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Your file / Votre référence

Our file / Notre référence
N7L2-0925 (expired)

November 16, 2001.

David Hohnstein
Environmental Coordinator
Echo Bay Mines Ltd., Lupin Operation
9818 International airport
Edmonton, AB T5J 2T2

August 11, 2001 Water Licence Inspection - Report

Firstly, I wish to thank Barry Lowe for the much appreciated time and assistance provided during the tour of the minesite. Attached for your records is the Industrial Water Use Inspection Report pertaining to the August 11, 2001 inspection; the majority of the concerns raised during the previous inspection either had already been, or were in the process of being addressed. Nonetheless, the following considerations remain:

- **Tailings disposal:** Since the previous inspection, the Licensee has assessed that the recently noted seepage along M Dam was restricted to a zone of slightly fractured bedrock (figure 1). Therefore, as earlier planned, preparation work leading to the sealing of the upstream toe of M Dam with geotextile liner and/or tailings deposition had been undertaken (figure 2). In parallel, pooled water was observed between Coffer Dam and Dam 4 (figure 3). As the purpose of Coffer Dam is to act as a barrier keeping the toe of Dam 4 dry in order to minimize seepage potential, the Licensee was in the process of pumping the pooled water into Cell 4 (figure 4). Thus, the attached analytical results relating to a sample collected from the pond formed between Dam 4 and Coffer Dam reveal that while metal concentrations meet licenced thresholds, levels of arsenic (188 μg/L vs 5 μg/L), cadmium (0.3 μg/L vs 0.017 μg/L), copper (26 μg/L vs 4 μg/L), iron (1.5 mg/L vs 0.3 mg/L), lead (13 μg/L vs 7 μg/L), and zinc (119 μg/L vs 30 μg/L) exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. However, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), did not attribute toxicity to the pooled water. Nevertheless, given the fact that the field pH value of 3.7 breached the licenced standard of 6.0, a surface grab sample of Laurie Lake along the downstream side Coffer Dam was also taken in order to appraise possible seepage concerns. Although the sampling results appear inconclusive, the Inspector commends the Licensee for taking a diligent approach by pumping the pooled water into Cell 4 and ensuring that the toe of Dam 4 remains in the future as dry as possible.

- **Sewage disposal:** At the time of the inspection, the annual decant of the Sewage Lakes Disposal System was well under way. In fact, the level of the Lower Sewage Lake (figure 5) was significantly drawn down in relation to observations made during the previous inspection. However, as sewage effluent discharge was still occurring, repair/replacement work on the decant structure at Surveillance Network Program (SNP) station 925-14 had not yet been initiated. This being said, the attached analytical results relating to a sample collected from SNP station 925-14 (figure 6) indicate that while all licenced metal thresholds were met, the field pH breaches the licenced benchmarks (5.3 vs 6.0-9.5). In addition, concentrations of ammonia (5.24 mg/L vs 2.2 mg/L), arsenic (10 μg/L vs 5 μg/L), copper (7 μg/L vs 4 μg/L), and zinc (58 μg/L vs 30 μg/L) slightly exceed the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. However, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), did not attribute toxicity to the effluent discharged from the Sewage Lakes Disposal System.

Please feel free to contact me at (867) 975-4298 or lavalleep@inac.gc.ca if any questions/comments arise.

Sincerely,

Philippe Lavallée
Water Resources Officer
INAC, Nunavut District

c.c. - Nunavut Water Board, Gjoa Haven
- DFO Habitat Management, Iqaluit (Jordan DeGroot)
- EC Environmental Protection, Yellowknife (Anne Wilson)

Indian and Northern Affairs Canada | Affaires Indiennes et du Nord Canada

INDUSTRIAL WATER USE INSPECTION REPORT

Date: 2001/08/11 **Company Rep.** (Name/Title): Barry Lowe / Lands Administration

Licensee: **Echo Bay Mines Ltd.**, Lupin Operations **Licence No.:** **N7L2-0925** (expired)

WATER SUPPLY

Source(s): Contwoyto Lake **Quantity used:** recorded@ mill **Meter Reading:** mill @ 1 160 538 m^3

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Intake Facilities: NI **Storage Structure:** NI **Treatment Systems:** NI **Recycling:** NI

Flow Meas. Device: A **Conveyance Lines:** NI **Pumping Stations:** NI **Modifications:** NA

Comments: Water intake and supply facilities not inspected; only flow measuring devices at the mill. Minewater meter @ 43 047 560 US gallons. Potable water meter @ 7 572 580 US gallons.

