Ministry of the Environment, Conservation and Parks

Drinking Water and Environmental Compliance Division, Northern Region

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Ministère de l'Environnement, de la Protection de la nature et des Parcs

Division de la conformité en matière d'eau potable et d'environnement, Direction régionale du Nord

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DATE, 2024

His Majesty the King in right of Ontario as represented by the Minister of Mines
Mine Rehabilitation Section
933 Ramsey Lake Road
Sudbury, ON
P3E 6B5

Attn: Marc Stewart, Senior Manager, Mine Rehabilitation Section

RE: Director's directions under section 60 and 61 of the Ontario Water Resources Act, Lockerby Mine

It is my understanding that the patented lands at the Lockerby Mine Site have forfeited to the Crown in right of Ontario. Environmental Compliance Approval No. 7425-5D7NU7 (the "**ECA**") previously held by Falconbridge Limited was therefore transferred into the name of the "His Majesty the King in Right of Ontario as represented by the Minister of Mines" ("**MINES"**). The ECA is outdated to the extent that it: (i) reflects Falconbridge Limited's sewage works, which require upgrades, and (ii) does not currently contain monitoring requirements and effluent limits. Further, MINES requires the ability to discharge stormwater collecting at the site to prevent uncontrolled release, and potentially environmental impairment, while progressive rehabilitation is undertaken.

After substantive communication, MINES and the Ministry of Environment, Conservation and Parks ("**MECP"**) have agreed on an interim set of effluent limits for this discharge (detailed in Appendix 1). As MINES is currently conducting studies to support the development of site-specific discharge limits, these conditions are *interim* until such time that sufficient technical information has been gathered to establish site-specific discharge limits and related conditions. At such time MINES will submit an application to MECP to amend the ECA accordingly.

On this basis, and in consultation with the ministry's Northern Region Technical Support Section, I herein direct MINES to maintain, repair and operate the current sewage treatment system, in accordance with Section 60 of the *Ontario Water Resources Act* (OWRA) subject to the following conditions:

1) Except as otherwise provided by these conditions, MINES shall operate the works as approved under Environmental Compliance Approval No. 7425-5D7NU7 such that:

   a) the effluent meets the monthly average effluent quality limits listed in Table 1 and makes best efforts to meet the monthly effluent quality objectives in Table 2,

   b) the final effluent is substantially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or colouration on the receiving waters,

   c) lime and /or caustic soda is added to pond water as needed to maintain the pH set point; and

   d) the means are available to enable a second pass through treatment and allow for extended residence times, such as the use of stop logs, sandbags, and/or pumping back of water.

I hereby direct that MINES make the following returns to me, or any successor Director ("**Director**"), in respect of the Works:

2) MINES shall report to the Director orally as soon as possible any non-compliance with the compliance limits listed in Table 1, and in writing within seven (7) days.

3) Where effluent quality exceeds the monthly average effluent objectives listed in Table 2, MINES shall notify the Director in writing by including this information in the monthly status report required by Section 7 below. Further MINES shall develop a plan, to the satisfaction of the Director to investigate the cause of the exceedance(s) and address such exceedances. The plan should consider at a minimum, additional monitoring, treatment and assessment to determine appropriate remedies.

4) MINES shall conduct effluent, process and receiver monitoring programs, including at a minimum the parameters and frequencies listed in in Tables 3, 4 and 5, and provide sampling reports to MECP upon request.

5) Within 20 days of receipt of this Direction, a standard operating procedure for sampling (a Sampling SOP) and including, at a minimum the following:

   a) A map of appropriate scale depicting the site, treatment works and all proposed sampling location,

   b) A description of the sampling sites,

   c) Sampling sites established at the following locations:
      i. Pre-existing final effluent (effluent compliance point - location #9),
      ii. Pre-existing Pond #4A water (location #11),
      iii. Pre-existing Pond #5 discharge (location #13),
      iv. Pre-existing Pond #4 discharge (location #7),
      v. Zilch Lake near field (the general area just downstream of the location where the discharge channel enters Zilch Lake), and
      vi. Zilch Lake far field that is upstream of the outflow from Zilch Lake.

d) A list of the parameters and sampling frequency for which samples will be analyzed by an independent accredited laboratory.

6) Within 60 days of this Direction, the following programs and workplans:

a) Baseline sediment and benthic invertebrate community structure monitoring program, including sediment quality monitoring.

b) A framework to determine the need for a fish and fish habitat study.

c) A workplan to establish an assimilative capacity assessment/mixing zone study that is consistent with Procedure B-1-5 Deriving Receiving Water Based Point Source Effluent Requirements for Ontario Waters.

7) On the 15th day of each month during the term of this Direction, a status report containing:

a) the water level in ponds #5 and #4,

b) daily effluent volumes for each day during the previous calendar month,

c) the average daily flow rate (arithmetic mean of the daily effluent volumes for the previous calendar month),

d) any operational issues experienced in the previous calendar month,

e) the results of field pH and conductivity measurements for the previous calendar month, and

f) sampling data in spreadsheet and pdf format with all monitoring results received for the previous calendar month, including the identification of exceedances of effluent criteria from Table 1 and Table 2, if any.

