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Re: June 2015 – Monthly Monitoring Report for Water Licence 2AM-DOH1323

This report is comprised of monitoring requirements as set out in Part J and Schedule J of water licence 2AM-DOH1323, and additional requirements from AANDC. Licence items include:

- Part E (Conditions applying to Water Use) Item 1;
- Part G (Conditions Applying to Waste Management and Waste Management Plans) Items 1, 3(b) and 23 (a), 24 (c, e), 28, 29, 30, 32;
- Part J (Conditions Applying to General and Aquatic Effects Monitoring) Items 4(a), 8, 12 (a, d, g), 14, 15, 16, 20 and 21(e, f).

Other monitoring requirements stipulated in the licence refer to facilities that have not been constructed. During the subject period of this report the focus of activities at Doris North was surface exploration, underground test work, water management and environmental compliance. Sampling locations monitored under this licence (seasonally or when facilities are operational) are provided in Figure 1.

Part E: Conditions Applying to Water Use

Item 1: Water Usage and Part J, Item 12(a) Water Volume

323 m^3 of water was extracted from Windy Lake for Doris Camp domestic use this month as permitted by water licences 2BE-HOP1222 and 2AM-DOH1323. Water was not used under the 2AM-DOH1323 licence for drilling in support of the Doris North mine this month. Water used for surface drilling in June in support of the Regional Exploration program is reported under 2BE-HOP1222. 126 m^3 of water was used for core processing, underground drilling and other industrial purposes in support of the Doris North mine development. 47 m^3 of water was used for dust suppression on site roads this month. Compliant berm discharge water was also used for dust suppression to reduce the volume withdrawn from the environment for this purpose. Water usage is presented in Table 1.

Table 1: Water usage, in cubic meters, June 2015

Water Usage	Domestic Water Use from Windy Lake ST-7a (m^3)	All Other Water Use* (m^3)	Total (m^3)
Monthly Total	323	173	496
Annual Cumulative	1284	316	1600

**Includes industrial uses such as surface and underground drilling, dust suppression, concrete batching, etc.*

No water was applied for ice road development during the month.

Schedule J: Water Quality Monitoring at Water Intake

Monthly water quality samples were taken from monitoring stations ST-7 (Doris Lake raw water) and ST-7A (Windy Lake raw water) in accordance with the Schedule J requirements of the licence. Water quality results are presented in Table 2 below.

Table 2: Monthly Compliance Sample Results for ST-7 and ST-7a, June 2015

		Sample ID	ST7-09JUN15	ST7A-16JUN15
		ALS ID	L1624288-1	L1627832-1
		Date Sampled	6/9/2015 2:10:00 PM	6/16/2015 10:45:00 AM
Parameter	**Units**	**Detection Limit**	**Water**	**Water**
Hardness (as CaCO3)	mg/L	0.5	63	14.9
pH	pH	0.1	7.52	7.23
Total Suspended Solids	mg/L	3	5.1	<3.0
Ammonia, Total (as N)	mg/L	0.005	<0.0050	<0.0050
Nitrate (as N)	mg/L	0.005	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.001	<0.0010	<0.0010
Orthophosphate-Dissolved (as P)	mg/L	0.001	<0.0010	<0.0010
Phosphorus (P)-Total	mg/L	0.002	0.0213	0.0083
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050
Fecal Coliforms	CFU/100mL	1	<1	<1*
Total cyanobacterial cell count	cells/mL	1	52700	877*
Aluminum (Al)-Total	mg/L	0.005	0.0094	0.151
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0005	<0.00050	<0.00050
Barium (Ba)-Total	mg/L	0.02	<0.020	<0.020
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.1	<0.10	<0.10
Cadmium (Cd)-Total	mg/L	0.00001	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	0.1	11.2	2.95
Chromium (Cr)-Total	mg/L	0.001	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030
Copper (Cu)-Total	mg/L	0.001	0.0046	0.0011
Iron (Fe)-Total	mg/L	0.03	0.831	0.194
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0041	<0.0010
Magnesium (Mg)-Total	mg/L	0.1	8.51	1.83
Manganese (Mn)-Total	mg/L	0.0003	0.0196	0.00637
Mercury (Hg)-Total	mg/L	0.00001	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010
Nickel (Ni)-Total	mg/L	0.001	<0.0010	<0.0010
Potassium (K)-Total	mg/L	2	3.1	<2.0
Selenium (Se)-Total	mg/L	0.0001	<0.000050	<0.000050
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	45.9	7.3
Thallium (Tl)-Total	mg/L	0.0002	<0.00020	<0.00020
Tin (Sn)-Total	mg/L	0.0005	<0.00050	<0.00050
Titanium (Ti)-Total	mg/L	0.01	<0.010	<0.010
Uranium (U)-Total	mg/L	0.0002	<0.00020	<0.00020
Vanadium (V)-Total	mg/L	0.001	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050
Biochemical Oxygen Demand	mg/L	2	3	<2.0
Oil and Grease	mg/L	5	<5.0	<5.0
Oil And Grease (Visible Sheen)		n/a	NO	NO
Microcystin	ug/L	0.2	-	<0.20*

** results on Lab Work Order L1627821-1 for Potable Water Station PDC10 (same location as ST-7a)*

Part G: Conditions Applying to Waste Management and Waste Management Plans.

