

NUNAVUT WATER BOARD

DECISION

*Date of Hearing: **November 15, 2001***
*Date of Decision: **December 19, 2001***

IN THE MATTER OF Article 13 of the *Nunavut Land Claims Agreement*,

- and -

IN THE MATTER OF the amendment of Echo Bay Mines Limited's Lupin Mine industrial water licence.

Cite as: re: Lupin Licence Security Amendment 2001

TABLE OF CONTENTS

APPEARANCES

SUMMARY

1. PROCEDURAL HISTORY AND BACKGROUND
2. ISSUES
3. SUMMARY OF EVIDENCE
4. ANALYSIS
5. CONCLUSION

APPENDIX A: SUBMISSIONS AND CORRESPONDENCE

APPENDIX B: EXHIBIT LIST

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SUMMARY

On May 25, 2001, the Nunavut Water Board received an application from Echo Bay Mines Limited requesting an amendment to Part B, Item 2 of License NWB1LUP0008 with respect to the security deposit to be furnished by EBM. EBM requested a reduction of the security from \$29.2 millions to \$15.5 millions. The Board gave notice of the application and sought comments from interested parties. Following the receipt of written submissions from the Applicant and DIAND, the Board held a hearing in Kugluktuk on November 15, 2001. The Board reviewed all written and oral submissions and decided to adjust the security amount to \$25.5 million, to be paid in progressive installments over a period of five years. The assessment of the total security was determined by applying Nuna's unit costs for labour and material, the use of a two-metre cover of esker material over tailings as a means to keep tailings frozen and prevent acid generation, cost provisions for major items such as the winter road, fuel delivery, remediation of contaminated soils, and post closure monitoring, and the addition of a sufficient amount for project engineering and contingency. The Board added significant reductions to the total reclamation cost as accepted by the NWB in the Lupin 2000 renewal to account for EBM's good compliance record and the fact that Lupin was established long before new policies on mine reclamation in the NWT and Nunavut were put forward by DIAND, and an additional discount to take into account its financial situation.

1. PROCEDURAL HISTORY AND BACKGROUND

Procedural History

This matter involves an amendment to water licence NWB1LUP0008 for Echo Bay Mines Limited's Lupin Mine. This licence authorizes Echo Bay Mines Limited (EBM) to use water and dispose of waste in conjunction with their mining operation, and requires, among other things, that EBM furnishes a security deposit of \$29.2 millions. The Lupin Mine site is located on Crown Lands within the Burnside watershed in the Kitikmeot region of Nunavut at longitude 111°14' W and latitude 65°46' N.

The initial water licence was issued by the Northwest Territories Water Board on June 1, 1981 and expired on May 31, 1987. Two amendments were approved during the term of the first licence:

- 1) Amendment No.1 modified waste disposal conditions to allow and set discharge limits for the disposal of sewage wastes separately from the tailings discharge;
- 2) Amendment No. 2 followed a public hearing and was approved to allow discharge of mine water to the Sewage Lakes system subject to specified criteria, and the licence was extended to May 31, 1990.

The water licenses were renewed in 1990, 1995 and 2000. The most significant amendment was made to the licence in 1994 to allow EBM to use paste backfill technology to return a portion of tailings underground. The 1995 licence was issued pursuant to the *Northwest Territories Waters Act* and Regulations and was due to expire on May 31, 2000. No modifications or amendments to the licence were made during this term. The only significant operating change occurred in January 1998 when Lupin entered into a care and maintenance phase due to the decline of world gold prices. EBM notified the Board of resumption of operation on March 28, 2000. The Board issued the current license, NWB1LUP0008, on July 1, 2000 for a term of eight years.

On May 25, 2001, the Board received an application for licence amendment from EBM. In accordance with Article 13 of the *Agreement Between the Inuit of the Nunavut Settlement Area and her Majesty the queen in Right of Canada* (NLCA). The Board decided to hold a hearing before approving the application. Notice of the public hearing was given at least sixty days before the hearing date.

A public hearing was held in Kugluktuk on November 15, 2001. At the hearing, the Board heard submissions from EBM and DIAND.

Background

EBM is one of the largest producers of gold and silver in North America. In 2000, EBM produced 694,663 ounces of gold and 12 million ounces of silver from four mines, three located in the USA (Round Mountain, McCoy/Cove, and Kettle River) and Lupin located in Nunavut. The history of EBM in Canada's North began in 1964 at Port Radium, on the shores of Great Bear Lake about 41 kilometers south of the Arctic Circle. After 19 years of mining, reclamation was initiated in 1982 and completed by 1985. In the Northwest Territories, EBM also reclaimed the Pine Point Mine, and in the United States of America, it reclaimed the Alaska Juneau mine which was recently given a complete release without prejudice by the state of Alaska, and the Borealis Mine, which received the Nevada State Excellence in Mine Reclamation Awards for both "Mine Reclamation" and "Overall Mine Reclamation"¹.

EBM obtained an option for the Lupin property from Inco in 1979 and proceeded with an underground exploration program. In 1980, the decision was made to proceed with development and construction of the Lupin Mine. From startup in 1982 until operations were suspended at the end of 1997 due to high cash operating costs and low gold price, 2.8 million ounces of gold were extracted. Based on the prospect of better gold prices, the mine was reopened late in 1999. In 2000, Lupin produced 117,729 ounces of gold. Proven and probable ore reserves are estimated at more than 400,000 ounces of gold.

The Lupin Mine site is located on the western shore of Contwoyto Lake, Nunavut, approximately 285 kilometers southeast of the community of Kugluktuk, 80 kilometers south of the Arctic Circle and 400 kilometers northeast of the City of Yellowknife, Northwest Territories.

The site is currently accessible year round by aircraft and seasonally by winter road, and is in treeless arctic tundra. The climate is severe with winter and summer temperatures typically ranging from -50° Celsius to +30° Celsius. Permafrost in this area typically persists to depths of several hundred meters.

The gold deposit lies in an amphibolite vein structure containing variable amounts of gold-bearing sulphides. The geological structure in the vicinity of the mine site has been tilted and folded resulting in a deposit, which consists of three steeply dipping links that are referred to as the east zone, center zone and west zone.²

¹ Hugh Ducasse, Manager of Loss Control and Environmental Affairs, EBM. Speaking Notes. NWB Public Hearing. November 15, 2001. Kugluktuk, Nunavut.

² "Initial Environmental Evaluation for the Lupin Gold Project", prepared for Echo Bay Mines Limited by Beak Consultants Limited and Mary Collins Consultants Limited. January 1980.

2. ISSUES

The application for license amendment is limited to the amount of security to be furnished by EBM as a requirement of Part B, Item 2 of License NWB1LUP0008, which states: "The Licensee shall post and maintain a security in the amount of \$29.2 million dollars in the form and schedule as required by the Minister of Indian and Northern Affairs Canada."

The issue to be decided is, therefore: should there be a change to the overall amount of security for the reclamation or abandonment of the Lupin Mine?

3. SUMMARY OF EVIDENCE

A. Echo Bay Mines Limited

EBM applied for a review and subsequent reduction to the amount of security that must be posted pursuant to license NWB1LUP0008. In their application³, EBM indicates that following the issuance of license NWB1LUP0008 by the NWB, it sought an independent assessment of the current reclamation liability at Lupin. Nuna Logistics Ltd. (Nuna) was invited to review Lupin's reclamation liability and to submit a proposal to carry out all reclamation activities upon closure, with the assistance of Clark Builders (Clark) and EBA Engineering Consultants (EBA).

