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January 29, 2020

Licensing
Nunavut Water Board
P.O. Box 119
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Re: December 2019 – Monthly Monitoring Report for Water Licence 2AM-DOH1335

This report is comprised of the monitoring requirements set out in Part I and Schedule I of water licence 2AM-DOH1335 Amendment 2 (the licence), and additional requirements from CIRNAC.

During the subject period of this report, the focus of activities at Doris North was underground mining, construction, ore processing, water management and environmental compliance.

Underground dewatering rates at the Doris mine periodically exceeded 2,000 m^3/day in December. In accordance with the Hope Bay Project Groundwater Management Plan, Specific Performance Threshold 2 (SPT-2) was observed and appropriate responses were carried out. Notice was provided to the CIRNAC Inspector on January 8th, 2020. The increased pumping rate can be attributed to the installation of an additional pump that allowed for increased dewatering of water being stored in various areas of the mine. Three diamonds drill holes were also intersected temporarily increasing inflow rates. The holes are routinely encountered and are plugged and grouted immediately upon discovery.

No discernable decrease in water level was observed in Doris Lake in December. Water level elevations appear consistent with past variations during December, and the water elevation remained above the Low Action Trigger of 21.506 masl. Refer to Table 7 and Figure 6 below for Doris Lake water elevation data.

Development of the Madrid North Portal continued in December. Mining activities continued in the Naartok East Crown Pillar Recovery Trench under this licence during the month. Figure 1 shows construction activities at the Madrid North Portal laydown including portal development and the waste rock pad. Figure 2 shows mining activities at the Naartok East Crown Pillar Recovery Trench.

Monitoring locations associated with Madrid infrastructure (MMS) will be established with the Inspector as per Part I Item 3 as construction of Madrid facilities are completed. Sampling locations monitored under this licence (seasonally or when facilities are operational) are provided in Figure 7 and Figure 8 at the end of this report.

Figure 1. Madrid North Portal Laydown and Waste Rock Storage Pad, December 2019

Figure 2. Naartok East Crown Pillar Recovery Trench, December 2019

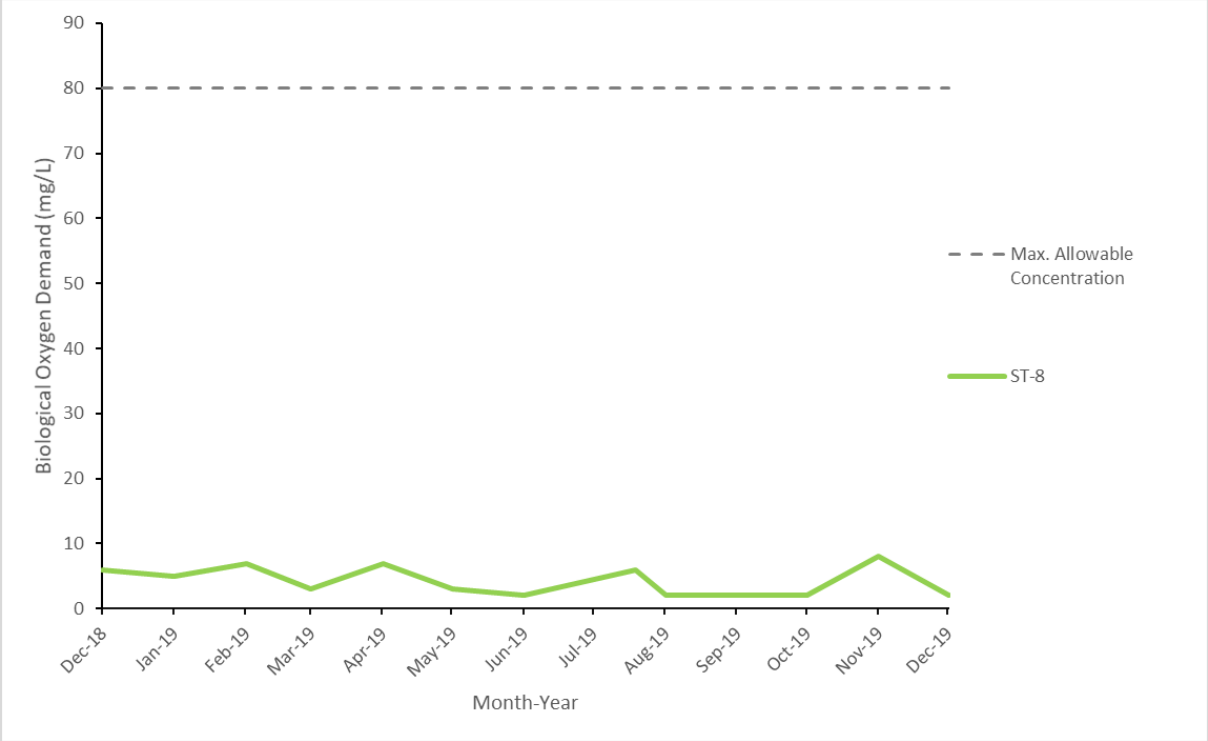
Site Wide Water Quality Monitoring Program (Part I Item 3 and Schedule I)

