MEADOWBANK DIVISION

Monitoring Program Summary Report

August 2011

Type A Water License 2AM-MEA0815

Table of Contents

SECTION 1 • BACKGROUND 1

SECTION 2 • WATER MANAGEMENT 2

2.1 WATER USAGE 2
2.2 SEWAGE TREATMENT PLANT MONITORING 2
2.3 DEWATERING 3
2.3.1 Northwest Arm of Second Portage Lake 3
2.3.2 Bay Goose Impoundment Area 6

SECTION 3 • SPILL MANAGEMENT SUMMARY 8

List of Tables

Table 2-1: Freshwater Usage (m^3) 2
Table 2-2: STP Effluent Results 3
Table 2-3: Second Portage Arm Dewatering Monitoring – pH and Al 4
Table 2-4: Second Portage Arm Dewatering Monitoring – TSS and Turbidity 5
Table 2-5: Bay Goose Impoundment Area Dewatering Monitoring – pH and Al 6
Table 2-6: Bay Goose Impoundment Area Dewatering Monitoring – TSS and Turbidity 7
Table 3-1: Summary of AEM Internal Spill Reports 8

SECTION 1 • BACKGROUND

As required under Part I, Item 25 of Type A Water License 2AM-MEA0815, this report documents the water management and monitoring activity at the mine site for the month. This activity includes: water usage, sewage treatment plant discharge water quality and dewatering monitoring.

Additionally, a summary of the AEM internal spill reporting for the month is included.

SECTION 2 • WATER MANAGEMENT

2.1 WATER USAGE

Freshwater usage for August 2011 is summarized in Table 2.1 below. Freshwater usage for the month totals 101,137 m^3. The consumption of fresh water for mine and mill operations (including production drills, batch plant and dust control) was 97,141 m^3 and the consumption of reclaim water in the mill was 200,061 m^3.

Table 2-1: Freshwater Usage (m^3)

	August
Camp	3,516
Mine & Mill Operations	97,141
Emulsion Plant	215
Water Truck	265
Total	**101,137**

2.2 SEWAGE TREATMENT PLANT MONITORING

Five water samples were taken at the effluent of the sewage treatment plants (STP) in August. The results showed the system is working well. The difference in ammonia between the first two weeks and the last three weeks reflects a change in analytical testing; as of August 15, 2011 AEM requested the lab analyze for ammonia-ammonium, instead of ammonia alone.

Table 2.2 presents the monitoring results.

Table 2-2: STP Effluent Results

Date	Units	1-Aug-11	8-Aug-11	15-Aug-11	22-Aug-11	29-Aug-11
Ammonia	mg/L	<0.05	<0.05	17.9	21.4	35.2
BOD-5	mg/L	11	7	7	28	9
COD (mg/L)	mg/L	54	52	95	76	110
Total Suspended Solids	mg/L	16	11	15	19	11
Nitrite	mg N/L	0.09	0.16	0.01	0.16	0.2
Nitrate	mg N/L	33.3	34.3	40.7	37.8	39.8
pH *	units	3.7	5.5	4.3	3.8	3.7
Total Phosphorus	mg/L	14.6	14.3	13.9	13.1	13.9
Fecal Coliform	UFC/100 mL	88	4	10	1 000	92
Total Coliform	UFC/100 mL	400	<100	100	9 000	1000

2.3 DEWATERING

2.3.1 Northwest Arm of Second Portage Lake

Dewatering of the northwest arm of Second Portage Lake continued throughout the month. The water treatment plants were in operation for 22 of the 31 days.

The pH and Aluminum concentrations at the outlets of the TSS water treatment plants were as follows:

- pH 24 hour minimum/maximum: 6.67/7.38 units (Limit is 6-9 units)
- Al 24 hour maximum concentration: 1.970 mg/L (Limit is 3.0 mg/L)

Table 2.3 summarizes the dewatering monitoring results for pH and Aluminum for the month.

Table 2-3: Second Portage Arm Dewatering Monitoring – pH and Al

Date	DD-WTP-01		DD-WTP-02		Both WTP Outlets	
	pH	Total Al	pH	Total Al	pH 24-hour Mean	Al 24-hour Mean
	units	mg/L	units	mg/L	units	mg/L
2011-08-01	6.76	0.924			6.76	0.924
2011-08-02			6.67		6.67	
2011-08-03						
2011-08-06	7.18		7.32		7.25	
2011-08-07	7.30		7.45		7.38	
2011-08-08	7.15	0.319	7.31	0.325	7.23	0.322
2011-08-10			7.19		7.19	
2011-08-15	7.30	0.434			7.30	0.434
2011-08-19						
2011-08-22			6.82	0.492	6.82	0.492
2011-08-24			6.94		6.94	
2011-08-27	6.97	1.970	6.91		6.94	1.970
2011-08-29			6.83	1.650	6.83	1.650
2011-08-30		1.420				1.420
2011-08-31						

There was one exceedance of the 24 hour mean regulatory criteria (22.5 mg/L) for Total Suspended Solids (TSS); August 14 (56 mg/L). The plant operators took immediate mitigative measures to reduce the TSS concentrations at the outlet; the following day the TSS concentration was below the regulatory criteria (3 mg/L). The 31 day mean TSS concentration remained below the regulatory criteria of 15 mg/L.

