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Nunavut District Office
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PC	JP
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March 25, 2003

NWB1LUP0008

Bill Danyluk, General Manager
Echo Bay Mines Ltd.
1210 Manulife Place, 10180-101 Street
Edmonton, Alberta T5J 3S4

Nunavut Water
Board

APR 17 2003

Public Registry

RE: August 19, 2002 Water Licence Inspection - Report

The Water Resources Officer (WRO) appreciates the assistance provided during the tour of Lupin Mine's water use and waste disposal facilities. Enclosed for your records is a copy of the Industrial Water Use Inspection Report performed on August 19, 2002. During the inspection the following observations were noted.

- ☐ **Water Supply:** The water intake is located 70 meters from the Water Intake Facility on Contwoyto Lake at a depth of 10 meters. The mine operates a small marina within 30 meters of the Water Intake Facility. No spill equipment was noted in the vicinity of the boat dock area. It is recommended that spill equipment be placed in the marina area to contain any spills that may occur in relation to the refueling and operation of boats and planes in this area. The Water Intake Facility was a very clean and in good operational condition with the exception of a leak at Pump # 3 (Photo 2). Enclosed analysis of potable water taken on Contwoyto Lake (Photo 1) at (SNP 925-01) indicates that Arsenic (0.0014 mg/L vs 0.025 mg/L), Cadmium (<0.0003 mg/L vs 0.005 mg/L), Chromium (<0.003 mg/L vs 0.05 mg/L), Copper (0.003 mg/L vs 0.01 mg/L), Lead (<0.001 mg/L vs 0.01 mg/L) and Zinc (<0.01 mg/L vs 5.0 mg/L) concentrations are found to be within the *Guidelines for Canadian Drinking Water Quality*. However pH (6.48 vs 6.5-8.5) is slightly in excess of the *Guidelines of Canadian Drinking Water Quality Maximum Acceptable Concentrations*. The Ultra Violet water disinfection system was operational during the inspection (Photo 3). The Ultra Violet disinfection system is located in an area with excessive milling dust. To reduce the potential of contamination while servicing the UV system some form of cover should be installed to reduce dust accumulation on the UV system and pipes located directly above the system.

030325NWB1Lup0008 inspection report - ILAE

- ☐ **Waste Disposal:** The Solid Waste Disposal Facility consists of Landfill, Burn Pit and Incinerator areas. Combustible waste is burned at the Solid Waste Burn Pit (Photo 11), or in the Incinerator (Photo 12). Waste oil is used to assist in burning waste at the Burn Pit (Photo 9). Non Combustible waste is buried at the Solid Waste Disposal area (Photo 10). The Sewage Disposal Lakes System consists of 2 lakes with decanting of Lake 2 (Photo 7) into a wetland of considerable vegetation (Photo 8) prior to entering Contwoyto Lake. Analysis enclosed of samples taken at Sewage Lakes Disposal System (SNP 925-14) decant structure indicates that pH (5.09 vs 6-9.5) exceed Water Licence Maximum Average Concentration.

- ☐ **Tailings Disposal:** Mine tailings are pumped to the tailings ponds (Photo 14) where the wastewater is held for 3 years. Mine wastewater treatment, is achieved with a combination of chemical pH neutralization and biodegradation. Tailings Pond 2 was in the process of being decanted at the time of inspection (Photo 13). Enclosed analyses of samples taken at (SNP 925-10) Tailings Pond # 2 syphoning structure indicate that pH (6.88 vs 6.5-9.5), Arsenic (0.0195 mg/L vs 0.1 mg/L), Copper (0.01 mg/L vs 0.3 mg/L), Cyanide (0.044 mg/L vs 1.6 mg/L) and Zinc (0.159 mg/L vs 0.8 mg/L) are in compliance with Licence Discharge Criteria.

- ☐ **Fuel and Chemical Storage:** The Inspection of the Tank Farm and associated drummed fuel storage area revealed a well managed and orderly facility with appropriate signs (Photo 5). There were no visible breaches of the storage area berm or synthetic liner. There was a small area where the berm liner was visible, by the fuel drum storage area (Photo 6). The visible portion of the liner should be covered with aggregate material. The Tank Farm and fuel drum storage were dry with no visible staining from fuel or oil. A storage area for empty drums was located within 100 meters of the potable Water Intake Facility. Given the natural slope of the land toward Contwoyto Lake the drums should be relocated or alternatively a retention berm should be installed in this drum storage area.