Water quality sampling was conducted in December at monitoring stations identified in Schedule I of the licence (ST-1 through ST-13, TL-1 through TL-12 and MMS-1 through MMS-10). Water quality samples were not collected for monitoring stations that were inactive during the month being reported (e.g., facilities that had not yet been constructed, were frozen during the month, or were not operationally active).

All parameters were compared to the applicable effluent quality limits outlined in Part D and Part F of the licence. No exceedances of effluent quality limits were observed in any samples collected this month. Results of all water quality monitoring are provided in Appendix A attached to this report.

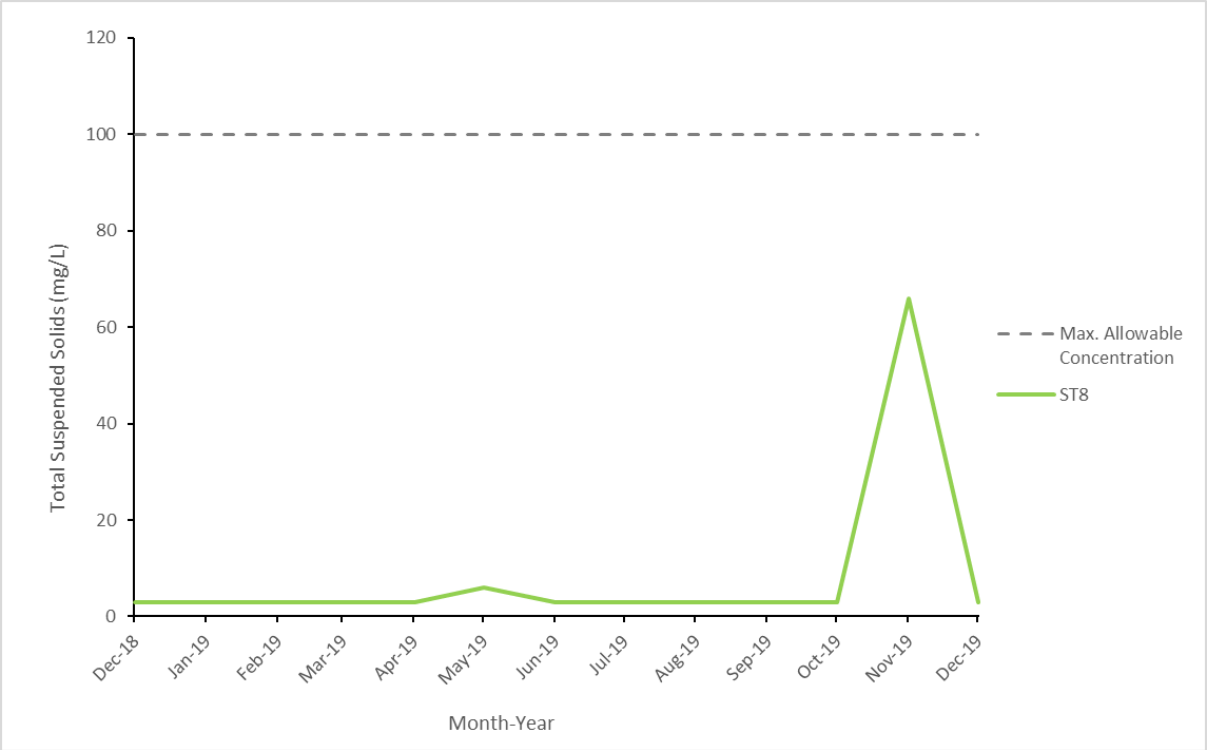
Figure 3 and 4 illustrates effluent quality characteristics for parameters of interest at select monitoring stations.