The turbidity and TSS concentrations at the outlets of the TSS water treatment plants were as follows:

- NTU 24 hour mean maximum concentration: 5.1 NTU (Maximum Limit is 30 NTU)
- TSS 24 hour mean maximum concentration: 56 mg/L (Maximum Limit is 22.5 mg/L)
- NTU 30 days mean maximum concentration: 3.6 NTU (Maximum Limit is 15 NTU)
- TSS 30 days mean maximum concentration: 12 mg/L (Maximum Limit is 15 mg/L)

Table 2.4 summarizes the dewatering monitoring results for turbidity and TSS for the month.

Table 2-4: Second Portage Arm Dewatering Monitoring – TSS and Turbidity

Date	DD-WTP-01(Out)		DD-WTP-02(Out)		Both WTP Outlets			
	24-hour Mean	Lab TSS	24-hour Mean	Lab TSS	NTU 24-hour Mean	TSS 24-hour Mean	NTU 30-day Mean	TSS 30-day Mean
	NTU	mg/L	NTU	mg/L	NTU	mg/L	NTU	mg/L
2011-08-01	1.9	6	Not in operation		1.9	6	3.6	11
2011-08-02	Not in operation		2.8	7	2.8	7	3.5	12
2011-08-03	Not in operation		Not in operation					
2011-08-04	Not in operation		Not in operation					
2011-08-05	Not in operation		Not in operation					
2011-08-06	0.9	4	0.9	5	0.9	5	3.5	11
2011-08-07	3.7	5	3.6	5	3.6	5	3.5	11
2011-08-08	3.6	6	4.0	6	3.8	6	3.3	11
2011-08-09	Not in operation		Not in operation					
2011-08-10	Not in operation		2.6	6	2.6	6	3.0	10
2011-08-11	Not in operation		Not in operation					
2011-08-12	2.7	7	Not in operation		2.7	7	2.9	10
2011-08-13	Not in operation		Not in operation					
2011-08-14	1.0	56	Not in operation		1.0	56	2.8	11
2011-08-15	4.0	3	Not in operation		4.0	3	2.8	11
2011-08-16	Not in operation		5.1	8	5.1	8	2.9	11
2011-08-17	Not in operation		1.0	< 1	1.0	1	2.8	11
2011-08-18	Not in operation		Not in operation					
2011-08-19	2.0	7	Not in operation		2.0	7	2.7	11
2011-08-20	Not in operation		1.2	6	1.2	6	2.7	11
2011-08-21	Not in operation		1.5	4	1.5	4	2.6	11
2011-08-22	Not in operation		0.8	2	0.8	2	2.4	10
2011-08-23	Not in operation		Not in operation					
2011-08-24	Not in operation		2.8	8	2.8	8	2.2	10
2011-08-25	1.0	5	Not in operation		1.0	5	2.1	10
2011-08-26	Not in operation		Not in operation					
2011-08-27	2.9	11	2.8	8	2.8	10	2.0	10
2011-08-28	5.6	5	1.3	8	3.4	10	2.0	10
2011-08-29	Not in operation		2.6	4	2.6	4	2.0	10
2011-08-30	1.4	7	1.0	5	1.2	6	2.0	10
2011-08-31	0.7	1	1.0	7	0.83	4	2.0	10

2.3.2 Bay Goose Impoundment Area

Dewatering of the Bay Goose impoundment area continued throughout the month. The water intake pumps were in operation for 31 days.

The pH and Aluminum concentrations at the pump intakes were as follows:

- pH 24 hour minimum/maximum: 6.75/7.16 units (Limit is 6-9 units)
- Al 24 hour maximum concentration: 0.086 mg/L (Limit is 3.0 mg/L)

Table 2.5 summarizes the dewatering monitoring results for pH and Aluminum for the month.