Item 1: Condition to Provide Notice of a Planned Discharge

Notification of planned discharges from facilities under this licence was provided to the Inspector on May 13, 2015.

Item 3(b): Conditions Applying to Sewage Effluent Quality and Schedule J, Table 2 Monitoring Requirements: Discharge from Wastewater Treatment Plant in cubic metres.

Monthly compliance samples were taken from monitoring station ST-8 (Wastewater Treatment Plant Effluent) in accordance with the Schedule J requirements of the licence (Table 3). All parameters were in compliance with discharge criteria.

Table 3: Monthly Compliance Sample Results for ST-8B, June 2015

			Sample ID	ST8B-02JUN15	Part G Item 3(b)	
			ALS ID	L1620402-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
			Date Sampled	6/2/2015 9:19:00 AM		
Parameter	Units	Detection Limit		Water		
pH	pH	0.1		7.87	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3		<3.0	100	100
Fecal Coliforms	CFU/ 100mL	1		<1	10,000	10,000
Biochemical Oxygen Demand (BOD_5)	mg/L	1		<2.0	80	80
Oil and Grease	mg/L	5		<5.0	5	10
Oil And Grease (Visible Sheen)		n/a		NO	No Visible Sheen	No Visible Sheen

This month, 260 m^3 of treated effluent was discharged from the sewage treatment plant.

Schedule J, Table 2 Monitoring Requirements: Runoff from Waste Water Treatment Plant Discharge (ST-9)

Monthly water quality samples were taken from monitoring station ST-9 (Runoff from Wastewater Treatment Plant Effluent) in accordance with the Schedule J requirements of the licence. Water quality results are presented in Table 4 below.

Table 4: Monthly Compliance Sample Results for ST-9, June 2015

		Sample ID	ST9-30JUN15
		ALS ID	L1635441-1
		Date Sampled	6/30/2015 8:25:00 AM
Parameter	Units	Detection Limit	Water
pH	pH	0.10	7.87
Total Suspended Solids	mg/L	3.00	<3.0
Fecal Coliforms	CFU/ 100mL	1.00	<1
Biochemical Oxygen Demand (BOD_5)	mg/L	1.00	3
Oil and Grease	mg/L	5.00	<5.0
Oil And Grease (Visible Sheen)		n/a	NO

Item 23(a): Water Discharged from the Sedimentation Pond (ST-1) and Reagent and Cyanide Storage Facility Sumps (ST-11) and Schedule J, Table 2 Monitoring Requirements

Water quality samples were collected from monitoring station ST-1 in accordance with Schedule J of the licence. Results are provided in Table 5 below. Levels of ammonia, iron and zinc exceeded the criteria for discharge to

tundra in Part G Item 23(a). 6381 m^3 of water was discharged from the Sedimentation Pond (ST-1) to the Tailings Impoundment Area (TIA) this month in accordance with Part G Item 23(d) of the licence. In June, 1780 m^3 of water was pumped from the Pollution Control Pond (ST-2) to ST-1. Monitoring was undertaken at the Pollution Control Pond (ST-2) this month in accordance with the requirements of Schedule J, Table 2 of the licence. Results are presented in Table 6 below.