Figure 3. Biological Oxygen Demand Results Consistently Below Discharge Criteria for Wastewater Treatment Plant (ST8)



Note: Maximum Average Concentration as per Part F Item 4(b).

Figure 4. Total Suspended Solids Results Consistently Below Discharge Criteria for Wastewater Treatment Plant (ST8)



Note: Maximum Average Concentration as per Part F Item 4(b).

Flow and Volume Measurements (Part F, Part I and Schedule I)

Table 1. Effluent discharge, December 2019

Facility	Station Code	Discharge Volume (m^3)	Exceedances of Discharge Criteria	Discharge Location	Licence Reference
Doris Sedimentation Pond *	ST-1	0	N/A	Tailings Impoundment Area	Part F Item 17
Doris Contact Water Pond #1	ST-2	0	N/A	Tailings Impoundment Area	Part F Item 17, 18(a)
Non-Hazardous Landfill Sump	ST-3	0	0	Facility not constructed	Part F Item 18(a)
Landfarm Sump	ST-4	0	0	Tailings Impoundment Area	Part F Item 18(b)
Doris Plant Site Fuel Storage Area	ST-5	0	0	Tailings Impoundment Area	Part F Item 18(b)
Rob Bay Single 5ML Fuel Storage Area	ST-6a	0	0	Tundra Discharge 13W 432904 7563494	Part F Item 18(b)
Rob Bay Fuel Storage and Containment Berm	ST-6b	0	0	Tailings Impoundment Area	Part F Item 18(b)
Doris Sewage Treatment Plant, Effluent	ST-8	1,397	0	Tundra Discharge 13W 432933 7559057	Part F Item 5(b-c)
Doris Sewage Treatment Plant, Sludge	N/A	29.8	N/A	Tailings Impoundment Area	Part I Item 5(f)
Doris Reagent and Cyanide Storage Facility Sump	ST-11	0	N/A	Tailings Impoundment Area	Part F Item 17
Doris Contact Water Pond #2	ST-13	0	N/A	Facility not constructed	Part F Item 17
Doris Mine Water Discharge	TL-12	72,904	N/A	Tailings Impoundment Area	
Madrid North Contact Water Pond	MMS-1	0	0	Tailings Impoundment Area	Part F Item 17, 18(a)
Madrid South Primary Contact Water Pond	MMS-2	0	N/A	Facility not constructed	Part F Item 17, 18(a)
Madrid South Secondary Contact Water Pond	MMS-3	0	N/A	Facility not constructed	Part F Item 17, 18(a)
Madrid South Fuel Storage Facility	MMS-5	0	0	Facility not constructed	Part F Item 18(b)
Madrid Brine Mixing Facility	MMS-6	0	N/A	Facility not constructed	
Madrid North Connector	MMS-7	0	N/A	No mining occurring at this time	
Madrid North Fuel Storage Facility	MMS-8	0	0	Facility not constructed	Part F Item 18(b)
Madrid Mine Water Discharge	MMS-10	0	N/A	Facility not constructed	

Records of visual monitoring of discharge to tundra are maintained on file as per Part I Item 11.