This Direction will terminate on May 31, 2025, unless amended and/or extended upon written approval by MECP to MINES.

Yours truly,

Jason Scott
Sudbury District Manager
Director, Section 60 and 61 *Ontario Water Resources Act*

Appendix 1

Table 1. Final Effluent Limits

Parameter	Monthly Average Effluent Limit (mg/L)
pH*	Between 6.5 and 8.5 at all times
Total Suspended Solids	15
Unionized Ammonia**	0.019
Cyanide (free)	0.005
Aluminum (dissolved)	0.075
Arsenic	0.005
Lead (dissolved)	0.0024
Iron	0.3
Manganese (dissolved)	0.27
Acute Toxicity: Rainbow Trout and *Daphnia magna*	Non-acutely lethal (not greater than 50% mortality in undiluted effluent)

*pH shall be monitoring daily and shall not exceed the above listed range at all times
**Unionized ammonia shall be calculated based on total ammonia N, and field pH and temperature measurements taken at the time of sample collection.

Table 2. Final Effluent Objectives

Parameter	Monthly Average Effluent Objectives (mg/L)
Chromium	0.001 (chromium VI) and 0.0089 (chromium III)
Cobalt	0.78 (µg/L)
Copper (dissolved)	0.4262 (µg/L)
Nickel (dissolved)	0.025
Selenium	0.001
Zinc (dissolved)	0.004
Sulphate	128

Appendix 1 (con't)

Table 3. Final Effluent Monitoring (Sampling Station 9)		
Parameter	**Frequency**	**Type**
Effluent discharge rate (L/s)	Hourly	Metered
Total daily effluent volume (m^3/day)	Daily	Metered
pH (field)	Daily	Grab + Continuous
Temperature (field)	Daily	Grab
Conductivity (field)	Daily	
Total Suspended Solids	Weekly	
Total Dissolved Solids		
pH		
Conductivity		
Hardness		
Alkalinity, Acidity		
Colour (true)		
Turbidity		
Total Kjeldahl Nitrogen, Nitrite, Nitrate		
Total Phosphorus		
Total Ammonia		
Unionized Ammonia (as N)*		
Dissolved Organic Carbon		
Cyanide (total)		
Cyanide (free)		
Sulphate		
Total and Dissolved Metals**	Weekly	
Mercury (low level)	Quarterly	
Acute Toxicity – Rainbow trout	Monthly	
Acute Toxicity – *Daphnia magna*	Monthly	

*Unionized ammonia shall be calculated based on total ammonia N, and field pH and temperature measurements

**ICP metal scan shall be both total and dissolved metals and shall include aluminum, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

Appendix 1 (con't)

Table 4. Process Monitoring (Sampling Stations 7, 11 and 13)		
Parameter	**Frequency**	**Type**
pH (field)	Daily	Grab (+ continuous where possible)
Temperature (field)	Daily	Grab
Conductivity (field)	Daily	
Total Suspended Solids	Weekly	
Total Dissolved Solids		
Conductivity		
Hardness		
Alkalinity, Acidity		
Colour (true)		
Turbidity		
Total Kjeldahl Nitrogen, Nitrite, Nitrate		
Total Phosphorus		
Total Ammonia		
Unionized Ammonia (as N)*		
Dissolved Organic Carbon		
Cyanide (total)		
Cyanide (free)		
Sulphate		
Total and Dissolved Metals**	Weekly	
Mercury (low level)	Quarterly	

*Unionized ammonia shall be calculated based on total ammonia N, and field pH and temperature measurements

**ICP metal scan shall be both total and dissolved metals and shall include aluminum, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.

Appendix 1 (con't)

Table 5. Receiver Monitoring (Sample Stations Zilch Lake near field, and Zilch		
Parameter	**Frequency**	**Type**
pH (field and lab)	Monthly	Grab
Temperature (field and lab)		
Total Suspended Solids		
Total Dissolved Solids		
Conductivity (field and lab)		
Hardness		
Alkalinity, Acidity		
Colour (true)		
Turbidity		
Total Kjeldahl Nitrogen, Nitrite, Nitrate		
Total Phosphorus		
Total Ammonia		
Unionized Ammonia (as N)*		
Dissolved Organic Carbon		
Cyanide (total)		
Cyanide (free)		
Sulphate		
Total and Dissolved Metals**		
Mercury (low level)	Quarterly	
Lake water levels	Measurements recorded every 15 minutes	Level logger
	Monthly during ice-free conditions	Staff gauge

*Unionized ammonia shall be calculated based on total ammonia N, and field pH and temperature measurements

**ICP metal scan shall be both total and dissolved metals and shall include aluminum, antimony, arsenic, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.