Table 5: Monthly Compliance Sample Results for ST-1, June 2015

		Sample ID	ST1-08JUN15	Part G Item 23(a)	
		ALS ID	L1624328-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
		Date Sampled	6/8/2015 4:06:00 PM		
Parameter	**Units**	**Detection Limit**	**Water**		
Hardness (as CaCO3)	mg/L	0.5	225		
pH	pH	0.1	7.94	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3	12.8	15.0	30.0
Alkalinity, Total (as CaCO3)	mg/L	1	57.2		
Ammonia, Total (as N)	mg/L	0.005	**2.78**	2.0	4.0
Bromide (Br)	mg/L	0.5	0.3		
Chloride (Cl)	mg/L	5	201		
Fluoride (F)	mg/L	0.2	0.049		
Nitrate (as N)	mg/L	0.05	8.33		
Nitrite (as N)	mg/L	0.01	0.0768		
Sulfate (SO4)	mg/L	5	21.5		
Cyanide, Total	mg/L	0.005	<0.0050	1.0	2.0
Aluminum (Al)-Total	mg/L	0.005	0.568	1.0	2.0
Antimony (Sb)-Total	mg/L	0.0005	<0.00050		
Arsenic (As)-Total	mg/L	0.0005	0.0005	0.05	0.10
Barium (Ba)-Total	mg/L	0.02	<0.020		
Beryllium (Be)-Total	mg/L	0.001	<0.0010		
Boron (B)-Total	mg/L	0.1	0.1		
Cadmium (Cd)-Total	mg/L	0.00001	0.0000177		
Calcium (Ca)-Total	mg/L	0.1	68		
Chromium (Cr)-Total	mg/L	0.001	0.002		
Cobalt (Co)-Total	mg/L	0.0003	0.0007		
Copper (Cu)-Total	mg/L	0.001	0.0055	0.02	0.30
Iron (Fe)-Total	mg/L	0.03	**0.684**	0.30	0.60
Lead (Pb)-Total	mg/L	0.0005	<0.00050	0.01	0.02
Lithium (Li)-Total	mg/L	0.005	0.0084		
Magnesium (Mg)-Total	mg/L	0.1	9.73		
Manganese (Mn)-Total	mg/L	0.0003	0.108		
Molybdenum (Mo)-Total	mg/L	0.001	0.0013		
Nickel (Ni)-Total	mg/L	0.001	0.0016	0.05	0.10
Potassium (K)-Total	mg/L	2	5.5		
Selenium (Se)-Total	mg/L	0.0001	0.000295		
Silver (Ag)-Total	mg/L	0.00002	<0.000020		
Sodium (Na)-Total	mg/L	2	67.3		
Thallium (Tl)-Total	mg/L	0.0002	<0.00020		
Tin (Sn)-Total	mg/L	0.0005	<0.00050		
Titanium (Ti)-Total	mg/L	0.01	0.037		
Uranium (U)-Total	mg/L	0.0002	0.00024		
Vanadium (V)-Total	mg/L	0.001	0.00208		
Zinc (Zn)-Total	mg/L	0.005	**0.0171**	0.01	0.02
Oil and Grease	mg/L	5	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	NO	No Visible Sheen	No Visible Sheen

Bold/shading indicates exceedance of Part G Item 23(a) Maximum Average Concentration and/or Maximum Concentration in a Grab Sample.

Table 6: Water Quality Data Summary for ST-2, June 2015

		Sample ID	ST2-08JUN15
		ALS ID	L1624328-2
		Date Sampled	6/8/2015 3:47:00 PM
Parameter	**Units**	**Detection Limit**	**Water**
Hardness (as CaCO3)	mg/L	0.5	425
pH	pH	0.1	7.98
Total Suspended Solids	mg/L	3	3.9
Alkalinity, Total (as CaCO3)	mg/L	1	81.4
Ammonia, Total (as N)	mg/L	0.25	10.6
Bromide (Br)	mg/L	0.05	0.63
Chloride (Cl)	mg/L	0.5	472
Fluoride (F)	mg/L	0.02	<0.20 *
Nitrate (as N)	mg/L	0.025	26.9
Nitrite (as N)	mg/L	0.001	0.188
Sulfate (SO4)	mg/L	0.5	46.3
Cyanide, Total	mg/L	0.005	<0.0050
Aluminum (Al)-Total	mg/L	0.006	0.136
Antimony (Sb)-Total	mg/L	0.0005	<0.00050
Arsenic (As)-Total	mg/L	0.0005	0.00068
Barium (Ba)-Total	mg/L	0.02	0.03
Beryllium (Be)-Total	mg/L	0.001	<0.0010
Boron (B)-Total	mg/L	0.1	0.22
Cadmium (Cd)-Total	mg/L	0.00002	0.0000448
Calcium (Ca)-Total	mg/L	0.1	135
Chromium (Cr)-Total	mg/L	0.001	0.001
Cobalt (Co)-Total	mg/L	0.0003	0.00103
Copper (Cu)-Total	mg/L	0.001	0.0041
Iron (Fe)-Total	mg/L	0.03	0.24
Lead (Pb)-Total	mg/L	0.0005	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0218
Magnesium (Mg)-Total	mg/L	0.1	18.4
Manganese (Mn)-Total	mg/L	0.0003	0.212
Molybdenum (Mo)-Total	mg/L	0.001	0.0024
Nickel (Ni)-Total	mg/L	0.001	0.0014
Potassium (K)-Total	mg/L	2	12.6
Selenium (Se)-Total	mg/L	0.0002	0.000667
Silver (Ag)-Total	mg/L	0.00002	<0.000020
Sodium (Na)-Total	mg/L	2	177
Thallium (Tl)-Total	mg/L	0.0002	<0.00020
Tin (Sn)-Total	mg/L	0.0005	<0.00050
Titanium (Ti)-Total	mg/L	0.01	0.011
Uranium (U)-Total	mg/L	0.0002	0.00043
Vanadium (V)-Total	mg/L	0.002	0.0009
Zinc (Zn)-Total	mg/L	0.005	<0.0050
Oil and Grease	mg/L	5	<5.0
Oil And Grease (Visible Sheen)		n/a	NO

* Detection Limit Adjusted due to sample matrix effects.