At the hearing, Nuna's Chairman and Chief Executive Officer, Mr. John Zigarlick, told the NWB that Nuna is a northern company with extensive experience in the north and at Lupin in particular, where it did some work on the tailings dam construction and provided site services. Similarly, EBA's Senior Environmental Geologist, Mr. Brent Murphy, told the Board that his company has substantial engineering and environmental experience in the north. His company was retained by EBM to initiate a technical review of proposed restoration activities at the Lupin Mine site as the first step in a proposed multi-phased program designed to provide a detailed evaluation of the overall reclamation approach for the mine site. This evaluation was requested to clarify the technical feasibility of the existing restoration plan for the mine site (especially within the Tailings Containment Area (TCA)) and to initiate the process of determining the potential technical viability of potential alternative methods for restoration/reclamation of the site. EBA also took part in the preparation of Nuna's cost estimate⁴ for the reclamation of the Lupin mine site.

³ Application for Amendment to License NWB1LUP0008. May 25, 2001.

⁴ Proposal and Cost Estimate For Echo Bay Mines Ltd. Lupin Mine Site Reclamation. Prepared for EBM by Nuna Logistics Ltd, Clark Builders, and EBA Engineering Consultants. January 19, 2001.

In its report⁵ (EBA Report) to EBM, EBA concludes that:

- There is an excellent database of geotechnical and geochemical information at the Lupin Mine site to allow a thorough review of the existing proposed reclamation option;
- The reclaimed tailings areas are frozen the majority of the year with a thin active layer ranging from 1.5 to two metres with cover thickness ranging from 0.5 to 1.5 metres;
- A cover of esker borrow material assists in limiting, but not preventing, the ingress of oxygen to the underlying potentially reactive tailings material;
- The cover concept assists with maintaining the tailings in a frozen condition within the reclaimed tailings deposition cells (Cells 1 and 2);
- The current reclamation option of 1.75 provides insufficient cover material to fully encapsulate the tailings material within permafrost;
- Total encapsulation of the tailings material with-in permafrost may not be technically feasible;
- Covers of 1.0 m or less thickness may be a viable reclamation option dependent upon the geochemical characteristics of the pore water within the active layer in the tailings;
- There are gaps in the data set that need to be addressed before a final reclamation and closure plan can be determined.

In the conclusion of its report, EBA recommends that the next phase of studies focus on collecting information that would help evaluate the feasibility of the current proposed closure plan. At the hearing, Brent Murphy of EBA, when cross-examined by Paul Smith, told the Board that these incomplete data would take an additional two years to gather.

Nuna's cost estimate was submitted to EBM on January 19, 2001 and forms part of the Application. Total cost of reclamation liability estimated by Nuna in their January 19, 2001 report is \$24, 598,800, based on an esker cover of 1.75 metre to cover tailings in the tailings containment area in a permanently frozen state so that the production of acid rock drainage is controlled. To this cost estimate, EBM added \$125,000 for post-closure monitoring and \$369,000 for engineering as recommended by Brodie Consulting Ltd. and accepted by the NWB in its June 30, 2000 decision, for a total cost of \$25,093,000⁶.

⁵ Technical Review, Abandonment and Restoration Plan, Lupin Mine, Contwoyto. Lake, Nunavut. Prepared for EBM by EBA Engineering Consultants. October 2001.

⁶ Application for Amendment to License NWB1LUP0008. May 25, 2001. Page 5.

In their submission, EBM insists that a closure cost estimate based on 1.75 metre of esker cover represents the extreme upper end of the spectrum for potential reclamation cost, and tells the NWB that research will be conducted to determine whether one metre of cover or less would be adequate to sufficiently slow or prevent acid rock drainage. Indeed, as part of their application, EBM submitted a proposal to evaluate the use of a rock cover that allows for air convection to promote and maintain permafrost in mine tailings, from David Sego and Kevin Biggar (Sego-Biggar proposal) of the University of Alberta⁷. However, at the hearing, EBM admitted that results of the research on alternative cover options would be available only after at least one or two field research seasons.

However, EBM anticipates that the results of test work and /or the introduction of an ice lens or other alternative method will be effective in reducing the esker cover to one metre, while they also agree that the ice lens option and coarse rock cover require further study⁸. Nevertheless, they are confident at this time that a one-metre esker cover will prevent acid generation and urge the Board to use this assumption as the basis for the calculation of reclamation work. Therefore, applying the same discount rates of 20% that were applied by the NWB in the assessment of the security amount in the June 30, 2001 decision, EBM contends that the revised reclamation security should be \$15.5 million based on a one-metre esker cover.

EBM agrees that it should be the responsibility of the NWB to set the security amount and subsequent payment schedule and proposes that the security be paid in installments over a period of eight years through a combination of the current down payment of \$2.9 million, cash, salvageable assets, warehouse inventory, forecasted progressive reclamation and the injection of \$500,000 annually in a reclamation trust fund. EBM also proposes an annual review process to review the security amount and revise the schedule of payment relative to new development.

At the hearing, EBM also told the Board that the company completed extensive progressive reclamation work over the past several years, and that it concluded approximately \$194,000 worth of reclamation work in the 2000 season, consisting in the removal of some unused buildings and several kilometres of tailings line⁹.

⁷ Proposal to Study Alternate Approaches to Cover Lupin Mine Tailings. Prepared for EBM by D.C. Sego and K.W. Biggar. University of Alberta. July 13, 2001.

⁸ Application for Amendment to License NWB1LUP0008. May 25, 2001. Page 6, in Conclusion, para. 1.

⁹ Kugluktuk Hearing notes. David Hohnstein's reply to Dionne Filiatrault's question.

B. Department of Indian Affairs and Northern Development (DIAND)

In their October 30, 2001 submission to the Board, DIAND pointed out that it was inappropriate for the Board to entertain an application for amendment of water licence NWB1LUP0008 at this time, since that licence had not yet been approved by the Minister and is therefore not an “issued” licence.

DIAND nevertheless suggested that if the Board ruled that the lack of ministerial approval of the Lupin licence did not prevent it from processing this application for amendment, then DIAND submitted that the Board should admit and consider, in support of the application, only evidence and arguments which the applicant could not have brought forward in the March, 2000 proceedings by exercising reasonable diligence. To illustrate this point, DIAND contended that an application to amend a licence must not be used as a substitute for an appeal or a judicial review application, as a means of presenting evidence or arguments which EBM put forward in the March, 2000 proceedings, or could have put forward had it exercised reasonable diligence.

DIAND also referred to the Department’s draft Mine Reclamation Policy for Nunavut (initial draft September 27, 1999) which provides further guidance on the need for a licensed mining company to provide the Crown with financial assurance adequate to ensure that the site is reclaimed by the mining company and not the taxpayers, but with respect to older mining operations, they concur that a case-by-case assessment must be made.

In their submission, DIAND stated that traditional mine tailings reclamation in permafrost areas generally involved covering tailings with suitable granular material to ensure that permafrost will re-form in the tailings area, and that the extent of re-formation will be such that, even at the time of maximum melt, the active layer will not extend downwards into the tailings material so that tailings oxidation will not occur. DIAND points out that the Sego-Biggar proposal states that “temperatures have been measured beneath these two covers (0.5m and 1.0m in thickness) and indicate that thaw has penetrated to about 1.75m below the cover material.” They continue with “at least 1.75 m thickness of cover [is required] to prevent thaw from penetrating into the underlying tailings”. And further state “it has been suggested that a cover of up to 2m thick may be required.”