* Note: Volume reported includes effluent transferred from the Doris Contact Water Pond #1, Landfarm Sump, Doris Plant Site Fuel Storage Area, Rob Bay Fuel Storage and Containment Berm and Doris Mine Water Discharge.

Table 2. Discharge from TIA, December 2019

Month	Number of days of discharge	Discharge Volume (m^3)	Exceedances of Discharge Criteria*
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Annual Cumulative	**0**	**0**	**0**

* Discharge criteria as outlined in *Metal and Diamond Mining Effluent Regulations*.
Acute Lethality testing conducted as outlined in Part F Item 22 and Part I Item 14

Table 3. Water usage, December 2019

Month	Windy Lake (ST-7A)	Doris Lake (ST-7)					Total Usage
	Domestic Water (m^3)	Domestic Water (m^3)	Surface Exploration (m^3)	Industrial Usage* (m^3)	Dust Suppression (m^3)	Winter Track (m^3)	
January	1,438	0	0	16	0	432	1,886
February	1,341	0	0	48	0	275	1,664
March	1,403	0	0	77	0	0	1,480
April	1,422	0	0	20	0	2	1,444
May	1,513	0	0	83	0	0	1,564
June	1,374	0	0	30	96	0	1,500
July	1,340	0	0	33	0	0	1,373
August	1,294	0	0	78	48	0	1,420
September	1,274	0	0	68	81	0	1,422
October	1,418	0	0	36	0	0	1,454
November	1,464	0	0	57	0	0	1,521
December	1,539	0	0	95	0	0	1,634
Annual Total	16,820	0	0	641	224	709	18,394
Annual Allowance	**43,800**			**1,930,000**		**60,000**	**2,033,800**

As permitted by water licence 2AM-DOH1335 Part E Item 1 and Part I Item 5(a)(b).
* Includes industrial uses such as mining, core processing, concrete batching, etc.

Table 4. Volume of Reclaim Water from the TIA for Process Water, December 2019

Month	Reclaim Water (m^3) *
January	64,572
February	57,207
March	69,824
April	60,913
May	61,908
June	57,603
July	69,389
August	79,005
September	84,230
October	82,918
November	77,744
December	76,670
Annual Cumulative	**841,984**

* As per Part E Item 5 and Part I Item 5(c)
Numbers rounded to the nearest cubic meter.

Table 5. Doris Waste Rock and Ore Volumes, December 2019

Month	Waste Rock Management					Underground Void Space			Ore Processing and Tailings Management		
	Produced from Mining Activity (tonnes)	Backfilled Directly to Mine (tonnes)	Returned Underground from Temporary Waste Rock Pile* (tonnes)	Moved to Temporary Waste Rock Pile (tonnes)*	Cumulative on Temporary Waste Rock Pile (tonnes)*	Volume Created from Mining Activities (tonnes)	Cumulative Volume Available for Backfill (tonnes)	Cumulative Volume Available for Backfill (m^3)	Quantity of Ore Processed** (tonnes)	Total Dry Tailings Placed in TIA** (tonnes)	Total Dry Detoxified Tailings Placed Underground** (tonnes)
December Balance	-	-	-	-	838,227	-	1,287,608	510,092	-	-	-
January	37,535	29,226	8,326	8,309	838,210	27,861	1,259,747	523,016	45,387	44,133	1,054
February	34,681	29,440	76,020	5,241	767,431	-27,625	1,287,372	540,300	47,479	46,178	1,261
March	35,005	22,895	82,592	12,110	696,949	-31,976	1,319,347	558,377	52,083	50,519	1,576
April	33,999	39,184	54,683	-5,185	637,081	-38,889	1,280,458	564,018	40,046	38,750	773
May	35,786	35,769	7,320	17	629,778	8,405	1,288,863	569,634	61,969	59,998	1,945
June	39,331	12,018	320	27,313	656,771	40,354	1,329,217	584,160	56,316	54,565	1,551
July	40,833	18,405	260	22,428	678,939	57,152	1,386,369	604,664	43,908	42,578	1,276
August	40,531	21,269	0	19,262	698,201	32,338	1,418,707	616,214	56,885	55,302	2,053
September	42,633	14,700	0	27,933	726,134	46,855	1,465,562	632,948	56,783	55,150	1,715
October	33,204	15,178	0	18,026	744,160	34,210	1,499,772	645,165	55,557	53,427	2,079
November	29,106	12,304	0	16,802	760,962	36,169	1,535,941	658,083	41,080	39,438	1,854
December	27,580	14,431	140	13,149	773,971	28,065	1,574,006	671,728	35,439	33,830	1,694
Cumulative Total	430,224	264,819	229,661	165,405	773,971	212,919	1,574,006	671,728	592,932	573,868	18,831