The Reagent and Cyanide Storage Facility Sumps (ST-11) is not constructed.

Items 24(c): Landfarm Sump (ST-4) and Schedule J, Table 2 Monitoring Requirements

No water was discharged from the Landfarm Sump (ST-4) this month. Pre-discharge water quality samples were collected from monitoring station ST-4 in accordance with Schedule J, Table 2 of the licence. Results are provided in Table 7. All parameters were in compliance with discharge criteria and water will be discharged to tundra in accordance with Part G Items 24(c) and 24(d) of the licence. No water was discharged from this facility in June.

Table 7: Pre-Discharge Water Quality Results for ST-4, June 2015

		Sample ID	ST4-09JUN15	ST4-28JUN15	Part G Item 24(c)	
		ALS ID	L1624434-1	L1635560-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
		Date Sampled	6/9/2015 10:00:00 AM	6/28/2015 11:20:00 AM		
Parameter	**Units**	**Detection Limit**	**Water**	**Water**		
pH	pH	0.1	7.96	8.33	6.0-9.0	9
Total Suspended Solids	mg/L	3	11.8	3.3	15.0	30.0
Total Oil and Grease	mg/L	5	<5.0	<5.0	5.0	10.0
Oil And Grease (Visible Sheen)		n/a	NO	NO	No Visible Sheen	No Visible Sheen
Total Ammonia - N	mg/L	0.005	0.011	0.0096	2.0	4.0
Total Lead	mg/L	0.00005	0.00037	0.000098	0.01	0.02
Benzene	mg/L	0.0005	<0.00050	<0.00050	0.37	
Toluene	mg/L	0.0005	<0.00050	<0.00050	0.002	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	0.090	

Bold/shading indicates exceedance of Part G Item 24(c) Maximum Concentration in a Grab Sample.

Items 24(e): Fuel Storage and Containment Facility Sumps (ST-5, ST-6a and ST-6b) and Schedule J, Table 2 Monitoring Requirements

Compliance monitoring samples were collected prior to discharge and daily during discharge at the Doris Tank Farm (ST-5) and Roberts Bay tank farms (ST-6a and ST-6b) this month. Excluding elevated TSS in sample ST6A-24JUN15 (which was consequently discharged to roads and/or the overburden stockpile), all other results were in compliance with the licence. Results are presented in Tables 8 through 10 below.

A discharge notification for these facilities was provided to the Inspector on May 13, 2015. Dewatering of these facilities was undertaken during the month. Samples were collected daily during discharges from the facilities. Compliant berm water (or berm water with TSS as the only elevated parameter) was used for dust suppression and other industrial purposes; permission was granted for this use by the Inspector on May 14, 2015.

Table 8: Pre-Discharge and Daily Discharge Compliance Monitoring Water Quality Data for ST-5, June 2015

		Sample ID	ST5-01JUN15	ST5-09JUN15	ST5-22JUN15	Part G Item 24(e)	
		ALS ID	L1620640-4	L1624616-6	L1631704-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
		Date Sampled	6/1/2015 8:32:00 AM	6/9/2015 10:00:00 AM	6/22/2015 8:05:00 AM		
Parameter	**Units**	**Detection Limit**	**Water**	**Water**	**Water**		
pH	pH	0.1	8.12	8.23	8.13	6.0– 9.0	9
Total Suspended Solids	mg/L	3	<3.0	<3.0	<3.0	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005	0.000088	<0.000050	<0.000050	0.01	0.02
Oil and Grease	mg/L	5	<5.0	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	NO	NO	NO		
Benzene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	0.002	

Bold/shading indicates exceedance of Part G Item 24(e) Maximum Concentration in a Grab Sample; however no exceedances observed.

Table 9: Pre-Discharge and Daily Discharge Compliance Monitoring Water Quality Data for ST-6A, June 2015

		Sample ID	ST6A-03JUN15	ST6A-05JUN15	ST6A-06JUN15	ST6A-08JUN15	ST6A-12JUN15	Part G Item 24(e)	
		ALS ID	L1624616-1	L1624616-2	L1624616-3	L1624616-4	L1626304-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
		Date Sampled	6/3/2015 10:50:00 AM	6/5/2015 8:52:00 AM	6/6/2015 9:05:00 AM	6/8/2015 9:00:00 AM	6/12/2015 9:15:00 AM		
Parameter	**Units**	**Detection Limit**	**Water**	**Water**	**Water**	**Water**	**Water**		
pH	pH	0.1	8.21	8.13	8.06	8.16	8.06	6.0– 9.0	9
Total Suspended Solids	mg/L	3	3.1	<3.0	<3.0	4.2	4	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005	<0.000050	0.000314	0.000327	0.000296	0.000331	0.01	0.02
Oil and Grease	mg/L	5	<5.0	<5.0	<5.0	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	NO	NO	NO	NO	NO		
Benzene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.002	

Bold/shading indicates exceedance of Part G Item 24(e) Maximum Concentration in a Grab Sample.