DIAND therefore concludes that EBM has not demonstrated that a thinner cover or an alternate option would achieve the desired objective, and that until such time as new scientific evidence demonstrates that another option to a thicker tailings cover is as effective, feasible, suitable and reliable, there is no substantiation to support a change in reclamation assumption and consequently in reclamation costs. DIAND continues to maintain that the cost assessment shall be based on the assumption that third-party rates will have to be paid if the Crown had to conduct abandonment or reclamation work, and that equipment

belonging to the licensee or its contractors will be either unavailable for use or in a condition such that it is unsuitable for use.

Upon review of the information submitted by EBM, DIAND recommended that the Board maintain the required amount of security at \$29.2 million, but asked the Board to set the schedule of payment. On the other hand, they contended that the form of security was the their responsibility and that accordingly they would ensure that security is posted in a form or forms acceptable to the Crown.

4. BOARD'S ANALYSIS

A. Jurisdiction and preliminary issues

Under Article 13 of the NCLA, the NWB is seized with jurisdiction to consider this application. In Article 13.2.1, the NWB has the responsibilities and powers over the regulation, use and management of water in the Nunavut Settlement Area.¹⁰ The NWB is authorized under Article 13.8.1 to request a broad range of information from an applicant, including information regarding steps to mitigate adverse impacts and other matters deemed relevant.¹¹

At the beginning of this hearing, DIAND made a motion that the Board should not decide on this amendment application because it is the Minister, in DIAND's opinion, and not the NWB, who has the decision-making responsibility over this licence. With respect, the Board disagrees. In dismissing this motion the Board stated in Kuglutuk that it would "... process this application by way of its normal procedure." The Board's reasons for its position are twofold:

¹⁰ Article 13.2.1 provides:

A Nunavut Water Board (NWB) shall be established as an institution of public government. It shall have responsibilities and powers over the regulation, use and management of water in the Nunavut Settlement Area, on a basis at least equivalent to the powers and responsibilities currently held by the Northwest Territories Water Board [...], and any other responsibilities acquired under this Article.

¹¹ Article 13.8.1 reads:

[T]he NWB, when considering a water application, may issue guidelines to the applicant for provision of information with respect to the following: [...]

(b) any qualitative and quantitative effects of the proposed water use on the water management area, including anticipated impacts on other water users of that area;

(c) steps which the proponent proposes to take to avoid and mitigate adverse impacts; [...]

(h) any other matters that the NWB considers relevant.

Also under s. 16(2) of the *NWT Waters Act*:

The Board shall require an applicant for a licence to provide the Board with such information and studies concerning the use of waters or deposit of waste proposed by the applicant as will enable the Board to evaluate any qualitative and quantitative effects thereof on waters.

1. Practically, since the Minister has not yet “approved” the first EBM license (which the NWB signed *July 1, 2000*), the Board does not want to introduce uncertainty into the process by implicitly, or in any other way, agreeing that its 2000 license is unenforceable; and
2. More importantly, the Board’s authority under Article 13.7.1 states:

With the exception of domestic or emergency use of waters as set out in Section 5 of the *Northern Inland Waters Act* RSC 1985, c. N-25, no person may use water or dispose of waste into water without the approval of the NWB. [Emphasis added]

Thus, until a federal judge directs otherwise, the decision is for the Board to make.

Also at the Kugluktuk hearing, DIAND made a motion to limit EBM’s evidence. It was DIAND’s contention that EBM, in the current license amendment, wanted the Board to “rehash” evidence that had been led the previous year, including from Mr. Brodie who did not appear at this hearing. In sum, EBM, according to DIAND, wanted to reopen matters that were reasonably available to them to argue last year. For this issue, the Board ruled in favour of DIAND. In particular, the Board will not reconsider the \$29.2 million dollar security amount as stipulated in its earlier decision.¹² While we note that last year’s amount is significantly less than other estimates previously provided to the Board,¹³ the NWB has, nevertheless, revised the security amount, slightly lower, for reasons set out below.

B. Should there be a Reduction in Security and Environmental Considerations

Burden of Proof

DIAND argued that any reduction to the current security amount should only occur if the Applicant discharges its obligation to prove to the Board that there are good grounds to do so. We agree that the Applicant has the burden, using its own evidence, to meet a proper standard of proof before any discharge is met.¹⁴ The Board concurs with DIAND’s view of the evidentiary principle

¹² Nunavut Water Board Decision re *Lupin Licence Renewal 2000* at page 30.

¹³ BCL’s amount: \$44.6 million (2000 dollars) and Nuna’s amount: approximately \$25 million (for a 1.75 m cover).

¹⁴ The NWB’s *Rules of Practice* state:
In cases in which the Board accepts evidence, any party offering such evidence shall have the burden of introducing appropriate evidence to support its position. Where there

applicable to administrative tribunals, which is that the proponent has the burden to prove its case on a balance of the evidence before us.

The Board has determined that, after considering and balancing all of the evidence, the Applicant has not met the standard of proof that would allow us to reduce the security as drastically as suggested by EBM. First, and foremost, the Applicant has not completed its studies at the mine site, which are necessary to prove to the Board that the environment will be restored and protected. We do not believe RBM can change the reclamation practices and still protect the aquatic and related environment—at least not from what we now see. Significant data gaps exist due to the failure to complete these studies.¹⁵ For example, EBM's consultant identified and summarized the data problem or gaps as:

- The current geochemical characteristics of the tailings (and predictions of the future characteristics) should be completed.
- The water quality of the current and likely future pore water should be characterized.
- The buffering capacity of pond waters to handle the seepage of potentially acidic waters from adjacent tailings cells should be evaluated.¹⁶

At the hearing, the Board heard that these incomplete data would take an additional two years to gather.¹⁷ Once the two years have passed, we invite EBM to return to us and update the evidence. The Applicant is also asking the Board to consider alternative methods to the traditional esker cover option, for example the use of a coarse rock cover as proposed by Sego-Biggar, or a self-sustained water cover option studied by the University of Waterloo in the early part of the 1990s. The first option will be studied by Sego-Biggar in the next few field seasons while the second was rejected by EBM because of ongoing monitoring requirements. Again, the Board is encouraged by EBM's initiative to explore other means to minimize the potential for acid generation of the tailings, but it finds that conclusive data that would justify a reduction in cover thickness is

is conflicting evidence, the Board will decide which evidence to accept and will generally act on a balancing of the evidence.

¹⁵ In EBA's Lupin presentation (Exhibit 7), the data limitations include:

- Lack of concrete geochemical data characterizing pore water from active layer, and
- Presence and extent of potential impacts resulting from pore water are unknown at this time

¹⁶ EBA's *Technical review, abandonment and restoration plan*. Dated October 31, 2001.

¹⁷ Hearing: Paul Smith cross examination of Brent Murphy, and Bill Danyluk who said that "we want 2 years to prove the top layer reduction to 1.0 metres".

lacking. As stated in the EBA report¹⁸, “placing an esker cover over the higher elevation tailings to encourage permafrost aggradation with the tailings (is) consistent with industry-accepted practice to minimize the availability of oxygen and the sulphide oxidation rate within sulphidic mine waste” and the Board is not inclined to depart from this practice until irrefutable evidence is presented.

