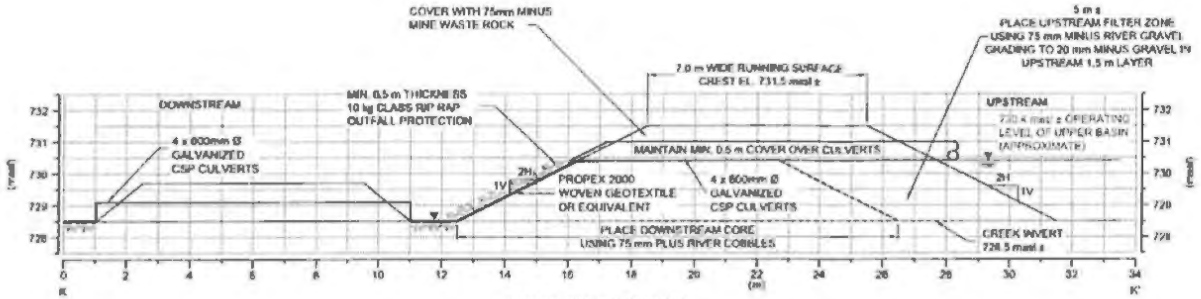
BY: CJM, KVG	SCALE: 1:3,500	DATE: 2014/05/01	REF No. 621717-LH-009 REV. 0
CHKD: GJ	PROJECTION SYS: NAD 1983 UTM Zone 10N		

MXD Path: Z:\LOBE\EAM-BC\Current Projects\Mount Polley Mining Corporation\621717_Mount Polley_Mine\4.0 Execution\4.5 GIS and Drawings\GIS-Mac\Series\621717-LH-009_Roads.mxd

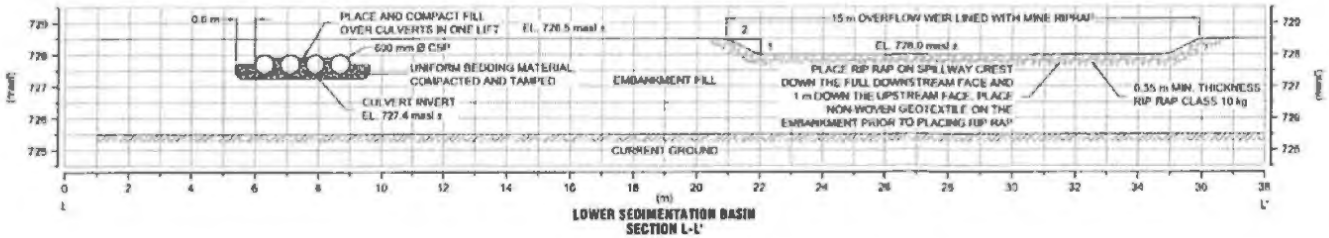
Project Path: P:\Current Projects\Mount Polley\621717\



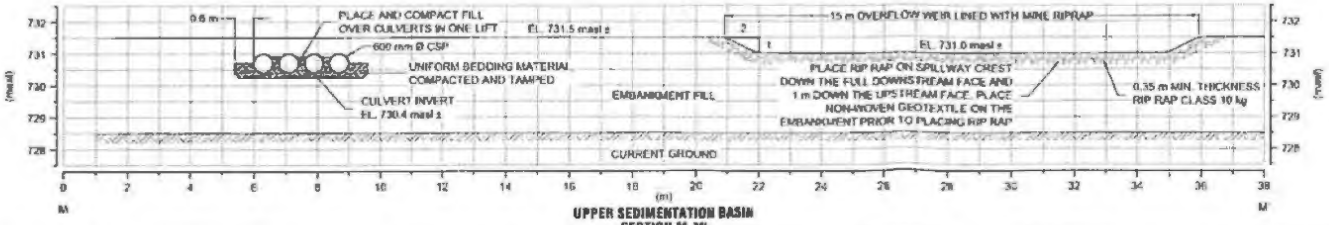
LOWER SEDIMENTATION BASIN
CROSS SECTION J-J'



UPPER SEDIMENTATION BASIN
CROSS SECTION K-K'



LOWER SEDIMENTATION BASIN
SECTION L-L'



UPPER SEDIMENTATION BASIN
SECTION M-M'

LEGEND

ISSUED FOR REGULATORY SUBMISSION

NOT FOR CONSTRUCTION

NOTES

1. ALL ELEVATIONS ARE APPROXIMATE AND NEED TO BE FINALIZED BASED ON FIELD SURVEY.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
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REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
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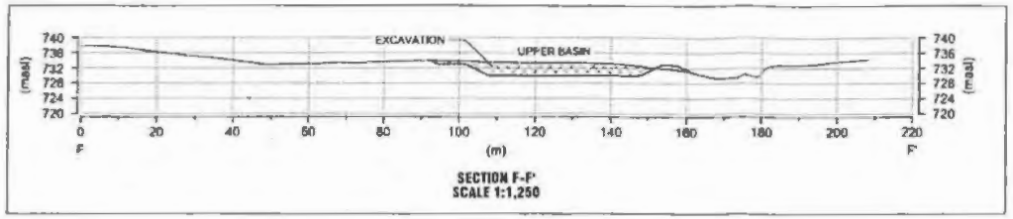
SNC·LAVALIN

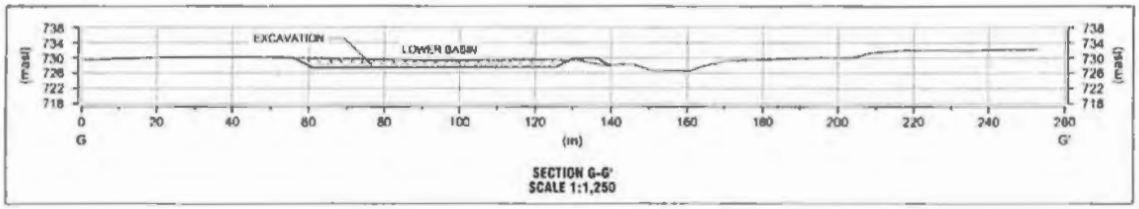
CLIENT NAME:	PROJECT LOCATION:
MOUNT POLLEY MINING CORPORATION	LOWER HAZELTINE CREEK, QUESNEL LAKE, BC

SEDIMENTATION BASIN SECTIONS

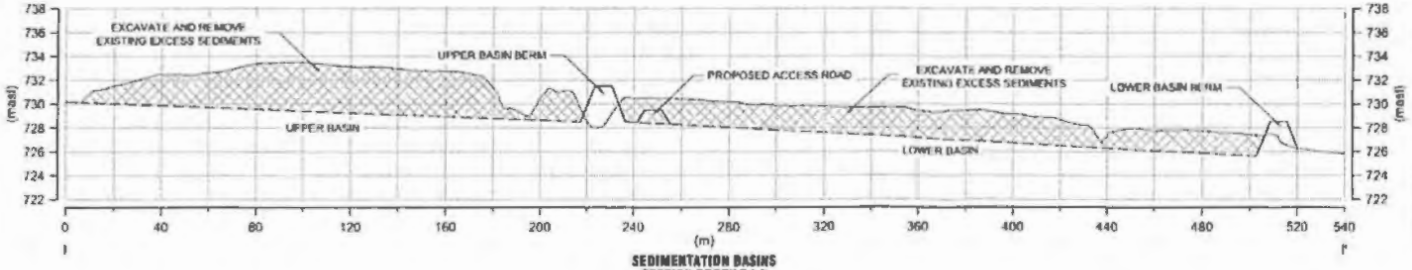
DWN BY: COM	SCALE: 1:150	DATE: 2014 09 05	SERIES No:	REV: 0
CHK'D:	PLOT: 20140911.1344	CADFILE: 621717R08	621717-LH-007	



