Nunavut Water Board File # NWB1NAN0208

NUNAVUT WATER BOARD

Reasons for Decision

For

Approval of the Nanisivik Mine Closure and Reclamation Plan filed by CanZinco Limited

Date of Decision: *July 1, 2004*

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I. SUMMARY

Water Licence NWB2NAN0208 ("Licence") was issued to CanZinco Limited ("CanZinco" or the "Licensee") by the Nunavut Water Board ("NWB" or "Board") on October 1, 2002. Part G of the Licence requires CanZinco to submit to the NWB for approval, a closure and reclamation plan, as well as a number of preliminary reports, prior to the completion of the final reclamation and closure plan. The Nanisivik Mine Human Health and Ecological Risk Assessment and a Phase II Environmental Site Assessment were submitted on January 30, 2003 and were conditionally approved by the NWB following technical meetings in Iqaluit and Ottawa. On February 6, 2004, the Nunavut Water Board received from CanZinco, the *Nanisivik Mine 2004 Reclamation and Closure Plan* ("Reclamation and Closure Plan"), submitted in accordance with Part G of the Licence and containing the following nine appendices: *Engineering Design of Surface Reclamation Covers* (Part G-4); *Assessment of Surface Cell and Test Cell Taliks* (Part G-5); *Quarry Development and Reclamation Plan* (Part G-6); *Detailed Design of the West Twin Dyke Spillway* (Part G-7); *Rock Piles and Open Pits Closure Plan* (Part G-8); *Closure Monitoring Plan* (Part G-9); *2003 Phase III Environmental Site Assessment* (Part G-13); *Human Health and Ecological Risk Assessment* (Part G-14); and the *Landfill Closure Plan* (Part G-17). The *Waste Disposal Plan* (Part G-16) and *West Twin Disposal Area Closure Plan* (Part G-15) were submitted, on March 3, 2004 and March 5, 2004, respectively.

On March 24, 2004, the Board gave notice of a public hearing and invited interested persons to make representations to the Board. In preparation for the hearing, the Board held a technical meeting in Yellowknife on May 4 and 5, 2004 to review outstanding technical issues in advance of the submission of final interventions. A pre-hearing conference to discuss the scope of the hearing, procedural issues and other relevant matters was held on May 6, 2004 in Yellowknife. Prior to the public hearing, written representations were filed by the Hamlet of Arctic Bay ("Hamlet"), Nunavut Tunngavik Incorporated ("NTI"), the Government of Nunavut ("GN"), the Department of Indian and Northern Affairs Canada ("DIAND"), Environment Canada ("EC"), the Department of Fisheries and Oceans Canada ("DFO"). Submissions from Acres International Ltd.

(“Acres”) of Winnipeg, Manitoba and Dillon Consulting (“Dillon”) of Cambridge, Ontario, both retained by the Board as independent expert witnesses to assist the Board and all parties in these proceedings, were also filed. The Board held a public hearing in Arctic Bay on June 3 and 4, 2004 to hear evidence from CanZinco and interested parties.

In consideration of all issues and submissions by interested parties, the Board decided to approve the Reclamation and Closure Plan submitted by CanZinco, subject to several terms and conditions that will be appended to the Licence.

II. APPEARANCES

March 29, 2003 Nanisivik Technical Meeting – Iqaluit

CanZinco	Bill Heath Bob Carreau
Nunavut Water Board	Dionne Filiatrault Patrick Duxbury
Gartner Lee Limited	Eric Denholm
Jacques Whitford Environment Limited	David Rae Malcolm Stephenson
NTI	Stefan Lopatka Neida Gonzales
GN	Earle Baddaloo Bernie MacIsaac Bruce Trotter Bob Moquin
Hamlet of Arctic Bay	Levi Barnabas
EBA Engineering, Consultant GN and INAC	Brent Murphy
GN – Justice	Susan Hardy
Environment Canada	Colette Meloche
DIAND	Michael Roy Constantine Bodykevich
Workers' Compensation Board	Martin Van Rooy
Acres International	Ramli Halim

September 22, 23, 2003 Nanisivik Technical Meeting – Ottawa

CanZinco	Bill Heath Bob Carreau
Nunavut Water Board	Philippe di Pizzo Dionne Filiatrault Patrick Duxbury

	Bill Tilleman
EBA Engineering, Consultant GN and INAC	Brent Murphy
DIAND	Stephanie Hawkins
GN – Justice	Susan Hardy
GN	Bernie MacIsaac Bruce Trotter
Dillon Consulting	Ulysses Klee Bryan Leece
Gartner Lee Limited	Eric Denholm
Jacques Whitford Environment Limited	David Rae Malcolm Stephenson
Hamlet of Arctic Bay	Levi Barnabas

May 4,5,6, 2004 Nanisivik Technical Meeting & Pre-Hearing - Yellowknife

CanZinco	Bill Heath Bob Carreau Murray Markle
Nunavut Water Board	Philippe di Pizzo Dionne Filiatrault Patrick Duxbury Stephen Lines Bill Tilleman Ben Kogvik
Acres International	Ramli Halim
Workers' Compensation Board	Martin Van Rooy
Gartner Lee Limited	Eric Denholm
BGC Engineering	Jim Cassie
Department of Fisheries and Oceans	Derrick Moggy Paul Herage

NTI – Cambridge Bay	Stefan Lopatka George Hakongak
Environment Canada	Stephen Harbicht
EBA Engineering/INAC, GN	Don Hayley Brent Murphy
DIAND	Stephanie Hawkins Jeff Holwell
Justice Canada	Norm Cavanagh
GN - Environmental Protection	Joel Holder Gladis Lemur
GN – Justice	Linda Tingley
Lorax Environmental	Jay McNee
Arctic Bay Residents	Iga Muckpaloo Imo Muckpaloo

June 3-4, 2004 Public Hearing – Arctic Bay

CanZinco Limited	Bill Heath Bob Carreau Steve Keenan Fred Bailey Murray Markle
BCG Engineering	Jim Cassie (Consultant)
Gartner Lee Limited	Eric Denholm
Hamlet Council of Arctic Bay	Niore Iqalukjuak (Mayor) Daniel Aola Sakiasie Qaunaq Roy Takakuma Liza Calaso
DIAND	Carl McLean Stephanie Hawkins Constantine Bodykevich
Justice Canada	Norm Cavanagh

(Legal Counsel for INAC)	Anusha Aruliah
Department of Fisheries and Oceans	Derek Moggy
Department of the Environment, Nunavut	Earl Baddaloo
Department of Health & Social Services, Nunavut	Bruce Trotter
Department of Justice, Nunavut (Legal Counsel for Nunavut)	Susan Hardy
EBA Engineering (Consultant to Government of Nunavut, DFO)	Brent Murphy
Community and Northern Development, Nunavut	Rhoda Katsak
Community Government Services, Nunavut	Doug Sitland Louise Kilby David Itairan
Environnent Canada	Colette Meloche
NTI (Cambridge Bay)	George Hakongak
Acres International	Ramli Halim
Arctic Bay Residents	Mucktar Akumalik Kunuk Oyukuluk Kautaq Joseph Qapik Attagutsiaq Tootalik Oykuluk Akikuluk Shappa Moses Oyukuluk Sheena Qaunaq Jason Palluk Tommy Tatatuapik Tommy Kilabuk Olayuk Kigutikkaq Leah Oqallak Tootalik Ejangiaq Mary Attagutaaluk Piuyuq Tatatuapik

III. BACKGROUND

The Nanisivik Mine was a zinc, lead and silver underground mine owned by CanZinco Ltd., a wholly owned subsidiary of Breakwater Resources Ltd ("Breakwater"). The mine is located in the Canadian Arctic on northern Baffin Island. The mine site lies on the south shore of Strathcona Sound, on the Borden peninsula, at latitude 73º 02'N and longitude 84º31"W. The environment around the mine site is typical of the High Arctic region, characterized by extremely cold temperatures, low precipitation, continuous permafrost and largely barren surface soils, which results in the mine area having minimal vegetation coverage and wildlife usage.

The mine is located 1,650 kilometres north of Yellowknife, 750 kilometres north of the Arctic Circle, and approximately 25 kilometres by road from the Hamlet of Arctic Bay, which is located on the shore of Arctic Bay on the Adams Sound. This community, with a population of about 700 people, composed of a majority of Inuit, is located west of Nanisivik. Access to the mine site and to Arctic Bay is *via* scheduled air service twice weekly from Iqaluit to the Nanisivik airport, 9 kilometres south of Nanisivik, which can handle Boeing 727 and 737 jet aircrafts on a 1,950-metre gravel airstrip. Freight is delivered to Nanisivik and mine concentrates were exported to Europe by ship during the short summer open water season, which usually runs from July to November.

Nanisivik is an Inuktitut word that means "the place where one finds things." The ore body was first discovered in 1910 by Arthur English, a prospector on Captain Joseph Bernier's second Canadian government expedition to the High Arctic. The area around the Nanisivik mine was mapped for the Geological Survey of Canada in 1954 and the occurrence of galena and sphalerite in pyrite zones was noted. Based on the work of the Geological Survey of Canada, Texasgulf Inc. initiated exploration work in 1957. In 1972, Mineral Resources International Limited purchased the property and after completing a positive feasibility study on the project, formed Nanisivik Mines Ltd. MRI ultimately became a wholly owned subsidiary of AEC West Limited, formerly Conwest Exploration Company Limited. At the time of startup, mine life was estimated to be 12

years. In July 1996, Breakwater acquired Nanisivik Mines Ltd. from AEC West Limited. In 1997, the mine was sold to CanZinco.

The Main Lens mined at the Nanisivik mine is flat lying and outcrops on surface at both ends of the zone. The geometry of the mineralized body and the presence of permafrost permit large underground excavations and the use of large-scale mining equipment. In the Main Zone, the primary mining method was mechanized room-and-pillar. Sulphide ore was mined primarily by underground methods and milled on site to produce lead and zinc concentrates. The mill operated at a nominal 2,200 tonnes per day. Mine personnel and their families resided in the Town of Nanisivik, which was constructed as part of the mine facilities. The Nanisivik Town facilities included a school, church, post office, recreation center, dining hall, houses and apartments.

During 2001, Nanisivik produced 113.6 million pounds of zinc in concentrate as well as 539,380 ounces of silver from 774,920 tonnes of ore milled. Minesite operating costs *per* tonne of ore milled were $50.33 in 2001 compared with $38.88 and total cash costs in 2001 were US$0.42 per pound of payable zinc compared with US$0.41 per pound of payable zinc in 2000. The mine had an operating loss of $20.3 million in 2001 compared with an operating profit of $15.7 million in 2000. Operating cash outflow was $15.9 million on gross sales revenue of $54.5 million in 2001 compared with a cash flow of $19.9 million in 2000 on gross sales revenue of $82.8 million. Capital expenditures in 2001 were $3.9 million compared with $8.2 million in 2000[1]. As a consequence of the low zinc price, CanZinco developed a new mining plan to optimize mine performance. The plan eliminated the mining of the lower grade portions of the ore body and resulted in the early closure of the mine in September, 2002.