- ☐ **Non-Compliance of Act:** During the 2002 season a number of discharge criteria breaches of the Water Licence were noted. On September 9, 2002, pH of (5.85 vs 6-9.5) and on September 16, 2002 pH (5.96 vs 6-9.5) was recorded at (SNP 925-14) . All 4 unauthorized spills have been reported to the spill line. A followup report is required for Spill 02-591 as stipulated in (Part H Item 4-C of) the Water Licence.

If there are any concerns or questions in regards to this inspection, please contact me at (867) 975 4298 or bodykevichc@inac.gc.ca.

Sincerely,

A handwritten signature in blue ink, appearing to read 'CB', followed by a long horizontal flourish.

Constantine Bodykevich
Water Resources Officer (WRO)
INAC, Nunavut District

cc. -Nunavut Water Board, Gjoa Haven (Dionne Filiatrault)
 -CG&T, Iqaluit (Doug Sitland)
 - Baffin Health & Social Services, Iqaluit (Bruce Trotter)
 - EC Environmental Protection, Yellowknife (Anne Wilson)
 - INAC Water Management, Iqaluit (Michelle Mc Christie)



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INDUSTRIAL WATER USE INSPECTION REPORT

Date: August 19, 2002 Company Rep. (Name/Title): Bill Danyluk /General Manager

Licensee: Echo Bay Mines Ltd., Lupin Operations Licence No.: NWB1LUP0008

WATER SUPPLY

Source(s): Contwoyto Lake

Quantity used: 918,662 cubic
meters

Meter Reading: 324,016 cubic
meters

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

Intake Facilities: A Storage Structure: NI Treatment Systems: A Recycling: NA

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

Comments: Inspected Water Intake Facility on Contwoyto Lake. The facility was well kept with the exception of pump # 3 leak requiring maintenance. The disinfection of drinking water is achieved by treating water with Ultra Violet light. Of some concern is the location of the UV sterilization system in a relatively dusty location, this could be of particular concern when maintenance is required on the UV unit. Some form of dust protection may be provided for the unit and pipes located above. The drinking water treatment system was well maintained and operational at the time of inspection.

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: A Dyke Inspections: A

Conveyance Lines: A Pond Treatment: A Runoff Diversion: A

Discharge Meas. Device: A Dams, Dykes: A Erosion: A

Freeboard: A Seepages: A Spills: 02-319, 02-346, 02-528
and 02-591

Effluent Discharge Rate: A Samples Collected: Contwoyto Lake (925-01), sewage
discharge (925-14), tailings discharge Pond 2 at Dam 1A (925-
10)

Comments: Flow from the culvert at Sewage Pond #2 (SNP 925-14) was sampled. Burning of garbage was observed at burn pit during the inspection. The decanting of Tailings Pond # 2 at decanting structure Dam 1A was in progress during sampling (SNP 925-10).

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: A New Construction: NA Fuel Storage: A

Mine Water Discharge: A Chemical Storage: A Annual Report: A

Comments: The Tank Farm is totally enclosed in a retention berm. There was no noticeable fuel or water within the berm noted during the inspection.

Violations of Act or Licence: Follow up report has not been submitted for all the last spill (02-591) 200 to 300 gallons of mine water on December 23, 2002. Analysis of discharge from sewage Pond # 2 SNP 925-14 indicates that pH measurements do not meet Licence discharge criteria.

General Comments: The Mine has dealt with most of the 4 unauthorized spills in a diligent manner. Follow up reports have been submitted in a timely manner for all but the last spill dated December 9/02. Most of the chemical analysis submitted by the Mine, and samples taken by the WRO indicate that SNP measurements meet the Licence discharge criteria. Discharge measurements taken by the Mine for September 2002 from sewage Pond 2 (SNP 925-14), and samples taken by the Inspector in August 2002 indicate that pH measurements do not meet Licence discharge criteria.