SECTION F-F'
SCALE 1:1,250



SECTION G-G'
SCALE 1:1,250



SEDIMENTATION BASINS
SECTION PROFILE I-I'
SCALE H 1:2,000 V 1:400

LEGEND

ORIGINAL GROUND

DESIGN

ISSUED FOR REGULATORY SUBMISSION

NOT FOR CONSTRUCTION

NOTES

1. ALL ELEVATIONS ARE APPROXIMATE AND BASED ON LIDAR DATA.

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
-		

REVISIONS

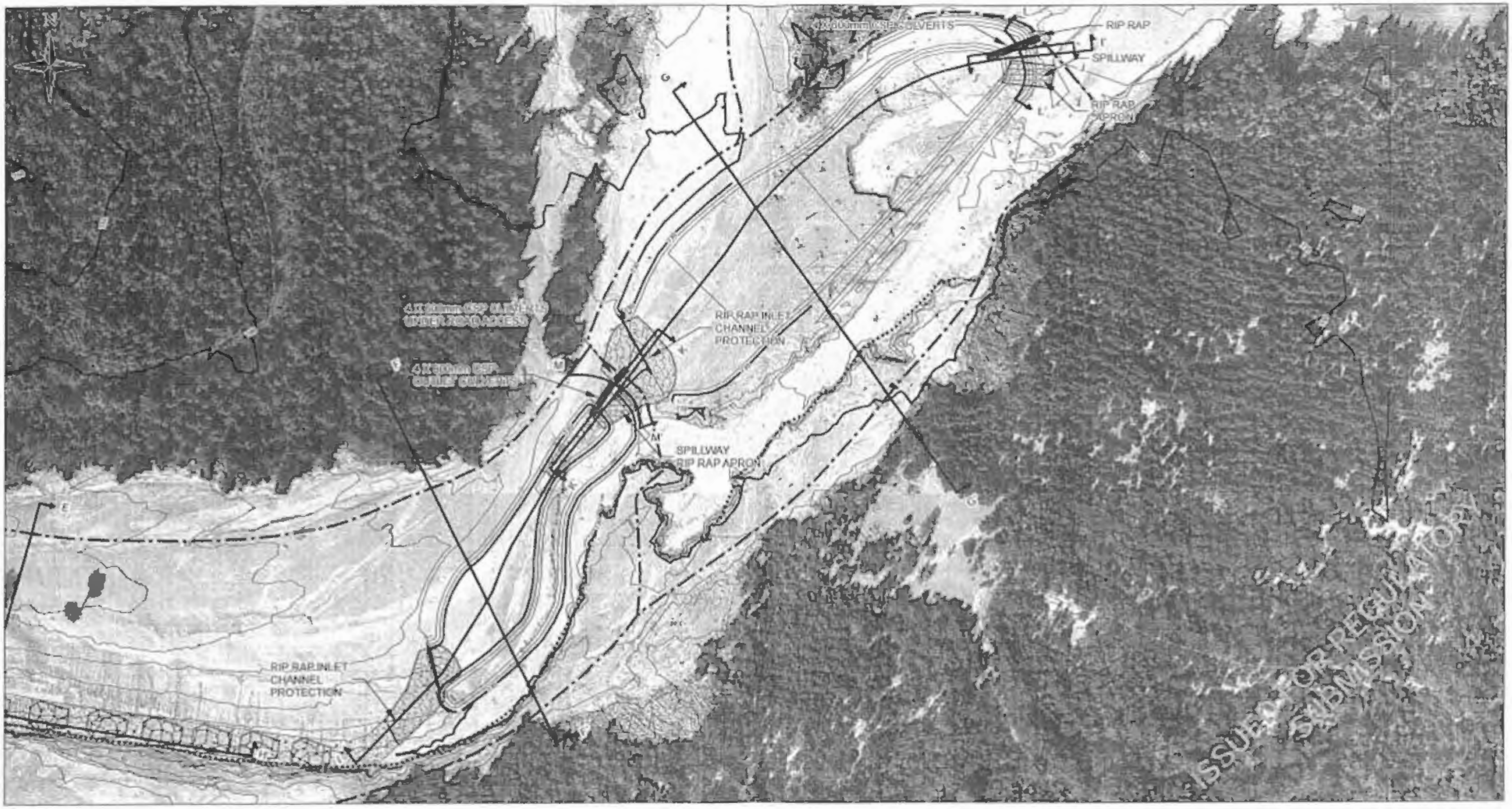
REV.	DATE	DESCRIPTION	BY	CHK
0	-	-	-	-

SNC·LAVALIN

CLIENT NAME:	PROJECT LOCATION:
MOUNT POLLEY MINING CORPORATION	LOWER HAZELTINE CREEK, QUESNEL LAKE, BC

SEDIMENTATION BASINS AND CREEK REACH PROFILES

DWN BY: CDM	SCALE: AS SHOWN	DATE: 2014 09 05	SDMES No:	REV.: 0
CHKD:	PLOT: 20140911.1345	CADFILE: 621717R08	621717-LH-008	



LEGEND

- 1 METRE CONTOUR
- 10 METRE CONTOUR
- SECTIONS
- CREEK BANK STABILIZATION
- TEMPORARY ACCESS ROAD
- ABANDONED ROADS
- GRAVEL
- RIFFLE POOL
- RIP RAP
- SPILLWAY

NOTES

1. ORIGINAL IN COLOUR.
2. NUMERICAL SCALE REFLECTS FULL-SIZE PRINT. PRINT SCALING WILL DISTORT THIS SCALE, HOWEVER SCALE BAR WILL REMAIN ACCURATE.
3. INTENDED FOR ILLUSTRATION PURPOSES, ACCURACY HAS NOT BEEN VERIFIED FOR CONSTRUCTION OR NAVIGATION PURPOSES.
4. ALL ELEVATIONS ARE APPROXIMATE, BASED ON LIDAR SURVEY. SEDIMENTATION BASIN EMBANKMENT ELEVATIONS TO BE DETERMINED BASED ON FIELD SURVEY AND FINAL DESIGN.

REFERENCES

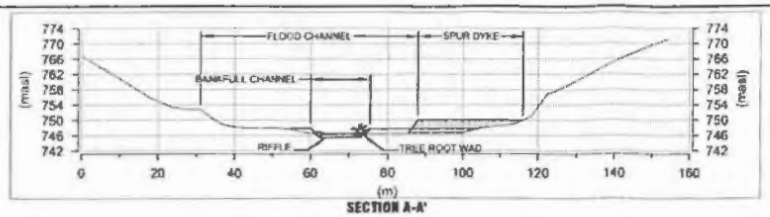
WMS-TOPORAMA ON WMS.ESS-WS.NRCAN.GC.CA
CONTOURS AND ORTHOPHOTO DERIVED FROM AERIAL SURVEY CONDUCTED BY MCELHANNEY.

SNC · LAVALIN

CLIENT NAME: MOUNT POLLEY MINING CORPORATION
PROJECT LOCATION: MOUNT POLLEY MINE, BRITISH COLUMBIA

SEDIMENTATION BASINS PLAN VIEW

BY: CJW, KVG	SCALE: 1:2,000	DATE: 2014/08/11	REF No. REV: 0
CHKD: GJ	PROJECTION: NAD 1983 UTM Zone 10N		621717-LH-005



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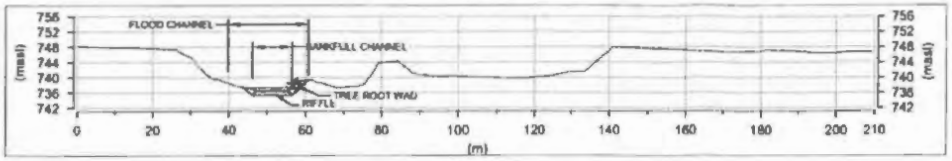

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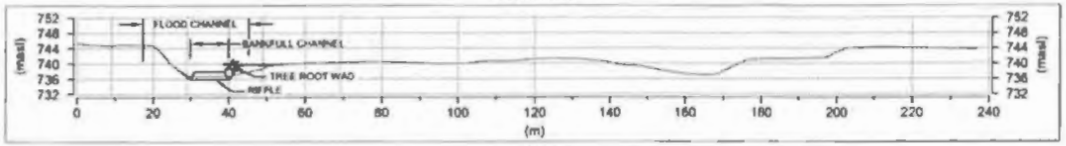

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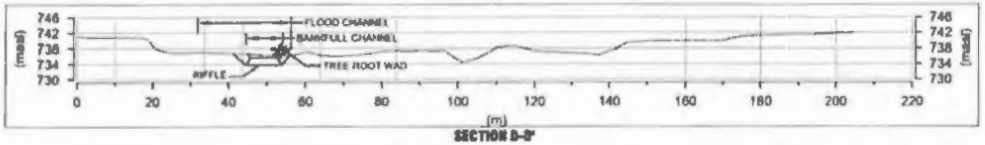

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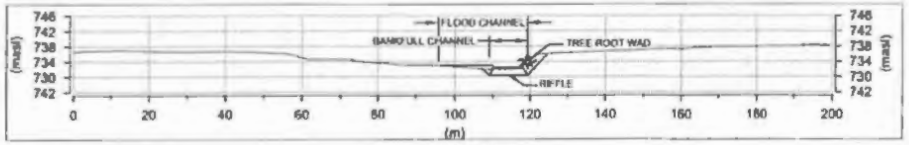

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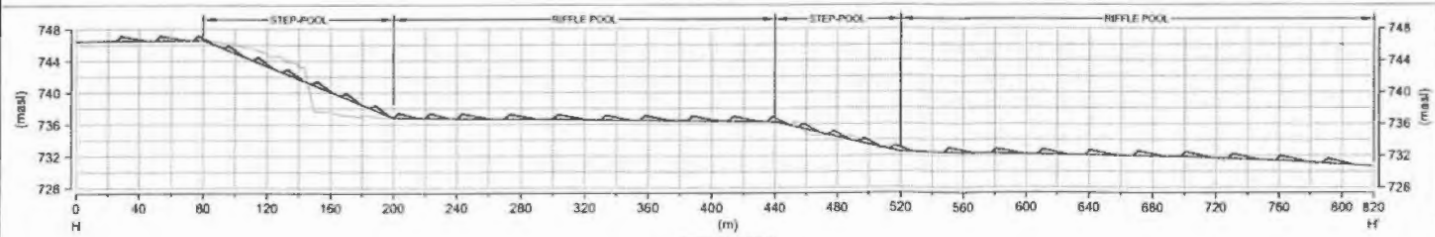
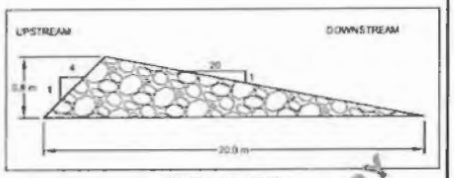


UPPER CHANNEL
SECTION PROFILE H-H'
SCALE H 1:3,000 V 1:600

LEGEND

ORIGINAL GROUND

DESIGN



ROCK RIFFLE DETAIL
NOT TO SCALE

ISSUED FOR REGULATORY SUBMISSION

NOT FOR CONSTRUCTION

NOTES

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
--		

REVISIONS

REV.	DATE	DESCRIPTION	BY	CHK
0	--	--	--	--

0 10 METRES 50

SNC·LAVALIN

CLIENT NAME:
MOUNT POLLEY MINING CORPORATION

PROJECT LOCATION:
LOWER HAZELTINE CREEK, QUESNEL LAKE, BC

RIVER SECTIONS AND CHANNEL REACH PROFILE

DWN BY: CDM	SCALE: 1:1,250	DATE: 2014 09 05	SERIES No: REV.: 0
CHK'D: JZ	PLOT: 20140911.1350	CADFILE: 621717R08	621717-LH-006

MOUNT POLLEY
MINING CORPORATION

LOWER HAZENTINE CREEK,

QUESNEL LAKE, BC

DRAWINGS

DRAWING NUMBER	DRAWING TITLE
621717-LH-001	COVERSHEET
621717-LH-002	EXISTING CONDITIONS
621717-LH-003	PLAN VIEW OF WORKS
621717-LH-004	CHANNEL PLAN VIEW ABOVE SEDIMENTATION PONDS
621717-LH-005	SEDIMENTATION BASINS PLAN VIEW
621717-LH-006	RIVER SECTIONS AND CHANNEL REACH PROFILE
621717-LH-007	SEDIMENTATION BASIN SECTIONS
621717-LH-008	SEDIMENTATION BASINS AND CREEK REACH PROFILES
621717-LH-009	TEMPORARY ACCESS ROADS - PLAN VIEW AND CROSS SECTION
621717-LH-010	BANK STABILIZATION - PLAN VIEW AND DETAILS