* As per Part I Item 5(d)(e)

** As per Part I Item 6

Note: Void space created from mining activities is determined as the sum of the initial void space as calculated in March 2017 and void space created each month from mining activities. A negative volume of void space created in a month indicates that a higher volume of waste rock and detoxified tailings was returned underground compared to the volume of void space created from new mining activities.

Table 6. Madrid North Waste Rock and Ore Volumes, December 2019

Month	Waste Rock Management						Underground Void Space			Ore Processing
	Produced from Mining Activity (tonnes)	Backfilled Directly to Mine (tonnes)	Returned Underground from Temporary Waste Rock Pile* (tonnes)	Moved to Temporary Waste Rock Pile (tonnes)*	Used for Construction (tonnes)	Cumulative on Temporary Waste Rock Pile (tonnes)*	Volume Created from Mining Activities (tonnes)	Cumulative Volume Available for Backfill (tonnes)	Cumulative Volume Available for Backfill (m^3)	Quantity of Ore Processed** (tonnes)
December Balance	-	-	-	-	-	-	-	-	-	-
January	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0	0	0
July	5,957	3,255	0	0	2,702	0	1,726	1,726	616	0
August	45,896	6,054	0	6,868	32,973	6,868	38,026	39,751	14,197	0
September	28,335	6,766	0	7,683	13,886	15,979	20,967	60,719	21,069	0
October	56,585	4,149	0	25,722	26,713	50,191	65,073	125,792	30,729	5,392
November	105,757	7,431	0	95,253	2,861	148,433	111,839	237,631	63,183	12,753
December	102,561	2,209	0	97,856	932	249,296	125,582	363,213	84,793	23,097
Cumulative Total	248,723	29,864	0	233,382	80,067	249,296	363,213	232,453	84,793	41,242

* As per Part I Item 5(d)(e)

** As per Part I Item 6

Note: Void space created from mining activities is determined as the sum of the initial void space created each month from mining activities. A negative volume of void space created in a month indicates that a higher volume of waste rock was returned underground compared to the volume of void space created from new mining activities.

Table 7. Doris Lake Water Level (ST-12), December 2019

Month	Minimum Water Level (masl)	Maximum Water Level (masl)	Mean Water Level (masl)	Monthly Water Level Variation (masl)**	Comparison of Mean Water Level from Month to Month (masl)^	Low Action Level Trigger (masl)*
January	21.726	21.747	21.739	0.011	0.019	21.347
February	21.725	21.743	21.736	0.018	-0.003	21.347
March	21.723	21.743	21.733	0.020	-0.003	21.347
April	21.735	21.757	21.751	0.022	0.018	21.347
May	21.748	21.756	21.752	0.008	0.001	21.347
June	21.758	22.659	22.176	0.901	0.424	21.347
July	22.040	22.449	22.236	0.409	0.060	21.347
August	21.965	22.030	21.983	0.065	-0.253	21.347
September	21.895	21.978	21.938	0.082	-0.045	21.506
October	21.831	21.889	21.866	0.058	-0.072	21.506
November	21.812	21.832	21.822	0.020	-0.044	21.506
December	21.816	21.836	21.829	0.019	0.007	21.506

