



MEADOWBANK DIVISION

Monitoring Program Summary Report

August 2015

Type A Water License 2AM-MEA1525

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SECTION 1 • BACKGROUND

As required under Part I, Item 20 of Type A Water License 2AM-MEA1525, this report documents the water management and monitoring activities at the mine site for the month. This includes water usage, Vault Attenuation Pond discharge water quality, East Dike Seepage discharge water quality, RSF Seepage, Assay Road Seepage and sewage treatment plant discharge water quality (which is directed to the onsite storm water management pond).

In addition, a summary of spills/actions for the month are reported.

SECTION 2 • WATER MANAGEMENT

2.1 WATER USAGE

Freshwater usage for August 2015 is summarized in Table 2.1 below. The total freshwater consumption for the month was 41,678 m³. The total amount of reclaim water used in the mill for August was 263,389 m³. Reclaim water is supplied by the TSF South Cell.

Table 2-1: Freshwater Usage (m³)

	August
Freshwater Storage Tank	41,504
Emulsion Plant	175
Water Truck	0
Total	41,678
Year to date total	640,674

2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In August a total of 1,755 m³ was pumped back to the North Cell TSF from the ST-16 sump. Total year to date is 17,626 m³.

As per the Freshet Action Plan, AEM continued the daily visual inspections at the RSF and NP-2 Lake. To date, the water level in ST-16 area has been very low preventing any possible seepage through the till plug.

2.3 ASSAY ROAD SEEPAGE

In August, water in the interception trench and the original containment berm and sumps was pumped back to the mill. The total volume pumped was 4,467m³. Total year to date pumped from MW-203, the interception trench and containment is 24,608m³. AEM is conducting daily visual inspections of these areas and to date no concern has been observed.

2.4 SEWAGE TREATMENT PLANT

One (1) effluent wastewater sample was taken from the onsite sewage treatment plant (STP's) in August.

The Seprotech STP results are shown in Table 2.4.1 below; the LJ-Mix STP results are shown in Table 2.4.2. The results of the discharge indicate the system is working well. The effluent is discharged to the stormwater management pond and is pumped to the TSF

(2x/year). This water becomes part of the reclaim pond. There is no discharge to the receiving environment.

Table 2.4.1: Seprotech Effluent Results

Parameters	Units	August 3, 2015
Ammonia	mg N/L	0.17
Ammonia-Nitrogen	mg N/L	29.2
Total Kjeldahl Nitrogen	mg N/L	32.7
BOD-5	mg/L	12
COD	mg/L	74
Total Suspended Solids	mg/L	14
Nitrate	mg N/L	8.86
Nitrite	mg N/L	0.80
pH*	Units	7.0
Fecal Coliform	UFC/100 mL	330
Total Coliform	UFC/100 mL	29,000

Table 2.4.2: LJ-Mix Effluent Results

Parameters	Units	August 3, 2015
Ammonia	mg N/L	<0.01
Ammonia-Nitrogen	mg N/L	5.2
Total Kjeldahl Nitrogen	mg N/L	7.91
BOD-5	mg/L	11
COD	mg/L	71
Total Suspended Solids	mg/L	19
Nitrate	mg N/L	23.4
Nitrite	mg N/L	0.08
pH*	Units	5.1
Fecal Coliform	UFC/100 mL	650
Total Coliform	UFC/100 mL	7000

*Parameter measured by STP operators

2.5 VAULT ATTENUATION POND EFFLUENT

Discharge from the Vault Attenuation Pond occurred for the whole month except on August 28th. During the month, a total of 547,986 m³ was discharged thru the diffuser into Wally Lake. Total year to date discharged is 946,476 m³.

Four weekly effluent samples were taken at ST-10 in August. No Actiflo Water Treatment Plant was necessary during the month as the TSS levels were below the effluent criteria stated in Part F, Item 4 of the Water License.

The sample results are shown in Table 2.5.1 below.

Table 2.5.1: ST-10 Effluent Results

Date Parameters	Units	Max. grab conc.	4-Aug-15	10-Aug-15	17-Aug-15	24-Aug-15	Monthly Average	Max. avg. conc.
pH*		6.0-9.0	7.08	7.96	6.92	7.73	7.42	6.0-9.0
TSS	mg/L	30	3.5	1	3	1	2	15
TDS	mg/L	1400	103	109	117	126	114	1400
Turbidity*	NTU	15	1.81	2.46	2.73	2.23	2.31	15
Aluminium	mg/L	3.0	0.038	0.062	0.075	0.023	0.05	1.5
Dissolved Aluminium	mg/L	2.0	<0.006	<0.006	<0.006	<0.006	<0.006	1.0
Arsenic	mg/L	0.2	<0.0005	0.004	<0.0005	0.0088	0.0033	0.1
Cadmium	mg/L	0.004	<0.00002	<0.00002	0.00003	0.00004	0.00002	0.002
Copper	mg/L	0.2	<0.0.005	0.0033	0.0015	0.0028	0.002	0.1
Mercury	mg/L	0.008	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.004
Ammonia nitrogen	mg N/L	40	0.59	0.96	1.20	1.17	0.98	20
Nickel	mg/L	0.4	0.0038	0.003	0.0034	0.0032	0.0034	0.2
Nitrate	mg N/L	100	2.2	2.47	3.20	3.85	2.93	50
Lead	mg/L	0.2	<0.0003	<0.0003	0.0135	0.0031	0.0042	0.1
Phosphorus	mg/L	3.0	<0.01	0.01	0.06	<0.01	0.02	1.5
Zinc	mg/L	0.4	<0.001	0.004	0.001	<0.001	0.002	0.2
Chloride	mg/L	1000	3.9	4.5	5.5	5.9	5.0	500