Table 2-5: Bay Goose Impoundment Area Dewatering Monitoring – pH and Al

Date	BG-PUMP-1		BG-PUMP-2		Both PUMPS	
	pH	Total Al	pH	Total Al	pH 24-hour Mean	Al 24-hour Mean
	units	mg/L	units	mg/L	units	mg/L
2011-08-01	7.16		Not in operation		7.16	
2011-08-02	6.84		Not in operation		6.84	
2011-08-03	7.05		6.72		6.89	
2011-08-04	6.97		7.10		7.04	
2011-08-05	6.80		7.14		6.97	
2011-08-06	7.00		7.12		7.06	
2011-08-07	6.99		7.01		7.00	
2011-08-08	Not in operation		6.88		6.88	
2011-08-09	Not in operation		7.03		7.03	
2011-08-10	Not in operation		6.91		6.91	
2011-08-11	Not in operation		6.97	0.052	6.97	0.052
2011-08-15	6.71	0.013	6.79	0.022	6.75	0.018
2011-08-22	Not in operation		6.88	0.086	6.88	0.086
2011-08-27	7.07	0.088	7.03		7.05	
2011-08-29	6.94	0.092	7.03	0.110	6.99	

The turbidity and TSS concentrations at the pump intakes were as follows:

- NTU 24 hour mean maximum concentration: 5.0 NTU (Maximum Limit is 30 NTU)
- TSS 24 hour mean maximum concentration: 8 mg/L (Maximum Limit is 22.5 mg/L)
- NTU 30 days mean maximum concentration: 3.7 NTU (Maximum Limit is 15 NTU)
- TSS 30 days mean maximum concentration: 2 mg/L (Maximum Limit is 15 mg/L)

Table 2.6 summarizes the dewatering monitoring results for turbidity and TSS for the month.

Table 2-6: Bay Goose Impoundment Area Dewatering Monitoring – TSS and Turbidity

Date	BG-PUMP-1		BG-PUMP-2		Both PUMPS			
	24-hour Mean	Lab TSS	24-hour Mean	Lab TSS	NTU 24-hour Mean	TSS 24-hour Mean	NTU 30-day Mean	TSS 30-day Mean
	NTU	mg/L	NTU	mg/L	NTU	mg/L	NTU	mg/L
2010-08-01	5.0	1	Not in operation		5.0	1		
2010-08-02	4.7	1	Not in operation		4.7	1		
2010-08-03	4.5	2	4.8	13	4.6	8		
2010-08-04	5.8	8	4.3	2	5.0	5		
2010-08-05	4.3	< 1	4.1	< 1	4.2	1		
2010-08-06	3.5	2	4.2	2	3.9	2		
2010-08-07	3.3	2	3.3	2	3.3	2		
2010-08-08	Not in operation		3.6	1	3.6	1		
2010-08-09	Not in operation		3.7	< 1	3.7	1		
2010-08-10	Not in operation		4.1	< 1	4.1	1		
2010-08-11	Not in operation		3.3	< 1	3.3	1		
2010-08-12	Not in operation		2.7	< 1	2.7	1		
2010-08-13	2.8	< 1	2.9	< 1	2.8	1		
2010-08-14	5.6	< 1	2.7	< 1	4.1	1		
2010-08-15	2.9	< 1	2.9	< 1	2.9	1		
2010-08-16	2.4	1	2.3	1	2.4	1		
2010-08-17	2.7	1	Not in operation		2.7	1		
2010-08-18	3.0	1	Not in operation		3.0	1		
2010-08-19	2.9	< 1	Not in operation		2.9	1		
2010-08-20	Not in operation		2.3	< 1	2.3	1		
2010-08-21	Not in operation		2.0	< 1	2.0	1		
2010-08-22	Not in operation		2.1	< 1	2.1	1		
2010-08-23	2.0	< 1	2.0	3	2.0	2		
2010-08-24	1.8	1	1.9	2	1.9	2		
2010-08-25	2.1	2	2.0	2	2.0	2	3.7	2
2010-08-26	1.9	1	1.9	1	1.9	1	3.6	2
2010-08-27	2.1	< 1	2.1	1	2.1	1	3.3	2
2010-08-28	1.3	1	1.4	1	1.3	1	3.2	2
2010-08-29	2.5	1	1.6	2	2.0	2	3.1	2
2010-08-30	1.8	< 1	1.8	1	1.8	1	3.0	2
2010-08-31	2.0	< 1	1.5	< 1	1.7	1	2.9	2

SECTION 3 • SPILL MANAGEMENT SUMMARY

AEM has developed a system of tracking spills on-site. Table 3.1 summarizes the AEM internal spill reports for the month. Four spills occurred on site and two were reported to the GN spill hotline.

Table 3-1: Summary of AEM Internal Spill Reports

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2011-08-05	Slurry	40 m^3	Between the leach tank and the temporary Genset	Broken pipe	Pumped up the water inside mill tailing tank; contaminated soil taken to Tailing Pond	N
2011-08-14	Oil	40 L	Airport parking lot	Motor failure	Contaminated soil taken to Quarry 22	N
2011-08-19	Oil	11,2 m^3	AWPAR km 34	Tractor trailer off road	Contaminated soil taken to Quarry 5 over a tarp	Y
2011-08-31	Oil	400 L	Between Talbon and Nahanni shop	Fork of the zoom boom puncture tote	Sucker truck pumped up the oil and put it into drums and sent to hazmat area; contaminated soil taken to hazmat area	Y