Constantine Bodykevich

Inspector's Name

Inspector's Signature

Lupin Mine Inspection Pictures 2002

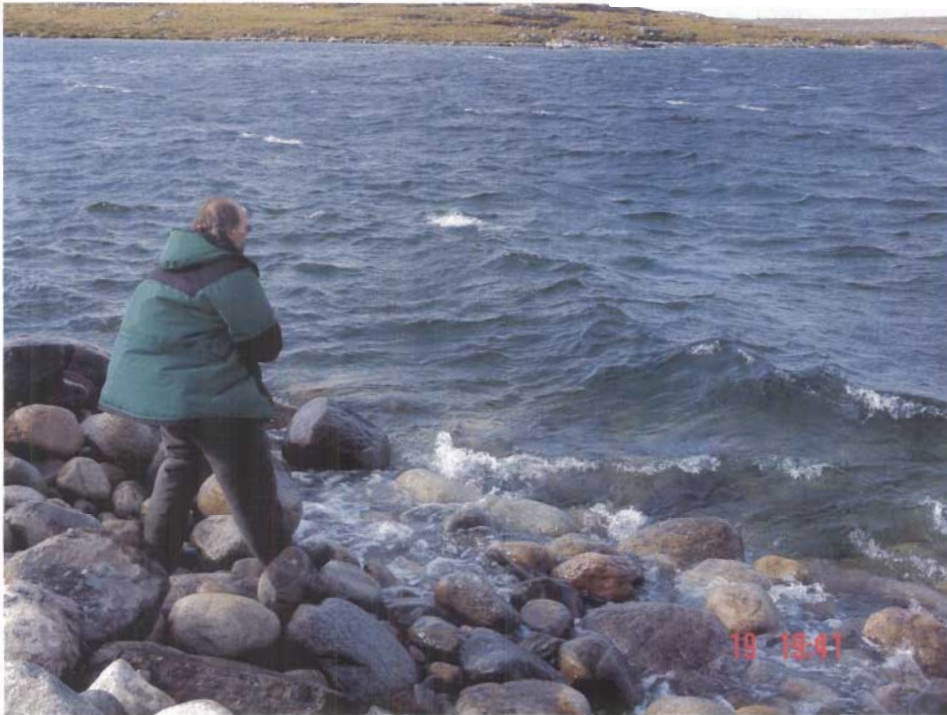


Photo # 1. Potable water supply for Lupin Mine, Contwoyto Lake.



Photo # 2. Some leakage from water supply pump in foreground at Water Intake Facility, SNP station -01.



Photo # 3. Ultra Violet Disinfection System for potable water in milling complex.



Photo # 4. Empty drum storage area located by Contwoyto Lake Water Intake Facility.



Photo # 5. Chemical and fuel storage area with posted sign.



Photo # 6. Tank Farm and drummed fuel storage. The area is bermed and lined with synthetic impermeable liner.



Photo # 7. Sewage Lake # 2 of Treatment Lake System.

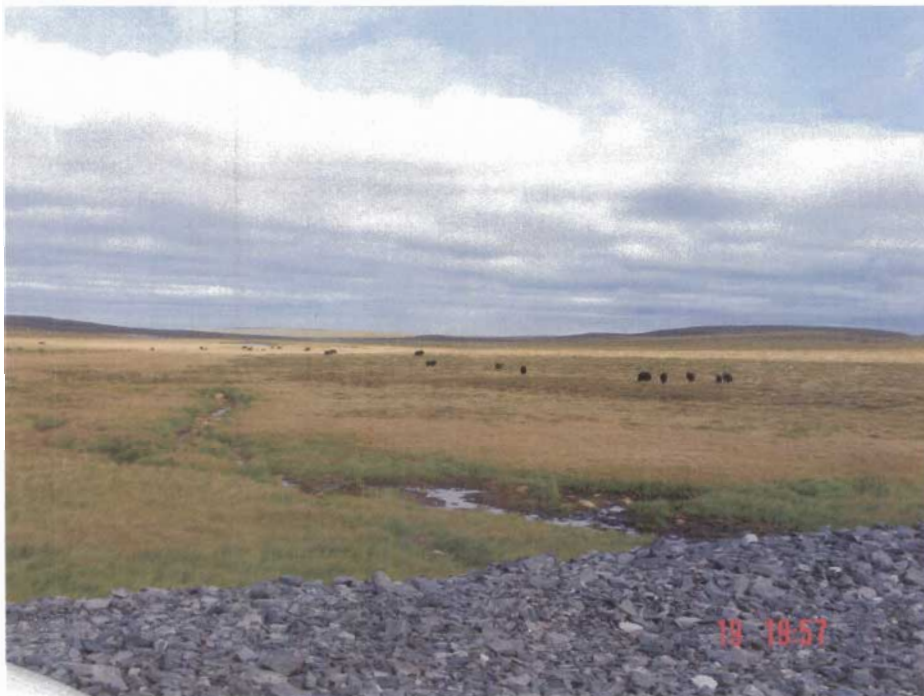


Photo # 8. Location of sewage sample at discharge end of culvert centre of photo. Sewage Lake discharge, considerable vegetation prior to effluent entering Contwoyto Lake.