*Parameter measured by technician on the field

2.6 EAST DIKE SEEPAGE EFFLUENT

Discharge from the East Dike Seepage started on August 8 and was in operation continually afterwards. During the month, a total of 14,586 m³ was discharged into Second Portage Lake. Total year to date discharged is 95,305 m³.

Four weekly effluent samples were collected at ST-8 in August. TSS results did not exceed the maximum average concentration (15 mg/L) and maximum allowable grab sample concentration (30 mg/L) permitted by the Water License, Part F, Item 6. Monitoring results are shown in Table 2.6.1 below.

Table 2.6.1: East Dike Seepage Discharge Results

Parameters	Units	8-Aug-15	10-Aug-15	17-Aug-15	25-Aug-15	Average Concentration
Total Suspended Solids	mg/L	4	2	<1	2	2

2.7 NON CONTACT WATER

Portage Area East diversion ditch (ST-5) results are shown in Table 2.7.1 below and Portage Area West diversion ditch (ST-6) results are shown in Table 2.7.2. TSS results didn't exceed

the maximum average concentration (15 mg/L) and maximum allowable grab sample concentration (30 mg/L) permitted by the Water License, Part F, Item 6.

Table 2.7.1: Portage Area East Diversion Ditch (ST-5) Results

Parameters	Units	3-Aug-15
Total Suspended Solids	mg/l	<1

Table 2.7.2: Portage Area West Diversion Ditch (ST-6) Results

Parameters	Units	3-Aug-15
Total Suspended Solids	mg/l	<1

SECTION 3 • SPILL MANAGEMENT

AEM has developed a thorough internal system of tracking spills on-site. Table 3.1 summarizes the AEM spill reports for the month. Nine (9) spills occurred on site and none was reportable to the GN spill hotline. AEM contained, cleaned up and disposed of the spill material adequately. The majority of the clean-up material was taken to the AEM Landfarm. Absorbent pads are eventually disposed of at the on-site incinerator. Spill clean-up material containing a majority of snow is disposed in the TSF.

Table 3-1: Summary of AEM Internal Spill Reports

Date of Spill	Hazardous Material	Quantity (L/Kg)	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2015/08/01	Propylene glycol	2L	Transit Laydown	Workers were moving the rad with the crane, when the rad tilted left. Glycol from rad spilled in through the pipes.	Glycol was soaked up through spill rags. The pipe was recapped with diapers. Contaminated material was adequately disposed of in the yellow roll-off bin.	No
2015/08/05	Hydraulic Oil	20L	Power plant G4 rad	Hydraulic hose designed to lift the box of a truck leaked.	Contaminated material cleaned up and adequately disposed of in the yellow roll-off bin.	No
2015/08/09	Fuel	90L	Tank farm	A rock got caught under the fuel tank of a truck and ruptured the bottom of the tank.	The spill was scraped on the floor with an excavator. Spilled contaminants were disposed of adequately.	No
2015/08/10	Hydraulic Oil	5L	Pushback parking	Broken hydraulic line.	Absorbant pads were applied on the spill absorbing all the contaminated oil. Contaminated pads were adequately disposed of in the yellow roll-off bin.	No
2015/08/13	Diesel	5L	BL spud barge	The fuel tank in a truck parked in a slope overfilled during fueling operations.	Contaminated material cleaned up and adequately disposed of in the yellow roll-off bin.	No
2015/08/16	Fuel	40L	Tank farm	The fuel tank in a truck overfilled during fueling operations.	The fuel valve was shut off and contaminated soil was collected and disposed of in the roll-off bin.	No
2015/08/20	Coolant	50L	Vault pit 5116820	Mechanical issues encountered with a haul truck.	Secondary containment was applied under the leak. Spill rags were applied on top of the contaminated soil.	No

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2015/08/22	Propylene glycol	5L	AWAR km 73	During refilling operations, the vent valve got stuck causing a spill of propylene glycol.	Contaminated material cleaned up and adequately disposed of in the yellow roll-off bin.	No
2015/08/29	Calcium chloride	30L	On the road between gym and sewage treatment plant	A tote of liquid calcium chloride was cracked and some leaked onto the sea can floor during transportation.	No action was taken. Product is used as dust suppressant on the road.	No