			Sample ID	ST6A-13JUN15	ST6A-19JUN15	ST6A-22JUN15	ST6A-24JUN15	ST6A-28JUN15	Part G Item 24(e)	
			ALS ID	L1627960-1	L1631704-4	L1631704-2	L1633291-2	L1635600-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
			Date Sampled	6/13/2015 8:45:00 AM	6/19/2015 8:20:00 AM	6/22/2015 8:25:00 AM	6/24/2015 6:20:00 PM	6/28/2015 8:00:00 AM		
Parameter	**Units**	**Detection Limit**		**Water**	**Water**	**Water**	**Water**	**Water**		
pH	pH	0.1		8.1	8.15	8.18	8.12	8.3	6.0– 9.0	9
Total Suspended Solids	mg/L	3		<3.0	7.1	<3.0	**21.3**	<3.0	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005		0.000239	0.000369	0.000094	0.000297	0.000084	0.01	0.02
Oil and Grease	mg/L	5		<5.0	<5.0	<5.0	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a		NO	NO	NO	NO	NO		
Benzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.002	

Bold/shading indicates exceedance of Part G Item 24(e) Maximum Concentration in a Grab Sample.

Table 10: Pre-Discharge and Daily Discharge Compliance Monitoring Water Quality Data for ST-6B, June 2015

			Sample ID	ST6B-09JUN15	ST6B-16JUN15A	ST6B-16JUN15B	ST6B-22JUN15	ST6B-28JUN15	Part G Item 24(e)	
			ALS ID	L1624616-5	L1627960-2	L1627960-3	L1631704-3	L1635600-2	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
			Date Sampled	6/9/2015 8:55:00 AM	6/16/2015 9:15:00 AM	6/16/2015 9:15:00 AM	6/22/2015 8:55:00 AM	6/28/2015 8:00:00 AM		
Parameter	**Units**	**Detection Limit**		**Water**	**Water**	**Water**	**Water**	**Water**		
pH	pH	0.1		8.34	8.27	8.29	8.27	8.41	6.0– 9.0	9
Total Suspended Solids	mg/L	3		<3.0	<3.0	<3.0	<3.0	<3.0	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005		0.000065	<0.000050	<0.000050	<0.000050	<0.000050	0.01	0.02
Oil and Grease	mg/L	5		<5.0	<5.0	<5.0	<5.0	<5	5	10
Oil And Grease (Visible Sheen)		n/a		NO	NO	NO	No	NO		
Benzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.002	

Bold/shading indicates exceedance of Part G Item 24(e) Maximum Concentration in a Grab Sample; however no exceedances observed.

Item 28, 29, 30 and Part J Item 8: Water Quality Discharged from Tailings Impoundment Area (TL-1, TL-2, TL-3 or TL-4.)

Pre-discharge water quality sampling was conducted this month at three stations associated with the TIA discharge (TL-1 through TL-3) in accordance with Part J Item 8 and Schedule J, Table 2 of the licence. Results are presented in Tables 11 through 13 below. Exceedances of the Part G Item 30 criteria for aluminum and iron were noted in samples collected at Doris Creek station TL-3, downstream of the TL-4 discharge location. However, discharge from the TIA had not yet commenced and these concentrations were lower than aluminum and iron results upstream of the discharge location (station TL-2) indicating concentrations are elevated in the background creek water.