WASTE DISPOSAL

Tailings: **Tailings Pond:** x **Natural Lake:** **Underground:**

Sewage: **Sewage Treatment System:** **Tailings Pond:** **Natural Water Body:** x

Continuous Discharge: **Intermittent Discharge:** x

Solid Waste: **Open Dump:** **Landfill:** **Burn & Bury:** x **Underground:**

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Discharge Quality: sampled	**Decant Structure:** U	**Dyke Inspections:** A
Conveyance Lines: A	**Pond Treatment:** A	**Runoff Diversion:** A
Discharge Meas. Device: A	**Dams, Dykes:** U	**Erosion:** U
Freeboard: A	**Seepages:** U	**Spills:** none reported
Effluent Discharge Rate: A	**Samples Collected:** sewage discharge (925-14), pond @ Coffer Dam	

Comments: Discharge from the Tailings Containment Area (TCA) not planned for this year; no noticeable flow from the Pond 2 discharge at Dam 1A, SNP station 925-10. Cell 5 has been partly drawn down, enabling the upcoming deposit of tailings along the upstream toe of M Dam; dam sealing work to be undertaken prior to freeze up. Pooled water between Coffer Dam and Cell 4 being pumped into Cell 4; likely surface runoff, but possible seepage. Preparing to siphon the contents of Pond 1 into Pond 2, prior to the transfer of Cell 4 into Pond 1. Level of the Lower Sewage Lake significantly lowered since the previous inspection; repair/replacement work to be undertaken once decant is terminated, prior to freeze up. Flow noted from both the siphon line and the discharge culvert. No concerns noted at the solid waste disposal facility.

GENERAL CONDITIONS

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Ore & Waste Rock Stockpiles: NI	**Records & Reporting:** A	**SNP:** A
Geotechnical Inspection: A	**Posting/Signage:** A	**Contingency Plan:** A
Restoration Activities: NI	**New Construction:** NA	**Fuel Storage:** NI
Mine Water Discharge: NI	**Chemical Storage:** NI	**Annual Report:** A

Comments: No concerns noted.

Violations of Act or Licence: Possible acid seepage through Dam 4, pooled within Coffer Dam, prudently pumped into Cell 4. Decant structure of the Sewage Lakes Disposal System to be repaired/replaced shortly.

General Comments: Concerns raised during the previous inspection have either been addressed or were in the process of being dealt with.

Philippe Lavallée

Inspector's Name

Inspector's Signature

figure 1. Seepage zone along M Dam, with Pond 2 in background; 2001/08/11.

figure 2. Isolation work on the upstream face of M Dam, facing Cell 5; 2001/08/11.

figure 3. Coffer Dam beyond Cell 4, with Laurie Lake in background; 2001/08/11.

figure 4. Pumping, into Cell 4, of water pooled by Coffer Dam; 2001/08/11.