Regarding cover material, the Applicant is urging the Board to reduce the material from a depth of two metres to one metre. The Board disagrees with this reduction for several reasons. First, as indicated, there is sufficient evidence to suggest that even a 1.75-metre esker cover will not adequately encourage permafrost aggradation. Second, some scientific studies at Lupin are incomplete. Third, the Board accepts the application of the precautionary principle to its security deposit decisions where there are incomplete data or unverified testing procedures.

Precautionary principle

The Board notes governments and courts have advanced the precautionary principle, both domestically and internationally. Some examples may be helpful: the federal *Canadian Environmental Protection Act, 1999*¹⁹ states:

2. (1) In the administration of this Act, the Government of Canada shall, having regard to the Constitution and laws of Canada and subject to subsection (1.1),²⁰

(a) exercise its powers in a manner that protects the environment and human health, applies the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation, and promotes and reinforces enforceable pollution prevention approaches [...] [Emphasis added]

In the federal *Oceans Act*,²¹ the national strategy will be based on the principles of

(a) Sustainable development, [...]

¹⁸ p. 5, Section 4.0, para. 1.

¹⁹ S.C. 1999, c. 33.

²⁰ Subsection (1.1) provides: In giving its advice and recommendations, the [National Advisory] Committee shall principle use the precautionary principle.

²¹ 1996, c. 31

- (c) The precautionary approach, that is, erring on the side of caution.²²
[...]

Under the Principles of the *Canada-wide Accord on Environmental Harmonization*:²³

Governments agree that their environmental management activities will reflect the following:

1. Those who generate pollution and waste should bear the cost of prevention, containment, cleanup or abatement (polluter pays principle);
2. Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation (precautionary principle) [...] [Emphasis added]

Turning to the courts, in *611428 Ontario Ltd. v. Metropolitan Toronto and Region Conservation Authority*²⁴ the Ontario Court of Justice (General Division) dealt with an appeal where a tribunal (i.e., the Mining and Lands Commissioner) had refused company permission to place fill on certain lands "...due to the impact [...] on the conservation of land."²⁵ The drainage area was the biggest concern where the Commissioner's findings included:

1. First order streams²⁶ play an integral role in the health of the downstream watercourse. [...]

²² Section 30.

²³ A document by the Canadian Council of Ministers of the Environment.

²⁴ [1996] O.J. No. 1392

²⁵ Paragraph 3.

²⁶ Paragraph 20 (10.) described "first order streams" as follows:

A river system is like a tree. The mainstream of the river is the trunk; from the trunk emerge branches and from them smaller branches, and from the smaller branches twigs. The West Rainbow Creek is a smaller branch of the Humber River tree and it has twenty-nine twigs or first order streams. If you fill the twig or first order stream i.e. a tributary valley of the system, the results are;

- (i) higher flood peaks,
- (ii) loss of storage capacity,
- (iii) diminished intake of nutrients,
- (iv) sedimentation,
- (v) increase of water temperature, and,
- (vi) deterioration of the quality of the water downstream. [...]

2. Headwater first order streams play a unique role. The functions performed by first order streams will have an effect on downstream characteristics by impacting on water temperature, removing sedimentation and providing nutrients while filtering out chemicals.
3. The role a first order stream, within the headwaters, plays within the watercourse, is precariously fragile.
4. No model was presented at the hearing to indicate a threshold for intrusion into the watershed beyond which development should not be allowed. In the absence of such a model, the Commissioner found that it was appropriate to apply a precautionary principle to development.
5. Headwaters must be regarded as fragile. [...]
6. Changes to the stream characteristics within the headland reaches will be compounded throughout the watershed. [...] [Emphasis added]

Further to item 4 (above), the Commissioner stated:

No model was presented at the hearing to indicate a threshold for intrusion into the watershed beyond which development should not be allowed. In the absence of such a model, the tribunal finds that it is appropriate to apply a precautionary principle to development involving first order and intermittent streams within the headwaters of a watercourse, so that, in the absence of calculation of a threshold or demonstration of no net impact, development within such land should not proceed. This precautionary principle is applied in recognition of the integral role of water in environmental and human health.²⁷ [Emphasis added]

The appeal was dismissed. While Contwoyto Lake is *not* a headwater, it nevertheless has for the Inuit of Nunavut an ecosystemic²⁸ role when looking to water-based impacts from mining operations.

Most recently the Supreme Court of Canada applied the precautionary principle. In *114957 Canada Ltée (Spraytech, Société d'arrosage) v. Hudson (Town)*,²⁹ the

²⁷ Paragraph 25.

²⁸ In Article 12.1.1 of the NCLA, "ecosystemic" means relating to the complex of a natural community of living organisms and its environment functioning as an ecological unit in nature.

²⁹ 2001 SCC 40.

Court concluded the Town's regulation (i.e., its by-law) of a pesticide is consistent with principles of international law and policy.³⁰ The Court held:

The interpretation of [the Town's by-law] contained in these reasons respects international law's "precautionary principle", which is defined as follows at para. 7 of the Bergen Ministerial Declaration on Sustainable Development (1990): In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. [Emphasis added]

From the foregoing, the precautionary principle appears to mean: (i) gravitate toward greater caution when facing unknown environmental impacts; and (ii) remedial measures to prevent environmental degradation must proceed despite scientific uncertainty. Further to (ii), the measures should be reasonable (e.g., cost-effective). In applying this principle to EBM, where there *may be* threats of serious (perhaps irreversible) damage and the science is debatable, the Board would be wise to not fall victim to data gaps that might threaten the environment. In other words, we will not depart from what is suggested to be a minimum standard of two metres until safely proven otherwise.

Evidence

The Board accepts Mr. Murphy's evidence (the scientist hired by the Applicant) that 2.0 metres will still protect the environment better than 1.75 metres; in other words, the more cover the better.³¹ There is other evidence (Sego-Biggarr proposal³², Golder³³, EBA³⁴, and BCL³⁵) that the Board relies on that two metres is better than one metre, or even 1.75 metres.

³⁰ In paragraph 32, the Supreme Court of Canada noted:

Scholars have documented the precautionary principle's inclusion "in virtually every recently adopted treaty and policy document related to the protection and preservation of the environment" [...]. As a result, there may be "currently sufficient state practice to allow a good argument that the precautionary principle is a principle of customary international law" [...]. The Supreme Court of India considers the precautionary principle to be "part of the Customary International Law" [...]. In the context of the precautionary principle's tenets, the Town's concerns about pesticides fit well under their rubric of preventive action.