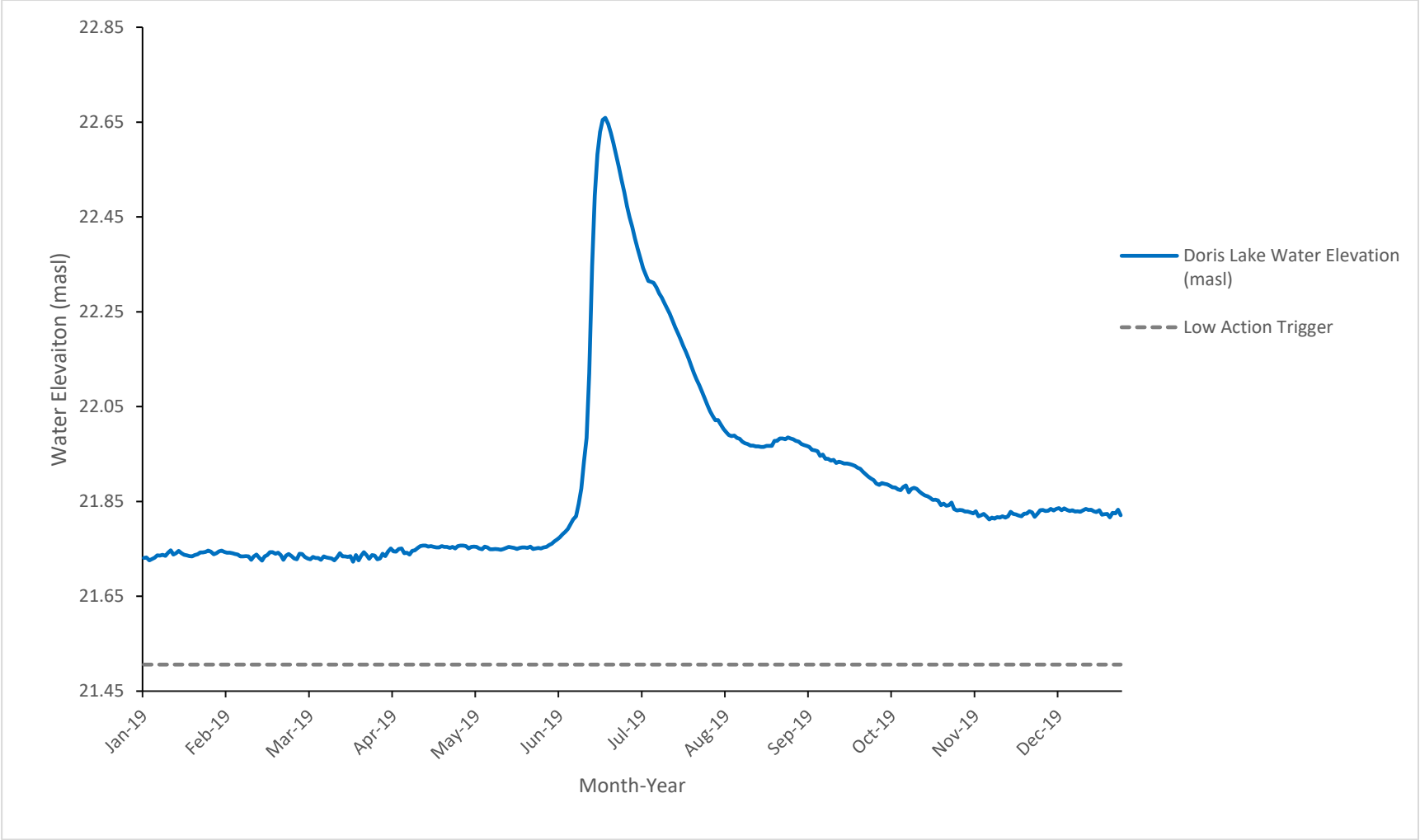
As per Part I Item 1 and outlined in the *Hope Bay Project Aquatic Effects Monitoring Plan*.

* Low action level trigger is relative to the average water level value (September 10-30, 2018/19) measured in Doris Lake. Low action level trigger (-0.42 m) outlined in Section 5.4 of the Doris Aquatic Effects Monitoring Plan, September 2016.

** Monthly Water Level Variation is calculated as the difference between the Maximum Water Level and the Minimum Water Level measured during the month.

^ Comparison of the change in water level from month to month. This value is calculated by subtracting the Mean Water Level of the current month from the Mean Water Level of the previous month (e.g. February Mean Water level - January Mean Water level). A positive value from this calculation indicates a rise in water level since the previous month; a negative value from this calculation indicates a drop in water level since the previous month.

Figure 5. Doris Lake Water Level (ST-12), 2019



Waste Management (Part F Item 10 and 11)

No offsite waste disposal occurred in December.

Summary of Assessments of Water Balance and Water Quality Model (Part F Item 24 and Part I Item 12 c)

Average monthly water quality, hydrologic, and climatic monitoring data were collected while in operations during December. Data will contribute to the assessment of the water and load balance model, and will be compared to the predicted water quality and elevation within the TIA and will be reported in the annual report for 2019.

Thermal Monitoring (Part I Items 7, 8 and Schedule I)

Thermal monitoring undertaken as per Part I Items 7, 8 and Schedule I is reported in the annual Geotechnical Report.

Site Freshet and Precipitation Conditions (Part I Item 12(d))

Visual monitoring was conducted during major rain events and periods of sustained precipitation in December.

The Diversion Berm and associated check dam were observed to be functioning as designed and diverting non-contact water around the Doris site infrastructure. Photos of this infrastructure are provided in Figure 5 below.

Inspections were completed of site culverts throughout the month of December. No issues were identified with these water management structures as they were observed to be frozen.

Figure 6. Diversion berm dry during December

Incident Reporting

Spill # 19-465 - While performing daily inspections, the Sewage Treatment Plant operator identified that the main lift station in Doris Camp had begun to overflow. An estimated 100L of untreated sewage was released to the gravel floor inside the lift station building. No material was released to the camp pad surrounding the building.

At the time of the incident, maintenance was being performed in this section of the camp and a planned power shut down of this area had been conducted. Power to the main lift station had been cut to allow this maintenance to proceed resulting in shutdown of the pump from the main lift station to the Sewage Treatment Plant. Secondary lift stations from other sections of the camp continued to feed into the main camp lift station sump resulting in the overflow.

An incident investigation was conducted soon after the incident occurred and identified the following root causes:

- Failure to identify risk of overflow within the system when initiating the power shutdown; and
- Inadequate procedures related to shutdown of facilities in this section of the camp which would identify the need to provide backup power to the main lift station pump.

Upon discovery, a vacuum truck was used to remove material from within the lift station for transfer to the Sewage Treatment Plant to prevent further overflow until the maintenance was completed and power was restored. Contaminated crush was hand excavated from around the lift station sump and lime was placed on the impacted area to prevent the development of odors or pathogens.

The following corrective/preventative actions were identified to reduce the likelihood of a reoccurrence:

- Improved task planning to be completed by Supervisor prior to initiating planned electrical shutdowns;
- Identify all infrastructure affected during planned maintenance, the potential risks to that infrastructure and develop mitigation measures to minimize those risks prior to starting a task.

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

Yours sincerely,

Sarah Warnock
Environmental Superintendent
Hope Bay Project
(867) 988-6882 ext. 102

Cc:
Omer Pasalic, Water Resources Officer, CIRNAC
Oliver Curran, Vice President - Environmental Affairs, TMAC
Jerome Girard, Mine General Manager, TMAC

Figure 7. 2AM-DOH1335 SNP Monitoring Locations

Figure 8. 2AM-DOH1335 SNP Monitoring Locations