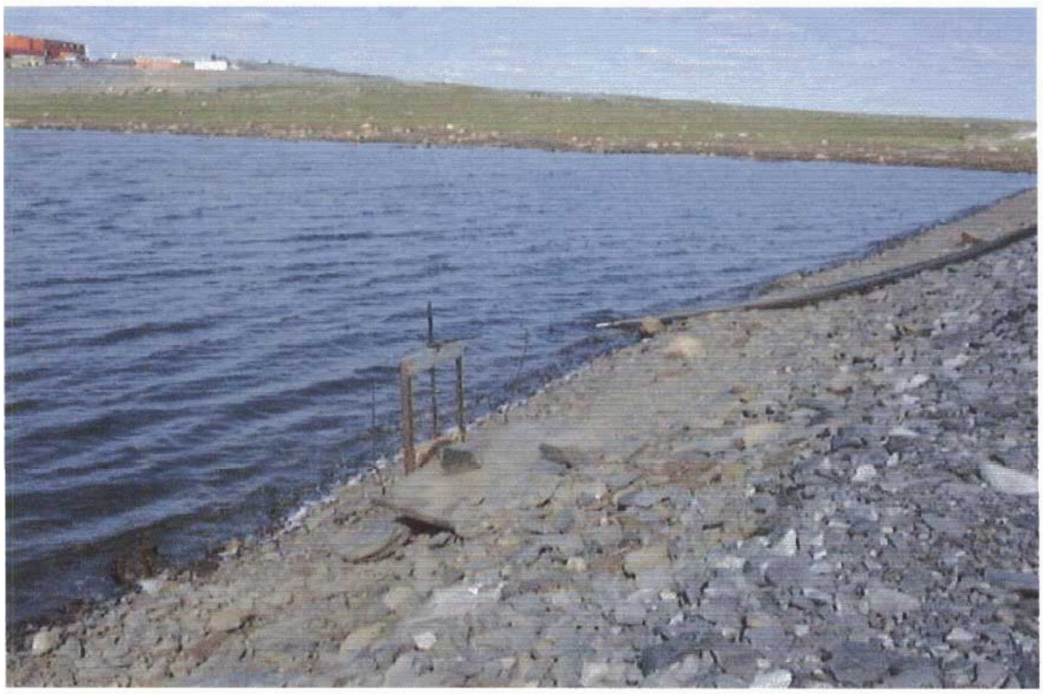

figure 5. Final retention dam of the Sewage Lakes Disposal System; 2001/08/11.

figure 6. Discharge from the Sewage Lakes Disposal System, SNP 925-14; 2001/08/11.

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: Cell 4 dam **Taiga Sample ID: 212052**

Client Project: **Sample Type:** Poss. Seepage **Received Date:** 13-Aug-01

Location: Lupin **Sampling Date:** 11-Aug-01

Report Status: **Final** ***Approved by:***

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Nutrients	Ammonia as N	1.24	mg/L	0.005	06-Sep-01
	Nitrate+Nitrite as N	0.034	mg/L	0.008	21-Aug-01
Organic	Cyanide, Total	< 0.003	mg/L	0.003	30-Aug-01
Physicals	Solids, Total Suspended	15	mg/L	3	04-Sep-01
Total Metals	Arsenic	188	µg/L	1.0	14-Aug-01
	Cadmium	0.3	µg/L	0.3	21-Aug-01
	Chromium	< 3	µg/L	3	21-Aug-01
	Cobalt	111	µg/L	1	21-Aug-01
	Copper	26	µg/L	2	21-Aug-01
	Iron	1500	µg/L	30	20-Aug-01
	Lead	13	µg/L	1	21-Aug-01
	Manganese	7760	µg/L	1	21-Aug-01
	Nickel	91	µg/L	1	21-Aug-01
	Zinc	119	µg/L	10	21-Aug-01

Report Date: Monday, September 17,

Field Data (01/08/11) Coffer Dam
Temperature: 12.0 °C
Conductivity: 534 µS/cm
pH: 3.7 **Time:** 11:11

Field Data (01/08/11) Laurie Lak
Temperature: 13.0 °C
Conductivity: 101 µS/cm
pH: 5.2 **Time:** 11:20

REPORT OF TOXICITY USING MICROTOX

COMP. /LOCATION: **Lupin, Cell 4 Dam**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: **August 11, 2001 / 11:11**

Date/Time Received: **August 13, 2001**

Date/Time Test Start: **August 14, 2001 / 2:56 PM**

Sample Type: Elutriate
Sampling Method: Grab

Method: ***Environment Canada Laboratories SOP#830.0 Revision 1, for Microtox Testing in Compliance wit November 1992: Biological Test Method: Toxicity Test Using Luminescent Bacteria Photobacterium phosphoreum), November 1992, EPS 1/RM/24.***

Environment Canada has conducted testing on the material sampled according to its own Microtox standards an procedures. The data proceeding from that testing is intended as a preliminary screening tool only, and cannot b used for any other purpose. This data is provided on the condition that it not be used in any report that is intende for public or official use.