³¹ Hearing: Murphy

³² Sego-Biggarr proposal, p. 3: "trial esker cover have been constructed to 0.5 and 1 m thicknesses on portions of the tailing surface. Temperatures have been measured beneath these two covers and indicate that thaw has penetrated to about 1.75 m below the cover surface. This would indicate the present use of the esker material would require at least 1.75 m thickness of

While cover thickness is an important factor, the Board is aware of other factors and studies. We are comforted by oxidation studies³⁶ of mine tailings in Rankin Inlet that the size of the thickness appears not as important as the mean annual temperature (which should remain below -2.0°C). As the authors of these studies concluded for Rankin Inlet and other mine sites:

- (1) The experimental program demonstrated that a significantly reduced but measurable oxidation takes place at -2°C . [...] At -10°C , no oxidation is measurable in any of the tailings experiments.
- (2) Within the large portion of the tailings thickness at Rankin Inlet that has fallen below a mean annual temperature of -2°C , reactivity and oxidation are expected to be very low. However, there may be limited sulphur oxidation in the upper 2 m of the buried tailings if they experience temperatures above -2°C during summer months. [...]
- (3) Encapsulating tailings in permafrost should minimize oxidation there the tailings temperature is maintained below -2°C . [...] [The mean annual temperature] is determined by a number of factors including vegetation, presence of standing water and snow cover. In some parts of the Arctic, mean annual temperature has increased by up to 1.7°C over the last century, thus climate variability is a factor requiring consideration as well.³⁷

The Board is concerned with the last point: it seems to those of us who live in Nunavut that mean annual temperatures are increasing. Regarding climate change, global, as well as Arctic, warming is a major concern by many people and countries. As reported by Environment Canada,³⁸ with which we agree:

Our Canadian Arctic is warming up and at an unprecedented rate. Aboriginal and Inuit elders, and Territorial leaders are telling us that they are already experiencing the effects

cover to prevent thaw from penetrating into the underlying tailings. It has been suggested that a cover of up to 2 m thick may be required.”

³³ Closure Cost Estimate and Scoping of Mine Closure Issues, Lupin Mine, NWT. Golder Associates Ltd. & PCL Construction Northern Inc., December 1997. In NWB Public Registry.

³⁴ EBA Report, p. 7: “the current reclamation option of 1.75 m provides insufficient cover material to fully encapsulate the tailing material within permafrost.”

³⁵ Submission dated March 20, 2000. In NWB Public Registry.

³⁶ J.L. Meldrum, H.E. Jamieson & L.D. Dyke “Oxidation of mine tailings from Rankin Inlet, Nunavut, at subzero temperatures” *Canadian Geotech Journal* 38: 957-966 (2001). Marked as Exhibit 8.

³⁷ Page 965.

³⁸ Source: Environment Canada's website (<http://www.ec.gc.ca/envhome.html>) which is public domain information.

of climate change.

As the world warms, temperature changes will be greater in the North, and they will be greater in winter than in summer. By 2100, winters in parts of the Canadian Arctic are projected to be 5 to 7°C warmer than they are today.³⁹

Increased temperatures support the argument for greater, not lesser, cover thickness, among other things, to compensate for warming. The Board recognizes EBM's attempt to prove that a cover layer of less than two metres will fully protect the environment by minimizing oxidation. Sharing this interest in fully protecting the environment, the Board is committed to examining, when available, future scientific research results to see if a cover of less than two metres may be justified. But the studies have to be completed first, and they are not. So we must wait.

Further to the two metres, there is an assumption that industry standards are an optimal benchmark set by industry, regulators and others based on, in part, empirical findings. A change in an industry standard is one result that tribunals, such as this Board, are interested in knowing. In the presence of the current industry standard, and in the absence of proven research, the Board cannot justify making this cost adjustment (i.e., reducing the cover thickness under two metres).

Interconnectedness of land and water

While the Board has decided to slightly decrease the security amount, it should remain relatively high for other reasons. As stated in its *Lupin Licence Renewal 2000* and an earlier decision,⁴⁰ the Board felt it was difficult for anyone assessing security or reclamation costs to draw distinctions between land and water (i.e., to totally exclude land). The NWB has not changed its mind about guarding fresh water and the environment that it nurtures. As the Board has unequivocally stated:

All elements of the environment, including land and water, are interconnected; what affects one part of the environment can ultimately have an impact on the other environmental elements. By altering the natural elements of the environment, traditional Inuit culture and use of the

³⁹ This excerpt is from Environment Canada's website article titled "Climate Change at The North Pole" in Issue 1, December 18, 2000 of *EnviroZine* (Environment Canada's On-line Newsmagazine) at <http://www.ec.gc.ca/EnviroZine>.

⁴⁰ *Re: Security Deposit for BHP Boston Gold Project*. See pages 16 to 20.

land and water can be directly affected. The Board recognizes that [...] factors related to water, from mining activities, can affect Inuit culture.⁴¹

This interconnectedness is reflected in the above precautionary principle example which recognizes the integral role of water in environmental and human health--especially for our Inuit culture that thrives on the land.

Balancing of interests including the Applicant's ability to pay

When evaluating an adjustment to the security amount, the Board was mindful of EBM's strong economic warning in its closing arguments. Two officers of the company, Mr. Danyluk and Mr. McCrank, made those arguments. At the hearing, Mr. Danyluk stated:

Mr. Chairman, the current economic realities facing the mining industry compel both the NWB and DIAND to work with EBM to develop a reclamation security amount and subsequent schedule of payment that is both reasonable and affordable. By staying in operation, we will continue to generate a substantial tax contribution to all levels of government. [...] All we ask is for reasonable security terms to allow us to remain in operation.

Mr. McCrank stated:

Asking us to place on deposit the total reclamation dollar amount that reflects the worst-case environmental scenario then adds a vision that our company goes bankrupt requiring the extensive use of contractors and consultants along with their higher rates and profit requirements. This is unrealistic. This high up front deposit approach is not the best use of the money nor do we have the financial capacity to comply at this time.

EBM's counsel, Mr. Ignasiak, focused the Board's attention on section 12 of the *Northwest Territories Water Act*⁴² (NWTWA). This section requires the Board to balance the interests of protecting the environment with the economic well-being of the company. Section 12 of the NWTWA states:

⁴¹ *Lupin Licence Renewal 2000* at p. 26. The factors listed are omitted. This decision also noted the land/water relationship recognized in governments' definitions of the environment.

⁴² S.C. 1992, c. 39.

The objects of the Board are to provide for the conservation, development and utilization of waters in a manner that will provide the optimum benefit therefrom for all Canadians and for the residents of the Northwest Territories in particular.

The Applicant again asked the Board to consider the “ability of the applicant to pay”. With this request in mind, section 17(1) of the NWTWA states:

The Board may require an applicant for a licence, a licensee or a prospective assignee of a licence to furnish and maintain security with the Minister, in an amount specified in, or determined in accordance with, the regulations [...] and in a form prescribed by those regulations or a form satisfactory to the Minister.

Under section 12(1) and (2) of the *NWT Water Regulations*:⁴³

The Board may fix the amount of security required to be furnished by an applicant under subsection 17(1) of the Act in an amount not exceeding the aggregate of the costs of

- (a) abandonment of the undertaking;
 - (b) restoration of the site of the undertaking; and
 - (c) any ongoing measures that may remain to be taken after the abandonment of the undertaking.
- (2) In fixing an amount of security pursuant to subsection (1), the Board may have regard to
- (a) the ability of the applicant, licensee or prospective assignee to pay the costs referred to in that subsection; or
 - (b) the past performance by the applicant, licensee or prospective assignee in respect of any other licence. [Emphasis added]

Further, it is the Board's understanding that EBM has a bleak cash flow projection. We note in EBM's *Annual Report 2000*:⁴⁴

⁴³ SOR/93-303 P.C. 1993-1213 8 June, 1993.

⁴⁴ Exhibit 1.