Photo # 9. Burn Pit, waste oil in drums used to operate Burn Pit.



Photo # 10. Top of Solid Waste Disposal Facility Landfill area.



Photo # 11. Burn Pit in operation.



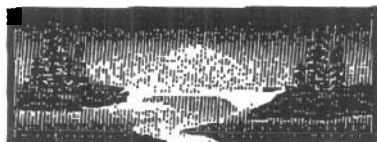
Photo # 12. Incinerator used to burn non hazardous waste.



Photo # 13. Tailings Pond 2 Siphon Discharge Structure. Dam 1A location of Tailings discharge SNP-925-10 sample location.



Photo # 14. Mine Tailings Line discharge .



Taiga Environmental Laboratory
4601-52nd Ave., Box 1500, Yellowknife, N.T. X1A 2K3

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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: pot water lupin

Taiga Sample ID: 222508

Client Project:

Sample Type:

potable

Received Date: 26-Aug-02

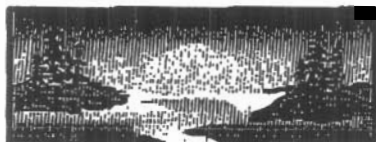
Location: Lupin Mine

Sampling Date: 19-Aug-02

Report Status: Amended

Approved by:

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
<u>Physicals</u>					
Alkalinity	2.5	mg/L	0.3	16-Sep-02	
Colour	<5		5	16-Sep-02	
Conductivity, Specific	14.6	µS/cm	0.3	16-Sep-02	
pH	6.48	pH units	0.05	16-Sep-02	
<u>Major Ions</u>					
Calcium	0.98	mg/L	0.05	29-Aug-02	
Chloride	0.5	mg/L	0.2	06-Sep-02	
Hardness as CaCO ₃	4.46	mg/L	0.17	29-Aug-02	
Magnesium	0.49	mg/L	0.02	29-Aug-02	
Potassium	0.40	mg/L	0.03	28-Aug-02	
Silica, Reactive	0.21	mg/L	0.02	12-Sep-02	
Sodium	0.68	mg/L	0.02	28-Aug-02	
<u>Metals, Total</u>					
Aluminum	<30	µg/L	30	30-Aug-02	
Antimony	1.1	µg/L	0.5	30 Aug 02	



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- CERTIFICATE OF ANALYSIS -

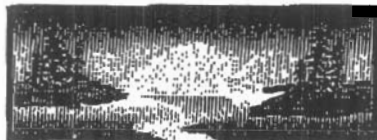
Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: pot water lupin

Taiga Sample ID: 222508

Arsenic	1.4	µg/L	1.0	24-Oct-02
Barium	2	µg/L	1	30-Aug-02
Beryllium	<2	µg/L	2	30-Aug-02
Cadmium	<0.3	µg/L	0.3	30-Aug-02
Cesium	<0.4	µg/L	0.4	30-Aug-02
Chromium	<3	µg/L	3	30-Aug-02
Cobalt	<1	µg/L	1	30-Aug-02
Copper	3	µg/L	2	30-Aug-02
Iron	54	µg/L	30	25-Oct-02
Lead	<1	µg/L	1	30-Aug-02
Lithium	<3	µg/L	3	30-Aug-02
Manganese	1	µg/L	1	30-Aug-02
Molybdenum	<1	µg/L	1	30-Aug-02
Nickel	<1	µg/L	1	30-Aug-02
Rubidium	1.0	µg/L	0.5	30-Aug-02
Selenium	<10	µg/L	10	30-Aug-02
Silver	<0.3	µg/L	0.3	30-Aug-02
Strontium	5	µg/L	1	30-Aug-02
Thallium	<0.4	µg/L	0.4	30-Aug-02
Titanium	<3	µg/L	3	30-Aug-02
Uranium	<0.3	µg/L	0.3	30-Aug-02
Vanadium	<1	µg/L	1	30-Aug-02
Zinc	<10	µg/L	10	30-Aug-02