LEGEND

ISSUED FOR REGULATORY SUBMISSION

NOT FOR CONSTRUCTION

NOTES

REFERENCE DRAWINGS

DWG. NO.	DATE	DESCRIPTION
–		

REVISIONS

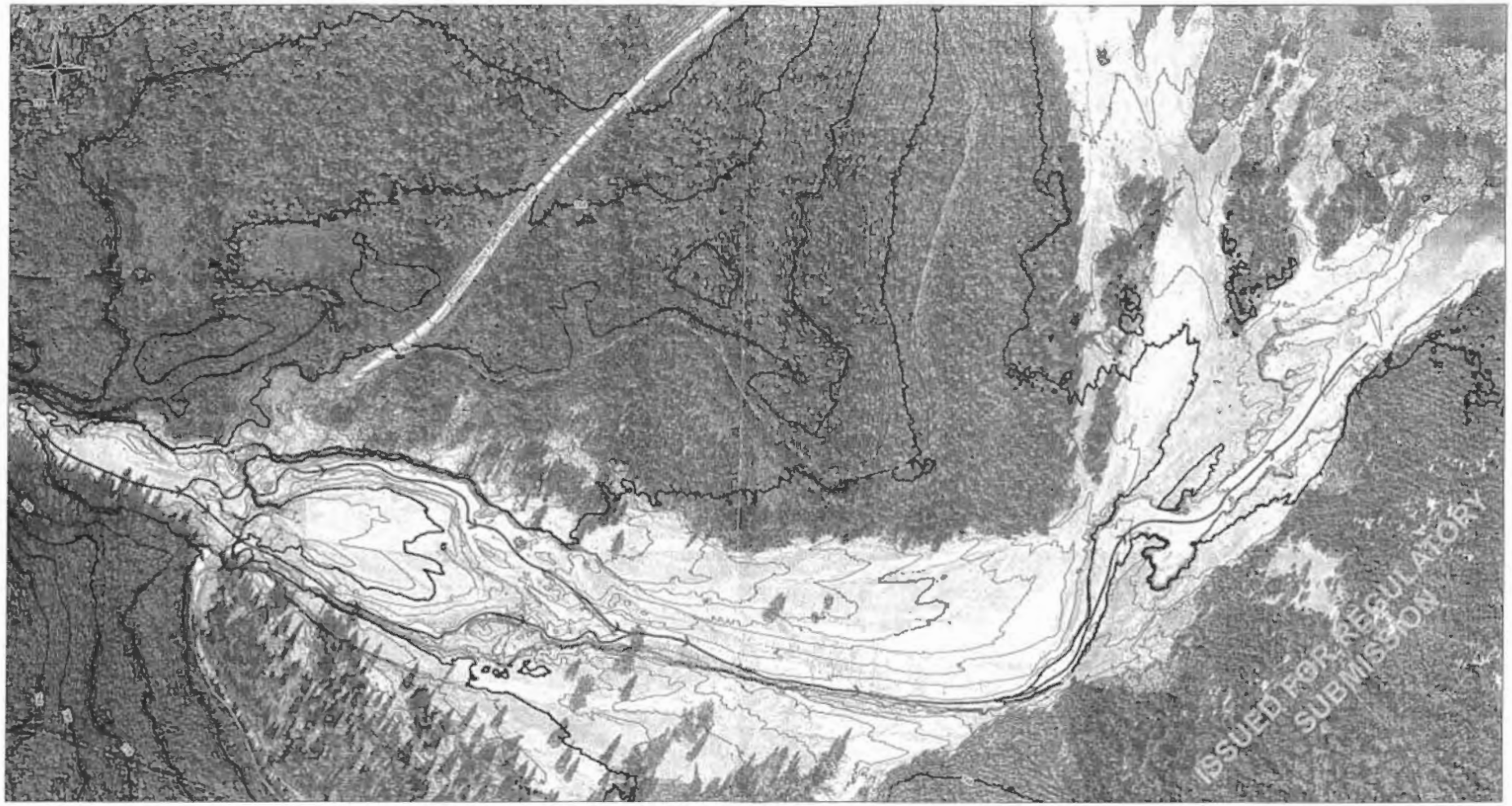
REV.	DATE	DESCRIPTION	BY	CHK
0	–	–	–	–

SNC·LAVALIN

CLIENT NAME:	PROJECT LOCATION:
MOUNT POLLEY MINING CORPORATION	LOWER HAZELTINE CREEK, QUESNEL LAKE, BC

COVERSHEET

DWN. BY: CDM	SCALE:	DATE: 2014 09 05	SERIES No: REV.: 0
CHK'D:	PLOT: 20140911.1343	CADFILE: 621717R08	621717-LH-001



LEGEND

- 1 METRE CONTOUR
- 10 METRE CONTOUR
- APPROXIMATE EXISTING CHANNEL WITH FLOW DIRECTION
- TRIM GRAVEL ROADS
- ABANDONED ROADS

NOTES

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REFERENCES

WMS-TOPORAMA ON WMS.ESS-WS.NRCAN.GC.CA
CONTOURS AND ORTHOPHOTO DERIVED FROM AERIAL SURVEY CONDUCTED BY MCELHANNEY

SNC·LAVALIN

CLIENT NAME: MOUNT POLLEY MINING CORPORATION	PROJECT LOCATION: MOUNT POLLEY MINE, BRITISH COLUMBIA

EXISTING CONDITIONS

BY: CJW, KVG	SCALE: 1:3,500	DATE: 2014/09/11	REV: 0
CHKD: GJ	PROJECTION/DATUM: NAD 1983 UTM Zone 10N		621717-LH-002

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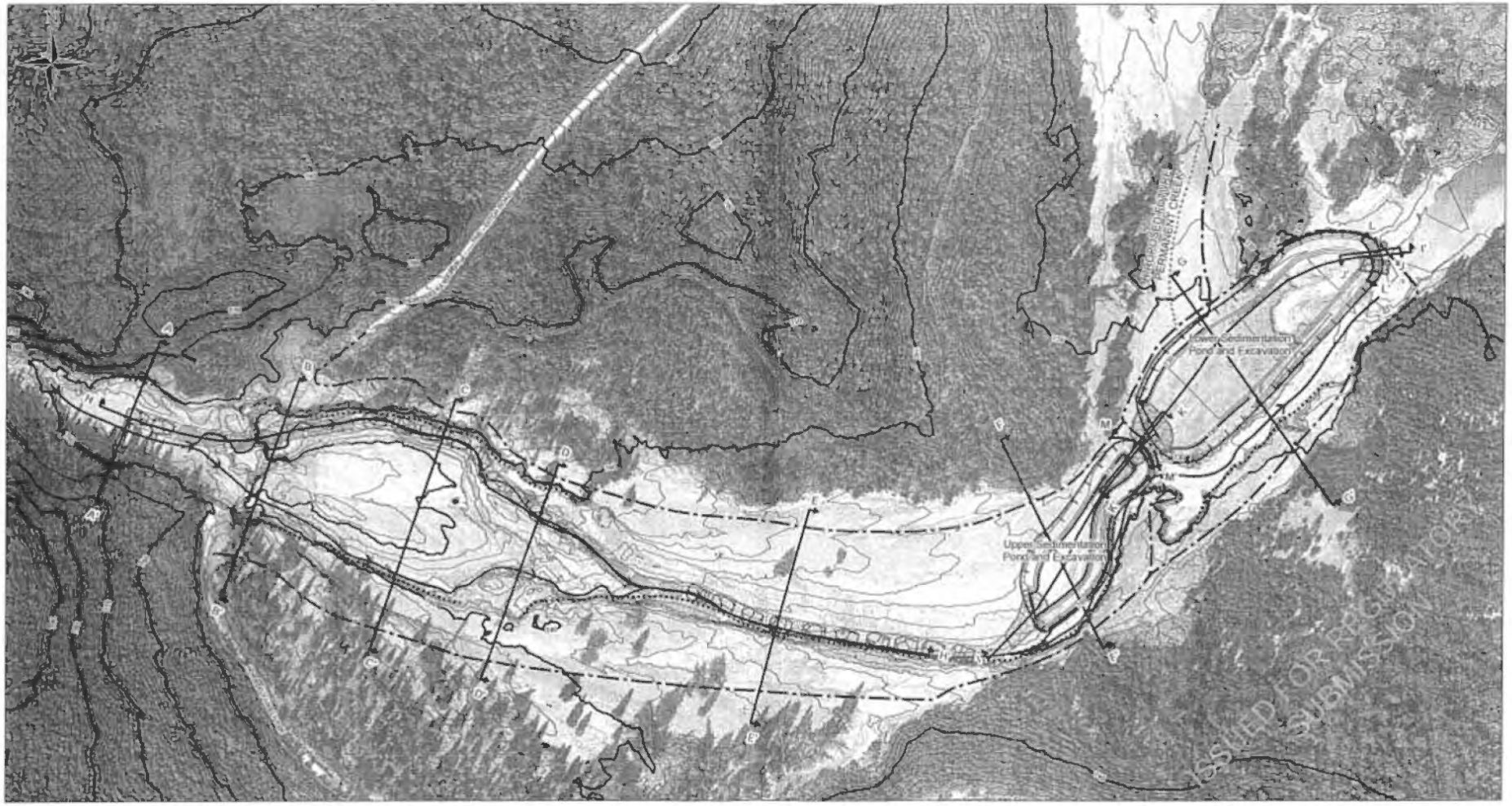

LEGEND

- APPROXIMATE EXISTING CHANNEL CENTER WITH FLOW DIRECTION
- SECTION
- 1 METRE CONTOUR
- 10 METRE CONTOUR
- CREEK BANK STABILIZATION
- TEMPORARY ACCESS ROAD
- TRIM GRAVEL ROADS
- ABANDONED ROADS
- SEDIMENT PONDS
- GRAVEL
- RIFFLE POOL
- RIP RAP
- SPILLWAY
- STEP POOL

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CONTOURS AND ORTHOPHOTO DERIVED FROM AERIAL SURVEY CONDUCTED BY MCELHANNEY

SNC·LAVALIN

CLIENT NAME: MOUNT POLLEY MINING CORPORATION	PROJECT LOCATION: MOUNT POLLEY MINE, BRITISH COLUMBIA

PLAN VIEW OF WORKS

BY: CJW, KVG	SCALE: 1:3,500	DATE: 2014/09/11	REF No. 621717-LH-003 REV: 0
CHKD: GJ	PROJ COORD SYS: NAD 1983 UTM Zone 10N		

MXD Path: Z:\LOBEAM-BC\Current Projects\Mount Polley Mining Corp\acad\621717_Mount Polley Mine\4.0 Execution\4.5 GIS and Drawings\GIS\Mapfiles\621717-LH-003_Works.mxd