RESULTS: **NON TOXIC at 45% concentration**

TEST ORGANISMS:
Species: Vibrio fisheri (Photobacterium phosphoreum)
Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: **N/A** (No pH adjustment)

Sample Appearance: **Clear, no colour adjustment**

Lot # of Osmotic Adjusting Solution: OAS007

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: **August 14, 2001 / 02:56 PM**

Test Method: Basic 45% Test, 15 minute incubation.

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Reagent Lot #: ACV026-6

IC_{50} - 15 minutes mg/L: **2.3 mg/L**

IC_{50} Confidence Range: **1.7 to 3.2 mg/L**

TEST ANALYST: Ron Bujold

INITIAL: RB

Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3
Tel: (867)-669-2788
Fax: (867)-669-2718

- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: Sewage Discharge 925-14 **Taiga Sample ID:** 212053

Client Project: **Sample Type:** sewage **Received Date:** 13-Aug-01

Location: Lupin **Sampling Date:** 11-Aug-01

Report Status: **Final** ***Approved by:***

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Nutrients	Ammonia as N	5.24	mg/L	0.005	06-Sep-01
	Nitrate+Nitrite as N	14.1	mg/L	0.008	21-Aug-01
	Phosphorous, Total	0.103	mg/L	0.004	29-Aug-01
Physicals	Solids, Total Suspended	4	mg/L	3	04-Sep-01
Total Metals	Arsenic	10.0	µg/L	1.0	14-Aug-01
	Cadmium	<0.3	µg/L	0.3	21-Aug-01
	Chromium	<3	µg/L	3	21-Aug-01
	Cobalt	18	µg/L	1	21-Aug-01
	Copper	7	µg/L	2	21-Aug-01
	Iron	208	µg/L	30	20-Aug-01
	Lead	<1	µg/L	1	21-Aug-01
	Manganese	491	µg/L	1	21-Aug-01
	Nickel	34	µg/L	1	21-Aug-01
	Zinc	58	µg/L	10	21-Aug-01

Report Date: Monday, September 17,

Field Data (01/08/11) 159-14
Temperature: 14.5 °C
Conductivity: 2 520 µS/cm
pH: 5.3 **Time:** 12:32

REPORT OF TOXICITY USING MICROTOX

COMP.../LOCATION: **Lupin, 925-14, Lagoon Discharge**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: **August 11, 2001 / 12:32**

Date/Time Received: **August 13, 2001**

Date/Time Test Start: **August 14, 2001 / 3:49 PM**

Sample Type: Elutriate
Sampling Method: Grab

Method: ***Environment Canada Laboratories SOP#830.0 Revision 1, for Microtox Testing in Compliance wit November 1992: Biological Test Method: Toxicity Test Using Luminescent Bacteria Photobacterium phosphoreum), November 1992, EPS 1/RM/24.***

Environment Canada has conducted testing on the material sampled according to its own Microtox standards an procedures. The data proceeding from that testing is intended as a preliminary screening tool only, and cannot b used for any other purpose. This data is provided on the condition that it not be used in any report that is intende for public or official use.

RESULTS: **NON TOXIC at 45% concentration**

TEST ORGANISMS:
Species: Vibrio fisheri (Photobacterium phosphoreum)
Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: **N/A** (No pH adjustment)

Sample Appearance: **Clear, no colour adjustment**

Lot # of Osmotic Adjusting Solution: OAS007

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: **August 14, 2001 / 01:57 PM**

Test Method: Basic 45% Test, 15 minute incubation.

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Reagent Lot #: ACV026-6

IC_{50} - 15 minutes mg/L: **2.3 mg/L**

IC_{50} Confidence Range: **1.7 to 3.2 mg/L**

TEST ANALYST: Ron Bujold

INITIAL: RB