Table 11: Pre-discharge Water Quality Sample Results for TL-1, June 2015

		Sample ID	TL1-08JUN15	TL1-12JUN15	TL1-15JUN15
		ALS ID	L1624424-1	L1626296-1	L1628002-1
		Date Sampled	6/8/2015 10:05:00 AM	6/12/2015 8:15:00 AM	6/15/2015 5:30:00 PM
Parameter	**Units**	**Detection Limit**	**Water**	**Water**	**Water**
Hardness (as CaCO3)	mg/L	0.5	62.7	40.5	82.6
pH	pH	0.1	7.62	7.49	7.93
Redox Potential	mV	-1000	-	-	-
Total Suspended Solids	mg/L	3	16.1	3.3	<3.0
Total Dissolved Solids	mg/L	10	135	92	189
Ammonia, Total (as N)	mg/L	0.005	0.0258	0.0117	0.0113
Bromide (Br)	mg/L	0.05	0.078	<0.050	0.102
Chloride (Cl)	mg/L	0.5	46.9	29.4	48.8
Fluoride (F)	mg/L	0.02	0.055	0.041	0.051
Nitrate (as N)	mg/L	0.005	0.0866	<0.0050	0.0263
Nitrite (as N)	mg/L	0.001	0.0012	<0.0010	<0.0010
Orthophosphate-Dissolved (as P)	mg/L	0.001	0.0024	0.0016	<0.0010
Phosphorus (P)-Total	mg/L	0.002	0.0196	0.0359	0.0134
Sulfate (SO4)	mg/L	0.5	3.09	1.9	2.42
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050	<0.0050
Aluminum (Al)-Total	mg/L	0.005	0.0145	0.0245	0.0108
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050
Barium (Ba)-Total	mg/L	0.02	<0.020	<0.020	<0.020
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.1	<0.10	<0.10	<0.10
Cadmium (Cd)-Total	mg/L	0.00001	<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	0.1	14.6	9.6	18.6
Chromium (Cr)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030	<0.00030
Copper (Cu)-Total	mg/L	0.001	<0.0010	0.0011	0.001
Iron (Fe)-Total	mg/L	0.03	0.169	0.17	0.096
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0038	0.0027	0.0057
Magnesium (Mg)-Total	mg/L	0.1	6.38	4.02	8.77
Manganese (Mn)-Total	mg/L	0.0003	0.0225	0.0306	0.0197
Mercury (Hg)-Total	mg/L	0.00001	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010
Potassium (K)-Total	mg/L	2	2.5	<2.0	2.9
Selenium (Se)-Total	mg/L	0.0001	<0.000050	<0.000050	<0.000050
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	22.6	12.8	29.7
Thallium (Tl)-Total	mg/L	0.0002	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050

			Sample ID	TL1-08JUN15	TL1-12JUN15	TL1-15JUN15
			ALS ID	L1624424-1	L1626296-1	L1628002-1
			Date Sampled	6/8/2015 10:05:00 AM	6/12/2015 8:15:00 AM	6/15/2015 5:30:00 PM
Parameter	**Units**	**Detection Limit**		**Water**	**Water**	**Water**
Titanium (Ti)-Total	mg/L	0.01		<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.0002		<0.00020	<0.00020	<0.00020
Vanadium (V)-Total	mg/L	0.001		<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050

Table 12: Pre-discharge Water Quality Sample Results for TL-2, June 2015

		Sample ID	TL2-15JUN15A	TL2-15JUN15B	Part G Item 30
		ALS ID	L1628002-2	L1628002-3	Maximum Concentration of Any Grab Sample (mg/L)
		Date Sampled	6/15/2015 6:30:00 PM	6/15/2015 6:30:00 PM	
Parameter	**Units**	**Detection Limit**	**Water**	**Water**	
Hardness (as CaCO3)	mg/L	0.5	35.5	35.8	
pH	pH	0.1	7.5	7.46	6.0 - 9.0
Total Suspended Solids	mg/L	3	<3.0	<3.0	15.0
Total Dissolved Solids	mg/L	10	130	128	
Ammonia, Total (as N)	mg/L	0.005	<0.0050	<0.0050	1.54
Bromide (Br)	mg/L	0.05	0.172	0.169	
Chloride (Cl)	mg/L	0.5	49.6	49.5	150
Fluoride (F)	mg/L	0.02	0.044	0.044	
Nitrate (as N)	mg/L	0.005	<0.0050	<0.0050	2.9
Nitrite (as N)	mg/L	0.001	<0.0010	<0.0010	0.060
Orthophosphate-Dissolved (as P)	mg/L	0.001	<0.0010	<0.0010	
Phosphorus (P)-Total	mg/L	0.002	0.0181	0.0243	
Sulfate (SO4)	mg/L	0.5	2.14	2.14	
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050	0.010
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050	0.005
Aluminum (Al)-Total	mg/L	0.005	**0.179**	**0.19**	0.100
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050	
Arsenic (As)-Total	mg/L	0.0005	<0.00050	<0.00050	0.0050
Barium (Ba)-Total	mg/L	0.02	<0.020	<0.020	
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010	
Boron (B)-Total	mg/L	0.1	<0.10	<0.10	
Cadmium (Cd)-Total	mg/L	0.00001	<0.0000050	<0.0000050	0.000017
Calcium (Ca)-Total	mg/L	0.1	5.88	5.91	
Chromium (Cr)-Total	mg/L	0.001	<0.0010	<0.0010	
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030	
Copper (Cu)-Total	mg/L	0.001	0.0014	0.0014	0.002
Iron (Fe)-Total	mg/L	0.03	**0.383**	**0.392**	0.300
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050	0.001
Lithium (Li)-Total	mg/L	0.005	0.003	0.0029	
Magnesium (Mg)-Total	mg/L	0.1	5.07	5.12	
Manganese (Mn)-Total	mg/L	0.0003	0.0443	0.0452	
Mercury (Hg)-Total	mg/L	0.00001	<0.0000050	<0.0000050	0.000026
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010	0.073
Nickel (Ni)-Total	mg/L	0.001	<0.0010	<0.0010	0.025
Potassium (K)-Total	mg/L	2	2.1	2.2	
Selenium (Se)-Total	mg/L	0.0001	<0.000050	<0.000050	0.0010
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020	0.0001
Sodium (Na)-Total	mg/L	2	25.2	25.5	
Thallium (Tl)-Total	mg/L	0.0002	<0.00020	<0.00020	0.0008
Tin (Sn)-Total	mg/L	0.0005	<0.00050	<0.00050	
Titanium (Ti)-Total	mg/L	0.01	<0.010	<0.010	
Uranium (U)-Total	mg/L	0.0002	<0.00020	<0.00020	
Vanadium (V)-Total	mg/L	0.001	0.00052	<0.00050	
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050	0.030