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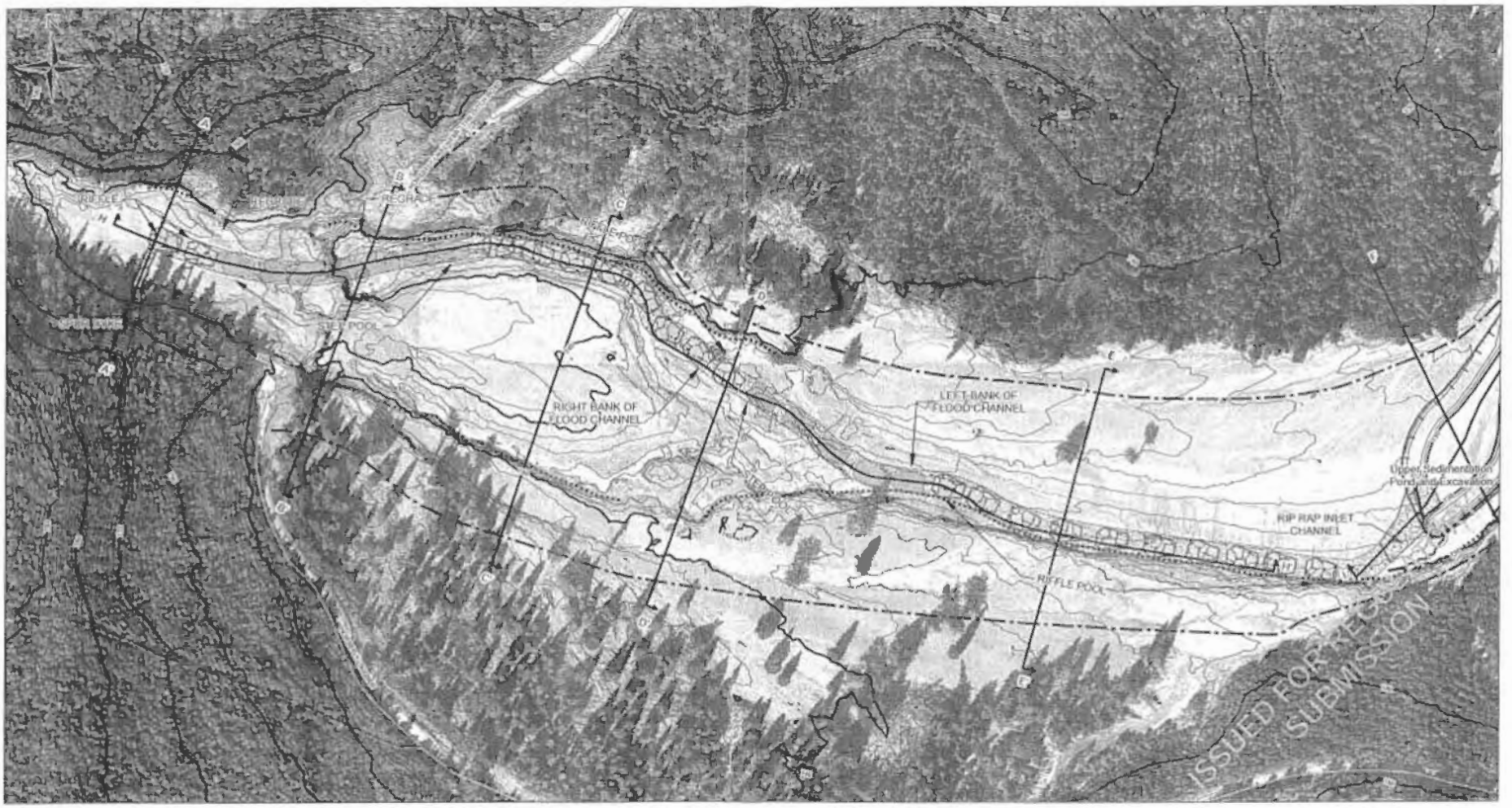

LEGEND

- 1 METRE CONTOUR
- 10 METRE CONTOUR
- SECTION
- CREEK BANK STABILIZATION
- TEMPORARY ACCESS ROAD
- TRIM GRAVEL ROADS
- ABANDONED ROADS
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REFERENCES

0 12.5 25 50 75 100 Metres

WMS-TOPORAMA ON WMS.ESS-WS.NRCAN.GC.CA
CONTOURS AND ORTHOPHOTO DERIVED FROM AERIAL SURVEY CONDUCTED BY MCELHANNEY

SNC·LAVALIN

CLIENT NAME: MOUNT POLLEY MINING CORPORATION	PROJECT LOCATION: MOUNT POLLEY MINE, BRITISH COLUMBIA

CHANNEL PLAN VIEW ABOVE SEDIMENTATION PONDS

DESIGN: C.DE VOS	SCALE: 1:2,500	DATE: 2014/09/11	REV: 0
CHECK: GJ	PROJECTION & DATUM: NAD 1983 UTM Zone 10N		621717-LH-004

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Mount Polley Mining Corporation
IMPERIAL METALS CORPORATION

September 10, 2014

Ministry of Environment
Ministry of Energy and Mines
Ministry of Forests, Lands and Natural Resource Operations

Re: REVIEW OF INTERIM MEASURES BEING IMPLEMENTED FOR POLLEY LAKE DRAW-DOWN

Dear Sirs,

As you are aware from our correspondence of August 13, 2014, Mount Polley Mining Corporation (MPMC) have been reducing the water level of Polley Lake behind a plug formed from the Tailings Storage Facility (TSF) Breach of August 4, 2014. This dewatering was deemed necessary by our engineering advisors, BGC Engineering Inc. and is consistent with an order under the *Water Act*.

As you are no doubt aware, the process of dewatering Polley Lake has resulted in the discharge of turbid water into Quesnel Lake. We are concerned that these actions may conflict with other statutory obligations. MPMC has been working expeditiously towards developing an Erosion and Sediment Control Plan (ESCP) for Hazeltine Creek which we hope will reduce the sediment loads into Quesnel Lake as we continue to reduce the water level of Polley Lake. We are seeking your direction to assist us in confirming or revising our present actions.

At present, Polley Lake is approximately 1.3 m above its natural water level and our engineers are concerned that this might pose a safety and property risk. In particular, they are concerned that the stability of the sediment plug could be comprised by:

- Internal erosion caused by seepage of water through the sediment plug.
- Erosion from external surface water flow onto the sediment plug leading to downcutting.
- Because fall rains are expected to add to Polley Lake, the dewatering of the lake remains necessary to create freeboard in advance.

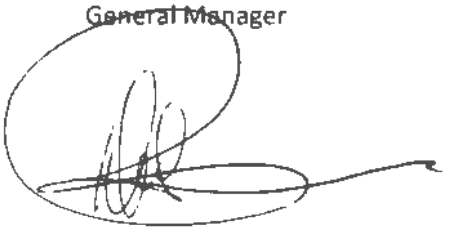
In these circumstances, we are concerned that continuing with our dewatering programs to fulfill certain regulatory requirements may result in non-compliance with other current statutory

BOX 12 • LIKELY • BC • V0L 1N0 • PHONE: 250-790-2215 • FAX: 250- 790- 2268

obligations. Given that we have been working with you with respect to our response programs, we respectfully request, on an urgent basis, that you provide us with clear direction as to the actions we are taking.

Mount Polley Mining Corporation

Dale Reimer
General Manager



BOX 12 • ELKFORD • BC • V0B 1N0 • PHONE: 250-790-2215 • FAX: 250-790-2268

Vanderburgh, Ken FLNR:EX

From: Vanderburgh, Ken FLNR:EX
Sent: Wednesday, September 10, 2014 10:37 AM
To: Pedersen, Mike FLNR:EX
Subject: Fw: Timber Rights question: Mount Polley-related

From: Demchuk, Tania MEM:EX
Sent: Wednesday, September 10, 2014 10:32 AM
To: Vanderburgh, Ken FLNR:EX
Subject: Timber Rights question: Mount Polley-related

Hi Ken,

I'm not sure who best to direct this question to, so please forward me to the right person if necessary.

Follow-up coming out of the Senior Officials Committee meeting (government and First Nations), included a question about timber salvage rights and who owns the Timber Rights. Are you able to provide me with an answer? Please feel free to call.

Thank-you!
Tania

Tania Demchuk, MSc, GIT
Senior Environmental Geoscientist
Mines and Mineral Resources Division
Ministry of Energy and Mines
250-952-0417

Vanderburgh, Ken FLNR:EX

From: Stolar, Harold B FLNR:EX
Sent: Friday, August 22, 2014 1:54 PM
To: Venos, Gerry FLNR:EX; Vanderburgh, Ken FLNR:EX; Stewart, Rodger W FLNR:EX; MacDougall, Gerry L FLNR:EX
Cc: Hamm, Mark FLNR:EX
Subject: FW: Emailing: Mount Polley Debris Clean Up in Quesnel Lake
Attachments: Mount Polley Debris Clean Up in Quesnel Lake.pdf

---

Inspiring Stewardship through Respectful Conversation Harold

-----Original Message-----
From: Penny Carpenter s.22
Sent: Friday, August 22, 2014 9:37 AM
To: dparsons@imperialmetals.com; 'Dale Reimer'; Russell Gibson; Weir, David J FLNR:EX; Stolar, Harold B FLNR:EX
Subject: FW: Emailing: Mount Polley Debris Clean Up in Quesnel Lake

-----Original Message-----
From: Emily Cheung [mailto:echeung@dwbconsulting.ca]
Sent: August-22-14 7:56 AM
To: 'Don Parsons'
Cc: s.22 Brian Aitken; Josef Lerch
Subject: RE: Emailing: Mount Polley Debris Clean Up in Quesnel Lake

Please find attached the revised report with the minor changes for clarification in the fabric and rock gradation.

Emily Cheung, MASc, PEng, FEC
Engineering Manage

DWB Consulting Services Ltd.
Office: (250) 562-5541 (ext 239)
Cell: (250) 961-5262
Fax: (250) 562-5561
echeung@dwbconsulting.ca
www.dwbconsulting.ca

-----Original Message-----
From: Mark Thompson
Sent: August-21-14 2:55 PM
To: 'Don Parsons'
Cc: s.22 Emily Cheung; Brian Aitken
Subject: RE: Emailing: Mount Polley Debris Clean Up in Quesnel Lake

Dear Mr. Parsons,

A revised copy of the document is attached with the recommended changes including newly appended ARD test results.

Sincerely,

Mark Thompson, MSc, MEd, RPBio
Ecologist

DWB Consulting Services Ltd.
Office: (250) 562-5541 (ext 279)
Cell: (250) 961-9520
Fax: (250) 562-5561
mthompson@dwbconsulting.ca
www.dwbconsulting.ca

-----Original Message-----
From: Brian Aitken [mailto:baitken@dwbconsulting.ca]
Sent: Thursday, August 21, 2014 2:07 PM
To: Don Parsons
Cc: s.22 Emily Cheung; Mark Thompson
Subject: Re: Emailing: Mount Polley Debris Clean Up in Quesnel Lake

We will revise and send out immediately. Penny we will leave it to you to submit to flnro.