The Nanisivik Mine is situated on land leased from the Government of Canada under the Territorial Lands Act and Regulations. Mineral title to the Nanisivik Mine is held under mineral leases. Surface title was also required for certain operations mostly on Crown Lands under the control of DIAND. However, at mine start-up, the surface rights

[1] From Breakwater Resources Ltd.'s Internet web site (http://www.breakwater.ca)

to one block, called the Block Transfer, were transferred to the Government of the Northwest Territories, subsequently the Government of Nunavut, following the creation of the Territory of Nunavut on April 1, 1999. The operation of the Nanisivik Mine was governed by an Agreement signed on June 18, 1974 (Master Agreement) between Nanisivik Mines Ltd. (as assignee of Mineral Resources International Limited (MRI)) and DIAND which provided for the development and operation of the Nanisivik Mine.

The Nanisivik Mine facilities consisted of an underground mine and a 2,200-tonne *per* day concentrator using conventional crushing, rod and ball mill grinding, differential lead and zinc flotation, and concentrate drying. Breakwater recently installed a dense media separation (DMS) plant at Nanisivik that came on-stream in July 2001. Main mine components include the following:

Open Pits

The West Open Pit is adjacent to the north bank of Twin Lake Creek, about 500 metres east of the industrial plant. The south side of the pit is along the bank of Twin Lakes Creek adjacent to the West Adit of the main underground mine. The East Open Pit is at the east end of the underground workings adjacent to the East Adit. The north and east limits of the pit are defined by the surface contours where mining intersected the moderately sloping topography. The south and west sides are vertical walls containing some sulphide. The west pit wall connects to the primary underground workings. Runoff from the surrounding topography drains to the East Adit Treatment Facility ("EATF"). The Oceanview Pit is a flat lying sulphide zone adjacent to the Oceanview decline about 5 kilometers east of the industrial plant. The site slopes gently north and solar heating effects are considered moderate. The Oceanview area, in general, contains high metal concentrations in the overburden.

Solid Waste Disposal Sites

There are three sites that have been used as waste disposal areas: a "bone-yard" area used for scrap metal and other pieces of equipment located west of the tank farm and east of Twin Lakes Creek. A second bone-yard is located at the Maintenance shop. The last site

is the current waste disposal site that has been used for both municipal and industrial waste.

Underground Workings

There are eight openings to the main underground workings in addition to the main underground access. Other portals are located at Oceanview, K-Baseline and Area 14 and are separate from the main underground workings. There is also a ventilation raise to the surface at Oceanview.

Tailings Disposal and Treatment

Tailings resulting from the mining and milling process were deposited in the West Twin Disposal Area ("WTDA"), which consists of the Surface Cell, Reservoir, Test Cell Area, West Twin Dyke, the polishing pond, and the decant structure, as well as tailings and water return pipelines.

Mill tailings were deposited subaqueously (under water) for the first 14 years of operation, and on the surface since 1990. The West Twin Dyke, currently 18 metres high at a nominal elevation of 388 metres above sea level, divides West Twin Lake into the subaerial or Surface Cell in the western portion of the original lake, and the subaqueous cell or Reservoir and Test Cell area and dyke in the eastern portion of the lake. The Reservoir receives and stores water decanted from the Surface Cell and runoff water from the watershed and the Test Cell areas.

Waste Rock Storage Areas

Waste rock dumps are associated with portal and open pit development, and waste rock has been used to build roads. There are waste rock piles at 02 South Dump, 09 South Dump, 39 North Dump (East Adit), K-Baseline, Oceanview, and Area-14. Sulphide bearing waste rock has been produced by mining and placed around the site.

Water Management Structures

Runoff from the East Adit waste rock disposal area and the East Open Pit area is collected and directed to the EATF where it is treated with lime and processed through a series of retention ponds.

Dump Ponds

Two dump ponds, one east of the town site along the pipeline right of way and the other near Twin Lakes Creek below the mill, have been established within the WTDA system to collect tailings when the mine drains sections of the tailings line during emergency shutdowns and other maintenance operations.

Borrow Pits, Stockpile Pads, Roads and Other disturbed Areas

Several borrow pits are located throughout the mine site. There are also stockpile pads adjacent to the portals at Area 14, K-Baseline, and Oceanview for temporary broken ore storage. Local roads service the airport, dock, East Twin Lake and the town Site. Other roads service the mine, the EATF, WTDA, Oceanview, K-Baseline and Area 14. Portions of the mine service roads were constructed with mine waste. Other surface disturbances include storage areas, vehicle parking spaces, and building foundations.

Surface Structures

Surface structures include the industrial complex and concentrator, DMS circuit, power plant, maintenance shops, warehouse, administration and technical offices. The industrial complex was built on bedrock and reinforced with a concrete foundation. The concentrate storage building in the dock area includes a truck weight scale, several conveyors and the ship loader used to load concentrates from the storage building to the ships. The town site consists of residences, bunkhouse, PAMO building, ice rink, church, Dome, carpenter shop/food storage building, a generating station, NorthwestTel equipment trailers, government garage, and central government buildings/recreation centre.

Petroleum and Chemical Storage Areas

Many chemicals such as mill reagents (hydrated lime used to control the process pH), copper sulphate and xanthate (used to control the flotation grade and recovery of final concentrates), bulk ammonium nitrate, bulk calcium chloride salt, are stored on the dock area. The tank farm comprises 19 steel tanks of various sizes located in a lined and dyked enclosure, which is adjacent to the concentrate storage shed. There is sufficient storage for 13.9 million litres of P60 diesel, 1.1 million litres of Jet A1, 0.6 million litres of gasoline and a waste products tank for motor oil, glycol, etc. The intermediate day tanks consist of two 105,000-litres diesel tanks and one 47,000-litre gasoline tank located in a dyked and lined enclosure adjacent to the industrial building. Numerous end user tanks are located around the mine site for different uses. Two buildings and a 1,000 L fuel tank are associated with the ANFO explosive facility. The mill concentrator required a number of bulk chemicals for efficient recovery of metals from the ore. Other petroleum products such as lubricants, solvents and minor specialty products are also located on the mine site. Paints are kept and mixed in the carpenter shop. Janitorial supplies and kitchen cleaning agents are kept in the warehouse or near the point of use.

Other Disturbed Areas

The stolport is a small airstrip that was used during exploration and construction of the mine. Only the runway strip and light posts remain. NorthwesTel has satellite dish antennas, small electrical equipment buildings, and radio antennas adjacent to the STOLport. Both the stolport and NorthwesTel equipment are located approximately half a kilometre directly north of the landfill/landfarm site.

A landfarm was created adjacent to the landfill approximately one kilometer west of town to remediate the fuel spill at the carpenter shop in 2000.

IV. PROCEDURAL HISTORY

The first water licence for the Nanisivik Mine, licence N5L3-0159, was issued by the Northwest Territories Water Board on July 5, 1976 pursuant to the Northern Inlands Waters Act, and subsequently renewed in 1978, 1983, 1988, and 1991. The previous licence, NWB1NAN9702, was issued on July 31, 1997 by the Nunavut Water Board after a hearing held in Arctic Bay on September 24, 1996 and an extensive *ad hoc* post-hearing procedure followed by the NWB to allow interested parties to review the application and make comments to the NWB. That licence authorized the then-owner of the mine, Nanisivik Mines Ltd. ("NML"), to use water for industrial purposes at its lead/zinc mining and milling operations located in Nanisivik, Northwest Territories for an original term of five years until July 31, 2002, and required of CanZinco to post and maintain a financial security of $ 1 million within 30 days of issuance of the licence and $1 million annually thereafter for the term of the licence. The Qikiqtani Inuit Association ("QIA") sought to have that decision set aside by filing an application pursuant to section 18.1 of the *Federal Court Act* for judicial review[2]. The decision under review was challenged under two main headings: the procedure followed by the NWB did not comply with the rules of natural justice or with the statutory standard required of the NWB; the NWB ignored evidence that was before it and failed to exercise its jurisdiction, particularly with regard to the dumping of raw sewage into Northwest Territories waters and the development of guidelines to govern the payment of compensation for environmental degradation caused by the mine's use of water pursuant to the licence. In her October 8, 1997 decision, Justice J. Reid dismissed the applicant's request that the NWB's decision be quashed.

Amendments were approved by the NWB on December 9, 1999 to allow for open pit operations at Ocean View, and on March 20, 2002 to allow the conduct of exploration drilling activities. On December 7, 2001 the NWB extended the expiry date of the licence to September 30, 2002 to coincide with the proposed end of mining and milling operations and the beginning of closure and decommissioning activities.

[2] ***Qikiqtani Inuit Assn. v. Canada (Attorney General),*** **(1998-10-09) FC T-2019-97**

On February 2, 2001, CanZinco filed an application for licence renewal for continued mining and milling operations. However, later that year, Breakwater announced in a press release dated October 29, 2001 that due to continued depressed metal prices, the Nanisivik mine would be closing in September 2002. In that press release, Breakwater stated that during the first six months of 2001 the Nanisivik mine had an operating loss of $8.3 million and a cash outflow of $6.1 million. As a result of historic weak zinc prices and the likelihood that prices would remain weak a new mining plan was developed for the Nanisivik mine, which focused on the accelerated removal of the mine pillars but no mining of lower grade reserves and resources.

The February 2001 application for licence renewal was then withdrawn when CanZinco formally notified the NWB in a letter dated November 13, 2001 of the permanent cessation of mining and milling operations at the Nanisivik Mine. In accordance with Part H, Item 8 of Licence NWB1NAN9702, CanZinco then filed an application for a water licence on February 12, 2002 and submitted its final closure and decommissioning plan in support of the application on February 28, 2002. The Application and the Closure and Reclamation Plan ("Application") were forwarded to the Nunavut Planning Commission ("NPC") for conformity to the regional land use plan as required under S. 11.5.10 of the Nunavut Land Claims Agreement ("NLCA"), and simultaneously to the Nunavut Impact Review Board ("NIRB") for the purpose of environmental assessment. The NPC concluded that the Application was in conformity with the approved regional land use plan; NIRB then determined that the project could proceed with only a screening and recommended that the NWB hold a comprehensive public hearing. NIRB issued its screening decision containing specific terms and conditions to guide reclamation activities after the public hearing.

A public hearing was then held by the NWB in Arctic Bay on July 22, 23, and 24, 2002, and Licence NWB2NAN0208 was issued by the NWB on October 1, 2002. The Licence contains several terms and conditions, including the obligation for CanZinco to furnish a $17.6 million as financial security, and the requirement to submit a final reclamation and closure plan. In addition, the NWB requested that CanZinco submit as

appendices to the final reclamation and closure plan or as stand-alone documents, the following studies or reports: (1) an assessment of the proposed covers; (2) an assessment of the postulated talik in the Surface Tailings Cell and the Test Cell; (3) an assessment of the quarries required for cover construction; (4) the details of the proposed spillway; (5) an assessment of all waste rock; (6) an assessment of all monitoring requirements; (7) a comprehensive Environmental Site Assessment ("ESA"); (8) a Human Health and Ecological Risk Assessment ("HHERA"); (9) a landfill closure plan; and (10) a waste disposal plan.

To assist CanZinco in the development of the reclamation and closure plan, the NWB held several technical meetings, including one in Iqaluit on March 29, 2003 to discuss the Phase II ESA, the HHERA and the Emergency Response Plan ("ERP"), and in Ottawa on September 22 and 23, 2003 specifically to discuss the HHERA. The Phase II ESA and the HHERA were conditionally approved by the Board August 22, 2003 and November 21, 2003, respectively, through written hearings.

On February 6, 2004, CanZinco submitted its *Nanisivik Mine 2004 Reclamation and Closure Plan* and the following eleven appendices except the Waste Disposal Plan and West Twin Disposal Area Closure Plan which were submitted on March 3 and March 5, 2004, respectively:

G-4 Engineering Design of Surface Reclamation Covers:
G-5 Assessment of Surface Cell and Test Cell Taliks;
G-6 Quarry Development and Reclamation Plan;
G-7 Detailed Design of the West Twin Dyke spillway;
G-8 Rock Piles and Open Pits Closure Plan;
G-9 Closure Monitoring Plan;
G-13 Phase III ESA;
G-14 HHERA;
G-15 West Twin Disposal Area Closure Plan
G-16 Waste Disposal Plan;

G-17 Landfill Closure Plan.

On March 24, 2004, the NWB gave notice of a public hearing to be held in Arctic Bay on the week of May 31 to June 4, 2004, and subsequently held a technical meeting in Yellowknife on May 4 and 5, 2004 to review and discuss technical issues related to the Reclamation and Closure Plan and supporting documents, before the submission of representations before the public hearing. The technical meeting was followed by a pre-hearing conference on May 6, 2004, to discuss procedural and other issues in preparation of the hearing. The public hearing date was set for June 3 and 4, 2004 in Arctic Bay.

At the hearing, the Board heard evidence from CanZinco and representations from the Hamlet of Arctic Bay, Nunavut Tunngavik Incorporated, the Government of Nunavut, the Department of Indian and Northern Affairs Canada, Environment Canada, the Department of Fisheries and Oceans Canada , several members of the community of Arctic Bay in attendance, as well as Acres International Ltd. (“Acres”) of Winnipeg, Manitoba, who was retained by the Board as an independent expert witness to assist the Board and all parties in these proceedings,

V. THE PROPOSED RECLAMATION AND CLOSURE PLAN

The *Nanisivik Mine 2004 Reclamation and Closure Plan* is the main document submitted by CanZinco under Part G(3) of the Licence. It presents the plan's objectives and outlines the process that has led to the plan's development, which includes the July 2002 public meeting, technical meetings and public consultations. It also summarizes the studies conducted by researchers before mining occurred, describes the geology of the site, where minerals were extracted, how they were extracted and then disposed of, and summarizes results from the many studies that were carried out during the life of the mine, including: groundwater seepage in the tailings disposal area; acid rock drainage; effects of the mine on aquatic life; landfill assessment; metal concentrations in Twin Lakes Creek; and various studies on the tailings disposal area. The Reclamation and Closure Plan also presents the conclusions of other reports required under Part G of the Licence, which are hereby summarized as follows:

Engineering Design of Surface Reclamation Covers Report (G-4)

The use of covers, made of shale, gravel and sand, is a major part of CanZinco's plan to reclaim different area at Nanisivik. The covers are to be built over potentially acid generating areas (open pits, tailings disposal area, rock piles), as well as on top of the landfill, so that their contents are frozen permanently.

This report submitted pursuant to Part G(4) of the Licence, provides the following information:

- A review of the different cover options, using different types of material;
- The reasons behind selecting the thickness and type of material for the covers;
- A plan for grading the covers, and an estimate of quantity of material needed;
- A monitoring plan to assess the effectiveness of the covers after reclamation;
- A contingency plan to be implemented should the covers not perform correctly.

The covers will comprise of locally available crushed shale as insulating material, and sand and gravel as erosion protection.

A cover of 1.0m of shale and 0.25m of sand and gravel over the tailings disposal area is suggested to be sufficient to keep the tailings frozen, despite global warming predictions. BGC Engineering based their decision upon long term studies of the tailings disposal area.

The covers for open pits, rock piles and the landfill are suggested to be 1.95m of shale and 0.25 of sand and gravel. BGC Engineering based their decision on results from the cover that was built at Area 14 satellite deposit.

West Twin Disposal Area Talik Investigation Report (G-5)

Placement of tailings on land occurred at the West Twin Disposal Area ("WTDA") after 1990. The tailings were deposited behind a frozen dyke in an area called the Surface Cell. Another smaller part of the tailings area, called the "Test Cell", also had tailings placed on land.

Pursuant to the requirements of Part G(5) of the Licence, BGC Engineering carried out drilling tests in the WTDA to learn about the conditions inside the mass of tailings. The report concludes that:

- There are large unfrozen zones ("**taliks**") of tailings in both the Surface and Test Cell;
- There are approximately 6 500 000 cu^3 of tailings in the Surface Cell; about 2 000 000 cu^3 are unfrozen. Another 1 000 000 cu^3 of unfrozen tailings are in the Test Cell;
- Due to the presence of salts in the tailings, some taliks have temperatures below 0^oC;
- It is predicted that it will take between 7-8 years for tailings to the base of the dyke to freeze in the Surface Cell;
- It is predicted that it will take between 27-32 years for the deepest parts under the Surface Cell to completely freeze;

- As the tailings freeze, liquid will be expelled from the Surface Cell and Test Cell. In the case of the Surface Cell, this will likely result in frost heaving of the surface which will require repair from time to time;
- A monitoring program for examining the freezing of the taliks is provided, which will include visual inspection, measurement of temperatures, installation of equipment and water quality tests.

Quarry Development and Closure Plan Report (G-6)

A major component of reclamation at Nanisivik will involve building covers over the tailings area, as well as over the landfill, waste rock piles and open pits. Development of quarries is required to provide material for the covers. Shale, as well as sand and gravel will be extracted for the covers. The report, submitted as a requirement of Part G(6) the Licence presents information on:

- Development plans for the quarries;
- Reclamation and grading plans for the quarries after use;
- A monitoring plan to assess the quality of excavated material;
- Contingency plans to be implemented in the event that more material is needed.

<u>Shale Quarries</u>

- Local shale will be the main material in the covers
- Nanisivik Mine has GN or DIAND quarrying permits for seven shale quarries (see map on next page)
- Four shale quarries will be used in reclamation
- About 794 400 m^3 of shale will be needed for covers
- The four shale quarries can provide up to 1 350 000 m^3 of material;
- Nanisivik shale is non-acid generating, does not release metals and has some neutralizing ability
- Quarry sides and floors will be sloped to stabilize and promote drainage after quarries are finished with.

<u>Sand and Gravel Quarry</u>

- A top layer of sand and gravel will be required for the covers as armoring/erosion protection
- Sand and gravel to be extracted from quarry located between West and East Twin Lakes
- About 180 350m^3 of material will be required for covers
- There is approximately 375 000m^3 of material available in the top 2m of the deposit

West Twin Disposal Area Surface Cell Spillway Design Report (G-7)

After mine closure, water must be able to drain from the Surface Cell of the West Twin Disposal Area without any external assistance. CanZinco Limited proposes to build a spillway from the Surface Cell to the reservoir of the WTDA so that seasonal runoff can drain away. Key information contained in this report, submitted as a requirement of Part G(7) of the Licence, includes the following:

- The spillway has been designed to withstand severe storm events and will be able to carry the runoff
- The location of the spillway was determined through site investigations that included test pits and boreholes, as well as laboratory testing of soil and bedrock
- The Surface Cell is to be graded to drain towards the spillway
- The spillway will be 6m wide with a base founded in the bedrock
- Areas of the spillway that are to be constructed on fractured bedrock will be armoured with rip rap stone to prevent erosion
- To prevent erosion in the Reservoir, the spillway outlet will be widened and will have a plunge pool below it to reduce the energy of the water that is running down the channel
- A service road will be constructed along the spillway route to permit inspection and maintenance
- Approximately 49 000 m^3 of material will be excavated for spillway construction
- Approximately 400 m^3 of rip rap fill will be placed for erosion protection

Rock Piles and Open Pits Closure Plan (G-8)

Waste rock, created from both open pit and underground mining, was stockpiled in various locations around Nanisivik. The type of waste rock varies from acid generating rocks to neutralizing rocks; although, in general, the waste piles are acid neutralizing. During the past decade, much of the waste rock has been disposed of by placing it underground or in open pits. There is still approximately 70 000 m^3 of waste rock that requires disposal.

The walls of the open pits contain zones of mineralized rock, which is prone to acid-rock drainage, although the walls are largely made of neutralizing rock. To reclaim the open pits and waste rock, CanZinco intends to do the following:

- Relocate waste rock so that there is little or no need for reclamation of the rock piles;
- Fill the open pits to achieve a smooth surface that is safe and allows drainage away from the pit;
- Construct covers over the pits, made of shale and gravel, so that the pits' content freezes into the permafrost; and
- Maintain a monitoring and contingency program.

The covers will consist of 1.95 m of crushed shale with an additional 0.25 m layer of Twin Lakes sand and gravel to provide protection against erosion. A quality control program will be implemented so that the covers meet the design specifications.

The reclaimed pits and piles will be monitoring until 2010 and a contingency plan will be in place, in the event that reclaimed areas do not perform to expectations.

Reclamation and Closure Monitoring Plan Report (G-9)

The report was prepared in accordance with Part G(9) of the Licence to fulfill the following two objectives:

- To identify management needs so that the environment is protected; and

- To assess the overall performance of the reclamation activities

The Monitoring Plan is divided into two time periods:

- Reclamation Period – Active physical reclamation of the mine site (2004-2005)
- Closure Period – Only small maintenance work carried out; (2006-2010)

The Monitoring Plan consists of the following four components:

Water quality monitoring

- 25 water monitoring stations are identified where water can be consistently sampled for water quality and contaminants
- Sampling of temporary streams and water bodies related to reclaimed areas will also occur
- Metal loading studies carried out during the previous water licence will be continued so that regulators will know the contribution of metals from various locations into Twin Lakes Creek

Geothermal monitoring

- 78 geothermal instruments, placed at various locations, will be monitored throughout the entire monitoring period
- The monitoring equipment will be used to assess underground temperatures, ground movements, permafrost development, active-layer depth

Confirmatory soil sampling

- Used to confirm the success of clean-up efforts for contaminated soil
- To establish that at least 95% of soil that exceeds unacceptable levels of contaminated has been cleaned up
- On-site screening of soils will be conducted alongside clean-up efforts and will be confirmed by off-site laboratory testing

Physical stability of earth structures

- To consist of annual inspections by a geotechnical engineer who will inspect reclaimed structures, including:
- West Twin and Test Cell Dykes; Surface Cell Spillway; Reservoir Outlet; East Twin Lake outlet area; Landfill cover; Open pit covers.

The monitoring period may extend beyond 2010 should results indicate that the site has not yet stabilized or met reclamation objectives.

Both CanZinco and the NWB will be required to review monitoring data and respond to it. Quarterly reports and an annual environmental report will be filled with the NWB and offered for public review.

CanZinco will file a Comprehensive Assessment Report with the NWB in 2010 that assesses the environmental stability of the site. Should the site be proven stable, CanZinco will request a release from further monitoring obligations.

2003 Phase 3 Environmental Site Assessment Report (G-13)

The report provides an update of the *Phase II Environmental Site Assessment* that was conditionally approved by the NWB last year. At the time of the approval, 15 conditions were required of CanZinco by the NWB. Each of the 15 conditions has been addressed in the new report.

The report also presents results of field work undertaken in 2003, which expanded upon field work carried out in 2002. 267 soil samples were collected from 90 test pits. 15 groundwater samples were also collected. The soil and water samples were analyzed for metal and hydrocarbons contamination. The following summarizes the main results of the of the 2003 field work:

<u>Dock Area</u>

- Hydrocarbon contaminated soil is present in the dock cell of the ship loader, around the refuge station, and along the pipeline from the dock to the tank farm

- Hydrocarbon contamination does not extend further than 40m down slope from the berm of the tank farm
- Zinc contaminated soil was identified around the concentrate shed, load out dock and refuge station
- Lead contaminated soil was identified around the concentrate shed

STOL Airstrip

- It was determined that hydrocarbon contaminated soil does not extend more than 45m from its point of origin
- Lead contamination of the surface soils was identified

Town, Carpenter Shop

- The extent of hydrocarbon contaminated soil near the Carpenter Shop was investigated; it does not extend more than 50m down slope of the building

Industrial complex

- Hydrocarbon contaminated soils were identified down slope of day tanks and around the waste oil tank and oil water separator
- Metal contaminated soil is present around the industrial complex in the top layer of soil

Warehouse Yard

- Hydrocarbon contamination was identified in surface soils

Landfarm

- The landfarm was developed to remediate soil contaminated from a hydrocarbon spill at the Carpenter's shop. Only 25% of the soil in the landfarm has been reclaimed in the landfarm treatment

Landfill

- No metals or hydrocarbon contaminated soil was detected down gradient or next to the landfill

K-Baseline

- Isolated hydrocarbon contaminated soil was identified at this satellite mine

Roads

- Hydrocarbon contamination of surface soils was identified near refuge station storage tanks along the roadways
- Metal contaminated soil is present near the Oceanview mine workings and along the surface of the roadway between the dock and the industrial complex.

Human Health and Ecological Risk Assessment (G-14)

This report, dealing with toxicological concerns arising from the reclaimed mine site, was reviewed and approved by the NWB on November 17, 2003.

West Twin Disposal Area (WTDA) Reclamation Plan Report (G-15)

This report, submitted as a requirement of Part G(15) of the Licence, presents information concerning the reclamation of the WTDA that is not already included in the Spillway Plan, Talik Report, Quarries Report or Cover Designs Report. The following issues are addressed in the WTDA report:

- Water cover for submerged tailings in the Reservoir;
- Shoreline protection design for the Reservoir to protect against erosion and ice-scouring;
- Removal of water control outlet structures and construction of open outlet channel to permit natural water flow;
- Erosion protection for East Twin Diversion Dike and channel

Objectives

The specific objectives of the WTDA plan include:

- Isolating tailings from air to prevent acid rock drainage;
- Preventing movement of tailings into the environment; and
- Transforming the WTDA into a safe area which blends into the environment

To meet those objectives the following actions will be required:

- Establishing a shale/sand and gravel cover over the Surface Cell;
- Maintaining a minimum 1m depth water over the Reservoir to minimize tailing exposure to oxygen;
- Establishing erosion protection around shoreline of Reservoir to minimize movement of tailings due to wave action and ice scouring;
- Constructing a spillway to drain water from the Surface Cell to the Reservoir;
- Grading of West Twin Dyke and placement of Twin Lakes sand and gravel on it for erosion protection; and
- Removing water control structures and building open outlet channel to return water level to original natural elevation

Monitoring and Contingency Planning

The long term concentration of zinc in WTDA discharge water is predicted to be similar to natural background levels.

The report proposes a monitoring program to evaluate the performance of the WTDA reclamation activities, which includes:

- Ground temperatures in cover, tailings and ground;
- Water pressure in the Surface Cell (talik monitoring)
- Water quality of discharge water
- Climate data;
- Inspections by staff and geotechnical engineer

The report provides contingency planning in the event that aspects of the WTDA reclamation do not perform as predicted.

Nanisivik Mine Waste Disposal Plan Report (G-16)

This report was initially submitted to the NWB on August 1, 2002 as a requirement of Part G(16) of the Licence. After a public review of the document, it was determined that

the report was deficient in a number of areas. Further clarification was identified for 18 items. CanZinco was instructed on January 6, 2004 to revise the report to address these clarifications.

The report's objective is to provide a system for waste disposal that protects human health and the environment. The report suggests two principle ways to dispose of waste at Nanisivik:

- Depositing of waste in the underground workings so that gravity and permafrost migration will seal the waste in place; and
- Depositing of waste into pits, sealed with engineered covers, to allow permafrost to seal the waste in place

The report provides a simple waste classification system for depositing waste in certain locations, which are selected on the basis of the waste's potential risk to human health and the environment. Hydrocarbon soils, for example, will be isolated in the mine's underground workings.

Waste handling will be documented and will include a description of the waste, decontamination required (if any), storage location and estimated storage volume. The documentation will be made available to the NWB and other regulators.

The following volumes are presented in the report:

- Quantity of solid waste (non soil) – 23 500m^3
- Quantity of hydrocarbon contaminated soil – 53 700m^3
- Quantity of metal contaminated soil – 92 400 m^3
- Quantity of waste rock – 70 000 m^3
- Available space in underground workings – 345 000m^3
- Available space in pits – 120 000m^3

Nanisivik Mine Landfill Closure Plan (G-17)

The Nanisivik landfill occupies approximately 4 ha and its thickness ranges from 2m to 10m. During operations, waste was typically burned at the landfill before being covered with shale. Prior to 1990, oils, glycols and lead-acid batteries were placed in the landfill. In order to close the landfill, the report has established the following objectives:

- To provide a landfill cover design that will isolate landfill material from the environment;
- To provide a monitoring plan that assesses the effectiveness of the landfill cover;
- To provide a contingency plan in the event that the landfill cover does not perform correctly

The closure approach for the landfill is to construct a cover over it, consisting of 1.95 m of crushed shale and 0.25 m of Twin Lakes sand and gravel. The cover will ensure that all materials in the landfill are permanently frozen below the active zone. The surface of the landfill will be graded appropriately before the cover is placed.

Monitoring will occur during the reclamation and post-closure period and will include:

- Surface and ground water sampling and analyses (for possible metal and hydrocarbon contamination running off from the landfill area)
- Geothermal monitoring (temperature and permafrost behaviour)
- Physical geotechnical inspections (physical stability, erosion issues)

If monitoring activities indicate that cover is not effective, the following actions are proposed:

- Increase frequency of monitoring and data review;
- Repair erosion of the cover;
- Place additional cover over the landfill; and
- Extend the period of monitoring beyond 2010

VI. ISSUES

Issue 1: Who bears the onus for discharging the burden of proof?

The onus for discharging the burden of proof is addressed in Section 8.13 of the Nunavut Water Board Rules of Practice, which states:

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

This section makes it clear that the burden of proof falls upon the Licensee, CanZinco Limited. The Licensee must provide convincing evidence to persuade the NWB of the merits of its position in order to successfully discharge this burden.

Issue 2: Approval of the Reclamation and Closure Plan (Part G, Items 3-9)

The Nanisivik Mine 2004 Reclamation and Closure Plan presented by CanZinco for NWB approval was developed over two and a half years and included a series of four technical meetings which brought together a pool of technical expertise from across Canada.[3] These technical meetings included representatives from many Canadian and Nunavut government departments, including those intervening at the June 3-4, 2004 Public Hearing (the "Hearing"). The opening and closing remarks of these interveners attending the Hearing, including the Government of Nunavut[4], Indian and Northern Affairs Canada[5], Environment Canada[6], and the Department of Fisheries and Oceans

[3] Transcript, Volume 2, pages 289-290, lines 21-9.

[4] "The closure and reclamation plan, including the recent commitments that you have heard discussed earlier, represents, in our view, a sound process for the reclamation." Closing remarks of the Government of Nunavut presented by Susan Hardy, Transcript, Volume 2, page 302, lines 20-23.

[5] "In closing, INAC would like to reiterate the fact that this process, the reclamation and closure plan, the develop [sic] process has been interactive and has been done on a cooperative basis with the involvement of many parties. We have come a long way from two years ago, and we are very satisfied with the process to date." Closing remarks of Indian and Northern Affairs Canada presented by Stephanie Hawkins, Transcript, Volume 2, page 305, lines 10-6.

[6] "Through the course of the review of the reclamation and closure plan, Environment Canada has had the opportunity to identify many of our concerns, either directly to the proponent or through technical sessions that have been arranged by the Board. And as a result of these interactions, it has been able to conclude that the majority of our concerns have been addressed.", Environment Canada Presentation presented by Colette Meloche, Transcript, Volume 2, page 273, lines 4-11.

Canada[7], demonstrated to the NWB the strong support which exists for the overall approval of the Reclamation and Closure Plan.

At the same time, CanZinco, in a letter to the NWB dated May 14, 2004 responding to information requested at the final technical meeting held in Yellowknife on May 3-4, 2004 and in its presentation at the Hearing, has agreed to make certain changes to the Reclamation and Closure Plan submitted to the NWB. Further, the interveners' presentations demonstrate additional outstanding issues which the NWB believes require changes to the Reclamation and Closure Plan. Thus, a central issue for determination by the NWB was whether or not the various components of the Reclamation and Closure Plan as submitted by CanZinco were sufficiently complete to proceed with any further approval at this time.

To make this determination, the NWB considered the overall completeness of the Reclamation and Closure Plan, as well as the general nature of the outstanding issues discussed in detail below. Further, the NWB considered the evidence presented by the interveners regarding their overall satisfaction with the Reclamation and Closure Plan and CanZinco's high degree of cooperation in revising the Reclamation and Closure Plan over the past two and a half years, including CanZinco's past performance in meeting its commitments on technical studies. On this latter matter, Ms. Stephanie Hawkins, speaking on behalf of Indian and Northern Affairs Canada, stated:

> ...the proponent in the meeting in Calgary in 2002, made a commitment to undertake a number of technical studies. And they have met that and achieved all of these commitments made at that meeting, and they are to be commended in this for their efforts.[8]

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[7] "So once again, I think the plan basically is very good from the standpoint of fish and fish habitat.", Closing remarks of the Department of Fisheries and Oceans Canada presented by Derreck Moggy, Transcript, Volume 2, page 309, lines 3-6.

[8] Transcript, Volume 2, page 306, lines 4-9.

Moreover, Ms. Colette Meloche, speaking on behalf of Environment Canada, stated "Environment Canada is also satisfied with CanZinco's submitting an addendum to the various reports, rather than a revised reclamation plan."[9]

For these reasons, the NWB concluded generally that the Reclamation and Closure Plan is sufficiently complete to permit approvals as required in the License subject to CanZinco complying with the appropriate conditions and modifications required for each component of the Reclamation and Closure Plan as set out specifically in the following sections.

Approval of the Closure and Reclamation Plan (Part G, Items 3-9)

The Nunavut Water Board has approved, **subject to the conditions and modifications set out below**, the Nanisivik Mine 2004 Reclamation and Closure Plan submitted as per Part G, Item 3 of Licence NWB1NAN02208 and the related appendices:

- Engineering Design of Surface Reclamation Cover Report assessing the proposed cover as per Part G, Item 4 of the Licence;
- West Twin Disposal Area Talik Investigation Report assessing the postulated Talik in the surface tailings cell and the test cell as per Part G, Item 5 of the Licence;
- Borrows Areas Development and Closure Plan Report assessing all quarries required for cover construction as per Part G, Item 6 of the Licence;
- West Twin Disposal Area Surface Cell Spillway Design Report on the proposed spillway as per Part G, Item 7 of the Licence;
- Rock Piles and Open Pits Closure Plan assessing all waste rock as per Part G, Item 8 of the Licence;
- Reclamation and Closure Monitoring Plan Report on monitoring requirements as per Part G, Item 9 of the Licence.

2(a)(1): The Licensee is to investigate the industrial complex and concentrate storage shed concrete foundation areas for potential contamination and report to the NWB the findings and any related changes to the Engineering Design of Surface Reclamation

[9] Transcript, Volume 2, page 307, lines 5-7.

Cover Report, including but not be limited to a determination of whether the foundations and any associated contaminated soils should be removed and stored in the underground mine workings, for NWB approval.[10]

2(a)(2): The Licensee is to conduct a geochemical inspection of the West Open Pit and West Open Pit access road and report to the NWB the findings and any related changes to the Rock Piles and Open Pits Closure Plan for NWB approval. [11] The Licensee is to amend the Final Closure and Reclamation Plan to set out the plans for the disposition of five active transformers and PCB light ballasts on site, including a commitment to confirm that access to the underground transformer will not be blocked during the course of the reclamation work and that the removal of the underground transformer will take place prior to the sealing of the portals, for NWB approval.[12]

2(a)(3): The Licensee is to amend the Borrows Areas Development and Closure Plan Report to require the maintenance of a 50-meter buffer zone between all quarries and adjacent water bodies.[13]

2(a)(4): The Licensee is to amend the Final Closure and Reclamation Plan to include annual water quality monitoring, including total metals, TSS, pH, temperature, and

[10] CanZinco undertook this commitment as Item 1 of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed this commitment at the Hearing (Transcript, Volume 1, pages 65-66, lines 17-16, and Volume 2, page 154, lines 3-13).

[11] CanZinco undertook this commitment as Item 8 of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed this commitment at the Hearing (Transcript, Volume 2, page 153, lines 8-12).

[12] Environment Canada recommended the amendment related to these federally regulated materials (Transcript, Volume 2, pages 275-276, lines 8-15). CanZinco had no objection to this recommendation (Volume 2, page 277, line 2).

[13] CanZinco agreed to consider this commitment as Item 6 of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and subsequently agreed to the commitment at the Hearing (Transcript, Volume 1, page 80, lines 23-25).

conductivity at the inlet and outlet to Kuhulu Lake during the reclamation and closure periods.[14]

2(a)(5): The Licensee is to alter the Closure Monitoring Plan Report to lengthen the current 5 year minimum post closure monitoring period to such time as the NWB determines that there is sufficient strength of evidence, based on objective criteria to be determined during the development of the Terms for a Comprehensive Performance Review in 2007 (Part G, Item 22), to conclude that the Nanisivik site is stable and that no possibility for future negative effects exists. In determining that the reference to a 5 year period of post closure monitoring should be amended to require monitoring until such time as the NWB determines that there is sufficient strength of evidence, the NWB considered several factors. First, there is evidence before the Board that suggests the 2 year reclamation period plus 5 year post closure monitoring period is not sufficient from the outset. Mr. Bill Heath, presenting for CanZinco, stated "We estimate that it is going to take seven to eight years for the surface cell talik to freeze to the depth of the Dike, and that's a significant milestone. In seven to eight years, once it is frozen down to the bottom of the Dike, that really eliminates a lot of potential risk."[15] Second, several interveners have expressed reservations about a 5 year post closure monitoring program. Mr. Carl McLean, presenting for Indian and Northern Affairs Canada, provided only conditional support for the closure and monitoring plan stating "...this support is conditional on the proponent's identified commitment to modify the program, including lengthening of the monitoring period to address any and all concerns and environmental impacts that may be identified." [16] Ms. Susan Hardy, speaking on behalf of the Government of Nunavut stated "...the fact that the plan recognizes that the Water Board will give the approval that terminates monitoring is very significant to us. The monitoring would end only after an

[14] CanZinco undertook this commitment as Item 11 of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed this commitment at the Hearing (Transcript, Volume 1, page 74, lines 3-9).

[15] Transcript, Volume 1, pages 35-36, lines 21-26.

[16] Transcript, Volume 2, page 248, lines 6-10.

acceptable performance result is demonstrated. And that's a feature of their plan that doesn't match exactly with the stating that they think that will be seven years. Both ideas are in the plan. And the second one is more preferable to us, that it will be the Board who says seven years is right, based on the monitoring results you receive." [17]

Mr. George Hakongak, presenting for Nunavut Tunngavik Incorporated, stated "A significant concern resulting from the reclamation closure plan is the very short duration of monitoring before the comprehensive review planned for the year 2010. Many of the processes active on the site that could lead to adverse environmental impacts would take decades to manifest. Some of the processes are: Freeze-back of taliks in the tailings, acid rock drainage and degradation of the shale material in the reclamation covers.....It is strongly considered that it will be impossible to predict the ultimate fate of the reclamation measures at the mine site in 2010, given the complex interrelated processes taking place, particularly within the tailing facilities. A much longer closure monitoring period is strongly recommended to adequately assess the impacts of the reclamation and closure activities. The concern for NTI is that the long-term liability for the site could be prematurely released from the mining company based on predictions that turn out to be inaccurate."[18] The Hamlet of Arctic Bay recommended a 25 year monitoring period after completion of the clean up of the site and cites the agreement for DEW line site monitoring as a precedent for this recommendation.[19] Thus the Board recognizes the need to consider a longer post reclamation monitoring period.

Moreover, the NWB is of the view that this alteration is consistent with the post monitoring obligation as it is understood by CanZinco. CanZinco has acknowledged that the proposed 5 year post monitoring program is a minimum period of time for monitoring and subject to extension as a result of contingency plans required to respond to the proposed monitoring program.[20] Mr. Bob Carreau, presenting for CanZinco, correctly

[17] Transcript, Volume 2, page 206, lines 4-14.
[18] Transcript, Volume 2, pages 183-184, lines 19-19.
[19] Transcript, Volume 2, page 165, lines 15-21.

[20] Transcript, Volume 1, page 36, lines 14-17, and page 55, lines 13-18.

stated that "The overall objectives, in very general terms, is a return of the land to its natural conditions. We want to eliminate long-term care and maintenance so that the land is stable."[21] In response to the concerns expressed by interveners he further stated "One of the ones that came up on several interventions, is seven years monitoring adequate?...it is a living document, and we haven't made that clear...We have used a lot of site experience and feel very confident that we can predict how the site is going to behave. If it behaves differently then we will consider monitoring the site longer."[22] Further, he stated that the terms of reference established for the Comprehensive Environmental Review will determine "what are the results that we are looking for to be able to say that Nanisivik has reached stability and it is safe to leave."[23] A related issue is surveillance. The following items in the License support the need for physical "surveillance" as part of the monitoring plan:

Item D, Part 11 requires that the Licensee shall operate and maintain the East Adit Treatment Facility such that (i) The inspection of the retention pond and structures carried out weekly during periods of open water and records are kept of those inspections for review upon request of an Inspector.

Part D, Item 12 (v) requires signage to be posted and maintained around the West Twin Disposal Area and (vi) inspections of the West Twin Disposal Area and tailing lines are to be carried out weekly and records kept of these inspections for review upon request of an inspector.

Part D, Item 13 sets out that the Licensee shall perform more frequent inspections of the area specified in Part D, Item 11(i) and 12(vi) at the request of the inspector.

Part H, Item 4 the Licensee shall continue to maintain the necessary signs to identify the stations of the Monitoring Program. All signs shall be located and maintained to the satisfaction of an inspector.

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[21] Transcript, Volume 1, pages 56-57, lines 26-3.
[22] Transcript, Volume 1, page 64, lines 12-23.
[23] Transcript, Volume 1, page 56, lines 3-12.

Sampling also requires a presence at the site: Part H, Item 5 The Licensee shall collect the samples of effluent referred to in this part without delay when the circumstances permit if, at any time, the period specified for collecting samples was extended due to (i) unforeseen circumstances cause safety concerns or access problems and render the collection of samples of effluent impracticable; or (ii) the Licensee notifies the inspector of the circumstances.

Various items in Part H require collection of "grab samples" and "composite samples", and quarterly collection of water samples (Item 40).

There are a number of transcript quotes from CanZinco that demonstrate they are aware that there must be ongoing physical "surveillance" as part of the monitoring requirements.[24]

2(a)(6): The Licensee is to amend the Closure Monitoring Plan Report to provide a plan for the installation and monitoring of instrumentation and a contingency plan for the failure of instrumentation providing critical data to the monitoring program, including a recommendation that local residents be trained as required to ensure the monitoring program can be carried out without the presence of current mine staff after the closure, to the NWB for approval. The NWB is of the view that the post closure monitoring plan must be properly managed to ensure that the criteria established for the monitoring program are met and instruments must be managed such that critical data is available. Failure to do so may well lead to extended post closure monitoring.

2(a)(7): The Licensee is to amend the Closure Monitoring Plan Report to include providing the Council of the Hamlet of Arctic Bay with an executive summary in Inuktitut and a complete copy in English of the quarterly and annual post closure monitoring reports provided to the NWB.[25] In addition, the NWB recommends to the

[24] Volume 2, pages 36, 46, 47, and 54.
[25] CanZinco agreed to make NWB reports available to the people of Arctic Bay throughout the closure monitoring period (see Transcript, Volume 1, page 43, lines 17-20 and page 91, lines 7-13).

Licensee that it consider amending the Reclamation and Closure Plan to include periodic tours of the reclamation site for residents of Arctic Bay during the reclamation period.

2(a)(8): The Licensee is to finalize and append to the Reclamation and Closure Plan, the preliminary integrated information schedule presented at the Hearing. The final schedule is to include establishing the timeline for each major activity, including estimated start and completion dates for each activity and an indication if an activity is continuous or intermittent, and a critical path establishing which activities depend on the completion of other activities. The schedule is to be maintained and an updated appendix provided to the NWB each quarter or more frequently if significant changes are made to the schedule.

Approval of a report on the Environmental Site Assessment (Part G, Item 13)

On August 22, 2003, the NWB conditionally approved a Phase II Environmental Site Assessment. The conditional approval cited 15 conditions. In response to the conditional approval, CanZinco prepared and submitted for approval a Phase III Environmental Site Assessment on February 6, 2004. With the exception of the Item #3 of the conditional approval relating to the list of contaminants of concern of Nanisivik, the NWB has determined that these conditions have been met. As a result, NWB has approved, subject to the conditions and modifications set out below, the 2003 Phase III Environmental Site Assessment Report submitted as per Part G, Item 13 of the Licence.

2(b)(1): The Licensee is to conduct a polychlorinated biphenyl (PCB) sampling program in the soils beneath and surrounding the PCB storage facility and of the slab and the materials used for construction and maintenance, and report to the NWB the findings and any related changes to the Phase III Environmental Site Assessment Report for NWB approval.[26]

[26] CanZinco undertook this commitment as Item 3 of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed this commitment at the Hearing (see Transcript, Volume 1, page 72, lines 17-20).

2(b)(2): The Licensee is to conduct a total nitrogen, nitrate, and nitrite concentrations sampling program in the soils surrounding the ANFO Plant and report to the NWB the findings and any related changes to Phase III Environmental Site Assessment Report for NWB approval.[27]

Approval of a West Twin Disposal Area Closure Plan (Part G, Item 15)

The Nunavut Water Board has approved, subject to the conditions and modifications set out below, the West Twin Disposal Area Reclamation Plan Report submitted as per Part G, Item 15 of the Licence.

Approval of an Underground Mine Solid Waste Disposal Plan (Part G, Item 16)

The Nunavut Water Board has approved, subject to the conditions and modifications set out below, the Nanisivik Mine Waste Disposal Plan Report submitted as per Part G, Item 16 of the Licence.

2(d)(1): The Licensee is to provide a validation of the NRCan analysis using current mine conditions and a certified opinion of a Engineer on the future risks associated with mine stability issues, and any related changes to the Nanisivik Mine Waste Disposal Plan Report for NWB review.[28]

2(d)(2): The Licensee is to provide for NWB review, a detailed design closure and monitoring plans certified by a Professional Engineer for the mine portals, ventilation raises, and all other mine openings to surface.

Approval of a Landfill Closure Plan (Part G, Item 17)

[27] CanZinco undertook this commitment as Item 5 of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed this commitment at the Hearing (see Transcript, Volume 1, page 72, lines 21-25).

[28] CanZinco undertook this commitment as Item 2 a) of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed this commitment at the Hearing (see Transcript, Volume 2, page 152, lines 5-6).

The Nunavut Water Board has approved, subject to the conditions and modifications set out below, the Nanisivik Mine Landfill Closure Plan submitted as per Part G, Item 17 of the Licence.

2(e)(1): The Licensee will amend the Nanisivik Mine Landfill Closure Plan to include monitoring of hydrocarbon parameters BTEX, and F1 and F4 compounds every two weeks at NML-26, NML-30, and NML-29 monitoring stations during the reclamation period, with reduced frequency in the post closure period with prior approval of the reduction by the NWB. CanZinco undertook a commitment to monitor at the NML-29 location as Item 4 b) of its letter dated May 14, 2004 to the Executive Director of the Nunavut Water Board and further confirmed the commitment to this monitoring at the Hearing[29] At the Hearing, Environment Canada stated its understanding that the proposal made by CanZinco was "to monitor every two weeks for these parameters at NML-26 monitoring station."[30] Environment Canada advised the Board that a monitoring frequency of every two weeks was satisfactory.[31] However, Environment Canada recommended that the monitoring be extended to include two additional locations in order to indicate if there is any movement of hydrocarbons from the landfill.[32] CanZinco had no objection to this recommendation.[33]

2(e)(2): The Licensee will amend the Nanisivik Mine Landfill Closure Plan to require NWB approval prior to the removal of any parameter from the monitoring regimes, including the leachate monitoring program.[34]

[29] Transcript, Volume 2, page 153, lines 3-7.
[30] Transcript, Volume 2, page 274, lines 7-11.
[31] Transcript, Volume 2, page 274, lines 12-13.
[32] Transcript, Volume 2, pages 274-275, lines 16-1.
[33] Transcript, Volume 2, page 277, line 2.
[34] Indian and Northern Affairs Canada recommended the amendment requiring prior approval for the removal of any monitoring (see Transcript, Volume 2, page 250, lines 16-19). CanZinco had no objection to this recommendation (see Transcript, Volume 2, page 251, line 21).

Issue 3 **Compliance with Conditions**

CanZinco shall submit for NWB review or approval, in accordance with the *Letter of Approval*, alterations to the specific plans, reports or assessments as required to satisfy the conditions mandated in the *Letter of Approval*.

Moreover, in accordance with section 51(2) of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*[35] (the "Act") the Board reserves the right to hold a subsequent public hearing on the Mine Reclamation and Closure Plan and/or site visit. The requirement for a public hearing and/or site visit will be determined based on the nature and extent of findings and related amendments that are submitted for approval, as well as the results of the Annual Report to be filed with the Board no later than March 31, 2005 in accordance with Part B, Item 6 of the License. In particular, this will include consideration of Item 6(v), a summary of any closure and reclamation work undertaken during the year and an outline of any work anticipated for the next year, including any changes to implementing and scheduling, and item 6(vii) a public consultation/participation report describing consultation with local organizations and the residents of Arctic Bay.

Furthermore, the Board is aware through the Indian and Northern Affairs Canada Compliance Report that CanZinco may not be in compliance with the security conditions set out in Part B, Item 2 and/or Item 3 of the License.

These reasons for decision are specific to approvals sought under Part G, Items 3 through 9, 13, and 15 through 17 of the License and are *not to be construed by the Licensee as either a statement of compliance with any other conditions of the License or as a waiver of the requirement to comply with all of the conditions of the License.*

Issue 4. **Is this decision an "amendment" of the Licence such that Ministerial approval is required?**

Section 56 of the Act sets out the requirement for Ministerial Approval:

[35] 2002, c. 10.

(1) The issuance, amendment, renewal and cancellation of a type A licence and, if a public hearing is held, a type B licence are subject to the approval of the Minister.

(2) Within 45 days after the Minister receives a licence that has been issued, amended or renewed or a notice of cancellation of a licence, the Minister shall make a decision on whether to approve...

The October 2002 Reasons for Decision granting the CanZinco License contemplated that amendments to the Licence may be required when information is received from studies pending at the time of October 10, 2002 decision:

> Section 43 provides for the amendment or cancellation of licenses in situations where the NWB deems it to be in the public interest. Section 43(1) states:
>
> **43.** (1) Subject to this Act, the Board may
> (a) on application by the licensee, renew a licence, with or without changes to the conditions of the licence;
> (b) amend, for a specified term or otherwise, any condition of a licence
> (i) on application by the licensee,
> (ii) to deal with a water shortage, or
> (iii) where the Board considers the amendment to be in the public interest; and
> (c) cancel a licence
> (i) on application by the licensee,
> (ii) where the licensee, for three successive years, fails to exercise the licensee's rights under the licence, or
> (iii) where the Board considers the cancellation to be in the public interest.
>
> The NWB has concluded that the licence will be valid for a term of five years. Due to the fact that all necessary studies have yet to be filed, this licence will be subject to amendment and variation by the NWB as and when required under subsection 43(1). In other words, the NWB, after another public hearing tentatively scheduled for the first quarter of 2003, will determine amendments based upon additional information received from currently pending studies. From those studies, the NWB will amend the licence based upon whatever is presented and the NWB deems at that time to be in the public interest. [36]

The term "amendment" is not defined in the Act. However, the Act permits the NWB to include conditions in a licence for studies to be undertaken and plans to be submitted. Section 70 states:

[36] Reasons for Decision for License Application for the Closure and Reclamation of the Nanisivik Mine, Nunavut Water Board, October 10, 2002, page 20.

> **70.** (1) Subject to this Act and the regulations, the NWB may include in a licence any conditions that it considers appropriate, including conditions relating to
>
> (a) the manner in which waters may be used;
>
> (b) the quantity, concentration and types of waste that may be deposited and the manner of depositing waste;
>
> (c) the studies to be undertaken, works to be constructed, plans, including contingency plans, to be submitted, and monitoring programs to be undertaken; and
>
> (d) any future closing or abandonment of the appurtenant undertaking.
>
> (2) The monitoring programs referred to in paragraph (1)(c) may specify responsibilities of the applicant, the Nunavut Impact Review Board or Her Majesty the Queen in right of Canada.

It is not specifically stated to whom the plans permitted in section 70(1)(c) are to be submitted, however, a reasonable interpretation of that section is that such plans are submissions to the NWB. This is supported by section 70(2) which permits the NWB to specify responsibilities of other parties only for "monitoring programs referred to in (1)(c)" and not for all aspects of 70 (1)(c). This supports a finding that ongoing NWB activities related to licence conditions authorized by 70(1)(c) are not "amendments" to the licence.

The term "amendment" is defined in Part A, Item 2 of the Licence as meaning "a change to any terms and condition [sic] of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence." The conditions of CanZinco's Licence clearly contemplate an ongoing and iterative approval process, as well as an annual reporting and review process. In this context, the specific conditions of the licence are not subject to "correction, addition or deletion"; rather the specific requirements to fulfill the conditions have evolved during the closure and reclamation of the mine and are subject to the Board's ongoing review and approval. Moreover, the term "amendment" is not used in the relevant conditions in the licence. This supports a finding consistent with the preceding interpretation of section 70 of the Act.

Section 51(2) of the Act permits the Board, when satisfied that it would be in the public interest to do so, to hold a public hearing in connection with any matter relating to its

objects. Section 35 states the objects of the Board are "to provide for the conservation and utilization of waters in Nunavut, except in a national park, in a manner that will provide the optimum benefit from those waters for the residents of Nunavut in particular and Canadians in general." Thus the holding of a public hearing does not necessarily mean that the underlying terms and conditions of the licence are being reconsidered or amended. In fact, the June 3-4, 2004 Hearing was specifically relative to the "Nanisivik Mine's Closure and Reclamation Plan", not the amendment of the License. As such, the NWB has determined that the approval of the Plan as set out in the previous section does not constitute an amendment to the License.

VII. ISSUES OUTSIDE THE MANDATE OF THE BOARD

The NWB noted that a number of items arose during the Hearing that are not within the mandate of the NWB. The Board nevertheless wishes to set out these concerns to remind the parties of the undertakings that were made at the Hearing and of the importance of these issues to Arctic Bay.