Early in 2000, the American Stock exchange advised the Company that its listing eligibility was under review. The review was undertaken because the Company had fallen below two of the Exchange's continued listing guidelines – the Company had sustained net losses in its five most recent fiscal years (1995 to 1999) and, in the Exchange's view, the Company's shareholders' equity [...] is inadequate. The Company is addressing the Exchange's concerns [and] ... [t]his process will continue for the foreseeable future.⁴⁵

Cognizant of the appellant's ability, or lack thereof, to pay,⁴⁶ the Board's leniency could have possibly resulted in no deposit at all, either now or in the future. However, our concern is that if the Board was to have no deposit, or a heavily reduced security amount, and insolvency was to occur, no jobs would be secure and the cost for remediation and clean-up will be borne by the federal Crown (via all taxpayers in Nunavut and elsewhere in Canada). If it is true that the Applicant is negotiating the restructuring of \$160 million in debt, and that restructuring is favourable, this can be brought to our attention at that time, but today that has not happened⁴⁷ and may never occur.

In the austere outlook of the *Annual Report 2000*, the company states that it can only operate the Lupin through 2004⁴⁸, which means that the ability to generate cash or liquid type security in Nunavut may, at that time, disappear. This situation for the Lupin mine appears compounded by the questionable financial strength (e.g., see above Exchange review) of the company's operations elsewhere in the world.⁴⁹ All of this leaves the Board with significant concerns. And when a company's financial health is marginal, the protection of the security deposit becomes the highest priority.

⁴⁵ Page 15.

⁴⁶ Hearing: When asked by Dionne Filiatrault about EBM's current credit rating, Bill Danyluk replied that "we have a heavy debt load, and we cannot get a bond or letter of credit." In the *Annual Report 2000*, it states "[c]ost containment is the mantra" (at page 3).

⁴⁷ McCrank presentation (page 1, dated November 15, 2001).

⁴⁸ Page 11.

⁴⁹ The Board notes the following:

Early in 2001, regulators in Nevada formally called upon two of the Company's subsidiaries to provide other security to replace corporate guarantees that had been given in respect of the Round Mountain and McCoy operations. The subsidiaries disagreed with the regulator's position and [...] the outcome cannot be predicted ... (*Annual Report 2000* at page 16).

Asset value, salvage and inventory

EBM wanted the Board to deduct \$3.7 million dollars (net) for salvage value to assets, and an additional \$6.4 million dollars for inventory. In reply, DIAND's legal counsel, Mr. Webber, urged the Board not to make this deduction and the Board agrees. As stated in the *Lupin Licence Renewal 2000* decision:

EMB wants the Board to categorize the salvageable value of EBM assets as a credit against the final A & R calculation. [...] The Board concludes that EBM's asset credit proposal is not acceptable, largely because of: 1) the difficulty in tracking the priority of security interests and/or liens in major assets, and 2) because of the likelihood that such assets, if valuable, would likely disappear quickly in the unfortunate (and never planned) case of insolvency.⁵⁰

However, the Board has decided the asset or salvage and inventory can be a *form* of security, providing the Minister has so elected and used that form based on the information then available to DIAND.⁵¹ The Board is not aware of any change in DIAND's position regarding this matter.⁵²

Good track record

The Board agrees that EBM has a good track record and encourages it to continue. This matter was discussed and taken into account through credits in

⁵⁰ Page 28.

⁵¹ Under s. 17(1) of the NWTWA, the form is either prescribed by the Regulations or a form satisfactory to the Minister. The Regulations in section 12(3) state:

Security [...] shall be in the form of

- (a) a promissory note guaranteed by a bank in Canada and payable to the Receiver General;
- (b) a certified cheque drawn on a bank in Canada and payable to the Receiver General;
- (c) a performance bond approved by the Treasury Board for the purposes of paragraph (c) of the definition "security deposit" in section 2 of the Government Contract Regulations;
- (d) an irrevocable letter of credit from a bank in Canada; or
- (e) cash.

⁵² As stated in the *Lupin Licence Renewal 2000* (at page 28), DIAND's reasons for not accepting the use of salvageable assets as part of the security were:

- the Crown may not have a legal right to the salvageable assets
- it cannot be predicted what assets will actually be on site, who has the rights to the assets, what condition the assets will be in, and the actual value on that date
- the actual value realized for the asset may be lower than anticipated
- costs associated with preserving and disposing of the assets
- the Crown may not want to assume ownership of the assets

the *Lupin Licence Renewal 2000* decision, with the security amount decreased accordingly (by 10%).⁵³ A similar decrease (of 10%) will be applied in the final determination of the total security.

Credit for established mining operations

Again, this credit was acknowledged in the *Lupin Licence Renewal 2000* decision,⁵⁴ and the Board decides that this credit will be applied again in today's decision.

Credits for last year's reclamation

At the current hearing, the Board received information that the company has spent \$194,000 in reclamation costs. Assuming that these reclamation costs actually reduced the overall security, and the Board will give the benefit of any doubt to the company, we thereby reduce EBM's security amount by \$194,000.

Progressive reclamation

EBM urged the Board to look to proposed future events in reducing the amount of security required by \$7.676 million and proposed the following payment formula:

Year	Reclamation Security Balance (Jan. 1)	Forecasted Progressive Reclamation Work	EBM Payment To Reclamation Trust Fund * (July 1)	Revenue From Salvage Of Warehouse Inventory	Revenue From Salvage Of Machinery & Equipment
2001	\$ 15,466,000	\$ 194,000	\$ 2,920,000		
2002	\$ 12,352,000	\$ 59,000	\$ 500,000 *\$ 117,000		
2003	\$ 11,676,000	\$ 945,000	\$ 500,000 *\$ 141,000		
2004	\$ 10,090,000	\$ 1,288,000	\$ 500,000 *\$ 167,000		
2005	\$ 8,135,000	\$ 1,044,000	\$ 500,000 *\$ 194,000		
2006	\$ 6,397,000	\$ 1,119,000	\$ 335,000 *\$ 222,000		

⁵³ See pages 29-30.

⁵⁴ *Ibid.*

2007	\$ 4,721,000	\$ 1,230,000	*\$ 244,000	\$ 400,000	
2008	\$ 2,847,000	\$ 1,797,000	*\$ 254,000	\$ 500,000	\$ 1,000,000
2009 Total	\$ (704,000)	\$ 7,676,000	\$ 6,594,000	\$ 900,000	\$ 1,000,000
Balance	\$ (704,000)	\$ 0	\$ 6,594,000	\$ 700,000	\$ 2,727,000

For reasons stated above, we disagree. DIAND⁵⁵ stated that if EBM actually does the future work, the company could later come back (also see *Lupin Licence Renewal 2000* decision⁵⁶) and claim for credit at that time. We believe, like DIAND, that the proper way to make progressive reclamation adjustments is to wait until *after* the work is completed *before* giving any credit. This will be done through annual periodic review.⁵⁷

C. Revised security amount, form of security and payment schedule

Use of Third Party Rates for Reclamation Work

At the hearing, EBM maintained that the cost of reclamation estimated by BCL, which formed the basis of the security amount set in license NWB1LUP0008, was hastily prepared and based on unreasonable assumptions⁵⁸. Mr. Danyluk pointed out that the RECLAIM model is only a tool for roughly estimating reclamation costs in the absence of more tangible data, whereas EBM provided the Board with an accurate estimate based on third party contractor rates, from a consortium of reputable northern consulting and construction companies. The Board recognizes Nuna's northern costing experience. While, as indicated in the preceding sections, the Board does not agree with the reduction in the thickness of the tailings cover proposed by EBM, we acquiesce with the company that the rates for labour and material used by Nuna in their calculation of the cost of reclamation offer a high degree of confidence and we decide that those rates can be safely used to determine the cost of reclamation based, among other things, on a two-metre esker cover over tailings.