Brian

Sent from my iPhone

> On Aug 21, 2014, at 1:32 PM, "Don Parsons" <dparsons@imperialmetals.com> wrote:
>
>
> Penny
> A good practical report. We should not have difficulty meeting the recommendations. Change Russ Parsons to Russ Gibson. I will check with our Enviro group for a standard spill plan. I will forward the ARD calcs soon.
> Thanks
> Don
>
> Don Parsons, Chief Operating Officer
> dparsons@imperialmetals.com
> 604.488.2652 | mobile 778.836.2652
>
> Imperial Metals Corporation
> 200-580 Hornby Street, Vancouver, BC V6C3B6
> 604.669.8959 | www.imperialmetals.com

>
>
>
> -----Original Message-----
> From: Brian Aitken [mailto:baitken@dwbconsulting.ca]
> Sent: Thursday, August 21, 2014 8:17 AM
> To: s.22 Don Parsons
> Cc: Emily Cheung
> Subject: Emailing: Mount Polley Debris Clean Up in Quesnel Lake
>
> Report attached. Let me know if you require any changes.
>
>
> Brian Aitken, RPBio, PAg, CPESC
> Environmental Manager
>
> DWB Consulting Services Ltd.
> Office: (250) 562-5541
> Cell: (250) 961-0043
> Fax: (250) 562-5561
> baitken@dwbconsulting.ca
>
>
>

August 20, 2014

Ministry of Forests, Lands and Natural Resource Operations
Water Stewardship Cariboo Region
400-640 Borland Street
Williams Lake, BC, V2G 4T1

DWB File No 14274-219

Attention: David Weir, PAg – Water Section Head

RE: Monnt Polley Tailings Pond Failure Debris Clean-Up in Quesnel Lake

---

The Mount Polley mine tailings pond failure occurred on August 4, 2014 when the tailings pond partially breached, releasing water and tailings slurry into downstream waters. The resulting debris torrent caused by the sudden release of water and sediment behind the dam carried felled trees, mud and debris scoured away the banks of Hazeltine Creek which flows out of Polley Lake and continued into the nearby Quesnel Lake. The debris torrent significantly eroded Hazeltine Creek and the associated riparian vegetation causing a large amount of sediment and woody debris to be deposited into Quesnel Lake.

DWB Consulting Services Ltd (DWB) was contacted on August 15th by Penny Carpenter (Eaglecrest) and Russel Gibson (Imperial Metals) and requested to attend the site at Quesnel Lake for a meeting and to provide professional recommendations concerning environmental and engineering aspects of the proposed woody debris clean-up operations. Brian Aitken, RPBio and Emily Cheung, PEng of DWB attended the site August 19th to meet with Imperial and Ministry of Forest, Lands and Natural Resource Operations (MFLNRO) staff to discuss the scope of the services required. MFLNRO staff in attendance included David Weir - Water Section Head, Robin Hoffos -Section Head Habitat Management and Lee Williston. The clean-up of the woody debris within the lake was already well underway with significant progress made in the clean-up effort prior to DWB's site meeting.

The reason why DWB was retained by Imperial Metals was to provide engineering and environmental expertise to the efforts in support of an extension to the Order originally granted to Imperial Metals by MFLNRO to clean up the woody debris in Quesnel Lake under emergency conditions. This original Order expires August 21st and must be extended to allow the clean-up works to continue.

The clean-up of the woody debris in Quesnel Lake is currently being undertaken by a host of local individuals/property owners, machine operators, forests licenses, first nations, consultants and contractors working under the direction of Penny Carpenter (Eaglecrest) and Russel Gibson (Imperial Metals). Clean up of Quesnel Lake to date consisted of: (1) booming the debris along the shoreline in heavy debris areas, (2) using boats to pick up and boom loose floating debris, (3) mapping the shoreline to determine extent and density of the rafted woody debris, (4) piling shoreline woody debris by hand and/or small machinery and (5) using a tug boat and boom sticks to transport some of the woody debris to the exiting

West Fraser log sort/load out (52° 29' 56" Lat and 121° 12' 4" Long) where it has been contained within log booms. Moving forward, DWB has been asked to provide the following scope of services:

A. Environmental mitigation and monitoring for the debris containment and clean up along the shoreline by both hand/machines and the transport of this material to the West Fraser load out utilizing tugs via barge/boom,

B. Engineering expertise to design and construct a suitable load out ramp at the West Fraser site that will allow wood debris to be removed from the boomed storage area at least until the end of October under the receding water levels in the lake. Once removed from the water, the woody debris will sorted and stored upland for uses yet to be determined,

C. Environmental mitigation and monitoring for the design/construction of the load out ramp described above and also the decommissioning of the ramp in 2015 when it is no longer required.

The following report provides the required engineering and environmental information in the order which it is presented above.

(A) Environmental mitigation and monitoring requirements for the debris clean up in Quesnel Lake

Clean up operations are well underway and it appears they have been completed in an environmentally sensitive manner thus far. During the inspection with MFLNRO on August 19th, very little floating debris was observed in the lake between the West Fraser load out and Hazeltine Creek that was not already contained within high density debris areas which were enclosed within booms. The largest floating accumulations are in Mitchel Bay and the bay at Hazeltine Creek which is a no work area due to safety constraints concerning the unstable tailings dam at Mount Polley upslope of this location. The majority of the remaining wood debris was rafted along the shoreline due to the receding water levels. A significant portion of this material has been piled along the shoreline via hand labour and small machines. To date, most of the affected shoreline (est 40-50km) has been assessed for debris accumulations and categorized as light, moderate or heavy based on the debris density. Also one load of debris enclosed within a large log boom has been transported to the West Fraser load out location and secured to the existing piles for eventual removal from the lake.

Moving forward, the following Best Management Practices (BMP's) and environmental mitigation will be incorporated into the woody debris clean up and transport to the load out:

1) It is recommended that the entire existing shoreline which was affected by debris accumulations be video recorded before and after the clean-up operations. This will not only provide evidence that the shoreline was adequately cleaned up, but will also provide proof in the spring that there was significant older natural woody debris which was present before the dam failure along the

shoreline. At this time the difference between wood that recently came down due to the failure and the older natural occurring wood is very evident.

2) All debris possible, both floating and rafted needs to be removed from Quesnel Lake by the end of October.

3) All debris accumulation areas along the foreshore which are flat enough to allow access by light tracked equipment via barge and have been mapped and **categorized as heavy or medium** will be re-visited to determine beach conditions. Any area of beach that is soft and will lead to significant rutting by machinery will be flagged as 'Machine Free Zones'. Any area of these beaches which provide enough ground support that significant rutting will not occur may be accessed by light tracked equipment and debris piled as close to the existing shoreline as possible to allow efficient collection of debris by a barge. Some beaches may not be suitable for tracked machinery at all and may require all hand labour. Only remove new debris from the recent event (ie do not remove older greyed woody debris that was clearly present before the dam failure which provides important aquatic habitat). Each beach should have at least one landing location flagged so that the barge knows where to off-load any equipment during drop off or pick up.

4) Any debris accumulation areas along the foreshore that have been mapped and **categorized as light** or that are too steep for machinery will be removed by hand (no equipment permitted on the beach). This debris will be removed from the foreshore and scattered above the high water mark (HWM) of the lake or picked directly from the water via barge. Any debris which is too large to move by hand will be bucked into manageable pieces before it is placed above the HWM. Only remove new debris from the recent event (ie do not remove older greyed woody debris that was clearly present before the dam failure which provides important aquatic habitat).

5) EXCEPTION TO POINTS 3 AND 4 FOR CARIBOO ISLAND. Those affected areas along Cariboo Island will all be hand labour only. No machinery permitted on foreshore. Due to archeological considerations, First Nation monitoring required for any works on the island and all woody debris will be removed even in light density areas as per methodology described in bullet 6, paragraph II.

6) Once material has been piled on the beach, it will be removed via barge and tug boat with an excavator (or in the case of Mitchell Bay may be partially accessed from the land with a dump truck). Where the beach has been determined to be stable, the barge will nose into the shore and ramp lowered to the foreshore. The excavator will disembark from the barge and load the debris onto the deck. The debris will be piled carefully onto the barge ensuring that all pieces are secured so that they do not fall off during transport. If the barge is full, the excavator may be left at the beach until the barge arrives back for final pick up. If this should occur, the excavator must be parked as far back from the water as possible, preferably in an area which does not drain directly back into the lake. All equipment in operation within the HWM of the lake will have fully stocked spill kits in them should a spill arise. Refer to spill plan in bullet 12. Once the beach has been fully cleared of debris, the excavator will prepare to leave the beach, ensuring that any

significant ruts or beach disturbances have been fully recontoured to natural grade before re-boarding the barge.

Where the beach has been determined to be too soft for machinery, the barge will nose into the shore and the ramp will be lowered to the foreshore. The excavator will be allowed to drive down and sit on the ramp, but will not leave the ramp (i.e., no tracks on beach). All material will be reached from the barge. Once all debris is removed or the barge is full, the excavator will move back up the ramp and leave with the barge.

7) Mitchell Bay has been identified by MFLNRO as an area of special concern due to the presence of shore spawning kokanee. Shore spawning kokanee are present in Quesnel Lake in critical convergence zones near the mouth of creeks and where upwelling or significant subsurface flows are present. They prefer gravel to moderate sized cobble bottom substrate which is present in Mitchell Bay. Hazeltine Creek area has also been identified as one of these shore spawning locations; however, due to the amount of sediments deposited at the mouth of this creek the habitat has been affected and is less of a concern at this time. MFLNRO has identified a critical spawning period for kokanee starting mid-September in this area. A detailed report by the Province of BC in 2003 entitled, 'Summary of Quesnel Lake Kokanee and Rainbow Trout Biology Stock Management Report No 17' identifies a later period for Quesnel Lake shore spawning kokanee between October and November. In any case, all boating/barging activities along the near shore area in Mitchell Bay need to be completed before this time period to ensure that spawning kokanee populations are not affected. This area should be the highest priority for removing the debris piles before any other area.

8) While barging woody debris down the lake, all debris will secured so that it does not fall back into the water. The onboard excavator and toe tug will have spill kits in them as per bullet 12. It will be transported to the West Fraser load out and preferably off loaded directly onto the load out ramp when it arrives as described later in this document. If this is not possible, then the debris will be offloaded into a contained boom area secured to the existing dolphin piles for later removal. Care must be taken to avoid loss of small woody debris into the lake during this process.

9) All floating woody debris that is temporarily contained in booms will be barged down the lake in a large boom (ie rather than on a barge). Care must be taken in removing any floating debris that is embedded in the bottom substrate. If it can be removed easily without significant bottom disturbance and/or is a boat hazard it should be removed, otherwise leave the wood embedded and do not remove. Only remove new debris from the recent event (i.e., do not remove older greyed woody debris that was clearly present before the dam failure which provides important aquatic habitat). Once all the floating debris has been corralled, it will be pushed together and enclosed in a large towing boom which will be transported down the lake. It is important that no small woody debris escape during this transport and a follow up boat may be required to pick up straggler pieces that have broken off. Once the boom arrives at the West Fraser off load site, the boom will be secured to the existing dolphin piles for later removal.

10) The debris removal around the mouth of Hazeltine Creek will require extensive works; however no works can proceed until the safety concerns at the upslope tailings dam at Mount Polley are addressed. It is hoped that this area will be cleared for work by safety within the next month. If the area around the mouth of Hazeltine Creek cannot be accessed due to safety concerns prior to winter freeze up, it must be secured so that no wood can escape into the lake in the spring. It is fully expected that more woody debris will be deposited into Quesnel Lake from Hazeltine Creek during any flood or heavy rain events due to the instability of the scoured channel. Currently the entire mouth of Hazeltine Creek is contained with a log boom. It is recommended that a second log boom be constructed and left in place until at least next summer for added security during heavy rain events and spring runoff. **It has been requested that all works at the mouth of Hazeltine Creek have a first nation monitor present.**

11) Debris storage at the West Fraser load out will be contained fully within a secured boomed area and anchored to the existing dolphin piles until such time as it can be removed from the water. It is important to conduct a bottom survey before additional debris is stored at this location so that the pre-use condition is known. This area has been previously used for many years as a load out and so it is expected that there is woody accumulations already present to some degree. All small woody debris and any sunken debris as a result of the temporary storage at this location must be removed. Once all debris has been removed and the project complete, a comparison bottom survey must also be completed to provide evidence of this.

12) Throughout the debris collection, transport and removal process it is very important that all involved in the clean-up follow general spill prevention and response procedures should a spill be encountered. This is especially important around aquatic environments. All equipment must carry stocked spill kits and crews must be trained in their use and the reporting requirements. In addition, several large drum aquatic spill kits should be present in key locations (i.e., on the barge and at the load out at a minimum). If Imperial has a standard spill plan that can be used, then it should be adopted for this project, otherwise it is recommended that a detailed spill plan be prepared for the project.

(B) <u>Engineering considerations for the design and construction of a load out ramp</u>

Once the wood debris has been transported to the West Fraser load out site, it will be temporarily stored in booms secured to the existing dolphin piles. From this storage area it will be pushed to the shallow with a tug where it will be lifted out of the water by a button top log loader. The log loader will deck this material behind the machine where it will be grasped with a front end loader and transported to the upland sort area for sorting and storage until an appropriate use can be determined. As the lake bottom is very soft/shallow and receding at this location, a causeway ramp has been proposed to be constructed in order to be able to reach the wood without having to drive a machine into the water. The temporary ramp will be constructed of rock and will be designed to allow a minimum depth of water at the end during the lowest expected flow so that the wood can be floated to this location for removal.

General Design

Design considerations for the causeway ramp have been formulated from the site visit conducted August 19, 2014. No site survey information was available at the time of this report; however, due to the nature of the emergency conditions and the requirement to remove the debris as quickly as possible from the lake, the design has been formulated with the use of prescriptions (3 pages inclusive) that include photographs and diagrams outlining the location, size and specifications for the causeway ramp. A site inspection report is also included for reference. The intention of the ramp is to facilitate the removal of the logs and debris with the use of machinery out of the water. It is expected that the ramp will require 1.3m of height to remain out of the water during activities.

Currently the lake level is estimated to be at 1.0-1.3m below the high water mark and historically has an average yearly maximum daily fluctuation of 2.23m with a historical minimum fluctuation of 1.576m and historical maximum of 3.008m. Lake levels historically continue to fluctuate through August and September but the trend shows levels will continue to drop from August through until spring when levels are expected to rise again typically in April (Water Survey of Canada gauged water level station 08KH011 1956-2012). Due to the short term use and unknown water levels in the upcoming seasons, the ramp is not designed to meet a specific control lake level or return period elevation, but simply to provide clearance from lake elevations for the emergency works operations in the next weeks. Spring removal of logs and debris that may be required in 2015 may not be able to commence until lake levels reach below the constructed ramp surface. Lake depths from the present water level measured during the site visit past the toe of the ramp near the boom was 4m or 13ft. Although this was measured beyond the toe of the ramp, it may indicate that additional rock may be required to achieve operating levels if water surface elevations do not continue to drop.

The access causeway ramp design consists of a rock ramp from the existing load out to approximately 25m into Quesnel Lake. The ramp will be wide enough (12m) to accommodate an excavator and trucks for hauling rock in or debris out of the lake. The ramp is to extend from the existing load out access straight out into the lake. The ramp profile will be constructed from a rock base overlain with non-woven geotextile and capped with surfacing material that will seal preventing spills into the rock base below. Additional details are provided in the design specifications and depicted in the prescriptions attached.

Construction Procedure

The upslope existing load out access is to be stripped of organics and sufficient base material preferably shot rock, shall be placed to stabilize the access to the present lake water level. Rock thickness shall taper from a minimum 300mm to required thickness estimated at 1000mm at the toe of the ramp. If additional length is required or depths vary from the assumed depths, additional thickness of rock will be required as depths at this location were not confirmed. Once rock has been placed, a non-woven geotextile shall be overlaid on the rock and a cap of granular or shot rock material placed on top to provide a running surface and prevent any spills from entering into the lake from on top of the ramp.

A rock source has been located approximately 1 km from the load out site and samples have been sent to Imperial Metals laboratory to test for acid leaching potential. This rock has been deemed suitable due to its size and angularity but results from the tests were not available at the time of the report.

Design Specifications

Specifications for construction consist of the following:

Material	Specification	Approx Quantity
Riprap rock for ramp base material	Class 50 kg rock	600 m3
Maximum rock side slopes at toe	1.5:1 (H:V)	-
Maximum rock side slopes along ramp	2:1 (H:V)	-
Ramp footprint on lake	-	380 m2
Non Woven geotextile	Armtec 200 or approved equivalent	360 m2
Surfacing material or shot rock capping	3" minus clean gravel or pit shot rock	54 m3

Riprap rock shall be clean angular rock that is consistent with the following gradation requirements:

Class 50kg rock - Approx. Average dimension

85% of rock to have average dimension >155mm
50% of rock to have average dimension >330mm
15% of rock to have average dimension >475mm

The rock must be well graded meaning that all dimensions must be represented in the material supplied. This will provide a more stable ramp consisting of smaller and larger rocks that will fit together.

The rock shall be laid on the lake bottom and not keyed in. Due to the nature of the short term usage of the ramp, the rock is expected to withstand normal wave action and not intended for permanent installation or protection. If unusual events are to occur within the period of time that the ramp is in place, repair work may be required.

All quantities provided are for works within the lake and have allowed for waste for supply quantities. These quantities are supplied for the purpose of procurement and are not an indication of maximum or required quantities. Final requirements will be determined by the design engineer or her representative on site. Any variations from the materials specified, must be approved by the design engineer. Material quantities for preparation of upland slope area have not been provided. Quantities are based on the area agreed upon during the site visit to a maximum of 25m extension into the lake; however, this may be altered at the discretion of the Imperial Metals representative. If further length of ramp is required to meet the required depth of 1.0m above the lake bottom, additional volume of these materials will be required.

Conformance

All materials shall meet or exceed the specifications as listed in the table. A site supervisor representative from DWB shall determine suitability of materials should there be any variations or substitutions. Documentation by the site supervisor will be provided to the design engineer along with a constructed volume survey for purpose of reporting. Tracking of volumes shall be completed including truck loads delivered for shot rock, capping material, and riprap rock delivered to site.

Decommissioning Plan

Upon determination through the agencies and Imperial Metals Corp., once the required debris removal operations are completed, the ramp shall be removed. The ramp is to be dismantled by removing the far toe of the ramp furthest in the lake first. If salvage of the rock is required, removal of the capping material should be completed first and then followed by the removal of the geotextile and finally the rock. All materials shall be removed, stored, stockpiled, or disposed of in accordance with Imperial Metals policy and the environmental requirements discussed in this report.

(C) Environmental considerations for the design, construction, operation and decommissioning of the load out ramp

The following environmental mitigation will be implemented during the engineered design, construction, operation and decommissioning of the load out.

Design Phase

During the design, the location was chosen at an historic existing load out location. The footprint of the new structure will be minimized, along with the rock volume so that it can be used until Oct-Nov, but will likely be partially submerged during spring conditions. This design limits the amount of rock required, but also will reduce the decommissioning at the end of its use. All rock used in the ramp construction planned for placement in or near the lake has been tested for ARD (test results appended). The design also incorporates larger rock on the bottom/base of the ramp separated with geofabric and smaller rock/fines on the running surface. The smaller material on the surface will act as a filter to soak any minor leaks or drips that may occur during operation, rather than using purely coarse material where spills would directly enter the lake if they should occur.

Construction Phase

Construction will proceed under appropriate weather conditions and will occur under a compressed timeline of 3-4 days. As machinery will be working around water, all equipment will be inspected for leaks/drips prior to be allowed to work on the project. For the construction phase of the project, an environmental monitor (EM) will be present to conduct these inspections and carry out the balance of the environmental duties described below. Firstly, a construction prework will be held by all parties involved with the construction at which time the EM will go over the conditions of the MFLNRO Order and the mitigation that has been proposed. Then before the ramp is constructed within the lake, a floating silt curtain will be installed around the ramp location. This will prevent any fines from negatively affecting local water quality. The EM will conduct turbidity monitoring inside and outside the floating silt curtain to record its effectiveness. In addition, the EM will conduct fish salvage as required during construction. There will be no stop nets, but the site will be enclosed by the floating silt curtain. An attempt will be made to set minnow traps each night in the isolated area. If fish are caught, they will be recorded and released outside of the enclosed area. The EM will be responsible for implementing/following the Spill Plan (refer to bullet 12) and reporting as required. *It should be noted that some heavy leachate was noted to the right of the proposed ramp which appeared to be draining from an adjacent wet draw seeping from an historic log sort area covered with bark. This was not a result of any activities associated with this*

project. Following construction, the EM will prepare a short post construction report with photo documentation of the measures implemented. A component of this report will be an asbuilt with estimated footprint and rock volumes used in construction.