Several residents spoke to the issue of employment for local people during the reclamation and post closure monitoring of the mine closure. CanZinco has stated an intention to involve and employ members of the community. At the same time, the Board heard from the Government of Nunavut that it was providing some pre-trade training to persons in the community so that people are ready for employment in the reclamation project, and from interveners that spoke to the importance of training and using local people during the post closure monitoring of the mine when permanent mine staff left the site. The Board is encouraged by this convergence of interests and hopes all parties will work together to train and employ Arctic Bay residents throughout the reclamation and closure period.

Representatives of the Council for the Hamlet of Arctic Bay and many of the individuals present at the Hearing also spoke strongly about the need to make surplus goods and building materials available to the residents of Arctic Bay. CanZinco has expressed a willingness to provide additional benefits in the form of materials, furnishings, housing

and large infrastructure to the residents of Arctic Bay to the extent that it is safe to do so. At the Hearing CanZinco asked the Government of Nunavut for specific guidance on which materials, furniture and infrastructure can be safely transferred, donated or sold to the people of Arctic Bay. To the greatest extent possible the Board encourages the Government of Nunavut to work with CanZinco to make materials that are safe and usable available to the people of Arctic Bay.

Finally, several residents of Arctic Bay expressed a heartfelt desire for tangible acknowledgement of the community's contribution to the Nanisivik Mine. Suggestions brought forward at the Hearing included a monument or cairn on Mt. Fuji commemorating the local people that were part of the exploration and development of the mine, and the preparation of a written history of the mine to record the contribution made by the local community and the impact of the mine on the community of Arctic Bay so that the next generation could see how the Inuit were involved in this important part of history. Mr. Bill Heath, speaking on behalf of CanZinco, told the Hearing that it was important that something concrete be done to acknowledge the contribution made by the people of Arctic Bay and doing so was important to CanZinco as well. The Board encourages CanZinco to work with the Arctic Bay community and, if at all possible, with the federal and territorial Parks departments to accomplish this.

The Government of Nunavut advised the NWB that it was convening a meeting with the residents of Arctic Bay in mid-July. CanZinco stated at the Hearing that it would very much like to participate at that meeting. The Board hopes that the concerns of the residents set out in this section can be more fully addressed by the parties at that time.

On the matter of abandonment and reclamation of assets belonging to third parties, during the Hearing, the Board was advised that preliminary discussions are underway between the Government of Nunavut and CanZinco for the Licensee to undertake the reclamation of Government of Nunavut assets located in the mine reclamation area.[37] The Board encourages these parties to reach agreement on this matter and confirms that should such

[37] See Transcript, Volume 2, page 222, lines 5-15.

an agreement be reached, the related reclamation activities undertaken by CanZinco will be permitted under the existing License, subject to the terms and conditions of the License. However, if an agreement is not reached with CanZinco, the Government of Nunavut is bound by section 7 of the Act and an application must be made to the NWB for a separate water license prior to undertaking reclamation activities. The Board notes this obligation was acknowledged by the Government of Nunavut at the Hearing.[38]

VIII. CONCLUSION

For the reasons listed above, the Board approves CanZinco's Closure and Reclamation Plan for the Nanisivik Mine, subject to the terms and conditions set out in Part VI of these Reasons for Decision.

Dated at Iqaluit, this _____ day of July, 2004.

_____
Thomas Kudloo
Chairman

[38] See Transcript. Volume 2, page 223, lines 1-13.

APPENDIX A – LIST OF SUBMISSIONS AND CORRESPONDENCE

Application:

1. Cover letter and initial submission of the Nanisivik Mine 2004 Reclamation and Closure Plan, dated February 6, 2004.

Initial Submissions and Correspondence:

1. Letter to Bob Carreau Corporate Manager Breakwater Resouces Ltd. dated February 6, 2004 Re: 23635 Nanisivik Landfill Closure Plan. Harvey Choy, M.A.Sc.,P.Eng, Eric Denholm, B.A. Sc .,P.Eng.

2. Letter to Bob Carreau Corporate Manager Breakwater Resources Ltd. dated February 6, 2004 Re: 23635 – Nanisivik Mine Rock Piles and Open Pits Closure Plan. Eric Denholm, Senior Mining Consultant, Principal Gartner Lee Ltd.

3. Letter to Robert Carreau Corporate Manager, Breakwater Resources Ltd. dated February 6, 2004 Re: Final Report: Engineering Design of Reclamation Covers. James W. Cassie Specialist Geotechnical Engineer BGC Engineering Inc.

4. Letter of Report to Nunavut Water Board dated February 6, 2004 Re: Nanisivik Mine 2004 Closure and Reclamation Plan. Prepared by CanZinco Ltd.

5. Letter to Nanisivik Distribution List dated February 9, 2004 Re: CanZinco Ltd. Submission of its Nanisivik Mine 2004 Reclamation and Closure Plan. Phyllis Beaulieu, Licensing Administrator NWB.

6. Letter to Distribution List dated February 9, 2004 Re: CanZinco Ltd. Submission of its Nanisivik Mine 2004 Reclamation and Closure Plan. Patrick Duxbury Mine Reclamation Coordinator NWB.

7. Letter to TAP, Dionne Filiatrault Senior Technical Advisor NWB, Meighan Wilson INAC, Christopher Baron, DFO Winnipeg, Stephan Harbicht Environment Canada dated February 9, 2004 Re: Report submitted by CanZinco Ltd. Mine Metal Mining EEM Study Design. Jenny Ferone Regional Environmental Effects Monitoring Coordinator.

8. Letter to Patrick Duxbury Project Coordinator NWB dated February 13, 2004 Re: Review Schedule of Nanisivik Mine 2004 Reclamation and Closure Plan. Elizabeth Sherlock A/Manager, Water Resources.

9. Letter to Distribution List dated February 16, 2004 Re: NWB's intentions to send its Mine Reclamation Coordinator to Arctic Bay. Philip di Pizzo, Executive Director NWB.

10. Letter to Nanisivik Distribution List dated February 16, 2004 Re: Nunavut Water Board proposed timeline for the review of the Nanisivik Mine 2004 Reclamation and Closure Plan. Patrick Duxbury Mine Reclamation Coordinator NWB.

11. Letter to Philip di Pizzo Executive Director NWB dated February 24, 2004 Re: Nanisivik Reclamation and Closure Plan. Stephen Traynor, Director, Operations INAC.

12. Letter to Phillipe di Pizzo Executive Director NWB, Robert Carreau Corporate Manager CanZinco Ltd. dated February 28, 2004 Re: Nanisivik Report delayed. Dionne Filiatrault Senior Technical Advisor NWB

13. Letter to Patrick Duxbury Mine Reclamation Coordinator NWB dated February 28, 2004 Re: Possible Technical Meeting. Michael Roy Qikiqtani Regional Coordinator Water Resouces INAC – Nunavut Regional Office.

14. Letter to Phillipe di Pizzo Executive Director NWB dated March 1, 2004, Request for further information Re: Waste Disposal Plan for Nanisivik Mine (NWB1NAN0208)-Part G-Item 16. Murray Markle Site Manager. Nansivik Mine.

15. Letter to Nanisivik Distribution List dated March 5, 2004 Re: Review of West Twin Disposal Area Closure Plan and Waste Disposal Plan for Nanisivik Mine. Phillipe di Pizzo Executive Director NWB.

16. Letter to Robert Carreau Corporate Manager Environmental Manager, CanZinco Ltd. dated March 10, 2004 Re: Detailed Design of West Twin Dyke Spillway. Ken A. Bocking P. Eng Principal Golder Associates Ltd.

17. Letter to Philippe di Pizzo Executive Director NWB dated March 11, 2004 Re: Response to March 5, 2004. Bill Heath President CanZinco Ltd.

18. Letter to Philippe di Pizzo Executive Director NWB dated March 12, 2004 Re: Scheduling of Nanisivik Mine Closure Technical Meetings and Pre-Hearing. Stephen Traynor, Director, Operations. INAC Nunavut Regional Office.

19. Letter to Philippe di Pizzo Executive Director NWB dated March 12, 2004 Re: Review Schedule for Nanisivik Reclamation and Closure Plan. Susan Hardy Legal Counsel, Legal and Constitutional Law Division.

20. Letter to Board Members dated March 12, 2004 Re: NWB1NAN0208. Philippe di Pizzo Executive Director NWB.

21. Letter to Phillipe di Pizzo Executive Director NWB dated March 15, 2004 Re: Thank you. Niore Iqalukjuaq Mayor of Municipality of Arctic Bay.

22. Letter to Nanisivik Distribution List dated March 18, 2004 Re: Establishment of Timetable for the review of the 2004 Nanisivik Mine Closure and Reclamation Plan. Philipe di Pizzo Executive Director NWB.

23. Letter to Nanisivik Mine Distribution List dated March 18, 2004 Re: Notice of Hearing. Phyllis Beaulieu Licensing Administrator NWB.

24. Letter to Distribution List dated March 22, 2004 Re: Directions regarding the technical meeting and pre-hearing conference for the approval of the Nanisivik Mine Closure and Reclamation Plan. Philip di Pizzo Executive Director NWB.

25. Letter to Distribution List dated March 22, 2004 Re: Request for review of 2003 Geotechnical Inspection of Waste Containment Dikes – Nanisivik Mine Nunavut. Phyllis Beaulieu Licensing Administrator NWB.

26. Letter to Arctic Bay and Pond Inlet dated March 24, 2004 Re: Notice of Application and Hearings. Phyllis Beaulieu Licensing Administrator NWB.

27. Letter to Distribution List dated March 24, 2004 Re: Report on Public Hearing held In Arctic Bay. Phyllis Beaulieu Licensing Administrator NWB

28. Letter to Philipe di Pizzo Executive Director NWB dated March 25, 2004 Re: Water License NWB1NAN0208. Murray Markle Site Manager Nansivik Mine.

29. Letter to Phyllis Beaulieu, Licensing Administrator dated March 25, 2004 Re: Report on Public Meeting held in Arctic Bay. Robert Carreau Corporate Manager Breakwater Resources Ltd.

30. Letter to Distribution List dated March 25, 2004 Re: Report on Public Meeting held in Arctic Bay. Phyllis Beaulieu Licensing Administrator NWB.

31. Letter to Phillipe di Pizzo Executive Director NWB dated March 31, 2004 Re: Submission of Water License No: NWB1NAN0208 Nanisivik Mine CanZinco Ltd. Murray Markle Site Manager Nanisivik Mine.

32. Letter to Phillipe di Pizzo dated March 31, 2004 Re: Water License No. NWB1NAN0208 Nanisivik Mine CanZinco Ltd. Murray Markle Site Manager Nanisivik Mine.

33. Letter to Philipe di Pizzo Executive Director NWB dated April 1, 2004 Re: 2004 1st Quarter Effluent Monitoring Report. Murray Markle Site Manager, Nansivik Mine.

34. Letter to Phillipe di Pizzo Executive Director NWB dated April 1, 2004 Re: 2004 1st Effluent Monitoring Report. Murray Markle Site Manager Nanisivik Mine.