Quantum

For the preceding reasons, the Board concludes there should be a reduction in the current security amount. At the hearing, NWB staff asked for confirmation or clarification from EBM and Nuna in regard to their stance on some of the items

⁵⁵ Lee F. Webber: Closing remarks.

⁵⁶ Page 31.

⁵⁷ See Periodic Review on page 31 of *Lupin Licence Renewal 2000* decision.

⁵⁸ Bill Danyluk's opening remarks. Kugluktuk hearing. November 15, 2001.

that were included in BCL's cost estimate, but were not readily apparent in Nuna's estimate. These items included to cost to open and maintain the winter road, fuel delivery, remediation of contaminated soil under tank farms, removal and disposal of hazardous materials, treatment of supernatant at the tailings pond, decontamination of tanks and pipes, provision of riprap materials for dams and dikes, revegetation, etc. EBM replied that all of the above costs had been included in Nuna's estimate. However, precise values of each of the above activities were impossible to check or verify as Nuna prepared the cost estimate based on time, material and labour utilization and the costs of these items were not specifically indicated in Nuna's cost estimate. Consequently, the Board decided to add to Nuna's base calculation the following additional cost items, which were suggested in BCL. The Board added an amount of \$125,000 for post-closure monitoring, which was recognized by EBM. While EBM indicated at the hearing that all of the additional costs listed by BCL had already been included in Nuna's estimate, the Board cannot find any explanations of how these costs had been accounted for in the Nuna's estimate. The Board believes that the major cost items (winter road, fuel delivery, and contaminated soil remediation), which vary approximately between \$600,000 and \$1.6 million, should still be added to the revised cost estimate, but with an adjustment as shown below. The Board assumes however that other smaller costs items are included by Nuna as stated at the hearing but believes that a contingency of 10% should be added to cover unknown or undefined reclamation costs. As a result of these adjustments, the Board has decided to reduce Echo Board's current security requirement (of \$29.2 million dollars) to \$25.5 million dollars. The Board's rationale has been set out above. The calculation of \$25.5 million, along with explanations, is as follows:

Reclamation Activity	Value in 2000 \$	Comments
Basic Cost Calculation (Nuna's report)	24,337,900	Based on 1.75 m cover
Additional 25 cm tailings cover	1,975,000	Add to make 2 m cover
2000 Reclamation Work	(194,000)	From EBM
Additional Reclamation Costs as suggested by BCL	0	Assumed included in Nuna's report
Hazardous material removal and disposal	0	Assumed included in Nuna's report
Clean fuel tanks before demolition	0	Assumed included in Nuna's report
Contaminated soil remediation	1,000,000	Adjust from BCL value of \$1,522,775 ⁵⁹
Decontamination of pipes and tanks in mill	0	Assumed included in Nuna's report
Cover filled stopes and demolition waste	0	Assumed included in Nuna's report
Tailings supernatant treatment	0	Assumed included in Nuna's report
Fill for erosion resist on dams	0	Assumed included in Nuna's report
Revegetation	0	Assumed included in Nuna's report
Winter road – heavy use for 1 year	1,586,650	Adjust from BCL value of \$6,488,00 ⁶⁰
Winter road – light use for 2 years	596,000	Id.
Fuel Delivery	1,025,610	Adjust from BCL value of \$1,235,370 ⁶¹

⁵⁹ See letter from M. J. Brodie (BCL) to the NWB, Re: "Lupin Mine – Review of A&R Plan and Reclamation Cost Estimate, March 20, 1999."

⁶⁰ Id.

⁶¹ Ibid.

Contractor mobilization of equipment	0	Assumed included in Nuna's report
Equipment standby for 2 winters	0	Assumed included in Nuna's report
Post-closure monitoring	125,000	
Engineering – 1.5%	30,452,160	
	456,782	
Contingency – 10%	30,908,942	
	3,090,894	
RECLAMATION COST	33,999,836	
NWB 2000 Reduction – 20%	(6,799,967)	
Additional Reduction – 5%	(1,699,991)	
AMOUNT OF SECURITY	\$25,499,878 rounded to \$25.5 million	

Form of security

The Board understands the form of security is either set by the Regulations⁶² or the Minister.⁶³ Section 17(1) of the NWTWA authorizes the Board to require an applicant to furnish and maintain security with Minister, and section 12(1) of the Regulations authorizes the Board to fix the amount of security. While the Board cannot dictate the form of security, the Board believes there is potentially substantial merit in pursuing a Reclamation Trust Fund. There are advantages to this type of security, which the Board recognized in its *Lupin Licence Renewal 2000* decision,⁶⁴ and we recommend it to the Minister even more strongly this year.

Schedule of payments

The Board has decided on the following payment schedule over a 5 year time period, due as follows:

2001	\$2.92 million (already furnished)
January 31, 2002	\$1.58 million
July 1, 2002	\$2.0 million
January 1, 2003	\$3.5 million
January 1, 2004	\$4.5 million
January 1, 2005	\$5.0 million
January 1, 2006	\$6.0 million

⁶² Section 12(3) of the Regulations.

⁶³ Section 17(1) of the NWTWA.

⁶⁴ Page 30.

Total \$25.5 million

5. CONCLUSION

The Board has decided that EBM's request for a drastic reduction on their security amount at Lupin should be denied. The Board has, however, lowered the overall security slightly to \$25.5 million as described above and as per the list of payments.

APPENDIX A – LIST OF SUBMISSIONS AND CORRESPONDENCE

Application:

1. Application for water licence amendment for EBM's Lupin Mine dated May 25, 2001 received May 25, 2001.
2. Letter dated May 11, 2001 received May 29, 2001 with attached report. "Cost Estimate for Lupin Mine Site Reclamation."
3. Letter dated July 16, 2001. "Amendment to Security Deposit for Licence for Lupin" with the attached "Proposal to Study Alternate Approaches to Cover Lupin Mine Tailings."

Initial Submissions and Correspondence:

1. Letter to Mr. Bill Danyluk dated June 8, 2001. "Application for Amendment to Licence NWB1LUP0008." Philippe di Pizzo, Executive Director, Nunavut Water Board. Gjoa Haven.
2. Submission dated June 13, 2001. "Echo Bay Mines Ltd. – Lupin Mine – Amendment to Water Licence NWB1LUP0008." Anne Wilson, Water Pollution Specialist, Environment Canada. Yellowknife.
3. Submission dated June 14, 2001. "Amendment Application – Oral Hearing Procedure." Bill Danyluk, General Manager, Lupin Operations, Echo Bay Mines Ltd. Edmonton.
4. E-mail dated June 14, 2001. "Urgent: Lupin Mine Water Licence." Lee F. Webber, Justice Canada. Yellowknife.
5. E-mail dated June 14, 2001. "Re: Urgent: Lupin Mine Water Licence." Philippe di Pizzo, Executive Director, Nunavut Water Board. Gjoa Haven
6. Letter to distribution list dated June 14, 2001. "Amendment to Security Deposit for Licence for Lupin." Rita Becker, Licensing Administrator, Nunavut Water Board. Gjoa Haven.
7. Letter to distribution list dated June 15, 2001. "Amendment Application – Licence NWB1LUP0008." Philippe di Pizzo, Executive Director, Nunavut Water Board. Gjoa Haven.
8. Letter dated July 5, 2001. "Amendment to Security Deposit License #NWB1LUP0008." Ruth Niptanatiak-Wilcox, Asst. Senior Administrative Officer, Municipality of Cambridge Bay. Cambridge Bay.

9. Submission dated July 11, 2001. Martin Ignasiak, Legal Counsel for Echo Bay Mines Ltd., Fraser Milner Casgrain LLP. Edmonton.
10. Letter to Mr. Martin Ignasiak dated July 12, 2001. "Application for Amendment to Licence NWB1LUP0008." Philippe di Pizzo, Executive Director, Nunavut Water Board. Gjoa Haven.
11. Submission dated July 13, 2001. "Application for Amendment to Licence NWB1LUP0008." John Donihee, Counsel for the Kitikmeot Inuit Association, Gullberg, Wiest, MacPherson & Kay. Yellowknife.
12. Letter dated July 16, 2001. Martin Ignasiak, Legal Counsel for Echo Bay Mines Ltd., Fraser Milner Casgrain LLP. Edmonton.
13. Submission dated July 17, 2001. Martin Ignasiak, Legal Counsel for Echo Bay Mines Ltd., Fraser Milner Casgrain LLP. Edmonton.
14. Letter to distribution list dated July 24, 2001. "Application for Amendment – Licence NWB1LUP0008." Philippe di Pizzo, Executive Director, Nunavut Water Board, Gjoa Haven.
15. Submission dated July 25, 2001. "Amendment Application – Participation of Brodie Consulting Ltd." Bill Danyluk, General Manager, Lupin Operations, Echo Bay Mines Ltd. Edmonton.
16. Letter to distribution list dated July 30, 2001. "NWB Hearing Rule 3.1 and John Brodie's participation." Philippe di Pizzo, Executive Director, Nunavut Water Board, Gjoa Haven.
17. Submission dated August 1, 2001. "Issues raised by Echo Bay in connection with pending application for adjustment of security amount." Lee F. Webber, Legal Counsel to DIAND, Department of Justice Canada. Yellowknife.
18. Letter to Mr. Bill Danyluk dated August 10, 2001. "Application for Amendment – Licence NWB1LUP0008." Philippe di Pizzo, Executive Director, Nunavut Water Board, Gjoa Haven.
19. Letter dated September 12, 2001. "Scheduled Public Hearing for Echo Bay Mines Ltd. Lupin Operations." Anne Wilson, Water Pollution Specialist, Environment Canada. Yellowknife.

Intervention Statements:

1. Intervention Statement dated October 30, 2001. "In the matter of: Water licence number NWB1LUP0008 (Lupin Mine), and an Application to the Nunavut Water Board by Echo Bay Mines Ltd. for amendment of the licence." Department of Indian Affairs and Northern Development.
2. Intervention Statement from Echo Bay Mines dated November 1, 2001 including the following:
 - a. Letter dated November 1, 2001. Martin Ignasiak, Legal Counsel for Echo Bay Mines Ltd., Fraser Milner Casgrain. Edmonton
 - b. Letter dated October 31, 2001 with report of October 2001. "Technical Review, Abandonment and Restoration Plan, Lupin Mine, Contwoyto Lake, Nunavut." R.B. Murphy, Project Director, EBA Engineering Consultants Ltd. Yellowknife.
 - c. Resume "R.B. (Brent) Murphy, M.Sc., P.Geol., Senior Environmental Geologist, EBA Engineering Consultants Ltd.

Post-Hearing Submissions:

1. E-mail dated November 18, 2001 with attached "Toward a Mine Site Reclamation Policy for the Northwest Territories" Draft of December 8, 2000 from the Department of Indian Affairs and Northern Development. Hugh Ducasse, Echo Bay Mines Ltd. Edmonton.
2. Letter dated November 20, 2001. "Material to be considered with respect to Echo Bay's application for amendment of water licence NWB1LUP0008." Paul Smith, Manager, Water Resources, Nunavut Region, Department of Indian Affairs and Northern Development. Iqaluit.
3. Letter dated November 21, 2001. "Draft document entitled 'Toward a Mine Site Reclamation Policy for the Northwest Territories.'" Lee F. Webber, Legal Counsel to DIAND, Justice Canada. Yellowknife.
4. Letter dated November 22, 2001. Martin Ignasiak, Legal Counsel to Echo Bay Mines Ltd., Fraser Milner Casgrain LLP. Edmonton.
5. Letter dated November 26, 2001. "Guidelines document cited by Echo Bay." Lee F. Webber, Legal Counsel to DIAND, Justice Canada. Yellowknife.
6. E-mail dated November 27, 2001. "Nunavut Water Board (NWB) – Lupin Licence." Martin Ignasiak, Legal Counsel to Echo Bay Mines Ltd., Fraser Milner Casgrain LLP. Edmonton.

APPENDIX B – LIST OF EXHIBITS FILED AT THE NOVEMBER 15, 2001 PUBLIC HEARING

1. “Annual Report 2000.” Echo Bay Mines Ltd.
2. Press Release dated November 1, 2001. Third Quarter Results, Echo Bay Mines Ltd.
3. “Amendment Hearing – Opening Remarks.” Bill Danyluk, General Manager, Lupin Operations, Echo Bay Mines Ltd. November 15, 2001.
4. “Public Hearing Presentation – Lupin Mine, Nunavut.” Hugh Ducasse and Dave Hohnstein, Echo Bay Mines Ltd.
5. Speaking Notes. Hugh Ducasse, Manager of Loss Control and Environmental Affairs, Echo Bay Mines Ltd.
6. “TCA Presentation Script.” Dated November 13, 2001. Dave Hohnstein. Echo Bay Mines Ltd.
7. Presentation. “Lupin, NU.” EBA Engineering Consultants Inc.
8. “Oxidation of mine tailings from Rankin Inlet, Nunavut, at subzero temperatures.” J.L. Meldrum et. al. NRC Canada. 2001.
9. Report titled “Proposal and Cost Estimate for Echo Bay Mines Ltd. Lupin Mine Site Reclamation.” Nuna Logistics. January 19, 2001.
10. Letter to Philippe di Pizzo dated November 15, 200. “Reclamation Security and Payment Schedule Proposal.” Bill Danyluk, General Manager, Lupin Operations, Echo Bay Mines Ltd., Edmonton.
11. Presentation titled “Proposal- Reclamation Security and Payment Schedule.” Bill Danyluk, General Manager, Lupin Operations, Echo Bay Mines Ltd., Edmonton.
12. Presentation notes. Jerry McCrank, Vice-President, Operations. Echo Bay Mines Ltd.
13. Toward a Mine Reclamation Policy for the Northwest Territories. Draft. December 8, 2000. Department of Indian Affairs and Northern Development.

14. "Development Mine Reclamation Policy for the Northwest Territories." Department of Indian Affairs and Northern Development. January 8, 1999.
15. "Development of Mine Reclamation Policy for Nunavut." Department of Indian Affairs and Northern Development. September 27, 1999.
16. Public Registry. "NWB1LUP0008 Echo Bay Mines Limited Lupin Project." Nunavut Water Board. Gjoa Haven.