Operation Phase

Once constructed, it is expected that the ramp will immediately be utilized to start removing debris from the water. As with construction, all equipment must be inspected for leaks/drips before being allowed to be used near the water and on the ramp. Should a spill occur, follow the Spill Plan (refer to bullet 12) and report as required. All employees working near the water need to be trained in spill response. An aquatic spill drum with floating spill boom must be present near the ramp location where it can be quickly deployed in the case of a spill. During woody debris removal with the button top, be careful not to lose small wood pieces into the lake. Should this occur, they will need to be collected and removed. All wood removed from the water will be transported and stored in the upland sort area where it will be sorted/graded for future yet to be determined use.

Decommissioning Phase

The ramp will be left in place until the summer of 2015. As previously described, it is expected that additional woody debris will be deposited from Hazeltine Creek into Quesnel Lake during the spring runoff in 2015. This woody debris will also need to be removed next year. Once Imperial is confident that all woody debris has been captured and removed, the load out will be fully decommissioned and returned to its predisturbance condition. This should coincide with low water levels in the lake and appropriate fisheries timing windows to minimize environmental impacts. As with the construction phase, an EM will be present and will aid in deploying the floating silt curtain during the rock removal. Turbidity monitoring will also be conducted. Once all the rock has been removed from the lake, a diversion ditch will be installed at the top of the grade to divert surface runoff from the freshly deactivated foreshore. Also, all exposed soils will be seeded. A final bottom survey will be conducted where the woody debris was stored to ensure that no additional wood has sunken. Once complete, an environmental close-out report will be completed, with photos and estimated total volume of wood removed.

Should you have any questions regarding this report, please do not hesitate to contact either of the undersigned at your convenience.

Sincerely,

COLLEGE OF APPLIED BIOLOGY
Brian A. Aitken
R.P. Bio #1424
CAB

Aug 21/14

Brian Aitken, RPBio, PAg, CPESC
Corporate Environmental Manager

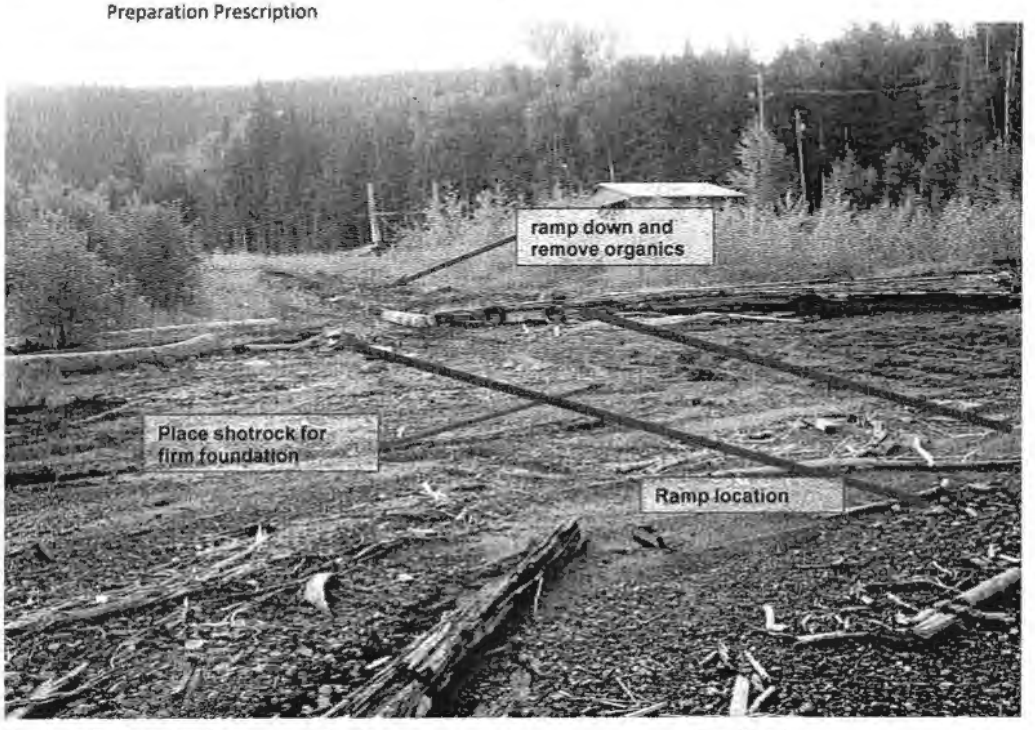
Emily Cheung, MASc, PEng, FEC
Corporate Engineering Manager

Cc Penny Carpenter (Eaglecrest), Russel Parsons (Imperial Metals), Robin Hoffos (MFLNRO) and Lee Williston (MFLNRO)

Imperial Metals Corporation Quesnel Lake, BC

Emergency Works Prescriptions Priority: Immediate

Site : Quesnel Lake Load out Preparation Prescription — Z Road — 20-Aug-14

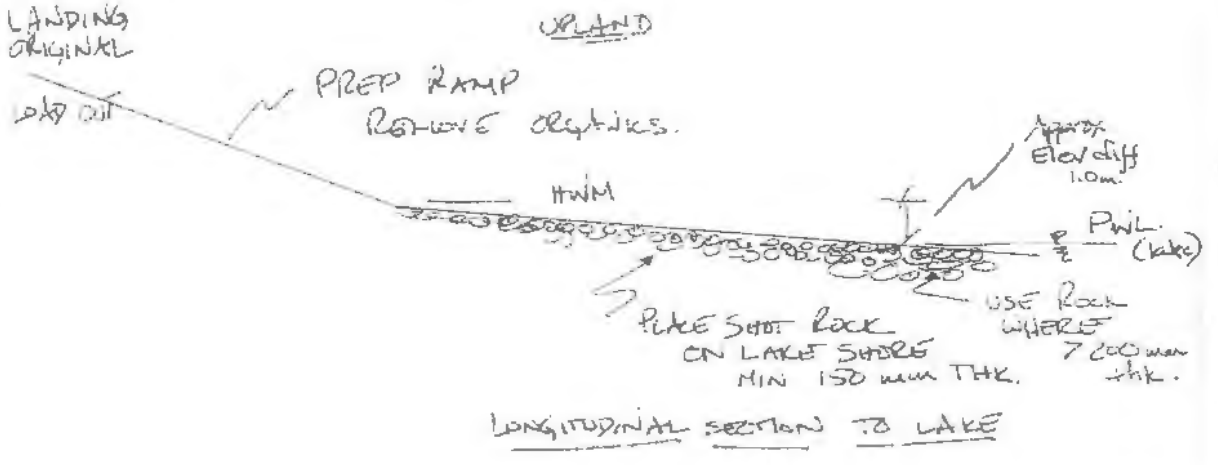


Works to be completed: Upland

1 Prepare ramp down to lake level including stripping
2 Place shot rock to firm up foundation for access
3 Prepare site in accordance with environmental plan for isolation
4 Build up land ramp with shot rock and rock to the present water level
5 Use of riprap rock and shot rock required where thickness exceeds 200mm

Specifications:

1 Clean shot rock for foundation
2 Removed organics placed in an appoved location
3 Minimum 150mm thick shot rock to provide stabilisation
4 Class 50kg riprap



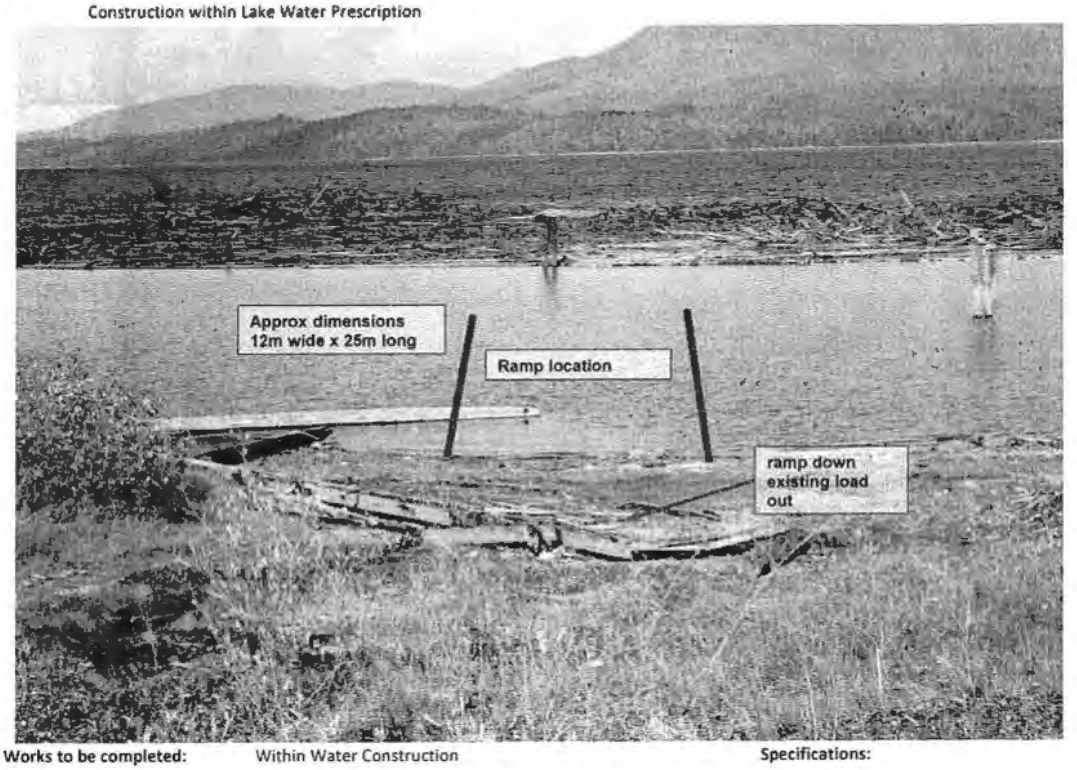
 By: EAC **DWB Consulting Services Ltd.**