35. Letter to Dionne Filiatrault Senior Technical Advisor NWB dated April 7, 2004 Re: Nanisivik Mine Review 2003 Geotechnical Inspection of Waste Containment Dikes. Ramli Halim P. Eng Acres International Ltd.

36. Letter to Nunavut Water Board dated April 7, 2004 Re: Nanisivik Mine Review of 2003 Geotechnical Inspection of Waste Containment Dikes. R.A Halim Senior Technical Engineer Acres International Ltd.

37. Letter to Phyllis Beaulieu Manager of Licensing NWB dated April 16, 2004 Re: NWB1NAN0208 Review of 2003 Geotechnical Inspection of Waste Containment Dikes Nanisivik Mine. Gladis Lemus Ph.D. Department of Environment.

38. Letter to Stephanie Hawkins INAC Nunavut Regional Office dated April 16, 2004 Re: Annual Dikes Inspection Report 2003 Nanisivik Mine Nunavut Water Board License NWB1NAN0208. Donald W. Hayley Principal Engineer EBA Engineering Consultants Ltd.

39. Letter to Phyllis Beaulier Manager of Licensing NWB dated April 16, 2004 Re: Review of 2003 Geotechnical Inspection Waste Containment Dike's Nanisivik Mine. Stephanie Hawkins INAC Nunavut Regional Office.

40. Letter to Distribution List dated April 20, 2004 Re: Site Visit (Information Only).

41. Letter to Dionne Filiatrault Senior Technical Advisor NWB dated April 26, 2004 Re: Nanisivik Mine Reviews of the 2004 Submission of the Nanisivik Mine Reclamation and Closure Plan. R.A. Halim P.Eng Senior Geotechnical Engineer Acres International Ltd

42. Letter to Phillipe di Pizzo Executive Director NWB, Robert Carreau Corporate Manager Environmental Affairs, Breakwater Resource Ltd. dated April 26, 2004 Re: Technical questions derived from review of the Nanisivik Mine 2004 Reclamation and Closure Plan. Stephen Traynor, Director, Operations INAC. Nunavut Regional Office.

43. Letter to Philippe di Pizzo Executive Director NWB dated April 26, 2004, Re: Reclamation and Closure Plan-GN Comments (Department of Environment). Gladis Lemus, Ph.D. Department of Environment GN.

44. Letter to Philippe di Pizzo Executive Director NWB dated April 26, 2004 Re: License NWB1NAN0208 – Nanisivik Mine 2004 Reclamation and Closure Plan – GN Comments Department of Environment. Gladis Lemus Ph.D. Department of Environment.

45. Letter to Patrick Duxbury Mine Project Coordinator NWB and Robert Carreau Corporate Manager Breakwater Resources Ltd. dated April 26, 2004 Re: Nanisivik Mine Reclamation and Closure Plan – Primary Issue List. Colette Meloche Environmental Assessment Specialist Environment Canada.

46. Letter to Nanisivik Distribution List dated April 28, 2004 Re:Agenda for Technical Meeting and Pre-Hearing on the 2004 Nanisivik Mine Closure and Reclamation Plan. Dionne Filiatrault Senior Technical Advisor NWB.

47. Letter to Phillipe di Pizzo Executive Director NWB dated April 29, 2004 Re: License NWB1NAN0208 Nanisivik Mine HHERA Oct 2003 GN Comments (Department pf Environment). Gladis Lemus Ph. D. A/Director Environmental Protection Division GN.

48. Letter to Gladis Lemus Ph.D. A/Director Environmental Protection Division Department of Environment GN dated April 30, 2004 Re: GN-DOE Comments on Nanisivik Mine HHERA Oct. 2003. Dionne Filiatrault Senior Technical Advisor NWB.

49. Letter to Gladis Lemus GN Cc. Nanisivik Distribution List dated April 30, 2004 Re: Response to GN's submission on HHERA. Patrick Duxbury Mine Reclamation Coordinator NWB.

50. Letter to Nanisivik Distribution List dated April 30, 2004 Re: Response to GN's submission on HHERA. Patrick Duxbury Reclamation Coordinator NWB.

51. Pre-Hearing Notes on a meeting dated May 4, 2004 Yellowknife, NWT Re: Nanisivik Mine Final Closure and Reclamation Plan

52. Pre-Hearing Notes on a meeting dated May 5, 2004 Yellowknife, NWT Re: Nanisivik Mine Final Closure and Reclamation Plan.

53. Pre-Hearing Notes on a meeting dated May 6, 2004 Yellowknife, NWT Re: Nanisivik Mine Final Closure and Reclamation Plan.

54. Letter to Distribution List dated May 10, 2004 Re: Technical Meeting and Pre-Hearing conference Nanisivik Mine Reclamation & Closure Plan NWB License NWB1NAN0208. Philippe di Pizzo Executive Director NWB.

55. Letter to Dionne Filiatrault Senior Technical Advisor NWB dated May 13, 2004 Re: Review of Government of Nunavut Department of Environment comments on HHERA for Nanisivik Mine Closure. Bryan Leece Ph.D. Senior Toxicologist/Risk Assessment Specialist Dillon Consulting Ltd.

56. Letter to Philippe diPizzo, NWB dated May 14, 2004 re: Response to Information Requests – Nanisivik Mine 2004 Reclamation and Closure Plan. Robert Carreau, Breakwater Resources Limited

57. Letter to Philippe diPizzo, NWB dated May 14, 2004 re: Response to Nanisivik Pre-hearing Information Requests. Stephanie Hawkins, Indian and Northern Affairs.

58. Letter to Nanisivik Distribution List dated May 19, 2004. Re:Report on NWB's recent community consultation activities in Arctic Bay. Philippe di Pizzo Executive Director NWB.

59. Letter to Nanisivik Distribution List dated May 26, 2004 Re: NWB response to concerns raised by the GN Department of Environment's April 29, 2004 concerning the Nanisivik Mine HHERA. Patrick Duxbury Project Coordinator NWB.

60. Letter to Distribution List dated May 26, 2004 Re: Nunavut Water Board response to concerns raised by the GN Department of Environment's April 29, 2004 letter concerning Nanisivik Mine HHERA. Patrick Duxbury Project Coordinator NWB

61. Letter to Philippe diPizzo, NWB dated May 26, 2004 re: Request Status of the Environmental Effects Monitoring requirements for the closure of Nanisivik pursuant to the Metal Mining Effluent Regulations. Stephen Harbicht, Environment Canada

62. Fisheries & Oceans Canada Intervention Comments Nanisivik Mine - Closure and Reclamation Plan, dated May 28, 2004.

63. Fisheries & Oceans Canada Intervention Comments for the Nanisivik Mine Closure and Reclamation Plan – Executive Summary, dated May 28, 2004.

64. Letter to Philippe diPizzo, NWB dated May 28, 2004 re: License NWB1NAN0208 – Nanisivik Mine Human Health and Ecological Risk Assessment Oct 2003 – Response to NWB (May 26, 04) and Dillon

Consulting (May 13, 04) Review. Earle Baddaloo, Department of Environment.

65. Letter to Philippe diPizzo, NWB dated May 28, 2004 re: License NWB1NAN0208 – Public Hearing Submission on behalf of the Government of Nunavut. Susan Hardy, Department of Justice.

66. Nunavut Tunngavik Inc. Submission to the Nunavut Water Board for the Final Hearing (June 2004, Arctic Bay) of the Breakwater Resources Reclamation Closure Plan of the Nanisivik Minesite, dated May 28, 2004.

67. Letter to Philippe diPizzo, NWB dated May 28, 2004 re: Nanisivik Closure and Reclamation Plan Public Hearing Submission. Stephen Harbicht, Environment Canada.

68. Letter to Philippe diPizzo, NWB dated May 28, 2004 re: Nanisivik Mine 2004 Reclamation and Closure Plan – Written Intervention. Glen Stephens, Indian and Northern Affairs Canada.

69. Acres International submission to the Nunavut Water Board on Nanisivik Mine's Closure and Reclamation Plan prepared for the June 3-4, 2004 Public Hearing in Arctic Bay/Nanisivik, dated May 28, 2004.

70. Letter to Dionne Filiatrault, NWB dated May 28, 2004 re: Human Health & Ecological Risk Assessment: Nanisivik Mine Peer Review. Bryan Leece, Dillon Consulting Limited.

71. Letter to Philippe diPizzo, NWB dated May 28, 2004, Subject: Nanisivik Reclamation letter from Hamlet of Arctic Bay. Niore Iqalukjuak, Mayor of Arctic Bay.

72. Letter to Philipe di Pizzo Executive Director NWB dated May 28, 2004 Re: 2003 1st Quarter Effluent Monitoring Report. Murray Markle Site Manager Nanisivik Mine.

73. Written Intervention by Indian and Northern Affairs Canada dated May 28, 2004 for Nanisivik Mine Reclamation and Closure Plan.

APPENDIX B – LIST OF EXHIBITS FILED AT THE JUNE 3-4, 2004 PUBLIC HEARING

Exhibit 1 Bill Heath, CanZinco Limited, Presentation (Electronic Version).

Exhibit 2 Bill Heath, CanZinco Limited, Presentation (Hard Copy Version).

Exhibit 3 Levi Barnabas, MLA for Quttiktuq, Statement to the Nunavut Water Board, dated June 2, 2004.

Exhibit 4 Susan Hardy, Government of Nunavut, Presentation "Nanisvik Mine Closure and Reclamation Plan NWB Public Hearing – June 3-4, 2004" (Electronic Version).

Exhibit 5 Susan Hardy, Government of Nunavut, Presentation "Nanisivik Mine Closure and Reclamation Plan NWB Public Hearing – June 3-4, 2004" (Hard Copy Version).

Exhibit 6 The Nanisivik Legacy in Arctic Bay, A Socio-Economic Impact Study, prepared by Brubacher and Associates, on behalf of the Government of Nunavut, 2002.

Exhibit 7 Carl McLean, Indian and Northern Affairs Canada, Presentation "Intervention – 2004 Nanisivik Reclamation and Closure Plan, Arctic Bay June 3-4, 2004 Nunavut Water Board Public Hearing" (Electronic Version).

Exhibit 8 Carl McLean, Indian and Northern Affairs Canada, Presentation "Intervention – 2004 Nanisivik Reclamation and Closure Plan, Arctic Bay June 3-4, 2004 Nunavut Water Board Public Hearing" (Hard Copy Version).

Exhibit 9 Map identifying approximate location of abandoned airport landfill (identified by Moses Oyukuluk).

Exhibit 10 Canadian Coast Guard Nanisivik Lease L-9195300 Map.

Exhibit 11 Ramli Halim, Acres International Limited (Consultant to the Nunavut Water Board), Presentation "Nanisivik Mine – Nunavut Public Hearing in Arctic Bay, June 3-4, 2004 Closure and Reclamation Plan" (Electronic Version).

Exhibit 12 Ramli Halim, Acres International Limited (Consultant to the Nunavut Water Board), Presentation "Nanisivik Mine – Nunavut Public Hearing in Arctic Bay, June 3-4, 2004 Closure and Reclamation Plan" (Hard Copy Version).