Bold/shading indicates exceedance of Part G Item 30 Maximum Concentration in a Grab Sample.

Table 13: Pre-discharge Water Quality Sample Results for TL-3, June 2015

		Sample ID	TL3-15JUN15A	TL3-15JUN15B	Part G Item 30
		ALS ID	L1628002-4	L1628002-5	Maximum Concentration of Any Grab Sample (mg/L)
		Date Sampled	6/15/2015 6:30:00 PM	6/15/2015 6:30:00 PM	
Parameter	**Units**	**Detection Limit**	**Water**	**Water**	
Hardness (as CaCO3)	mg/L	0.5	37.2	36.9	
pH	pH	0.1	7.5	7.55	6.0 - 9.0
Total Suspended Solids	mg/L	3	5.4	<3.0	15.0
Total Dissolved Solids	mg/L	10	134	127	
Ammonia, Total (as N)	mg/L	0.005	<0.0050	<0.0050	1.54
Bromide (Br)	mg/L	0.05	0.175	0.176	
Chloride (Cl)	mg/L	0.5	51	51	150
Fluoride (F)	mg/L	0.02	0.045	0.045	
Nitrate (as N)	mg/L	0.005	<0.0050	<0.0050	2.9
Nitrite (as N)	mg/L	0.001	<0.0010	<0.0010	0.060
Orthophosphate-Dissolved (as P)	mg/L	0.001	<0.0010	<0.0010	
Phosphorus (P)-Total	mg/L	0.002	0.0173	0.0184	
Sulfate (SO4)	mg/L	0.5	2.24	2.24	
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050	0.010
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050	0.005
Aluminum (Al)-Total	mg/L	0.005	**0.156**	**0.161**	0.100
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050	
Arsenic (As)-Total	mg/L	0.0005	<0.00050	<0.00050	0.0050
Barium (Ba)-Total	mg/L	0.02	<0.020	<0.020	
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010	
Boron (B)-Total	mg/L	0.1	<0.10	<0.10	
Cadmium (Cd)-Total	mg/L	0.00001	<0.0000050	<0.0000050	0.000017
Calcium (Ca)-Total	mg/L	0.1	6.29	6.21	
Chromium (Cr)-Total	mg/L	0.001	<0.0010	<0.0010	
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030	
Copper (Cu)-Total	mg/L	0.001	0.0013	0.0014	0.002
Iron (Fe)-Total	mg/L	0.03	**0.353**	**0.35**	0.300
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050	0.001
Lithium (Li)-Total	mg/L	0.005	0.003	0.0029	
Magnesium (Mg)-Total	mg/L	0.1	5.22	5.19	
Manganese (Mn)-Total	mg/L	0.0003	0.0379	0.037	
Mercury (Hg)-Total	mg/L	0.00001	<0.0000050	<0.0000050	0.000026
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010	0.073
Nickel (Ni)-Total	mg/L	0.001	<0.0010	<0.0010	0.025
Potassium (K)-Total	mg/L	2	2.2	2.2	
Selenium (Se)-Total	mg/L	0.0001	<0.000050	<0.000050	0.0010
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020	0.0001
Sodium (Na)-Total	mg/L	2	26.1	25.9	
Thallium (Tl)-Total	mg/L	0.0002	<0.00020	<0.00020	0.0008
Tin (Sn)-Total	mg/L	0.0005	<0.00050	<0.00050	
Titanium (Ti)-Total	mg/L	0.01	<0.010	<0.010	
Uranium (U)-Total	mg/L	0.0002	<0.00020	<0.00020	
Vanadium (V)-Total	mg/L	0.001	<0.00050	<0.00050	
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050	0.030
Hexavalent Chromium	mg/L	0.001	<0.0010	<0.0010	0.0010
Oil and Grease	mg/L	5	<5.0	<5.0	5
Oil And Grease (Visible Sheen)		n/a	NO	NO	

Bold/shading indicates exceedance of the greater of background concentration at station TL2 or Part G Item 30 - Maximum Concentration in a Grab Sample.

Item 32: Tailings Impoundment Area Discharge Volume – Comparison of Flows at TL-4 and TL-2

Discharge from the TIA began June 30, 2015. A comparison of flows is presented in Table 14 below.

Table 14: Comparison of Flows at TL-4 and TL-2, June 2015

Date	TL-4 Discharge (m^3)	10% of TL-2 Flow (Predicted) (m^3)
June-18-15	0	22378
June-19-15	0	21600
June-20-15	0	22378
June-21-15	0	22291
June-22-15	0	22116
June-23-15	0	22005
June-24-15	0	21896
June-25-15	0	21413
June-26-15	0	21258
June-27-15	0	20619
June-28-15	0	20397
June-29-15	0	19915
June-30-15	3182.83	19545

Schedule J: Tailings Impoundment Area Water Quality (TL-10)

Monitoring at TL-10 is conducted annually prior to the deposition of tailings into the Tailings Impoundment Area. This monitoring is scheduled to be completed in August 2015.

Part J: Conditions Applying to General and Aquatics Effects Monitoring

Item 4(a): TIA Discharge Quality – Water Quality Comparison/Deviations

Exceedances of Part G, Item 30 criteria for aluminum and iron were noted in pre-discharge samples at Doris Creek station TL-3 (downstream of TL-4 discharge location); however, discharge from the TIA did not commence until June 30, 2015. Elevated concentrations of aluminum and iron were observed during sampling events at TL-2 (upstream of the TIA discharge location) and concentrations of aluminum and iron at station TL-1 (TIA discharge intake) were not elevated. This indicates that these concentrations are naturally elevated in Doris Creek and are not a project related effect.

Item 8 and Schedule J, Monitoring Requirements: Acute Lethality Testing (TL-1 and TL-4)

Pre-discharge acute lethality testing was conducted at sample station TL-1 (TIA intake) this month. Results indicate that effluent is non-acutely toxic to Rainbow Trout and Daphnia magna (Table 15).

Table 15: Acute Lethality Testing, Pre-Discharge at TL-1, June 2015

Sample ID	**TL1-15JUN15**
ALS ID	**L1628002-1**
Sample Date/Time	**15/6/2015 17:30**
Parameter	Results*
96-h LC50 Rainbow Trout Acute Toxicity EPS 1/RM/13	>100%
48-h LC50 Daphnia magna Acute Toxicity EPS 1/RM/14	>100%

*>100% indicates all test organisms survived ie: non-lethal

Item 12d: Tonnages of Waste Rock Stored on the Temporary Waste Rock Pad

Underground test mining restarted in April 2015 and modifications to the existing vent raise were also started. The waste rock produced from the test mining program will be stored underground until September 2015 when more underground equipment is delivered to site on the sea lift and the waste rock can be hauled to surface. The total volume of waste rock on the temporary waste rock pad is 189,607 tonnes, as per the December 2011 survey.

Item 12g: Tail Lake Ice Thickness

Ice thickness measurement on the TIA is only required following deposition of tailings.

Item 14, 15, 16 and Schedule J, Monitoring Requirements: Thermal Monitoring

Thermal monitoring undertaken under this part is reported in the annual Geotechnical Inspection Report.

Item 20: Daily Visual Monitoring of Discharges to Tundra

Discharges to tundra occurred at stations ST-5 and ST-6B. This month discharges to the Roberts Bay overburden stockpile occurred at station ST6-A as permitted by the Inspector. During daily discharge sampling, visual observations were made and no erosion was noted. Water accumulated at station ST6-A was also discharged to site roads for dust suppression.

Item 21 (e) Daily Visual Assessment of Suspended Sediment at TIA

During sample collection at station TL-1 and during weekly dam inspections, visual assessments were made for suspended sediment at the TIA. No suspended sediment was noted during the month.

Item 21 (f) Doris North Camp Diversion Berm Effectiveness

During spring melt and after heavy rainfall events, visual observations were made of runoff associated with the diversion berm. No sedimentation was noted and water is effectively routed away from camp facilities.

Environmental Incident Reporting

No incidents occurred pertaining to this licence during the period.

Should there be any questions regarding this monthly report, please contact John Roberts at John.Roberts@tmacresources.com.

Yours sincerely,

M. John Roberts
Vice President, Environmental Affairs
Hope Bay Project
(416) 628-0216

cc. Eva Paul, Water Resources Officer, AANDC

Figure 1. 2AM-DOH1323 SNP Monitoring Locations