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- CERTIFICATE OF ANALYSIS -

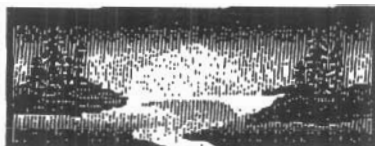
Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: pot water lupin

Taiga Sample ID: 222508

Data Qualifier Descriptions:



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Tel: (867)-669-2788
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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: lupin sewage pond water2

Taiga Sample ID: 222509

Client Project:

Sample Type: sewage

Received Date: 26-Aug-02

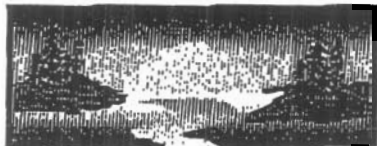
Location: Lupin Mine

Sampling Date: 19-Aug-02

Report Status: Amended

Approved by: _____

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
<u>Physicals</u>					
Alkalinity	0.4	mg/L	0.3	16-Sep-02	
Colour	10		5	16-Sep-02	
Conductivity, Specific	4000	µS/cm	0.3	16-Sep-02	
pH	5.09	pH units	0.05	16-Sep-02	
<u>Major Ions</u>					
Calcium	303	mg/L	0.05	29-Aug-02	
Chloride	1130	mg/L	0.2	18-Oct-02	
Hardness as CaCO ₃	856	mg/L	0.17	29-Aug-02	
Magnesium	24.1	mg/L	0.02	29-Aug-02	
Potassium	20.5	mg/L	0.03	28-Aug-02	
Silica, Reactive	1.07	mg/L	0.02	12-Sep-02	
Sodium	413	mg/L	0.02	28-Aug-02	



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- CERTIFICATE OF ANALYSIS -

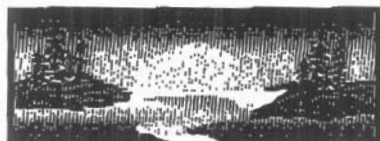
Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: lupin sewage pond water2

Taiga Sample ID: 222509

Data Qualifier Descriptions:



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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: SNP925-10

Taiga Sample ID: 222507

Client Project:

Sample Type: *Waste Water*

Received Date: 26-Aug-02

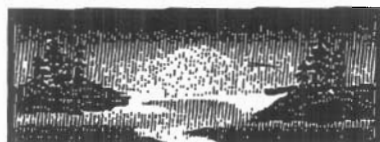
Location: Lupin Mine

Sampling Date: 19-Aug-02

Report Status: Amended

Approved by: _____

Test Parameter	Result	Units	Detection Limit	Analysis Date	Data Qualifier
<u>Physicals</u>					
Alkalinity	9.0	mg/L	0.3	16-Sep-02	
Colour	10		5	16-Sep-02	
Conductivity, Specific	872	$\mu\text{S}/\text{cm}$	0.3	16-Sep-02	
pH	6.88	pH units	0.05	16-Sep-02	
<u>Major Ions</u>					
Calcium	72.3	mg/L	0.05	29-Aug-02	
Chloride	47.3	mg/L	0.2	06-Sep-02	
Hardness as CaCO_3	211	mg/L	0.17	29-Aug-02	
Magnesium	7.40	mg/L	0.02	29-Aug-02	
Potassium	7.47	mg/L	0.03	28-Aug-02	
Silica, Reactive	5.32	mg/L	0.02	12-Sep-02	
Sodium	85.5	mg/L	0.02	28-Aug-02	
<u>Organic</u>					
Cyanide, Total	0.044	mg/L	0.003	10-Sep-02	
Cyanide, WAD	<0.003	mg/L	0.003	10-Sep-02	



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- CERTIFICATE OF ANALYSIS -

Prepared For: DIAND Nunavut District Office

Attn: Constantine Bodykevi

Sample ID: SNP925-10

Taiga Sample ID: 222507

Metals, Total

Arsenic	195	µg/L	1.0	24-Oct-02
Cadmium	<0.3	µg/L	0.3	26-Nov-02
Chromium	<3	µg/L	3	26-Nov-02
Cobalt	48	µg/L	1	26-Nov-02
Copper	10	µg/L	2	26-Nov-02
Iron	324	µg/L	30	25-Oct-02
Lead	<1	µg/L	1	26-Nov-02
Manganese	982	µg/L	1	26-Nov-02
Nickel	83	µg/L	1	26-Nov-02
Zinc	159	µg/L	10	26-Nov-02

Data Qualifier Descriptions: