

June 21, 2016

Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
X0B 1J0

Re: May 2016 – 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 INAC. 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 drilling, underground mining, construction, 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

A total of 705 m³ of water was extracted from Windy Lake for domestic use this month as permitted by water licences 2BE-HOP1222 and 2AM-DOH1323. 14 m³ of water from an unnamed lakes proximal to the drill locations was used in the 2AM-DOH1323 licence area for surface exploration drilling. A total of 656 m³ of water was used from Doris and Windy Lakes (652 m³ and 4 m³, respectively) for underground drilling and other industrial purposes in support of the Doris North mine development. 154 m³ of water was used for dust suppression on site roads this month. Water usage is presented in Table 1.

Table 1: Water usage, in cubic meters, May 2016

Water Usage	Domestic Water Use from Windy Lake ST-7a (m ³)	Domestic Water Use from Doris Lake ST-7 (m ³)	Doris Surface Exploration Drilling (m ³)	All Other Industrial Water Use** (m ³)	Total (m ³)
Monthly Total	705	0	14*	810	1,529
Annual Cumulative	3,183	0	298	1,429	4,910

* All water withdrawn from unnamed lakes proximal to the drilling location; location coordinates maintained on file.

** Includes industrial uses such as underground drilling, core processing, dust suppression, concrete batching, etc.

No water was applied for ice road development during the month. In total, 1,068 m³ of water has been applied in 2016 for ice road development. These quantities are not included in the usage indicated in Table 1.

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, May 2016

Sample ID			ST7-17MAY16	ST7A-03MAY16
ALS ID			L1770135-1	L1763655-1
Date Sampled			5/17/2016 9:20:00 AM	5/3/2016 8:30:00 AM
Parameter	Units	Detection Limit	Water	Water
Hardness (as CaCO ₃)	mg/L	0.5	56.1	93.1
pH	pH	0.1	7.79	8
Total Suspended Solids	mg/L	3	4.8	<3.0
Ammonia, Total (as N)	mg/L	0.005	<0.0050	<0.0050
Nitrate (as N)	mg/L	0.005	<0.0050	0.0347
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	0.0263	<0.0020
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050
Fecal Coliforms ^	MPN/100mL	1	<1	<1*
Aluminum (Al)-Total	mg/L	0.005	0.0095	0.0143
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	9.87	16.1
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	0.0018	0.0015
Iron (Fe)-Total	mg/L	0.03	0.061	0.105
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0031	0.0097
Magnesium (Mg)-Total	mg/L	0.1	7.64	12.8
Manganese (Mn)-Total	mg/L	0.0003	0.00675	0.00132
Mercury (Hg)-Total	mg/L	0.00001	0.0000054	<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	2.7	5.4
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	38.2	69.9
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	3
Oil and Grease	mg/L	5	<5.0	<5.0
Oil And Grease (Visible Sheen)		n/a	No	No

* results on Lab Work Order L1763671-1 for Potable Water Station PDC10 (same location as ST-7a)

^ Analytical laboratory adopted new methodology determine Fecal coliform concentrations effective April 30, 2016. Results now presented as Most Probable Number per 100mL (MPN/ 100mL).

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 3, 2016.

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

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, May 2016

Sample ID			ST8B-10MAY16	Part G Item 3(b)	
ALS ID			L1766621-1	Maximum Average Concentration	Maximum Concentration in any Grab Sample
Date Sampled			5/10/2016 10:50:00 AM		
Parameter	Units	Detection Limit	Water		
pH	pH	0.1	7.86	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3	<3.0	100	100
Fecal Coliforms ^	MPN/ 100mL	1	<1	10,000	10,000
Biochemical Oxygen Demand (BOD ₅)	mg/L	2	3	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

Bold/shading indicates criteria exceedance, if any observed.

^ Analytical laboratory adopted new methodology to determine Fecal coliform concentrations effective April 30, 2016. Results now presented as Most Probable Number per 100mL (MPN/ 100mL), this data remains comparable to the Water Licence criteria.

This month, 728 m³ 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 Schedule J requirements of the licence. Water quality results are presented in Table 4 below.

Table 4: Monthly Compliance Sample Results for ST-9, May 2016

Sample ID		ST9-17MAY16	
ALS ID		L1770128-1	
Date Sampled		5/17/2016 11:00:00 AM	
Parameter	Units	Detection Limit	Water
pH	pH	0.10	7.65
Total Suspended Solids	mg/L	3.00	<3.0
Fecal Coliforms ^	MPN/ 100mL	1.00	5.00
Biochemical Oxygen Demand (BOD ₅)	mg/L	1.00	11.00
Oil and Grease	mg/L	5.00	<5.0
Oil And Grease (Visible Sheen)		n/a	No

Bold/shading indicates criteria exceedance, if any observed.

^ Analytical laboratory adopted new methodology to determine Fecal coliform concentrations effective April 30, 2016. Results now presented as Most Probable Number per 100mL (MPN/ 100mL), this data remains comparable to the Water Licence criteria.

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 iron exceeded the criteria for discharge to tundra in Part G Item 23(a). No water was discharged from the Sedimentation Pond this month. 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. No water was discharged from the Pollution Control Pond this month.

Table 5: Monthly Compliance Sample Results for ST-1, May 2016

Sample ID			ST1-21MAY16	Part G Item 23(a)	
ALS ID			L1772857-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
Date Sampled			5/21/2016 11:20:00 AM		
Parameter	Units	Detection Limit	Water		
Hardness (as CaCO3)	mg/L	0.5	123		

pH	pH	0.1	7.74	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3	13.3	15.0	30.0
Alkalinity, Total (as CaCO ₃)	mg/L	1	45.4		
Ammonia, Total (as N)	mg/L	0.005	1.25	2.0	4.0
Bromide (Br)	mg/L	0.5	0.154		
Chloride (Cl)	mg/L	5	82.2		
Fluoride (F)	mg/L	0.2	<0.020		
Nitrate (as N)	mg/L	0.05	2.97		
Nitrite (as N)	mg/L	0.01	0.0575		
Sulfate (SO ₄)	mg/L	5	6.64		
Cyanide, Total	mg/L	0.005	<0.0050	1.0	2.0
Aluminum (Al)-Total	mg/L	0.005	0.545	1.0	2.0
Antimony (Sb)-Total	mg/L	0.0005	<0.00050		
Arsenic (As)-Total	mg/L	0.0005	<0.00050	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	<0.10		
Cadmium (Cd)-Total	mg/L	0.00001	0.0000262		
Calcium (Ca)-Total	mg/L	0.1	42.4		
Chromium (Cr)-Total	mg/L	0.001	0.0028		
Cobalt (Co)-Total	mg/L	0.0003	0.00069		
Copper (Cu)-Total	mg/L	0.001	0.0035	0.02	0.30
Iron (Fe)-Total	mg/L	0.03	0.939	0.30	0.60
Lead (Pb)-Total	mg/L	0.0005	<0.00050	0.01	0.02
Lithium (Li)-Total	mg/L	0.005	0.0036		
Magnesium (Mg)-Total	mg/L	0.1	4.28		
Manganese (Mn)-Total	mg/L	0.0003	0.105		
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010		
Nickel (Ni)-Total	mg/L	0.001	0.0018	0.05	0.10
Potassium (K)-Total	mg/L	2	<2.0		
Selenium (Se)-Total	mg/L	0.0001	0.00011		
Silver (Ag)-Total	mg/L	0.00002	<0.000020		
Sodium (Na)-Total	mg/L	2	24.8		
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	0.033		
Uranium (U)-Total	mg/L	0.0002	<0.00020		
Vanadium (V)-Total	mg/L	0.001	0.00245		
Zinc (Zn)-Total	mg/L	0.005	0.0067	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 criteria exceedance, if any observed.

Table 6: Monthly Compliance Sample Results for ST-2, May 2016

Sample ID			ST2-21MAY16
ALS ID			L1772857-2
Date Sampled			5/21/2016 11:40:00 AM
Parameter	Units	Detection Limit	Water
Hardness (as CaCO ₃)	mg/L	0.5	1210
pH	pH	0.1	7.62
Total Suspended Solids	mg/L	3	10.3
Alkalinity, Total (as CaCO ₃)	mg/L	1	55.9
Ammonia, Total (as N)	mg/L	0.25	14.3
Bromide (Br)	mg/L	0.05	1.5
Chloride (Cl)	mg/L	0.5	1200
Fluoride (F)	mg/L	0.02	<0.40 *
Nitrate (as N)	mg/L	0.025	40.1
Nitrite (as N)	mg/L	0.001	0.472
Sulfate (SO ₄)	mg/L	0.5	66.5
Cyanide, Total	mg/L	0.005	<0.0050
Aluminum (Al)-Total	mg/L	0.006	0.154
Antimony (Sb)-Total	mg/L	0.0005	<0.00050
Arsenic (As)-Total	mg/L	0.0005	0.00097
Barium (Ba)-Total	mg/L	0.02	0.061
Beryllium (Be)-Total	mg/L	0.001	<0.0010

Boron (B)-Total	mg/L	0.1	0.13
Cadmium (Cd)-Total	mg/L	0.00002	0.0000849
Calcium (Ca)-Total	mg/L	0.1	411
Chromium (Cr)-Total	mg/L	0.001	<0.0010
Cobalt (Co)-Total	mg/L	0.0003	0.00168
Copper (Cu)-Total	mg/L	0.001	0.0071
Iron (Fe)-Total	mg/L	0.03	0.226
Lead (Pb)-Total	mg/L	0.0005	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0365
Magnesium (Mg)-Total	mg/L	0.1	44.6
Manganese (Mn)-Total	mg/L	0.0003	0.693
Molybdenum (Mo)-Total	mg/L	0.001	0.002
Nickel (Ni)-Total	mg/L	0.001	0.0026
Potassium (K)-Total	mg/L	2	18.8
Selenium (Se)-Total	mg/L	0.0002	0.000669
Silver (Ag)-Total	mg/L	0.00002	<0.000020
Sodium (Na)-Total	mg/L	2	307
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	0.018
Uranium (U)-Total	mg/L	0.0002	0.00072
Vanadium (V)-Total	mg/L	0.002	0.00094
Zinc (Zn)-Total	mg/L	0.005	0.0065
Oil and Grease	mg/L	5	<5.0
Oil And Grease (Visible Sheen)		n/a	NO

* Dilution required due to high Dissolved Solids / Electrical Conductivity.

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

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

No water was discharged from the Landfarm (ST-4) this month and no sampling was conducted.

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. All results were in compliance with requirements of Schedule J Table 2 of the licence. Results are presented in Tables 7 through 9 below.

Table 7: Monthly Compliance Sample Results for ST-5, May 2016

Sample ID			ST5-19MAY16	ST5-27MAY16	ST5-28MAY16	ST5-29MAY16	Part G Item 24(e)	
ALS ID			L1772223-1	L1776203-1	L1776203-2	L1776203-3	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
Date Sampled			5/19/2016 2:15:00 PM	5/27/2016 1:10:00 PM	5/28/2016 8:00:00 AM	5/29/2016 8:05:00 AM		
Parameter	Units	Detection Limit	Water	Water	Water	Water		
pH	pH	0.1	8.22	8.12	8.13	8.15	6.0– 9.0	9
Total Suspended Solids	mg/L	3	8.3	6.7	4.4	3.4	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005	0.000191	0.000346	0.000265	0.000189	0.01	0.02
Oil and Grease	mg/L	5	<5.0	<5.0	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	No	No	No	No		
Benzene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.002	

Bold/shading indicates criteria exceedance, if any observed.

Table 8: Monthly Compliance Sample Results for ST-6a, May 2016

Sample ID		ST6A-19MAY16	ST6A-26MAY16	Part G Item 24(e)	
ALS ID		L1772223-2	L1774961-1	Maximum Average	Maximum Concentration
Date Sampled		5/19/2016	5/26/2016		

Parameter	Units	Detection Limit	3:10:00 PM	2:10:00 PM	Concentration (mg/L)	in any Grab Sample (mg/L)
			Water	Water		
pH	pH	0.1	8.19	8.29	6.0– 9.0	9
Total Suspended Solids	mg/L	3	4.2	<3.0	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005	0.000069	<0.000050	0.01	0.02
Oil and Grease	mg/L	5	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	No	No		
Benzene	mg/L	0.0005	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005	<0.00050	<0.00050	0.002	

Bold/shading indicates criteria exceedance, if any observed.

Table 9: Monthly Compliance Sample Results for ST-6b, May 2016

Sample ID			ST6B-19MAY16	ST6B-26MAY16	Part G Item 24(e)	
ALS ID			L1772223-3	L1774961-2	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
Date Sampled			5/19/2016 3:45:00 PM	5/25/2016 1:30:00 PM		
Parameter	Units	Detection Limit	Water	Water		
pH	pH	0.1	8.2	8.28	6.0– 9.0	9
Total Suspended Solids	mg/L	3	7.5	3.1	15.0	30.0
Lead (Pb)-Total	mg/L	0.00005	0.000159	0.000156	0.01	0.02
Oil and Grease	mg/L	5	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	No	No		
Benzene	mg/L	0.0005	<0.00050	<0.00050	0.37	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	0.090	
Toluene	mg/L	0.0005	<0.00050	<0.00050	0.002	

Bold/shading indicates criteria exceedance, if any 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.)

Dewatering of the Tailings Impoundment Area has not yet re-commenced for 2016. No monitoring was conducted.

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

No water was discharged from the TIA to Doris Creek this month; a comparison of flows was not conducted.

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

Dewatering of the Tailings Impoundment Area has not yet commenced for 2016. No monitoring was conducted.

Part J: Conditions Applying to General and Aquatics Effects Monitoring

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

No water was discharged from the TIA this month and no water quality comparisons were made.

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

No water was discharged from the TIA this month and no water was sampled.

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

Waste rock produced from the underground mining program is hauled to surface. The volume of waste rock brought to surface in April was 7,475 tonnes. The current total volume of waste rock on Pad T and the temporary waste rock pad is 287,702 tonnes.

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. During daily discharge sampling, visual observations were made and no erosion was noted. Compliant water accumulated at stations ST-6a was discharged to site roads for dust suppression.

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

No suspended sediment was noted during the month.

Item 21 (f) Doris North Camp Diversion Berm Effectiveness

An assessment of effectiveness was not conducted on the Diversion Berm this month due to freezing conditions

Incident Reporting

No incidents pertaining to this licence occurred during this month.

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

Yours sincerely,



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Vice President, Environmental Affairs
Hope Bay Project
(416) 628-0216

cc. Eva Paul, Water Resources Officer, INAC

Figure 1. 2AM-DOH-1323 SNP Monitoring Locations