Imperial Metals Corporation Quesnel Lake, BC

Emergency Works Prescriptions Priority: Immediate

Site : Quesnel Lake Load out Z Road 20-Aug-14

Construction within Lake Water Prescription

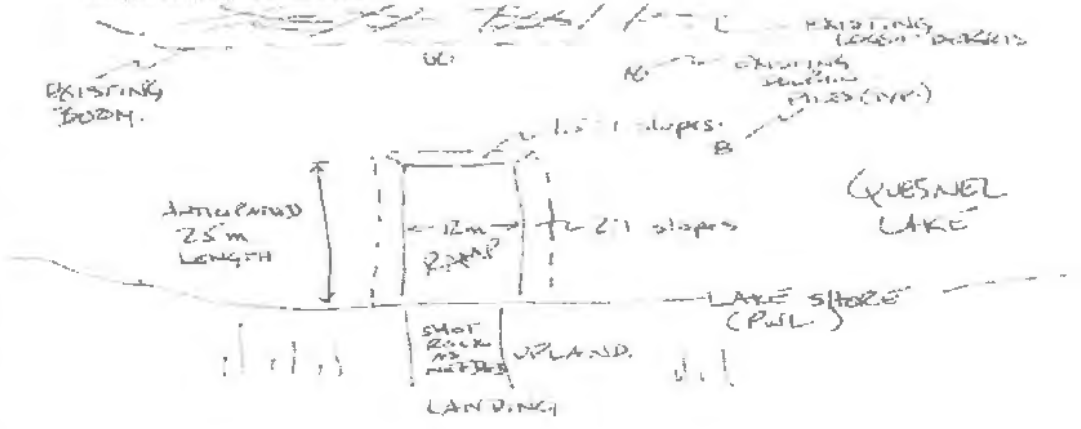


Works to be completed: Within Water Construction

1 Rock to be placed from shore side and built up into the lake
2 Continue to place rock at minimum 300mm thickness at shoreline
3 Gradually build out rock to desired approximate 25m off shore
4 Side slopes to be constructed at 2:1 (H:V)l outer toe 1.5:1
5 Place non-woven geotextile over rock layer
6 Cap ramp with clean gravel or shot rock to a minimum 150mm
7 Ensure ramp is tracked and packed sufficient to support truck loads and prevent spillage into lake waters

Specifications:

1 Clean shot rock for foundation
2 Expected max 1.3m deep at toe
3 Class 50kg approved riprap rock
4 Final ramp top width =12m
5 Larger rock on bottom of ramp
6 Armtec 200/Mirafi 160N/Geotex 601 or approved equivalent non woven geotextile



PLAN VIEW

Imperial Metals Corporation Quesnel Lake, BC

Emergency Works Prescriptions Priority: Immediate

Site : Quesnel Lake Load out Z Road 20-Aug-14
Construction Details

Acceptable well graded rock available at local quarry (pending testing).

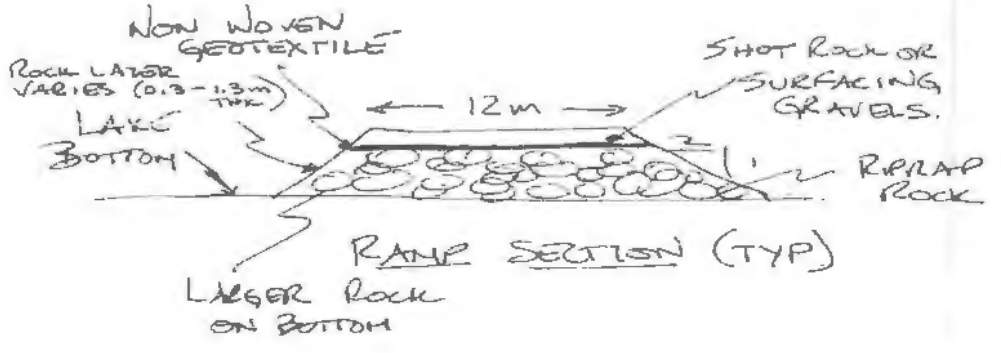
Works to be completed:

1 Upland ramp access along load out access
2 Ramp in lake water from present water to approx. 25m
3 For detail section of ramp see sketch below
4 Side slopes to be constructed at 2:1 (H:V)
5 Provide smooth transition from upslope to in lake ramp construction
6 Smaller material must be sloped gradually to prevent erosion

Specifications:

1 Riprap rock Class 50kg

85% avg dimension >	155mm
50% avg dimension >	330mm
15% avg dimension >	475mm



 By: EAC DWB Consulting Services Ltd.

DWB Consulting Services Ltd.

SITE INSPECTION REPORT

DATE OF SITE VISIT: August 19, 2014 DATE OF REPORT: August 20, 2014

OWNER: Imperial Metals Coporation
CONTRACTOR: Eaglecrest
Project: Quesnel Lake Log Salvage

Purpose of Site Visit: Inspection of the log load out location and condition of log salvage operations for the design of the causeway ramp for load out of barged and towed log booms on Quesnel Lake as a result of material brought down Hazeltine Creek to Quesnel Lake. Scope includes determining suitability of location for ramp including design for ramp. Photo 1 shows the proposed location and existing logs ready for load out.

Due to the nature of the works and requirements for quick removal of the material from the lake, emergency prescriptions including design requirements for the ramp are to be prepared for use in construction.

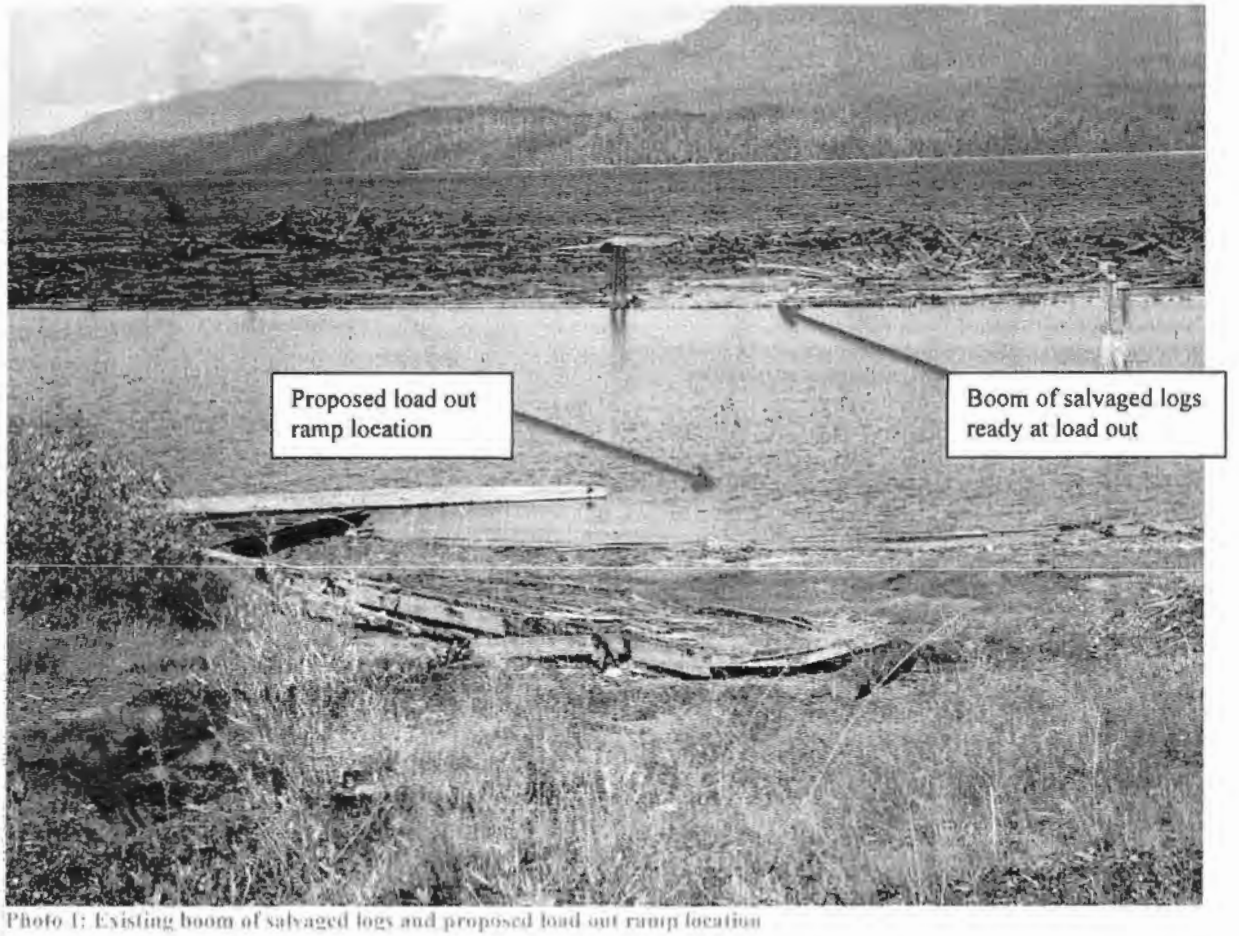


Photo 1: Existing boom of salvaged logs and proposed load out ramp location

Historical Information: Works are planned to begin with the ramp down to the high water mark and then to the present water levels for construction of the causeway ramp. The location was used previously as a log sort and load out and evidence of these operations are still clearly visible.

Photo 2: Load out up lake from present water level

Field Visit: The site visit was conducted to determine feasibility of a ramp into Quesnel Lake in order to remove the boomed logs and additional logs waiting to be towed/barged to the load out location. A boat tour was conducted down the lake along the shores to examine the logs and debris that has not been collected yet as well as the material already piled and the material boomed at the mouth of Hazeltine Creek.

Location of Works: Along Quesnel Lake, BC, with load out location at 52° 29' 56" Lat and 121° 12' 4". Hazeltine Creek is located west of the load out location approximately 20 km along Quesnel Lake. The ramp location from the current shoreline to the end of the ramp is estimated at 25m long by 12m wide for use by an excavator and trucks.

Photo 3: Mouth of Hazeltine Creek with boom at foreground

Recommendations:

The following recommendations are steps in planning for the design of the ramp works.

1. Provide a report and prescriptions for emergency works.
2. Plans for immediate construction of ramp including environmental monitoring and supervision.
3. Complete hydrotechnical study of lake levels and effects on design.
4. Complete ramp works design based on site information collected.
5. Provide a design summary report for construction.
6. Complete a removal plan for short term installation of ramp.
7. Liason with agencies to achieve all permits and approvals required to complete works.
8. Construction and completion of works including supervision.

It is expected that the installation of the ramp will be completed within the next week and will remain in place until fall of 2015. This will allow for additional removal of material in the spring and summer of 2015 after freshet.

Emily Cheung, MASC, PEng, FEC
For
DWB Consulting Services Ltd.

Mount Polley Mines

ANALYSIS CERTIFICATE - MOUNT POLLEY

Job Number: **8000-AUG14**
Reference:
Client: **Geology**

Received Date: **21 August 2014**
Report Date: **21 August 2014**

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Bill Smith
Laboratory Manager

OnLine LIMS

21 August 2014

ALS Metallurgy

Certificate of Analysis

Mount Polley - KM4354

Date: August 20, 2014

Sample	Elements									
	S	C								
MPMC 1A	0.07	0.11								
MPMC 2A	0.13	0.16								
MPMC 3A	0.08	0.08								
MPMC 4A	0.05	0.09								
MPMC 5A	0.07	0.50								
MPMC 6A	0.08	0.33								
Gavin Lk Rd	0.13	0.34								
	%	%								

Norman Monteith, Certified Assayer

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